SONG and DANCE
Math Arranges Nature

EPIPHANIES TO SHIFT THE PARADIGM

Introducing ***HUT*** **...** HARMONIC UNIFIELD THEORY

MARK C BILLINGTON CASA OMEGA JAN 2025

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Introducing ***HUT*:**
HARMONIC UNIFIELD THEORY

"New difficulties arising in the development of science force our theory to become more and more abstract. Unexpected adventures still await us. But our final aim is always a better understanding of reality… The simpler our picture of the external world and the more facts it embraces, the stronger it reflects in our minds the harmony of the universe… To obtain even a partial solution the scientist must collect the unordered facts available and make them coherent and understandable by creative thought." *Evolution of Physics*, Albert Einstein & Leopold Infeld

from Mariam Webster dictionary:

epiphany
a usually sudden manifestation or perception of the essential nature or meaning of something

paradigm
a philosophical or theoretical framework of any kind

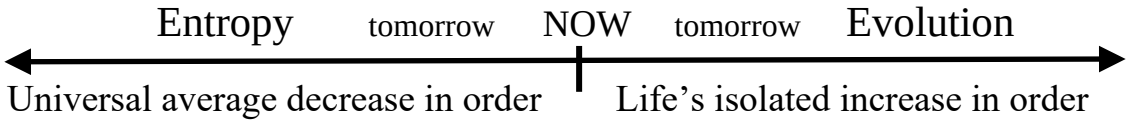
Cover: 2 x 5 dance art by Toño Castañeda of San Blas, Mexico

MARK C BILLINGTON

Casa Omega January 20, 2025

Humanity's Story of Unifying Ideas

Advancements in science come from unifying incomplete or separate ideas. Religions have unified many ideas into one, or some. Art unifies many perspectives into one product. Life brings together and synergizes separate elements, molecules, minerals, and nutrients into a single unified organism. Oppositely, entropy, defined by the second law of thermodynamics (*2LoT*), has everything falling apart throughout the universe. Entropy is the measure of disorder, the disorder that *2LoT* has increasing, on the average, from the beginning of time until the end. The end of the march of entropy is equilibrium, like a lake calming after a storm. In our Earth reality, our biosphere delays the marching onslaught of entropy and our protected pocket allows life to evolve. Science shows that life has been increasing complexity for three and a half billion years.



After his first two main accomplishments, being the Special and General Theories of Relativity, Einstein coined the term Unified Field Theory. This became his life goal. *Song and Dance Math Arranges Nature* claims that the Harmonic Unifield Theory, *HUT*, presents the correct solution for Einstein's unaccomplished quest. Specifically, Einstein sought for a math that would define the common field guiding both gravitation and electromagnetism. The nuclear weak force and the nuclear strong force have joined in the energy fields that must be united in a unified field theory. *HUT* claims the mathematical set known as harmonics defines the unified field and accurately solves the problem.

Harmonics begin upon equilibrium. Consider that the lake which has calmed represents equilibrium. Lobbing a small rock onto water disturbs the flat surface tension. As gravity pulls the rock downward, stretching the surface of the water downward at the same time, the resilience of the water's surface causes it to rebound upward. Then gravity pulls the wave downward again. As this oscillation continues, the energy dissipates outward causing concentric circles on the water's surface. The rings diminish in force as the source point oscillation loses energy. This

sequence creates a unified field of harmonic wave information on the water. The universe is like that, the big bang being the pebble-point and the lake equilibrium being original void, which is expressible with Einstein's zero cosmological constant, being the universal vacuum's average energy density.

Yet original void is not a two-dimensional plane. This occurs with the void's creation of the virtual particle-antiparticle pairs that must dance in patterns to avoid annihilation. The dancing pairs' high order contains the void and provides the background 2-D surface upon which the universal harmonics manifest all that is. One point's single disturbance upon the equilibrium allows the expansion of the harmonically diversifying unified field. This opens the question for *HUT* scientific discussion: if this dance from the void is so organized that entropy can deteriorate and recreate the information for all time, does this require a choreographer?

As a rainbow, electromagnetism displays its cohesive unification within the harmonic unified field. Gravity too is displayed as the cohesiveness of gravity's rainbow. Imagine filling five balloons to equal size with 1) air, 2) helium, 3) water, 4) oil, and 5) sand. Imagine standing on a diving board over a swimming pool. One at a time, drop the five balloons. Witness that gravity does not treat all objects the same. Gravity is in differential layers. The helium balloon goes up and away. The air balloon drops to float on the water's surface. The sand balloon sinks to the bottom of the pool. The oil balloon sinks to break through and float just along the water's surface. The water balloon drops down and moves more freely below the surface than the oil balloon, but not pegged to the bottom like the sand balloon. Gravity's rainbow, displayed in the sinking and buoyancy layering of the five balloons, is based upon atomic-molecular weight and density, affected by temperature and pressure.

During Einstein's life, the science of holography was not yet known. Holographic understanding is key to a new paradigm of understanding how two or more fields unify. When recording a hologram on a holographic plate, these two fields must merge: the unified field of the reference wave, and the field of the diversified objective wave. The

joining of these two fields requires a “fixed point” within the object side that relates directly to the unity of the reference side. This fixed point serves as the fundamental tonal center providing overtones to harmonize the diversification of the object side.

The summary for *HUT* is: The Synthesis of the Zero Cosmological Constant with Holography and Harmonics into the Unified Field Theory.

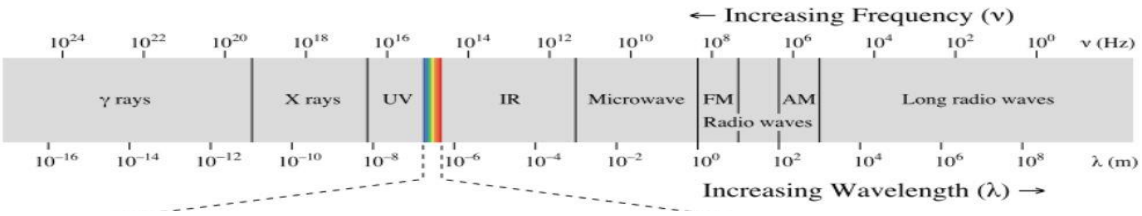
HUT’s purpose is to show that one hologramic reference and its diversified harmonic field dominate all other fields within existence, demonstrated through a precise re-ordering of the periodic table, and a harmonic equation for where our solar system’s planets orbit. Also presented is a retuning to a truly harmonic music scale. Basic atomic charges are altered to reflect quark charges, which dispenses of the problem of missing anti-matter. Biology’s dependance upon the math of harmonics is proposed. The inventions, discoveries, and imaginings of the human mind within sciences, arts, and religions are all shown, through a signal to noise ratio, to be dependent upon the hologramic-harmonic unified field. The current scientific paradigm has difficulty finding a proper model to use as a tool for understanding the very tool that is doing the understanding. *HUT* is proposed as being the new paradigm for humanity. The extension of this new paradigm to individuals is that every part of creation is within the greater whole, and that the whole is within every part, which necessarily concludes that every part contains every part.

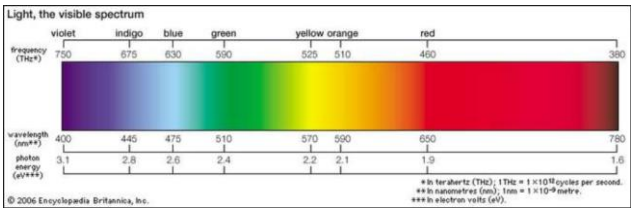
T.H. White in *The Once and Future King* had Merlin explaining to young Arthur that the best way to overcome sadness is to learn something. The purpose of this *HUT* outreach is to provide a special perspective for anyone, even everyone, to learn what we already know, but too often cannot remember, or reformulate. If we, as a species, can lighten our hearts just a bit, many new graces can occur.

Song and Dance Math Arranges Nature
(SADMAN)

HOLOGRAMIC HARMONIC UNIFIED FIELD THEORY

PROPOSALS FOR SCIENCE EDUCATION





The above three pieces of art from the internet have been used here without permission, as have others throughout the book.

The Synthesis of the Zero Cosmological Constant with Holography and Harmonics into the Unified Field Theory

SONG and DANCE
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EPIPHANIES TO SHIFT THE PARADIGM

Introducing ***HUT*****:**
HARMONIC UNIFIELD THEORY

Theoretical Science Non-Fiction

CASA OMEGA

0123456789

January 20, 2025
Keep-on-Editing Edition

This book is
dedicated
to Juniper
and to people
who *believe* enough
in the need to *choose*
to *learn* more about
harmony.

Due to continuous minor and major changes to HUT
and lacking anyone except myself for editing
the numbers and words in this book,
errors must be inevitable.
$I = Mc^B$

Song and Dance Math Arranges Nature

EPIPHANIES TO SHIFT THE PARADIGM

Introducing ***HUT*****:** HARMONIC UNIFIELD THEORY

"There was a harmonious reality underlying the laws of the universe,
Einstein thought, and the goal of science was to discover it."
Einstein, His Life and Universe, Walter Isaacson

Source signal grows and fades

My quest was to know how the momentum of human imagination, memories, and plans could transcend the constraints of our own bodies that are positioned in a specific time and place. At Eagle Point, on San Juan Island in Washington State, October 4, 1982, I found my answer in the synthesis of a zero cosmological constant with holography and harmonics into a unified field theory.

With my job as a professional ski patroller between 1979 and 1988, we did regular transceiver practice. While triggering avalanches with dynamite, inside our ski parkas, patrollers carry these gadgets which can either transmit or receive, depending on the flip of a switch. Ski with it broadcasting a signal so if you are buried in an avalanche, your partners can switch from transmitting to receiving a signal. The rescuer skis zigzags down the hill while listening to the avalanche victim's signal. As the signal grows, the volume is turned down to increase sensitivity. The rescuer skis past the buried transceiver, and the signal intensity decreases, requiring a turn-around. This is the way to home in on the signal. At Alpental, then at Crystal Mountain, it was one of my jobs to train people. I would ski down in a place that was already tracked up enough, allowing the visual tracking of my movements to be obscured. I would bury the transmitter, and the trainees at the top of this practice area received the signal.

The skier begins uphill and traverses down, tuning in the signal by turning down the volume, trying not to ski too low.

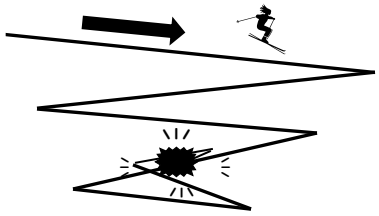


Fig.0.1 Transceivers
Narrowing in on the signal until right on top, this is where the rescuer digs.

Searching for this theory has been the same: the search for the strongest signal. Many people claim to have unified field theories, and I would guess that most of those people, like me, do not have proper credentials for easily obtaining peer review for such a claim. My attitude is that *HUT* must state my proposals for refining and furthering science education and that the clarity of my proposed signal must stand on its own, regardless of my lack of affiliations, degrees, publications, and other credentials.

Contents of Chapters

HUT Proposal: Harmony is the One Field that Guides Everything

"…this volume is one long argument…" Darwin, *Origin of Species*

* sub-chapter contents located at beginning of chapter

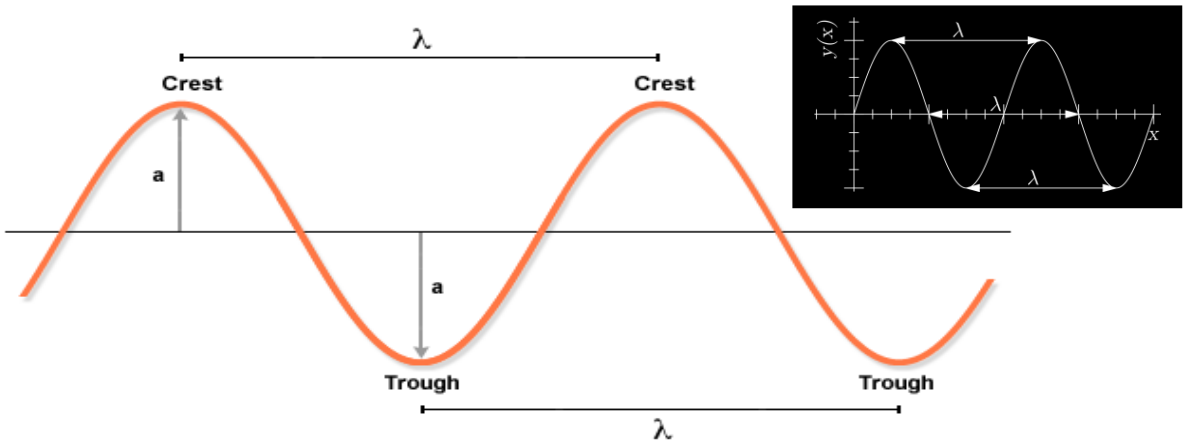
The FURTHER section discusses science without including God.
FURTHER MORE no longer avoids the unification of science with God.
BEYOND imagines the limits of order and imagination beyond time and space.

Note: throughout *HUT*, the words like electromagnetism and electromagnetic are abbreviated as EM. Also, "dimension" is abbreviated often as -D, as in {1-D, 2-D,3-D}.

Contents of Figures

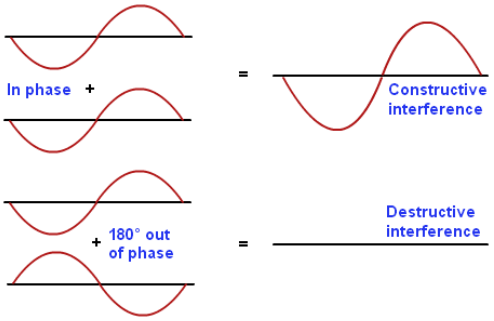
Due to 42 years of continual changes to this project,
no index has been created, though one is needed very much.

Fig.0.2 **Wave Vocabulary** diagrams from internet without permission

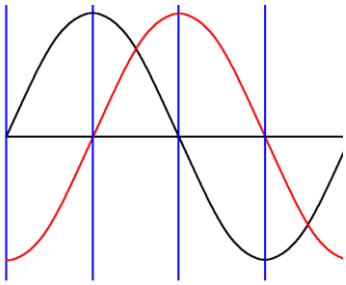


Amplitude (a) in light is brightness, and in sound is volume.
Frequency or wavelength (f or λ) in sound is the specific tone and in light is color.

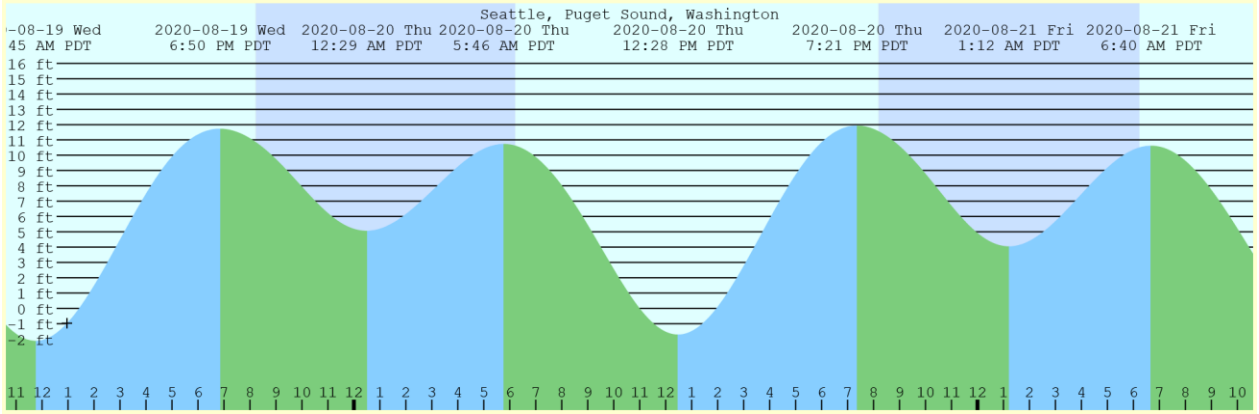
Wavelength = lambda = λ = one "cycle": from one point to its equivalent, as from crest to crest
Frequency = f = number of cycles to pass a point per unit of time: Hertz (cycles per second)
Speed = c = frequency x wavelength = $f\lambda$
Amplitude = a = wave height between trough or crest and horizonal mid-line (rest position)
Phase = comparison (in degrees) of trough & crest locations of two or more wavelengths:



90° out of phase:



The location and timing relationship of two or more repeating waveform cycles define phase.

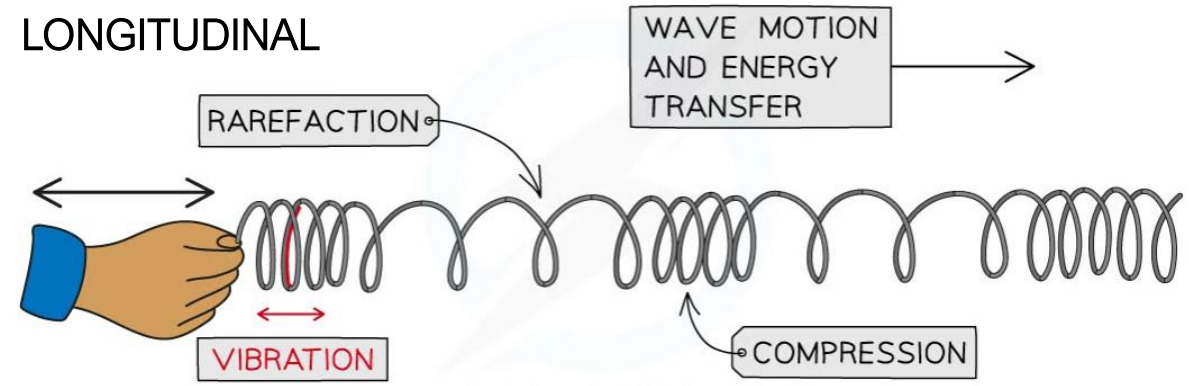


These troughs & crests of ocean tides are composite gravity waves of Moon & Earth cycles with the Sun. A **Fourier Analysis** separates the multiple wave cycles from a composite wave.

Longitudinal and Transverse Waves

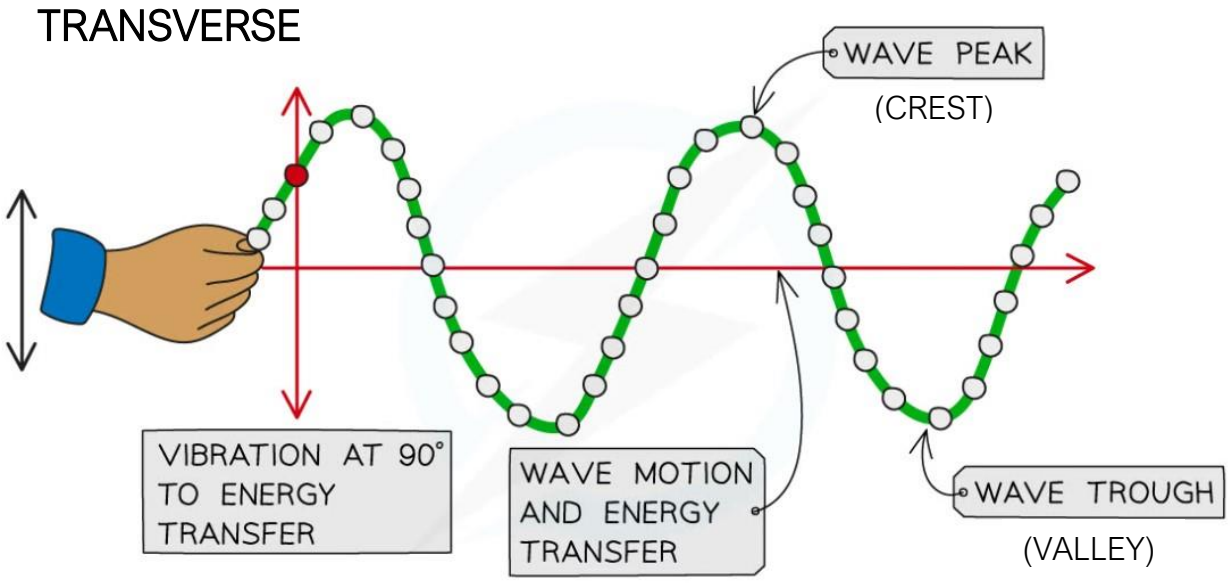
A wave can be an organized motion of energy from one point to another. The wave does not necessarily transport matter. Exception example: the ocean wave as a carrier wave transports a surfer. The wave particles only move in their own neighborhood, but wave energy continues forward *through* the medium*. Waves are generally divided into two types: longitudinal waves and transverse waves. Particles in the path of a longitudinal wave move forward and backward ↔. Particles in the path of a passing transverse wave move up and down ↕.

Fig.0.3 Longitudinal vs Transverse



Longitudinal waves are seen when playing with a popular *slinky* spring toy. Sound waves are an example, produced and transmitted in solid, liquid, and gas. Drawings modified from: IGCSE.

Transverse waves are material waves that pass through solids and light waves passing through the "void" (possibility field in *HUT*): rolling over the water surface.



The hand waving a rope is an experiment easily done at home. Tie one end stationary to a wall or have a friend hold it steadily. A guitar string with *transverse* waves creates pressure in the air, transferring energy to the *longitudinal* waves of sound, striking our ear drums with compressions that transfer to electrical transverse waves (with longitude mixed in) reaching our brains for our minds to interpret, bringing meaning to our world consciousness.

Fig.0.4 (note: λ/2 = ॐ, see Figs.I.1 & .XX.6)

Harmonic References

Wave integers described	Harmonic H number	Frequency multiplier	Pitch class
One arch, up *or* down: (λ/2)	First harmonic: ॐ	Fundamental tone: f	Doe
Two arches, up *and* down: λ	Second harmonic: 2ॐ	1st overtone*: $2f$	Doe
Three arches: 3λ/2	Third harmonic: 3ॐ	2nd overtone: $3f$	Sol
4 arches: 2 up & 2 down: 2λ	4th harmonic: 4ॐ	3rd overtone: $4f$	Doe
5 arches: 2.5 λ = 5λ/2	5th harmonic: 5ॐ	4th overtone: $5f$	Mee
6 arches: 3λ	6th harmonic: 6ॐ	5th overtone: $6f$	Sol
7 arches: 3.5 λ = 7λ/2	7th harmonic: 7ॐ	6th overtone: $7f$	Ah
8 arches: 4λ	8th harmonic: 8ॐ	7th overtone: $8f$	Doe
9 arches: 4.5 λ = 9λ/2	9th harmonic: 9ॐ	8th overtone: $9f$	Rae
10 arches: 5λ	10th harmonic: 10ॐ	9th overtone: $10f$	Mee
11 arches: 5.5 λ = 11λ/2	11th harmonic: 11ॐ	10th overtone: $11f$	Fu
12 arches: 6 λ	12th harmonic: 12ॐ	11th overtone: $12f$	Sol
13 arches: 6.5λ	13th harmonic: 13ॐ	12th overtone: $13f$	Mu
14 arches: 7 λ	14th harmonic: 14ॐ	13th overtone: $14f$	Ah
15 arches: 7.5λ	15th harmonic: 15ॐ	14th overtone: $15f$	Tee
16 arches: 8 λ	16th harmonic: 16ॐ	15th overtone: $16f$	Doe…

***f* = frequency** The fundamental frequency is multiplied by integers, producing overtones.
λ = lambda = wavelength = physics' term for 2 arches on a vibrating string: 1 up *and* 1 down. Harmonics' fundamental tone is one half of a wavelength, λ/2, a single arch up *or* down. Removing the 2 from under lambda makes discussing harmonic math much cleaner. Used here to remove the 2 is a newly appointed mathematical symbol, ॐ, the Hindu symbol expressing the universal fundamental tone. Using ॐ as the fundamental tone, **ॐ = λ/2** (second column above), allows the math to be free of the dividing by two. E.G., 7λ/2 = 7ॐ.

*After the *1st* or *2nd*, precise numeric accounting of "overtones" becomes non-productive. Where n = {1,2,3,4…}, it is enough to acknowledge that the accepted accounting is:
nth harmonic = (nth – 1) overtone

Definitions of: UNIFIED FIELD THEORY

1. a theory unifying the four interacting fields (electromagnetic, gravitational, weak, and strong) previously described by separate field theories.

2. …field theory that allows…fundamental forces and elementary particles to be written in terms of a pair of physical and virtual fields. (*Wikipedia*)

3. …the long-sought means of tying together all known phenomena to explain the nature and behavior of all matter and energy in existence...A unified field theory would reconcile seemingly incompatible aspects of various field theories to create a single comprehensive set of equations. Such a theory could potentially unlock all the secrets of nature and make a myriad of wonders possible... (*What is.com*)

4. … an attempt to describe all fundamental forces and the relationships between elementary particles in terms of a single theoretical framework…forces can be described by fields that mediate interactions between separate objects…Einstein and others attempted to construct a unified field theory in which electromagnetism and gravity would emerge as different aspects of a single fundamental field. They failed…. (*Encyclopedia Britannica, Christine Sutton*)

5. …Albert Einstein spent the last thirty years of his life on a fruitless quest for a way to combine gravity and electromagnetism into a single elegant theory.

   Einstein was motivated by an intellectual need to unify the forces of nature. He felt very strongly that all of nature must be described by a single theory. "The intellect seeking after an integrated theory cannot rest content with the assumption that there exist two distinct fields totally independent of each other by their nature," Einstein said in his Nobel lecture in 1923.

   In addition, he believed there was a link between the need to resolve apparent paradoxes of quantum mechanics and the need to unify electromagnetism and gravity. Einstein always insisted that quantum mechanics could be derived from some more complete theory. For Einstein, who was never satisfied with the weirdness and randomness inherent in quantum theory, any acceptable unified field theory had to have quantum mechanics as a consequence. (American Physical Society)

6. (from: *HUT*)

An equation expresses equality between two different fields such as mass and energy, and therefore does not define the unified-field theory. The equation $E = Mc^2$ already contains the unified set-mathematics of harmonic wavelengths and frequencies, exemplified when expressed using symbolic replacements derived from the equation: $c = f\lambda$.

With $c = f\lambda$, where speed (c) equals frequency (f) times wavelength (λ), the harmonics enter into $E = Mc^2$ as $E = M(f\lambda)^2$.

The equation, $c = f\lambda$, applies not just to the constant speed of light, but to all constant speeds, such as sound, a rolling wheel, or the frequency of the different lengths of steps of people—allowing them to walk side-by-side at the same speed—in harmony.

Harmony is the unified field that all else abides by. Harmony is the unified field theory.

Science seeks new unifications.
Once the scientist has a unifying experience,
the work begins to diversify unity into clear details.
Once the parts needed to demonstrate unity are clarified,
then unity needs to be exposed to students of the many parts.

For an explanation of this logo,
created by Mark and Ammah Billington, see chapter XVII.

The author of *HUT* claims no appreciable affiliations,
credentials, publications, nor any formal education
in the fields of chemistry, physics, or any science.
All attempts to publish, to achieve peer review
fail to get past the secretaries who respond
that such a submission is unfit for review.
UnFiT = Unified Field Theory

SONG and DANCE Math Arranges Nature

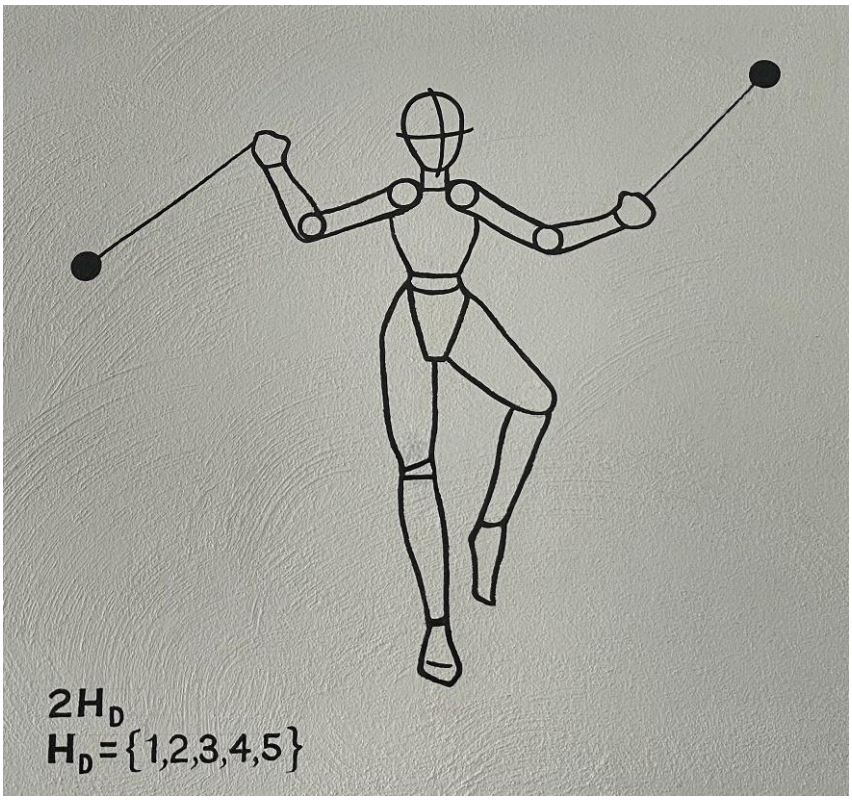
The Dancing Singing Circle is the Common Denominator of the Harmonic Universe, of Unity and Diversity.

The Circle Song

The harmony song begins with the fundamental tone {1}:
A constant frequency. The unchanging HUM.
The mono-tonous sound of a circle.
Next follow the overtones {2, 3, 4, 5…}:
whole number multiples of the fundamental frequency.

The Circle Dance

Referring to a pair of particles on the 2 ends of a string…
Begin, one particle {1} spinning one circle {1} per cycle: 1 x 1.
Next, two particles {2} each spin one circle {1} per cycle: 2 x 1.
Then two particles {2} each spin two circles {2} per cycle: 2 x 2.
More complex patterns: 2 x 3, 2 x 3 hyper spin, and 2 x 5.
Essential phase relationships respect Pauli's exclusion principle:
when and where each particle moves in relation to the other particle.



**"It ain't what you don't know that gets you in trouble.
It's what you know for sure that just ain't so." Mark Twain**

**"I am only one, but I am one. I cannot do everything, but I can do something.
And I will not let what I cannot do interfere with what I can do."
Edward Everett Hale**

**"…things that do not fit into the existing paradigm are hard to think about."
Scientific American, February 2010, Billock and Tsou**

**"Whenever something doesn't fit the reigning paradigm, the initial response
in the mainstream is to deny the facts. To suggest that systems formally defined
as separate were actually interrelated was paradigm busting…"
Molecules of Emotion, Candace B. Pert**

**"Nothing that results from Human progress is achieved with unanimous consent,
and those who are enlightened before the others are condemned to pursue
that light in spite of others." Christopher Columbus**

**"Great minds discuss ideas. Average minds discuss events.
Small minds discuss people." attributed to Eleanor Roosevelt**

"The future belongs to those who believe in the beauty of their dreams." ibid

**"Our job in physics is to see things simply, to understand a great many
complicated phenomena in a unified way… there always continues a steady
evolution of theoretical ideas, leading almost imperceptibly to changes in
previous beliefs." Steven Weinberg, 1979, receiving Nobel Prize.**

**"…knowledge cannot spring from experience alone but only from the
comparison of the inventions of the intellect with observed facts."
Albert Einstein**

**"That which produces harmony in the chorus of the universe
seems a discord to our partial hearing"
in *Genius* T.V. series, Albert Einstein paraphrasing Walter Rathenau's words**

**"Man carries the world in his head, the whole astronomy and chemistry
suspended in a thought. Because the history of nature is characterized
in his brain, therefore he is the prophet and discoverer of her secrets.
Every known fact in natural science was divined by the presentiment
of somebody, before it was *actually* verified." Ralph Waldo Emerson**

**"One of the joys of science is that, on occasion, we see a pattern that reveals the
order in what initially seems chaotic. A jumble becomes part of a simple plan,
and you feel you are seeing right through something to find its essence."
Neil Shubin, *Your Inner Fish***

**"Taking a new step, uttering a new word, is what people fear most."
Dostoyevsky**

**"The bravest are surely those who have the clearest vision of what is before
them, glory and danger alike, and yet notwithstanding go out to meet it."
Thucydides**

"Nothing in life is to be feared. It is only to be understood." Marie Curie

**"…we know how dangerous it is to overestimate intuition."
Albert Einstein & Leopold Infeld, *The Evolution of Physics***

Choosing to read HUT

I had finished high school math by tenth grade, being Algebra 1,2,3,4 and Geometry 1 & 2. I do not use any more complicated math methods in *HUT*. However, like the alphabet, with which new poems, songs, prose, and essays may be written when new inspiration arises, I use the math methods from middle school in ways people have not before. This makes it new, though it is not more complex than anything required to finish high school.

The reader of *HUT* needs willpower enough
to care to open the cover and to even begin reading,
and then keep up that willpower through the whole tome.
The reader needs enough self-confidence and trust in the author
to not just bail out with, "Oh, I could never understand that."

The reader needs enough focus not to be distracted by a gazillion distractions which welcome one to focus on them.
To learn about *HUT*, one needs to keep choosing.
Choose during every word, number, drawing,
every page, chapter, and to the end…

Then the serious student will start again.
It takes willpower. The will to know.
It takes self-activation.
It takes choice.

$$I = Mc^B$$

Epistemology is the study to be able to differentiate between justified belief and opinion

"The work presumes... a fair amount of patience and force of will on the part of the reader. The author has spared no pains in his endeavor to present the main ideas in the simplest and most intelligible form... [and has] purposely treated the empirical physical foundations of the theory in a 'step-motherly' fashion, so that readers unfamiliar with physics may not feel like the wanderer who was unable to see the forest for trees. May the book bring someone a few happy hours of suggestive thought!" Albert Einstein

Note:
Any references not imbedded immediately in the text, will follow as a group shortly after paragraphs or section.

It is only because the universe is so reasonable that we can do science.

A theory encompasses data gathered during experiments and observations. Experiment is intended to test theory and possibly provide more data to be assimilated or eliminated by the theorist. If any facts or quotes in *HUT* contain error, if grammar or spelling has faults, the author does not know yet. If some words used seem to echo another author too much, it is not intended. The information sources have been extensive and are not all documented as much information is so freely available from so many references. The author invented and discovered many ideas without knowing they had already been written from different perspectives. Many of these unique perspectives of the author remain in the text because they are perceived to have value. If some text is too redundant for some readers, or needs to be more redundant for others: please tolerate. If important perspectives seem to have been excluded, please forgive.

$I = Mc^B$

I ONEMANY PROPOSAL

"It is a glorious feeling to discover the unity of a set of phenomena
that seem at first to be completely separate." Albert Einstein

This chapter sets up the premise upon which the remaining of the book's proposals must rest: the void, the virtual particle and virtual anti-particle, harmony, the possibility field, the singularity, and the spatial expansion of the probability field, allowing time. This foundation allows a highly ordered universal beginning. According to the second law of thermodynamics, the highest order is the beginning so that time transition from beginning to end will display continuous entropy, being the average increase of universal disorder. Without an explanation for the ultimate order in creation's beginning, there can exist no plausible unified scientific theory.

Beginning Creation

E Plurabus Unum; Unity and Plurality; One with reductions; A unified field theory with many parts, each containing the whole. *HUT* 's presentation: from the void comes one and many.

The first question could only be, something like, "Where to Begin?". Or how to begin. Or when to begin. Without time, *before the beginning* cannot be before the beginning. A successful theory, like the universe, must *begin <u>from</u>* the timeless and space-less void. The void has no time nor space, thus no beginning, middle, nor end. Void is before the beginning and after the end and void permeates and affects all of creation, throughout time and space.

From the original void, a 0-D point stretches into a virtual 1-D string with two polarized ends—instantly, since there is not yet any "real" time. Physics allows the two ends to be a virtual particle and a virtual anti-particle. In *HUT*, the word "orbitron" refers to any object, "virtual" or "real", that orbits in a pattern. The string ends are the orbitrons that must spin around the center of the string. This string dance can virtually exist in virtual space and time, but nothing is "real"… it is the possibility field, not the probability field where all is experienced as real.

To sustain, the connected virtual particle and virtual anti-particle must dance well because if they collide, they transition into two photons which are absorbed into the void. The orbitrons require ordered dancing: a choreograph. Probability-field definitions of this void disturbance do not consider a possibility-field transition able to sustain the dancing virtual pair.

Throughout history, arguments requiring a *choreographer* to bring about such order are mostly delegated to religion. One can avoid religious vocabulary by simply saying that the nature of the universe's most extreme equilibrium, the cosmic void, *just so-happens* to have the potential for this harmonically ordered dance. But "just so-happens" is not scientific.

Orbitrons dance order. Their limited and repeating patterns allows the sustainability that we are—proof exists because *life is*. The universe had to begin ordered, not disordered.

The virtual particle-antiparticle pair perform the harmonic dance emanating as the possibility field, which, from the space and time perspective of the probability field, is like a dream. Our material world is within the probability field, built from a limited variety of atoms with electrons dancing probability field patterns. Our bodies and brains operate in the probability field. Our minds still operate within the possibility field, not limited by normal time and space.

Zero cosmological constant

Pre-spacetime vacuum, original void, is best described by Einstein's *zero cosmological constant*. In 1915, Albert Einstein made public his general theory of relativity equations which showed the universe was either expanding or contracting. But Einstein believed in the Dutch philosopher Spinoza's book called *Ethics* which stated that "It follows that God is immutable [and] … all His attributes are immutable." This bothered Einstein enough that he said, "For now, we can add on the left side of the field equation, an unknown universal constant". He used the

Greek letter lambda and called it the "cosmological constant," saying, "Not much harm is done thereby…the proposed new universal constant determines the average density of the universe that can remain in equilibrium." With this sleight of hand, Einstein's froze the changing size of the universe to his perspective of a beautiful spherical unchangeable universe.

In 1917, Einstein published "Cosmological Considerations in the General Theory of Relativity" in which he introduced the additional constant into his general relativity equations which he adjusted to include his non-zero cosmological constant. This measures the energy density of the original void, the same void that would be achieved if all matter and antimatter of the universe canceled each other out. To have energy density left over at the end of all collapsing, be that density either matter or antimatter, means there would be a positive or negative cosmological constant: a non-zero-sum game. If there is an equality and a conservation of matter and anti-matter, then there is exactly enough to cancel everything out, back to the zero cosmological constant: a zero-sum game.

During Darwin's era, biologists and the church had imposed static life—no changing—no evolution—immutable. Darwin did not give in. But Einstein did. He tweaked his work with a non-zero cosmological constant because by adding anything non-zero, and repeating that through time, things accumulate. With a non-zero *cosmo*logical *con*stant, our visual space would warp in ways we are more familiar with in a mirrored fun house, where convex and concave visual realities dominate, and the $1/d^2$ (Fig.VIII.4) visual relationship we so believe and survive in is all warped. But visual warping is not our day to day experience.

Einstein mathematically froze our universe for 12 years, until Edwin Hubble's telescopic research yielded results. The light from far-away stars showed a shift in color toward red, revealing wavelengths that stretched out. The stars were moving away from us. If the stars were to move towards us, their light would be blue shifted as, to our perspective, the wavelengths compressed. The speed of light remains the same, but the color spectrum changes depending on the compression or expansion of the light waves based upon the source's physical relative motion towards or away from the observer, and/or visa versa.

Based on Hubble's news, Einstein changed back to show a zero cosmological constant. In George Gamow's book, *My World Line: An Informal Autobiography*, he said, "…when I was discussing cosmological problems with Einstein, he remarked that the introduction of the cosmological term was the biggest blunder he ever made in his life." Being zero, the constant did not ever need to be created or named. Ironically, error created the label, and now it is useful. That is an example of a beneficial mutation of consciousness. The error was maybe one of Einstein's greatest acts of genius. Once created on paper, the cosmological constant revealed adherence also to one over distance squared, $1/d^2$, like with gravity, light, sound, and such. This inverse square law defines the spherical shape of space being created. The zero cosmological constant is the origin of the unified field grounding the universe, defining the inverse square law and all other laws. The source of the universe, the zero cosmological constant, creates the mathematical dance to surround it, which creates, grounds, and stabilizes all else.

Cosmic dance

Quantum mechanics allows the universe's perfect void to have fluctuations, creating a connected pair of a virtual particle and a virtual anti-particle—potential orbitrons—that spin into their own virtual space and time before canceling out upon collision. The orbitrons' collision would be most unlikely if they were not connected. The dance of the superstring is an ordering of the orbitrons' avoidance possibilities, originating and sustaining creation's probability fields.

When a virtual particle and anti-particle pop into simultaneous existence, this infers a

beginning of at least virtual space and time since there must be virtual separation and virtual motion. These particles annihilate when "close" enough, so they must perform a highly ordered dance to maintain their own virtual separate existence.

This coordinated duality dance allows the beginning of creation to be highly ordered. The second law of thermodynamics can then enact its entropy on the universe, establishing the arrow of time, degenerating from high order to low order—harmonic degeneration. The final loss of all order results by default in equilibrium, which, due to the collapse of all matter and anti-matter, returns to pure void expressible as the zero cosmological constant.

The "nature" of original void is to break its own inertia that does not have space, time, nor $E = Mc^2$, and venture into this highly ordered dance of the superstring. The nature of the void allows the sustaining of the original dance that keeps a virtual particle and anti-particle separate. The more virtual time that the virtual particle exists, the more it becomes an ordinary particle.

Elemental math source

"To deny the ether is ultimately to assume that empty space has no physical qualities whatever. The fundamental facts of mechanics do not harmonize with this view." Albert Einstein

Let **n** be non-negative integers, **n** = {0,1,2,3,4…}, defining frequency relationships of infinite harmonics, where zero {0} is the source, be that a quiet guitar string or the original void. The **possibility field**'s ordered dance-of-the-superstring emits from the original void {0}, becoming One {1}, the fundamental tone. Then harmonic overtones are two and beyond {2,3,4,5…}. See Fig.I.1. The integer set **n** is needed to create our reality, but its *infinity must be limited in a variety of ways to allow sustainability*. For creating atomic elements, let four subsets of **n** be $\mathbf{n_a}$, $\mathbf{n_b}$, $\mathbf{n_c}$, and $\mathbf{n_d}$. Start with $\mathbf{2n_a}$, where $\mathbf{n_a}$ = {1,2,3,4,5}. This defines a dancing orbitron pair (2) composed of a virtual particle and virtual anti-particle, expressed by the 2 in $\mathbf{2n_a}$.

The possibility field's completed dance initiates the **probability field** which begins space and time, ***defined*** by the formula $\mathbf{2n_b^2}$, where $\mathbf{n_b}$ = {1,2,3,4}, making $\mathbf{2n_b^2}$ = {2,8,18,32}. The mirroring effect allows a part or *all 120 electrons* in the **eight electron-fields** around the nucleus of every atom: $\mathbf{2(2n_b^2)}$ = {2,8,18,32,32,18,8,2}; for a maximum total of 120. The science world is currently undecided on how many elements are possible to include in the completed periodic table. The principal quantum number multiplier, $\mathbf{2n_b^2}$, with $\mathbf{n_b}$ = {1,2,3,4} and the mirror effect, $\mathbf{2(2n_b^2)}$ leads to the defendable conclusion of 120 elements in a completed periodic table.

To define patterns within four **sub-electron-field**s, {s, p, d, f}, use the formula $\mathbf{2n_c}$, with $\mathbf{n_c}$ being a limited set of odd numbers: $\mathbf{n_c}$ = {1,3,5,7}: $\mathbf{2n_c}$ = {2,6,10,14}. In the electron-field formula $\mathbf{2n_b^2}$, and the sub-electron-field formula $\mathbf{2n_c}$, *the number two used as multipliers refers to the two electrons comprising each pair*. Paired electrons stabilize chemistry.

Let $\mathbf{n_d}$ = {1,2,3,4…120}, allowing all atomic numbers of the newly creating atoms.

The squaring within $\mathbf{2n_b^2}$ reflects the geometry of the curved area of a sphere's surface, $\mathbf{4\pi r^2}$, and the area of a circle, $\mathbf{\pi r^2}$, both with radius-distance squared, $\mathbf{r^2}$ (Fig. VIII.4), all created by the zero cosmological constant. The shape of a circle laid onto the surface of a sphere defines our experience of the expansion of space in any direction from the central source, *proportionally* squaring with the distance, $\mathbf{d^2}$, weakening as $\mathbf{1/d^2}$, known as the inverse square law, Fig.VIII.4, witnessed with electricity, magnetism, light, gravity, sound, distribution of spray paint, etc.

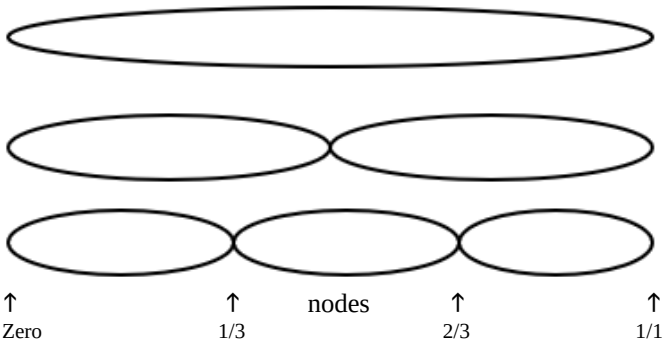
From Einstein's book *Relativity*, if one reads this quote with poetic freedom, he describes a palindromic mirror effect going through the $\mathbf{2n_b^2}$ sequence, {2,8,18,32}, then mirroring back down through {32,18,8,2}. Let the first **32** in {2,8,18,**32**,32,18,8,**2**} (see Fig.II.9) be "circumference of the universe", then let "the whole 'world-sphere'" signify the final **2** in the mirrored set:

"…the circumference of a circle first increases with the radius until the 'circumference of the universe' is reached, and that it thence forward gradually decreases to zero for still further increasing value of the radius. During this process the area of the circle continues to increase more and more, until finally it becomes equal to the total area of the whole 'world-sphere.'"

One-dimensional vibrating string Compare to Fig.0.3

The OneMany proposals in *HUT* rest upon the math of harmonics as a fundamental template within all science fields. One dimensional, 1-D, string harmony, refers to frequency multipliers, the set of non-negative Harmonic Integers: $H_I = \{0, 1, 2, 3, 4\ldots\}$. See Fig.I.3. The 0 is the string at rest with no energy passing over it. The 1 is the first harmonic (Fig.I.1), being the fundamental tone. The 2 is the second harmonic, being the first overtone. The third harmonic is the second overtone, followed by the fourth harmonic, and into theoretical infinity.

Fig.I.1 Standing wave patterns {1,2,3…} See Figs.0.4 & XX.6

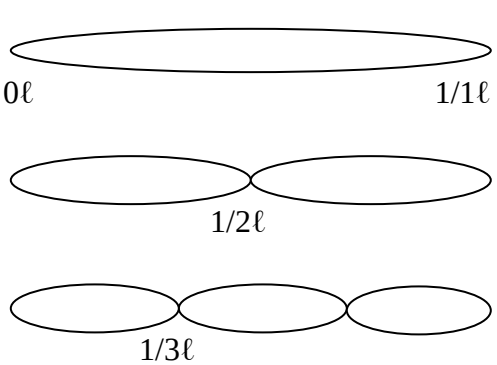


ॐ = λ/2 (fundamental tone, Om, is a half of a wavelength on entire string) (see Fig.0,2)

Here, let n be all positive integers—whole numbers: n = {1,2,3,4,5,6,7,8,9…∞}.

*Harmonic series as multipliers of the fundamental frequency f: n = {1/1, 2/1, 3/1, 4/1…∞}.
Harmonic series as 1st nodal point ratios of the 1/1 stringlength: ℓ/n = {1/1, 1/2, 1/3, 1/4…∞}ℓ.
ℓ/n = Stringlength ratio of first nodal point after zero on the entire 1/1 stringlength ℓ.
ॐ = λ/2 = single wave crest or trough between the two end nodal points on the ℓ stringlength.
*ℓ = nλ/2 = nॐ = number of wavelengths λ for each harmonic on the entire string 1/1 ℓ.
ॐ = fundamental tone stringlength between any two adjacent nodes for each harmonic.

Fig. I.2 ॐ = λ/2



Lambda, λ, is the symbol for wavelength. Equating the accepted scientific notation of λ/2 with ॐ, Om, to refer to any 1/1 fundamental tone, allows mathematical elegance. When the first node location after zero = 1/n L, the whole string shows nλ/2 = nॐ ↔ nf *

*Note: any nॐ also relates to the fundamental frequency's multiplier, nf. E.g.: 3 consecutive waves, 3ॐ, between four string nodes means the string's fundamental frequency is tripled: 3f.

HUT builds upon the foundation that the merging point of all physics, biology, chemistry,

and mind sciences, of all science, art, and religion, is the universal harmonic fundamental tone: 1/1 (ƒ or ॐ). One-over-one can refer to both fundamental frequency and fundamental stringlength. Frequency and stringlength have an inverse relationship—they are reciprocals of one another. The 1/1 fundamental stringlength has a 1/1 fundamental frequency. A 1/2 stringlength nodal location produces a doubled 2/1 frequency. A node at one-third stringlength has tripled the fundamental frequency. These are the harmonic overtones that degenerate towards infinity in whole numbers and their reciprocals. Harmonic degeneration is commonly known as entropy, which measures increasing disorder, the essence of the 2nd law of thermodynamics.

To use ॐ for a mathematical symbol makes harmonic accounting simpler (Fig.I.2). An elegant 1/1 ॐ harmonic fundamental tone relates to an inelegant one-half of a wavelength, symbolized as 1/2 lambda: 1/1 ॐ = 1/2 λ = λ/2. This enables the referential symbol ॐ to be applied mathematically as any fundamental tone. In India, ॐ is the Sanskrit symbol for Om and refers to the original universal fundamental tone, the signal which Hindus, Buddhists, Sikhs, and *HUT* claim is included in entirety, diluted by noise, in every part of creation (chapter XVI).

H factors

Historically, harmony's imagined infinity has been a burden in the mathematics of physicists. To have workable limits within the infinite, *HUT* introduces H symbols, sets of harmonically progressing variables, shown in Fig.I.3 as frequency rather than stringlength ratios—until the *Note*. From void {0} comes the fundamental tone {1}, followed by the infinite harmonic overtones: H_O. These H factors, and others, will be used throughout this book.

Fig.I.3 Constants of harmonic order (see *Note*, below)

Harmonic Integer (non-negative):	$H_I = \{0, 1, 2, 3, 4\ldots\}$
Harmonic Sequence:	$H_S = \{1, 2, 3, 4\ldots\} = H_I + 1 = n$
Harmonic Overtones:	$H_O = \{2, 3, 4, 5\ldots\} = H_S + 1 = H_I + 2$
Harmonic Dance Possibility:	$H_D = \{1, 2, 3, 4, 5\}$ {limited}
Harmonic Electron Probability:	$H_E = \{1, 2, 3, 4\}$ {limited}
Harmonic Atomic Numbers	$H_A = \{1, 2, 3, 4, 5\ldots120\}$ {limited}
Harmonic Binary (in each *moment*):	$H_{BM} = \{0, 1\}$ {limited}
Harmonic Binary (through *time*, base-ten):	$H_{BT} = \{0, 1, 2, 4, 8\ldots\} = \{0, 2^{H_I}\}$
Harmonic Chord (pitch class roots):	$H_C = \{1, 3, 5, 7\ldots\} = 2H_I + 1$
Harmonic Pitch Classes	$H_{PC} = H_C \times 2^{H_I}$ e.g. $3 \times 2^{H_I} = \{3,6,12,24\ldots\}$
Harmonic Theta (4 Pitch Class Octave):	$H_T = \{4, 5, 6, 7\}$ {←limited ↓}
Harmonic 8 Pitch Class Music Octave	$H_M = \{8, 9, 10, 11, 12, 13, 14, 15, 16\}$
Harmonic Upper Partial:	$H_U = \{H_S + 1\}^2 = \{H_I + 2\}^2 = \{H_O\}^2$
Harmonic Prime Number:	$H_P = H_O - H_U = H_O - \{H_O\}^2$

Note: each frequency (***ƒ***) set can be *reciprocated* (R) to become stringlength (ℓ) ratios.
E.g.: $H_S = \{1, 2, 3, 4\ldots\}$***ƒ*** becomes: $1/H_S = H_{SR} = \{1/1, 1/2, 1/3, 1/4\ldots\}$ℓ.
Some sets have limited (L) subsets—e.g.: $H_{SL} = H_D$. *All are subsets of* H_I.

Creation comes from the void and manifests into the possibility field's dance, evolving into the expanding probability field, allowing the periodic table, which in *HUT* has been re-arranged (Chapter II) to adapt correctly to the unfolding of a limited principle quantum number $2n^2 = 2H_{SL}^2 = 2H_E^2$ into what we witness as a creation founded upon the math of harmonics.

Chapter IX focuses through holography on the unified field theory. Until then, the chapters are building the underlying harmonic physics for the synthesizing.

"…without the belief in the inner harmony of our world, there could be no science."
The Evolution of Physics Albert Einstein and Leopold Infeld

"The aim of science is not to open the door to infinite wisdom,
but to set a limit to infinite error." *Life of Galileo* by Bertolt Brecht

"A theory is more impressive the greater the simplicity of its premises, the more different things it relates, and the more expanded its area of applicability." Albert Einstein

"How does the idea of a poem come?... It's the same for a man of science. It is a sudden illumination, almost a rapture. Later, to be sure, intelligence analyzes and experiments confirm or invalidate the intuition. But initially there is a great forward leap of the imagination." ibid

"It is impossible, however, to divide science into separate and unrelated sections… The initial and fundamental steps [of pioneer work in science] are always of a revolutionary character. Scientific imagination finds old concepts too confining, and replaces them by new ones. The continued development along any line already initiated is more in the nature of evolution… To raise new questions, new possibilities, to regard old problems from a new angle, requires creative imagination and marks real advance in science… To obtain even a partial solution the scientist must collect the unordered facts available and make them coherent and understandable by creative thought… It is a strange coincidence that nearly all the fundamental work concerned with the nature of heat was done by non-professional physicists who regarded physics merely as their great hobby." *The Evolution of Physics,* Albert Einstein & Leopold Infeld

"Our job in physics is to see things simply, to understand a great many complicated phenomena in a unified way… there always continues a steady evolution of theoretical ideas, leading almost imperceptibly to changes in previous beliefs." Steven Weinberg, 1979, receiving Nobel Prize.

"Some who are too impatient to study it feel frustrated because they do not understand it and so they do not like it. Others fear that its findings may run counter to their beliefs, will upset them emotionally and so they shun it." Whiting, in *Genetics is Easy*, Phillip Goldstein

"I by no means expect to convince experienced naturalists whose minds are stocked with a multitude of facts all viewed, during a long course of years, from a point of view directly opposite to mine. It is so easy to hide our ignorance… and to think that we give an explanation when we only restate a fact…" *The Origin of Species*, Charles Darwin

"…in 1859…the scientific world was in the midst of a tremendous controversy over Darwinism. It is sometimes stated that the biologists of the day were too busily engrossed in this controversy to notice the work of an obscure Augustinian monk. But this does not seem logical, for, at that very time, the scientific world was hunting high and low for an explanation of heredity as an aid to understanding evolution. This is evident from the fact that dozens of vague and often fantastic theories of heredity were proposed between 1860 and 1890. And all this time, [Gregory] Mendel's carefully worked out explanation remained unknown." *Genetics is Easy* by Phillip Goldstein

"The real discoverer [of atomic number] was the amateur scientist Anton van den Broek whose contributions tend to be neglected… [he] was praised by Rutherford, who nevertheless privately resented the intrusion of amateurs… Rutherford… coined the expression 'atomic number'" *The Periodic Table,* Eric R Scerri

II PERIODIC ELEMENTS REORGANIZED

"…the beauty of present theories is an anticipation, a premonition, of the beauty of the final theory. And in every case, we would not accept any theory as final unless it were beautiful."
Steven Weinberg in *Dreams of a Final Theory*

1) How much should quantum physics' manifestation of the table of electron configurations influence the arrangement of the periodic table?
2) How many elements will be displayed in the completed periodic table? Why?
3) Lawrencium is now believed to be needed to move its position in the periodic table. Where does it really fit in, and why?
4) What errors remain in the currently accepted periodic table that are corrected by adapting and rearranging according to the electron configurations?

Abstract

An electron configuration pattern is defined here with a new vocabulary of the ***Judges***: ***ju**mp **d**esi**g**nating **e**lement**s***. Underlining the six^{+} quantum-defined *JUDGE* types in the included table of electronic configurations reformulates *HUT*'s periodic table of the elements.

Fig.II.1 shows the periodic table as currently accepted by *IUPAC*, the International Union of Pure and Applied Chemistry. Note that Lawrencium Lr 103 is positioned in the bottom right corner, though this is now believed to be an error.

Introduction

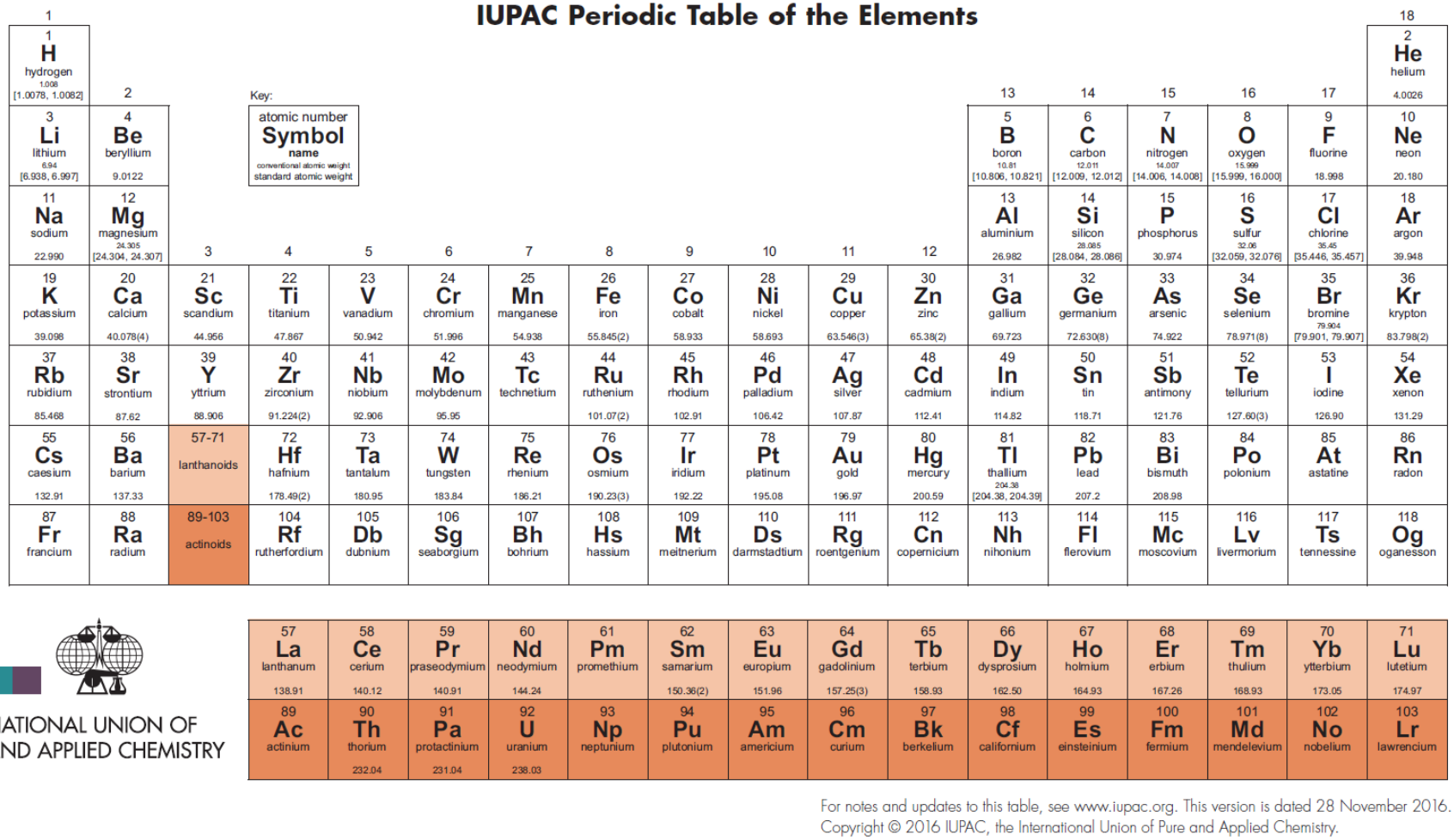
The April 9, 2015 edition of *Nature* published lab results from Japan regarding the position of lawrencium Lr 103 in the currently accepted periodic table of the elements. This claim enlivened discussion among professional chemists about the need to reposition Lr 103. To deal with this singular change to the periodic table, the International Union of Pure and Applied Chemistry, *IUPAC*, formed a project group in 2016 called: "The constitution of group 3 of the periodic table; project No.: 2015-039-2-200".

The *IUPAC* task group can only make decisions regarding the four elements of "group 3", choosing between one of two element columns: {*Sc, Y, La, Ac}* **or** {*Sc, Y, Lu, Lr}*. The task group chair said in May 16, 2015 *Science News* about the lawrencium situation: "We need a more global approach." To satisfy the *IUPAC* task group's quest requires introducing *HUT*'s larger quantum physics perspective of electron configurations based on the principal quantum number, $2n^2$. This *IUPAC* problem is solved here by the *Judges*, resulting in the *Judges* establishing every position of every element in the periodic table, not just "group three".

Lawrencium being understood to be in the wrong position in the *IUPAC* periodic table is a verification that this Rearranged Periodic Table had predicted their predicament. Any future discoveries of elements out of place will also be verifying predictions made by *HUT*. Predictions of verifications are part of getting a science project known to the world, as Eddington's eclipse research verified Einstein's General Relativity predictions.

"[A new paradigm] …could be discovered only through something's first going wrong with normal research…The man who embraces [this] at an early stage must often do so in defiance of the evidence provided by [the normal research activities within a long-established stable paradigm]. He must, that is, have faith that the new paradigm will succeed with the many large problems that confront it, knowing only that the older paradigm has failed with a few. A decision of that kind can only be made on faith." Thomas S. Kuhn, *The Structure of Scientific Revolutions*

Fig.II.1


IUPAC Periodic Table of the Elements
Key:
atomic number
Symbol
name
conventional atomic weight
standard atomic weight
1 H hydrogen 1.008 [1.0078, 1.0082]
2 He helium 4.0026
3 Li lithium 6.94 [6.938, 6.997]
4 Be beryllium 9.0122
5 B boron 10.81 [10.806, 10.821]
6 C carbon 12.011 [12.009, 12.012]
7 N nitrogen 14.007 [14.006, 14.008]
8 O oxygen 15.999 [15.999, 16.000]
9 F fluorine 18.998
10 Ne neon 20.180
11 Na sodium 22.990
12 Mg magnesium 24.305 [24.304, 24.307]
13 Al aluminium 26.982
14 Si silicon 28.085 [28.084, 28.086]
15 P phosphorus 30.974
16 S sulfur 32.06 [32.059, 32.076]
17 Cl chlorine 35.45 [35.446, 35.457]
18 Ar argon 39.948
19 K potassium 39.098
20 Ca calcium 40.078(4)
21 Sc scandium 44.956
22 Ti titanium 47.867
23 V vanadium 50.942
24 Cr chromium 51.996
25 Mn manganese 54.938
26 Fe iron 55.845(2)
27 Co cobalt 58.933
28 Ni nickel 58.693
29 Cu copper 63.546(3)
30 Zn zinc 65.38(2)
31 Ga gallium 69.723
32 Ge germanium 72.630(8)
33 As arsenic 74.922
34 Se selenium 78.971(8)
35 Br bromine 79.904 [79.901, 79.907]
36 Kr krypton 83.798(2)
37 Rb rubidium 85.468
38 Sr strontium 87.62
39 Y yttrium 88.906
40 Zr zirconium 91.224(2)
41 Nb niobium 92.906
42 Mo molybdenum 95.95
43 Tc technetium
44 Ru ruthenium 101.07(2)
45 Rh rhodium 102.91
46 Pd palladium 106.42
47 Ag silver 107.87
48 Cd cadmium 112.41
49 In indium 114.82
50 Sn tin 118.71
51 Sb antimony 121.76
52 Te tellurium 127.60(3)
53 I iodine 126.90
54 Xe xenon 131.29
55 Cs caesium 132.91
56 Ba barium 137.33
57-71 lanthanoids
72 Hf hafnium 178.49(2)
73 Ta tantalum 180.95
74 W tungsten 183.84
75 Re rhenium 186.21
76 Os osmium 190.23(3)
77 Ir iridium 192.22
78 Pt platinum 195.08
79 Au gold 196.97
80 Hg mercury 200.59
81 Tl thallium 204.38 [204.38, 204.39]
82 Pb lead 207.2
83 Bi bismuth 208.98
84 Po polonium
85 At astatine
86 Rn radon
87 Fr francium
88 Ra radium
89-103 actinoids
104 Rf rutherfordium
105 Db dubnium
106 Sg seaborgium
107 Bh bohrium
108 Hs hassium
109 Mt meitnerium
110 Ds darmstadtium
111 Rg roentgenium
112 Cn copernicium
113 Nh nihonium
114 Fl flerovium
115 Mc moscovium
116 Lv livermorium
117 Ts tennessine
118 Og oganesson
57 La lanthanum 138.91
58 Ce cerium 140.12
59 Pr praseodymium 140.91
60 Nd neodymium 144.24
61 Pm promethium
62 Sm samarium 150.36(2)
63 Eu europium 151.96
64 Gd gadolinium 157.25(3)
65 Tb terbium 158.93
66 Dy dysprosium 162.50
67 Ho holmium 164.93
68 Er erbium 167.26
69 Tm thulium 168.93
70 Yb ytterbium 173.05
71 Lu lutetium 174.97
89 Ac actinium
90 Th thorium 232.04
91 Pa protactinium 231.04
92 U uranium 238.03
93 Np neptunium
94 Pu plutonium
95 Am americium
96 Cm curium
97 Bk berkelium
98 Cf californium
99 Es einsteinium
100 Fm fermium
101 Md mendelevium
102 No nobelium
103 Lr lawrencium
INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY
For notes and updates to this table, see www.iupac.org. This version is dated 28 November 2016.
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Electron Configuration Pattern
Redefines the Periodic Table of the Elements

"I am following the example of 17th century philosopher Rene Descartes.
He subjected all his beliefs to radical doubt so that he could build a
bedrock belief and build his cognitive life back up on firm principles."
Sheldon in TV's *Big Bang Theory* s12e10

Chapter II Table of Contents

Explaining Figures II.4-II.8

Figures II.4-II.8

"Resistance to the organized mass
can be effected only by the man who
is as well organized in his individuality
as the mass itself." Carl Jung

"It is disconcerting to reflect on the number
of students we have flunked in chemistry
for not knowing what we later found
to be untrue." Robert L. Weber
Science With a Smile

"If you memorize the periodic table it will speed you up if you're a chemist, but by and large, the reason you have a periodic table is so that you can store that information outside of your body. That way it frees up some part of your brain to do something else." Bill Nye

"Thus the atomic and electron theories introduce into science discontinuous physical quantities which can vary only by jumps*."
Einstein & Infeld, *The Evolution of Physics*

Acronym list (important)

ELF & SELF	**El**ectron-**F**ield & **S**ub-**El**ectron-**F**ield
JUDGES	**Ju**mp **D**esi**g**nating **E**lement**s***
JUV	**Ju**dges & **V**erdicts
RAPT	**R**e-**A**rranged **P**eriodic **T**able
TEC	**T**able of **E**lectron **C**onfigurations
Verdicts	**Ver**tical **Dict**ations[1]

[1]vertical in TEC, horizontal in RAPT RECT

'…the deepest part of theoretical chemistry must end up in quantum mechanics."
Richard Feynman, *Six Easy Pieces*

Study Plan

This page is a quick-teach of the *Judges (Jump Designating Elements)* pattern. Each newest electron in all sequential atoms either joins into the same *sub-electron field (SELF)* as the previous atom, being <u>zero</u> change, or the electron *jumps* into a different *SELF*, being <u>one</u> change. This {0,1} binary concept of *Judges* enables understanding the order behind the rearranged periodic table *(RAPT)*. Diagrams on this page are snipped from actual figures in this chapter. To understand the *Judge* patterns, reduce them down to a single element as a fundamental reference, or else the whole symphony of the elements can remain a confused cacophony. Begin with the first Special *Judge*, beryllium 4, initiating, *designating*, the <u>forward jump</u> from 2S into 2P.

#	Element ↓	*ELF* / *SELF*	x = → / symbol →	1	2	3	4	5	6	7	8
				s	s p	s p d	s p d f	s p d f	s p d	s p	s
1	Hydrogen		H	1							
2	**Helium**		**He**	**2**	0						
3	Lithium		Li	2	1						
4	Beryllium		Be	2	2 0	←					
5	Boron		B	2	2 1	←					
6	Carbon		C	2	2 2						
7	Nitrogen		N	2	2 3						
8	Oxygen		O	2	2 4						
9	Fluorine		F	2	2 5						
10	**Neon**		**Ne**	2	**2 6**	0					

Special Judges code:
xs (Judge)
→ (Gavel)
xp (Verdict)
This fill-pattern jumps forward out of sub-field *xs* and into *xp*.

Judge is the acronym for ***Ju**mp **d**esig**n**ating **e**lement.* Noble gases, except He & Ubn, are **Pass** *Judges* that forward jump from *xp* → *(x + 1)s*. He 2 is the lone **Sass** Judge: 1s → 2s

Fig.II.2
Study plan

From figures in chapter:
← TEC
↙ JUV
↓ RAPT RECT

Above, in the 2-s ⇩ column, <u>forward jump</u> from beryllium, ($2s^2$), down and over to boron's 1 in the 2p column ($2p^1$). Then continue down the p column: 2,3,4,5, to Neon's $2p^6$. See the jump pattern in front of the skier. ↗

Special (SP) Judges; **S**→Jump Metals

xs → xp

S→Jump Metals	**s** sub-field w/field #
4 Beryllium	$2s^2$
12 Magnesium	$3s^2$
30 Zinc	$4s^2$
48 Cadmium	$5s^2$
80 Mercury	$6s^2$
112 Copernicium	$7s^2$

s ↓ p
1
2 0
2 1
2 2
2 3
2 4
2 5
2 6

s→jump metals ↓ ↘

PSV2-A / DSV2	SPV1 2	
Be 4	**B 5**	**C 6**
Mg 12	**Al 13**	**Si 14**
Zn 30	**Ga 31**	**Ge 32**
Cd 48	**In 49**	**Sn 50**
Hg 80	**Tl 81**	**Pb 82**
Cn 112	***Pe* 113**	**Fl 114**

xs→xp
Special Judges

In Fig.II.8, forward jump from Neon's $2p^6$ to sodium's 3s column: $3s^1$. Each *Judge* is underlined, the line being the Judge's *Gavel*, and elements that follow are *Verdicts*. *TEC*'s explicit *Judge* pattern of the vertically dictated verdicts and the explained anomalies affects every element in the periodic table, re-arranging it. See ⇗ beryllium Be 4 in the *RAPT* snippet. Beryllium's horizontal Verdicts' are labeled as **SP**ecial Judge's **V**erdict #**1** (SPV1), 2, 3, 4, etc.

The key to understanding is that the Judges designate jumping into a new SELF. In *TEC*, compare beryllium to calcium. In old-school periodic tables, Fig.II.1, they align. But calcium is an S-backward-jumper—different from S-forward-jumpers. Using *JUV* & *TEC*, compare other Special Judges to beryllium. Look at all the *Judges* found in Fig.II.4, *Judges* and Verdicts, *JUV*, and find them each underlined in Fig.II.8, *TEC*. The elements following the Judges are the Verdicts. To understand more, read about *JUV* system anomalies and look each one up in *TEC*.

Here Come the *Judges* (use Fig.II.4 & .II.8)

The *Judge* pattern has not been acknowledged and utilized until now (partial exception—see on the next page: The Diagonal Rule). The *Judge* raps the Gavel to establish the Verdicts.

The underlined *Judge* patterns in *TEC* show certain atoms filling *the outermost* electron field (*ELF*) with the same pattern as follows magnesium Mg 12 and beryllium Be 4, labeled *s→jump* metals ("*ess* forward-jump metals")—Special Judges. Aligning all elements initiating the same pattern, Be 4 and Mg 12 must move from their currently accepted position to be above zinc Zn 30. Be & Mg have been misaligned above calcium Ca 20, an s-*back*-jumper properly grouped with Sr 38, Ba 56, and Ra 88—Stud Judges—which jump *backwards* to continue filling **3d, 4d, 5d, 6d** in *each second-outermost ELF*.

Other changes to the periodic table follow this pattern, including the relocation of lawrencium **Lr** 103. In *TEC*, the *Judges* are underlined, and this pattern marker is transferred to the Rearranged Periodic Table: *RAPT.* One gaveled class-barrier line shifts to be after Judge nobelium No 102, not after the verdict Lr 103.

S P D F: Subtle Power Dance Finale (use Fig.II.5 & Chapter I's Elemental Math Source))

Before learning the names other people use for {s, p, d, f}, the four *SELFs*, being {sharp, principal, diffuse, fundamental}, I had been using my memkey: {subtle, power, dance, finale}.

According to harmonic pattern, around an atomic nucleus are eight probable *ELFs.* Each ELF includes one to four *SELFs*, {**s, p**, **d**, **f**}, able to hold {2,6,10,14} electrons. As a lone *up* or *down* spin-oriented electron semi-chaotically buzzes around an atom, valence imbalance attracts a partner electron from another atom, inducing its opposite spin, and the new electron pair forms a *wavefunction orbit,* uniting atoms into a molecule: chemistry.

Exchanging position for any attempt to show momentum, *ELF & SELF* (Fig.II.5) show the up and down electrons paired. Around the nucleus, the first field (1) fills with two electrons (superscript 2) in the lonely (**s**) sub-field: ($1\mathbf{s}^2$). The second field fills with two sub-fields: two electrons in **s,** and six in **p** ($2\mathbf{s}^2$ and $2\mathbf{p}^6$). The third field fills three sub-fields: $3\mathbf{s}^2$, $3\mathbf{p}^6$, $3\mathbf{d}^{10}$. The fourth field fills with all four sub-fields: $4\mathbf{s}^2$, $4\mathbf{p}^6$, $4\mathbf{d}^{10}$, $4\mathbf{f}^{14}$. Not shown in Fig.II.5 (see Fig.II.9) are the 5th, 6th, 7th, and 8th fields with mirroring sub-fields: $5\mathbf{s}^2$, $5\mathbf{p}^6$, $5\mathbf{d}^{10}$, $5\mathbf{f}^{14}$. Then: $6\mathbf{s}^2$, $6\mathbf{p}^6$, $6\mathbf{d}^{10}$. Next: $7\mathbf{s}^2$, $7\mathbf{p}^6$. Finally, according to probabilities presented by the mirrored harmonic pattern, {2,8,18,32,32,18,8,2}, would be: $8\mathbf{s}^2$. Superscript numbers sum to 120-electrons allowed in the periodic table's final atom: Ubn 120. Lacking any agreed-upon theoretical reasoning, chemists ignore or disagree upon nature's $2H_e^2$ commitment to the 120-electron limit.

***TEC:* Table of Electron Configurations** (referring to Figs.II.4, 6 & 8)

Since the proposed *Judges* are dictated 100% by electron configurations, it is necessary to differentiate between the verifiable natural structure *TEC* creates for the periodic table, and the details the laboratory chemists are free to fill-in, e.g. radioactivity and class boundaries such as between ordinary metals, metalloids and non-metals. In *TEC*, the *Judges* are underlined because they initiate patterns and dictate the binary layout (non-change-0 vs. change-1) of *RAPT*, thus the {Judge, Gavel, Verdict} triad vocabulary: The *Judge's Gavel* establishes the *Verdicts.*

TEC referenced *CRC Handbook of Chemistry and Physics [67th edition]*, from: Foster, Laurence S: *Electronic Configuration of Elements*, who referenced: *Chemistry of Actinide Elements* by Joseph J. Katz & Glenn T. Seaborg, and *Inorganic Chemistry* by Therald Moeller.

Three Tiers for *RAPT* (compare Figs.II.5, 6 & 8)

The top tier of elements in *RAPT* Rect are filling their outermost *ELF*.

Stud and Fudge transition metals are set aside from the upper section in a second tier because their second-to-outermost fields play catch-up—with three anomalies.

Classes of lanthanoid and thoroid rare earth metals are the third tier in this periodic table because their third-to-outermost fields are playing catch-up—with two anomalies.

***JUV* System Anomalies** (Figs.II.4, 6 & 8)

These anomalies occur because of nature adapting to its own *integer integrity in the harmonic sequencing of all atomic numbers*, from H at atomic number 1 to unbinilium at 120.

Studying the regular electron patterns and anomalies in figures *JUV*, *TEC*, and both of the *RAPT*s familiarizes one with *Judges*, Gavels, and Verdicts. Note: due to the necessary *Conspirators* and *Recesses*, *RAPT* has 37 columns, not the traditional 32, as in Fig.II.1.

Usurpers** (Usp* in *TEC)**: four pairs of elements that repeat a Verdict number, designated inside oval shapes in *TEC*; and in *Rapt* with A & B: SDV5A&B and DFV7A&B. The *Usurpers* are Judge Wanna-Be's: Dis Judge (Cr 24 & Mo 42) and Fudge Judge (Eu 63 & Am 95). These become *one-time Judge sub-types for the single Verdict elements that follow each*: Mn 25, Tc 43, Gd 64 and Cm 96. After, the Verdicts return to the pattern leading into the four Usurpers.

Conspirators are two consecutive atoms where a Verdict number gets skipped in the filling sub-field, like Cm 96 going from 7 to 9 for Bk 97, rather than to 8. On *RAPT* Rect, within transition and rare earth metals, these skipped Verdict numbers are seen as boxes with arrows instead of elements. In *TEC,* brackets on left show which elements are Conspirators: Con{.

Recesses are the empty boxes in *RAPT* Rect without elements or arrows. Explicit in *RAPT* Round are the longer empty runs following Li 3 & Na 11, Ti 22 & Zr 40, and Uue 119 (ununennium, its temporary numeric Latin 119 name, similar to Ubn 120, unbinilium). Recesses balance the periodic table's layout. To respect necessary positioning of *Judges*, one pair of Conspirators contains a long recess*:* between Zr 40 and Nb 41.

Tier anomalies: Two Verdicts of two Usurpers, Mn 25 and Tc 43, as well as Conspirator Pd 46, are located in *RAPT* Rect's second tier, but belong in the first tier. The other two Usurper Verdicts, Gd 64 and Cm 96, are situated in the third tier but belong in the second.

Radioactive anomalies are Tc 43 & Pm 61, otherwise all radioactive elements are found after lead 82, starting with Bi 83 or Po 84. Chemists in labs decide these details, not *TEC*.

Anomaly notes: Tc 43 is triply (quadruply?) anomalous. Tc 43 is 1) a Conspirator, 2) an out-of-place radioactive element, 3) situated in the wrong tier due to being 4) an Usurper Verdict. Gd 64 and Cm 96 are each an Usurper Verdict and a Conspirator.

Anomalies to the rule that all atoms are Verdicts: hydrogen and helium. They are without a *Judge* and cannot be qualified as Verdicts. Only hydrogen, the alpha atom, is neither *Judge* nor Verdict. Helium is a Sass Judge sub-type all alone (see *TEC*), with Li 3 and Be 4 for Verdicts.

Unbinilium Ubn 120 is the anomaly to the rule that all final Verdicts are the newest *Judge*, because 120 is final judgement, the omega atom, and thus does not rap any Gavel to establish any Verdicts. Zn 30, La 57, Hg 80 and Cn 112 are lone Verdicts after their *Judge*. Pass Judges each only have only two Verdicts, same as after Stud Judge Ra 88 and Dis Judge Pd 46.

Th 90, Thor: Very Anomalous (Figs.II.1, 6 & 8)

> "Despite thorium's position in the … periodic table, it has an anomalous…$6d^2 7s^2$ electron configuration in the ground state." Wickleder et al., pg. 59 (see *TEC*)

Thor is the *Judge*. *TEC* and *RAPT* tell us Thorium is a Deft Judge **(d-***back*-jumpers-to-**f)** as well as Stud Verdict #2. Nature shows in *RAPT* that the first Verdict position after thorium, DFV1, has only an arrow, no element. The two Deft Judges are: Th 90 and La 57. Th 90 is alone in its column of *Judges*, while La 57 sits one column back, followed by a *recess* square above Th. Thorium overrules actinium's right to be *Judge*. Electron configurations dictate the class name change from *Actinoid* Rare Earth Metals to *Thoroid* Rare Earth Metals. Thorium's

uniqueness as a *Judge* grants enough poetic freedom for Thor's Gavel to go by the name of Thor's Hammer, which overrides the old school actinoid error with a *TEC* thoroid judgement.

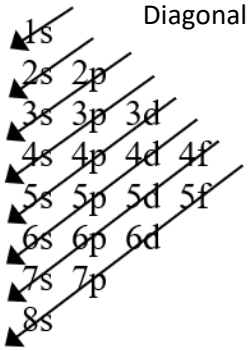
The Diagonal Rule & Anomalies

The **Aufbau** (German for "building-up") principle, formulated by Niels Bohr and Wolfgang Pauli in the early 1920s, was based on the claim that electrons fill atoms' lowest available energy levels ("shells" and sub-shells) before filling higher ones (e.g., **1s** before **2s**). Analyzing *TEC* shows anomalies to Aufbau's principle begin at potassium K 19 because it starts filling *ELF* 4 before *ELF* 3 is full. The only elements actually complying to Aufbau are: {1-18, 31-36, 112-120}. That's 33 of 120 elements, being only 27.5% compliance — 72.5% anomalies.

Aufbau is now considered to be old-school quantum theory, prior to quantum mechanics, when electron orbitals were considered concentric *shells*, similar to their depiction in *ELF & SELF* in Fig.II.5. This has since been modified. We now believe the wavefunction fields of paired electrons allow variable *penetration* due to differing radial distributions and probabilities, where, for instance, **4s** contains electrons before **3d** because **4s** *penetrates* closer to the nucleus, allowing a **4s** electron to experience more electromagnetic attraction than **3d**. Thus limitations of the Aufbau have given way to the **Madelung** energy ordering rule, named after the German physicist Erwin Madelung in 1936, also called the **Janet** rule, named after Charles Janet in 1927, and the **Klechkowsky** rule, named after the Russian chemist Vsevolod Klechkowsky in 1962.

Anomalies to Aufbau principle are decreased by *penetration's* **Diagonal Rule**, extended here to include 120 elements. Use *TEC* to examine the ten* Diagonal Rule Anomalies: all four Dis Judges, two Stud Judges (**6s**: Ba 56 & **7s**: Rn 88), and all four Usurpers. **The Diagonal Rule is shown here to be a precedent for emphasizing these newly named *Judges*:**

Fig.II.3
Diagonal rule



1s → 2s → 2p → 3s → 3p → 4s →
Sass Special Pass Special Pass Stud

3d → 4p → 5s → 4d → 5p → 6s → 4f →
Usp* Pass Stud Usp* Pass Stud* Usp*
Dis* Dis* Deft Fudge
Special Special

5d → 6p → 7s → 5f → 6d → 7p → 8s
Dis* Pass Stud* Usp* Dis* Pass
Special Deft Fudge Special

*10 anomalies

6 Judge types
+ 2 (sub-types)
Pass (& Sass)
Special
Stud
Dis
Deft
Fudge
(Usp)

Five Figures: Different perspectives come from each of these ways of looking at the elements…

1) *JUV:* *Judges* and Verdicts group together due to these patterns identified in *TEC*.
2) *ELF & SELF*: Understanding chemistry begins here. *ELF & SELF* expresses artistic freedom to show a frozen concentric 2-D pattern of electrons in fields and sub-fields. Compare to *TEC*.
3) *RAPT RECT:* The three tiers in *RAPT* show the filling of the 1st, 2nd and 3rd outermost fields of electrons—with five anomalies. *TEC* does not show this so explicitly.
4) *RAPT ROUND:* best shows the long recesses and the 6 *Judge* types' **bold** gaveled lines.
5) *TEC*: makes explicit the Judges, Usurpers, and Conspirators. Adapting to TEC, Conspirators in both *RAPT* Rect and Round have boxes with arrows inside, instead of elements. Usurpers are found in both *RAPTs* where column numbers show: 5A, 5B, 7A, 7B.

Figure II.4 *JUV*: *Judges* & Verdicts

Introduced here are the six Judge types. These are patterns that keep repeating. A Judge is a jump-off point defining the verdicts that follow. These patterns reorganize the periodic table.

Special (SP) Judges; S→Jump Metals

xs → xp

S→Jump Metals	s sub-field w/field #
4 Beryllium	$2s^2$
12 Magnesium	$3s^2$
30 Zinc	$4s^2$
48 Cadmium	$5s^2$
80 Mercury	$6s^2$
112 Copernicium	$7s^2$

s ↴ p	
1	
2	0
2	1
2	2
2	3
2	4
2	5
2	**6**

Pass (PS) Judges; Inert Elements, Noble gases

xp→(x + 1)s

Noble gases	p sub-field w/field #
*2 Helium**	~~$1s^2$~~
10 Neon	$2p^6$
18 Argon	$3p^6$
36 Krypton	$4p^6$
54 Xenon	$5p^6$
86 Radon	$6p^6$
118 Organesson	$7p^6$
120 Unbinilium	~~$8s^2$~~

p↴ s	
6	0
6	1
6	**2**

* Sass Judge

Next, Stud & Deft Judges are back-jumpers ↙:

Stud (SD) Judges; S←Jump Metals

alkaline earth metals xs ← (x – 1)d

s sub-field w/field #	
20 Calcium	$4s^2$
38 Strontium	$5s^2$
56 Barium	$6s^2$
88 Radium	$7s^2$

d↓ s	
0	**2**
1	2
2	**2**
…	
10	**2**

Deft (DF) Judges xd ← (x – 1)f

d sub-field w/field #	
57 Lanthanum	$5d^2$
90 Thorium	$6d^2$

f↓ d	
0	**2**
1	2
2	2
3	2
4	2
…	
14	**2**

Fudge (FD) Judges xf → (x + 1)d

f sub-field w/field #	
70 Ytterbium	$4f^{14}$ ↗
102 Nobelium	$5f^{14}$

f↴ d	
14	0
14	1
14	2
14	3
…	
14	**10**

Dis (DS) Judges xd → (x + 1)s

d sub-field w/field #	
29 Copper	$3d^{10}$ ↗
46 Palladium	$4d^{10}$ ↗
79 Gold	$5d^{10}$ ↗
111 Roentgenium	$6d^{10}$

d↴ s	
10	0
10	1
10	**2**

Note: only Pd46 has an s^1 Dis Verdict

Defining *Judges* and Verdicts: It's a pattern. *Judge* is the acronym for ***Ju**mp **d**esi**g**nating **e**lement.* Except hydrogen, every element is naturally categorized as either a *Judge*, a Verdict, or both. All *Judges* are Verdicts except Helium. Most Verdicts are not *Judges*. Every final Verdict is the newest *Judge*, except Ubn 120.

*3 Judge-code labels for **xs** → **xp**:*
***xs** (Judge) → (Gavel) **xp** (Verdict).*

Noble elements, also called the inert gases, are the **Pass Judges** (except He 2* & Ubn 120) jumping from *xp → (x + 1)s*, where x = electron-field (*ELF*) # = {1,2,3,4,5,6,7,8}; and {s,p,d,f} = sub-electron-field (*SELF*) = {2,6,10,14}. **Pass (PS) Judges'** name comes from P & S in: x**p**→ (x + 1)**s**, which reads: xp *forward-jumps* to (x + 1)s.

The elements following the Pass Judges are the Pass Verdicts. The first Verdicts after the Pass Judges are elements labeled ***Pass Verdict #1* (*Verdict Code: PSV1*)**. The entire periodic table has been re-arranged using this *Judge, Gavel,* and Verdict vocabulary.

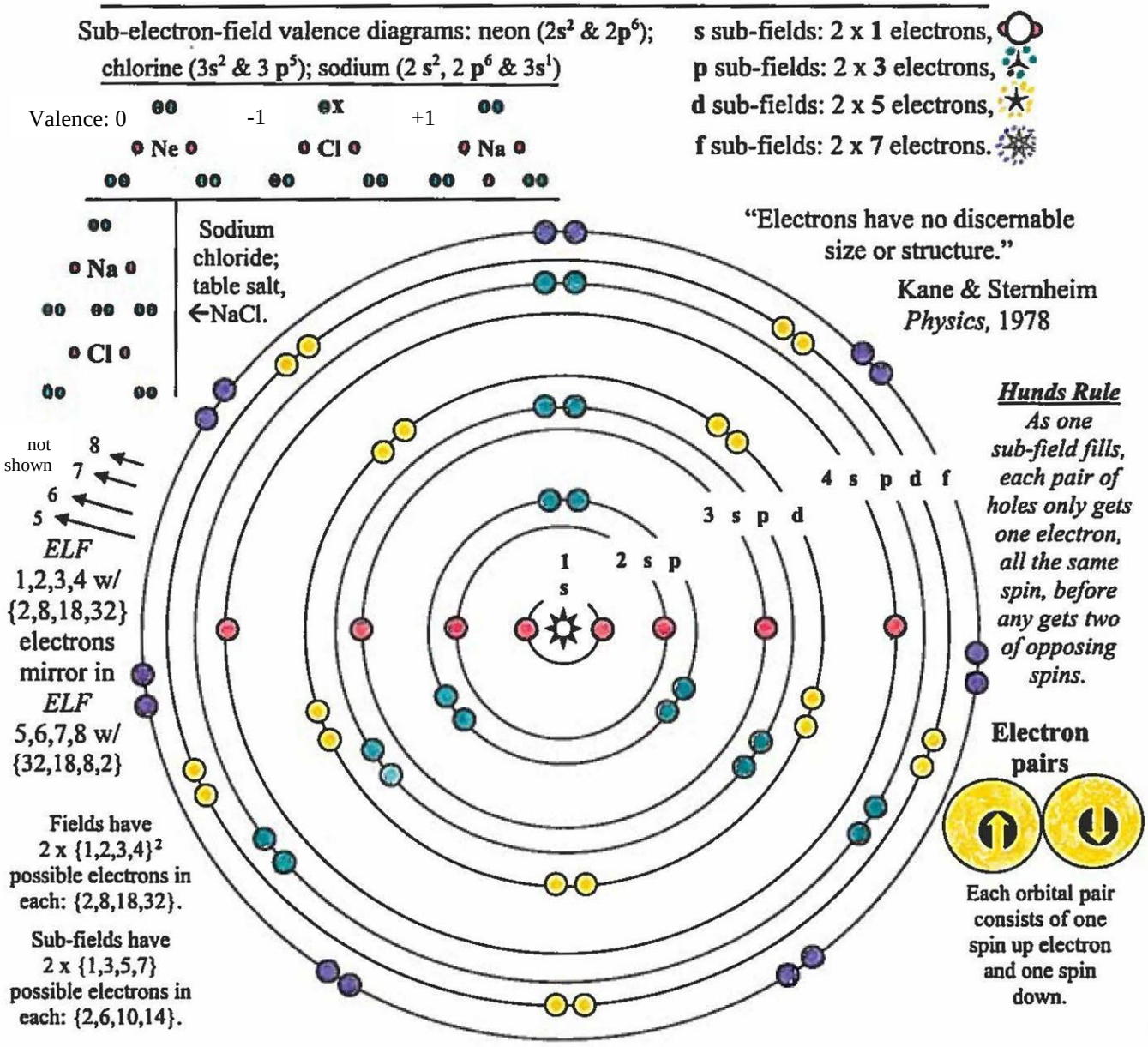
Introducing five other types of *Judges*.
Six elements are **Special (SP) Judges**: x**s** → x**p**;
two are **Fudge (FD) Judges**: x**f** → (x+1)**d**;
four are **Dis (DS) Judges**: x**d** → (x + 1)**s;**
two are **Deft (DF) Judges**: x**d** ← (x-1)**f**;
four are **Stud (SD) Judges**: x**s** ← (x-1)**d**.

Refer to the Special Judges in the top left diagram. These **S**→Jump Metals have filled to their outermost **S**-*SELF*, the jump-off position after which the P-*SELF* fills identical patterns for the elements that follow, into the Final Special Verdicts = Inert/Nobel Elements = Pass Judges.

Note that Stud Judges' calcium and the elements below all jump *backwards* ← from the **S** *SELF* to fill more electrons in the second-to-outer field. This required moving beryllium & magnesium to join similar elements in Special Judges: S forward → jump metals.

Fig.II.5 ***ELF & SELF: Electron Fields and Sub-Electron Fields***

Note: circles show convenient orbits and *positions* of actual complex patterns of electron *momentums*.
Shown: 4 electron fields out of 8. See: Fig.II.9 for all 8 electron fields



HARMONIES

SOUND	*SELF*	LIGHT
DOE	*subtle s*	*2 x 1 red*
SOL	*power p*	*2 x 3 blue-green*
MEE	*dance d*	*2 x 5 orange-yellow*
AH	*finale f*	*2 x 7 violet*

ELF & SELF CODE:

$3p^5$ = chlorine

The **3** refers to the electron field (*ELF*)
The **p** refers to the sub-electron-field (*SELF*)
Super-script **5** refers to # of electrons in **3p**.
Using *TEC*, go to *ELF* **3**, then to *SELF* **p**.
Then glance down to find which element has 5 electrons in **3p**, and the only answer is chlorine.

Fig.II.6 *RAPT** Rect *Re-arranged periodic table

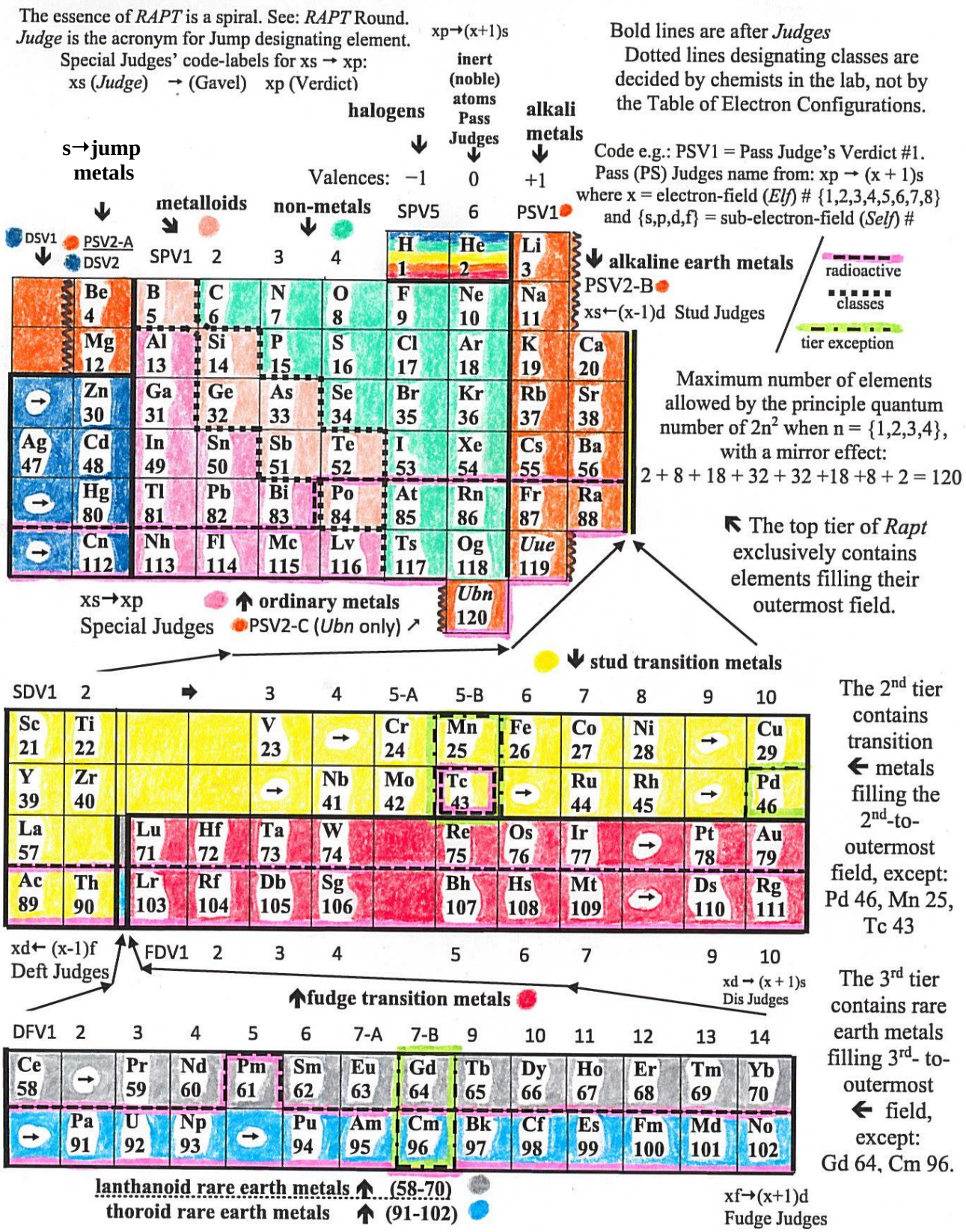


Fig.II.7

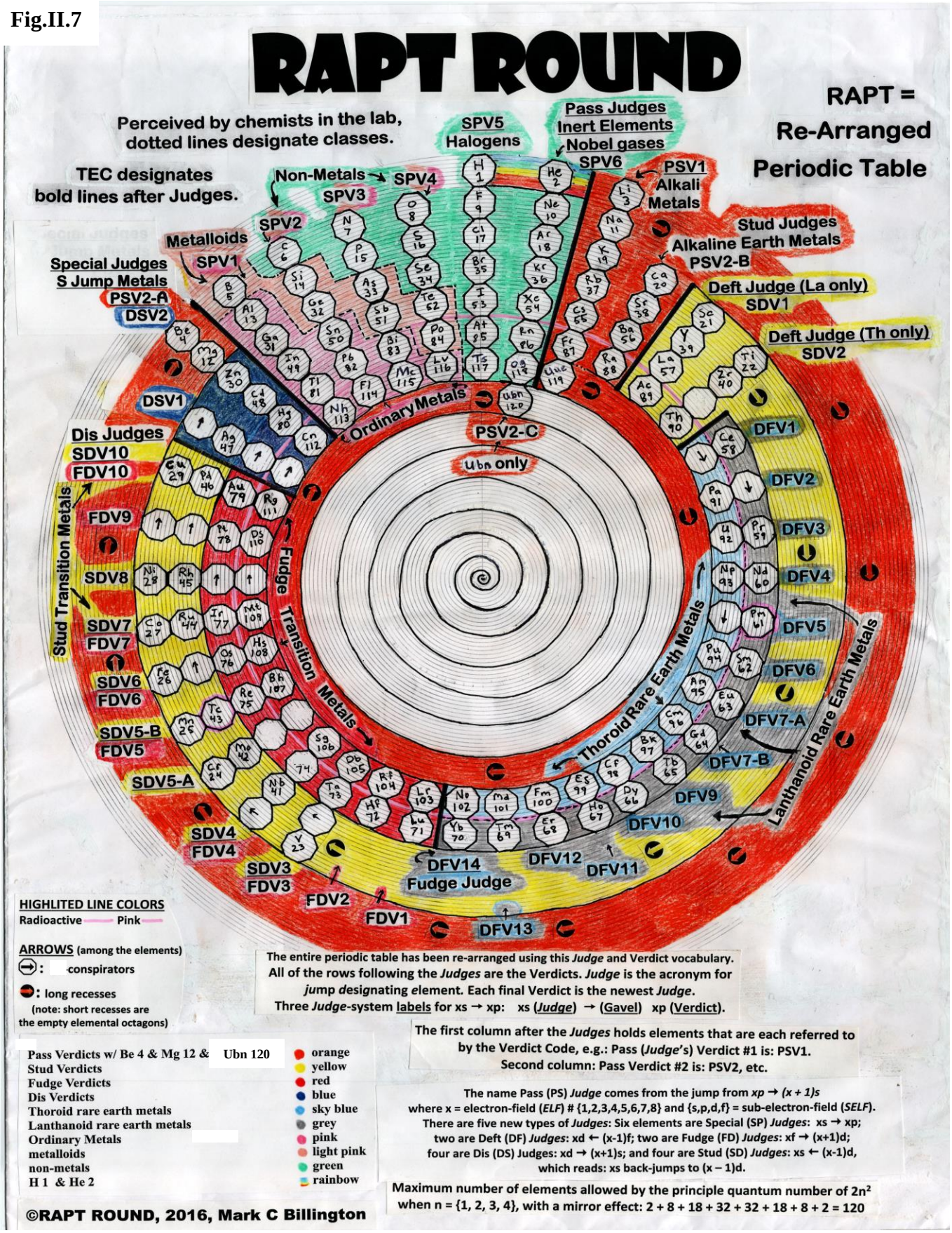

RAPT ROUND
RAPT = Re-Arranged Periodic Table
Perceived by chemists in the lab, dotted lines designate classes.
TEC designates bold lines after Judges.
Pass Judges Inert Elements Nobel gases SPV6
SPV5 Halogens
Non-Metals SPV4
SPV3
SPV2
Metalloids
SPV1
PSV1 Alkali Metals
Stud Judges Alkaline Earth Metals PSV2-B
Special Judges S Jump Metals PSV2-A
DSV2
Deft Judge (La only) SDV1
Deft Judge (Th only) SDV2
DSV1
Dis Judges SDV10 FDV10
Ordinary Metals
PSV2-C
Ubn only
DFV1
DFV2
DFV3
DFV4
DFV5
DFV6
DFV7-A
DFV7-B
DFV9
DFV10
DFV11
DFV12
DFV14 Fudge Judge
DFV13
FDV1
FDV2
FDV3
SDV4 FDV4
SDV5-A
SDV5-B FDV5
SDV6 FDV6
SDV7 FDV7
SDV8
FDV9
Stud Transition Metals
Fudge Transition Metals
Thoroid Rare Earth Metals
Lanthanoid Rare Earth Metals
HIGHLITED LINE COLORS
Radioactive Pink
ARROWS (among the elements)
: conspirators
: long recesses
(note: short recesses are the empty elemental octagons)
The entire periodic table has been re-arranged using this Judge and Verdict vocabulary.
All of the rows following the Judges are the Verdicts. Judge is the acronym for jump designating element. Each final Verdict is the newest Judge.
Three Judge-system labels for xs → xp: xs (Judge) → (Gavel) xp (Verdict).
The first column after the Judges holds elements that are each referred to by the Verdict Code, e.g.: Pass (Judge's) Verdict #1 is: PSV1.
Second column: Pass Verdict #2 is: PSV2, etc.
Pass Verdicts w/ Be 4 & Mg 12 & Ubn 120
Stud Verdicts
Fudge Verdicts
Dis Verdicts
Thoroid rare earth metals
Lanthanoid rare earth metals
Ordinary Metals
metalloids
non-metals
H 1 & He 2
orange
yellow
red
blue
sky blue
grey
pink
light pink
green
rainbow
The name Pass (PS) Judge comes from the jump from xp → (x + 1)s
where x = electron-field (ELF) # {1,2,3,4,5,6,7,8} and {s,p,d,f} = sub-electron-field (SELF).
There are five new types of Judges: Six elements are Special (SP) Judges: xs → xp;
two are Deft (DF) Judges: xd ← (x-1)f; two are Fudge (FD) Judges: xf → (x+1)d;
four are Dis (DS) Judges: xd → (x+1)s; and four are Stud (SD) Judges: xs ← (x-1)d,
which reads: xs back-jumps to (x – 1)d.
Maximum number of elements allowed by the principle quantum number of 2n²
when n = {1, 2, 3, 4}, with a mirror effect: 2 + 8 + 18 + 32 + 32 + 18 + 8 + 2 = 120
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Fig.II.8 *TEC*: Table of electron configurations

Electron Fields: ELF 1-8 (or K-R); Sub-Electron-Fields: SELF **s, p, d, f** (**s**ubtle **p**ower **d**ance **f**inale)

#	Element *ELF*	X = →	1	2	3	4	5	6	7	8	Valences possible	Class
	↓ *SELF*	symbol →	s	s p	s p d	s p d f	s p d f	s p d	s p	s	↓ (Plus sign implied)	Name
1	Hydrogen	H	1								-1, 1	h
2	**Helium**	**He**	**2**	0							**0**	i
3	Lithium	Li	2	1							1	am
4	Beryllium	Be	2	2 0							2	sm
5	Boron	B	2	2 1							-3, 3	m
6	Carbon	C	2	2 2							-4, 2, 4	n
7	Nitrogen	N	2	2 3							-1, -2, -3, 1,	n
8	Oxygen	O	2	2 4							-2	n
9	Fluorine	F	2	2 5							-1, 1	h
10	**Neon**	**Ne**	2	**2 6**	0						**0**	i
11	Sodium	Na	2	2 6	1						1	am
12	Magnesium	Mg	2	2 6	2 0						2	sm
13	Aluminum	Al	2	2 6	2 1						3	om
14	Silicon	Si	2	2 6	2 2						-4, 2, 4	n
15	Phosphorus	P	2	2 6	2 3						-3, 1, 3, 5	n
16	Sulfur	S	2	2 6	2 4						-2, 2, 4, 6	n
17	Chlorine	Cl	2	2 6	2 5						-1, 1, 2, 3, 4, 5, 7	h
18	**Argon**	**Ar**	2	2 6	**2 6**	0					**0**	i
19	Potassium	K	2	2 6	2 6	1					1	am
20	Calcium	Ca	2	2 6	2 6 0	2					2	ae
21	Scandium	Sc	2	2 6	2 6 1	2					3	om
22	Titanium	Ti	2	2 6	2 6 2	2					2, 3, 4	tm
23	Vanadium	V	2	2 6	2 6 3	2					2, 3, 4, 5	tm
24	Chromium	Cr	2	2 6	2 6 5	1					2, 3, 6	tm
25	Manganese	Mn	2	2 6	2 6 5	2					2, 3, 4, 6, 7	tm
26	Iron	Fe	2	2 6	2 6 6	2					2, 3, 4, 6	tm
27	Cobalt	Co	2	2 6	2 6 7	2					2, 3, 4	tm
28	Nickel	Ni	2	2 6	2 6 8	2					1, 2, 3, 4	tm
29	Copper	Cu	2	2 6	2 6 10	1					1, 2, 3	tm

Con / Usp — Con

Special Judges code:
xs (Judge)
→ (Gavel)
xp (Verdict)
This fill-pattern jumps forward out of sub-field *xs* and into *xp*.

Judge is the acronym for ***Ju**mp **d**esi**g**nating **e**lement.* Noble gases, except He & Ubn, are **P**a**ss** *Judges* that forward jump from *xp* →*(x + 1)s.* He 2 is the lone **S**a**ss** Judge: 1s → 2s

elemental class name	**key**	**memkey**
inert (noble) atoms	i	I
alkali metals	am	am
halogens	h	home,
ordinary metals	om	↑
alkaline earth metals	ae	Adam.
transition metals	tm	↑
S→Jump metals	sm	Some
thoride rare earth metals	te	tea?
lanthanide rare earth metals	le	Lemon?
metalloids	m	↑
non-metals	n	↑

note: Ag 47 has moved from the tm class, so for now its key code is DSV1. Good conductors like silver have free electrons outside the stable S & P sub-fields

1s → 2s → 2p → 3s → 3p → 4s ← 3d → 4s

	Z	Element	Symbol	1	2	3	4	5	6	7	8			
				s	s p	s p d	s p d f							
	30	Zinc	Zn	2	2 6	2 6 10	2 0					2	3d → 4s	sm
	31	Gallium	Ga	2	2 6	2 6 10	2 1					2, 3	4s → 4p	om
	32	Germanium	Ge	2	2 6	2 6 10	2 2					-4, 2, 4		m
	33	Arsenic	As	2	2 6	2 6 10	2 3					-3, 2, 3, 5		n
	34	Selenium	Se	2	2 6	2 6 10	2 4					-2, 2, 4, 6		n
	35	Bromine	Br	2	2 6	2 6 10	2 5					-1, 1, 3, 4, 5		h
	36	**Krypton**	**Kr**	2	2 6	2 6 10	**2 6**	0				**0**	4p → 5s	i
	37	Rubidium	Rb	2	2 6	2 6 10	2 6	1				1		am
	38	Strontium	Sr	2	2 6	2 6 10	2 6 0	2				2	5s ← 4d	ae
	39	Yttrium	Y	2	2 6	2 6 10	2 6 1	2				3		tm
Con	40	Zirconium	Zr	2	2 6	2 6 10	2 6 2	2				2, 3, 4		tm
Con	41	Niobium	Nb	2	2 6	2 6 10	2 6 4	1				2, 3, 4, 5		tm
Usp	42	Molybdenum	Mo	2	2 6	2 6 10	2 6 (5)	1				2, 3, 4, 5, 6		tm
Except. Con	43	Technetium	Tc	2	2 6	2 6 10	2 6 (5)	2				6		tm
Con	44	Ruthenium	Ru	2	2 6	2 6 10	2 6 7	1				2, 3, 4, 6, 7, 8		tm
Con	45	Rhodium	Rh	2	2 6	2 6 10	2 6 8	1				2, 3, 4, 6		tm
Con	46	Palladium	Pd	2	2 6	2 6 10	2 6 10	0				2, 4, 6	4d → 5s	tm
	47	Silver	Ag	2	2 6	2 6 10	2 6 10	1				1, 2, 3		DSV1
	48	Cadmium	Cd	2	2 6	2 6 10	2 6 10	2 0				1, 2	5s → 5p	sm
	49	Indium	In	2	2 6	2 6 10	2 6 10	2 1				1, 2, 3		om
	50	Tin	Sn	2	2 6	2 6 10	2 6 10	2 2				2, 4		om
	51	Antimony	Sb	2	2 6	2 6 10	2 6 10	2 3				-3, 3, 4, 5		m
	52	Tellurium	Te	2	2 6	2 6 10	2 6 10	2 4				-2, 2, 4, 6		n
	53	Iodine	I	2	2 6	2 6 10	2 6 10	2 5				-1, 1, 3, 4, 5, 7		h
	54	**Xenon**	**Xe**	2	2 6	2 6 10	2 6 10	**2 6**	0			**0**	5p → 6s	i
	55	Cesium	Cs	2	2 6	2 6 10	2 6 10	2 6	1			1		am
	56	Barium	Ba	2	2 6	2 6 10	2 6 10	2 6 0	2			2	6s ← 5d	ae
	57	Lanthanum	La	2	2 6	2 6 10	2 6 10 0	2 6 1	2			3	5d ← 4f	tm
Con	58	Cerium	Ce	2	2 6	2 6 10	2 6 10 1	2 6 1	2			3, 4		le
Con	59	Praseodymium	Pr	2	2 6	2 6 10	2 6 10 3	2 6	2			3		le
	60	Neodymium	Nd	2	2 6	2 6 10	2 6 10 4	2 6	2			3, 4		le
Except.	61	Promethium	Pm	2	2 6	2 6 10	2 6 10 5	2 6	2			3		le
	62	Samarium	Sm	2	2 6	2 6 10	2 6 10 6	2 6	2			2, 3		le
Usp	63	Europium	Eu	2	2 6	2 6 10	2 6 10 (7)	2 6	2			2, 3	↓	le

Usp: *Usurpers* (in ovals) repeat 5's & 7's in half full d & f sub-fields. No electrons are paired yet as they have identical spins. After these repeats, electrons join with *induced* reverse spins, pairing up with those already present. The *Usurpers* elements of each of the four ovals are Dis Judge (Cr 24 & Mo 42) and Fudge Judge (Eu 63 & Am 95) Wanna-Be's.

Con: *Conspirators* skip a number in the filling sub-field, coinciding with removal of an electron in a sub-field further out.

					s	p	d	f							
				1	2	3	4		5	6	7	8			
Con	64	Gadolinium	Gd	2	2 6	2 6 10	2 6 10	7	2 6 1	2			3		le
Con	65	Terbium	Tb	2	2 6	2 6 10	2 6 10	9	2 6	2			3, 4		le
	66	Dysprosium	Dy	2	2 6	2 6 10	2 6 10	10	2 6	2			3		le
	67	Holmium	Ho	2	2 6	2 6 10	2 6 10	11	2 6	2			3		le
	68	Erbium	Er	2	2 6	2 6 10	2 6 10	12	2 6	2			3		le
	69	Thulium	Tm	2	2 6	2 6 10	2 6 10	13	2 6	2			2, 3		le
	70	Ytterbium	Yb	2	2 6	2 6 10	2 6 10	14	2 6 0	2			2, 3	4f → 5d	le
	71	Lutetium	Lu	2	2 6	2 6 10	2 6 10	14	2 6 1	2			3		tm
	72	Hafnium	Hf	2	2 6	2 6 10	2 6 10	14	2 6 2	2			4		tm
	73	Tantalum	Ta	2	2 6	2 6 10	2 6 10	14	2 6 3	2			3, 4, 5		tm
	74	Tungsten	W	2	2 6	2 6 10	2 6 10	14	2 6 4	2			2, 3, 4, 5, 6		tm
	75	Rhenium	Re	2	2 6	2 6 10	2 6 10	14	2 6 5	2			-1, 1, 2, 3, 4, 5, 6, 7		tm
	76	Osmium	Os	2	2 6	2 6 10	2 6 10	14	2 6 6	2			2, 3, 4, 6, 8		tm
Con	77	Iridium	Ir	2	2 6	2 6 10	2 6 10	14	2 6 7	2			1, 2, 3, 4, 6		tm
Con	78	Platinum	Pt	2	2 6	2 6 10	2 6 10	14	2 6 9	1			1, 2, 3, 4, 6		tm
	79	Gold	Au	2	2 6	2 6 10	2 6 10	14	2 6 10	1			1, 2, 3	5d → 6s	tm
	80	Mercury	Hg	2	2 6	2 6 10	2 6 10	14	2 6 10	2 0			1, 2	6s → 6p	sm
	81	Thallium	Tl	2	2 6	2 6 10	2 6 10	14	2 6 10	2 1			1, 2, 3		om
	82	Lead	Pb	2	2 6	2 6 10	2 6 10	14	2 6 10	2 2			2, 4		om
Threshold	83	Bismuth	Bi	2	2 6	2 6 10	2 6 10	14	2 6 10	2 3			-3, 2, 3, 4, 5		om
	84	Polonium	Po	2	2 6	2 6 10	2 6 10	14	2 6 10	2 4			-2, 2, 4, 6		m
	85	Astatine	At	2	2 6	2 6 10	2 6 10	14	2 6 10	2 5			-1		nm
	86	**Radon**	**Rn**	2	2 6	2 6 10	2 6 10	14	2 6 10	**2 6**	0		**0**	6p → 7s	i
	87	Francium	Fr	2	2 6	2 6 10	2 6 10	14	2 6 10	2 6	1		1		am
	88	Radium	Ra	2	2 6	2 6 10	2 6 10	14	2 6 10	2 6 0	2		2	7s ← 6d	ae
	89	Actinium	Ac	2	2 6	2 6 10	2 6 10	14	2 6 10	2 6 1	2		3		tm
Con	90	Thorium	Th	2	2 6	2 6 10	2 6 10	14	2 6 10 0*	2 6 2	2		4		tm
Con	91	Protactinium	Pa	2	2 6	2 6 10	2 6 10	14	2 6 10 2	2 6 1	2		5	5f	te
	92	Uranium	U	2	2 6	2 6 10	2 6 10	14	2 6 10 3	2 6 1	2		2, 3, 4, 5, 6		te
Con	93	Neptunium	Np	2	2 6	2 6 10	2 6 10	14	2 6 10 4	2 6 1	2		3, 4, 5, 6		te
Con	94	Plutonium	Pu	2	2 6	2 6 10	2 6 10	14	2 6 10 6	2 6	2		3, 4, 5, 6		te
Usp	95	Americium	Am	2	2 6	2 6 10	2 6 10	14	2 6 10 7	2 6	2		3, 4, 5, 6		te
Con	96	Curium	Cm	2	2 6	2 6 10	2 6 10	14	2 6 10 7	2 6 1	2		3, 4, 5, 6		te
Con	97	Berkelium	Bk	2	2 6	2 6 10	2 6 10	14	2 6 10 9	2 6	2		3, 4	↓	te

Determined in the lab, not by *TEC*, the *Threshold* between 82 & 83 separates radioactive from stable atoms, with 2 *Exceptions* at 43 & 61.

* Note Thor's unique $5f^0$ leap from 90 to 91, Thor's Verdict #2: $5f^2$.

				1	2	3	4	5	6	7	8		
	98	Californium	Cf	2	2 6	2 6 10	2 6 10 14	2 6 10 10	2 6	2		3	te
	99	Einsteinium	Es	2	2 6	2 6 10	2 6 10 14	2 6 10 11	2 6	2		3	te
	100	Fermium	Fm	2	2 6	2 6 10	2 6 10 14	2 6 10 12	2 6	2		3	te
	101	Mendelevium	Md	2	2 6	2 6 10	2 6 10 14	2 6 10 13	2 6	2		2, 3	te
	102	Nobelium	No	2	2 6	2 6 10	2 6 10 14	2 6 10 14	2 6 0	2	5f → 6d	2, 3	te
	103	Lawrencium	Lr	2	2 6	2 6 10	2 6 10 14	2 6 10 14	2 6 1	2		*3*	tm
	104	Rutherfordium	Rf	2	2 6	2 6 10	2 6 10 14	2 6 10 14	2 6 2	2		*4*	tm
	105	Dubnium	Db	2	2 6	2 6 10	2 6 10 14	2 6 10 14	2 6 3	2		*3, 4, 5*	tm
	106	Seaborgium	Sg	2	2 6	2 6 10	2 6 10 14	2 6 10 14	2 6 4	2		*2, 3, 4, 5, 6*	tm
	107	Bohrium	Bh	2	2 6	2 6 10	2 6 10 14	2 6 10 14	2 6 5	2		*-1, 1, 2, 3, 4, 5, 6, 7*	tm
	108	Hassium	Hs	2	2 6	2 6 10	2 6 10 14	2 6 10 14	2 6 6	2		*2, 3, 4, 6, 8*	tm
Con	109	Meitnerium	Mt	2	2 6	2 6 10	2 6 10 14	2 6 10 14	2 6 7	2		*1, 2, 3, 4, 6*	tm
	110	Darmstadtium	Ds	2	2 6	2 6 10	2 6 10 14	2 6 10 14	2 6 9	1		*1, 2, 3, 4, 6*	tm
	111	Roentgenium	Rg	2	2 6	2 6 10	2 6 10 14	2 6 10 14	2 6 10	1		*1, 2, 3*	tm
	112	Copernicium	Cn	2	2 6	2 6 10	2 6 10 14	2 6 10 14	2 6 10	2 0		*1, 2*	sm
	113	Nihonium	Pe	2	2 6	2 6 10	2 6 10 14	2 6 10 14	2 6 10	2 1		*1, 2, 3*	om
	114	Flerovium	Fl	2	2 6	2 6 10	2 6 10 14	2 6 10 14	2 6 10	2 2		*2, 4*	om
	115	Moscovium	Mc	2	2 6	2 6 10	2 6 10 14	2 6 10 14	2 6 10	2 3		*-3, 2, 3, 4, 5*	om
	116	Livermorium	Lv	2	2 6	2 6 10	2 6 10 14	2 6 10 14	2 6 10	2 4		*-2, 2, 4, 6*	om
	117	Tennessine	Ts	2	2 6	2 6 10	2 6 10 14	2 6 10 14	2 6 10	2 5		*-1*	nm
	118	**Organesson**	**Og**	2	2 6	2 6 10	2 6 10 14	2 6 10 14	2 6 10	**2 6**	0	***0***	i
	119	Ununennium	Uue	2	2 6	2 6 10	2 6 10 14	2 6 10 14	2 6 10	2 6	1	*±1*	am
	120	**Unbinilium**	**Ubn**	2	2 6	2 6 10	2 6 10 14	2 6 10 14	2 6 10	2 6	**2**	***0***	i

Valences for 103 to 118 chosen to follow valence patterns from for 71 to 86.

6d → 7s

7s → 7p

7p → 8s

8 fields maximum probable: 2 8 18 32 32 18 8 2 = 120 according to:

Harmonic patterns (limited): Harmonic electron, H_E = {1, 2, 3, 4} and Harmonic chord, H_{CL} = {1, 3, 5, 7}

◎The filling of eight electron fields is dictated by $2H_E^2$ where H_E is natural numbers limited to H_E = {1,2,3,4} —with a mirror.
The number of electrons per field is figured first using $2H_E^2$ with H_E = 1. And then with H_E = 2, then H_E = 3, and H_E = 4:
The first four fields fulfill as: **$2H_E^2$ = {2, 8, 18, 32}:** $2 \times 1^2 = 2$ $2 \times 2^2 = 8$ $2 \times 3^2 = 18$ $2 \times 4^2 = 32$
With the mirroring, the **eight fields of electrons fulfill as $2(2H_E^2) = \{2, 8, 18, 32, 32, 18, 8, 2\}$**.

◎The four sub-electron-fields {s, p, d, f} fill according to $2H_{CL}$ ("2" is # in electron *pair*). $2H_{CL} = 2 \times \{1, 3, 5, 7\}$:
Sub-electron-fields {s, p, d, f} fill as: $2H_{CL}$ = {2, 6, 10, 14}: $2 \times 1 = 2$ $2 \times 3 = 6$ $2 \times 5 = 10$ $2 \times 7 = 14$

Six types of *Judges' codes*, where x = field # = {2,3,4,5,6,7} and{**s**,**p**,**d**,**f**} = sub-field letter.	**P**ass x**p** Judges' → Verdict: (x + 1)**s**	**Sp**ecial x**s** Judges' → Verdict: x**p**	**Fu**dge x**f** Judges' → Verdict: (x+1)**d**	**De**ft x**d** Judges' ← Verdict: (x-1)**f**	**St**ud x**s** Judges' ← Verdict: (x-1)**d**	**Di**s x**d** Judges' → Verdict: (x + 1)**s**

"No…point whatsoever…"

Members of the International Union of Pure and Applied Chemistry, *IUPAC,* have looked at this rearranged periodic table. They shared it at the 2015 International Convention in Korea, then at the Brazil convention in 2017. After, the director of *IUPAC* sent me this notice:

From Executive Director, Dr. Lynn M. Soby, *IUPAC* secretariat. August 7, 2017

The *IUPAC* secretariat does not handle suggestion of changes to the periodic table. This would be dealt with in an individual *IUPAC* project. However, an *IUPAC* project cannot use individual input of your kind, only peer reviewed scientific articles. In addition, there is currently no project intending to redefine the periodic table. Thus, there is no urgency, or point whatsoever, for you to communicate your ideas to any *IUPAC* official or project.

Your document as e-mailed to us and also in hard copies – has been discussed at meetings during the GA [General Assembly 2017 in Brazil]. All comments were quite clear, and can best be summarized as: This work can only be exposed to public view, after submission and proper refereeing to a specialist journal in the field of nuclear and atomic physics. Thus,

The steps you need to take are:

A. Have your findings published in a peer reviewed scientific journal.

B. Wait until such a time when an appropriate IUPAC project emerges and then notify the task group of your publication. Note that the current group 3 project is not an appropriate project for this.

Sincerely, Lynn

Quotes from the IUPAC Group Three project chair and three project members:

"…The periodic table is widely considered chemistry's prize exhibit: the most elegant condensation of all chemical lore, its 'beautiful idea' fit to stand alongside natural selection, the DNA double helix and the Dirac equation. How embarrassing, then, to admit that it doesn't actually have a definitive shape at all.

Besides, the table is said to be dictated by physics. It's not some arbitrary or empirical concoction: it has a structure defined and explained by the quantum theory of the atom, which governs the electronic configurations of elements…"

THE GROUP 3 DILEMMA, Philip Ball (member), 21 April 2017, Chemistry World

"Though there are many misconceptions concerning the nature and function of the periodic law and table, perhaps the most prevalent among modern chemists is the belief that the periodic table is nothing more than an electron configuration table." —William Jensen (member) 2015

"…in our series is the view that group 3 of the periodic table consists of Sc, Y, La and Ac. There is now enough evidence to show this is incorrect… In any case, it is high time that the idea of group 3 consisting of Sc, Y, La and Ac is abandoned." Eric Scerri (chair) 2015

"…scientists tend to base their work on models and approximations… the periodic table of chemistry is neither a theory nor a model but more akin to an 'organizing principle,' … study the periodic table as an example of yet another scientific entity that does a lot of useful scientific work without being a theory." Eric Scerri, The Periodic Table: Its Story and Its Significance

"Finally, as serious claims associated with elements having Z = 119 or above have not yet been made, we note that, for the first time, the Periodic Table exists with all elements named and no proposed or pending new additions. This, however, does not mean that the Periodic Table is complete…" Lars Öhrström (member) & Jan Reedijk (IUPAC, not with the project group) 2016

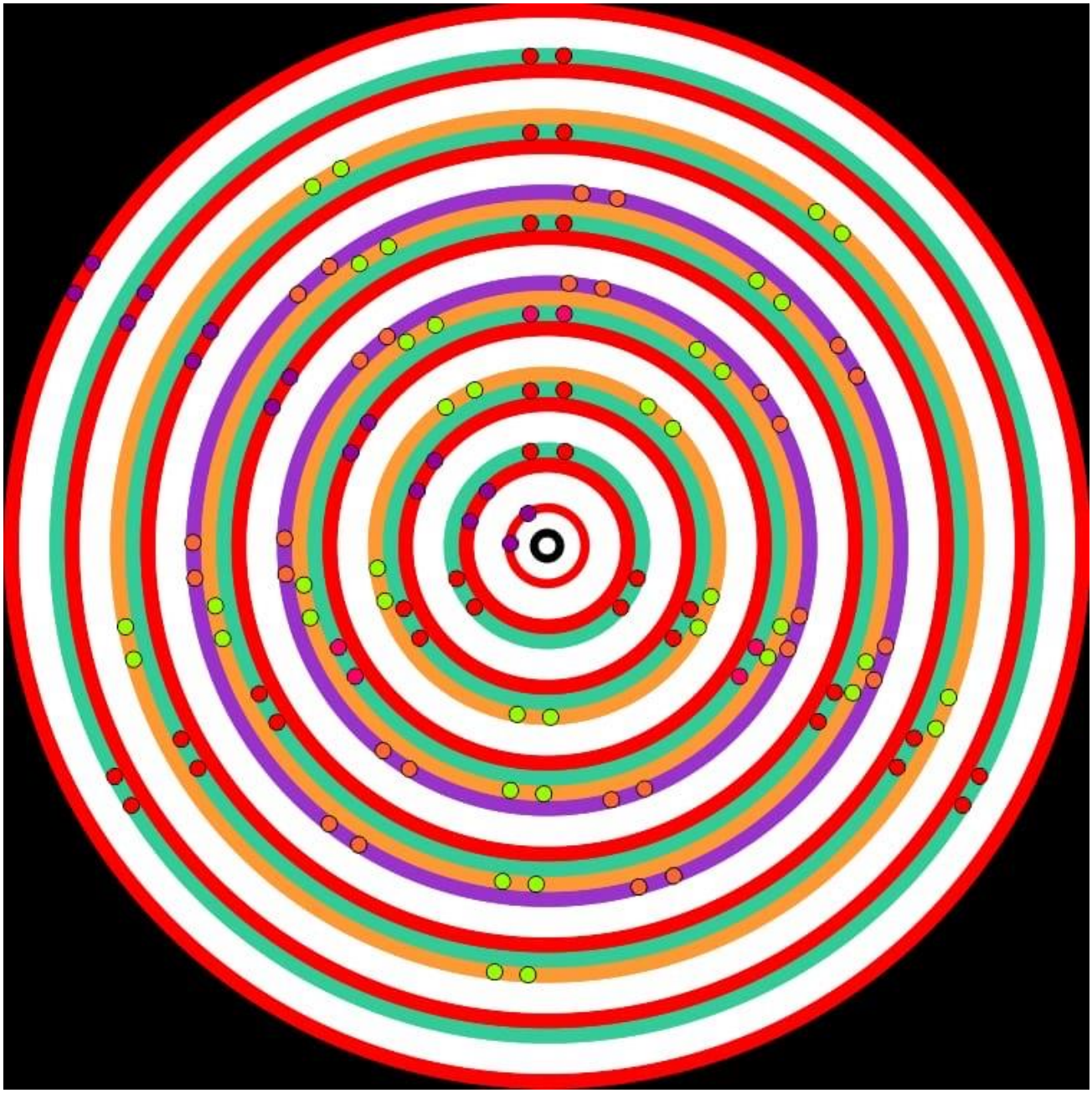


Fig.II.9 8 ELFs with 4 SELFs

Drawn with CorelDRAW by Toño Castañeda

SELF = $2H_C$			ELF = $2(2H_E^2)$
Subtle s	2 x 1 = 2	Doe	$H_A = 2(2H_E)$
Power p	2 x 3 = 6	Sol	$H_A = \{1,2,3,4\ldots120\}$
Dance d	2 x 5 = 10	Mee	$H_E = \{1,2,3,4\}$
Finale f	2 x 7 = 14	Ah	$2H_E^2 = \{2,8,18,32\}$

$H_C = \{1,3,5,7\}$ $2H_C = \{2,6,10,14\}$ $2(2H_E^2) = \{2,8,18,32,32,18,8,2\}$

"But it is necessary to insist more strongly than usual that what I am putting before you is a model—the Bohr model atom—because later I shall take you to a profounder level of representation in which the electron instead of being confined to a particular locality is distributed in a sort of probability haze all over the atom." Arthur Eddington

III CHANGE TO ± 1/3 CHARGE

1) Do we really have missing anti-matter, or could we recalculate and find a balance?
2) If ±1/3 charged quarks, none being neutral, were proposed within the proton and neutron in 1964, should we reconsider the basic electromagnetic charges in chemistry to be not based on the charges of an electron, a neutron, and a proton {–1, 0, +1}?
3) If ±1/3 quark electromagnetic charges also account for matter and anti-matter status, is it not dysfunctional to further enlarge from that quark micro-status into our present-day accounting of using, for example, anti-protons to quantify anti-matter?
4) When accounting for matter and anti-matter while calculating electron capture, can the laws of conservation simply ignore those quarks and anti-quarks within the nucleus?
5) If we accept the positive charge of the anti-down quark, $d^{-} = (+1/3)$, as the designator of anti-matter, then why, in the anti-up quark, $u^{-} = 2(–1/3)$, must we accept the negative charge for the anti-matter designator? Might the fix be simple and necessary?
6) Is science ignorant of the existence of 3 mini-quarks, including extra-lightweight?

Stephen Hawking in *The Brief History of Time* explained "...at the grand unification energy there is no essential difference between a quark and an antielectron." Reducing the basic electromagnetic units from an electron, a neutron, and a proton {–1, 0, +1} to multiples of the negative or positive 1/3 of the down and anti-down quarks allows defining (Fig.III.1) electrons, antielectrons, neutrinos, and antineutrinos the same as if they were mini-quark constructs.

"The idea of particles with fractional charges—that was considered to be a crank idea too."
Murray Gell-Mann, discoverer of the ±1/3 charges of quarks, August 2009

Quantifying basic EM particle charges as {-1/3, 1/3} rather than{0, 1, -1} produces a balance of atomic matter and anti-matter, the identical particles with opposite charges (Fig.III.8).

Quarks maintain unified motion within string nodal pairs and triplets (Fig.III.4). Quark masses are not measured individually. Based on $E = Mc^2$ and string theory, particle mass is the energy is created in the spinning string's length, tension, and cycle frequency, allowing particles of varying masses to exist within the same families. This allows an electron or a positron, considered less massive than an up or down quark, as well as the mass of a neutrino or anti-neutrino, to be quarkstrings made up of "mini-quarks" with lesser string length, tension, and/or frequency, regulating their *exonuclear* strong force. This permits the 3 x ±1/3 units for electrons and positrons to equate matter with matter, and anti-matter with anti-matter: an electron to three down quarks (3 x -1/3), and a positron to three anti-down quarks (3 x +1/3).

"In samarium hexaboride, the possibility is that the electron itself has broken apart. So instead of thinking of the electron as the building block, we would need to think of fractional parts of the electron as building blocks." Suchitra Sebastian, Cavendish Laboratory, Cambridge, 2016

"…experimentalists Horst Störmer and Daniel Tsui showed something even more baffling: under extreme conditions (even lower temperatures and stronger magnetic fields), the Hall conductance was quantized in fractional multiples of what had been previously observed. It's as if somehow electrons themselves were being split up into smaller particles, each carrying a fraction of the electron's charge. Störmer and Tsui, along with theoretical physicist Robert Laughlin, shared the Nobel Prize in Physics in 1998 for their work on this problem. Both the integer and fractional quantum Hall effects indicate that the electrons in these systems are somehow acting together in an unified, global manner," August 24, 2018, Whitney Clavin, Caltech

"'Anyons only exist as collective excitations of electrons under special circumstances' [Michael] Manfra said. 'But they have the demonstrably cool properties including fractional charge and functional statistics. It is funny, because you think, 'How can they have less charge than the elementary charge of an electron?' But they do."
September 4, 2020; *New evidence…quantum world*; Steve Tally, Purdue University

Electrons become fractions of themselves in graphene; by MIT Feb 21, 2024

Weird electron behavior gets even weirder: Charge fractionalization observed spectroscopically; by Miriam Arrell, Paul Scherrer Institute, March 6, 2024 "'Basic quantum mechanics tells us that the fundamental unit of charge is unbreakable: the electron charge is quantized…Achieving and observing states in which charge is fractionalized is exciting not only from the perspective of fundamental research,' says Gabriel Aeppli… who proposed the study. 'We observe this in an alloy of common metals at low but still relatively accessible temperatures.'"

Using ±1/3 quark charges for neutrons, neutrinos, and anti-neutrinos still makes them neutral electric charges, but the ±1/3 matter-antimatter quantities assigned to these in Fig.III.1 are needed to balance electron capture equations in Fig.III.2. For this reason, this train of thought will continue to count electrons, positrons, neutrinos, and antineutrinos as multiples of ±1/3.

Important: Fig.III.1 requires swapping established quark *names* between up and anti-up quarks. This maintains positive-negative consistency on what is matter and what is anti-matter, allowing anti-up quarks and anti-down quarks to match-up with the same charge. Also note that JJ Thomson misnamed the electron's *positive* electrical pressure as negative instead of *positive*. If we choose to fix this, what we call matter and anti-matter would also be affected (Chap. XIX).

Fig.III.1: Particles as ±1/3 charged units (see Figs.XXI.4 & .5 & .6)

Charge	Name	Components in ±1/3 units (electromagnetic and matter-antimatter)
–1/3	down quark	$d = (-1/3)$ ← proposed unit charges of ±1/3
+1/3	anti-down quark	$d^- = (+1/3)$ ←
+2/3	*up* quark	$u = 2(+1/3)$ ← These names [(*up u* and *anti-up* u^-)] need to
–2/3	*anti-up* quark	$u^- = 2(-1/3)$ ← swap positions to each other's components.
–1	electron	$e^- = 3\,d = 3(-1/3)$ ← These presently
+1	positron	$e^+ = 3\,d^- = 3(+1/3)$ ← are the accepted
+1	proton	$p = 2\,u + d = 4(+1/3) + (-1/3)$ ← {-1, 0, +1}
Ø	neutron	$n = u + 2\,d = 2(+1/3) + 2(-1/3)$ ← unit charges.
Ø	neutrino	$\nu = u + u^- = 2(+1/3) + 2(-1/3)$
Ø	anti-neutrino	$\nu^- = d + d^- = (+1/3) + (-1/3)$
Ø	neutral pi meson	$\pi^0 = d + d^- + u + u^- = 3(+1/3) + 3(-1/3)$
+1	positive pi meson	$\pi^+ = u + d^- = 3(+1/3)$
–1	negative pi meson	$\pi^- = u^- + d = 3(-1/3)$

How it should be:
u^- = +2/3 anti-up quark
u = -2/3 up quark

Due to the zero-cosmological constant in this theory, *down and anti-down quarks with ±1/3 electromagnetic charges are the basic units of matter and anti-matter*, and their universal quantity before and after particle decay are required to remain equal in quantity: symmetric and conserved. Utilizing Fig.III.1, electron capture (Fig.III.2) demonstrates the symmetry of ±1/3 units. At the end of the equation, " **= 0** " shows conservation of the zero-cosmological constant.

Fig.III.2: Electron capture $p + e^- \rightarrow n + \nu$ $\quad 4(+1/3) + 4(-1/3) \rightarrow 4(+1/3) + 4(-1/3) = 0$

A neutrino interacting with a neutron, ±1/3 symmetric, electron capture in reverse:

$n + \nu \rightarrow p + e^-$ $\quad 4(+1/3) + 4(-1/3) \rightarrow 4(+1/3) + 4(-1/3) = 0$

Accepted terminology of quark "colors" of red, green, and blue allows three different

quantum numbers. Instead, *HUT* equates "color" to three quarkstring nodes located at left end, center, and right end (Fig.III.3), whose relative motions allow obeying the Pauli exclusion principal while still satisfying the original need to accommodate separate quantum numbers. The dance of the quarkstring's three nodes must be harmonically in-phase or the string interferes with itself. The string is the strong force: "gluons". The nodes are the colors.

Fig.III.3: Three nodes of a single spinning quarkstring

"In string theory, 1-D strings trace out 2-D surfaces over time." Sci Am May 2011 Baez/Huerta

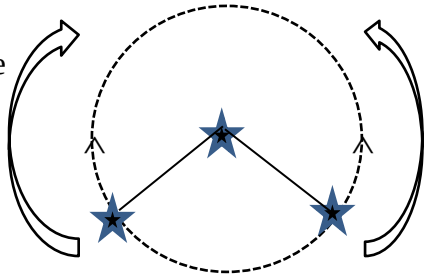
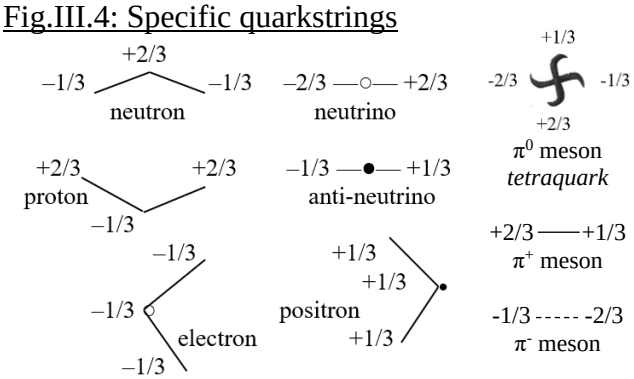


Figure III.3 shows the 3 single quark nodes found inside a neutron or proton, or 3 mini-quarks inside the electrons and positrons. The quarkstring must move precisely as two connected vectors—each spinning circles, oppositely pivoting around the string's center, avoiding collision. The single V shaped quarkstring contains down, anti-down, up, and/or anti-up quarks, or mini-quarks.

Original vacuum, the source of all pairs of virtual particles and virtual anti-particles, and everything else, must provide the string's color force; the dance (spin) energy. No other energy source is available. Extending this into a unified field theory, the strong force is the original void. The void is also the force source of electro-magnetic, nuclear weak, and gravitational fields (Fig.XXI.7). When the valence of an element's outer **s** and **p** sub-electron-fields are fulfilled, heat and light release from the diminishing dance-energy surrounding the cosmic void. This is measured as *electron affinity*, also a residue of the unifying vacuum force.

Three quarks in each proton and neutron demonstrate the first of three quarkstring options in the various sub-atomic particles (Fig.III.4). The second option has just *two quarks* residing at the two end nodes, like a baton, like a pi meson. The baton can twirl, but without the pivoting universal joint in its non-existing third center node. This limits the two ends of the baton to always spin in the same direction, separated by an average of 180°. Instead of being the spinning baton, a neutrino moves like an arrow, a mini-two-node quarkstring shooting through space and material objects, sometimes even faster than light when racing through certain materials' indexes of refraction. The third option is the *four quarks* in the neutral pi meson.

Fig.III.4: Specific quarkstrings



Even if we exchange names of up and anti-up quarks, as is needed, these numbers remain the same. Fidget spinner shaped π^0 meson composed of 4 quarks.

"When electrons and protons came together, they annihilated one another in a spray that could include quarks, anti-quarks, and gluons." *Strange Beauty*, George Johnson

See *HUT* chapter XXII superstring theory.

"…predominantly negative charge from one kind of quark tends to be located toward the outer part of the neutron, whereas net positive charge is located toward the center. The distance between those two concentrations is the 'charge radius.'" September 9, 2021
Groundbreaking technique yields important new details on … possible 'fifth force' (NIST)

Acting as force carriers, positive and negative, *pi mesons (pions)*, $\pi^{\pm}$, are absorbed and

assimilated by neutrons, protons, and tritium beta decay: Figs.III.5,6, &7. Through charge reversal, pions transform neutrons and protons into each other, defining strong interactions. The neutral pi meson, π^0, a superposition of π^+ combined with π^-, also interacts with atomic nuclei. To fulfill the missing 3(+1/3) + 3(–1/3) in neutron (β^-) and proton (β^+) beta decays (Fig.III.5), the π^0 can be the trigger. The symmetry requires the ±1/3 equivalence of a single π^0 for triggering beta decay. Combined pairs of $\{\nu + \bar{\nu}\}$, $\{e^+ + e^-\}$, and $\{\pi^+ + \pi^-\}$ are all ±1/3 symmetrical, {3(+1/3) + 3(–1/3)}, and, so far as satisfying the conservation of ±1/3 charges, would work fine as beta decay triggers. If considered in terms of ±1/3 charges, pions $\{\pi^+, \pi^-, \pi^0\}$ and the three weak force particles $\{W^+, W^-, Z^0\}$ are interchangeable in Figs.III.4, .5, .6, .7.

As demonstrated in Fig.III.2, calculate beta decays using Fig.III.1 or .4.

Fig.III.5: Neutron & proton beta decay

$n + \pi^0 \rightarrow p + e^- + \bar{\nu} = 0 \qquad p + \pi^0 \rightarrow n + e^+ + \nu = 0$

Showing a neutron decay into a proton, and a proton decay into a neutron.

Fig.III.6: Tritium beta decay

$$\frac{3}{1}H + \pi^0 \rightarrow \frac{3}{2}He + e^- + \bar{\nu} = 0$$

Note: the top number in the ratio is the number of neutrons plus protons. The bottom is the number of protons.

Four beta decay examples (Fig.III.7) also retain ±1/3 symmetry by assimilating π^0:

Fig.III.7: Four beta decay examples

$$\frac{239}{92}U + \pi^0 \rightarrow \frac{239}{93}Np + e^- + \bar{\nu} = 0 \qquad \frac{14}{6}C + \pi^0 \rightarrow \frac{14}{7}N + e^- + \bar{\nu} = 0 \quad (\text{“carbon 14 dating”})$$

$$\frac{13}{7}N + \pi^0 \rightarrow \frac{13}{6}C + e^+ + \nu = 0 \qquad \frac{22}{11}Na + \pi^0 \rightarrow \frac{22}{10}Ne + e^+ + \nu = 0$$

To quantify particles not as {1, 0, -1} for fundamental electromagnetic charges, but as {1/3, -1/3}, being the charges of an anti-down quark and a down quark, means that the new set quantifies electromagnetism as well as the symmetry of anti-matter and matter.

Three types of atomic radioactivity are beta, gamma, & alpha decay. Beta decay shoots out electrons or positrons (Fig.III.5, .6, .7). Gamma decay shoots out high energy photons. Alpha decay shoots out a pair of protons and a pair of neutrons that upon departure join into a single nucleus of a helium atom. Neither alpha nor gamma decay require an external insertion, such as π^0, to balance the ±1/3 symmetry—only beta—thus only beta decay is demonstrated here.

Quantifying ±1/3 as base units of matter and anti-matter suggests recalculating the cumulative symmetry of atomic, galactic, and universal matter and anti-matter. Popular calculating methods existed at least since Geoffrey Burbidge and Fred Hoyle claimed in April of 1958 that, “Anti-matter may exist in our galaxy, but it cannot exceed about one part in 10,000,000 of ordinary matter if it is there.” Caltech physicist Murray Gell-Mann did not publish his quark idea in *Physic Letters* until 1964. The three men partied together in Chicago, April, 1961. We must reconcile that 1958 claim with the 1964 discovery.

From the ±1/3 perspective, current science is in error when stating that $n + p + e^-$ shows missing anti-matter, specifically a positron and an anti-proton. When recalculating with ±1/3 symmetry (Fig.III.8), this way of balancing the equation shows no missing atomic antimatter:

Fig.III.8: No missing atomic anti-matter $\qquad n + p + e^- = 6(+1/3) + 6(-1/3) = 0$

“…an initial situation in which there were no more quarks than anti-quarks…is the most natural way to imagine the universe starting out.” *A Brief History of Time,* Stephen Hawking

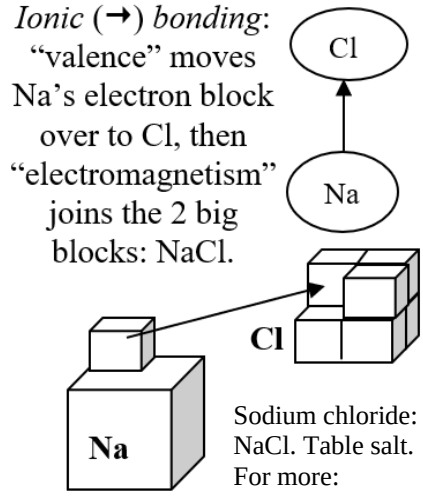
IV VALENCE CONFUSION

1) The force responsible for balancing the oxidation (valence) number (column near right side of Fig.II.8) of atoms is either ignored or attributed to electromagnetism. An electromagnetically neutral atom still displays the oxidation force, so these are not the same. Ignorance is not an acceptable answer for science. Will science admit ignorance enough to define or re-define the force of valence?

Source of valence force is not electromagnetic; it is magnetic

The periodic table has atoms with equal numbers of protons and electrons, making everything electromagnetically neutral. In chemistry, valence is the targeting attraction force existing between two or more neutral atoms. Whole number valences between -4 and 8 are observed. Valence of zero is an inert atom with **s** & **p** sub-fields satisfied, neither accepting an additional electron, nor offering to get rid of any electrons. Prevalently, negative valence numbers are the number of electrons needed to fill x**s** and x**p**, where x = field # {1,2,3,4,5,6,7,8}, and **s** or **p** = sub-field letter, of {**s**, **p**, **d**, **f**}, which complete with {2,6,10,14} electrons, {**s**, **p**} being {2, 6}. Positive number valences, beyond completed 2 + 6 = 8 electrons, being 2 in x**s** plus 6 in x**p**, tell that an atom has extra electrons to share, as do conductive metals.

Fig.IV.1 NaCl electron blocks



Sodium chloride: NaCl. Table salt. For more: Figs.VIII.9-11 & chapter XIX

Chemistry teachers mistakenly teach that valence is an electromagnetic force, but it is not because valence still exists with electrically neutral atoms. Valence of a neutral chlorine atom requires one electron to fulfill its $3s^2 + 3p^5$ sub-fields, thus it can rip the extra electron from neutral sodium's $3s^1$. As the electron moves from sodium to chlorine, Fig.IV.1, bringing both valences to zero, the atoms ionize to be electromagnetically charged atoms, forcing Na^+ & Cl^- to bind into a neutral molecule of NaCl: table salt. Valence force and electric force are not the same. Valence force is stronger as it can rip away an electrically bound electron.

Opposite electric charges of the proton and the electron bind those two together inside each atom. As chlorine lacks one electron to fulfill its outer s & p sub-fields, sodium has the one extra unpaired electron, beyond its fulfilled outer s & p sub-fields. The two unpaired electrons' magnetic attraction helps move the extra sodium electron to the position of the missing chlorine electron, so that both of their outer s & p sub-fields are zero valence. This results in the two neutral atoms becoming two ions that combine into NaCl. Both atoms, now combined as a molecule, have all their electrons paired, so magnetism is mostly cancelled, and the molecule is electrically neutral—stable.

The present day teaching of this valence force is unclear. To be acceptable, this *HUT* proposal requires contemplation regarding electromagnetism not being responsible for this oxidation valence force, only the extended residual strong force is a strong enough attraction to qualify as the source of valence. See Fig.XXI.12.

V DARK MATTER & DARK ENERGY SIMPLIFIED

1) Is Dark Matter, named and postulated to account for the huge percentage of total mass required to explain the galactic gravity we witness, simply an oversight of our present knowledge, or actually some unknown source of gravity causing the spatial contraction?
2) Is Dark Energy, named and postulated for space expanding more locally than farther away, simply an oversight of our present knowledge, or actually some unknown source of spatial expansion?

Dark Matter: Light has Mass Equivalence

"The Standard Model is the current best theory of particle physics, describing all the known fundamental particles that make up our Universe and the forces that they interact with. However, the Standard Model cannot explain some of the deepest mysteries in modern physics, including what dark matter is made of and the imbalance of matter and antimatter in the Universe."
Hayley Dunning, March 23, 2021

Scientists looking into space are not finding enough mass to account for the gravity which is mathematically required to hold galaxies together. The unobserved "missing" mass is estimated to be five times the amount of the mass that we do find. The mystery is: why do we not find the amount of mass that we need to find? We witness too much space contraction to explain. The missing mass is referred to as *dark matter*. Dark matter does not absorb, reflect, nor emit light, but it has gravitational effect.

Shine a flashlight up into the night air. Longer wavelengths of light are more invisible to the eye as they move through the void, between particles, in free momentum as a wave. Put smoke or dust in the air to interfere with the light wavefunction. Dust particles absorb some wavelengths, reducing the wave *possibility* to a particle *probability*, and reflect others as waves. Upon contacting the mass of the eye, the reflected wave collapses to a photon in position and transfers its momentum to an electrochemical impulse, allowing us to see light. This light momentum transition to the motion of a charged particle also occurs in the photo-electric effect, plant photosynthesis, and skin's vitamin D synthesis.

Particles are grouped under the two headings of *fermions* and *bosons*. Fermions, including leptons (electrons and neutrinos) and quarks (making up protons, neutrons, and mesons), cause space *to contract* towards its center of gravity, manifesting gravitational space warping. Bosons are energy carriers, like photons, gluons, W & Z bosons, maybe (?) gravitons.

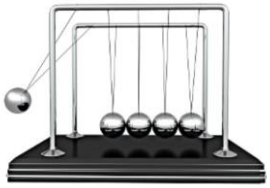


Figure.V.1
Newton's pendulum

Energy transfer through mass can be visually demonstrated by Newton's Pendulum, Fig.V.1. Light as a wavefunction interacts with fermions, as in a thin sheet of metal, manifesting a photon, transferring energy, and pushing out an electron, similar to Newton's pendulum. Einstein earned his Nobel Prize for this as the photo-electric effect, now used to automatically open doors into a supermarket. This shows that according to $E=Mc^2$, light energy has transferable *mass equivalence*.

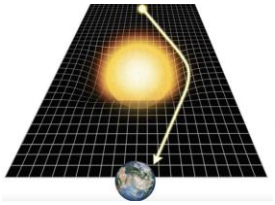
Einstein taught that mass is the measure of an object's energy. As frequencies change, blue light has more mass equivalency than red. As mass increases speed, kinetic energy increases. Utilizing the Lorenze constant, created to define space contracting in the direction of travel, we also define "relativistic mass", where mass increases towards the speed of light and infinity. This yokes time, 1-D of space, not 3, and mass. This show the common reference to be light, not distance, time, or mass. Mass, space, and time are created by decelerated light, as $E = Mc^2$ elegantly expresses.

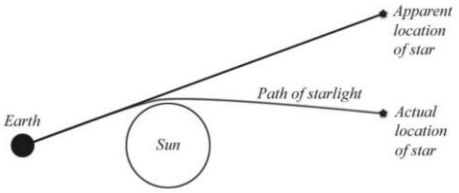
We consider light waves to be zooming through the universe as pure energy whose mass equivalence is conserved as momentum. The sun converts 4.7 million tons of mass into light energy every second. If light has no mass equivalence, the 4.7 million tons of mass escaping as light each second is breaking the law of conservation expressed by $E=Mc^2$. Ignoring light's mass equivalence allows the mystery of dark matter to be very popular.

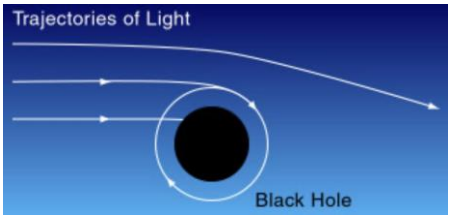
Light is unique because it exists as pure energy, with no recognizable "rest mass" in the $E=Mc^2$ equation. Even as light energy is pure momentum with no rest mass, in the 3-D *probability field*, light mass cannot equal zero unless we collapse the equation $E = Mc^2$. To avoid this, we can instead consider the wavefunction of light to be within the 2-D *possibility field*.

For light "traveling" in the 2-D possibility field, $E=Mc^2$ has collapsed. Distance in the direction of travel has reduced to zero, explained with Lorenze contraction. Time has stopped, according to special relativity. Only the two dimensions remain.

Traveling light has no rest mass, yet it bends around sources with high mass due to gravity warping space. When gravity bends space, passing light will bend away from its direct path to follow the warped space. While traveling light cannot accelerate anymore in the direction of travel, it can bend its course to the side in a gravitational field. Light going directly from a star into the sun, earth pr black hole will not accelerate in the direction of travel. The gravitational field can only change the direction of travel to the side. Since all bodies fall at the same rate, even if they have different weights, light falling to the side would have to do so at the same rate in void as a feather or a bowling ball







In the dominant 3-D gravitational field, without air resistance, a feather, a bowling ball, and a planet all accelerate the same towards the predominating center of a gravitational field. All frequencies of light waves also bend in the warped space toward the strong gravitational center, though light is unable to accelerate any more. Mass and energy fall into a black hole the same. Light waves have their own gravitational fields, identifying light to be dark matter.

When calculating missing mass, do scientists also leave out cosmic rays? Cosmic rays include protons accelerated to 99+% of the speed of light. Since "rest mass" does not change with velocity, it is the protons' kinetic energy that increases what is referred to as "relativistic mass". It took a huge amount of energy, like provided in a supernova, to accelerate the protons to that speed. It takes the same amount of energy to slow those protons down upon reaching Earth's atmosphere, which occurs when striking the nuclei of atmospheric oxygen and nitrogen, decaying into pions and other particles.

Mass, 3-D space, and time are not aspects of the 2-D possibility field. Light performs uniquely in both the possibility field and the probability field. Considered from observations in the 3-D probability field, invisible light as a wave must be treated as being within the 2-D possibility field, even while still providing gravity in the probability field. Light observed as a photon in position is clearly acting within the probability field. Light as a wave within the possibility field explains dark matter and the mass-gap hypothesis that is witnessed in the probability field. This is echoed by a "hidden sector" in string/M-theory which Lisa Zyga reported November 11, 2016, to explain dark matter (*Physical Review Letters*).

Rest mass is considered an invariant quantity, not changing with inertia, be that from

momentum or gravity, nor with the motion of the observer. *Relative mass* is considered a variant quantity, changing from its motion relative to an observer, even from a change in internal heat. Scientists admit that light has *relativistic mass*, but they also say that version is very confusing and should just be avoided in most discussions. These two different concepts of light simply get grouped together into one popular statement: light has no mass. At the speed of light, the wavefunction aspect of light must be pure energy, with no rest mass, since by approaching that speed, relative-mass would increase to infinity—an impossibility. Even as light is considered to have zero rest mass, we must still account for its observed inertia in space. All of this is allowable only if the wavefunction of light is not considered to be always in the probability field, but rather as a wave within the possibility field.

For light, both as 2-D waves in the void or as photons interacting with 3-D mass, scientists mistakenly do not assign light any mass-equivalence value to it. Errors enter by believing that since light has no rest-mass, that it is okay to consider that light has no mass equivalence. For accuracy, light, even if considered to be pure energy within some theoretical possibility field, must be considered to provide mass-equivalent gravity in the probability field.

"...radiation traveling through space and emitted from the sun contains energy and therefore has mass; the sun and all radiating stars lose mass by emitting radiation."
The Evolution of Physics, Albert Einstein & Leopold Infeld

"…the relativity principle requires that the mass be a direct measure of the energy contained in a body. Light carries mass with it." from a 1905 letter from A. Einstein to Conrad Habicht

Empty space is currently calculated as massless. With an average minimum of three-degrees kelvin background temperature, and with the fact that $E = Mc^2$, we must consider that there are mass-equivalent invisible waves of light everywhere. When light waves are not interacting with fermionic matter, like a flashlight beam at night not reflecting off any fog, smoke, or dust, the invisible bosonic energy must still be considered to have mass equivalence. This then requires recalculating the total universal mass and reconsidering that the missing mass referred to as dark matter might simply be missing from our understanding. The solution to the dilemma of missing mass is within all the unobstructed light. We do not see that light, and, in error, we refuse to count it as mass equivalent. Light in its wave form within "empty" space does not absorb, reflect, nor emit light, but has gravitational effect.

Dark Energy: Bosons Accelerate Space Expansion

Observations of supernova explosions show expansions of space farther away are not accelerating as much as closer to Earth. Non-zero cosmological constant explanations are popular for this, an *unsatisfying* solution for many analysts, as it would be for Einstein.

Edwin Hubble's explorations showed that everything in the universe is expanding away from everything else, like a balloon with dots drawn on it that is being filled up with air. The law that dark energy seems to be breaking is Hubble's Law which shows that the farther away a region of space is from Earth, the greater the acceleration of space expansion.

Consider a zero-dimension, 0-D, point to be the Earth's center. Expand outward into space from this point into concentric spheres. Let the expansion be constant along the *radius* through time. To an observer who is at the center of a sphere and examining distant, thus older, sections of space, each consecutive farther-out ringed section should be expanding at accelerated rates due to each and every point expanding. With the expanding circumference through constant radius extensions, there are more and more points to expand. Recent observations show that this is not the reality here, as closer regions of space are measured to be accelerating more rapidly.

Fermion particles, being quark constructs, electrons, and neutrinos, are constantly

contracting space around them while emitting bosons. Bosons, like gluons, $W^{\pm}$ & Z^0 bosons, proposed gravitons of gravitational waves, and photons, and even a pair of electrons acting as a single composite boson, can be considered as wave fronts. Huygens' Principle tells that every point of a wave front is the source of secondary spherical wavelets. As bosonic wave fronts expand outward from their fermion sources, according to the inverse square law, quantum field theory suggests the wave fronts destabilize the contained *original* vacuums within surrounding space, causing those contained vacuums to decay into creating new contained vacuums, thus expanding space, adhering to Huygens' Principle. Expansion of space can be imagined as closed superstring loops dancing order and containing void, which decay and create additional contained vacuums.

All bosons saturating our local space are from old and new stellar systems. Older, more distant regions of space *have not yet received as much* of the newer-created bosons from younger stars situated in the opposite direction from Earth. Due to the speed of light travelling so far, the space out there is ancient history. We witness local space regions expanding more rapidly due to it being *more saturated* with space-expanding bosons than we witness in the older areas farther away. Invisible light and other bosonic energies resolve the "dark energy" conundrum.

A balancing act: we postulate dark matter because locally we witness too much space *contraction*. We postulate dark energy because locally we witness too much space *expansion*. Combining the "dark matter" *contraction* of space caused by mass equivalence, and "dark energy" *expansion* caused by bosons, we witness warping as gravity's space contraction combined with wave-front space expansion. Since light has mass equivalence, it has gravity and can account for dark matter. Yet also, light waves expand space, and can account for dark energy. In differing times, places, and field strengths, the expanding and contracting cancel-out each other at different rates from our perspectives.

Probability field's 3-D space + time expand from possibility field's 2-D void dance. Probability field's space and time enfolds back into the possibility field's void dance. This is witnessed with black holes, where space and time disappear into a singularity, which still displays gravity.

To test the theory:

So much mass within stars is constantly converting to light, and the law of conservation says that light's mass equivalence cannot be ignored. According to Einstein's photo-electric effect, higher frequency light, like ultra-violet, having more energy, would have greater mass equivalency, adding more to dark matter than lower frequency light such as red. This constitutes a theoretical prediction for future research verifying dark matter's equivalence to light. If the light being calculated is towards the red end of the spectrum, the lesser energy would have less mass equivalence compared to blue light, meaning that red light allows more space expansion, thus increasing dark energy's counterbalance of dark matter.

Mathematical calculations could assign a mass equivalence to all bosonic waves vibrating through our universe, rather than claiming light is without mass. Waves of light cause space to expand while also causing space to contract. Calculations need to account for this, and only then will contracting and expanding space can be reassessed properly.

The possibility field, being other than the probability field, needs to be considered as being accessible to light as a wave, just as it is for virtual particles, while still showing light's gravitational effects within the probability field's space and time.

VI DISTANCE ≠ TIME

1) Did the cumulative works of Minkowski, Lorentz, and Einstein make an error in the yoking of 3 dimensions (3-D) of space with 1-D of time into 4-D spacetime?

2) Do we accept violating algebra's fundamental rule by multiplying one side of an equation's equals sign by something while not doing the same to the other side?

The traveler's time duration varies between moving a mile in a car, on a bicycle, in a jet plane, walking, and as light. To the observer by the side of the road, not traveling, the mile distance and direction remains unchanged. Since the speed varies, the time duration is not remaining constant as is the spatial distance. Time and space are not yoked and must be treated separately. At light speed, from the perspective of the light, time ceases to be, and 3-D space has changed to 2-D since the distance in the direction of travel reduces to nonexistent. Light does not perceive the distance traveled. Yoked *spacetime* is not the stage where all action happens. For all examples except for light's perspective, the stage is the 3-D space being traveled, and time measures the action. In light's 2-D perspective, time and 3-D travel distance are only imaginary.

In *Relativity, The Special and the General Theory,* Einstein tells how his work on dimensions combined with the works of Hendrik Lorentz and Hermann Minkowski. To clarify perspectives of dimensions: zero-dimension (0-D) refers to an imaginary point in a void. Stretch the point out to be a 1-D line with two ends: length. Rake that line or spin it to create a triangle, square, or a circle, all referred to as a 2-D plane: area. Raise up or spin that plane to make a 3-D cone, cube, or sphere: volume. Move in a line or rotate that cone, cube, or sphere, and they say that is 4-D spacetime. For *HUT*, it is simply 4-D time. Five dimensions would include the zero, being the imaginary dimension, with three dimensions of space, and one of time, expressed as:

$\{(2\text{ units})^0, (2\text{ units})^1, (2\text{ units})^2, (2\text{ units})^3, (2\text{ units})^4\}$ = {point, line, area, volume, time}

In 1892 Lorentz postulated length contraction. The Lorentz transformation showed a velocity-related reduction in length of the 1-D line in the direction of travel. Einstein's 1905 special theory of relativity postulated 4-D time dilation joined with Lorentz's 1-D length contraction, both caused by changing velocities of a moving object. Forward motion shrinks both the distance in the direction of travel, 1-D, and the duration of passing time: 4-D.

In 1907, Minkowski's response to Einstein's 1905 work was to verbally combine the three space dimensions expressed in terms of distance—height, width, depth—with one dimension of time passage into a unity of 4-D *spacetime*.

Concluding that story of special relativity, Einstein said: "…the discovery of Minkowski… was of importance for the formal development of the theory of relativity… his recognition that the four-dimensional space-time continuum…shows a pronounced relationship to the three-dimensional continuum of Euclidean geometrical space. In order to give due prominence to this relationship, however, we must replace the usual time co-ordinate ***t*** by an imaginary magnitude $\sqrt{-1} \cdot ct$ <u>proportional</u> to it…[then] the time coordinate plays exactly the same role as the three space co-ordinates. Formally, these four co-ordinates correspond exactly to the three space co-ordinates in Euclidean Geometry." [*<u>Proportional</u> was not underlined in original*.]

After ***t*** is multiplied by ***ic***, ***i*** being the imaginary number, $i = \sqrt{-1}$, and ***c*** being the speed of light, our paradigm has accepted that time is *formally* and *exactly* corresponding to space dimensions. *HUT* claims that imagining ***t*** to equal ***ict, t = ict,*** and claiming it to be reality is an unfair leap. Imaginary numbers are real in our minds only, and maybe the whole universe really is a mental construct, but there is nothing in accepted physical reality that multiplied by itself equals

minus one. Negative or positive numbers multiplied by themselves in the real world equal a positive number. Not negative. The source of the imaginary number is pure imagination, even though the equations that include ***i*** are, in "reality", printed on pages, allowing quantum scientists to make real predictions with high *probabilities* of coming true.

We quantify the three space dimensions with units of *distance (d)*: $\{d_1, d_2, d_3\}$. Using three dimensions of {height, width, and depth}, we can build a doll house. On a larger scale, we have longitude and latitude on the 2-D curved space of Earth's surface, with vertical altitude making up the 3-D experience. For the dimension of time, we use the letter ***t***: $\{d_1, d_2, d_3, t\}$. After Minkowski and Einstein, this changed, and no one seems to question the change. We now just group these three distance dimensions together with time into the cozy four dimensions of spacetime. The distance (d) form that Einstein's four-dimensions now takes is $\{d_1, d_2, d_3, \boldsymbol{ict}\}$. We get the ***t*** factor in there, but we just pretend we did not multiply ***t*** by ***c*** and ***i***. Truth: $t \neq ict$. Einstein's quote shows blame:

"…the imaginary time co-ordinate x_4 enters into the condition of transformation in exactly the same way as the space co-ordinates x_1, x_2, x_3. It is due to this fact that, according to the theory of relativity, the 'time' x_4 enters into natural laws in the same form as the space co-ordinates x_1, x_2, x_3."

Objectionable here are the words, "exactly the same way" and "It is due to this fact" and "in the same form" and "natural laws". We convince ourselves that ***t*** is x_4 because $\sqrt{-1}\ ct$ is accepted as "proportional". Then we pretend that using this manipulatory tactic is changing nothing else. Multiplying by ***i***, which is the imaginary number, $\sqrt{-1}$, and ***c***, the speed of light, changes our simple little $\boldsymbol{x_4 = time}$ dimension into $\boldsymbol{x_4 = ict}$. That is not the same as $\boldsymbol{x_4 = t}$ because $\boldsymbol{ict \neq t}$. But present-day science accepts using ***ict*** to replace *time* ***t*** because it satisfies a *desire* to make time into a dimension of distance, just like the three dimensions of space. The $\boldsymbol{x_4 = t = ict}$ is a cute trick, but is error.

The speed of light, ***c***, equals distance per time (e.g. miles per second), being ***d/t.*** Replace the ***c*** in ***ict*** with ***d/t*** and we have: $\boldsymbol{x_4 = itd/t}$. The $\boldsymbol{t/t = 1}$ and can be cancelled out, leaving us with $\boldsymbol{x_4 = id}$. The original cute little ***t*** has effectively been replaced with ***id***—imaginary diastance. The $\boldsymbol{x_4 = t = id}$ is not fair! The correct tee-shirt says: $\boldsymbol{t \neq id.}$

Putting ***id*** back into words, we find the glorified fourth dimensional time is being pushed on us as distance multiplied by the imaginary number, which has nothing to do with time at all. It is not "natural law". Einstein and Minkowski and the rest have just pretended this little math trick is as meaningless as multiplying something by one, or adding zero. But it is not. Einstein and the others *took the time completely out of time*. Their fourth-dimensional time is actually time-free. They slyly made time into just another *distance* dimension, except that ***id*** = *imaginary distance* and has no aspect of time or reality to it. The distance is not even real. It is imaginary, designated to the possibility field, which does not yet qualify as "natural law" within the probability field.

Einstein allowed himself to replace ***t*** with ***ict*** because it is "*proportional to it.*" When ***ict*** replaces ***t***, and is *correctly used* in an algebraic equation, the ***ic*** must be multiplied into the other side of the equation. If not, time is no longer time; time erroneously is just imaginary distance. These are not as interchangeable as we have been convinced they are. $\boldsymbol{t \neq id}$.

Einstein said, "It appears therefore more natural to think of physical reality as a four-dimensional existence, instead of, as hitherto, the evolution of a three-dimensional existence." But time is the measure of evolution *within* 3-D existence.

We have been accepting $\boldsymbol{t = ict}$, thus making time non-existent. Einstein concludes his discussion, "Thus if we choose as time-variable the imaginary variable ***ict*** instead of the real quantity ***t***, we can regard the spacetime continuum—in accordance with the special theory of relativity—as a 'Euclidean' four-dimensional continuum…" He's dreaming. He has the whole

scientific paradigm today accepting *time*, as witnessed with atomic half-lives, universal entropy, evolution, and overtones, to be *imaginary distance*. In Einstein's *Relativity* appendices, talking about Lorentz and Minkowski, he has completely accepted his erroneous conclusion: "We can regard Minkowski's 'world' in a formal manner as a four-dimensional Euclidean space (with imaginary time coordinate); the Lorentz transformation corresponds to a 'rotation' of the co-ordinate system in the four dimensional 'world.'"

Simply defining that 3-D space plus time make up four dimensions is acceptable, but not that time is defined as distance the same as the other three. The *spacetime* paradigm has made time into a distance, but this is not a reality in the probability field, just an error imagined to be true, and published as truth in literature within the probability field. When falsely making time into distance by multiplying time by the imaginary number, i, and the speed of light, c, it was not even necessary for Einstein to include the "i", except to show the whole mess to be imagined. And at the speed of light, time becomes irrelevant anyway. Einstein was not thinking correctly in this matter. Oops.

Space in 1-D contracts in the direction of travel while time dilates. Meanwhile, the other 2-D of space do not change, Einstein claimed 3-D space unifies with time, but at most only 1-D does.

Space can be curved, contracted, or expanded. Time can be dilated but not curved. The idea of curved spacetime is not correct. Time + 3-D space exist because 2-D light decelerated.

"What we observe is not nature in itself but nature exposed to our method of questioning,"
Werner Heisenberg

Summary of the disproof of a false claim False: $\boldsymbol{t = ict}$ ... True: $\boldsymbol{t = t}$ & $\boldsymbol{t \neq id}$ & $\boldsymbol{t \neq ict}$.

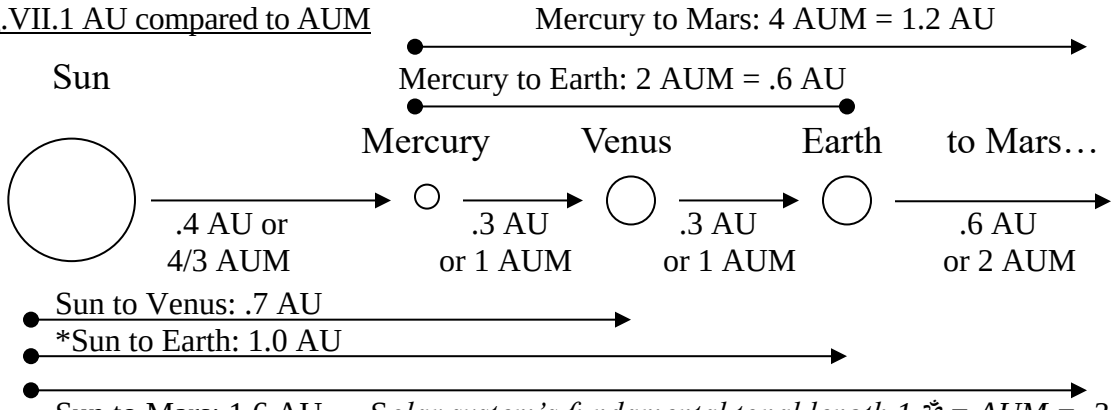
1) Einstein desired to yoke the *time* dimension {t} with the three distance dimensions, 3-D, of *space*, being measured as height, width, and depth: { d_1, d_2, d_3}. But not being a distance measurement, {d_4}, time{t} did not fit in as desired: { d_1, d_2, d_3, t}.
2) Einstein decided to multiply time {t} by two symbols, {i} and {c}, claiming this to be acceptable because time remained "proportional". The first symbol, the *imaginary number* {i}, is the non-existing square root of minus one: $\sqrt{-1}$. The second symbol is the *speed* of light {c}. Einstein made $\boldsymbol{t = tic}$. This is error: algebra does not allow multiplying one side of the equals sign with something, but not the other side. Calling it "proportional" is not accurate justification. Two important truths: $\boldsymbol{t = t}$; $\boldsymbol{t \neq tic}$.
3) Divide each side of the false equation $\boldsymbol{t = tic}$ by $\boldsymbol{t}$, with the false result being: $\boldsymbol{1 = ic}$.
4) C is speed, and speed equals distance over time: $\boldsymbol{c = d/t}$, e.g. miles per second.
5) In the false equation $\boldsymbol{1 = ic}$, replace $\boldsymbol{c}$ with $\boldsymbol{d/t}$: $\boldsymbol{1 = id/t}$.
6) In the false equation $\boldsymbol{1 = id/t}$, multiply each side by time, t, to get the error: $\boldsymbol{t = id}$.
7) With $\boldsymbol{t = id}$, Einstein made *time equal* to *imaginary distance*. Time equaling distance **d** is what he desired and claimed he achieved. Einstein's choice to yoke time with space has been accepted into science with his 4-D *spacetime*: {d_1, d_2, d_3, id_4}. But that result is beyond simply imaginary. It is algebraic scientific error since $\boldsymbol{t \neq id}$. Probability field reality is simple: $\boldsymbol{t = t}$. Time is a probability function of motion within a 3-D volume of space: {height, width, depth}. Our bodies are locked in time. Our minds can play in imaginary time and space, thus allowing the error of $\boldsymbol{t = id_4}$. Our paradigm accepts that the 4-D time unit is the same as the three distance measurement units, which is not true. Truth: $\boldsymbol{t \neq d}$. True summary: $\boldsymbol{t = t}$.

VII GRAVITY'S RAINBOW

1) Does gravity between objects in a system conform to a unified set of harmonic math?
2) Does the gravity of the sun shape space to define the locations of the averaged orbital paths around the sun?

Average radiuses of twelve orbital paths in the solar system demonstrate this 2-D harmonic layout, *at first* utilizing a binary subset, in base ten, of natural numbers through time: zero, one, and the doublings up from one: H_{BT} = {0, 1, 2, 4, 8…}. Earth's average distance from the sun defines one Astronomical Unit, 1 AU (Fig.VII.1*). Mercury is about .4 AU from the sun. The distances from Mercury to Venus and Venus to Earth are each about .3 AU, allowing: (.4 + .3 + .3) AU = 1 AU. Earth to Mars is about double .3 AU; Mars to Ceres, the largest asteroid, almost doubles again; Ceres to Jupiter doubles again; Jupiter to Saturn, then Saturn to Uranus each double again (Fig.VII.2). Using the distance from Mercury to Venus, .3 AU, as a 2-D fundamental measuring unit ॐ for the solar system allows *AU Modified*: AUM = .3 AU = ॐ.

Fig.VII.1 AU compared to AUM



Solar system's fundamental tonal length 1 ॐ = AUM = .3AU.

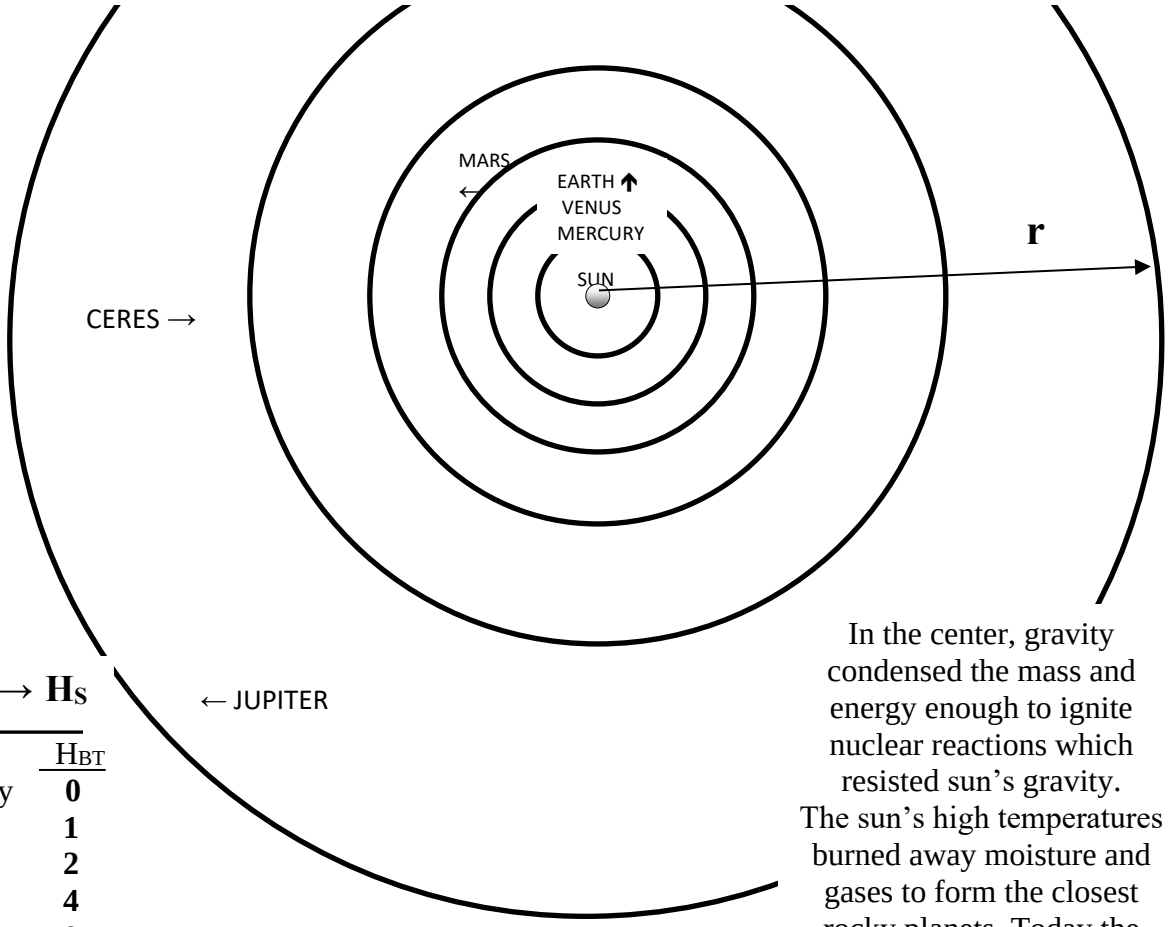
Let Mercury's circular average orbit be the zero. Venus orbits about 1 AUM away and Earth about 2 AUM. Mars is about 4 AUM, Ceres: 8, Jupiter: 16, Saturn: 32, and Uranus is about 64 AUM. Pluto, not Neptune, doubles to 128 AUM, breaking the harmonic binary-through-time (H_{BT}) pattern of only zero, 1, and doublings up from 1. Neptune orbits in *sub-H_{BT} degeneracy*, utilizing the first odd number after 1: the set of 3 and all its doublings (Fig.VII.2). Instead of using the AUM relationship of H_{BT} = {1,2,4,8} for {Saturn, Uranus, Neptune, Pluto} orbital distances, use H_{SL} = {1,2,3,4} to establish {32, 64, 96, 128} AUM. This places Neptune's average orbit at about 96 AUM from Mercury's orbit. The discovery of Quaoar, orbiting a billion miles beyond Pluto, then Eris, even farther out, show dwarf-planets that extend the sub-H_{BT} degeneracy sequence so that {Uranus, Neptune, Pluto, Quaoar, x, Eris} relate as {2, 3, 4, 5, x, 7}, revealing {64, 96, 128, 160, x, 224} AUM from Mercury's orbit. This leaves a new planet-type object x, *Aramara*, the sea goddess of the Huichol tribe of Mexico, potentially to be found at the {6} spot "x" in {2, 3, 4, 5, x, 7, y…}, thus at 192 AUM, or 57.6 AU, from Mercury's average orbit. We may also find a mini-planet, *Armonía*, for the Greek goddess of harmony, at the 8 spot "y", at 256 AUM, being 76.8 AU, from Mercury's orbit. See *Fig.VII.3 footnote c.*

Except for the harmonic set of sub-H_{BT} degeneracies, Hs, the actual average radius of each orbit from Mercury's average almost equals the harmonic binary set times AUM, thus: $r \approx H_{BT}$ AUM = .3H_{BT} AU. Add back in Mercury's approximate orbital distance from the sun, .4 AU, to derive the sun/point-centered equation: $\mathbf{r \approx (.3H_{BT} + .4)\ AU} = (H_{BT} + 4/3)$ AUM

Continues on page 40…

Fig.VII.2 Unbounded harmonic orbits Compare to Fig. VIII.1 & 2 and Fig.X.17

Formed from a slowly spinning spherical nebula made of an interstellar cloud of dust and gas, our future solar system began by gravitating together and heating up, condensing itself into the shape of a lentil, referred to as the lenticular solar nebula disk. The conservation of angular momentum caused spin to accelerate and to bring most of the mass into the center. Flattening outward from the condensed central mass, the protoplanetary disk formed. The opposition of gravity's centripetal force vs the spin's centrifugal force separated the disk into rings at harmonic distances from the center. The rings condensed into proto-planets, becoming our planets in their harmonic orbits shown in Figs.VII.1 & .2.



$H_{BT} \rightarrow H_S$

	H_{BT}	H_S
Mercury	**0**	
Venus	**1**	
Earth	**2**	
Mars	**4**	
Ceres	**8**	
Jupiter	**16**	
Saturn	**32** ↔	**1**
Uranus	**64**	**2**
Neptune	96	3
Pluto	**128**	**4**
Quaoar	160	5
Aramara	192	6
Eris	224	7
Armonía	**256**	**8**

In the center, gravity condensed the mass and energy enough to ignite nuclear reactions which resisted sun's gravity. The sun's high temperatures burned away moisture and gases to form the closest rocky planets. Today the orbiting planets still continue at the harmonic distances from the sun.

$$\mathbf{r \approx (.3H_{BT} + .4)\ AU}$$

An equation that locates all of our planets' average orbits with 99.42% accuracy.

The symbol **r** is radius, and one astronomical unit, **AU**, is the distance from earth to sun.

Notice: Mercury's orbit is the zero, not the sun. The zero occupies 2-D space like Fig.VIII.1 & 2. These are not radiating orbits. They are shown as standing waves.

Fig.VII.3: Comparing sun centered equation's predicted distances with actual

		predicted			
Planet	H_B Value	$r \approx (.3H_B + .4)$ AU	million mi[a]	average actual AU	% difference
Mercury	0	.4	35.9	0.386	+ 3.5
Venus	1	.7	67.2	0.723	- 3.2
Earth	2	1.0	93	1.00	0
Mars	4	1.6	141.6	1.523	+ 4.8
Ceres	8	2.8	257	2.763	+ 1.3
Jupiter	16	5.2	483.7	5.201	- 0.02
Saturn	32	10.0	885.6	9.526	+ 4.7
Uranus	64	19.6	1.8 billion	19.354	+ 1.3
Neptune	96[b]	29.2	2.8 ↕	30.107	- 3.1
Pluto	128	38.8	3.7	39.785	- 2.5
Quaoar	160[b]	48.4[d]	4.7[c]	50.538	- 4.4
Aramara	192[b]	58[d]	*e*	*e*	*e*
Eris	224[b]	67.6[d]	6.4	68.817	- 1.8
Armonía	256	77.2[d]	*e*	*e*	*e* ☻
				± error average %:	0.58[f]
				average accuracy %:	99.42[f]

Chart footnotes:

AU = 1.49597807 x 10^{11} meters, or 93 million miles

[a]from: *National Geographic* magazine insert, Dec. 2006

[b]Neptune, Quaoar, Aramara, Eris vary harmonically with H_S from H_B (see chart in Fig.VII.2)

[c]4.7 is established from the discoverers' estimate of "one billion miles past Pluto" at 3.7. *A problem is I do not trust the average orbit numbers that I have for all the new discoveries in our solar system, including: Quaoar, Haumea, Makemake, Eris, Orcus, Sedna, et al.*

[d]as predicted by this chart prior to orbitrons' discoveries

[e]predicted by this chart but possibly not yet found

[f]predicted distances have an average variation from the actual locations of less than 1%, (0.58%) with maximum variations of less than 5%, averaging ± 2.6 % from zero, which are consistent with the statistical two-standard-deviation rule for *significance* at 95%. The averaged 99.42% accuracy makes the equation "significant"— even while being ignored.

Doing the chart's math (use H_B & H_S chart in Fig.VII.2)**:**

1. *H_B Value* of Saturn is 32. When the harmonic pattern shifts from *binary* to *sequence*, begin H_S = 1 for the 32 of Saturn, followed by (2 x 32), (3 x 32)…. The chart's two undiscovered planets are predicted by the equation to be located at: $r \approx \{6,8\}$ x 32 AUM.
2. To change *miles* to *actual AU*: divide *miles* by 93 million.
3. To figure *% difference*: from the equation's predicted AU distance, e.g. for Mercury that's .4 AU; subtract the actual AU, .4 - .386 = .014. Divide this answer by the equation's predicted AU distance: .014 ÷ .4 = 0.035. This is your answer but it is not in *percent* yet, so we must move the decimal two places right: 0.035 = 3.5 %.
4. To find *% average*: add up all %, including the plus and minus signs, and divide by the number of planets. To change *error %* to *accuracy %*: subtract *error* from 100%.

Harmony Dictates Gravity

Air resistance causes falling things to float like a feather, allowing an airplane to fly. Air resistance builds up against a falling object, causing a *terminal velocity*, a speed from which it *accelerates* no more. When an object falls in a vacuum, with no air resistance, with the accelerating force of gravity (g) near the surface of the Earth, the object accelerates at 32 feet (9.8 meters) per second per second, written as $g = 32\ f\ s^{-2}$ or $32\ f/s^2$ or $9.8\ m/s^2$.

Using two H values, H_I and H_C, this chart shows gravity's harmonic progressions: Harmonic Integer: $H_I = \{0, 1, 2, 3, 4\ldots\}$; Harmonic Chord: $H_C = \{1, 3, 5, 7\ldots\} = 2H_I + 1$.

"Let us again consider a stone dropped from a tower. We have seen that its velocity increases as it falls, but we should like to know much more. Just how great is this change? And what is the position and the velocity of the stone any time after it begins to fall? We wish to be able to predict events…" The Evolution of Physics, Einstein & Infeld

Fig.VII.4: Thirty-two feet per second per second*

H_I	$32H_I$	$16H_I$	$16H_I^2$	$16H_C$	$16H_C$
After # of seconds	Speed in feet/second	Av. speed f/s since 0 sec.	Dist. (ft) fell since 0 sec.	Dist. (ft) fell in last sec.	Av. speed f/s in last sec.
0	0	0	0	0	0
1	32*	16	16	16	16
2	64	32	64	48	48
3	96	48	144	80	80
4	128	64	256	112	112
5	160	80	400	144	144
6	192	96	576	176	176
7	224	112	784	208	208
8	256	128	1024	240	240
9	288	144	1296	272	272

* $g = \mathbf{32}\ f\ s^{-2}$ is for Earth and can be changed for another planet's surface, effecting the rest of the chart with adapted xH values. Here x = 32 & .5x = 16. Earth's surface gravity, little "g", equals big "G", gravitational constant, times the Mass of the Earth, divided by the Radius of the Earth: $g = G\ M_E/R_E$. "G" is the measurement of force between 2 objects each of 1kg mass, centers separated by 1 meter. Only the mass and radius of Earth is part of little g, in $g = \mathbf{32}\ f\ s^{-2}$, not the mass of the object falling, showing gravity is warping space, not pulling on an object. This means that in a vacuum, all objects falling side by side accelerate the same. 🌍 $G = 6.67 \times 10^{-11}\ N\ m^2\ kg^{-2}$, where "m" is meters and "N", newton, is a *force* defined by Newton's second law: Force equals mass times acceleration, F = ma. In F = ma, acceleration is separate and not dependent on mass. One newton equals: $1N = 1\ kg\ m\ s^{-2}$, where "kg", kilogram, is the measurement of "m", mass, and "$m\ s^{-2}$", *meters per second per second,* is the "a", acceleration measurement, being $32\ f\ s^{-2}$ at Earth's surface. The newton introduces the harmonic H factors into acceleration, ms^{-2}, as $32\ H_I$ allows. 🌍 A newton—on the Earth's surface called weight "w"—is a measurement of gravity's force on an object, and g = w/m, this time "m" being mass. 🌍 Force is also: $F = ma = Gmm'/r^2$, where "G" is the gravitational constant, times the mass of the first object, a rock, times the mass of the second object, Earth. The radius separating the centers of the two objects, squared: "r^2". This $1/r^2$ shows the inverse square law from Fig.VIII.4.

...continued from page 36

Differences shown in Fig.VII.3 between the twelve actual orbital distances and the equation's predicted distances have average variations of 0.58%, being 99.42% accuracy. The individual and group significance of these predictions is shown by their consistency of being within 95% of being exact. The 4.7% variation of Saturn towards Jupiter should be explainable by the massiveness of Jupiter. The 4.8% variation of Mars should be because it is influenced more by Earth's gravity than by attraction to scattered asteroids.

"If the chance of a fluke is less than 5 percent, two possible conclusions remain: There is a real effect, or the result is an improbable fluke." Tom Siegfried; March 12, 2010; Science News

"…it would be a bracing achievement, and major progress, to identify any concrete observable phenomenon that brings in truly characteristic features of quantum gravity beyond the semiclassical approximation in common use. Actual observation would bring the subject to another level." Frank Wilczek

Adjusting the .3 and .4 variables in $r \approx (.3H_B + .4)$ AU varies the errors' locations. E.g. Mercury and Earth average orbits both yield 0% error in the equation: $r \approx [.5(x-y)H_B + y]$ A.U., where x = 1AU and y = mercury's average orbital distance. Using actual distances from Fig.VII.3, Mercury and Earth have 0% error margins at: $r \approx (.307H_B + .386)$ AU. Or choose the error to be 0 % at Mercury and 0% overall average: add the 12 orbitons' actual AU distances. Subtract 12 times Mercury's .386 AU. Divide by the sum of all 12 H_{BT} and H_S values. This equals .3054, making our equation: $r \approx (.3054H_B + .386)$ AU. Etc.

By adjusting the variables to accommodate gravitational differences of secondary central masses, harmonic patterns of their orbiting systems might be defined, as for Jupiter's moons. Detailed analysis of Jupiter's orbiting moons must also include the sun's massive influence, which is a second orbital center. New data being gathered on other solar systems also lends itself for future exploration of this idea. It is also possible, though unpalatable to some scientists, that our solar system is *unique* in being so close to the harmonic pattern. Earth is in an isolated pocket delaying entropy locally. Maybe a harmonic biosphere demands a harmonic solar system.

This simple harmonic pattern of zero and natural numbers occurs naturally in 1-D string harmony. The integers found in the planetary orbits define the gravitational field—warped space quantified as undulations in a 2-D plane. This shape of the gravitational field forces the rapidly moving planetary masses to concentrate their orbital paths where the harmonics dictate.

Conservation of Cohesion or Parity

Mathematical parity results when a unity divides into two groups, like numbers into odd or even, or like ± electric charges, or magnets into north and south poles, then individuals of those two groups are put together. What they do will define if they have *consistent* parity.

Add same number parities, like odd with odd, 3 + 3 = 6, or even with even: 4 + 4 = 8, and the results are always even. Add opposite parities: even plus odd always equals odd: 4 + 3 = 7.

Using the same number parities to multiply, odd times odd, 3 x 5 = 15, results in odd, and even times even equals even: 6 x 4 = 24. Opposite parities, even times odd, multiply to be even.

Of positive and negative numbers, multiplying similar number parities, meaning negative times negative, -3 x -7 = 21, or positive times positive, the product is always positive (making the square root of minus one to be the imaginary number: $\boldsymbol{i} = \sqrt{-1}$). Multiply a negative number times a positive and always get negative: -3 x 5 = -15

Although numbers show parity, the imaginary number, ***i***, being the square root of minus one, does not. It breaks the law of parity conservation since there is no real solution to the square

root of a negative number. The imaginary number, ***i***, violates the conservation of parity and limits the validity of claims about any results obtained using ***i***.

Two equations to show the parity of a positive integer (n) and its reciprocal (1/n) are:

$n \times 1/n = 1$ e.g. $9 \times 1/9 = 1$ and $n \div 1/n = n^2$ e.g. $9 \div 1/9 = 9 \times 9/1 = 9^2 = 81$

Since the parity definition in physics gets more complex than these math examples, *HUT* will explore more conservation of *duality* perspectives, mostly avoiding use of the word *parity*.

Conservation of duality is exhibited in each of electricity and magnetism when the forces are separate: opposite polar fields [(+ & -) or (n & s)] attract, and identical polar fields repel.

It has been said that gravity avoids the duality question because we do not know of a gravitational field interacting with an anti-gravitational field. But that is not what the other examples do. We do not have numbers and anti-numbers, we have even and odd, or positive or negative. We do not have magnetism and anti-magnetism. The unified magnetic field is observed to be reduced to two different poles: north or south.

Gravity does not seem to have dualities, but gravity, including buoyancy, does have dominance and sub-dominance, witnessed as cohesion. *Local* gravity is a simple cohesion alignment based on atomic weight, density, pressure, and temperature, yielding atomic mass and radius. From *American Heritage Dictionary*, combining "coherent" and "cohesion": "the mutual attraction by which elements of a body are held together…waves with a continuous relationship among phases." Gravity's rainbow is witnessed with a helium balloon rising through air at a birthday party, or a basalt oceanic tectonic plate subducting under a less massive granite continental plate, as at the Cascadia Subduction Zone.

Thought experiment: fill five imaginary balloons to equal size with 1) air, 2) helium, 3) water, 4) oil, and 5) sand. Imagine standing on a diving board over a swimming pool. One at a time, drop the five balloons. Witness that gravity does not treat all objects the same. Gravity is in differential layers. The helium balloon goes up and away. The air balloon drops to float on the water's surface. The sand balloon sinks to the bottom of the pool. The oil balloon sinks to break through and float just along the water's surface. The water balloon drops down and moves more freely below the surface than the oil balloon, but not pegged to the bottom like the sand balloon.

This cohesive ordering was 100% predictable even while gravity's duality is not observed. Gravity's rainbow utilizes molecular weight and density affected by temperature and pressure. On all objects, gravity pulls down, buoyancy pushes up. Buoyancy is the pressure exerted by fluid surrounding an object. An earthquake breaks up adhesive layers and allows cohesion to reclaim some territory. Relative to each other, objects sink down or float up.

The rainbow of light waves reduces into the same type of non-duality ordering as gravity: *cohesion*. Light does not have anti-light, nor does a photon have either a positive or a negative aspect of which we know. For observers, light's rainbow has a continuous relationship among frequencies, as does harmonic gravity's rainbow, demonstrating *conservation of cohesion*.

Unity's cohesive diversification of a system contrasts with unity's duality division.

Ignoring social and genetic aberrations, humans live with nature's two gender system, representing duality—not representing the sliding scale of cohesive diversification. Gender conserves duality: opposite sexes reproduce while same sexes do not reproduce together.

Notice that up & down electron spins show duality in that like-spins won't pair up, but opposite spins will. It is claimed that spin force is not one of the main four forces, that it is a quantum force only. But they are all within the harmonic unified field emanating from void.

The current paradigm expects four forces to be combined into the unified field theory. Regarding duality: Gravity avoids conservation of duality because of its unity, which we see

instead as *cohesively* diversified, like a rainbow. Strong interactions are said to never violate duality because gluons treat left & right spin quarks identically.

Separated, electricity and magnetism each show duality, but combined as electro-magnetism, light is not divided into *duality* with a positive or a negative field. Light in a unified state does not obey conservation of duality because it does obey conservation of cohesion, as demonstrated with a rainbow, similar to gravity's rainbow. Light's natural duality is its dual nature of being either a particle or a wave: a light particle or a wave interacts with a particle, and all reveal themselves to be particles. A light wave can pass through another light wave.

The 4) weak nuclear interaction is responsible for the half lives of atoms and other break-downs at the sub-atomic level. Assumptions say that this weak force should also obey the conservation of parity. The words are from Isaac Asimov:

"…the 'K-meson' was discovered…unstable and quickly broken down into 'pi-mesons.' Some K-mesons gave off two pi-mesons in breaking down and some gave off three pi-mesons and that was instantly disturbing. If a K-meson did one, it ought not be able to do the other… no number can be the sum of two odd numbers in one case and three odd numbers in another."

Chen Ning Yang and Tsung Dao Lee won the Nobel Prize in 1957 for showing the assumed parity of the K-meson breakdown does not conserve parity, causing a problem for scientists. To perceive that K-mesons obey the conservation of coherency instead of parity, the two or three pi mesons produced is like seeing frequencies of more red or more green, also a 2 to 3 ratio. Entropy is simplified down to one fundamental tone degenerating and increasing frequency into harmonic overtones, beginning with the second harmonic, then the third. These cohesive overtones are the purest definitions of degeneracy over time because they follow strict harmonic law, as do atomic half-lives. Conservation of unity's duality establishes dualistic systems while conservation of cohesion produces diversification inherent in unified harmonic fundamental-overtonal systems.

Discussions regarding parity within the Yang-Mills problem suggest that what is needed is a "duality transformation". To resolve this, the proposed theory here is that we must shift from our reduced duality perspective of parity to also, and at times alternatively, embrace the *cohesive nature* of the unified field. The Yang-Mills theory also describes a mass-gap discrepancy which recognizes that a photon can have a "positive mass", yet light as a wave can travel the speed of light, thus requiring it to be "massless". This would have $M = 0$ in $E = Mc^2$, forcing the equation to disappear. The problem here is that light as pure energy must still be considered to have mass equivalence, revealing this when the wave strikes mass and the wave collapses to a photon. This mass-gap confusion supports the idea that light is a candidate for the dark matter (chapter V) for which physicists are looking. The mass-gap and dark matter controversies address the confusion about the nature of light's mass equivalence. Yang-Mills problem also claims that the nuclear strong force is restricted to the atomic nucleus which *HUT* challenges in proposing mini-quarks and gluons in exo-nuclear electrons (chapters IV & XXI). The remainder of the Yang-Mills problems might be solved by realizing time ***t*** became the fourth dimension by changing it to $\boldsymbol{t = ict}$ and calling that okay because it is *proportional* (see chapter VI).

Choosing to use in *HUT* the term: Dance of the Superstring

"There are more things in heaven and Earth, Horatio, than are dreamt of in your philosophy."
Hamlet, by William Shakespeare

Superstring is an established term that I appropriated for my work. The prefix "super" used in the term supersymmetry demands that for any fermion type particle there is a bosonic

particle force carrier. Whether that claim true or not is not my chosen business. The pairing of matter-antimatter particles is referred to as symmetry.

I throw the rock-particle on a calm pond and its momentum stretches the water's surface as the pebble sinks. The resilience of the warped surface rebounds upward, then falls to gravity again, repeating as it dissipates the energy and the harmonic field expands outward.

Traveling light waves carry momentum and will collapse to become a particle when colliding with a fermion. Light is a wave when it travels, not like the rock particle. Light's wave collapse defines light's position of contact, where it is defined as a particle as it passes its momentum on to an electron… and instantly the specific photon is no more. To designate that light particle, the photon, to be a force carrier is not accurate. The light wave carried the momentum and collapsed to a particle *and* annihilated in a single instant as the momentum passed to the electron. I do not commit to the imagined supersymmetry theory requirements, as they demand a photon's supersymmetric fermion partner to be a *photino*. None of that is any of my business. I simply choose to use the name "dance of the superstring".

Superstring theory became popular after my 1982 initiation into using string harmonics and void within holography to understand the ordered universe. I theoretically use the 2 x 5 dance to contain the void, which then diffuses outward to be the 2-D possibility field, which I believe is the Higgs Field which gives mass to the particles in physics. Mass establishes the center of the gravity-well of warped space. The Higgs field allows the 3-D space + time + mass + gravity + life… as we know it all in the flesh. Read more gravity, particles, and waves in chapter XXI. The next chapter, VIII, does share my perspective of 11-D required by superstring theory.

"A more general theory which would contain both relativistic and quantum ideas in a harmoniously unified form was needed." Georg Gamow, *Thirty Years that Shook Physics*

Possible ways to explore this theory of gravitational fields

1) Study condensing nebulas to see if the surrounding rings display harmonic patterns.
2) In our solar system and others, seek out and quantify average orbital paths of previously unknown orbiting planets and quasi-planets and check if they fit within the parameter of the equation's predictions. Searching at the predicted average orbital distances makes the search areas smaller, though the actual orbital paths can vary widely from the average.
3) Further reexamining today's scientific claims and confusions will unfold the cohesive value of the harmonic field unifying gravity and electromagnetism. It may at times be more important to reexamine currently valued data than to just blindly collect more data.

Gravity's standing wave fundamental tone for our solar system

At 20 °C (68 °F), the speed of sound (c) in air travels about 343 meters per second

c = 343 m/s = f λ = frequency x wavelength = 262 Hz x 1.309160305343511 meters

262 Hz frequency (f) of sound (DOE) has a wavelength (λ) = 1.309160305343511 meters

Or, as the fundamental tone: λ/2 = ॐ = 0.6545801526717557 meters

1 A.U. = 149,597,870,700 meters and **.3 A.U. = 44,879,361,210 meters = 1/1 AUM = ॐ = λ/2**

0.6545801526717557 meters x 2^{36} = **44,982,405,573.37 meters**

44,879,361,210 meters ≈ 44,982,405,573.37 meters*

*Since choosing 20 °C is relatively arbitrary, if we change the temperature at which the speed of sound is calculated, we could make the wavelengths equal.

Meaning: gravity's fundamental tone for our solar system is about 36 octaves (2^{36}) below the tone of middle C on an equitempered piano.

VIII SPACE & DIMENSIONS OBEY HARMONY

1) Can harmonics qualify as the common set of math defining space and its parameters?

Chapter VIII Subtitle index

Harmony in space

Research has shown harmonic vibrations emanating in space:

"University of Arizona astrophysicist, Henry Hill, announced that the *whole* sun was quivering like some mammoth ball of jelly… indicating the sun is vibrating, or 'ringing' like a giant bell" Hendry, Allan, *Omni Magazine*, Oct. 1982

"The sun is very much like a musical instrument except that its typical notes are at a very low frequency—some 100,000 times lower than middle C"
Yvonne Elsworth, Birmingham Solar Oscillations Network, 2017

"At California Institute of Technology the author heard a tape recording of such Earth vibrations played back at a speed far higher than the recording speed.
The earthquake had set the Earth ringing like a bell!"
Everest, F. Alton, 1973, *Acoustic Techniques for the Home and Studio*

Science currently supports: the universe started with the little poof. We presently call it the big bang, but initiating from the possibility field, no bang can be noticed. With no relative slow or fast or big or small at the start, a big bang expanding into nothing is the same as a little poof, like watching a video of a volcano and changing its speed between slow and fast motion. As the field of possibility initiates the field of probability, time and 3-D space is only beginning.

From the beginning… creation's expansion is said to speed up, then slow down. With time, space expansion speeds up again due to space-expanding bosons (chapter V). With more expansion comes continued cooling so that at one point in the universe's future, fermions and associated bosons must symmetrically phase shift and collapse. Heat from the big little bang poof allowed spatial construct, while continued separating, cooling, and collapsing degenerates into spatial destruct… back to the zero cosmological constant… zip… zip… nada.

Gravity of the massive sun defines the shape of surrounding space, and the locations (Fig.VII.2) where the speeding particles gravitate their fermion mass: the averaged harmonic orbits of the planets, quasi-planets, and asteroids. Similar to 6 & * space (Figs.VIII.1& .2) this makes gravity's fundamental tone's standing wavelength for our harmonic solar system to be .3 AU = 1/1 AUM = ॐ, (Fig.VII.1), equivalent to a low harmonic tone 36 octaves below middle C sound on a piano (see the math at the end of chapter VII).

Demonstrating 2-D fields unified by harmonics H_S = {1,2,3,4…}: 6 & 8 space

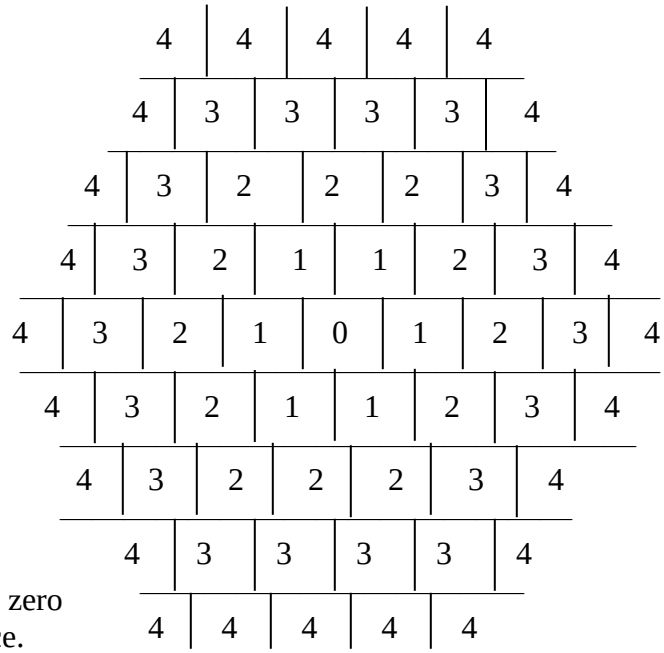
(compare to Fig.VII.2)

A taut 1-D string at rest contains zero wave patterns. A vibrating string has harmonic standing waves: first, the fundamental ॐ = {1}, then harmonic overtones: H_Oॐ = {2,3,4,5…}ॐ (Fig.I.1). Combined, this is the harmonic sequence H_S frequency multipliers: H_S = {1,2,3…}ॐ. These linear 1-D harmonics translate to the *unbounded* 2-D planar surface in 6 and 8 spaces. In Fig.VIII.1, instead of: ॐ = {1}, let ॐ = {6 x 1}. Then in Fig.VIII.2, let ॐ = {8 x 1}.

Fig.VIII.1:
Six-space $6H_S$

The space occupied by the center square is referred to as zero. *Any square can be the zero center*, making 8-space to be "non-local".

Note: the center zero requires space. Compare to Figs.XX.3 & VII.2



Six-space appears as staggered bricks in a wall, or like a snowflake. See Fig.XV.3. In six-space, the number of squares in each ring equates to six times the number of each expanding ring, which is the set of natural numbers, n, the harmonic sequence: n = H_S = {1,2,3,4…}. $6H_S$ predicts each ring's circumference size into infinity: $6H_S$ = {6, 12, 18, 24…}.

Choosing the zero position collapses the non-local space into local space, *instantly* defining the size of each concentric ring into infinity.

Fig.VIII.2:
Eight-space $8H_S$
Using an infinite checkerboard grid centered on any square, the zero, surrounding is eight-space: $8H_S$ = {8, 16, 24…}.

This harmonic 2-D plane was demonstrated with planetary orbital distances from the sun in Fig.VII.2.

4	4	4	4	4	4	4	4	4
4	3	3	3	3	3	3	3	4
4	3	2	2	2	2	2	3	4
4	3	2	1	1	1	2	3	4
4	3	2	1	**0**	1	2	3	4
4	3	2	1	1	1	2	3	4
4	3	2	2	2	2	2	3	4
4	3	3	3	3	3	3	3	4
4	4	4	4	4	4	4	4	4

"The Tao [Way] is … like the eternal void: filled with infinite possibilities."
Tao Te Ching 4

"The Way begot one, and the one, two; then the two begot three. And three, all else…"
Tao Te Ching 42

Non-local vs local spatial patterns

"Nonlocality is an intrinsic characteristic of nature and one of the key differences between quantum physics and classical physics, which recognizes only local correlations."
Phys.Org, 9 7 2018, José Tadeu Arantes

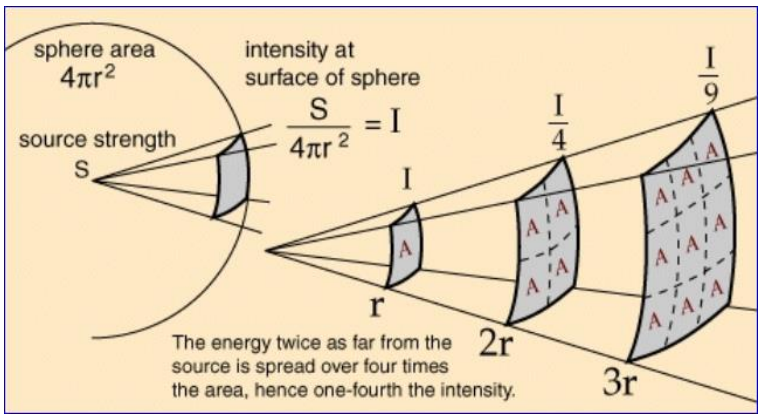
The reality we generally experience and consider is like a photograph where each part only includes its own piece, referred to as localized space. Alternatively, holography presents non-local space, where each part of the holographic plate contains all the information of the whole image (Fig.IX.1). Non-local space is rejected by many scientists from being any part of empirical science, though the mathematics of fractals, a broken magnet, even cells in a living body can demonstrate non-local space where every part contains the whole.

Non-local space is demonstrated by six and eight spaces in Figs.VIII.1 & 2 because the zero center square can be any square in the extending grid patterns. Any square chosen as zero displays the $6H_S$ or $8H_S$ surrounding patterns, allowing every part to contain the whole.

Local space is demonstrated in Fig.VIII.3, with 50 stars circling the single center star. Around that one middle star are five stars in the *first* ring, ten in the *second* ring, 15 in the *third* ring, 20 in the *fourth*. Divide total number of stars in each ring by five to find $H_S = \{1,2,3,4\ldots\}$, showing this to be: $5H_S = \{5,10,15,20\ldots\}$. Not just any star can be the center and display the whole $5H_S$ pattern. This is *local* 5-space. See Fig.XXII.19.

Fig.VIII.3: Five space $5H_S$

Fig.VIII.4: Spherical harmonics: $1/d^2$



Space's spherical harmonics, inverse square law, & atoms

"Kepler…reasoned that light, starting from one point in space [the candle flame], spreads out… in all directions, in the form of a sphere…the light's brightness was related to the size [the surface area] of the sphere." *Tycho & Kepler*, by Kitty Ferguson

"…the law of gravitation … every particle attracts every other particle with a force which varies inversely as the square of the distance… assumed to be universally true." Isaac Newton

Due to the (2 x 5) limit of the original 2n *harmonic possibility dance*, with $n = H_D = \{1,2,3,4,5\}$, the *harmonic electron probability*, with $n = H_E = \{1,2,3,4\}$, is capable of transferring information when inserted into $2H_E^2$. This is the same as the principal quantum number in quantum physics, $2n^2$, able to translate possibility into probability. The 2 in $2H_E^2$ allows two particles to join into a *pair* and dance similar to the universe's original virtual matter and anti-matter dance-pair. The 2 is for two ends of a single dancing string: 2 orbitrons. The harmonic squaring in $2H_E^2$ is the expansion of space (Fig.VIII.4) radiating in all directions from the central

source, demonstrated when gravitational, electrical, magnetic forces, light, and sound *expand spherically through space from a central point, squaring proportionally with the distance, d^2, with intensity weakening as $1/d^2$*. From the 0-D point-centered void, the zero cosmological constant disperses as units of $1/d^2$ in the creation of the 2-D circular and the 3-D spherical shape of space. From the center of the sphere, we extend a circular cone out onto the sphere's surface, area defined by formulas $\mathbf{4\pi r^2}$ & $\mathbf{\pi r^2}$. Radius, **r**, squaring into surface areas of a circle and a sphere, $\mathbf{r^2}$, is the source of the squaring in $1/d^2$, called the *inverse square law* (Fig.VIII.4).

Detailed in chapter II, $H_E = \{1,2,3,4\}$, and $2H_E^2 = \{2,8,18,32\}$, predicts the maximum probable number of electrons within the first four electron fields of all atoms. Beyond the fourth field (Fig.VIII.5), the same numbers of maximum probable electrons unfold in a mirrored decreasing order: $2(2H_E^2) = \{2,8,18,32,32,18,8,2\}$ (Fig.II.9).

Electrons drop into sub-field degeneracies. A 32-electron field degenerates into sub-fields of {2,6,10,14}, relating as $2H_{CL}$. Again the 2 is because electrons pair-up. $H_{CL} = \{1,3,5,7\}$ is a *limited* set within the infinite odd numbers of the harmonic *chord* set, $H_C = \{1,3,5,7\ldots\}$.

Fig.VIII.5: Electron configuration of uranium, U, 92

field name:	K	L	M	N	O	P	Q	*R
field number:	1	2	3	4	5	6	7	8
92 electrons =	2 +	8 +	18 +	32 +	21 +	9 +	2	
sub-field =	2	↓ 2+6+10	↓	2+6+10+3	↓		2	
degeneracy		2 + 6	2+6+10+14		2 + 6 + 1			
*max. probable:	2	8	18	32	32	18	8	2

Except for *, data from Foster, Laurence S: Electronic Configuration of Elements;
From: Katz, Joseph J. and Seaborg, Glenn T. *Chemistry of Actinide Elements*
& Moeller, Therald, *Inorganic Chemistry* (see Fig.II.8)

Beginning & Sustaining Space & Time

Our only tools here are imagination and vocabulary. Imagine: before the beginning of time, space, and $E = Mc^2$. There is only original void: 0-D, an imaginary point. With the mind, imagine a point in and of the void. Imagine the 0-D point stretches into an imaginary 1-D string with the two ends moving around. Using will power, imagine the unified string's two ends dancing, one a virtual particle and the other a virtual anti-particle. If this pair does not co-ordinate in the dance, being connected, the imagined orbitrons must collide, and upon doing so, the pair first becomes two photons, which then dissipate back into void. Blink. Imagine.

"Before" annihilating, the *virtual* dancing pair creates *virtual* 2-D space in a hint of virtual time. For re-creation, with your mind's will power: will the unified string's two ends to dance a special dance, so orderly that the two ends avoid collision. The harmonic dance within this *possibility field*, $2H_D$, with $H_D = \{1,2,3,4,5\}$, creates self-sustaining patterns, each alternating between closed and open circles (**o, s**) for phase transitions. The dancing sphere's rotation cannot be up, down, left or right yet, because without "outside" relativity, direction is pointless.

Assimilating more and more virtual energy within the void's manifesting of the ordered virtual particle-antiparticle pair, spinning, rotating, increasing angular momentum, this highly organized singularity reaches critical density with maximized stored information. The *possibility* field's superstring 2 x 5 dance shifts to become the "2 x 3 spin" and thus transforming into the *probability* field singularity which can begin 3-D space with time, defined by $2H_E^2$ where $H_E = \{1,2,3,4\}$. Suddenly: the little **poof!** — creating the expansion of $2H_E^2$ space and time.

Before the big little poof bang that begins space, time, and the reduced probability field, "outside" the dancing singularity there is no space or time to measure speed or size. The field of possibility includes *virtual* particles that are not quantifiable with $E = Mc^2$. The possibility field creates its own virtual reality with $2H_D$, where $H_D = \{1,2,3,4,5\}$. The one dance 2 x 5 contains and is energized by the void. He one dance multiplies into many, creating the hologramic virtual 2-D unified field. Upon this, one 2 x 5 dance shifts to dance the 2 x 3 spin, to begin the field of probabilities with $H_E = \{1,2,3,4\}$ in $2H_E^2$, creating 3-D space, time, energy, mass, and gravity.

Our universe's highly ordered initial angle and initial speed was pre-defined by the possibility field's implicit 2 x 5 dance of the superstring surrounding original void, which shifts to the explicit 2 x 3 spin probability field dance. Every new point within all space and time sustains itself through the same patterns as the original virtual particle/anti-particle pair's 2 x 5 dance around original void. The extended 2 x 5 possibility field dance has been called ether and Higgs field, which continuously surrounds void at every point in $2n^2$ probability space.

Scientists who are popular proponents of the holographic universe theories seek some unknown type of a 2-D holographic "plate" to be able to qualify their theories as more valid. We view our $E = Mc^2$ world as the field of probabilities. Except as consciousness, and as light and gravity in mysteries such as dark matter, we are mostly blind to the etheric 2n field of possibilities. The 2-D plate they seek is not of the $2n^2$ field of probabilities where they search for it. The holographic "plate" is the field of possibilities, only imaginable from the probability field. A black hole has collapsed all incoming 3-D probability field into a concentrated 2-D possibility field point, still displaying gravity that warps surrounding 3-D space.

"…gravity swallows light. It's like a kind of hole in space." Oppenheimer in 2023 movie

HUT labels the natural state of the 2 x 5 dance as being "virtual", being possibility—not probability—the field of possibility upon which our hologramic probability universe plays. Now human imagination is beginning to evolve our body to dance the 2 x 5, manifesting a most important $2H_D$ timeless consciousness in a $2H_E^2$ time-full way (see book-cover art).

As a background of the orderly 2 x 3 spin big bang expansion, the 2n superstrings continue spinning their 2 x 5 virtual orbitrons around the original zero energy density vacuum, defining a massless possibility field. In the rapidly cooling new probability field universe, the dispersing energy re-combines, maintaining the spinning 2 x 3 spin dances, to become quark-gluon soup which initiates the ±1/3 charged quarks and anti-quarks dancing in groups. The 2 x 3 spin quarkstring dances contain original void within the probability field, the source of the nuclear strong force needed to bind the nuclei of atoms. The void is the source of all forces. Quarks and anti-quarks join into neutrons and protons, manifesting $2H_E^2$ probability fields for electrons, atoms, molecules, and gravity (chapters II & III), everything guided by harmony.

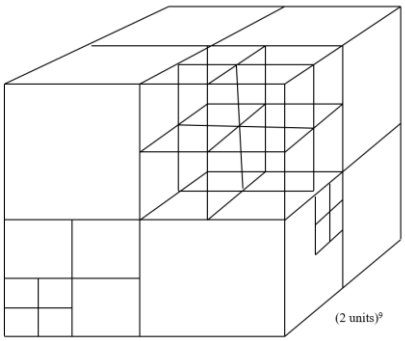
"For gravity…the quantum fluctuations of space and time, dubbed 'spacetime foam'…spiral out of control…one possible explanation…is that nature [*can*]…rein in these quantum effects…three gravitons interact just like two copies of three interacting gluons…figuratively speaking, gravity is the [*harmonic*] square of the strong nuclear interaction…Is supergravity theory free of infinities? Or does its high degree of symmetry merely curb some of its excesses as a small number of loops? In the latter case, trouble should creep in at five loops…sometimes these theories emerge from a careful reexamination of the principles we already know." Scientific American, May 2012, Bern, Dixon, Kosower

Inside the Ka'ba –- 10 or 11 dimensions

American Heritage Dictionary states *ka'ba* is an Arabic root-word that means *cube*. In the

science and math of topology, a cube is a 3-D figure with a 2-D surface that can be formed into other shapes, like a sphere. Thus, in topology a sphere and a cube are related. Cube comes from a root word with the assumed basic meaning "to bend", which eventually came to mean a round or hollow object, etymologically relating a sphere and a cube. E.g. Spanish *cubeta* = bucket.

Fig.VIII.6: Design for ka'ba



½" 1" 2"

For now, consider the cube rather than the sphere: A cube is made up of twelve edges forming right angles, aligning perceived 3-D space: four heights, four depths, and four widths. Rotate the cube and it shows 4-D: time passing. The cube is also perceivable in 9-D and can demonstrate 10-D & 11-D of string theory.

One can use dice, snap cubes, or ABC blocks; 4 x 4 x 4 = 64 total needed. Assemble these 64 blocks into a 4 x 4 x 4 cube (Fig.VIII.6) to demonstrate zero through 9 dimensions. The motion of the 64-cube-construct-cube shows 10-D. Counting 0-D as a dimension shows as 11-D.

Infinity must be limited to allow sensory beings to exist. Living organisms delay chaos by limiting, without eliminating, infinite harmony, never wandering too far from harmony's 1/1 home base. Total dimensions are limited in superstring theories, counted as ten dimensions, 10-D, or as 11-D if 0-D, the zilch dimension, is included: 0-D → 10-D shows as 11-D (Fig.VIII.8). Construction of space and time in zero through ten dimensions generates repeating patterns.

Imagine no space or time: the zero-energy-density-vacuum of Einstein's zero cosmological constant. From the vacuum, a 0-D point expresses the potential for point unity, $(1 \text{ unit})^0$, and duality, $(2 \text{ units})^0$. The virtual point generatrix stretches out to two points, a 1-D string with an overall length of $(2 \text{ units})^1$. Imagine the string in two halves like two sides of a V. As in Fig.VIII.7, the two halves must spin in phase in opposite directions from each other to avoid annihilation. This can be visualized as two string-end nodes pivoting around the oscillating middle node in a circular 2-D plane.

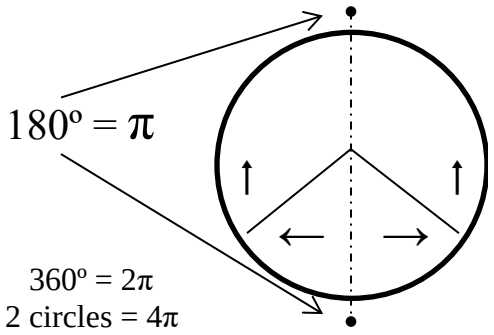


Fig.VIII.7: String spinning 2-D plane

3 string nodes: two ends, one middle. As the spinning string passes itself every 180º, physics will refer to each of these motions as *spin = 2*, *theorized* for gravitons: 2 cycles per circle, with cycles starting over each ½ circle, being pi, π. Contrarily, fermions with *spin = 1/2* show as a figure 8: **½ cycle per circle ↔ 2 circles, 4π, per cycle.** Partner gravitons, if the theory is valid, would dance *opposite*, each with spin = 2: Fig.VIII.7.

Accepted physics vocabulary says each electron in a pair has ½ spin, or ½ cycle per circle: "spin = 1/2" = ½ cycle per circle = 1 cycle per 2 circles, being a 2 circles per cycle dance.

Using ka'ba blocks, Fig.VIII.8, to understand dimensional limitations, we can *predict, ponder, and speculate* about space and time activities within each dimension of the geometric progression. Since squaring of "one" changes nothing, begin with "two" units. Each consecutive harmonic doubling generates each dimension $\{(2 \text{ units})^0, (2 \text{ units})^1, (2 \text{ units})^2 \ldots (2 \text{ units})^{10}\}$, accompanied by periodic perspective shifts back to three dimensions (exponents divisible by 3: {3, 6, 9}). Total dimensions are counted as 10-D, or as 11-D if $(2 \text{ units})^0$ is considered.

In Fig.VIII.8, {0,1,2,3,4,5}-D are virtual possibilities, more consciousness than matter. O-D void point. 1-D dancing string: H_D = {1,2,3,4,5}. Phase-shift into possibility field's $2H_D$ dance allowing 2-D $(2 \text{ units})^2$, Fig.VIII.7. Into 3-D, $(2 \text{ units})^3$, the 2 x 5 dance contains void, perceivable as a new type of 0-D point. Rotation around the axis allows a dimensional shift from $(2 \text{ units})^3$ to $(2 \text{ units})^4$, 4-D, expanding into 5-D, $(2 \text{ units})^5$, the holographic unified field, *Huf*, into 6-D and the 2 x 3 spin spherical dance singularity. Inconceivable dimensions like $(2 \text{ units})^6$ can be enfolded, from 6-D to 3-D: $(2 \text{ units})^6 = ((2 \text{ units})^2)^3 = (4 \text{ units}^2)^3$. This $(4 \text{ units}^2)^3$ 6-D space, the big bang singularity, is perceivable as a 0-D or 3-D. Note that the singularity of a black hole is within 6-D and light waves travel within 5-D, both of which in the rest of *HUT*, away from this Kaba demonstration, are referred to as 2-D

Progressing to $(2 \text{ units})^7$, a 7-D linear quark string with 3 nodes is similar to 1-D or 4-D. The sudden 7-D big bang expansion defines space and time in the $2n^2$ probability field where n = H_E = {1,2,3,4}. The 3 quarks within a single quarkstring spin a circular 8-D plane, $(2 \text{ units})^8$ that we can view as 2-D, like Fig.VIII.7, or as 5-D.

Next, 9-D perceptually simplifies as a cube or sphere, a warp-able space: $(2 \text{ units})^9 = ((2 \text{ units})^3)^3 = (2^3 \text{ units}^3)^3 = (8 \text{ units}^3)^3$, Fig.VIII.6. This 9-D re-construct of 0-D, 3-D, and 6-D contains the 3 quarks dancing according to $2H_E^2$, where H_E = {1,2,3,4}. The 9-D instantly advances into generating the 10-D motion that we normally call {3,4}-D, manifesting neutrons and neutrinos which transition into protons and electrons.

We live in {9,10}-D, calling it {3,4}-D. Dimensions {0,1,2,3,4,5,6,7,8} are enfolded. The spinning interface of 10-D time, $(2 \text{ units})^{10}$, with our "3-D" sensory input of $(2 \text{ units})^9$ space allows wavefunctions of human consciousness to perceive as both mass and energy, as position and momentum, as particle and wave—unified and reduced—combined… time-full and timeless.

Reduced perspective looks out from inside the dance, sphere, or cube, subject to the inverse square law. Imagine being a point, centered in a cube, looking outward, and suddenly begin rotating, going from $(2 \text{ units})^9$ to $(2 \text{ units})^{10}$, and space and time are experienced. Only by rotating the reduced nine spatial dimensions, allowing 10-D, can we perceive motion, and thus time. Joining the more unified perspective of the less diversified possibility field with the more diversified perspective of the probability field creates our experience of consciousness.

Our mental ability to perceive light's particle/wave duality is an alternation between 9-D reduced state and 10-D unified state. The M side of $E = Mc^2$ grants a 9-D reduced perspective, as with our sensory experience, where the clock is ticking, and space is extended spherically. Complete 0-D to 10-D unified perspective, inclusive of all 11 dimensions, allows our flesh-mass-point-centered perspective to theorize "external" light in a vacuum and the E side of $E = Mc^2$, where the clock stops and the direction of travel is reduced to a distance of zero. This leads into the unified field theory and the paradigm shift, evolving humanity into understanding harmony. From before time to now, consciousness has imagination has access to all 0 to 10-D

"Extra dimensional theories are sometimes considered science fiction with equations. I think that's a wrong attitude. I think extra dimensions are with us, they are with us to stay, and they entered physics a long time ago. They are not going to go away." Leonard Susskin

"Technically you need the extra dimensions. At first people didn't like them too much, but they've got a big benefit, which is that the ability of string theory to describe all the elementary particles and their forces along with gravity depends on using the extra dimensions." Ed Witten

"Evolution has ensured that our brains just aren't equipped to visualize 11 dimensions directly. However, from a purely mathematical point of view it's just as easy to think in 11 dimensions, as it is to think in three or four." Stephen Hawking

Fig.VIII.8: Universal harmonic progression in ten or eleven dimensions (10-D or 11-D)

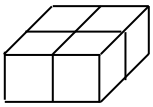
$(2 \text{ units})^0$ • Void. 0-D. Virtual reference point. No relativity, no space, no time. Zero cosmological constant. Circle potential. Referred to as the 11-D.

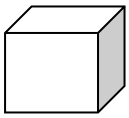
$(2 \text{ units})^1$  linear 1-D, a curving virtual string whose ends must dance circle patterns or the two ends annihilate each other. A choreographed pattern allows:

$(2 \text{ units})^2$  a particle & antiparticle able to avoid collision on two ends of a single virtual string spinning dual circles in a virtual 2-D plane (see Fig.VIII.7).

$(2 \text{ units})^{\mathbf{3}}$  Possibility field 2n dance, with potential n ={1,2,3,4,5}. String dancing virtual 2 x 5 singularity; left + right = 0 sum spin. A point-like 3-D similar to 0-D. Fundamental dance contains all information necessary for the hologramic universe, the Dreamer of creation.

$(2 \text{ units})^4$  or  Like curvilinear 1-D. Shift from 2 x 5 singularity extends to more 2 x 5 dances: 4-D string dance *containing* void. Initiating virtual expansion into the 2-D field background.

$(2 \text{ units})^5$  2-D **possibility field** containing many 2 x 5 dances surrounding void. 5-D plane-like field is a "2-D" hologramic unified field (Higgs field). Older names: *luminiferous ether*; *Akashic record.*

$(2 \text{ units})^6$  Black hole: 6-D point dimension like 0-D & 3-D. Stabilizing virtual 2 x 3 hyper spin dance, increasing spin-energy, gaining potential: remaining unchanged, possibility field initiates symmetry breaking into 2-D (5-D) **Higgs field** and 3-D + time (9- & 10 -D) **probability field**. 1st mass: big bang singularity. Electroweak breaks: EM + weak.

$(4 \text{ units}^2)^{\mathbf{3}}$

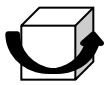
$(2 \text{ units})^7$  or  Big Bang expands into Planck space & time with 7-D quark-gluon string tube, with two end nodes, maybe one in middle: 2 or 3 quarks. Perceived as the probability field's "1-D". Sustains existence by spinning into 8-D.

$(2 \text{ units})^8$  8-D spinning quark string (Fig.VIII.7), measured as Planck length and time, manifests our perceived "2-D" space, like $(2 \text{ units})^2$ & $(2 \text{ units})^5$. Higgs field settles, drags "2-D" quark-gluon soup to be "3-D" mass reality in probability field.

$(2 \text{ units})^9$  9-D is perceived as a 3-D space, able to be warped. Manifests as a "3-D" particle in a position, with associated 10-D wavefunctions.

$(8 \text{ units}^3)^{\mathbf{3}}$

See Fig.VIII.6 From a distance, visually and gravitationally, 9-D can be treated as a 0-D, 3-D or 6-D point, like a planet or star seen from far away. The cube, enfolded as $(8 \text{ units}^3)^3$, provides the template for making atoms: the *8 units* show as 8 electrons fulfill each outer electron **s** & **p** sub-fields: Figs.VIII.9 & .10.

$(2 \text{ units})^{10}$ *time*  or  10-D is the rotation of 9-D's $(2 \text{ units})^9$. Perceived as "4-D" time, allowing wavefunctions, such as for electrons and photons, or even a tidal chart showing lunar momentum, or a skier-particle leaving wave-tracks in deep snow. The 10-D timeline allows consciousness within a body, identifiable with a 1-D, 4-D, or 7-D line.

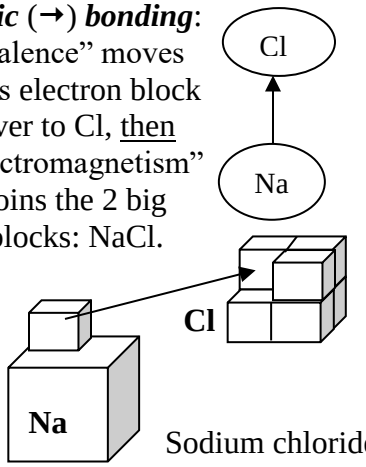
"Scientists now believe that there is a monster theory that underlies all of these competing theories: the so-called M theory, which lives in 11 dimensions, not 10." *Zero* by Charles Saife

Fig.VIII.9

Molecules assembled with Ka'ba

Each block is one electron in the outer (±) s = 2 + p = 6 = 8 sub-electron fields, trying to fulfill zero-valence. Inner sub-fields are enfolded within, not visible or necessary for this exercise.

Ionic **(→)** ***bonding***: "valence" moves Na's electron block over to Cl, then "electromagnetism" joins the 2 big blocks: NaCl.

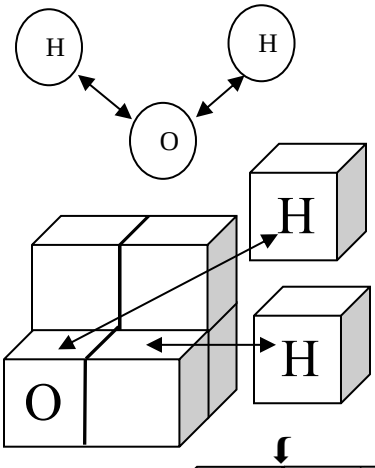


Sodium chloride NaCl: table salt, also called "halite" (same as Fig.IV.1)

(2 units)^{9} = *(8 units^{3})^{3}* (See Fig.VIII.6 & .8)

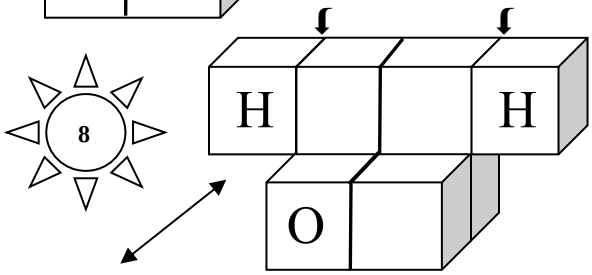
The ninth dimension, 9-D, (2 units)^{9}, can be enfolded as (8 units^{3})^{3} and be perceived as a 3-D cube. Enlarged cubes of (8 units^{3})^{3} are made up of 8 smaller cubes, defining the shape of atomic space, as shown here, when valence completes **s** & **p** sub-electron fields with 8 electrons (Fig.VIII.9). Valence equilibrium depends on this rule-of-eights template to seal up the strong nuclear force: the *8 units* show as 8 electrons fulfilling (**s** = 2) **+** (**p** = 6) sub-electron fields (Fig.II.5). An electronic configuration of elements shows that inert gases, except helium and Ubn which each fill with s = 2, all *stabilize* with these eight electrons in their outer fields: Fig.VIII.10.

Below are 2 ways of using blocks to build the water molecule. The 1st is aesthetic but fails to demonstrate bond numbers. The 2nd honors the bond number, applicable in more situations. Both demonstrate ***covalent*** **(↔)** ***bonding*** where electrons are *shared* rather than *stolen*.



Water H_2O

⬀ Aesthetic. This forms a nice cube, following the rule of eight, but the fact that the two hydrogen electrons each bond with only one oxygen electron is not being represented.

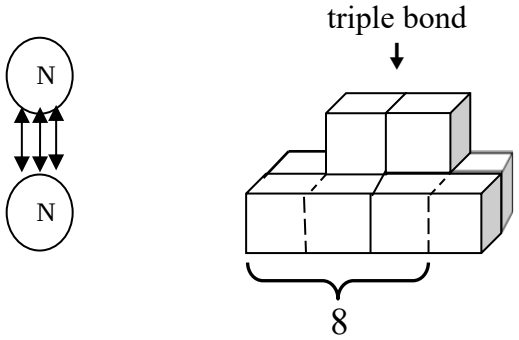


⇦ Here single bonds are represented.

Water H_2O

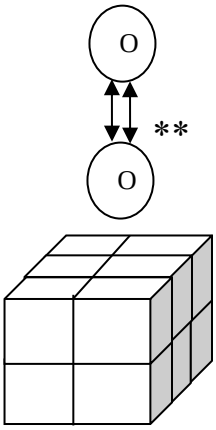
⇦ Honoring the bonding number and the rule of eight using snap-blocks. This makes it a fine model to demonstrate the four H_2O hydrogen bond terminals utilized in the joining of many water molecules into one drop. See Fig.VIII.20. Demonstrated with blocks, the terminals can twist and turn to show the flow of water, or break the hydrogen bonds to show water separating, as with a mist, spray, or splash.

Covalent **(↔)** ***bonding***: each cube is 1 electron. Make water, H_2O: oxygen (8) is a minus 2 valence—needing 2 electrons to fill **(s = 2) + (p = 6) = 8** sub-fields. Use six cubes for oxygen: 4 in a square with 2 on top. The two hydrogen atoms bring the two needed electron cubes. 6 + 2 = 8 ✓



Molecular nitrogen, N_2
Honoring atmospheric nitrogen's triple bond, while each atom contributing five outer-field electrons is ←able to perceive eight.

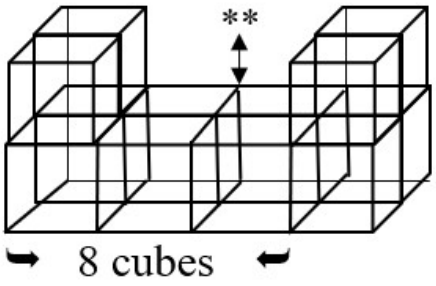
Next, the aesthetic oxygen molecule that honors the rule of eights is compared with the other way which also honors the bonding number.



Molecular oxygen, O_2
← Aesthetic

Below ↓ is **a stable O_2 with a double bond****. Like the aesthetic model, ignoring the group of four cubes on the right allows the oxygen on the left to perceive itself with eight outer-field electrons, and vice versa. See Fig.XIX.10.

An unstable diradical O_2 *has only a single bond creating its pair of electrons, with the two unpaired electrons still able to steal electrons as an unstable free-radical oxidizing agent.*



Inside the nucleus, residual strong force (RSF) keeps positively charged protons from repelling each other. Current science says the RSF does not extend beyond the nucleus. In chapter IV & XXI, *HUT* shows RSF extending outside the nucleus as valence force, which is satisfied when (s = 2) + (p = 6) = 8 electrons fulfill the outer-most s & p sub-electron fields. See Fig.XXI.7

Fig.VIII.10: Eight electrons fill outer fields of inert elements

Inert Element	Atomic #	Electron Configuration							
He	2	2							
Ne	10	2	8						
Ar	18	2	8	8					
Kr	36	2	8	18	8				
Xe	54	2	8	18	18	8			
Rn	86	2	8	18	32	18	8		
Og	118	2	8	18	32	32	18	8	
Ubn	120	2	8	18	32	32	18	8	2
Shell (K-R) number:		1	2	3	4	5	6	7	8

Except for Og & Ubn, data is from same reference as Figs.VIII.5 & .II.8.
Ubn shows maximum probable electrons permitted by $2n^2$.

An electronic configuration of the elements shows that inert gases, except He & Ubn with just two outer electrons, all *stabilize* with only eight electrons in their outer fields, in **s** & **p** sub-fields. Valence equilibrium depends on this rule-of-eights to seal valence's strong nuclear force (chapter IV).

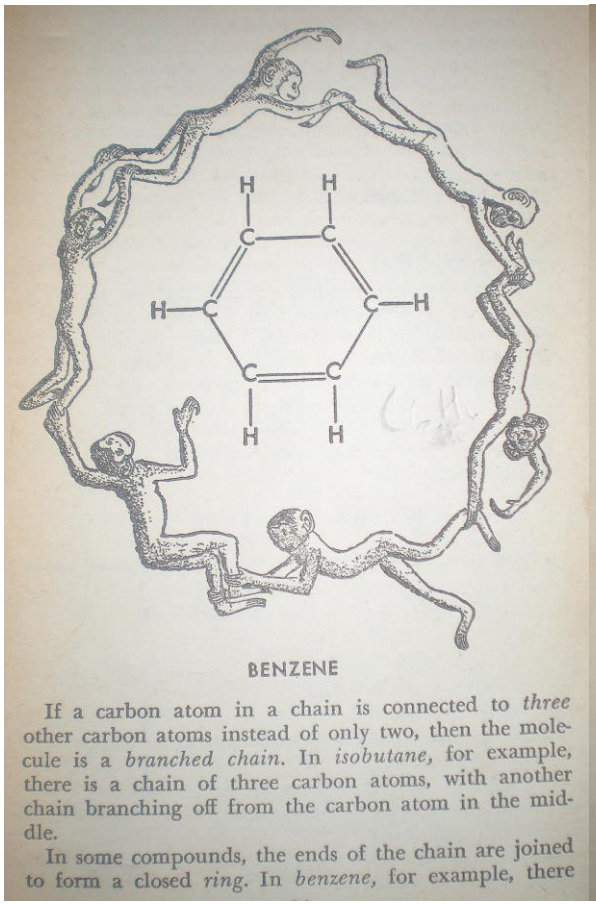
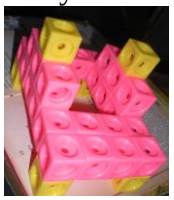


Fig.VIII.11 **Benzene ka'ba molecule**

Single hydrogen electron *Single bond* *Double bond*

Four outer field electrons on one carbon atom

The use of ka'ba snap-blocks demonstrates the looped molecule of benzene.
This method of molecular design honors the bonding number, and reflects the rule of eights.
Each group of four carbon electrons bond to four other electrons, giving itself the perspective of the required eight electrons.
The design can change and still honor the bonding number simply by turning groups of blocks up rather than flat*.
The versatility of this method of examining chemistry proves to be quite educational.



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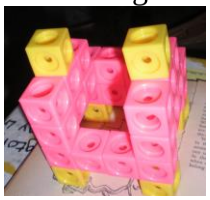
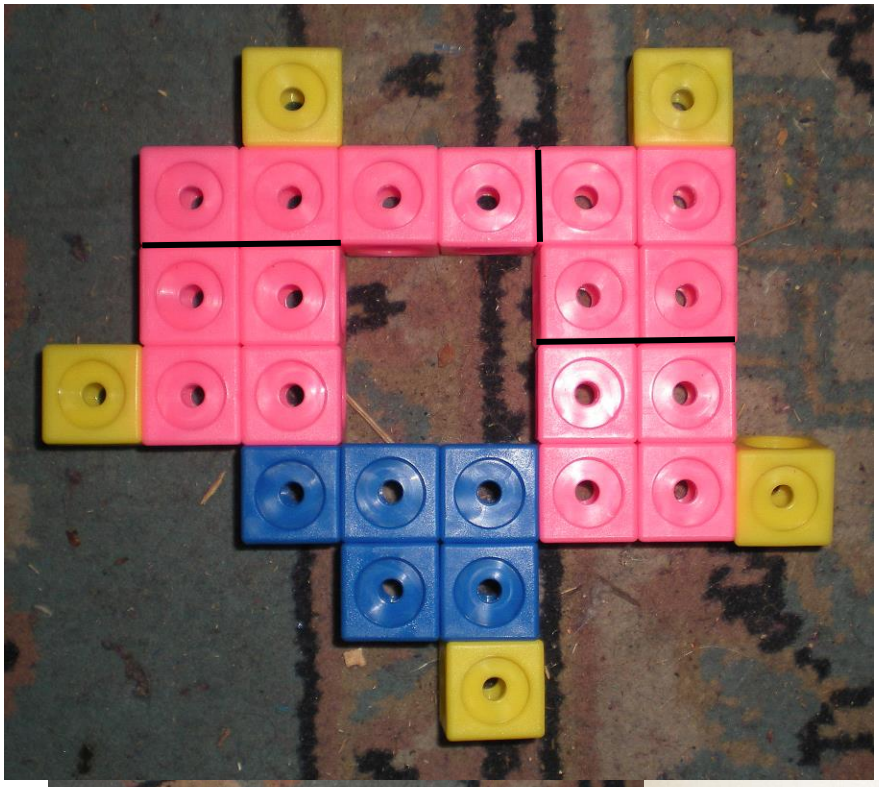
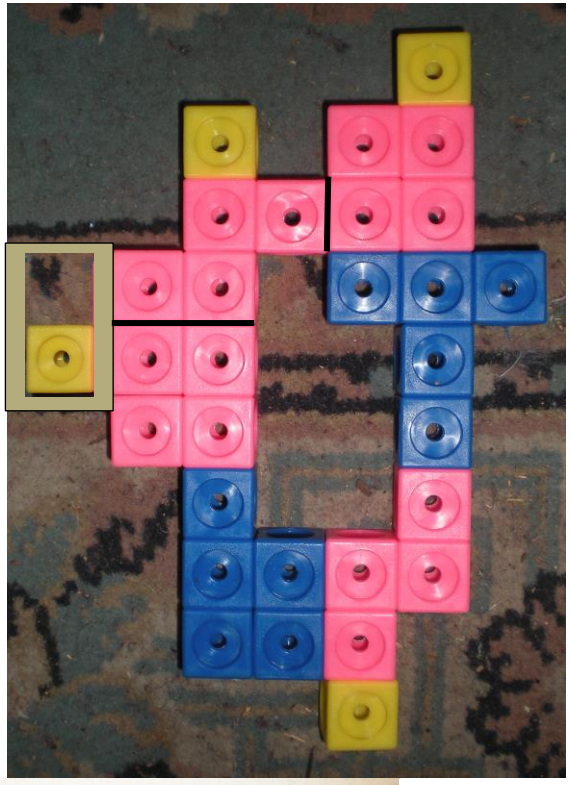


The book photos are from Irving Alder's *How Life Began*, 1957.

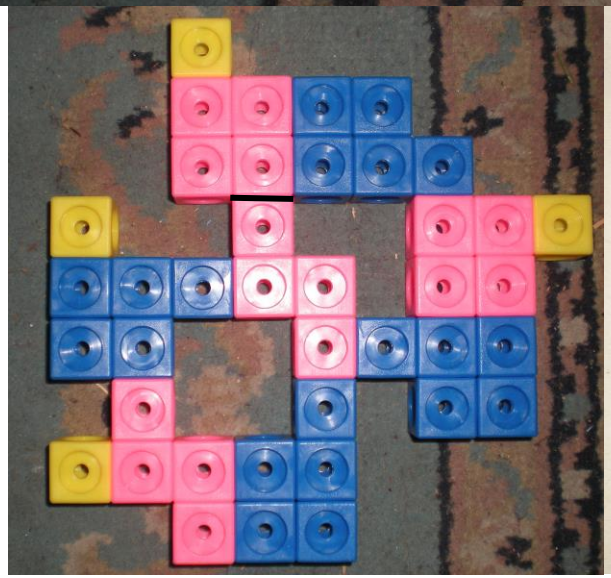


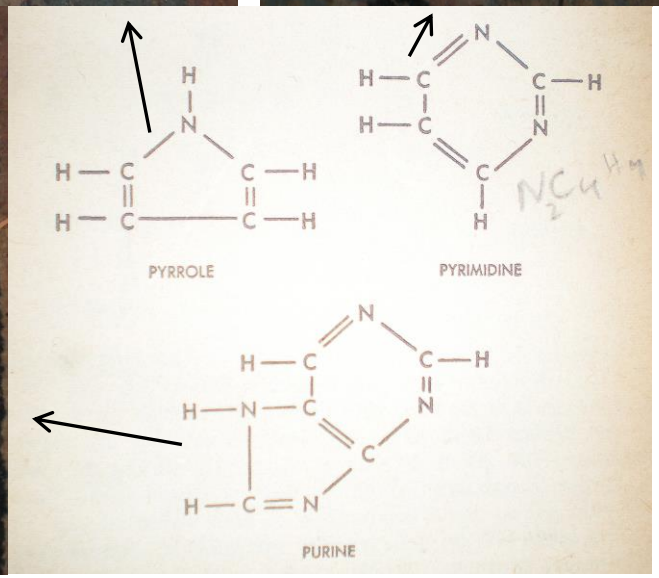


Hydrogen: yellow

Carbon: pink

Nitrogen: blue





These three molecules of pyrrole, pyrimidine, and purine incorporate nitrogen atoms as well as the carbon and hydrogen to fulfill the rule-of-eight. Each nitrogen has five outer electrons and needs to bond to three more electrons. Honoring the bond number, the ka'ba blocks here are shown flat, though again they can be molded to be more three-dimensional while still honoring bond codes.

Harmonics in {1, 2, 3, 4} dimensions

June 19, 2017, the journal *Nature Materials* told of an experiment at the Department of Energy's Lawrence Berkeley National Laboratory, with particles floating on top of a glycerin-water solution. The scientists observed the particles self-assembling with lifelike behaviors in response to sound waves. This stirred curiosities about how systems, living and nonliving, adapt when they are away from thermodynamic equilibrium.

If humans *choose* disharmony's excessive vibrations, we increase local entropy. As entropy increases disorder in a system, harmonic energy can be re-introduced to impose order on entropy, demonstrated with drumhead harmonics, Fig.VIII.12. Randomly drop a handful of sawdust or fine particulate sand on the top of a drum. Impose harmony: create the drum's resonating frequency on the inside of the drum so that the drumhead vibrates its fundamental tone. The + shows the part of the drumhead stretching upward. The – shows the part stretching down. The oscillating drumhead alternates + and –, vibrating the sand into the quiet linear or circular nodes between, around, or within oscillating sections. Increasing towards the next imposed harmonic frequency brings increased disorder until the second pattern appears. Increasing the frequency further, the third harmonic will appear. Harmonic compression waves impact the *bounded* 2-D (now ignoring ka'ba's 11-D model) circle-shaped drumhead surface, though not with the frequency ratio set {1,2,3,4,5…} of 1-D transverse waves on a stretched string. Calculus' partial differential equations (the word *partial* refers to harmonic overtones) calculate 2-D bounded harmonic drumhead frequencies.

Fig.VIII.12 Bounded harmonic drumheads (Figs.VII.1 - .2 & VIII.1 - .2: *unbounded* 2-D H_S math)

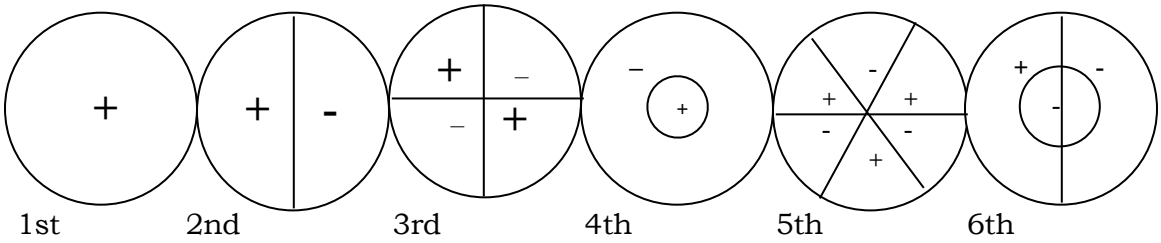
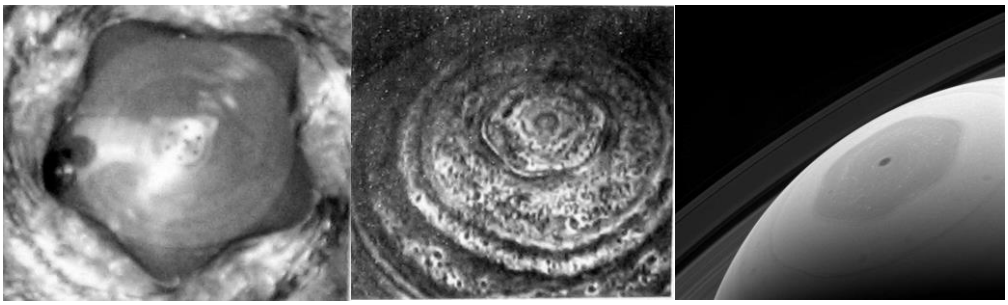


Fig.VIII.13 Spinning fluid vortex [1] Fig.VIII.14 Saturn's spinning gas vortex [2]



Harmonic 3-D patterns have appeared within the throat of a whirlpool of spinning fluid[1] (Fig.VIII.13). The vortex shapes change with increased spin rate (frequency): from circle, to ellipse, to propeller shape, to square, to pentagonal, then to hexagonal. The shape rotated also, though slower than the fluid forming it. The 3-D harmonics also appeared (Fig.VIII.14) in the vortex of spinning gases of Saturn's north pole atmosphere[2]. It formed the hexagonal shape just like Fig.VIII.13 had shown capability. Similar 3-D patterns formed with an increasing spin speed of superfluid helium, producing an increasing number of vortices[3] organized in enclosed patterns. Of the first through twelve harmonic patterns shown, five and six again revealed the

pentagon and hexagon.

References

1 Weiss, Peter, *Science News*, June 3, 2006 2 Cowen, Ron, *Science News*, April 28, 2007
3 Yarmchuk, Gordon and Packard, 'Observation of stationary vortex arrays in rotating superfluid helium', *Physical Review Letters*, 43: 214-217, 1979

Even time, popularly referred to as the "4th dimension", is also subject to harmonic law:

"The radioactive decay of an element is measured in terms of a characteristic time, the *half life*. The half life of a radioactive material is the time needed for half of the active atoms of any given quantity to decay… The ratio of radioactive decay are remarkably constant and are not affected by any external extremes, however drastic." Hewitt, Paul G., 1985, *Conceptual Physics*

In the November 22, 2008 *Science News* was an article regarding data showing a *changing* half-life of radioactive decay, inconsistent with the current paradigm: the "remarkably constant" half-life. The article reported scientific data from northern hemisphere laboratories, of radium-226 and silicon-32 radioactive decays, showing changing decay rates. The data shows that atomic decay decreases at times when Earth's northern hemisphere is closer to the sun, resulting in a longer half-life. The authors proposed the culprit to be neutrinos, whose effects vary according to the inverse square law, $1/d^2$, of the changing Sun-Earth distances.

Gravitational effects are also subject to $1/d^2$, and gravity is already formulated as *acceleration*. According to the theory of relativity, when mass accelerates, internal frequencies decrease. If… of two particles of the same type of mass and inertia, particle # 2 is accelerated to a new constant speed, its electrons must vibrate a lower frequency compared to particle #1, which still travels the lesser speed. Due to the internal change of #2, particle #1 would decay more quickly and *thus has a shorter half-life*. Being acceleration, increased gravity naturally decreases the internal frequencies, altering comparable half-lives. *Gravitational time dilation*, accepted as legitimate science, is able to alter the constancy of atomic half-lives.

"Similarly, it follows from the theory of relativity that a clock placed on the sun would have a different rhythm from one placed on the earth, since the influence of the gravitational field is much stronger on the sun than on the earth." *The Evolution of Physics*, Einstein & Infeld

As well as the seasonal differences with the sun, the varying Earth-Moon distances also have varying gravitational effects on Earth, as does the alignment of sun-Earth-moon. The moon's effects would also need to be calculated to allow the side of the Earth closest to the moon to be accounted for: 1/laboratory-to-moon distance squared. Calculating combined gravitational effects of the sun and moon would be comparable to, though different from, due to frictional delays, applying old local tide tables to all three charts shown in *Science News*. Even the fine details of the data chart for silver-108 might show more accurate correlations if compared to the gravitational effects of the sun and moon combined. As these gravitational effects are mostly averaged on a daily, monthly, and annual basis, historically the changing half-lives have been ignored. If this gravitational effect is verified, neutrinos, which are not a constant effect from the moon as they are from the sun, can be ruled out as the postulated cause.

Northwestern University, NU, announcement about Nature article, 10-18-2018: NSF funded Advanced Cold Molecule Electron (ACME) Electric Dipole Moment Search. Research by John Doyle at Harvard, David DeMille at Yale, and Gerald Gabrielse at NU:

"ACME researchers peered at the [electron's] shape with precision and saw a perfectly round sphere… 'If we had discovered that the shape wasn't round, that would be the biggest

headline in physics for the past several decades,' said Gabrielse., '…our finding is still just as scientifically significant because it strengthens the Standard Model of particle physics and excludes alternative models… The Standard Model as it stands cannot possibly be right because it cannot predict why the universe exists… That's a pretty big loophole.'

'Our result tells the scientific community that we need to seriously rethink some of the alternative theories,' DeMille said. Until researchers find evidence to the contrary, the electron's round shape—and the universe's mysteries—will remain."

"Many people say that Einstein failed [to discover his unified field theory] because he was simply ahead of his time. The knowledge and tools needed to complete a unified theory simply hadn't been developed before Einstein died in 1955." Ernie Tretkoff
[*HUT* note: Einstein had not been introduced to holography and he mostly ignored harmonics.]

"People talk about the grand unified theory that science is aiming for but if you have a grand unified theory that can account for all the data of observation and experiment but it can't account for consciousness, that theory cannot be true because you've missed something. We know that consciousness is real. So this is the challenge. It's about having a consistent picture of reality, one that is compatible with everything science tells us…" Philip Goff

"Out of clutter, find simplicity. From discord, find harmony.
In the middle of difficulty lies opportunity." Albert Einstein

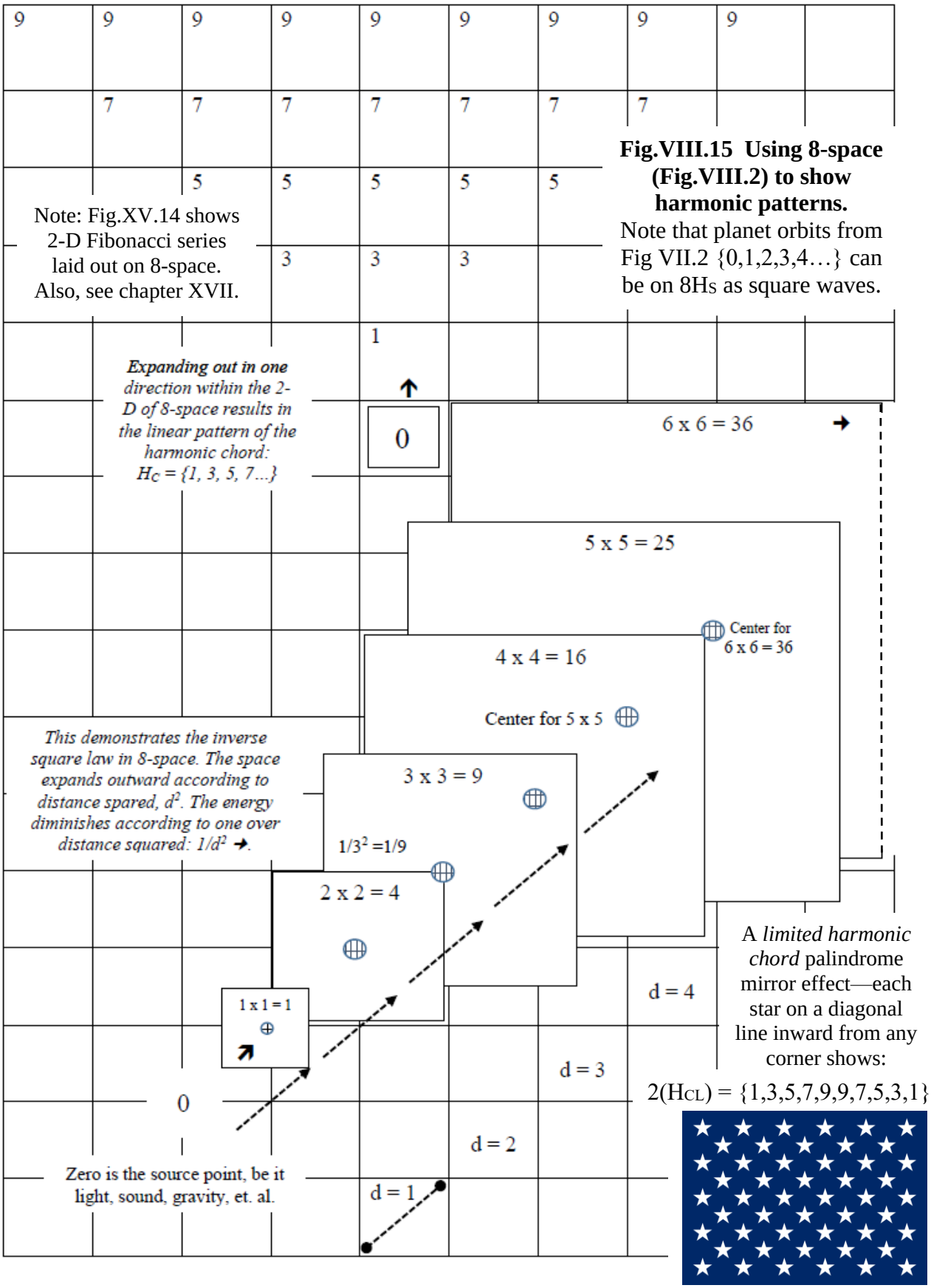
"The universe is not required to be in perfect harmony with human ambition."
Carl Sagan

"In each list every city can be assigned a rank, equal to 1 for the most populous city, 2 for the next most populous, and so on. Is there a general rule for all these lists that describes how the population decreases as the rank increases? Roughly speaking, yes. With fair accuracy, the population is inversely proportional to the rank… 1, 1/2, 1/3, 1/4, 1/5, 1/6… Is there an approximate rule that describes how the sales figures of the firms vary with their ranks? Yes, and it is the same rule as for populations… How about the exports from a given country in a given year in decreasing order of monetary value? Again, we find the same rule as a fair approximation." Murray Gell-Mann, *The Quark and the Jaguar*

[Solution— Fig.X.4: {1, 1/2, 1/3, 1/4…} is the harmonic sequence of consecutive nodal points]

"Atoms, molecules, and minute particles behave like tiny optical tuning forks and selectively scatter light waves of appropriate frequencies. The tinier the particle, the higher the frequency, and the higher the frequency of light it will scatter. This is similar to small bells that ring with higher notes than large bells. The nitrogen and oxygen molecules that predominate in the atmosphere are like tiny bells that 'ring' with high frequencies when energized by sunlight."
Conceptual Physics, Paul G. Hewitt

"Many medieval stained glass windows get their brilliant red and blue hues from nanoparticles of gold and silver suspended in the glass. Light passing through the glass sets off an oscillating plasmon wave that rings the metal bits like bells and scatters the light. Different scattering patterns appear depending on the angle of the sunlight—a single piece of glass can change from red to green as the sun sets." *Science News*, November 7, 2009



Note: Fig.XV.14 shows 2-D Fibonacci series laid out on 8-space. Also, see chapter XVII.

Fig.VIII.15 Using 8-space (Fig.VIII.2) to show harmonic patterns. Note that planet orbits from Fig VII.2 {0,1,2,3,4…} can be on 8Hs as square waves.

A *limited harmonic chord* palindrome mirror effect—each star on a diagonal line inward from any corner shows:

$2(H_{CL}) = \{1,3,5,7,9,9,7,5,3,1\}$

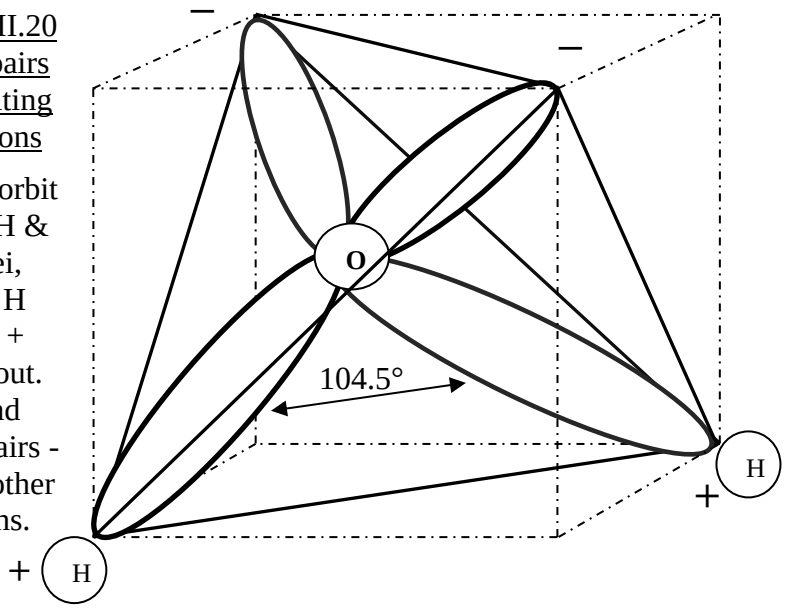
Internal molecular bonds (compare to Fig.VIII.4)

Elements build the molecules. Molecules build stars, planets, and life. Water is a good example: H_2O, two hydrogens and one oxygen covalently bonded. Paired electrons are shared between each hydrogen and the oxygen. Two other electron pairs orbit only with the oxygen.

The shared orbiting pairs generally remain between the two nuclei. According to Pauli's exclusion principle: because their paired order decreases probable *momentums* from the more chaotic buzz of a lone electron, this increases probable *positions*, and those orbital fingers are able to elongate, Fig.VIII.20. This paired-electron dance stabilizes the molecule.

Fig.VIII.20 Four pairs of orbiting electrons

Electrons orbit between H & O nuclei, leaving H protons + sticking out. O-bound electron pairs - stick out other directions.



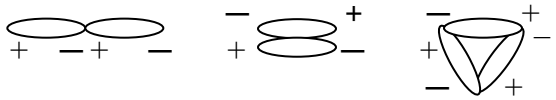
Allowed here are four H-bond terminals, two positive and two negative. Water, H_20, is envisioned in both a tetrahedron and a 3-D cube. The molecule is polarized since each orbiting pair of electrons has a net charge on its farthest reach from the oxygen nucleus.

Tensions of orbiting pairs change within the tetrahedron due to temperature and pressure. Cooling brings rigidity. The four terminals allow one water molecule to share *hydrogen bonding* with up to four more molecules. Due to cold, hydrogen bonds dominate more as ice, because of the rigidity of the tetrahedral shape, making crystalline structures with less dense spaces, able to float on water. Ice warms into liquid, increasing molecular motion; hydrogen bonds weaken, allowing molecules to dance and change partners more. More heat, more motion, makes steam.

Microwave ovens vibrate 245 GH, resonating-heating water molecules. Ice is more rigid and resonates less in the microwave oven, melting from the outside, so water is time released from the ice —thus can gently moisten dried tortillas better than just dripping water on them.

Fig.VIII.21: Dispersion force  ← This represents a lone water molecule with dipolar charges, with just two terminals (not 4).

Three different dipolar bonding geometries:



Often molecules, especially larger ones, can have more than two terminals.

When probability dictates a temporary gathering of electrons on one side of a nucleus, H-bonds in water are known as *van der Walls* or *London's dispersion force* (Fig.VII.21). This polarization induces polarization of nearby molecules. Dispersion bonds easily break and reform. Because of all the weakened bonds, water can splash, and can soak against the tug of gravity, up shirt sleeves as you wash dishes, called the capillary effect. Water is more attracted to the shirt's molecules than to other water molecules, or to Earth's gravity. Dispersion force rapidly weakens

with distance:

"[van der Waal's Force]…varies inversely as the seventh power of the distance between atoms." *The Atom and Beyond,* Sheldon Smith, 1965

With increasing distance, $1/d^7$ makes these H-bonds weaken more rapidly than $1/d^2$ for ionic bonds and gravity. The same book also has $1/d^3$ for ion-dipole bonds and $1/d^4$ for dipole-dipole bonds. Envisioning d^2 as a 2-D plane is easy, being a d^2 plane, whereas envisioning d^7 is not easy, being units^7. Maybe Sheldon Smith's data has been changed since 1965.

"[In the] dance of the electron spins…the spins influence each other, their processions coordinated as dancers do in a ballet. The new experiments have revealed surprisingly complicated choreographies." *Science News* May 26, 2007, Davide Castelvecchi

Point positions

One makes none. Two makes one. Three becomes two. Four is three.

With one point, zero dimensions 0-D is defined.
Two points allows a line in between, defining 1-D of length.
Three points allows a triangle, a step into 2-D, with length and width.
Four points allows a tetrahedral, 3-D utilizing length, width, and height.

"The aikido term *ma ai*, which means 'space harmony' ('ai' is Chinese for 'love,' and it translates into Japanese as harmonious connection) refers to the optimal distance point, where you're close enough to connect well and far enough to enjoy your own space." Stephen Gilligan

"String theory is an attempt at a deeper description of nature by thinking of an elementary particle not as a little point but as a little loop of vibrating string." Edward Witten

"String theory now has such dominant position in the academy that it is practically career suicide for the young theoretical physicists not to join the field… In reality, almost every new theoretical proposal is first presented in a way that is flawed and incomplete…" Lee Smolin

"I just think too many nice things have happened in string theory for it to be all wrong. Humans do not understand it very well, but I just don't believe there is a big cosmic conspiracy that created this incredible thing that has nothing to do with the real world." Edward Witten

"But the fact that some geniuses were laughed at does not imply that all who are laughed at are geniuses. They laughed at Columbus, they laughed at Fulton, and they laughed at the Wright brothers. But they also laughed at Bozo the Clown." Carl Sagan

Verifications of commonality of harmonics within space

Further calculations and research should verify the commonality of harmonics in space and time. The proof is in the deep-dish pie.

IX UNIFIED FIELD THEORY: Holography

"field 6. *phys*. A region of space characterized by a physical property, such as a gravitational force, having a determinable value at every point in the region." *American Heritage Dictionary*

1) People seeking a unified field theory usually wish to find an ***equation*** for a solution. But an equation is already in duality form with the equals sign separating the two different properties. Is it not more logical to seek a math ***set*** as the unity to use in equations?
2) Being a unified field theory, would it not need to include everything, not just physics, but also fields like biology and mind science—including the explanation for the occasional unifying mental experiences triggered by artistic, scientific, and religious pursuits?

A harmonic unified field is a single field encompassing the whole universe, and every physical and mental property that is part of the universe, with the harmonic value determinable at every point in time and space. The math of harmony is controlling everything and every force—fermions and bosons—electromagnetism, gravity, weak nuclear force, and strong nuclear force.

Exposing the unified field theory through a theory of consciousness is not what scientists generally expect. To do so, begin with the duality of time in $E = Mc^2$, with the clock stopped on the E side and the clock ticking on the M side. Further refine that time duality through the holographic *reference wave* and the harmonically diversified *object wave*. Unifying those two wave fields through the single point requirement of harmonics allows a new understanding of the universe's common reference origin. This unfolds the unified field theory that contains the unified electro-magnetic-weak-strong-gravity-valence-electron-pairing-conscious force.

Holographic Unified Mind: *HUM*

"The holographic continuum by nature allows new dimensions to integrate harmoniously with those already present." *Shufflebrain*, Paul Pietsch

Einstein died a generation before holography began inspiring scientific minds. In 1917, Albert Einstein presented the theoretical foundation for the laser. It was not until after Einstein's death that Theodore Maiman made the first optical laser operate on May 16, 1960. With the laser, the first optical hologram was made in 1962. During Einstein's life, in 1948, the physicist Dennis Gabor had invented electron holography, but unable to refine its focus, he gave up.

Let the word *holograph* generally refer to the apparatus, and let *hologram* refer to the image created by the holograph and viewed by the observer.

Motivated to find a vocabulary to explain the harmonizing order and chaos within and around us, I realized on September 10, 1982 I could use Einstein's $E = Mc^2$ to understand the interplay of the of mind's duality experience of time and no-time. On October 4, 1982, I again looked at a drawing of the workings of a holograph (Fig.IX.1) and compared the holographic model to my other studies. The harmonizing that super-imposes the two paths coming to the holographic plate satisfied my need to synergize the perspectives of void, energy, mass, time, and of everything in the environment being delivered to my brain via my senses and uniting with my memories. This model clarified the basic universal duality of unified and reduced mind.

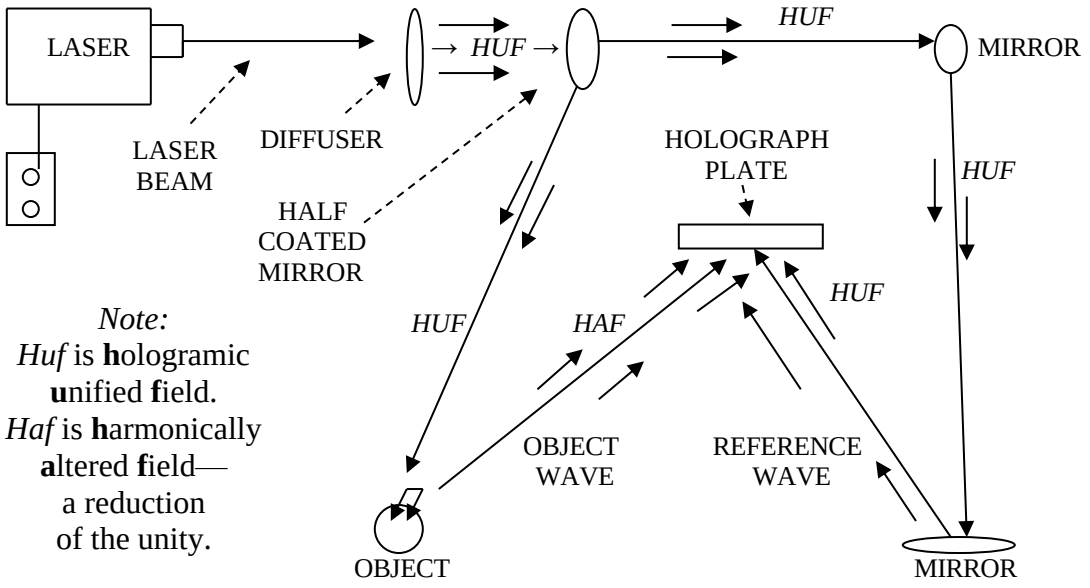
Suddenly, I was in the midst of a complete reordering of my own neural synapses. My paradigm shifted. I had not expected such a brilliant *ah-ha* experience, but it came, ready or not. All my academic research fit together as one idea. The epiphany was wonderful as long as I did not share it much. I found that my joy in such a new idea was not easily transferred to other people, and that to impose it was wrong. I made my goal: to adapt this idea to be mentally digestible for myself and for others. I had to analyze and synthesize existing data, assimilating and eliminating as needed. Then when socially appropriate, I attempt to make my idea available without imposing it. Finding my initial solution in the synthesis of the zero cosmological

constant with holography and harmonics established the guiding principles from which I could evaluate and construct my evolving unified field theory, a template from which to research other subjects and conclusions. Coming, going, time passing: today *HUT* is my solution to this quest.

Holography demonstrates both unified and reduced states of consciousness. Some holograms, like the poor-quality ones viewed on credit cards, are really several, each constructed with different colored laser beams from various angles. The credit card multiple hologram is then *reconstructed* from these same angles with the same specific frequencies which are found in either daylight or an ordinary light bulb. This theory states that mind stores memories by super-imposing multiple holograms on our cerebral cortex. Each holographic memory reconstructs when triggered specific frequencies stored within another memory, or in a specific smell, sound, sight, taste, feel, or change in heart rhythms. Holographic consciousness depends upon, and can experience, an unchanging unified source reference relating through an unchanging single tonal point, resulting in variation.

Paul Pietsch, professor of anatomy at Indiana University School of Optometry, worked with brains of continuing-to-live salamanders and separated a region believed to store specific memory. Yet the salamander showed the same memory relocated elsewhere. Brain functions traditionally believed to be locally stored in particular regions seemed to be located everywhere in the brain, referred to as *non-local* (Figs.VIII.1 & .2 & XXII.19) brain characteristics, an idea which threatened Pietsch's academic comfort-zone within his department. Pietsch wrote of his taboo non-locality conclusions in *Shufflebrain, the Quest for the Hologramic Mind*.

Fig.IX.1: Laser holography



A holographic plate's non-locally stored hologramic image reconstructs with a light frequency and angle identical to the one which had constructed it. With information being stored non-locally, if the holographic plate is shattered, every part can reconstruct the larger original whole image. *Every part contains the whole*. Each broken piece has less signal *intensity* than the original, with decreasing clarity based upon signal to noise ratio. Magnetism is like holography in that the field displaying north and south poles continues to exist in every piece after a magnet is shattered. Through cloning, DNA displays this non-locality pattern of the cellular parts containing all the information to reproduce the whole life form. In chaos mathematics, fractal geometry also shows the parts containing the whole. Since in our entropy-subjected holographic

universe every part contains the whole, unified harmonic information is conserved.

Holography begins with a laser (Fig.IX.1). The inside of a laser is a gas-filled tube with darkened light-absorbing sides and mirrored-reflecting ends. Electricity brings electrons into the laser, which energizes atoms so that their bound electrons jump up to a higher energy level. Determined by the change in energy when the electron drops back to its lower grounded orbit, the monochromatic photon is released. When that photon strikes another atom and forces that electron into an excited state, when relaxing again, a new photon emits. The emitting photons vibrate the same frequency and travel in the same direction. As these photons accumulate, exciting atoms which release more photons, this coherent light inside the laser contains one specific wavelength defining one specific color. Being coherent signifies that all the light waves are in phase with each other, moving in unity.

The coherent wave of light reflects off the mirrors and travel back and forth through the laser. The cascade effect occurs, stimulating more and more electrons to emit more in-phase photons of the same wavelength. The mirror at one end of the laser covers a hole which is "half-silvered," meaning it reflects some light and lets the high-enough energy light through, and that light is the laser light.

The highly ordered source light-wave, the laser beam, then passes through a diffuser, spreading into the coherent holographic unified field: *Huf*. This wave-front then moves on to a half-coated mirror, with part of the unified light field reflecting and part passing through: both light sets contain the same *Huf* information as the original laser beam, only less intense due to the spreading and dividing. Otherwise unchanged, the wave-front *passing through* the half-coated mirror then bounces off a mirror, then another, flooding the holographic plate as the *Huf* reference wave. The wave-front that *reflects* off the half coated mirror continues to the object, e.g. an apple, which *absorbs* specific frequencies. Some light is not absorbed and *reflects* onward to the holographic plate as the *Haf* object wave.

Wave-fronts arriving from reference and object sides carry two sets of information; the holographic unified field, *Huf*, being the reference wave, and the harmonically altered field, *Haf*, being the object wave. With their interference relationships of phase and amplitude arranged properly, harmonic frequency information is stored in the holographic plate. After developing the holographic plate, light from the original, or an identical laser frequency, diffused as the original unified field, *Huf*, can *reconstruct* a 3-D image of the apple. With correct phase and amplitude, the reference wave *Huf* must 1) interact with all the points on the holographic plate 2) while diversifying through a constant frequency stored within *Haf*, the object wave. In *Shufflebrain*, Paul Pietsch expressed this harmony through Brouwer's fixed-point theorem:

> "Brouwer's theorem guarantees that in a continuous distortion of a system—as in stretching without tearing a rubber sheet, or stirring without splashing a bowl of clam chowder—at least one point *must* remain unchanged. This point is the fixed point. Shinbrot describes how variants of the theorem have actually been used to predict contours on the ocean floor from characteristics on the water's surface. The absence of a fixed point is enough to deny a truly continuous relationship between two entities or magnitudes…Through the [fundamental tone] fixed point, the [harmonic] frequency spectrum in the object wave varies—but relative to the frequency of the reference…In order for a wave to serve reconstruction [of a hologram], it must [1] interact with all the components and [2] must also satisfy the fixed-point requirement."

Applying the holographic model to human consciousness requires defining the original reference wave and the fixed-point fundamental frequency. The universal reference is pre-creation void, beyond, as well as embedded within, space and time, defined by Einstein's zero

cosmological constant—original vacuum with zero energy density (chapter I). The universal fixed point is the geometry of a 0-D point centering a circle dance surrounding that void, with every point on any circle being essentially the same as every other in relation to the center. Any radius contains information able to re-create the whole. At the most fundamental level, the original void reference creates a virtual string whose ends show as a joined particle/anti-particle pair that spin separately in a unified pattern to keep them from annihilating each other. The void's purity and the virtual dance's fixed point singularity distribute along with the big bang, diffusing information, manifesting the possibility field's 2-D hologramic unified field, *Huf*, and further manifesting our 3-D space with time in creation's probability fields. See Fig.VIII.8.

The *possible* variety of circle dances, referred to in superstring theory as Calabi-Yau configurations, Fig.XVI.11, manifests creation's *probability* fields of $E = Mc^2$. The $2H_D$ superstring dance of the possibility field, with $H_D = \{1,2,3,4,5\}$, supplies the fundamental harmonic information for the whole universe. Within expanding space, and through energy, mass, and time, creation continues to organize in the probability field through $2H_E^2$ harmonics, with $H_E = \{1,2,3,4\}$, within optical, acoustical, electronic, and crystalline holography.

"A holographic optical element is a thin sheet of photosensitive material—think photographic film—that can replicate the functions of one or more additional optical components…"
Boaz Jessie Jackin, September 7, 2018, *Phys.Org*

"The claustrum is at the center of a widespread brain network, covering areas that are involved in cognitive processing," says co-first author Kimiya Narikiyo. "It essentially reaches all higher brain areas and all types of neurons, making it a potential orchestrator of brain-wide activity. The claustrum turns out to be vital for generating this slow-wave activity…The synchronization of silent and active states across large parts of the brain by these slow waves could contribute to consciousness…." by RIKEN Medical Xpress May 11, 2020
A 'consciousness conductor' synchronizes and connects mouse brain areas

The holograph is the *apparatus*. The hologram is the *image* produced. Speculating from this model to brain and mind sciences, the thin claustrum below the cerebral cortex's "thin layer of mantle measuring a millimeter or so" (-Dr. John Lorber) is the brain's holographic plate, using the senses and memories, activating through neurons and synapses to supply the coherence of wave frequencies as a hologramic image in the mind to be recorded. We use our eyes to see the landscape and, standing in one place, the scenery all around us is created into a hologramic image with which we can live. Yet we have more than just eyes to sense this hologramic reality. Touch a tree. It is hard. Cool. Skin nerve endings seem to be one big holographic plate. Hear a neighbor's voice and know exactly from whom and where it originated. Are ear drums the acoustical holographic plate? Maybe the retina of the eye? Smell a fire and know what it is. Maybe the olfactory epithelium is the holographic plate? Taste corn and know it. In the mouth and throat, is the holographic plate the cumulative taste buds on the tongue?

Hologramic unified mind explores beyond reduced constraints of flesh's space and time, remembering past, planning future, and imagining. Einstein believed if a clock could fly by Earth at the speed of light, like light seems to do, and be measured from Earth, it would appear to be a stopped clock, showing no time changes as compared to an Earth-bound clock: no aging.

For consciousness to work, there is a central observer, the single point requirement, what we all call *I Am*. We each said the words "I Am" at five years old, referring to ourselves. We still refer to ourselves the same. That central reducing observer *I Am* in each of us is the same *I Am* at any age, a constant through new synapses of changing times and places. Yet that observer *I Am* relates to the experiences and believes itself to be not just the *I Am*, free from changing time and

space, but “I am a man” or “I am a woman” or I am a writer or I am tired… we take on whatever observations with which we identify as our individual self, including our body’s name and age.

Einstein said, “Unless we are told the reference-body to which the statement of time refers, there is no meaning in a statement of the time of an event.” We choose our observational focus, our reference. We can focus on the clock that is stopped at the speed of light, or the clock that is ticking. Consider a two-sided coin. On one side, the unified *I Am* observes the *now* when we were five years old and the *now* of this moment as being the same. On the other side of the mental coin, reduced *I Am* observes the physical *now* of this moment, the precise tick of a clock, as different than the *now* from when we were five. As the unified *I Am* observer stays the same through space and time, perceiving itself as light, its clock stopped, the same *I Am* alternatively identifies with the mass world, the flesh, where space and time are reduced to the steady beat of a clock. One *I Am* in one body can even manifest many *I Am*s as a multiple personality disorder.

The equation $E = Mc^2$ can be applied to understand the two-sided coin as the dual perspectives of mass and energy. Though our flesh abides by a frozen value for c, the c value can vary for our subjective minds, utilizing bodily senses, affecting our *perspective* of time. Time can be experienced to slow in a balanced adrenalin shift, and maybe with the effects of marijuana for the first few times. After many adrenalin-shifts or repeated marijuana highs, mental time-shifts away from reduced fleshly time become more normal—assimilated. The *I Am* adapts.

For our *I Am* self to imagine or remember different times and places, our mind cannot be mass. Instead, synapses allowed by mass neurons stimulate energy dancing in void. Our minds are able to shift referential focus between mass, energy, and void, through various space and time perspectives of “c” values less than 186,000 miles per second—maybe extreme, as with an adrenalin-ATP “shift”, or in dreams, trauma, or through drug use. We each are our own *I Am* observer, making choices on how to deal with changing perspectives of space and time. Like the two sides of a spinning coin, the unified and reduced time-perspectives join into our variable subjective/objective consciousness. Time-free mind is energy in void. Our neurons in our time-locked bodies are mass. We rely upon our natural tendency towards integrity, assimilating both views from both sides of the $E = Mc^2$ equation, to stay balanced while in motion and at rest.

As $E = Mc^2$ shows, accelerated mass becomes energy, and decelerated energy becomes mass. According to the theory of special relativity, *when mass accelerates, internal frequencies decrease*. If I travel away from the Earth at a great speed and return, my internal clock, heart rate, and years, will have decreased frequency. Upon return, relative to people on Earth, I would have aged less. Our observed time is a byproduct of frequency: the number of cycles within a given time duration, e.g. one Earth day, the rotational speed of a clock, or the rate of a beating heart. Balanced adrenalin consciousness assimilates more of the slowed frequencies of theta, allowing time perspective shifts (chap XI), allowing a greater possibility to adapt and survive.

With two particles of the same type of mass and inertia, when one is accelerated to a new constant speed, its electrons vibrate a lower frequency compared to the other. Even though both particles' internal clock frequencies differ from each other and they do not travel at the same speed, light still travels the same speed compared to each particle: 186,000 miles per second. Expressed by $E = Mc^2$, mass’ relationship with light doesn’t change just because the mass is moving compared to some other mass.

Brainwave activity is electrical—energy in void. Mind analyzes and synthesizes object wave sets from memory and senses. New interference patterns holographicaly store memories as our brains’ synapses redistribute electro-magnetic fields. Ohm’s Law in electronics demonstrates the fundamental importance of constancy: $V = RI$, where V = voltage (potential difference, electrical pressure), R = resistance, and I = current. If the resistance is kept constant, then the

voltage and current may vary together. In a plumbing analogy: turn a water faucet to adjust voltage, releasing as water pressure. Solid circular pipes, like electrical wires, are relatively constant resistance, so a slight adjustment of the faucet allows the current to flow through the spout predictably: the voltage and the current varying directly. Instead, if the pipes were made with stretchable rubber, like from a balloon, the water would wobble through the inconstant resistance and chaotically squirt out the faucet: voltage and current varying not so directly, thus less predictable. Harmony and chaos represented as a signal to noise ratio vary according to the constant resistance. Holographic unified mind, individually or a collective, is a continuously distorting system that overcomes imbalance by maintaining alignment with the constancy of points on a circle, allowing a balanced signal-to-noise ratio. A disturbed person's monotone hum is the sound of a circle, as is a singing crystal challis, or a monk's brass bowl vibrating.

From the fundamental foundation into universal construct

"That string theory naturally incorporates the holographic principle… is another strong piece of evidence suggesting the principle's validity. I expect that regardless of where the search for the foundations of space and time may take us … holography will continue to be a guiding concept." *The Fabric of the Cosmos*, Brian Greene

This Harmonic Unifield Theory, *HUT*, is the vision of the synthesis of holography, harmonics, and the zero cosmological constant. This synthesis shows that all the information to create this universe is within every part. Within all the motions of the universe is the void. Through this void and its potential harmonic information inherent in a circle, all else can be reduced for examination: the unified field of commonalities—with signal-to-noise ratios.

Unified space expands out spherically according to $1/d^2$ (Fig.VIII.4). This inverse square law defines the spherical shape of non-local space where every point is its own center. The zero cosmological constant— *cosmocon*—is the origin of the universe and the unified field, defining the inverse square law and all other laws. The zero cosmocon source of the universe creates the dance to surround it, which creates all else that requires this one reference relating through the single point, the circle, sphere, helix-spiral-coil, $1/d^2$, allowing the math of harmonics.

Harmonic frequency multipliers are limited to positive integers—whole numbers. Two men learned of the integer limits of harmonics: 1) Niels Bohr used, without limiting, the harmonic sequence in what is referred to as the $2n^2$ quantum number, $n = H_S = \{1,2,3,4\ldots\}$, to show that electrons can only occupy orbits with integral energies. Like on a musical string, only whole numbers of waves can be present *or else they cancel each other out*. 2) Max Planck used two equations: the energy of an oscillating atom, $E=nhf$, and the quantum energy that an atomic oscillator could emit, $E_{n-1} - E_n = hf$, where the n in both is the unlimited set of harmonic non-negative integers: $n = H_I = \{0,1,2,3,4\ldots\}$. Limited, integers allow integrity, and the unified field.

The 2nd law of thermodynamics demands the universe to be constantly falling apart—entropy. Thus, the highest order was at the beginning. The arrow of time represents a universal average of increasing disorder, pointing from the beginning to the end. The beginning's order is the fundamental tone, the dance, containing all the information of the universe. Universal entropy is the harmonic degeneration of that beginning order towards increasing disorder.

When virtual particles and anti-particles pop into simultaneous existence, this infers a beginning of at least virtual space and time since there must be virtual separation and motion. These particles annihilate when close enough, so to maintain their own separate existence, they must perform a highly ordered dance. Unity of the coordinated duality dance is what allows the beginning of creation to be so highly ordered. The second law of thermodynamics can then enact its entropy on the universe, exploring the arrow of time, going from high order to low order. The

final loss of all order results by default in equilibrium, which with the collapse of all matter and anti-matter returns to pure void expressible as the zero cosmocon, of zero energy density.

The "nature" of the original void is to break its own inertia that has neither space, time, nor $E = Mc^2$, and venture into this dance of the superstring. The nature of the void is to remain the void while also *willfully* sustaining the original highly ordered dance that keeps the virtual particles and anti-particles separate, manifesting all unity, duality, and diversity of creation.

Higgs: possibility and/or probability

Quantum physics allows this perfect zero cosmological constant void to produce fluctuations, creating a connected pair of a virtual particle and a virtual anti-particle, orbitrons, that spin into their own virtual 2-D space and virtual time before canceling out. The superstring dance is an ordering of the orbitrons' avoidance possibilities, stabilizing and sustaining creation.

Two languages: *2n possibility* and *$2n^2$ probability*. In the 2n possibility dance, we have $n = H_D = \{1,2,3,4,5\}$, with the possible moves of $2H_D$: $2 \times \{1,2,3,4,5\}$. To expand into space and time with the transform $2n^2$, the shift in vocabulary from possibility to probability imposes a new limit on n; $n = H_E = \{1,2,3,4\}$. Insert this into $2H_E^2$ to show $2 \times \{1,2,3,4\}^2 = \{2,8,18,32\}$. In atoms, with the numbers mirroring back on themselves, the $2(2H_E^2)$ atomic probability field manifests with these numbers as the maximum number of *probable* electrons in eight fields:

❷ ❽ ❶❽ ❸❷ ❸❷ ❶❽ ❽ ❷

The popular Higgs boson field seems to be within the $2H_D$ possibility field, allowed by the zero cosmocon's grounding and containment by the *2 x 5 orbitron dance*. This is not the same as the $2H_E^2$ probability field, but it is what allows the probability field to contain mass, as well as space and time. The Higgs possibility field is the cause of mass, gravity, space, and time. Scientists say their discovered Higgs bosons have mass—in the probability field—so this is not the mass-free "Higgs field". The possibility field is not a field of mass, time, nor 3-D space. It qualifies as a 2-D "field" when referred to as a backdrop to the 3-D space plus time of the probability field. The winding and un-winding of the 2 x 5 dance would satisfy a net 0-spin as the Higgs boson requires, but the Higgs boson must be a massless Higgs in possibility field. When scientists measure their Higgs boson in a particle accelerator, just by being measured this particle shows as mass, the act of inserting energy to cross it over from the possibility to the probability field.

What scientists postulate as the wavefunctions of light "traveling" through the probability field is better to consider as light within the possibility field. Light operates in both possibility and probability fields: perceivable as wave momentum in the former, and as a photon-position transferring energy in the latter. In all cases, even when not represented at all on the M side of $E = Mc^2$, light necessitates accountability for its mass equivalence and gravitational effects, making light accountable for dark matter (chapter V).

Temporary equilibrium

"The entropy of an isolated system not in equilibrium will tend to increase over time, approaching a maximum value at equilibrium." Rudolf Clausius

"Entropy is the price of structure." Ilya Prigogine

"…if your theory is found to be against the second law of thermodynamics I can give you no hope; there is nothing for it but to collapse in deepest humiliation." Sir Arthur Stanley Eddington

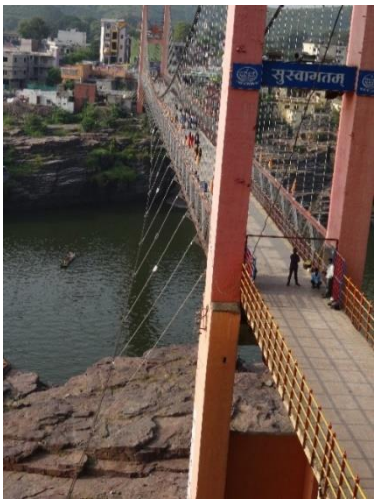
The grand finale of entropy is the state of equilibrium. There is no predominance in equilibrium, as in a calm pond. Upon equilibrium, predominance can begin, Fig.IX.2. A system requires predominance of a single point, the fundamental wavefunction through which all

frequencies and wavelengths of all else varies. This is harmony. Original void creates the dance and the beginning of order, from potentiality to possibility to probability to perception. The fundamental universal field contains void and the single wavefunction as the foundation. A fundamental tone degenerates into its harmonics as time's entropy brings on disorder. Limiting the infinity of harmony is required to sustain creation, to not have all harmony dissipated too quickly. Nature does this by focusing on the fundamental tone and the predominate harmonics. Chaos leads to equilibrium. Order requires predominance upon the equilibrium so that life can exist as a balance of order and chaos, from predominance to equilibrium to predominance to equilibrium...for as long as it lasts.

The problem with the word *equilibrium* is that we also use it for conditions that are not after chaos has beat down all systems at the end of entropy. For a sick person to reach equilibrium does not need to happen after the person is dead and the body has turned to dust. Equilibrium we often see as a good thing, the return to health, the temporary re-balancing of a deteriorating system.

Fig.IX.2 Equilibrium disturbed by predominance

Fig.IX.3 Cable allows temporary equilibrium



To reconcile the multiple meanings of the word equilibrium, look at this bridge, Fig.IX.3, in Omkareshwar, India. The cable below the bridge on the left, and another cable not visible on the right, stabilize the bridge from swaying in the wind. This effectively isolates the bridge from many vibrational potentials, allowing a *relative equilibrium*. The end of chaos would still destroy the bridge and Earth and the sun and all else in the universe, collapsing all matter and anti-matter back to the final equilibrium: the cosmic void. But that is the final equilibrium. The *temporary equilibrium* sustains balance and integration by dampening vibrations, like in a sport shoe, a rock balanced on a rock, a golf ball on a tee, or a car's shock absorber. The Earth is protected from vibrating cosmic radiations by our atmosphere, allowing the sustaining life we witness. A temporary equilibrium delays entropy. Too much harmonics causes the destruction of many systems. We stabilize our system with enough harmony, but not too much, maintaining relative equilibriums, both static and dynamic, stable and unstable, allowing temporary balance—sometimes.

Allowing for the complete biosphere we witness around Earth; how much debt does every life unit owe to the universal entropy fund? If calculated properly, the results might say that it takes the averaged continuing entropy of the whole universe just to grow this one Earthly paradise.

Proving unification

1) Unification theories, including superstring M theory and God, are limited by Gödel's Incompleteness Theorem as to what can be proven in the reduced perspective (chapter 1).
2) Therefore, for unification, even with accumulated data, experience and belief are the final proof for any individual. Believe it or not.

X CHROMATIC MUSIC IS NOT HARMONIC

1) Why does the math of harmonics in physics not match the math of what is currently accepted as harmonics in music?
2) Does accepted modern music really purposefully avoid natural harmonics in order to tune to a mathematically aberrated chromatic scale? Are most people ignorant of this?

Harmonic names and much math presented in this chapter were previously in the book, *Search for Ah…,* co-authored with Joe Flynn. In 1991, Joe contracted with The Evergreen State College in Olympia, WA, to study *HUT*'s harmonic music theory for his senior thesis.

Pythagorean Error and Correct Harmony

Accepted musical tuning systems are not in harmony with the natural physics of sound. This will be shown to have begun 2500 years ago with a math error that is still publicly ignored.

The field of numbers in Fig.X.1 shows the correct harmonic breakdown of a vibrating string. Every ratio represents a possible fret location for a harmonically shortened stringlength. The field of numbers reflects these three rules of harmonics. Also use Figs.0.2-.3 & I.1-.2-.3.

The first rule is nature's harmonic sequence: H_S = n = {1, 2, 3, 4, 5…}. This set refers to the number of λ/2 = ॐ standing wave-segments on a vibrating string, being the same number as the frequency multiplier: n *ƒ. Consecutive harmonic overtone, H_O, frequencies jump in steps equal to the fundamental tone {1}:* H_O = {2,3,4…}.

The second rule is the octave law: Any doubling of the fundamental frequency or of any overtone yields the same pitch-class at a higher octave. Any odd number, never having been doubled, introduces a new pitch-class: the harmonic chord subset, H_C = {1,3,5,7,9…}. Doubling each numeral of H_C yields frequency *pitch-classes*: Doe = H_{BT} = {1,2,4,8…}, Sol = $3H_{BT}$ = {3,6,12…}, $5H_{BT}$ = Mee = {5,10,20…}, $7H_{BT}$ = Ah = {7,14,28…}, $9H_{BT}$ = Rae = {9,18,36…}…

The third rule is reciprocation. The frequency multiplier set, n = H_S = {1,2,3,4…}, *reciprocates (R) to stringlength ratios of the first harmonic nodal points in the field of numbers,* (Fig.X.1): 1/n = H_{SR} = {1/1, 1/2, 1/3, 1/4…}. A nodal point is the quiet crossroads zero on a vibrating string at each end of the arcs that go up and down (Fig.I.1). The length between the fundamental (ॐ^F) tone's one arc's two end nodal points is the entire string length (L): L = λ/2 = ॐ^F. If the vibrating string's fundamental frequency, *ƒ*, is multiplied by 3 to 3*ƒ*, the whole stringlength L divides into 3 arcs, 3ॐ, showing the first node at L/3. Thus: x*ƒ* ↔ L/x ↔ xॐ.

Each of these stringlength ratios represents single wave-segments bounded by two nodes. A musical string at rest is zero. The fundamental tone 1/1 is bounded by the two nodes located at either end. It is **one** arching wave-segment that is half a wavelength, being lambda over two, λ/2 = ॐ^F, producing the fundamental frequency *ƒ,* the *1st Harmonic.* Note: the superscript F in ॐ^F refers to the *fundamental* tone's whole string that will be divided into overtones, each segment acting as its own fundamental tone; ॐ. **Two** arching wave segments, 2ॐ, one up-crest and one down-trough, the first overtone, is one wavelength, λ = 2ॐ, the *2nd Harmonic*. (Note: ॐ is no longer ॐ^F because each arc division of the whole string is treated as a fundamental tone on its own.) The second overtone, **three** wave-segments, 3*ƒ*, is 1.5 λ = 3ॐ, the *3rd Harmonic* (see Fig.I.1). A bounded "open string" vibrating 7 wave-segments is 7*ƒ* ↔ 3.5 λ = 7ॐ. Each segment between consecutive nodes is 1/7 stringlength L and is 7 times the frequency *ƒ* of the original 1/1 wave. Any stringlength fret ratio, like 2/3 L, is the reciprocal of the frequency multiplier, 3/2 *ƒ.*

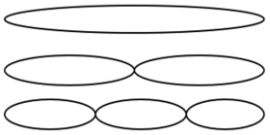
Halving or doubling of a stringlength or frequency yields a lower or higher octave of the same pitch-class: Doe = H_{BTR} = {1/1, 1/2, 1/4, 1/8…}L. And so on into theoretical infinity—limited by physical systems, like air resistance creating friction and heat.

Fig.X.1: Harmonic field of numbers as stringlength nodal ratios x/y

1/1	2/2	4/4	8/8	16/16	32/32…	Doe
				16/17…		
			8/9	16/18…		Rae
				16/19…		
		4/5	8/10	16/20…		Mee
				16/21…		
			8/11	16/22…		Fu
				16/23…		
	2/3	4/6	8/12	16/24…		Sol
				16/25…		
			8/13	16/26…		Mu
				16/27…		
		4/7	8/14	16/28…		Ah
				16/29…		
			8/15	16/30…		Tee
				16/31…		
1/2	2/4	4/8	8/16	16/32	32/64…	Doe
		4/9…				Rae
	2/5	4/10…				Mee
		4/11...				Fu
1/3	2/6	4/12…				Sol
		4/13…				Mu
	2/7	4/14…				Ah
		4/15…				Tee
1/4	2/8	4/16	8/32	16/64…		Doe
	2/9…					Rae
1/5	2/10…					Mee
	2/11…					Fu
1/6	2/12…					Sol
	2/13…					Mu
1/7	2/14…					Ah
	2/15…					Tee
1/8	2/16	4/32	8/64	16/128…		Doe
1/9…						Rae
1/10…						Mee
1/11…						Fu
1/12…						Sol
1/13…						Mu
1/14…						Ah
1/15…						Tee
1/16…	2/32	4/64 …				Doe

Left column: **1/1** L is the fundamental tone, & {1/2, 1/3, 1/4…}L are the overtones.

Reciprocals (x/y → y/x) of stringlength ratios yield harmonic frequency ratios



3 single strings vibrating up and down through time.

1st octave

"In these [string theories proposed as Unified Field Theories in physics] the basic objects are not particles, which occupy a single point in space but things that have a length but no other dimension."
A Brief History of Time
Stephen Hawking

2nd octave

To show the patterns, x/y fractions are not simplified. Bottom numbers "y" define pitch class. Top numbers "x" tell how many pitch classes in the first octave.

3rd octave

The field of numbers as frequencies or string nodes is an infinite reductive subset of the universal fundamental tone 1/1, including all positive integers or harmonic fractions.

4th octave

Standing waves: Fundamental tone 1/1 ॐ = λ/2 = 1/2 wavelength (Fig.I.1)

∞ →
↓

Expressible in both wavelengths and frequencies, this set of the field of numbers is the mathematics for the anticipated unification of science: Unified Field Theory (*UnFiT*); Grand

Unified Theory (*GUT*); Theory of Everything (*TOE*); Harmonic Unifield Theory (*HUT*). Every part contains the whole: Holagramic Unified Field (*HUF*). The problem with harmonic math is that it leads into infinity, so for creation it needs to be limited, as introduced in Fig.I.3.

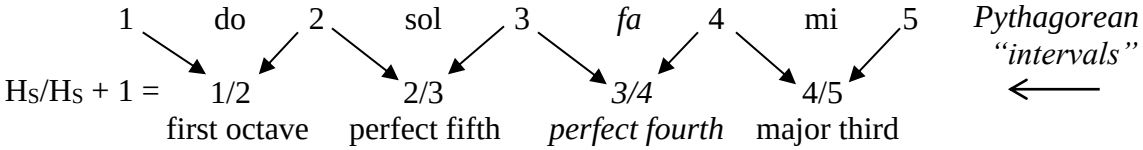
Down the left column of the field of numbers in Fig.X.1 are the harmonic sequence reciprocals for stringlength ratios, H_{SR} = {1/1, 1/2, 1/3, 1/4, 1/5…}. Across the top row are the equivalents of 1/1, doublings of both numerators and denominators: {1/1, 2/2, 4/4, 8/8…}. Multiplying the top horizontal ratios times the left vertical ratios results in the numerators of each ratio having doublings of one, H_{BT}, with H_S natural number denominators: H_{BT}/H_S. The ratios manifest as fret-able harmonically shortened stringlengths (called partials in physics) that can each play its own 1/2 wavelength fundamental tone, 1/1 ॐ, and thus resonate its own overtone sequence (called upper-partials): H_{OR} = {1/2, 1/3, 1/4…}.

As frequency multipliers, each doubling from one, H_{BT} = {1,2,4,8…}, is a new Doe. Between each pair of Does are number sets called *chords* or *octaves*. The first chord, {1,2}, is only two notes, both frequency multipliers being of the same pitch-class: Doe. The next chord, {2,3,4}, is a three-note chord, with two pitch-classes: Doe and Sol. The {4,5,6,7,8} chord has four pitch-classes: Doe, Mee, Sol, and Ah. The 8-pitch-class octave between 8 and 16 includes Doe, Rae, Mee, Fu, Sol, Mu, Ah, Tee, and the repeat of Doe. Between 16 and 32 is found the 16-pitch-class octave (Fig.X.13). Each of these emphasizes a subset of the harmonic scale.

In the first octave of the field of numbers, the first ratios, appearing from the left to the right, show the sequence of dominant pitch-classes {Doe, Sol, Mee, Ah, Rae…} based on reciprocals of the harmonic chord subset (1/odd numbers): H_{CR} = {1/1, 1/3, 1/5, 1/7, 1/9…}.

Pythagoras observed that a stretched string vibrates a harmonic sequence of whole numbers of wave-segments, called *open string harmonics*, Fig.X.8, starting with one single arch, ॐ, {1}, the fundamental tone, followed by the harmonic overtones H_O: two arches, 2ॐ, then three, four, etc.: H_O = {2,3,4,5,6,7…}ॐ. He experimented by shortening the string according to the following *consecutive pattern* (Fig.X.2), showing the non-harmonic 3/4 error. The ratios are named *intervals*, still used by a few people as fret locations on stringed instruments:

Fig.X.2: Erroneous consecutive pattern



Pythagorean ratios were combined with others to fill out varieties of 5, 7, 12 and other numbers of pitch-class octaves, many of which are grouped together and called "just tuning". The following just tuning choice (Fig.X.3), first proposed by Galileo Galilei's father, Vincenzo Galilei, is one example of a scale which includes tones not consistent with the Pythagorean consecutive pattern, nor with harmonics, specifically: *3/5, 5/8, 5/9*.

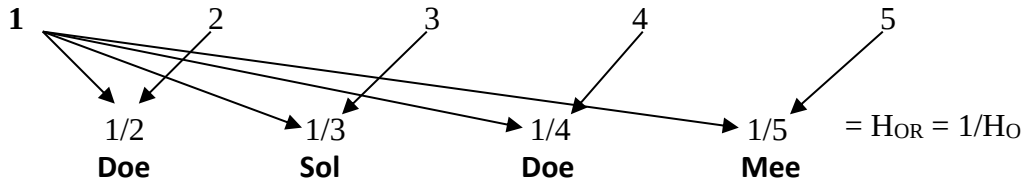
Fig.X.3: Just tuning: stringlength ratios

1st	2nd	3rd	4th	5th	6th	7th	8th/1st
do;C	re;D	mi;E	fa;F	sol;G	la;A	ti;B	do;C
1/1 ↓	8/9 ↓	4/5	3/4 ↓	2/3 ↓	3/5 ↓	8/15	1/2
	C#;Db	D#;Eb		F#;Gb	G#;Ab	A#;Bb	
	15/16	5/6		32/45	5/8	5/9	

No math pattern exists in this chromatic non-harmonic scale

Harmonic Materials in Tonal Music defines: "Music in which a single tone predominates over all the others is said to be 'tonal'... this (single) tone is called the 'tonal center'." From a 'tonal' perspective, Fig.X.4, Pythagoras would have discovered correct harmonic ratios for shortening a string. The **1** is the tonal center and remains the numerator over the H_0 denominator.

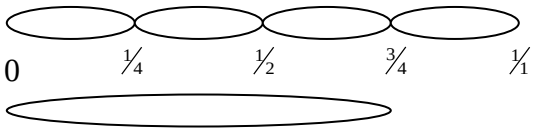
Fig.X.4: Accurate tonal perspective Compare to Fig.X.2.



The octave law's harmonic doubling allows longer stringlength ratios to be found between 1/1 and 1/2, each with the same pitch-classes as Fig.X.4's {1/2, 1/3, 1/4, 1/5}: {1/1, 2/3, 1/2, 4/5}(see Fig.X.1). A string shortened to 3/4 (Fig.X.2 & .5) *is not a harmonic* of 1/1. The 3/4 ratio is the first error in the consecutive pattern. Pythagoras confused the open and fretted string harmonics for humanity for the past 2,500 years (compare Fig.X.5 & .8 & .14):

Fig.X.5: Erroneous shortening to 3/4

Time lapse representation: a single string is stretching up and down.



← ¾ is within *Doe* open-string

← ¾ is error as fretted *fa*

If 3/4 stringlength produces a pitch-class that is not an overtone of 1/1, how do they sound good together? When 3/4 plays, the 1/1 fundamental tone's first octave, 1/2, must change pitch classes to become 3/4's chromatic "perfect fifth", a 2/3 harmonic relation of 3/4: 3/4 X 2/3 = 1/2. The fundamental tone loses its tonal center predominant position as Doe, to fa, the *usurper* tonal center, which forces Doe to become *fa*'s *sol*. The 1/1 tonal center loses the throne.

Fig.X.6: Harmonic tuning: frequency ratios

↓Octave	Doe	Rae	Mee	Fu	Sol	Mu	Ah	Tee	Doe
1	1/1	9/8	5/4	11/8	3/2	13/8	7/4	15/8	2/1
2	2/1	9/4	5/2	11/4	3/1	13/4	7/2	15/4	4/1
3	4/1	9/2	5/1	11/2	6/1	13/2	7/1	15/2	8/1
4	8/1	9/1	10/1	11/1	12/1	13/1	14/1	15/1	16/1

The fourth octave is also written:

8	9	10	11	12	13	14	15	16

← Harmonics 8 - 16

Fig.X.7: Just tuning, major scale: frequency ratios

↓Octave	do	re	mi	fa	sol	la	ti	do
1	1/1	9/8	5/4	4/3	3/2	5/3	15/8	2/1
2	2/1	9/4	5/2	8/3	3/1	10/3	15/4	4/1
3	4/1	9/2	5/1	16/3	6/1	20/3	15/2	8/1
4	8/1	9/1	10/1	32/3	12/1	40/3	15/1	16/1

The fourth octave is also written:

8	9	10	10 ⅔	12	13 ⅓	15	16

← "Chromatic: Pertaining to chords or harmonies based on nonharmonic tones." *American Heritage Dictionary* (unabridged)

By changing *stringlength* ratios to their *frequency* reciprocals and applying the octave/doubling rule, Fig.X.6 and Fig.X.7 compare harmonic frequency ratios with the just tuning ratios of Fig.X.3. Whole numbers 11, 13, and 14 are missing in just tuning's fourth octave (Fig.X.7) where two non-harmonic ratios, 10 ⅔ & 13 ⅓, replace the three missing harmonics.

Having resulted from Pythagoras believing there would be an eight tone octave between stringlength 1/1 and its first overtone at 1/2, chromatic interval names (see Fig.X.3), fifth, fourth, third, etc., can cause confusion. While chromatics' "perfect *fourth*" (3/4, fa) is fiction, physics' *fourth* harmonic is double the second harmonic, which is double the first, all three being the same pitch-class: Doe (not fa). The physics term, third harmonic, Sol, is called in just tuning: the "perfect fifth". The physics term, fifth harmonic, which is Mee, is just tuning's "major third".

Pythagorean errors[+] are blindly followed in Isaac Newton's seven-pitch-class scale in *Optics*, Book II: Part 4, Observation 8: "…the numbers, 1, 8/9, 5/6, 3/4, 2/3, 3/5, 9/16, 1/2, …express the lengths of a monochord sounding the notes in an [eight tone scale]." Newton mistakenly adopted these non-harmonic ratios, including 3/4, 5/6, 3/5, and 9/16, and he erroneously applied them from sound to the light spectrum, mentioning them four times as accepted fact in the book. His non-harmonic major third, E, 5/6, differs from Galilei's just tuning's harmonic 4/5 in Fig.X.3. Newton has a non-harmonic 9/16 for his 7th, *ti*, not 8/15.

As Newton did, so have many famous scientists and musicians, like Johannes Kepler, Mozart, and Einstein with his violin, inherited and accepted variations of the erroneous 12 tone chromatic musical tuning systems, mostly quite unaware of having chosen disharmony.

In J. Bronowski's 1976 *Ascent of Man*, the chapter five opening included a photo and caption, shown here in Fig.X.8, accepted as accurately representing the aged wisdom of harmonics. With my 1982 epiphany, I was trying to assimilate the condensed version of harmonics of Bronowski's Pythagorean numbers. In 1989, my attempt to reconcile the Pythagorean version of harmony with my epiphany of the single point theorem, chapter IX, allowed me to overcome Pythagoras' confusion by designing the field of numbers in Fig.X.1.

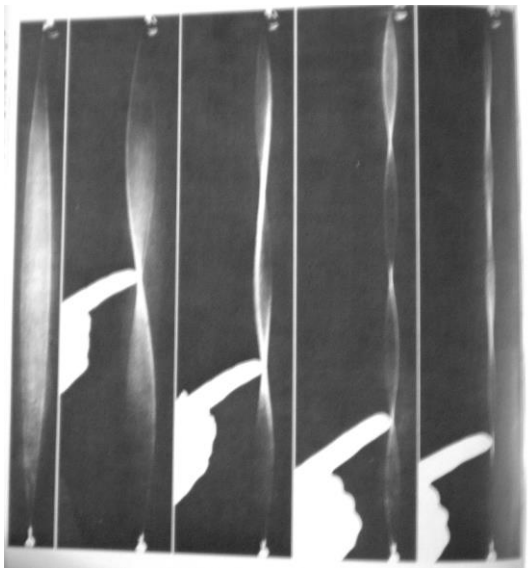
To view the Fig.X.8 photo, three perspectives, each with five ratios, are: A) open string harmonics: {1/1, 2/2, 3/3, 4/4, 5/5}, B) fretting at the finger, focus below for the true harmonics (Fig.X.4): {1/1, 1/2, 1/3, 1/4, 1/5}, and C) fretting at the finger in order to focus above it (Fig.X.2): {0, 1/2, 2/3, 3/4, 4/5}. Fretting the 1/4 overtone from B), yet focusing on the 3/4 residual "junk" stringlength of C), allowed the Pythagorean error that has remained hidden for 2500 years, forcing the true harmonics in (B) to fictitiously be the "junk"—like 3/4 really is.

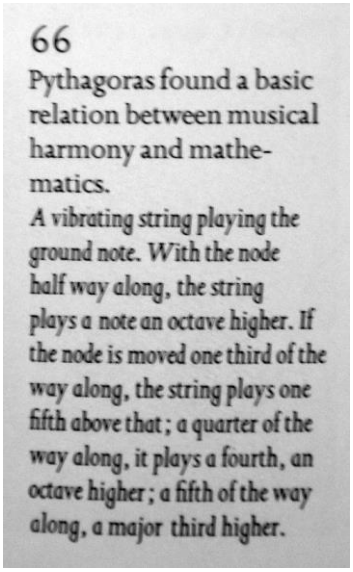
Bronowski's caption spreads confusion that began with labeling do = 1; re = 2; mi =3 (*third*); fa = 4 (*fourth*); sol = 5 (*fifth*); etc. His words in italics: *one third* [stringlength, being the third harmonic] *plays one fifth* [chromatic term "fifth" creates confusion], *one fourth* [accurate harmonic term] *plays a fourth* [accurate harmonic term, but intended as chromatic fa, thus is error], *and a fifth* [of the stringlength, a harmonic term] *plays a major third* [this is the chromatic term and is easily confused with physics' "third harmonic" term, which means something else].

Hermann Helmholtz's 1877 book, *On the Sensations of Tone* (chapter V.3 chart), told of the hammer striking the 1/7 point on piano strings to activate that passive harmonic node by instead making an antinode, a wave crest/trough, killing the seventh harmonic node. Nature's harmony interferes with the disharmony to which humans *choose* to tune. Harmony is forced to conform to our non-harmonic confusion. We adapt by making our errors into our "perfect" references. Harmonic life integrity suffers due to our ignorance-propelled paradigm, which is explained in Chapter XI brain science and in Chapter XII DNA.

Fig.X.8: Three & fifteen ways to view this photo

A) 5 harmonic ratios of the *open string* ↙ Photo and caption taken from
1/1 2/2 3/3 4/4 5/5 J. Bronowski's *Ascent of Man*





66

Pythagoras found a basic relation between musical harmony and mathematics.

A vibrating string playing the ground note. With the node half way along, the string plays a note an octave higher. If the node is moved one third of the way along, the string plays one fifth above that; a quarter of the way along, it plays a fourth, an octave higher; a fifth of the way along, a major third higher.

In 1673, William Noble and Thomas Pigot discovered natural overtones, realizing that a single vibrating string dissipates its fundamental tone's energy into an organized series of tones. This challenged the popular tempered scales which denied these precise natural fractions.

1/1 1/2 1/3 1/4 1/5

B) If string is *fretted* at the finger ↑: *below* the finger are the first five harmonics.

C) Pythagoras *fretted* at the finger, then in error he focused *above* the finger, making 4 *intervals* {0, 1/2, 2/3, 3/4, 4/5}, three of which are harmonic with 1/1 (not 3/4). This erred method must make the string longer in each step, not shorter as nature does, effectively making the Pythagorean fundamental to be zero, not 1/1 as nature rules.

Equitempered Popularity: No Fundamental Tone

"Concertgoers the world over still flock to hear its musical sounds, unaware of the long controversy that once brewed over the way its tones are arranged, in twelve steps within each octave. For most, the idea that they might be formulated another way has simply never arisen. Yet the equitempered debate never completely disappeared." *Temperament*, Stuart Isacoff

Around 1750, Bach began to popularize equitempered music with his well-tempered clavier. This non-natural tuning allowed a musician to play different scales without re-tuning the instrument since any tone can be the tonal center, contrary to the definition of a tonal center.. Converting an electronically tunable keyboard from today's widely accepted equitempered scale to twelve of sixteen tones in the natural harmonic scale requires tuning up or down with *cents* (Fig.X.9 and Fig.X.10). To formulate the equitempered scale using mathematics proposed by Simon Stevin around 1605, multiply the frequency of each consecutive tone by the "twelfth root of two": $\sqrt[12]{2} = 1.059463094$

Fig.X.9: 1200 cents per octave

Note:	C	C#	D	D#	E	F	F#	G	G#	A	A#	B	C	
	^	^	^	^	^	^	^	^	^	^	^	^	^	Musical cents
Cents:	100	100	100	100	100	100	100	100	100	100	100	100	100	escape nature's
Cents:	200		200		100		200		200		200		100	common sense.
Letter:	C		D		E		F		G		A		B	C	
Ratio:	1/1		55/49		63/50		578/433		433/289		37/22		185/98	2/1	← ugly ratios

In $\sqrt[12]{2}$, the 2 is the frequency multiplier between any pitch class tone and its first octave. The *arbitrarily chosen* twelve is the historically precedented number of tones for each octave. Between any tone and the next divides into 100 "cents", meaning there are 1200 cents assigned to each octave. Cents are a human chosen quantity not based on natural harmonics.

Starting with an equitempered frequency (Fig.X.10), multiply or divide by multiples of one cent, being the twelve hundredth root of two: 1 cent = $\sqrt[1200]{2}$ = 1.00057779. Tune higher or lower to yield twelve harmonic frequencies out of a sixteen harmonic pitch-class octave.

Fig.X.10: Harmonic-equitempered conversion

Hindi names	Keyboard note		Equitempered frequency (Hz)	Harmonic frequency(Hz)	Change in cents	Harmonic name *
Sa	C	do	524	524	0	Doe
	C#		554	556.75	+ 9	Doe #
Re	D	re	588	589.5	+ 4	Rae
	D#		622	622.5	+ 1	Rae #
Ga	E	mi	660	655	- 13	Mee
Ma	F	fa	698	720.5	+ 55	Fu
	F#		740	753.25	+ 31	Fu #
Pa	G	sol	784	786	+ 4	Sol
	G		830	818.75	- 24	Sol #
Da	A	la	880	851.5	- 57	Mu
	A#		932	917	- 28	Ah
Nee	B	ti	988	982.5	- 10	Tee
Sa	C	do	1048	1048	0	Doe

*For alternate names for harmonic sharps # see Fig.X.13.

Note: only 12 of the 16 harmonic tones per octave are converted. Harmonics: same frequency (32.75 Hz) separates each tone. Chromatics: same $\sqrt[12]{2}$ multiplier separates each tone.

Social Conversion

Fig.X.11: 16-pitch-class harmonic keyboard: *sipiclass*

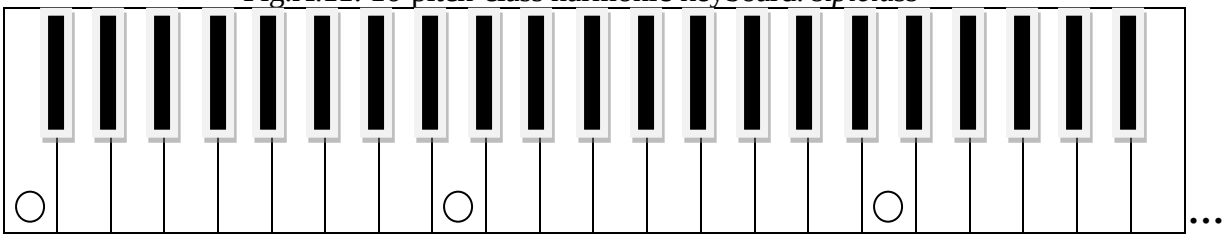
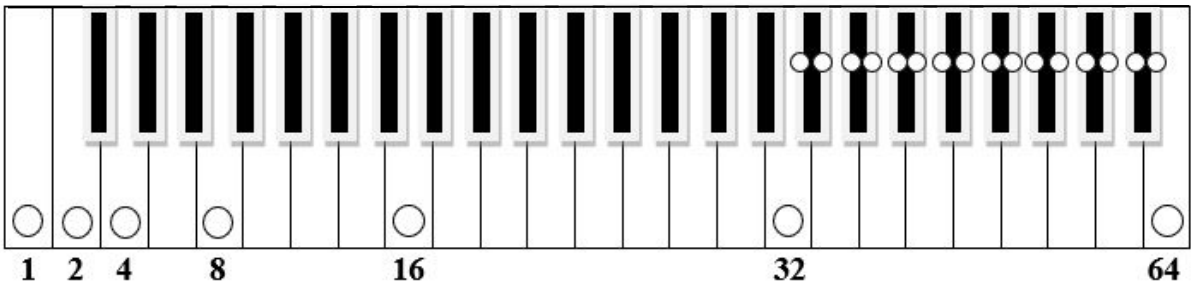


Fig.X.12 Expanding pitch-class harmonic keyboard: *expiclass*



RETUNE 1 = 32.75 Hz toopiclass = 2 fopiclass = 4 aypiclass = 8 thirpiclass = 32

Fig.X.11 shows a repeating *16-pitch-class harmonic keyboard* with 8 white keys per

octave and 8 black, rather than the 7 and 5 on popular 12 pitch-class chromatic keyboards (Fig.X.6). This repeating pitch-class keyboard doubles frequency between every tone after every new Doe. Each fundamental tone pitch class, Doe {1,2,4,8,16,32,64}, is specially marked: ○.

The *expanding pitch-class keyboard* (Fig.X.12) unfolds the harmonic sequence with the constant frequency of the fundamental tone, 32.75Hz, between every tone. The number of tones doubles within each consecutive octave, like in the field of numbers (Fig.X.1). Between Doe at 32 and Doe at 64, 16 small buttons are added to produce a 32 pitch-class octave.

Fig.X.13: One sixteen-pitch-class octave*

#	Name	Frequency	#	Name	Frequency
16	Doe	524 Hz.	25	Coo	818.75
17	Schoo	556.75	26	Mu	851.5
18	Rae	589.5	27	P	884.25
19	Lao	622.25	28	Ah	917
20	Mee	655	29	Chew	949.75
21	Fla	687.75	30	Tee	982.5
22	Fu	720.5	31	Wa	1015.25
23	Sthee	753.25	32	Doe	1048
24	Sol	786			

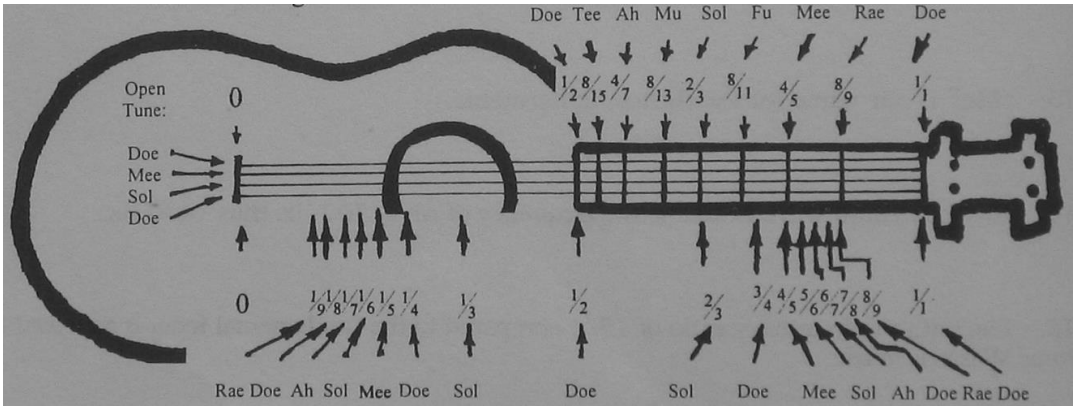
*1 Fundamental Doe: 32.75 Hz

To tune instruments to the field of numbers using frequencies, instead of stringlengths, first choose a frequency for the 1/1 tone. Fig.X.13 uses 32.75Hz. Use a tone generator channeled through a frequency counter then through an amplifier-speaker system. Tune by ear or with electronics, such as with an oscilloscope & Fourier analysis.

To make or convert fretted stringed instruments, the measurement for each harmonic fret location is determined from multiplying the whole string's length by the stringlength ratio (Fig.X.1). On a harmonically fretted instrument, Fig.X.14, tune one Doe string to a C note from an equitempered instrument (262 or 524 Hz, the same pitch-class as 32.75 Hz). Note that Fig.X.14 shows only eight frets per octave rather than 16, and only four strings rather than six.

By creating overtones on the vibrating open C string (Fig. X.8), or by pressing that reference string onto specific frets (*fretted string harmonics*), "open" tune a guitar's six strings to Doe, Sol, Doe, Mee, Sol, Doe, or some "minor" variation. Each string is its own fundamental, meaning the Sol string is its own Doe and has its own overtone sequence, resulting in more than 16 pitch-classes on a harmonic guitar. Each string is like a different key, though they just play the pitch-classes of the overtones of overtones, called upper-partials in physics.

Fig.X.14: Harmonic stringboard with 4 strings



Fretted string ratios (see Fig.X.1)

Some open string ratios

An equitempered guitar is limited to only 12 pitch-classes, making a 16 fret harmonic guitar a challenge to play for someone who can no longer depend on known fingerings for chords. For a beginner, though, it can be quite wonderful because the tones are not dissonant to

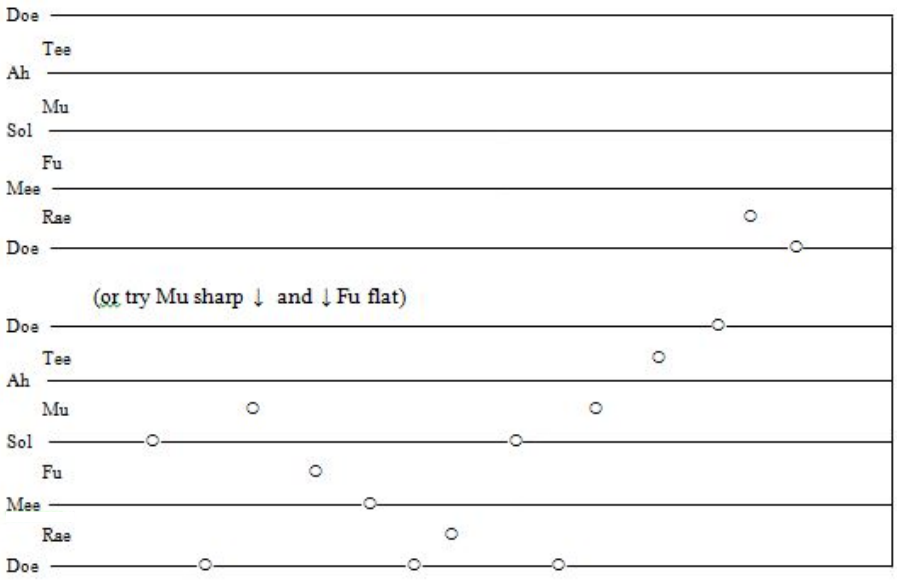
each other, only dominant and subdominant. Any single or combination of fingered frets allows a harmonic chord. Every barred fret allows a harmonic chord tuned with all other frets.

While only *some* ratios within the consecutive pattern (Fig.X.2) manifest harmonic fret locations, in Fig.X.14 *all* are node locations of open string harmonics within the first half of the whole string. The only *harmonic frets* (H_F) in the consecutive pattern are (excluding 1/1):

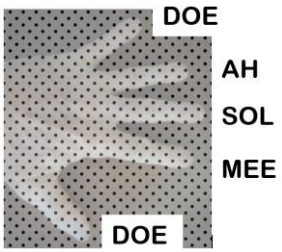
$$H_F = H_{BT}/(H_{BT} + 1) = \{1/2, 2/3, 4/5, 8/9, 16/17\ldots\}.$$

To write harmonic music, Fig.X.15, the five lines of a musical staff are, from bottom to top, {4,5,6,7,8}ॐ = {Doe, Mee, Sol, Ah, Doe}. Each five-line staff, or five fingers on one hand, thumb down, represents one octave. The top line Doe of one of the five-line staffs is identical to the bottom line of the next group above. The spaces between each of the five lines fill in the 8-tone scale. Attaching sharp (or flat) symbols fills out the 16-tone scale. Including plus or minus signs fills out the 32-tone scale. Whole, half, and other tone-symbols can also be applied.

Fig.X.15: Writing harmonic music



This harmonic song was converted from chromatics, as could be all music— by hand or with a good computer program accompanied by some subjective editing.



"When you know the notes to sing, you can sing most an-y-thing."
(Words are from the movie, *Sound of Music*)

Tonal relationships allow mono-harmonic melodies and poly-harmonic chord sequences. The popular 3-chord chromatic progression, {1,4,5}, {do, fa, sol}, is lost converting to harmony since fa at 3/4 is fiction in harmonic reality (Fig.X.5). The same {1/1, 3/4, 2/3} relationship is in harmony's 3-chord progression {Sol, Doe, Rae}, {2/3, 1/2, 4/9}: 2/3 x 3/4 = 1/2; 2/3 x 2/3 = 4/9.

The harmonic scale includes some of the 2/3 Sol relationships found in chromatics' cherished circle of fifths seen in Fig.XVI.12. E.g. Sol's Sol is Doe's Rae: 2/3 x 2/3 = 4/9 —or more simply, with only denominators: 3 x 3 = 9. Mee's Sol is Doe's Tee: 4/5 x 2/3 = 8/15, or 5 x 3 = 15. Sol's Ah equals Ah's Sol equals Doe's Flaaa (Fig.X.13): 3 x 7 = 7 x 3 = 21.

Harmonic Overtone Whistles

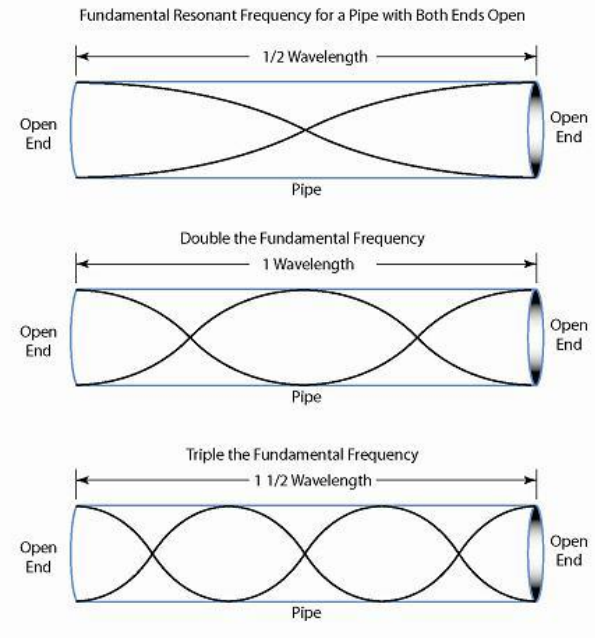
A ribbed drinking straw plays a limited harmonic sequence. Blowing into the ribbed straw whistles the patterns of standing waves, nature's harmonic overtones: $H_O = \{2,3,4,5\ldots\}$ (Fig.X.16). On its own, the hollow tube resonates the silent ambient 1/1 fundamental tone, the first harmonic of 1/1 *ƒ*, with half wavelength: 1/2 λ = ॐ. Blow into the straw very softly to hear

the 2nd harmonic, the first overtone, 2*f*, with the distance between nodal points being L/2. Blow harder into the straw to find the 3rd harmonic, 3ॐ, being the second overtone, 3*f*, and distance between nodes of L/3. Blow harder for the 4th: 4*f* ➔4ॐ ➔2 λ➔L/4. Then the 5th harmonic, and so on into theoretical infinity, though the limits of the physical system are soon reached. The straw increases frequency in natural harmonic steps—not a sliding scale. With practice, some straws will play the 2nd –7th harmonic tones: {Doe, Sol, Doe, Mee, Sol, Ah}. Blow with varying strengths on a flute, with all the holes fingered closed, and it demonstrates the same physics.

A *fiffle* is a harmonic instrument and it follows the same wave patterns as the drinking straw: the faster air moves, the higher the frequency, and the shorter the wavelength. In Figs.X.16 & .XX.7, the wave crests, not nodes, are at the tube ends, unlike on a string.

Make a fiffle: The mouth-piece of a little plastic recorder is needed. This will either be detachable or can be sawed off. It will be about four inches long. This mouthpiece then gets shoved into an approximately 2-foot-long piece of garden hose. Seal the two pieces together with electrician's tape or some method. This fiffle can be tuned to the C pitch-class of chromatic music. Starting with a longer hose, shorten it by cutting off a little at a time until the C tone is achieved. At this point, the fiffle will play a C and its natural overtones: harmonics two through nine, or fewer.

Fig.X.16 Open ended tube harmonics



Musical tubes, often about 31 inches long, might be found in toy stores. These are like giant ribbed straws that when spun in circles can also play harmonics two through seven. To tune to "C", one of these may be taped together with part of a second to lower the fundamental tone, which is length dependent. Start too long and cut shorter.

Note: here the depicted transverse waves are only representations of sound's actual longitudinal waves in air (pg. XIV).

"A small frog, of the genus Hyla, sits on a blade of grass about an inch above the surface of the water, and sends forth a pleasing chirp: when several are together they sing in harmony on different notes." Charles Darwin

"Music generally sets me thinking too energetically on what I have been at work on, instead of giving me pleasure." *Charles Darwin's Autobiography*

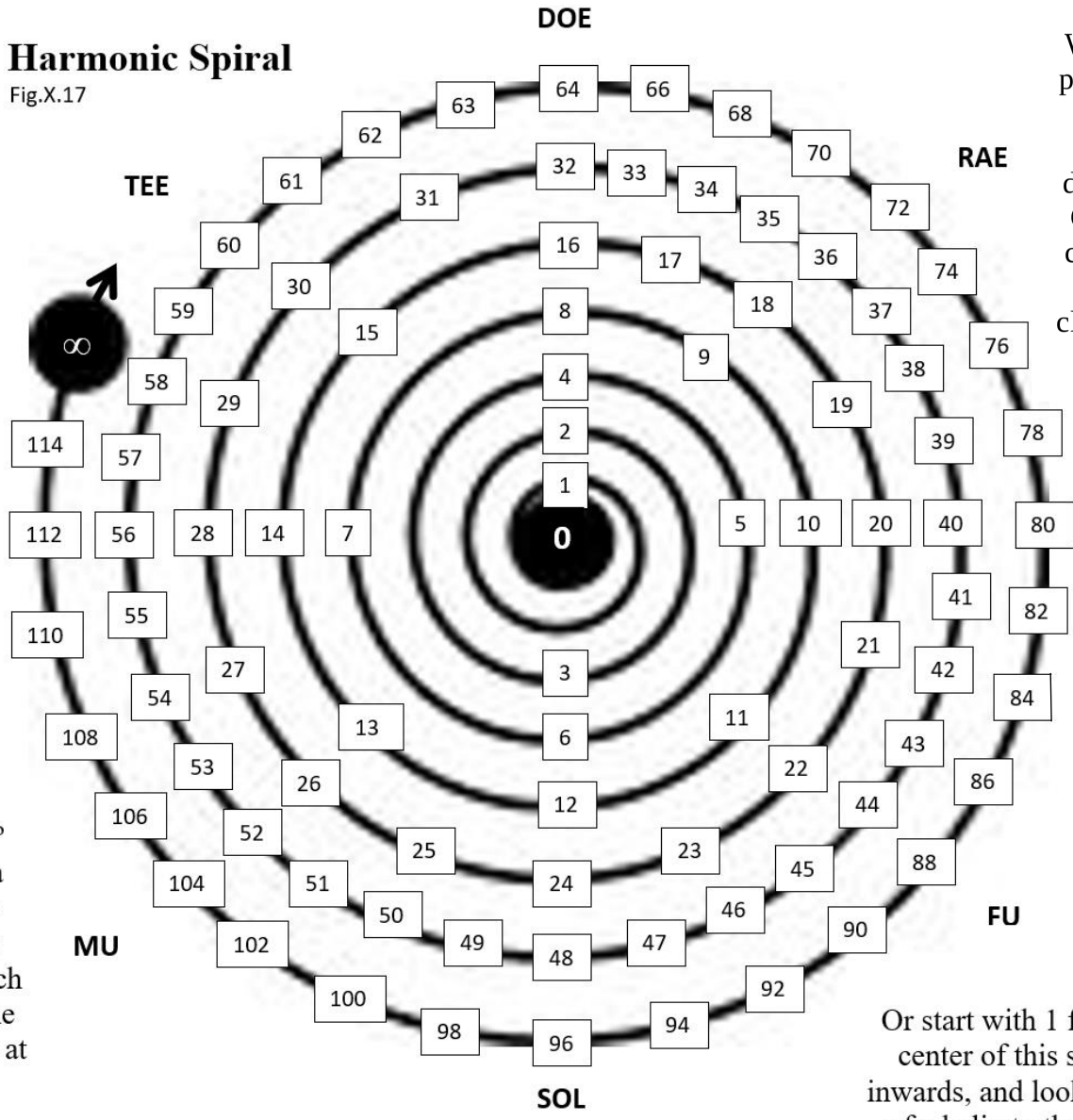
"Charles [Darwin] used whistles and other noisemakers to see how worms would react. They took no notice. Then he started striking bass notes on the piano. The worms scurried into their burrows." Irvin Stone, *The Origin*

To test this theory:

Testing for tonal relationships in nature might reveal intriguing results, like with bird songs. This calculation problem initiated by Pythagoras can be reconciled by recalculating correctly. The final proof is in the experiencing of the harmonic music in brainwaves and DNA.

Hasp: **Harmonic Spiral**

Fig.X.17



Within each radial pitch-class column, the closer to the center, the more dominant the tone. Comparing radial columns, the pitch class originating closest to the center is dominant.

This two-dimensional harmonic spiral can also be seen as a three-dimensional harmonic cone, looking down the outside from above.

Each 360º contains a complete chord, no matter which point on the circle starts at 0º.

Or start with 1 furthest from the center of this spiral, counting inwards, and look down the inside of a helix to the infinite center.

XI BRAINWAVE HARMONY

1) Are brainwaves affected by external vibrations, such as chromatic or harmonic music?
2) Are healthy brainwaves dependent upon harmonic vibrations?
3) Do specific brainwave frequencies and their relationships to each other matter?
4) Since our modern music is non-harmonic, might this affect our harmonic brainwaves?

Harmonic Octave in Theta

HUT claims that harmonics function in the body and mind, and that chromatics, being the world's popular musical tunings, are non-harmonic and do affect our harmonic essence. Chromatics create tangential cycles in our minds and bodies that loop over and over again, heating and deteriorating preferred harmonic cycles.

A paradigm shift to thinking of life sciences based on harmonics and grounded in holographic reality presents a system that must regularly renew itself. Since entropy naturally disassembles all order, life must remain aligned to harmonic energy's fundamental and predominant tones for maintenance, thus we breathe air, drink water, and eat food.

Entropy is a runaway harmonic system. Investing fresh predominant harmonic energy is the only way to temporarily overcome entropy. In this model, humans are also required by nature to periodically realign with harmony, like eating an orange, even if harmonic alignment seems chaotic, like an earthquake. It is all perspective. Harmony dominates chaos, and then harmony degenerates to chaos. And the pattern keeps repeating, and here we are, thinking about thinking.

Fig.XI.1 presents sets of frequency relationships in several octaves of sound. Fig.XI.2 shows one octave of light. The same harmonic relationship of frequencies {4,5,6,7,8} also defines a harmonic chord as theta in brainwaves, Fig.XI.3.

Mathematically, in string theory, harmonic waves vibrating between two end points, Fig.X.8, produce an infinite set of positive integers that function as frequency multipliers: a fundamental tone {1} and its overtones {2,3,4,5…∞}. These are all whole numbers because if they were not, the waves would cancel themselves out. In observed reality, too many waves interfere and rapidly increase disorder. *For a harmonic creation to sustain, the infinite harmonic sequence must be limited.* One way is for the universal fundamental tone to reduce its unity through an octave with four different pitch-classes (Fig.XI.1). This single harmonic chord is shown to be common to sound, light, and theta brainwaves. Chapter XII proposes that the form and function of DNA and RNA also depend upon this encoded chord to reduce the helixes' unified information. Theta chord {4,5,6,7,8} has the four most dominant pitch-classes: Fig.X.1.

Fig.XI.1: Pitch-class frequency-multipliers as octaves

Doe	Rae	**Mee**	Fu	**Sol**	Mu	**Ah**	Tee	⬇ octave repeat of first DOE Doe ←Pitch-classes
1								2 ←One pitch-class per chord
2				3				4 ←Two pitch-class chord
4		**5**		**6**		**7**		8 ←**Four pitch-class theta chord**
8	9	10	11	12	13	14	15	16 ←Eight pitch-class chord
16	18	20	22	24	26	28	30	32 ←Sixteen pitch-class chord
32…	36…						…	64 ←Thirty-two pitch-class chord

Human senses access different quanta and octaves of harmonic frequencies. We hear sound frequencies double through *several octaves* and still remain audible. Smell and taste have adapted to atomic frequencies. Rainbow colors are our visual perspective of a frequency range: Fig.XI.2. Our eyes cannot see beyond red into infrared, while our skin absorbs, emits, and feels

that as heat. Our eyes cannot see ultraviolet light, but that can blind and burn us. The lowest frequencies of visible light can only double once and still be seen: we can only see approximately a *single visual octave* (Fig.XI.2). Karl Pribram in October 1982 *OMNI* Magazine told about finding this as he studied how the brain has adapted to light, "the cells of the visual system… respond to approximately one octave of spatial frequency."

Fig.XI.2: Visual spectrum

Approx. color		***Frequency***	Wavelength	Name
Infrared	~	***4*** x 10^{14}Hz	750 nm	Doe
Red				
Orange	~	***5*** x 10^{14}Hz	600 nm	Mee
Yellow				
Green	~	***6*** x 10^{14}Hz	500 nm	Sol
Blue				
Violet	~	**7** x 10^{14}Hz	429 nm	Ah
Ultraviolet				

Notice in the visual spectrum that the *frequencies* relate as the set {***4,5,6,7***}. The four pitch-class names show in light's single octave: Doe, Mee, Sol, & Ah. In brainwave studies, this four-tone harmonic set is called *theta waves*. Fig.XI.3

As harmonic sound has the four dominant pitch-classes whose frequency multipliers relate as {4,5,6,7}, harmonic light isolates the same multipliers as four primary colors between infrared, appearing black, and sub-ultraviolet. Since it requires identifying a theoretical universal fundamental tone, exact frequencies of these four primary light quanta are possibly not yet known, but they are approximately {4,5,6,7} x 10^{14} Hz (Hertz, Hz, are cycles per second).

"Whereas humans possess three kinds of color-sensitive cones – eye cells sensitive to red, green and blue light – birds have a fourth cone type sensitive to ultraviolet light…Tetrachromacy – the possession of four cone types – appeared early in vertebrate evolution, and is common in birds as well as in many reptiles and fish, and likely even dinosaurs…said study lead author Mary Caswell Stoddard... Princeton University" *Inside Science*. Also see Figs.XIX.14 & .15.

Brainwaves on Keyboard

In brain and mind researches, different brainwave frequencies correlate to different states of consciousness, which, like sound, span several octaves. Theta brainwaves express the single {4,5,6,7}Hz harmonic chord-octave. A harmonic keyboard, Fig.XI.3, demonstrates brainwaves by displaying harmonics {1,2,3,4…64} Hz as tones. This scale maintains the same frequency as the fundamental between every tone, in this case, 1 Hz. The number of pitch-classes doubles within each consecutive octave, granting more differentiation (explained in music chapter). This theory does not assume that a brainwave of exactly 1 Hz is the same pitch-class as the not-yet-agreed-upon theoretical universal fundamental tone, though, for discussion, ignoring SCP*, 1 Hz is chosen for the fundamental brainwave. It is said that the brain stem maintains basic life, even with zero Hertz brainwave, but likely the SCP* continues (see Fig.XI.3 *Proposal & Fig.XX15).

To demonstrate brainwaves on an imaginary harmonic keyboard (Fig.XI.3), we will set the fundamental tone's frequency, the tone to the far left, to 1 Hz. If loud enough, this would be heard as clicks for the first few octaves. Each octave is sandwiched between the doublings up from one (white keys marked: O): from one to two, two to four… from 32 to 64.

Delta brainwaves, {1,2,3,4} Hz, low frequencies on a brainwave keyboard, span two short octaves. The 3 Hz in delta is the first differentiation from the fundamental pitch-class. A person isolated in delta is in deep, dreamless sleep, or a coma. Any access to such unified consciousness by our reduced perspective is experienced as the silent void. The experience lacks the differentiation upon which language depends to separate the self from all else. Unified delta,

with SCP*, is like the emptiness of Lao Tzu's *Tao*, like the background to Carl Jung's collective subconscious, and Hindu's *Namaste*, where two and more minds are accepted as One.

Rising out of deep sleep, the next higher frequencies differentiate delta's mostly unified consciousness into one complete octave of four pitch-classes. This allows more differentiation. Theta brainwaves, {4,5,6,7,8} Hz, display during sleeping and waking dreams, deep relaxation, inward focus, and increases one's mental suggestibility and imagery. Theta's low level of conscious differentiation allows rapid space and time changes, and ignorance of details. One researcher[1] explained, "Without theta rhythm, spatial memory is destroyed" and also that some animals' brainwaves shift to theta rhythms when they are in survival perspectives. Cat predation, rabbit apprehension, and rat exploration are mimicked by attention deficit children displaying the theta hunter mode,[2] like a child searching through his or her pack or desk during a lecture.

One book[3] discusses neuro-feedback research, correlating many brain and behavior problems, e.g. ADHD, with excessive theta at wrong times. Displayed in such ways as excessive distraction, hand movements, arguing, lying, or forgetting, these children's hyperactivity is each child's own ineffective method of trying to self-stimulate a shift from dominant daydreaming-sleepwalking theta state into a more effective combination of brainwaves. Amphetamines and other pharmaceuticals *stimulate* the brainwaves of these kids enough that the kids *slow down* their own self-stimulation, allowing them to relax and become more attentive. Some neuro-feedback practitioners have had successes in healing many of these problems without medication, by teaching the patient how to suppress their excessive theta while stimulating specific higher brain frequencies, where they can differentiate more effectively.

Other researchers[4] say it may not be necessary to suppress theta at all, that to enhance specific higher frequencies can be enough. Researchers[4,5] show that healthy states of mind awaken when theta and brainwaves from other octaves activate together. Meditating monks reached more clarity by specifically focusing on relaxing their hands and mouths.

Alpha, {8,9,10,11,12} Hz, is an awake, relaxed, meditative state, comprising the lower half of the {8-16} octave. People may experience the silent void when their consciousness concentrates around a specific alpha frequency, variable among individuals, able to bridge octaves between unified delta and higher frequencies of awakened consciousness[5]. Depending on the situation and person, intense concentration, relaxation, drugs, adrenalin-ATP "shifts", all can trigger a sudden "awakening"—healthy, or possibly unhealthy.

Out of a need to survive through unresolved past trauma, someone may partially linger in theta brain activity to hide from those memory details. When the person' consciousness can be relaxed enough to produce alpha waves, as with hypnotism, these frequencies might bridge to lower theta waves, allowing regression and the retrieval of memories, reconstructing suppressed past experiences. A person can then re-adapt to a poorly adapted past.

There is research[3] with the sensory-motor rhythms, SMR, {12,13,14,15} Hz, also called lower beta waves (see Fig.XI.3). SMR is the upper half of the {8-16} octave, shared with alpha, and is associated with a still body and an attentive mind, demonstrated by a cat sitting alertly still all except for the end of its twitching tail, or a person meditating while fingering beads. Neuro-feedback researchers have found much success in healing by enhancing SMR waves while suppressing excess theta. Kids play neuro-feedback computer games that give them more playing freedom when they reside in the preferred brainwaves. The child learns to guide his or her own mind to the most efficient functioning mode. Stimulating a child this way often bypasses further need for pharmaceutical stimulants. One researcher[6] found an effective healing technique by stimulating a 7 Hz theta wave into doubling up to SMR at 14 Hz. Like when blowing more forcefully through a flute, the brainwaves jumped up an octave, doubling frequency to the same

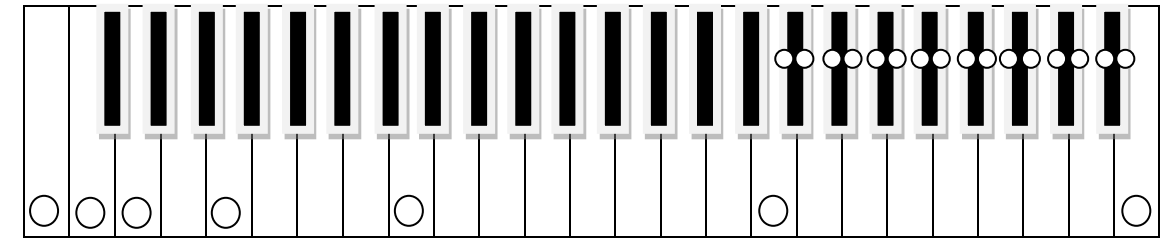
harmonic pitch-class. That under-stimulated 7 Hz tone and the healthy 14 Hz are called “Ah” on the harmonic keyboard, a tone not included on a popular chromatic keyboard. That same mind-researcher had also separated and explored the individual whole numbered brainwave frequencies, as if he anticipated they were each a separate tone on the harmonic keyboard.

Brainwaves on Keyboard **references**

1 Winson, Jonathan, November 1990, ‘The meaning of dreams’, *Scientific American*, p. 86
2 Sears, William and Thompson, L., 1998, *The ADD Book*, Little, Brown
3 Robbins, Jim, 2000, *A Symphony in the Brain*, Grove Press
4 Wise, Anna, 1995, *The High Performance Mind*, Tarcher/Putnam
5 Cade, C. Maxwell and Coxhead, Nona, 1989, *The Awakened Mind*, Element Books
6 Tansey, Michael A. 1993, *Biofeedback and Self-Regulation,* Vol 18, 33-44

On this harmonic brainwave keyboard, Fig.XI.3, right-brain/left-hand plays the less differentiated lower octaves. Left-brain/right-hand plays the more differentiated upper octaves.

Fig.XI.3 Harmonic brainwave keyboard



SCP*	Slow cortical potential, resting background
Delta	Deep sleep, located throughout the brain
Theta	Dream state
Alpha	Relaxed, awake
SMR	Sensory motor rhythm, listening, observing
Beta	Concentrating, active in specific brain parts
Gamma	Very intense performance

*Proposal. At .125 cycles per second, SCP is one beat every 8 seconds. The SCP brainwave acknowledges the heart’s, not the brain’s, pacesetting fundamental tone, originating in the heart’s sinus node, transferring to the brain stem.

SCP*, slow cortical potential, a background vibration, is about one cycle every eight seconds (.125 Hz), proposed here as monitoring the fundamental pace-setting rhythm in the heart. Triggered by stimulus, SCP’s changing rate communicates emotional effects on the heart. The brain effects the heartbeat, and visa-versa, through the SCP, controling emotions, guiding thoughts and actions back into a comfort zone. This allows harmony between brain and heart.

Beta brainwaves, awake and active consciousness, covers the whole octave {16-32} Hz. These higher frequencies are often associated with concentration and differentiation, stimulation, and active senses. Too much beta for too long a time can cause problems, necessitating the lowering of brainwave frequencies, thus the need for deep sleep, when the mind and body can

avoid differentiation and rest closer to the void and pitch class of the universal fundamental tone.

In an information overloaded world, if information is not being assimilated, it will be rejected—eliminated. A mind residing in the reduced differentiation of theta is a defense against excessive high frequency stimulation. Prolonged information overload, or very intense in a short time, can lead to a mental shutdown, the brain requiring rest at lower brain wave frequencies.

The mixing of lower brainwaves with the still active upper brainwaves can allow awareness of theta dream state, and even of the void of delta. This mental bridge is like the attainment of a Buddhist enlightenment, a Native American vision quest, a prolonged survival situation triggering hallucinations, or experiencing a new-paradigm epiphany.

The newest identified brainwave octave is gamma waves, shown in Fig.XI.3 as 32-64 Hz. This zone requires concentrated balance to maintain. To achieve the resonating balance, a variety of brainwave octaves are accessed. For instance, centering around four tones all in the same pitch class: gamma at 56 Hz halves to beta's 28 Hz, then halves again to SMR's 14 Hz, and again to theta's 7 Hz. This quantifies as *the zone*, *the field*, *Zen focus*, etc.: awake, active, and unified.

A baby's brain begins on the left side of the harmonic keyboard, living with almost no differentiation. With age, the child learns more and more adaptive techniques to the material world, allowing consciousness to climb into the higher frequencies, towards the right end of the keyboard, learning to differentiate among the five senses with stored experiences. In old age, we might back off from the excessive differentiation, hanging out in lower frequencies again—our evolutionary destiny. Balancing between too much and too little is the goal. As individuals and as a species, our brains perform our harmonic symphony of consciousness.

The brainwave frequency 32 Hz tone is near the lower end of normal human audible range. The lowest C on a piano, 32.75 Hz, can also be matched by the audible upper frequencies of an earthquake. Also see sections beginning with the one that includes Fig.XX.16.

"Man would like to learn the ways of the waves merely by watching them, but he cannot, because they set him dreaming. Try to count a hundred waves sometime and see."
Scientific American, August 1959

"A mind that is stretched by new experience can never go back to its old dimensions."
Oliver Wendell Holmes

Entangled Light: Being the Unified Field

After photons entangle, then separate, if spin is imposed on one particle, the second particle's spin is simultaneously defined, no matter the separation distance. Since information cannot travel faster than the speed of light, special relativity is said to be incomplete here because it does not allow simultaneous causality at a distance. Still, relativity understanding can reconcile this conundrum. The information is not traveling—it was never separated.

Special relativity does explain this quantum effect of two entangled photons that "separate". From human perspective, the two separated-yet-entangled particles must have stayed connected as a vibratory wavefunction. Scientists observing particles separating at the speed of light need to accept that from the perspective of light, the clock is stopped, and the measuring stick pointed in the direction of travel has shrunk to nothing. In this way, the confused scientists could *also* accept the measured photons as 2-D, not separate in time nor direction of travel.

Within the holographic model's unified field, the diffused reference 2-D wavefront has an omnipresent and overall simultaneity from our mass perspective. This universal special and temporal non-locality grants a more reasonable perspective to poorly understood scientific ponderings such as the quantum entanglement of two separated light particles.

Imagine: a long thin super-light-weight un-stretchable wire with a good handle on each

end. Two people pull steadily on the two ends and make the wire taut. While holding this firmly, one person jerks the wire. The jerk's information does not travel down the wire. The wire is non-elastic so that the jerk is simultaneously felt through the distance to the opposite end. Entangled photons are a little bit like that. In essence, entanglement is string theory being witnessed.

Quantum experimenters are confusing themselves by imposing their localized mass, flesh, and particle probability perspective of time and 3-D space measurements onto the non-local perspective of the light wave, for which any motion in the direction of travel, or change in time, do not even occur. The combined wavefunction continues to exist from before the two entangling particles were observed to be separated, right up to observing that a spin change imposed on one is manifesting simultaneously on the other. From our time-bound perspective, the clock is stopped for the entangled wavefunction, and the separating distance is zero. Acknowledging the photons' perspective that they never separated, then the observers can properly witness that the quantum entangled particles respond as we predicted.

A wormhole from the 3-D + time perspective is actually light's 2-D perspective. Light travels from point A to point B, no matter the distance in the 3-D + time perspective, yet light perceives no distance traveled and no time passing. To 3-D + time perspective, the two ends starting at A and finishing at B might be so connected by a wormhole that A and B are the same place and same time, which is precisely the perspective that light has.

The probability field displays time and 3-D space and the mathematics for our material universe abiding by $E = Mc^2$. Except as ink on paper, the square root of minus one is not part of our *probability field*, though in quantum mechanics it can make good predictions for actions within the probability field. Mathematics are mental creations—being within the *possibility field*—much like the stories of *Alice in Wonderland* and *Gulliver's Travels*. Though the time and space rules of the probability field do not restrict the freedom of the possibility field, the possibility field is still real, and the authors of imaginary productions transfer these into books and existing buildings found within the probability field. A unified field theory cannot just dismiss the possibility field and be complete. Virtual particle and virtual anti-particle pairs emitting from the original void are not bound in the restrictions of the probability field's time and 3-D space, but are instead the origins of space and time as we experience them.

A holographic brain allows a hologramic mind to store memories as multiple holograms. Brains, minds, DNA, everything use the same reference, being the original void manifesting the circle and the 2 x 5 possibility dance. Every part of the universe contains the whole. We all entangle with every sensory experience, to varying degrees. Consciousness is quantum entanglement. Our senses reach out for more entanglement, increasing our consciousness input. In *Shufflebrain,* Paul Pietsch added an extra eye to a salamander and the increased sensory input effectively increased its intelligence—at times too much even. Large quantities of data enter the brain, then are processed, and stored via harmonics within holography.

Our new memories store our entanglements. Deeply embedded entanglements become intuition and eventually inheritable instincts. The ease of retrieval depends upon the degree of entanglement. Attitudes, like forgiveness and apathy, affect the degree of entanglement. I look at a single leaf blowing in the wind and that may be a very low entanglement. I notice the light on the one leaf glitter, and it moves me… this is greater entanglement. I write about that leaf and that again increases the degree of entanglement. My grandmother was married to my grandfather and bore their children. That experience and memory is huge entanglement.

A young man and a young woman meet at an evening function and dance and talk and become enchanted. Their energies become entangled. Then they separate. There is a story with which I grew up. My mom's dad was off in the wilderness with his buddies fishing in icy

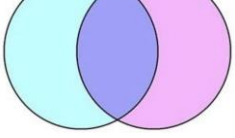
weather. The boat flipped and the fishermen all died. My grandfather's watch stopped in the cold water. At the same moment, my grandmother was playing bridge and suddenly had a terrible premonition about the bad accident, and her emotions interrupted the whole game. The bridge players noted the time. Later, the times of the stopped watches and the bridge game interruption were compared and were the same. Entanglement, what Einstein called spooky action at a distance, ended the bridge game. Such is love. And light. And mind is light. And void.

Unified mind, bridged into reduced consciousness, experiences sensory input and makes decisions while merged into the holographic unified field. Choreographed dancers can know this efficient blend of possibility and probability fields. Though planned, the group can flow into a wondrous level of unity. Highly efficient spontaneity is seen in a well-trained team when a special state of mind is achieved among the individuals, a phase transition merging separate reduced perspectives into a unity, sometimes referred to as *the zone*. The group acts as one single mind, like a flock of birds, or colonies of bees or ants. Spectators at sporting events perform this unity in what is known as *the wave*, which is part practiced and part spontaneous. Traffic patterns of cars can show this unity and be explained with Brouwer's single point theorem defining harmonics. Humans seem to be able to rise above their individualized particulate realities and harmonically, holographically, merge group mentality into a superfluidity of consciousness. Not just groups of people, but individuals can attain that zone, the *yoga*, the yoking, in extremely practiced endeavors, merging into the *unified field*, also referred to as the *flow* or the *Way* in such activities as gymnastics, skiing, dancing, golf, writing, or meditating—or with spontaneous and efficient adapting within an adrenalin shift triggered in an emergency situation.

The holographic unified field, *Huf* in Fig.IX.1, is grounded in void which manifests unity and becomes the source of all variation. As *Huf* blends with *Haf*, the harmonically altered field, *Huf* also remains continuously integral. As the reference, void is not bound by time nor space, and grounds the material universe with its sustaining virtual dance. Void manifests the possibility dance, then all probability unfolds as reducing harmonic forms and motions.

Always guiding each original entanglement is harmonics. A single originating oscillation resonates its single pattern into the two, or more, parties of an entanglement. If the two parties adapt by assimilating the single vibration, and each of them share the amplitude-wavelength-frequency-phase as a common denominator, then the two become harmonized due to one fundamental vibration accepted as the tonal reference. After, the two photons, or whatever the two units happen to be, are in phase due to that fundamental harmonic introduced by the oscillating point, string, or membrane. A single drum rhythm can be the shared oscillating membrane, and the rhythmic sharing in the dance of two people allows assimilating that rhythm as their unified body reference, which allows unified entanglement of the separate minds.

"The membrane oscillator functions as an interaction media, because the lasers don't talk to each other directly—the photons don't interact themselves, only through the oscillator…the interaction between photons and the membrane is wavelength independent, allowing in principle microwave-optical entanglement." Junxin Chen, 3 31 2020
"*Quantum-entangled light from a vibrating membrane*", by University of Copenhagen



Use the overlap of the two circles in the Ven diagram to show how much entanglement occurs. Like with two dancers sharing the same rhythm—they either align much or not so much. The more the violet overlap area, the greater the entanglement.

"How to Stop Thinking Without Falling Asleep"
From the movie, *Bagger Vance.* Words spoken by Will Smith:

"The trick is... to find your swing… now somewhere in all the harmony of all that is… all that was… all that will be… inside each and every one of us is one true authentic swing, something we was born with, something that is ours and ours alone, something that can't be taught to you or learned, something that got to be remembered… just keep swinging that club until you're part of the whole thing… that's a good thing… I think it's time …time for you to see the *field*… watch… almost like he's searching for something… then he finds it… watch how he's settling himself right into the middle of it… feel that focus… he's got a lotta shots he can choose from… but there is only one shot that is in perfect harmony with the *field*… one shot that's his… authentic shot… and that shot is gonna choose him… there's a perfect shot out there trying to find each and every one of us… all we got to do is get ourselves out of its way, and let it choose us. Look at him. He in the *field*. You can't see that flag as some dragon you got to slay. You have to look with soft eyes, see the place where the tides and the seasons and the Earth come all together, where everything that is… becomes One. You've got to seek that place with your soul… don't think about it… feel it… Now play the game. Your game. The one that only you was meant to play. The one that was given to you when you come into this world."

From *I.Q.* movie, words spoken by actor Tim Robbins, as an auto mechanic.
Response spoken by actor Walter Matthau, as the character Albert Einstein:

"When she came in the garage, it was like everything slowed down, and got very clear. It's like when you're milling a camshaft or grinding down the curve on a fender, and as you're doing it you just know that everything is going to work out perfect, everything is going to fit. You know? You ever have that feeling?"

Albert: "Yeah, one time in 1905."

Akeelah (Keke Palmer) in *Akeelah and the Bee*:

"You know that feeling where everything feels right, where you don't have to worry about tomorrow or yesterday, where you feel safe and doing the best you can. There's a word for that feeling. It's called Love…L…O…V…E…"

"The Music is All Around Us. All You Have to Do Is Just Listen"
Actor Robin Williams speaking in *August Rush*:

"Do you know what music is? It's God's little reminder that there is something else besides us in the universe… harmonic connection between all living beings everywhere, even the stars… harmonic dreams, sweet children… you know what's out there? A series of higher tones. It's arranged by nature. It's governed by the laws of physics of the whole universe. It's an overtone. It's an energy, it's a wavelength, and if you're not riding it, good *lorie*, you'll never hear it… only some of us are listening…"

From Sherlock Holmes, spoken by actor Robert Downy Jr.

"What started merely as an experiment has brought me to the threshold of a monumental discovery. Now if I play a chromatic scale there's no measurable response. But now, and this is remarkable, if I change to atonal clusters…voila, they fly in counterclockwise, synchronized concentric circles as though a regimented flock. Watson, this is exceptional. I, using musical theory, have created order out of chaos."

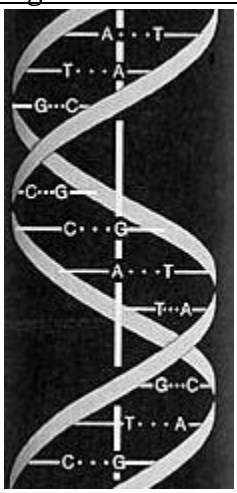
XII DNA HARMONY

1) Might DNA be constantly communicating with itself much like the nervous system does?
2) Might we make a tree of life that communicates better to each of us what levels of genus-species-variety traits have not significantly changed {0}, and which traits {1} have changed—a binary system: {0,1}, facilitating the locating of common ancestors?

Base Angle Information Transfer

HUT may inspire biology scientists to discuss DNA communicating its codes in more situations than only during replication, that DNA is always intercommunicating throughout the body. A healthy organism is quick and precise to detect itself and identify what is foreign: the brain and nervous system use electrical impulses; the endocrine system uses peptides and receptors. There are the immune and gastrointestinal systems, the microtubules, and proposed here: the photonic DNA system. All is united by holography and harmonics. The heart's rhythm provides and reflects the unified body and mind's overall balance.

Fig.XII.1: DNA double helix



← sugar

←**50° - 54°**

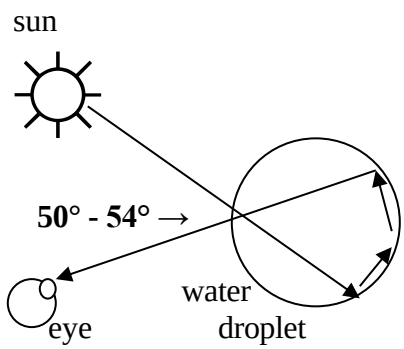
←base

← PO^4

HUT suggests that DNA and RNA communicate genetic sequences using a four-tone {Doe, Sol, Mee, Ah} (Fig.XI.1) harmonic code transported as light. *HUT* proposes that inside the fiber-optic-like crystalline structure of the sugar-phosphate helix in DNA and RNA, light functions as a carrier wave differentiating among the four bonding angles formed between the sugars and nitrogenous bases. Linus Pauling[1] measured angles between 50º and 54º produced by the joining of each of the four bases to sugars (Fig.XII.1 & .3). Isaac Newton[2] measured similar angles between 50º and 54º inside a water droplet that produces a secondary rainbow (Fig.XII.2 & .3).

[1]Pauling, L. & Corey, R.B., 1956, *Arch. Biochem. Biophys.* Vol. 65, 178-9
[2]Newton, I., 1704, *Optics*, Book I, Part 2, Proposition 9, Problem 4

Fig.XII.2: Secondary rainbow



HUT suggests that Pauling's angles, Fig.XII.3, which would need more precise measuring, should stimulate frequencies in the carrier wave relating as {4,5,6,7}, just as angles of reflecting light, which includes 4 primary colors, are perceived by the eye.

Note (not pertinent): Newton measured the primary rainbow to be between 40° and 42°.

Fig.XII.4 arranges the first letters of the four nitrogenous bases in mRNA; uracil, adenine, cytosine and guanine {U,A,C,G}. Each base is further assigned with a {4,5,6,7} frequency multiplier, according to the alignment in Fig.XII.3. Sequences of three bases, called codons, define each amino acid (Fig.XII.4); e.g. tryptophan is {U,G,G} or {4,7,7}. A harmonic keyboard, Fig.X.12, has tryptophan as {Doe, Ah, Ah}.

Fig.XII.3: Comparing two sets between 50º and 54º

Harmonic Name	Frequency multiplier	Newton's approx. color	Pauling's joining angle	RNA base
Doe	4	red	← 50º →	**U**racil (**T**hymine in DNA)
Mee	5	orange/yellow	← 51º →	**A**denine
Sol	6	green/blue	← 52º →	**C**ytosine
Ah	7	violet	← 54º →	**G**uanine

Fig.XII.4: Applying harmonic code to nitrogenous bases forming amino acids

First letter ▼	Second letter "U" 4	"A" 5	"C" 6	"G" 7	Third letter ▼
	*Phenylalanine	Tyrosine	Serine	Cysteine	U 4
4	*Leucine	(End chain)	"	(End chain)	A 5
"U"	*Phenylalanine	Tyrosine	"	Cysteine	C 6
	*Leucine	(End chain)	"	*Tryptophan	G 7
	*Isoleucine	Asparagine	*Threonine	Serine	U 4
5	* "	*Lysine	* "	Arginine	A 5
"A"	* "	Asparagine	* "	Serine	C 6
	*Methionine	*Lysine	* "	Arginine	G 7
	*Leucine	*Histidine	Proline	"	U 4
6	* "	Glutamine	"	"	A 5
"C"	* "	Histidine	"	"	C 6
	* "	Glutamine	"	"	G 7
	*Valine	Aspartic acid	Alanine	Glycine	U 4
7	* "	Glutamic acid	"	"	A 5
"G"	* "	Aspartic acid	"	"	C 6
	* "	Glutamic acid	"	"	G 7

This chart is modified from the biology text book: *Life on Earth* Wilson, et al., 1973
*The 9 essential amino acids may be found to be relating to the harmonics {8-16}.

Harmonic code applies to nitrogenous bases which make amino acids: Fig.XII.4. Notice the top left corner is {Doe, Doe, Doe} = {4,4,4} = {U,U,U}, acting as a fundamental tone. This quote says it in other words: "Phenylalanine… is the jumping off place for a chain of chemical reactions which is essential in the metabolism of man." *Genetics is Easy*, Philip Goldstein.

Harmonic Mutations

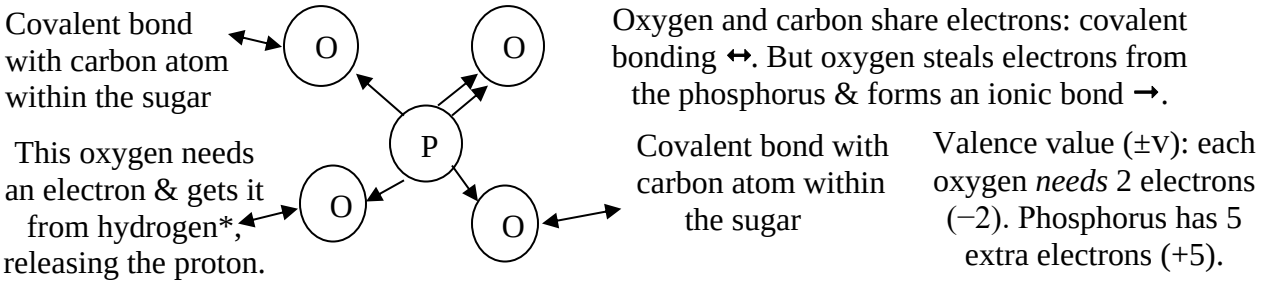
The light moving within DNA's helices is stimulated while passing the connecting angles of the nitrogenous base. This angle information is assimilated into that passing light, which acts as a carrier wave storing the frequency multiplier, comparable to an eye/brain assimilating rainbow frequencies as colors. The carrier wave passes each angle's "color" information along, be it healthy or mutated, with each three angles defining one amino acid. Then the chain of amino acids defines the proteins and "junk" DNA. The proteins make up our bodies, so the coordinating of accurate information is key to health, just as aberrations are key to mutations.

Pauling said, "small deformation" allows these angles to relax *towards* the 52º average. *HUT* claims that, in general, cancer begins with a non-harmonic imposition causing a base-angle mutation, followed by harmonic replication of the mutation. Moving past the *cost* of mutations, successfully assimilated mutations have a possibility to *benefit* successive stages of evolution.

Scientific American July 1996 published the article 'Sunlight and skin cancer' by Leffell, D.J. and Brash, D.E. which included a mutated angle in a skin cancer illustration—though the mutation is *away from* the 52º average: "Damage to a gene called *p53*". Sunlight radiation mutates the vulnerable 52º cytosine into being 50º (Fig.XII.3), sequentially binding erroneously to 50º thymine's partner adenine at 51º, instead of cytosine's partner guanine, 54º. With five or six or more of these mutations in a cell, cancer begins to turn off the cell's mechanism that, with age, would properly trigger its own death. When each cell fails to die, the cancerous growth eventually begins to use up too much of the host organism's resources, killing the host.

HUT explores the possibility that inside a sugar-phosphate helix, the phosphate (PO_4 in Fig.XII.5) produces the light to carry the information. One of the PO_4 oxygen atoms is not attached to a sugar, and accesses only one electron from the phosphorous, of the needed two. This oxygen, to fulfill its own -1 valence, uses another atom's electron, like hydrogen's*. In the form of heat or light measured in calories as *electron affinity*, energy releases when the oxygen atom is satisfied with eight outer electrons. The light channels though organic optical fibers of the helix, measuring angles of each nitrogenous base passed. Since the oxygen's valence has become zero, and the joining electron has ionized the oxygen, with heating (assumption) the new electron gets released and the oxygen again has -1 valence, attracting a new electron. A similar PO_4 energy pump is in ADP → ATP → ADP biology and in phosphorescence producing light.

Fig.XII.5: Phosphate molecule (PO_4) in sugar-phosphate backbone of DNA



According to *Smith's General Chemistry*, 1908; "slow union of cold phosphorus with atmospheric oxygen is accompanied by the evolution of light… ordinary phosphorus ignites at 35º [C]." Can this temperature be applied to phosphorus and oxygen bound up as phosphate in DNA? If so, normal body temperature for a human is 37ºC, warm enough for "the evolution of light." This could have been the same step in evolution: the body sustaining warmth and the releasing of DNA light. Most plants and some animals, such as cold-blooded ones, would still be adapted to sub-35º body temperatures, from prior to the evolution of warm-blooded life forms.

For the body-brain to decode the carrier wave's message, and synthesize all the complex Fourier patterns of the DNA/RNA bonding-angles, *HUT*'s photonic DNA requires a holographic model able to reconstruct stored wave interference patterns. Cloning verifies that, like holography, information of the whole organism is contained non-locally in individual cells.

The Guardian, Oct 24, 2018, Naaman Zhou, published in Nature Communications:
'Twisted' fibre optic light breakthrough could make internet 100 times faster

"Fibre optic cables use pulses of light to transmit information, but currently information can only be stored through the colour of the light, and whether the wave is horizontal or vertical… By twisting light into a spiral, engineers effectively create a third dimension for light to carry information: the level of orbital angular momentum, or spin. 'It's like DNA, if you look at the double helix spiral,' said Min Gu from RMIT University. 'The more you can use angular momentum the more information you can carry.'"

To know exact frequencies for four nitrogenous bases, we do not yet know the fundamental tone from which these four can be calculated. To find the universe's *fundamental* tone pitch class is important to further understanding brainwaves, DNA, music, and all else.

In the medical world, healing techniques might benefit by further researching harmony as a choice for tuning instruments. For treating cancer, vibrating the codes for healthy DNA might destructively overstimulate the invading cancer codes, causing the cancer cells to overheat and die. Proper radiation tuning of light and sound (Fig.XII.6) therapies might cause the desired damage to the cancer cells while leaving the healthy cells undamaged.

Imagine soaking in a hot tub humming with the fundamental 4-pitch-class chord: {4,5,6,7,8} = {Doe, Mee, Sol, Ah, Doe}. With harmonic tones carefully arranged to present the individual's healthy DNA code, musical vibrations come through underwater speakers, caressing one's body with the hum of life. Meanwhile, the tonal integrity destructively shakes the non-integrating cells, and the cancer dies. Research is needed.

Healthy options might extend to the tuning choices for sound and light frequencies for audio-visual media, such as cinematography. This would reintroduce the proper harmonics into body and mind, stimulating and rebuilding health. Research is needed.

April 1995, I stayed in Pasadena with my uncle and his wife, William and Janet Dreyer, who worked in the Church Building biochemistry labs on the Caltech campus. I researched in their libraries to find specific angles joining nitrogenous bases to the sugar-phosphate backbone in DNA, with no success. My biophysics pursuit offended my uncle. I found my desired numbers a few weeks later in a Friday Harbor, WA thrift house book about animal DNA; Fig.XII.1.

While in Pasadena, I was invited to visit Dr. Susumo Ohno at City of Hope, Beckman Cancer Research. He researched cancer-music connections and had learned of my work through a mutual collaborator and communicated his belief in my combining DNA and harmonics, that proper harmonics could target cancer while chromatics could create cancer. William R. Corliss wrote: "The SARC oncogene, a malignant gene first discovered in chickens, causes cancer in humans as well. When Ohno translated the gene to [*chromatic*] music, it sounded very much like Chopin`s Funeral March". Visiting Dr. Ohno's laboratory, his assistants all seemed familiar with my work, greeting me as if I was somebody important. Dr Ohno explained that he was at the end of his career, that the topics of his final lectures were already set, and his health was waning. He apologized because, though he believed me, he did not believe he could help me. Still, his expressing confidence did help. Dr. Ohno passed January 13, 2000.

On February 5, 2020, I found this article of the cooperation between researchers at Caltech and the City of Hope. I sent them my work, feeling that I could contribute, and based on similar vocabulary and focus, maybe already had:

Ultrasound can selectively kill cancer cells Feb. 5, 2020, by Caltech;
"A new technique could offer a targeted approach to fighting cancer: low-intensity pulses of ultrasound have been shown to selectively kill cancer cells while leaving normal cells unharmed. Ultrasound waves…have been used as a cancer treatment before… high-intensity bursts of ultrasound can heat up tissue, killing cancer and normal cells in a target area. Now, scientists and engineers are exploring the use of low-intensity pulsed ultrasound (LIPUS) in an effort to create a more selective treatment… Ortiz published a paper in 2016 in the Journal of the Mechanics and Physics of Solids showing that there was a gap in the so-called resonant growth rates of cancerous and healthy cells. That gap meant that a carefully tuned sound wave could, in theory, cause the cell membranes of cancerous cells to vibrate to the point that they ruptured while leaving healthy cells unharmed. Ortiz dubbed the process 'oncotripsy' from the Greek *oncos* (for tumor) and *tripsy* (for breaking)…"

Fig.XII.6: Harmonic ultrasound frequency range

FOUR OCTAVES OF HARMONICS {4,5,6,7} IN ULTRASOUND RANGE

using *32.75 Hz as the fundamental tone, Doe, to ascertain Mee, Sol, & AH.
Medical ultrasound produces frequencies in the range of 2 to 15 MHz
as compared to the range of human hearing, being 20 to 20,000 Hz.
One MHz = 1,000,000 Hz

DOE: 4 octaves of ultrasound

32.75 Hz x 2^{16} x 4/4 = 2,146,304 Hz

32.75 Hz x 2^{17} = 2,146,304 Hz x 2 = 4,292,608 Hz

32.75 Hz x 2^{18} = 4,292,608 Hz x 2 = 8,585,216 Hz

32.75 Hz x 2^{19} = 8,585,216 Hz x 2 = 17,170,432 Hz

MEE: 4 octaves of ultrasound

2,146,304 Hz x 5/4 = 2,682,880 Hz

4,292,608 Hz x 5/4 = 5,365,760 Hz

8,585,216 Hz x 5/4 = 10,731,520 Hz

17,170,432 Hz x 5/4 = 21,463,040 Hz

SOL: 4 octaves of ultrasound

2,146,304 Hz x 3/2 = 3,219,456 Hz

4,292,608 Hz x 3/2 = 6,438,912 Hz

8,585,216 Hz x 3/2 = 12,877,824 Hz

17,170,432 Hz x 3/2 = 25,755,648 Hz

AH: 4 octaves of ultrasound

2,146,304 Hz x 7/4 = 3,754,282 Hz

4,292,608 Hz x 7/4 = 7,512,064 Hz

8,585,216 Hz x 7/4 = 15,024,128 Hz

17,170,432 Hz x 7/4 = 30,048,256 Hz

*** 32.75 Hz** is the chosen fundamental tone in this work. However, *HUT* theory claims there is a universal fundamental tone that may not yet be known & in choosing 32.75 Hz, the calculations can be made and tested. To verify the universal fundamental tone with confidence may still be a way off in the future. *HUT*'s best evidence is at the end of chapter VII.

4 octaves of options from which to choose.
Double or halve each octave to obtain more

DOE: 2,146,304 Hz	DOE: 4,292,608 Hz
MEE: 2,682,880 Hz	MEE: 5,365,760 Hz
SOL: 3,219,456 Hz	SOL: 6,438,912 Hz
AH: 3,754,282 Hz	AH: 7,512,064 Hz
DOE: 8,585,216 Hz	DOE: 17,170,432 Hz
MEE: 10,731,520 Hz	MEE: 21,463,040 Hz
SOL: 12,877,824 Hz	SOL: 25,755,648 Hz
AH: 15,024,128 Hz	AH: 30,048,256 Hz

Other Ways to Search in the Human Body for Possible Harmonic Functioning

Doubling cells

It does not "… matter what kind of animal it is, its egg begins to develop by the process called CLEAVAGE." *Genetics is Easy* Philip Goldstein

The most obvious harmonic math of biology is the *cleavage* triggered by the sperm entering into the egg. The nucleus divides by mitosis; the one cell spits into two. Each cell in any harmonic binary moment either does not divide, {0}, or the cell divides once, {1}: H_{BM} = {0, 1}, potentially producing harmonic binary through time in base ten, H_{BT} = {1, 2, 4, 8, 16…}.

"In humans, over about five days, the single-cell body divides four times, to produce a ball of sixteen cells." *Your Inner Fish*, Neil Shubin

Heart rhythms

The *heart* serves our bodies as the tonal center for harmonizing all of our rhythms: "Buried high in the right atrium, a minute knot of cells sets the heart's pace. Called the

sinus node, its sparks send electrical impulses racing through the heart to other electrical cells woven throughout cardiac tissue. In perfect rhythm each successively explodes. The trail of electricity flashes so rapidly across the heart that all its cells appear to beat as one." *The Incredible Machine: The Human Body*, 1986, National Geographic Books

What is our sense of rhythm and time? Only the heart knows. Heart beat allows the subjective sense of rhythm and time, not counted as one of the five senses: see, hear, touch, taste, smell. Heart beat pacing rhythm and time is our sixth sense, communicating with the brain.

Photosynthetic unified field

The May 9, 2009 and Feb 27, 2010 issues of *Science News* tell about *photosynthesis*—finding electrons vibrating in plants, in a coherent phase relationship. Stimulated by photons from the sun. This natural photo-electric effect allows synchronistic alignment of electrons, referred to as *warm quantum cohesion*, an extremely efficient energy transfer. Within a hologramic model, this unified field of electrons is required as a reference wave for life to grow. The coherent vibration of electrons remain in phase with the universal hologramic unified field. Tests could be made within the animal kingdom, seeking to also find this electronic coherency transferred from sunlight, focusing on ultra-violet rays striking skin, stimulating a cohesive vibration of electrons allowing vitamin D production.

Harmonic organic elements

Fig.XII.7: Predominant organic elements

Percentage	Element	Atomic number	Pitch-class	Name
10%	Hydrogen	1	{1}	Doe
62%	Oxygen	8	{1}	Doe
20%	Carbon	6	{3}	Sol
3%	Calcium	20	{5}	Mee
3%	Nitrogen	7	{7}	Ah

Predominant organic elements' atomic numbers are in order of pitch-class dominance: H_C = {1,3,5,7…}, same classes found in the harmonic theta chord: H_T = {4,5,6,7} = {Doe, Mee, Sol, Ah}. Percentages from *Biology*, Scott & Foresman, 1980

Also note that type O- blood is the universal donor, as are plasma donors with type AB blood, which might also be Doe references in their systems, like phenylalanine in Fig.XII.4.

Microtubules as resonators

Strings and tubes recur in the study of harmonics: in music (a guitar and a flute), in superstring theory, and in protein construction, such as arteries and muscle fibers. *Microtubules* channel pressure waves that carry harmonic information, enabling quantum coherence for cells.

Microtubules are "…very tiny tubes of protein found in the cellular cytoplasm throughout the body…[They] appear to serve us as cellular pathfinders dissolving as cells prepare to divide, then reemerging in perfect position after mitosis… [They have the] uncanny ability to act in synchrony… [and to] guide impulses along intricate pathways within and between the cells… microtubules are miniature biological 'resonators' ..." *Brain/Mind*, June/July 1994

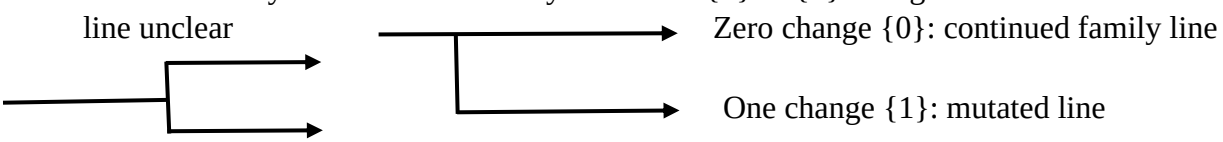
The body uses electrical potential differences to orchestrate harmonic motions. In stages through embryonic growth, the eyes must connect to the brain. The optical nerve must find direction to grow and connect the eyes and brain properly. The microtubules align the growth using attractions and repulsions of electrical charges, similar to Fig.0.1 transceivers.

"Within living cells, a two-headed protein called kinesin acts as a biological motor, hauling cargo. Fueled by chemical energy, the protein uses the two heads to 'walk' along microtubules, which form an inner scaffold in cells… [In a laboratory, placing] kinesin molecules in a solution of microtubules…the negatively charged microtubule turned toward the positive end of the electric field." Cunningham, Aimee, 05.27.2006, *Science News*

BID: Best Idea

The standard tree of life in biology is bifurcation, like a two-pronged fork, the handle ending in the middle of the beginning of the two prongs. This does not represent evolution well because the unchanged ancestral species, the fork's handle, does not normally end immediately when an old form mutates into a new species or sub-species. Ancestors need to be shown unchanged while mutating forms need to be seen as separating from the family line.

Fig.XII.8 Bifurcation vs Binary

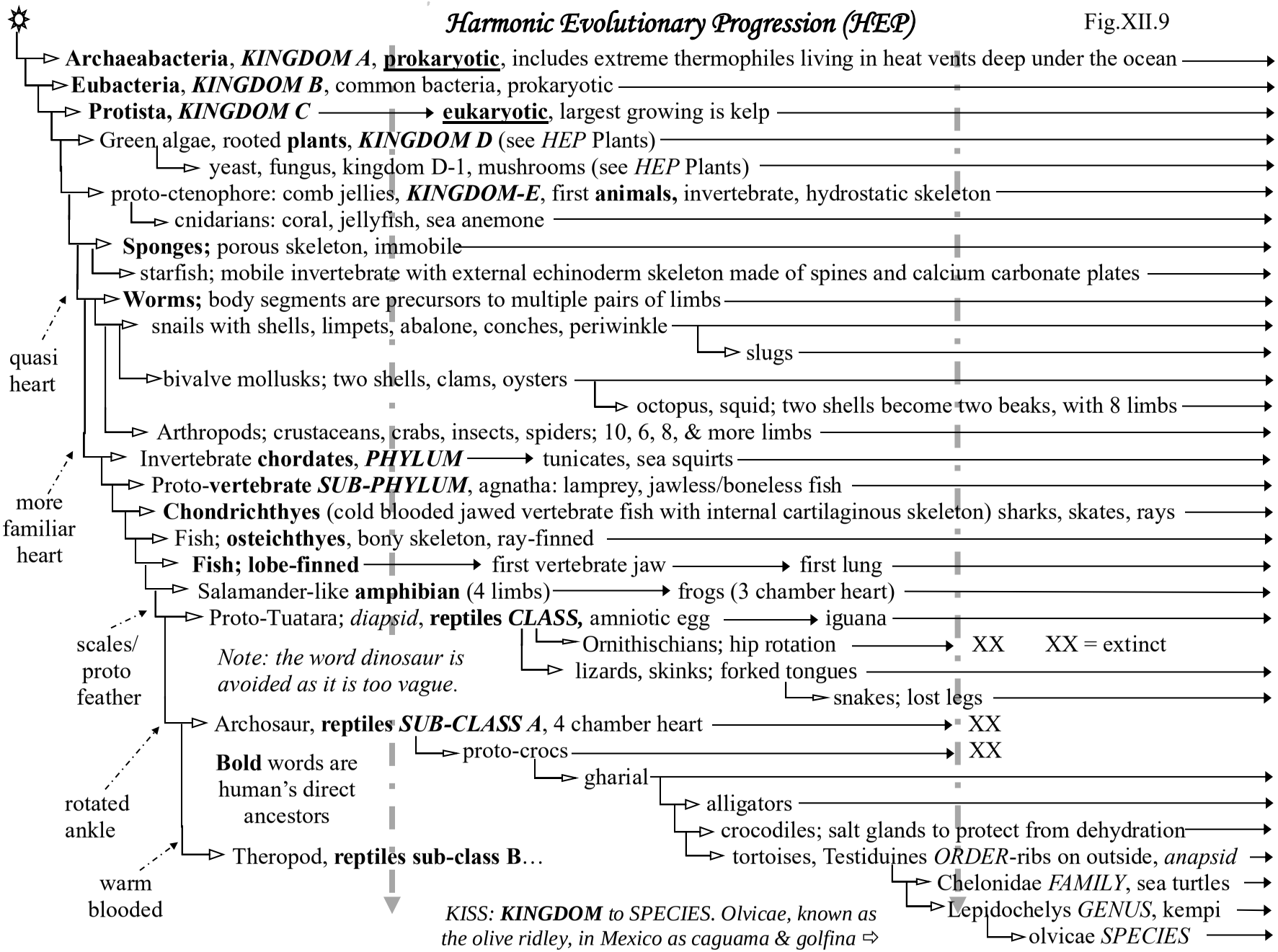


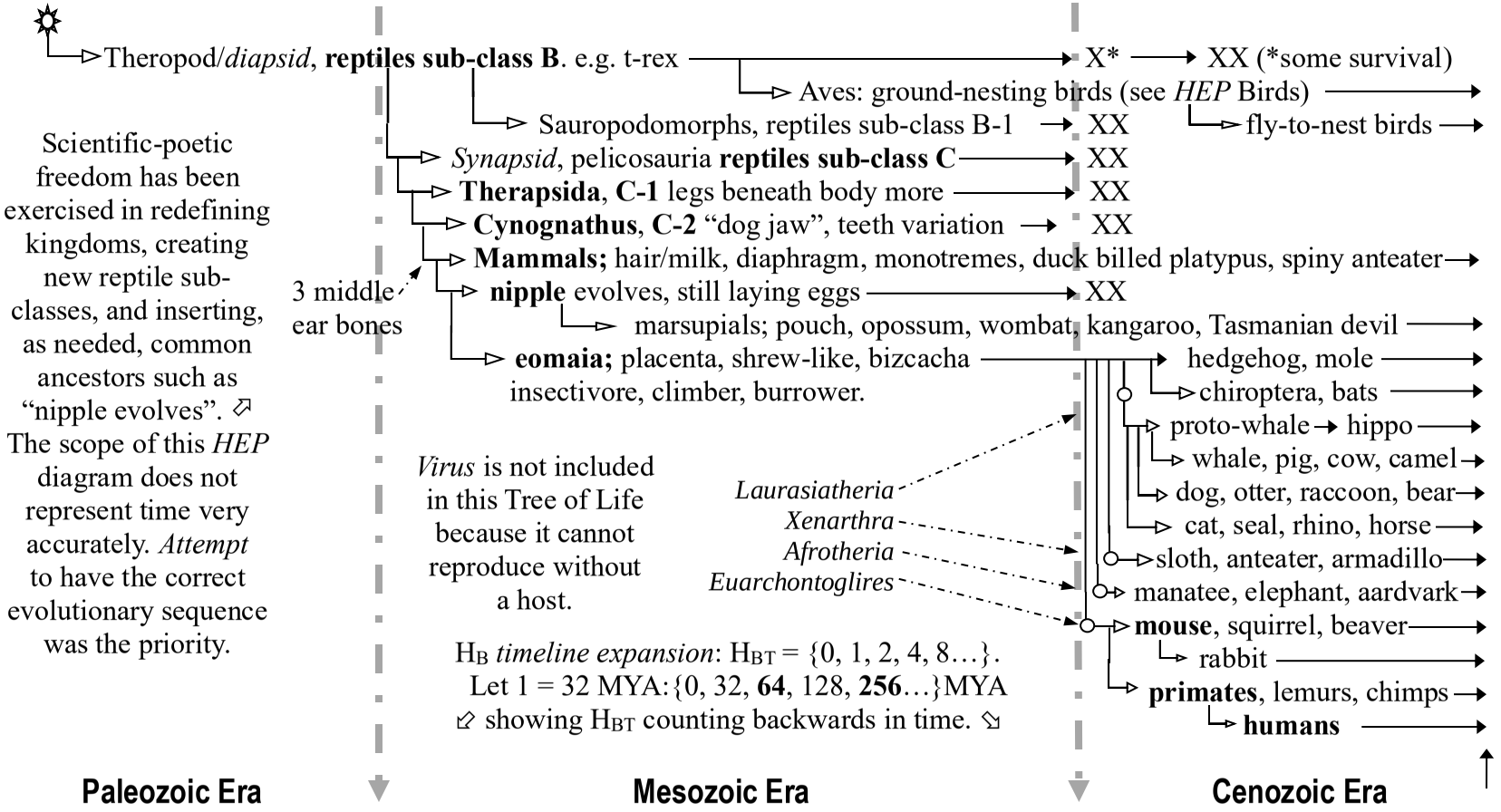
HUT presents *HEP* (Fig.XII.7), which will inevitably contain errors and imprecision. The binary aspect of evolution is proposed here as important to clarify confusion: delineating the ancestral lineage from a newly assimilated single, or grouped, mutation. *BID* is an acronym with an acronym within. BID is BEST IDEA, which is: *Binary Evolutionary System, Interdependent Earth Analysis*. It is just a chart with two axes. The vertical axis displays the evolutionary progression, and the horizontal axis holds the timeline.

Within the field created by the two axes, the tree of life is laid out as binary: either zero change {0} for a continuing ancestral line, or with one change {1} to show the desired scale of the mutation. At any intersection, the cumulation of many changes can be shown as one big change. Micro and/or macro magnifications allow researchers to study the desired scale of the mutations involved. As every generation accumulates mutations, showing too many of those destroys all appearance of a continuing ancestral lineage. But our biology science maintains the continuance of species regardless of the micro mutations. Example: ancient Greeks were considered basically the same as people today: homosapien. Showing fewer mutations allows us to view the entirety of the Tree of Life from evolution's first organism right up to present day.

"'These mutations from the past accumulate with every generation and exist in humans today', Wang said… Children's DNA from their parents contain roughly 25 to 75 new mutations…"
Indiana University, Jan 6, 2023

BID is just the HEP chart shown in Fig.XII.9, proposed as a synergistic international collaboration to create an ongoing tree of life chart with increasing or decreasing magnifications, creating one big $H_{BM} = \{0, 1\}$ binary system that the world agrees to fill in with the best explanations we can imagine and explain. With arising disagreements, a good computer program can assimilate both as two separate scenarios allowing observers to have better perspectives to plan their experiments and research goals. People could get together for BID parties, online and in person. As DNA, archeological, and other data are synthesized into BID, it could be an internationally coordinated growing evolutionary progression of consciousness.


Harmonic Evolutionary Progression (HEP)
Fig.XII.9
Archaeabacteria, KINGDOM A, prokaryotic, includes extreme thermophiles living in heat vents deep under the ocean
Eubacteria, KINGDOM B, common bacteria, prokaryotic
Protista, KINGDOM C
eukaryotic, largest growing is kelp
Green algae, rooted plants, KINGDOM D (see HEP Plants)
yeast, fungus, kingdom D-1, mushrooms (see HEP Plants)
proto-ctenophore: comb jellies, KINGDOM-E, first animals, invertebrate, hydrostatic skeleton
cnidarians: coral, jellyfish, sea anemone
Sponges; porous skeleton, immobile
starfish; mobile invertebrate with external echinoderm skeleton made of spines and calcium carbonate plates
Worms; body segments are precursors to multiple pairs of limbs
snails with shells, limpets, abalone, conches, periwinkle
slugs
quasi heart
bivalve mollusks; two shells, clams, oysters
octopus, squid; two shells become two beaks, with 8 limbs
Arthropods; crustaceans, crabs, insects, spiders; 10, 6, 8, & more limbs
Invertebrate chordates, PHYLUM
tunicates, sea squirts
Proto-vertebrate SUB-PHYLUM, agnatha: lamprey, jawless/boneless fish
more familiar heart
Chondrichthyes (cold blooded jawed vertebrate fish with internal cartilaginous skeleton) sharks, skates, rays
Fish; osteichthyes, bony skeleton, ray-finned
Fish; lobe-finned
first vertebrate jaw
first lung
Salamander-like amphibian (4 limbs)
frogs (3 chamber heart)
Proto-Tuatara; diapsid, reptiles CLASS, amniotic egg
iguana
scales/ proto feather
Ornithischians; hip rotation
XX
XX = extinct
Note: the word dinosaur is avoided as it is too vague.
lizards, skinks; forked tongues
snakes; lost legs
Archosaur, reptiles SUB-CLASS A, 4 chamber heart
XX
proto-crocs
XX
Bold words are human's direct ancestors
gharial
alligators
crocodiles; salt glands to protect from dehydration
rotated ankle
Theropod, reptiles sub-class B…
tortoises, Testiduines ORDER-ribs on outside, anapsid
Chelonidae FAMILY, sea turtles
warm blooded
Lepidochelys GENUS, kempi
olvicae SPECIES
KISS: KINGDOM to SPECIES. Olvicae, known as the olive ridley, in Mexico as caguama & golfina

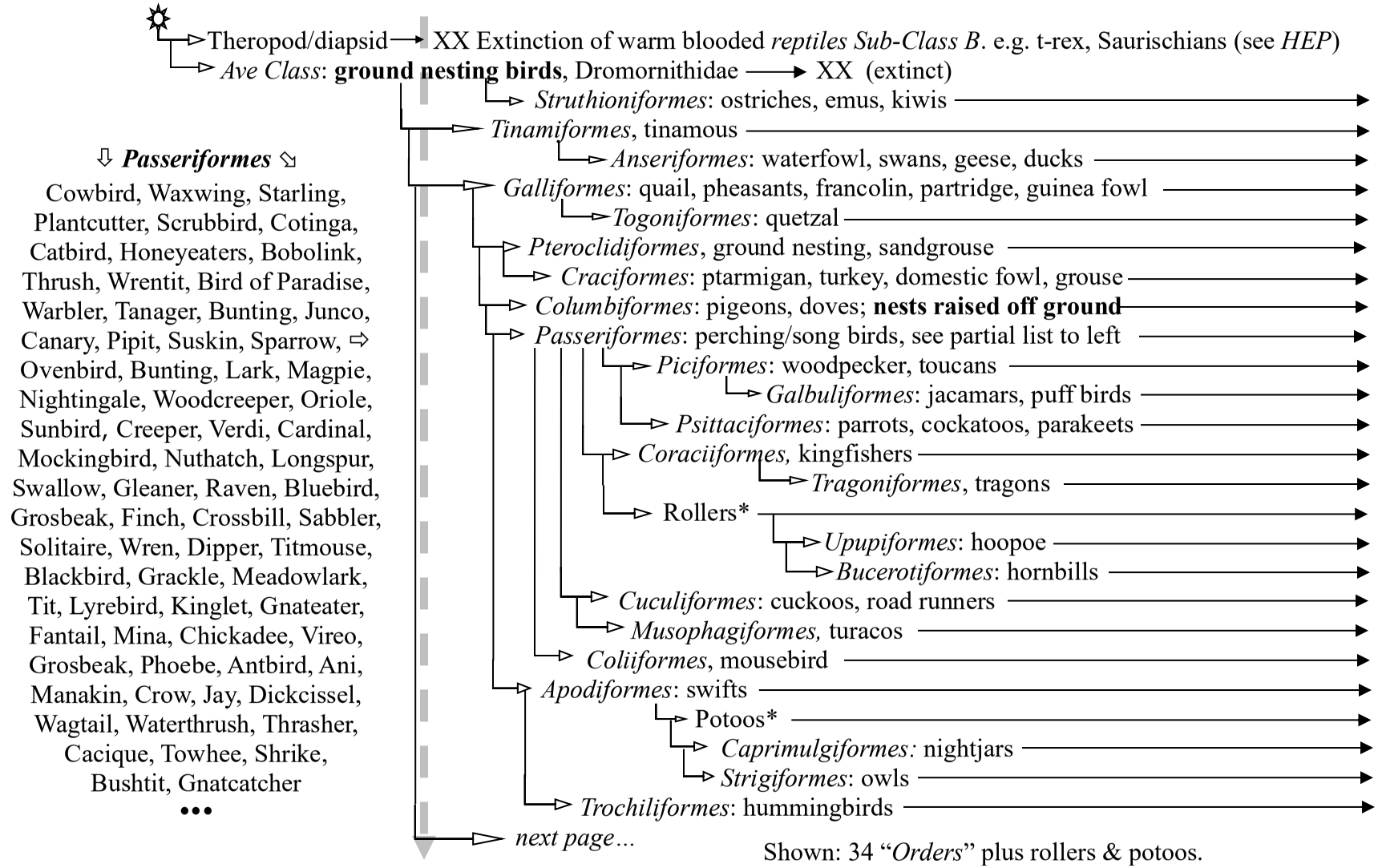


Diapsid: two holes on each side of the skull for jaw muscles; *synapsid*: one hole on each side; *anapsid*: no holes on either side.
Prokaryote: before the nut (cell without nucleus); *Eukaryote*: good nut (cell with nucleus)

HEP Talk: Binary Evolution

In the Harmonic Binary (H_B) Tree of Life, the number of changes *in any moment* is H_{BM} = {0, 1}. A straight horizontal line represents a *parent species* that remains *unchanged* {0} while an individual genetic *mutation* {1} branches off. All of the ⌙ right angled arrows represent a single, or series of, significant beneficial evolutionary mutations resulting in a new branch of life. Shown is an evolutionary mutation of one species at a time, though a new species may exhibit more than one characteristic change. After a new trait has evolved, descendant species may contain this trait, a vestigial, a modification, or another type of genetic memory.

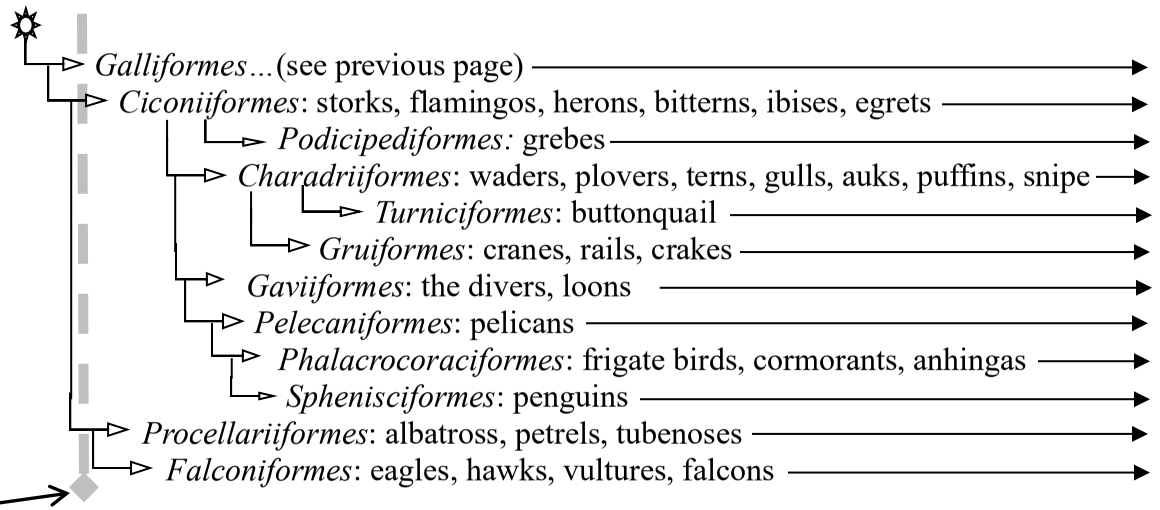
HEP BIRDS



Shown: 34 "*Orders*" plus rollers & potoos.

Cretaceous extinction: ~ 64 MYA Now:

Times shown are not precise.
This evolutionary progression sequence is but the author's guess, based on the conflicting information available. As the DNA reports come in, correcting any *HEP* errors is easy. Proper sequencing is the goal and the show will not be over until the fat DNA sings. Many birds, such as *Procellariiformes,* ⇨ are believed to have lived prior to the cretaceous extinction (???).



HEP Talk: Evolution Decreasing Entropy Locally

This *HEP* chart suggests evolution follows a natural harmonic progression. Universal time sequence of disordering is from low entropy, being high order, to high entropy, being low order. To create the increasing complexity of order in semi-isolated pockets, life reverses from this *average* universal increase of entropy: a worm, an octopus, a parrot, and a human have all survived and increased intelligence through time. Only by investing harmonic energy, imposing a sustaining single point tonal system, can the local increases in entropy be reversed to support life, exampled by a rabbit eating carrots, and skin using sunshine to make vitamin D. As a single evolving system, our biosphere and all life on Earth from the beginning to now is a single continuously living organism.

"…all the species of the same genus are the descendants of some one species…" *Origin of Species*, Charles Darwin

HEP Birds is an attempt to gain some control over just the **34 orders presented here**
(36 if we find correctness in *Rolleriformes** and *Potooiformes**) that include over 10,000 species of birds.

"…it seems to me, that species have been produced by ordinary generation: old forms having been supplanted by new and improved forms of life, the products of Variation and the Survival of the Fittest." *Origin of Species*, Charles Darwin

"When a group has wholly disappeared, it does not reappear; for the link of generation has been broken." *Ibid*

"If species had been independently created, no explanation would have been possible of this kind of classification, but it is explained through inheritance and the complex action of natural selection, entailing extinction and divergence of character…" *ibid*

HEP Magnifications

Errors are inevitable here.
The binary system is the proposal.

HEP Whales

- Eomaia, proto-placenta
- proto-whale, Pakicetis → hippopotamus
- *Cetaceans*, aka whales: proto-*Odontoceti*, first toothed whales (extinct?)
  - dolphins
    - porpoise
  - orca, aka killer whale "residents" that eat fish
    - orca, "transients" & "offshores" eating mammals/birds/fish
  - sperm whale (Moby Dick; with teeth)
  - *Mysticeti* (baleen, only vestigial teeth): grays, humpbacks, minkes

HEP Camels

- proto-whale, Pakicetis
- Camelidae, old world, evolved one hump, dromedary
- Camel, old world, two hump, bactrian
- Llama (Lama glama)
  - Guanaco (Lama guanicoe)
- Alpaca (Vicugna pacos)
  - Vicuna (Vicugna vicugna)

HEP Otters

- Canines
- Mustelids, weasels
  - minks, ferrets
  - martins
  - wolverines
- badgers
- river otter, drinks fresh water
- sea otter, assimilates water intake from salt water

HEP Talk: Evolving Systems

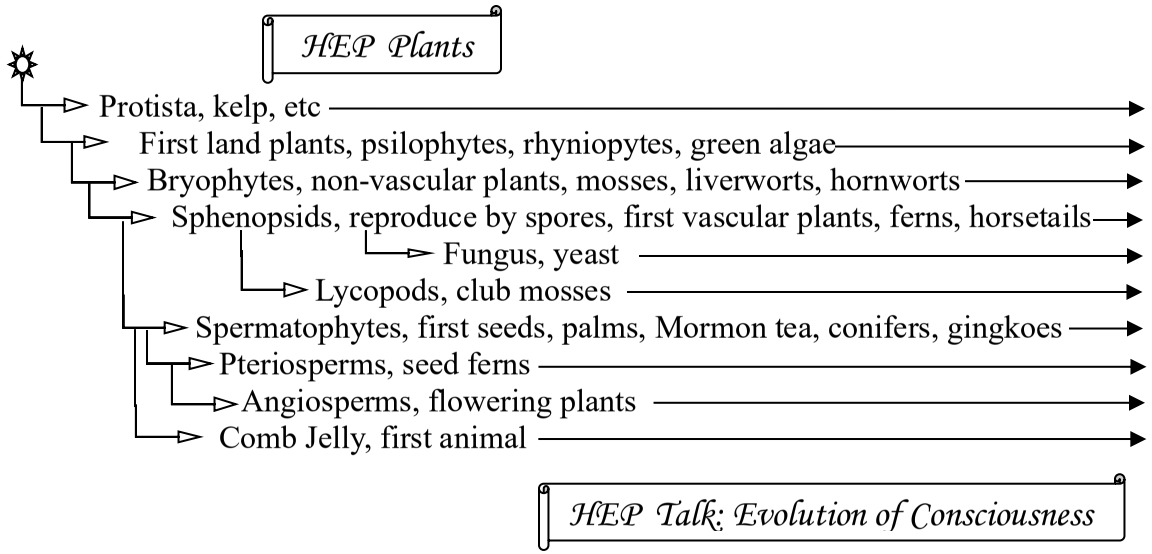
"…all the forms of life, ancient and recent, make together one grand system" Darwin, *Orig. of Spec.*

HEP Magnifications are meant to seed a beginning for other people to also magnify their chosen species, genus, and families. Evolution is the process of making mistakes, so start a *HEP* Mag with assumptions and write them down, right or wrong, as now there is something to research and edit. Start with an idea, like a seal evolving from a canine common ancestor which liked eating fish so much that… Check out the whiskers.

system, 8) the state or condition of harmonious, orderly interaction. *American Heritage Dictionary*

Darwin's "one grand system" must adhere to Brouwer's single point theorem, demonstrated in a tonal system, being harmonics, where the fundamental tone is the "single point" for the mutating frequencies and wavelengths to refer to throughout variation. Absence of a referential fixed point is enough to be considered not a *system* (chapter IX).

When organized on your computer, notice the way your folders line up from inside the first one. It's the same as the binary matrix of *HEP* and can be applied to other fields, such as rumor analysis: John told the secret to Mary. Mary told Betty then Jim. Betty called Jen and then Lucy. Lucy told Andy, who worked for the newspaper. Then everybody knew. *(Draw that!)*



Photosynthetic organisms remained in the ocean for 1 ½ billion years. Without a protective ozone layer, UV radiation on the land was lethal. When atmospheric oxygen levels rose, the ozone layer formed, and living things moved onto the land.

Magnification example:
↖ C*onifers* (cone bearing) include cedars, firs, hemlocks, junipers, yews, larches, pines, sequoias, and spruces. Then pines include cedars, et.al.

These quotes are from a book that should be read by anybody interested: *Your Inner Fish*, by Neil Shubin.

"At conception, we start as a single cell that contains all the DNA needed to build our body. The plan for the entire body unfolds via the instructions contained in this single microscopic cell. To go from the generalized egg cell to a complete human, with trillions of specialized cells organized in just the right way, whole batteries of genes need to be turned on and off at just the right stages of development. Like a concerto composed of individual notes played by many instruments, our bodies are a composition of individual genes turning on and off inside each cell during our development… The biological processes that make these different organs are versions of the same thing. When you see these deep similarities among different organs and bodies, you begin to recognize that the diverse inhabitants of our world are just variations on a theme… these off-on [binary] interactions underlie virtually all developmental processes."

"All animals are the same but different. Like a cake recipe passed down from generation to generation—with enhancements to the cake in each—the recipe that builds our bodies has been passed down, and modified, for eons. We may not look much like sea anemones and jellyfish, but the recipe that builds us is a more intricate version of the one that builds them."

"Recall that all our cells contain the same DNA; what differs is which bits of DNA are active. The genes involved in the sense of smell are present in all of our cells, although they are active only in the nasal area… The best analogy for smell comes from music: a chord. A chord is made up of several notes acting together as one. In the same way, an odor is the product of signals from lots of receptors keyed to different odor molecules. Our brain perceives these different impulses as one smell… The mammalian history of whales and dolphins is even written in the DNA of their odor perception apparatus… dolphins and whales no longer use their nasal passage to smell. What are these genes doing? The formal nasal passage has been modified into a blowhole… but humans do have a sense of smell, so why have so many of our odor genes been knocked out?... We humans are part of a lineage that has traded smell for sight."

XIII GEOSOLUNA CALENDAR PRECISION

1) If the words *month* and *moon* share the same root word, why does a Gregorian calendar's month not correlate with the Moon cycle? Are we ignoring our ignorance?
2) Why do we not choose to organize the calendar around the relative revolutionary and/or rotational cycles of the Earth *and* the Moon around the Sun?
3) Many cultures use two calendars: one is the *solar* oriented Gregorian calendar, which aligns the world socially, and one a *lunar* calendar to respect a second systemic reference. Without any clear and accurate historical unified *solar-lunar* calendar available, would society benefit by adopting a completely new calendar arrangement and adapting to it?

We can view the Earth, Sun, and Moon as particles with <u>position</u> *in* time and space. Alternatively, within our minds, then in mathematics and computers, we can view the three globes as waves with <u>momentum</u> *through* time and space, allowing us to have near-accurate predictions for future cycles, positions, and phases. To allow more ease in acknowledging tides and seasons here on Earth, a better calendar than we use today would harmonize the frequencies and wavelengths of revolutions and rotations of the Earth and Moon, with the Sun treated as stationary.

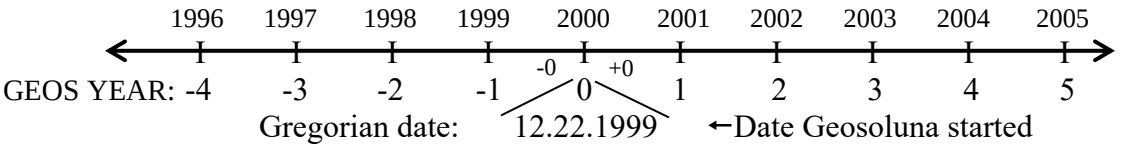
Presently, our Gregorian calendar uses the word *month* to refer to our time-period that averages about 30.44 days long. Month comes from the same root word as Moon. The Moon's average cycle is about 29.53 days long. And: $30.44 \neq 29.53$. The first day and the length of each Gregorian month, the length and placement of weeks, these have nothing to do with Earth, Sun, or Moon movements. We mostly remain ignorant of lunar phases with our Gregorian calendar. Humanity takes pride in being scientific, yet we lie about science and nature in our calendar, our music, and electron charges simply for the sake of the ignorance to which we are addicted.

HUT's new calendar, *Geosoluna*, aligns our time and space measurements of the Earth, Sun, and Moon in a way we currently neglect. Geosoluna's name is from *Geo* + *Sol* + *Luna*, translated as *Earth* + *Sun* + *Moon*. The Geosoluna solar New Year begins at winter solstice in the north hemisphere, being the summer solstice in the south, with each lunar month beginning on the new moon, and "geo" days starting at midnight. Geosoluna, for the family wall, with the calculations built in, would be printed off each year just like Gregorian calendars are now.

From our Earth perspective of the *cyclical phases* with the Moon and Sun, Geosoluna's *alignment* is what grants the scientific-poetic freedom to call it harmonic. With Geosoluna, during most years we can celebrate our birthday anniversary twice; solar and lunar birthdays are usually separate—well understood in India and China, but not in the USA or Mexico.

What is the Geosoluna Calendar?

<u>Fig.XIII.1 Geosoluna starting date</u>



The Gregorian and Geosoluna calendars have the arbitrarily chosen new-year days about ten days apart. The Gregorian calendar year's positive numbers date themselves back more than two millennium. Geosoluna's Year Zero begins from solstice December 22, 1999, also referred to as 2000 in Fig.XIII.1, and ends on solstice December 21, 2000 (2001 in the same figure). This

allows easy translation between Geosoluna and Gregorian calendars. From the starting date forward, to figure the Geosoluna year from a Gregorian year, simply remove the first two numerals (20) from 2000, 2005, or 2024 to find the Geosoluna years to be 00, 05, and 24.

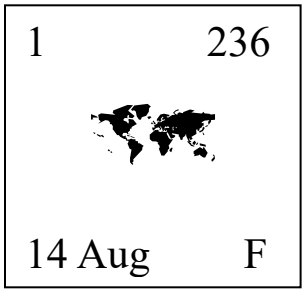
To figure the year translations for *BGZ* (*Before Geosoluna Zero*): subtract the queried year from 1999. E.g. 1999 – 1956 = 43 BGZ = Geos -43. Simpler in the mind: 2000 – 1956 = 44, then 44 – 1 = 43 BGZ. To figure Geosoluna from Gregorian B.C. (B*efore Christ*, also referred to as *Before Current Era*: B.C.E.), use for example 50 B.C.: -(1999 + 50) = Geos -2049 = 2049 BGZ. Simpler for the mind: from 50 B.C. subtract one (= 49) (because Geosoluna includes a year zero). Then add 2000 (2049), and change to negative (Geos -2049).

Geosoluna uses new names for days and months to avoid confusion. Month names are based on one harmonic octave of the color spectrum. The first day of the first month, Rainbow Way (RW,1), is the lunar New Year. RW always includes the solar New Year, being winter solstice N, summer solstice S. Then: Violet (VI,2), Way Blue (WB,3), Moon Blue (MB,4), Green Blue (GB,5), Way Green (WG, 6), Moon Green (MG,7), Yellow (YE,8), Orange (OR,9), Moon Red (MR,10), Way Red (WR,11), and Purple (PU,12). The occasional 13th month prior to RW is Rainbow Moon (RM,13).

The new day names are tones within one harmonic octave, the eight-tone chord in the wave set of {8, 9, 10, 11, 12, 13, 14, 15}: {Doe, Rae, Mee, Fu, So, Mu, Ah, Tee} (see chapter X). Relative to Gregorian days and months, nature wobbles more. Gregorian's only wobble is leap year day, February 29th, occurring approximately every four years, allowing 366 days rather than 365. The actual average number of Earth rotations per revolution of the sun is 365.242 days.

Data of lunar and solar phases, as from NASA, is required to set up Geosoluna. A single lunar cycle from new moon to new moon averages 29.53 days. Geosoluna is made up of four weeks of seven days each, totaling 28 days, being 1.5 days short of 29.5. Thus each two months needs to add three extra days [2 x 29.5 = (2 x 28) + 3], forcing some months to have one eight-day week with the three seven-day weeks. Other months have two eight-day weeks. This makes it so that roughly five out of eight possible Tee days do not exist. Occasionally one month needs an extra eight-day week—*dictated by lunar phase data*.

Fig.XIII.2 One Geosoluna day



Geosoluna days (Fig.XIII.2) account for relative positions and momentums of the Earth and Moon around the Sun (Fig.XIII.3). Geosoluna also shows Gregorian references, on the bottom: Friday August 14, 2015 (year noted on Fig.XIII.4's top right). This is familiar in the United States as 08.14.2015; in Mexico as 14.08.2015.

Four numbers are needed to reckon each Geosoluna date: lunar month, lunar day, solar day, solar year. The box's top two Geosoluna numbers are displayed after the Geos month number, and before the Geos year number (found on top of each month's page): 10.01.236.15. Decoded: 10th lunar month, Moon Red, then the 1st Doe Day of the new moon; and the 236th day since the December solstice (solar New Year, and first day of winter in the north hemisphere; first day of summer in the south). Then 15 refers to fifteen *completed* years since Geosoluna began.

The most natural division of a lunar month has four non-equal weeks, each beginning with a moon phase. Geosoluna's goal is that each of the four lunar phases occurs on a Doe Day. The exception occurs when adjusting a week to save the seventh day, resulting in a Lavender Week (lunar phase starts and ends the 7-day week) or a White Week (no lunar phase at all in that

week). When saving a week's seventh day, one lunar phase slips off the preferred Doe Day position. Which Doe Day lunar phase to sacrifice follows this sequence of priorities: the dark new moon should always be on Doe Day. Full moon gets second priority to not be changed, though this is sometimes required. The first quarter moon (we see it as a half of a circle), and the third quarter moon (also seen as half-circle) are both third priority—thus are the preferred phases to move away from Doe Day to save a seven-day week.

How to use Geosoluna: the dance of the orbs

Geosoluna calendar is an alternative to currently accepted methods that mark the passing of time. In Fig.XIII.3, Geosoluna orbs show motion relationships between Earth, Sun, and Moon. The dance of the orbs from the Earth perspective manifests as the Geosoluna calendar.

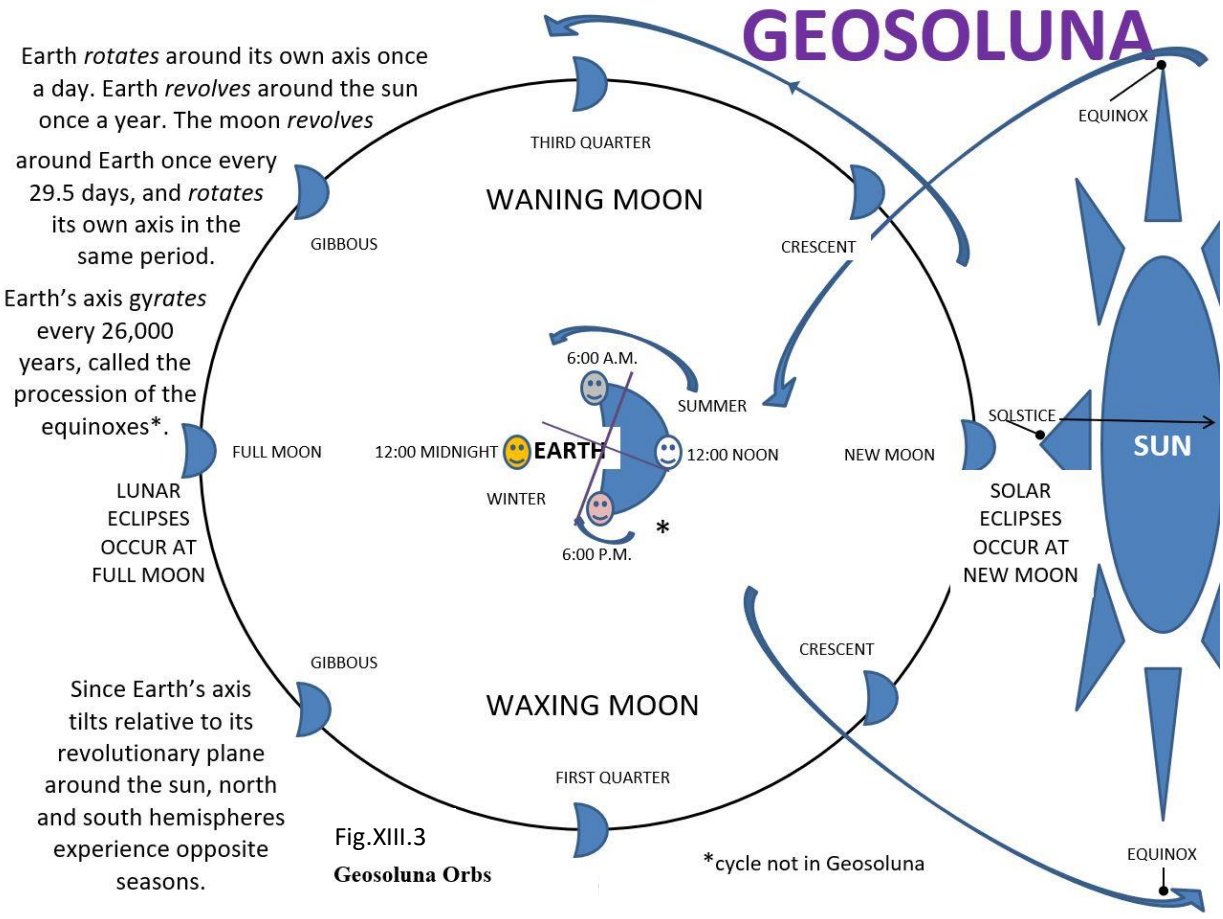


Fig.XIII.3
Geosoluna Orbs

Fig.XIII.4 shows one Geosoluna month. The solar year, beginning on the solstice, is still counted sequentially with 365 or 366 days, independent from each lunar month that begins on the new moon. If Geosoluna is accepted, adopted, and produced without reference to Gregorian and February 29th, Geosoluna's sequencing will automatically add the appropriate leap year day as the 366th day of the solar year. Note: Lunar Day One begins at the exact new moon moment. The pre-new-moon partial day is considered the lunar day zero.

10: Moon Red Geosoluna 15 …Aug & Sept 2015 Gregorian

Top left number is the lunar date. Top right is solar date counting from New Year's Day solstice. Bottom left and right are the Gregorian date and day. At least every three years has an extra month. Some weeks have the extra day, wobbling with the tides.

	DOE	RAE	MEE	FU	SOL	MU	AH	TEE
Geos:	1 236 New Moon 14:54 ○ UTC	2 237	3 238	4 239	5 240	6 241	7 242	8 243
Greg:	14 Aug F	15 Sa	16 Su	17 M	18 Tu	19 W	20 Th	21 F
	9 244 First Quarter 19:31 ◗	10 245	11 246	12 247	13 248	14 249	15 250	
	22 Sa	23 Su	24 M	25 Tu	26 W	27 Th	28 F	
	16 251 Full Moon 18:35 ●	17 252	18 253	19 254	20 255	21 256	22 257	
	29 Sa	30 Su	31 M	1 Sept Tu	2 W	3 Th	4 F	
	23 258 Third Quarter 09:54 ◖	24 259	25 260	26 261	27 262	28 263	29 264	30 265
	5 Sa	6 Su	7 M	8 Tu	9 W	10 Th	11 F	12 Sa

Fig.XIII.4 Moon Red 2015 Full moon, UTC Geosoluna notation: 10.16.251.15 (Lunar month, lunar day, solar day, solar year)

Geosoluna follows five rules, resulting in: 13th month at least every third year, as well as one or two weeks each month having an eighth day. Rules 1-4 are unbreakable, #5 is adaptable:

1) The solar New Year begins at the exact time of day of Gregorian's December Solstice.
2) Every year, the RW month always includes northern hemisphere's winter solstice.
3) Each month begins on a new moon. Lunar New Year is the 1st day of the 1st month (RW).
4) When solstice comes late in the year's first month, this forces adding the 13th RM month.
5) Each lunar phase occurs on first day of each week except when saving the week's 7th day.
Moon Day compliance priority order: 1) New Moon, 2) Full Moon, 3) 1st or 3rd quarter.

One Geosoluna project will be to design a computer program adapting the five fundamental rules, to be able to examine Geosoluna into the future and back into history.

Geosoluna perspectives

In Figs.XIII.5 &.6 & .7 are the theoretical calendar sliders *fixed on averaged numbers* (ignore if you wish). The Fig.VIII.5 lunar slider, new moon on the left, is set to the time that the new moon occurs before midnight. That new moon is Geosoluna's first day of every month. Setting the left side of the first lunar slider places its right end at a specific time on a specific date. This right end's time and date is transferred to the left end of the second week's slider, marked 7 or 7A. The right end of this second week's slider is the full moon and transfers to the left end of the third week's slider. The right end of the third week's slider transfers to start the fourth week. The end of the fourth week, the new moon, will transfer its time and date to begin

the next month. For one or two weeks per month, the positioning of the lunar slider's left end forces the right end to cross over the midnight line into the week's 8th day {7A, 14A, 21A, 28A}.

Even though astronomical data guides the actual Geosoluna, not averages, the solstice slider, Fig.XIII.6, using Gregorian references, aligns *averaged* lunar phases with the annual seasons, marked out with solstices and equinoxes. Set the solar slider's left end, the winter solstice in the northern hemisphere, to the lunar phase at its moment of occurrence. Assigning a year to be 12.3683 lunar cycles, the slider accumulates a thirteenth month every third year (3 x .333), except in some years when the extra month occurs the second year because .3333 ≠.3683.

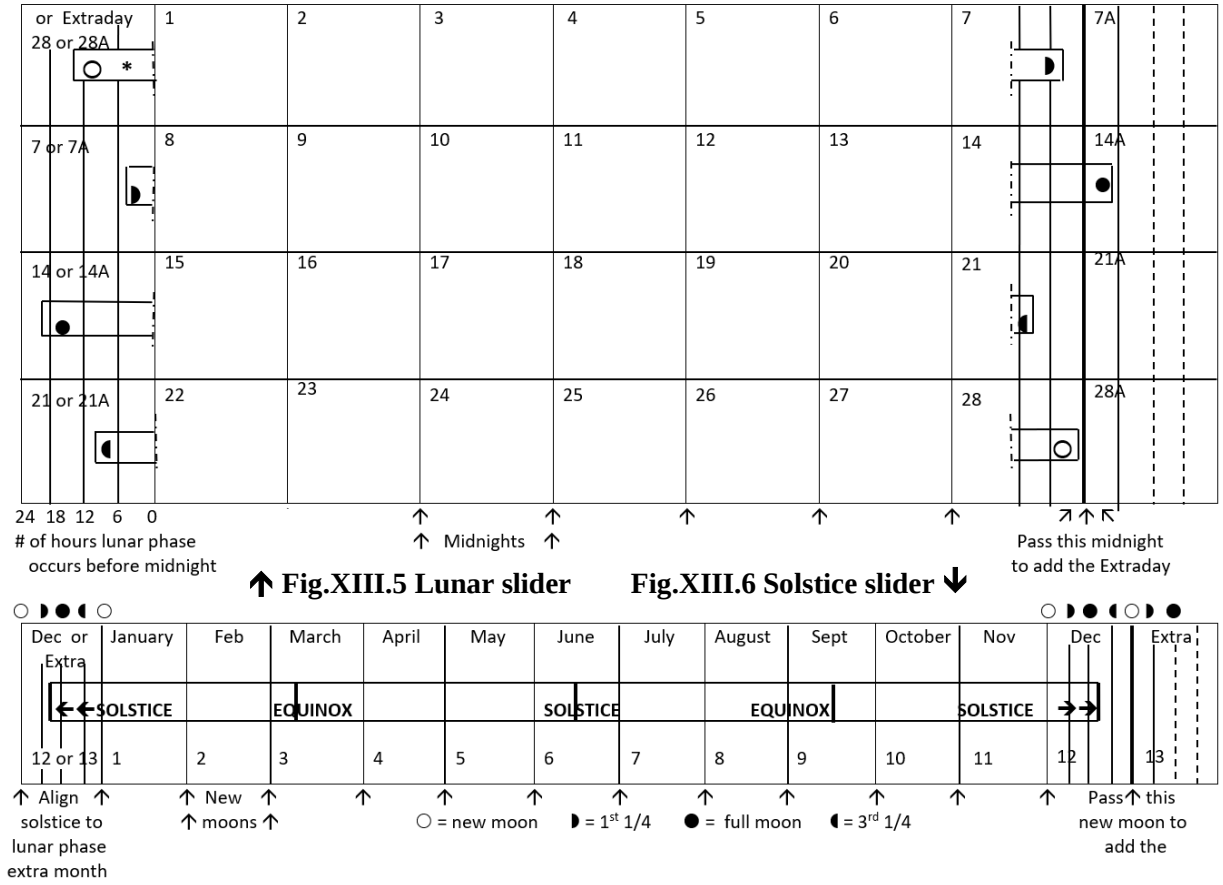
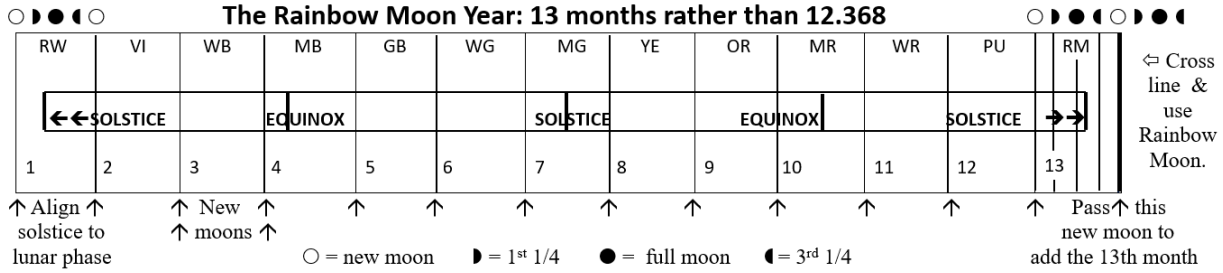


Fig.XIII.5 Lunar slider **Fig.XIII.6 Solstice slider**

Fig.XIII.7 Rainbow Moon slider (ignoring Gregorian references)



Gregorian calendar's only wobble is the added leap year (366th) day. The Geosoluna calendar, adapting more precisely to nature, has three types of wobbles: the occasional 366th day, one or two 8 day weeks per month, and some years require adding the 13th month.

If and when Geosoluna replaces the Gregorian calendar's predominance, NASA and others calculating the solar solstices and equinoxes would need to first make a 365 or 366 solar-day templet for each solar year to place the solstice temporal positions. Then upon that solar matrix, the lunar phases would be placed, removing the necessity of any Gregorian correlations.

Chapter XVI includes more information about Geosoluna and calendars through history.

Judging this proposal

Geosoluna accurately yokes Earth and Moon cycles around the Sun. To change to this accounting of nature would be a radical worldwide paradigm shift. Currently, daylight savings time adaptations show humanity cares not to be in rhythm with nature. With use, Geosoluna would show the accuracy, efficiency, adaptability, and benefits of being more in-phase with nature. The proof is in Geosoluna's four-numbered date.

"The Sun Stone, the famous Aztec calendar, is unquestionably a perfect summary of science, philosophy, art and religion." Samael Aun Weor

"Of course a new calendar would also mean a new society and a new way of doing things. For precisely that reason, the world has not gotten a new calendar—despite the appeals of common sense and many noble efforts over the past century and a half." Dr. José Argüelles

XIV PRIME NUMBERS EQUATION & MORE

1) Is there a way, a simple pattern, revealing all non-prime numbers towards infinity?
2) If we know all non-prime numbers, does that help us know all prime numbers?
3) If we know all prime numbers, would that help us know all twin prime numbers?
4) Is there an easier way to factor any number down to its prime number ingredients?
5) To locate non-primes, Eratosthenes sieve requires using primes. Is there a better way?

Interest in prime numbers goes back to before 300 BCE when Euclid in Greece proved them infinite. In 1859, attempting to uncover patterns among prime numbers, Bernhard Riemann formed his famous hypothesis using $\sqrt{-1}$. Prior to Riemann, analytic number theory became enriched with Leonhard Euler's infinite product formula. Seeking prime numbers, Euler restricted his one-dimensional zeta function to avoid the problems of the infinite, especially the harmonic vibrations. Riemann followed Euler's logic

HUT does not follow Euler's and Riemann's choices of *avoiding* harmonics to solve for infinite prime numbers. Also, *HUT* avoids using $\sqrt{-1}$ due to a lack of necessity (chapter VI).

***Harmony defines the margin between finite and infinite*, producing life when limited creatively** (Fig.I.3). Harmonics also reveals the pattern for infinite prime numbers.

Primes Uncovered Naturally

A prime number is any positive natural whole number except 1 that is evenly divisible by only 1 and itself. Non-prime numbers are composites: all natural numbers with more whole number factors than just 1 and themselves. All prime numbers plus all non-primes equals all natural numbers in the number line, except 1: $H_O = \{2,3,4,5,6\ldots\}$ (Fig.XIV.3).

Prime numbers can be expressed within two equations of *set arithmetic*:

$X = Y + Z$ $\quad\quad$ $\{\ \} = Y \cap Z$

where: $X = \{\text{all natural numbers except 1}\} = \{2,3,4,5\ldots\} = \text{number line} = H_O$.

$Y = \{\text{multiplication table's inner field integers }\} = \text{all non-primes} = H_O \times H_O$.

$Z = X - Y = \{\text{all prime numbers}\} = H_O - \{H_O \times H_O\}$

$\{\ \}$ = an empty set

$\cap$ signifies the intersection between the two sets; common members.

This is a simple way: Infinite primes are found in a number line by removing all the numbers that are found inside the field of a multiplication table. Children can do this.

Fig.XIV.1: Multiplication table

1	2	3	4	5	6	7	8…
2	4	6	8	10	12	14	16…
3	6	9	12	15	18	21	24…
4	8	12	16	20	24	28	32…
5	10	15	20	25	30	35	40…
6	12	18	24	30	36	42	48…
7	14	21	28	35	42	49	56…
8	16	24	32	40	48	56	64…
9	18	27	36	45	54	63	72…

Fig.XIV.2: Modified multiplication table

1	2	3	4	5	6	7	8	9…	$\{H_O\}^2$
2	4	6	8	10	12	14	16…		← = B
3	6	9	12	15	18	21	24	27…	
4	8	12	16	20	24	28	32…		↖ = F…
5	10	15	20	25	30	35	40	45…	
6	12	18	24	30	36	42	48…		↖ = E
7	14	21	28	35	42	49	56	63…	
8	16	24…							↖ = D
9	…							81…	
									↖ = C

Fig.XIV.3: Canceling non-primes from a number line

2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31…

The infinite set of prime numbers equals all natural numbers, except 1, minus all non-primes. The field within a multiplication table (Fig.XIV.1 & .2) defines the set of *all non-primes*. All primes are found by removing all the non-primes from the number line in Fig.XIV.3.

In Fig.XIV.2, below the squared integers along the center diagonal, lighter numbers repeat the numbers from above the diagonal and can be ignored to shortcut computation time. The rows and columns containing even numbers are already represented in the first row and thus can also be ignored, keeping just the first row. To locate all prime numbers from the line of all natural numbers except 1, Fig.XIV.3, remove all the darkened numbers found within the field of Fig.XIV.2. An equation expresses this regular order of primes.

The prime number set equals the natural number set, except 1, minus the product of each and every natural number, except 1, times each and every natural number, except 1. This defines the complete set of primes in the following equation (see H factors in Fig.I.3):

$p = \{n + 1\} - \{(n + 1) \times (n + 1)\}$ where:

p = all prime numbers = $\{2, 3, 5, 7, 11\ldots\infty\} = H_P$

n = all natural numbers = $\{1, 2, 3, 4\ldots\infty\} = H_S = H_I + 1 = H_O - 1$

n + 1 = every member of the set $\{2, 3, 4, 5\ldots\infty\} = H_O = H_S + 1 = H_I + 2$

$\{(n + 1) \times (n + 1)\}$ = {field set from Fig.XIV.2} = {every (n + 1) x every (n + 1)} = $\{H_O\}^2 = H_U$

This {field set from Fig.XIV.2} of all non-primes can be defined as: $\{H_O \times H_O\} = \{(n + 1) \times (n + 1)\} = n^2 + 2n + 1 = \{B, C, D, E, F\ldots\infty\}$. {B} represents the top horizontal in the field of Fig.XIV.2, while {C, D, E…} are diagonal lines (also see: Fig.XIV.4). Where:

A = 2n + 1 = (*not represented in Fig.XIV.2*) {set of all odd numbers except 1} = {3, 5, 7…}

B = 2n + 2 = {set of all even numbers except 2} = {4, 6, 8…} (*top horizontal within Fig.XIV.2*)

Note: {C,D,E…∞} are diagonals in Fig.XIV.2

$C = (2n + 1)^2$ = {set of each set A member squared} = $A^2 = \{9, 25, 49\ldots\} = 4n^2 + 4n + 1$

$D = C + 2A = A^2 + 2A = \{3^2 + 2(3), 5^2 + 2(5), 7^2 + 2(7)\ldots\} = \{15, 35, 63\ldots\} = 4n^2 + 8n + 3$

$E = D + 2A = \{21, 45, 77\ldots\} = \{[15 + 2(3)], [35 + 2(5)], [63 + 2(7)]\ldots\} = 4n^2 + 12n + 5$

$F = E + 2A = \{27, 55, 91\ldots\} = 4n^2 + 16n + 7$

G = $F + 2A = 4n^2 + 20n + 9$; **H** = $4n^2 + 24n + 11$; **I** = $4n^2 + 28n + 13\ldots$ **∞**

Summary: All primes = (n + 1) - {B, C, D...}

Non-primes = {B, C, D...}: B = 2n + 2; $C = 4n^2 + 4n + 1$; {D, E, F...} = {C, D, E...} + (4n + 2)

To chase prime numbers with interconnected computers, each letter of $\{H_O\}^2$ = {B, C, D, E…∞} (Figs.XIV.2 & .4) can be calculated on a separate computer, each feeding into a collating computer that is collecting all the newly discovered prime numbers as data to be accessed.

Primes in Excel

I presented to Marc Islam, an ex-Microsoft employee, my desire to program the prime number solution. He said we could begin with Microsoft Excel to process the data. Explaining the equations I'd developed, after the third meeting with Marc, April 16, 2010, I printed out and modified the following spread sheet (Fig.XIV.4) unfolding prime numbers.

C*olumn I* refers to how many times the number in *column II* appears among the non-prime numbers of *columns IV, V, VI*… Any zero in *column I* refers to a prime number, from Marc's "array formula" **{=sum(if(n=nonprime,1,0))}**, which calculates "ranges". The search

would be quicker if a program only searched the non-primes with the same number of digits as the **n** sought in column II. Once the primary program is locating primes, a secondary program multiplies them by integers, rapidly removing in advance many non-primes from column II.

Fig.XIV.4: Primes in Excel

I ⟺	II	III	IV	V	VI	VII	VIII	IX	X	XI →
0 = primes	number line	A=2n+1	B= A + 1	C = A^2	D=C+2A	E=D+2A	F=E+2A	G=F+2A	H=G+2A	I=H+2A
#=non-primes	n	A	B	C	D	E	F	G	H	I
--	1	3	4	9	15	21	27	33	39	45
0 ⟷	**2**	5	6	25	35	45	55	65	75	85
0 ⟷	**3**	7	8	49	63	77	91	105	119	133
1	4	9	10	81	99	117	135	153	171	189
0 ⟷	**5**	11	12	121	143	165	187	209	231	253
1	6	13	14	169	195	221	247	273	299	325
0 ⟷	**7**	15	16	225	255	285	315	345	375	405
1	8	17	18	289	323	357	391	425	459	493
1	9	19	20	361	399	437	475	513	551	589
1	10	21	22	441	483	525	567	609	651	693
0 ⟷	**11**	23	24	529	575	621	667	713	759	805
1	12	25	26	625	675	725	775	825	875	925
0 ⟷	**13**	27	28	729	783	837	891	945	999	1053
1	14	29	30	841	899	957	1015	1073	1131	1189
1	15	31	32	961	1023	1085	1147	1209	1271	1333
1	16	33	34	1089	1155	1221	1287	1353	1419	1485
0 ⟷	**17**	35	36	1225	1295	1365	1435	1505	1575	1645
1	18	37	38	1369	1443	1517	1591	1665	1739	1813
0 ⟷	**19**	39	40	1521	1599	1677	1755	1833	1911	1989
1	20	41	42	1681	1763	1845	1927	2009	2091	2173
1	21	43	44	1849	1935	2021	2107	2193	2279	2365
1	22	45	46	2025	2115	2205	2295	2385	2475	2565
0 ⟷	**23**	47	48	2209	2303	2397	2491	2585	2679	2773
1	24	49	50	2401	2499	2597	2695	2793	2891	2989
1	25	51	52	2601	2703	2805	2907	3009	3111	3213
1	26	53	54	2809	2915	3021	3127	3233	3339	3445
1	27	55	56	3025	3135	3245	3355	3465	3575	3685
1	28	57	58	3249	3363	3477	3591	3705	3819	3933
0 ⟷	**29**	59	60	3481	3599	3717	3835	3953	4071	4189
↓	↓		⇕	⇕	⇕	All non-prime numbers	⇕	⇕	⇕	↘ ∞

Infinite Factoring

"The problem of distinguishing prime numbers from composite numbers and of resolving the latter into their prime factors is known to be one of the most important and useful in arithmetic."
Carl Friedrich Gauss

Determining whether a number is prime has historically been a time-consuming process of trial and error. Whether or not a number is prime or non-prime can be determined by searching for it in the multiplication table's field. If not there, that number is prime.

Factoring of non-prime integers can be done with a multiplication table. Program a computer to analyze and store a finite portion of an infinite multiplication table (Fig.XIV.2). Enter the number that needs to be factored. The program must search the multiplication table's field for that number, which when found, identifies its two factors. Repeat the factoring sequence on those two factors. When the program no longer locates the multipliers within the field, those reduced multipliers are the sought-for prime numbers. Any 2-digit number is factored in the same way as a many-digit number. For example, factoring 72 leads to 8 x 9, which will lead to the exponents of the essential primes: 2 x 2 x 2 x 3 x 3 = 2^3 x 3^2 = 72.

Fig.XIV.5 shows a multiplication table using only prime numbers for axis multipliers. The numbers below the field's diagonal squares are redundant to numbers above the diagonal and can be ignored. The resulting triad-sets of the field's dark numbers, each with their primary multipliers, are all the possible number triads: {product, $prime_x$, $prime_y$}, e.g. {35, 7, 5}.

Fig.XIV.5: Prime number multiplication {H_P x H_P}

X	2	3	5	7	11	13…
2	4	6	10	14	22	26…
3	6	9	15	21	33	39…
5	10	15	25	35	55	65…
7	14	21	35	49	77	91…
11	22	33	55	77	121	143…
13	26	39	65	91	143	169…
17	…					

Difficulty factoring two large unknown prime numbers from their product has allowed these number triads to be used for encryption in computer programs for on-line credit card purchases. If it is this easy to crack that credit card code with a single data bank, the encryption should be changed.

Twins are Prime

"It would seem, however, that the density of prime twins never falls to zero and the number of prime twins is infinite. That, however, has *never been proved*." Isaac Asimov

Twin primes are all pairs of prime numbers that are separated by just one even number. Examples are: 5 & 7; 11 & 13; 17 & 19; etc. The accepted Eratosthenes sieve will be used to help show the pattern of twin primes.

Fig.XIV.6: Eratosthenes sieve multiplication {H_P x H_O}

X	2	3	5	7	11	13…
2	4	6	10	14	22	26…
3	6	9	15	21	33	39…
4	8	12	20	28	44	52…
5	10	15	25	35	55	65…
6	12	18	30	42	66	78…
7	14	21	35	49	77	91…
8	…					

This sieve is applied to a number line, H_O, by removing all whole number multiples of each prime number: $H_O - \{H_P \times H_O\}$. A special multiplication table, Fig.XIV.6, demonstrates {H_P x H_O} with the horizontal axis being prime numbers, H_P, and the vertical being H_O. The numbers in the field of this table are then removed from an H_O number line, satisfying the hunt for primes.

In Fig.XIV.4, the pattern of twin primes is visible with the arrows between columns I & II; the arrows pointing at column I's zeros. Starting at column II's #5: column I's sequence of zeros and ones repeat in order of: {0,1,0,1,1,1…}. Putting this pattern in equation form: using the column II number line, take all even whole numbers, $2H_S = \{2,4,6,8\ldots\}$, and multiply each by three: $3 \times (2H_S)$. This equation, plus or minus one, $3 \times (2\ H_S) \pm 1 = 6H_S \pm 1$, unless interfered with by Eratosthenes sieve, {H_P x H_O}, locates all pairs of prime numbers that are separated by a single even number—into infinity. The first example of Eratosthenes sieve interfering is the one (1) in column I of Fig.XIV.4, relating to column II's non-prime #25, being 5 x 5.

This twin primes equation is: ***Twin primes = {6H_S ± 1} - {H_P x H_O}.***

Fig.XIV.7 modifies Fig.XIV.6's {H_P x H_O}, removing repeats.

Fig.XIV.7: Eratosthenes sieve modified

	i	ii	iii	iv	v	vi…
X	2	3	5	7	11	13…
2	4	6	10	14	22	26…
3	6	9	15	21	33	39…
4	8	12	20	28	44	52…
5	10	15	25	35	55	65…
6	12	18	30	42	66	78…
7	14	21	35	49	77	91…
8	…					

Let $n = H_S = \{1,2,3,4\ldots\}$.

↔ In Fig.XIV.7, {i, ii, iii, iv, v…} are column titles.

Column i fills in with even #s, starting with 4: {2n + 2}.

Columns {ii, iii, iv…∞} use the prime number P designated to each column, to find results: $\{P^2, P^2 + 2P, P^2 + 4P, P^2 + 6P\ldots]\}$. Examples: ii = {9, 15, 21, 27…} iii = {25, 35, 45…}.

Columns {i, ii, iii, iv, v…} are all the same non-primes found in Fig.XIV.2, making the simplest expression for the pattern of twin primes: 6n ± 1, unless interfered by *non-primes*.

Fig.XIV.7 shows the same pattern, though reoriented, as Fig.XIV.2. This proves

Eratosthenes sieve uncovers all non-prime numbers: $\{n + 1\}^2$. Since Eratosthenes sieve is dependent on primes and redundant to non-primes, it will rarely need to be calculated any more.

The pattern of twin primes is: $\mathbf{(6n \pm 1) - \{(n + 1) \times (n + 1)\} = (6n \pm 1) - (n + 1)^2 = (6n \pm 1) – (n^2 + 2n + 1)}$. This shows all possible twin primes, $(6n \pm 1)$, excluding pairs interrupted by $\{n + 1\}^2$, being non-primes. Though a drawn-out proof may be requested by certain mathematicians, this equation simply defines the pattern of all twin prime numbers into infinity.

Prime Formula

HUT proposes that the twin prime equation $\mathbf{(6n \pm 1) - (n + 1)^2 = (6n \pm 1) – (n^2 + 2n + 1)}$ locates all prime numbers. Condensing this, *HUT* proposes that all prime numbers are found within the possible twin primes defined by $\mathbf{(6n \pm 1)}$. But not all possible twin primes are actual twin primes because the non-primes of $\mathbf{\{(n + 1) \times (n + 1)\}}$ interrupt.

> "A 'prime formula' will enable you to crank in 287,444,409,787 directly and tell you whether it is prime or not. Alas, there is no such formula, and it is not likely that any can ever be found (although I am not sure that it has been proven that none can be found). The order of primes along the list of numbers is utterly irregular and no mathematician has ever been able to work out any order, however complicated, which would make a 'prime formula,' however complicated, possible… No matter how we try to find a useful system that will yield primes only, non-primes will always sneak in… Is there any system that will allow us to crank out only non-primes?" Isaac Asimov, *The Left Hand of the Electron*

Regarding the "order of primes" that Asimov refers to, I am the "no mathematician". However, I still do not know how to plug any number X into a fixed formula except by building a large non-prime data base first. The method to identify all primes: first identify *all* non-primes. With $\mathbf{(6n \pm 1)}$ any number can be determined if it is a possible twin-prime, but to know if that specific twin prime possibility is ever interrupted by non-primes requires an infinite non-primes data base which can never be achieved because of the definition of infinite. Neither can a data bank of all infinite primes be achieved. Impossible.

HUT proposes that all prime numbers, ignoring two and three, are possible twin primes. These $\mathbf{(6n \pm 1)}$ prime candidates are only "possible" because a non-prime may cancel them out. To prove this proposal wrong, only one prime number that is not a twin prime number candidate needs to be found.

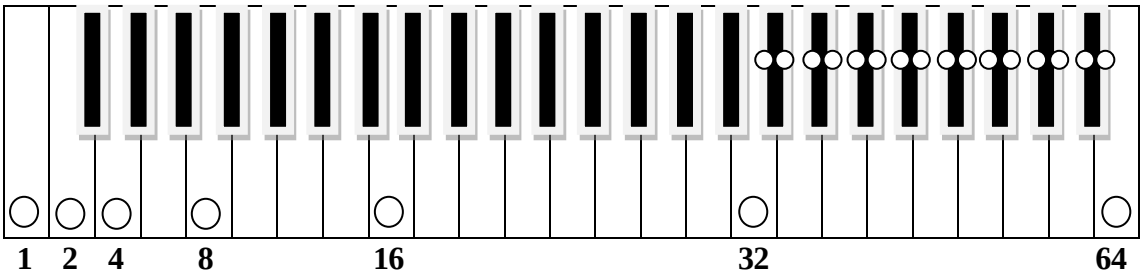
Primes Align Non-Reducible Differential Attributes

HUT's prime solution originated when I noticed that primary harmonics as an infinite subset of harmonics is found by subtracting the set of harmonic upper-partials, composite overtones, from harmonic partials, being overtones. In other words, from all overtones remove all the pitch-classes of overtones of overtones. Unless a whole numbered tone is a prime number, the same tone manifests another way: as an overtone of an overtone.

The pattern of primes is shown with the harmonic expanding-pitch-class keyboard, Fig.XIV.8. Doe is the fundamental frequency, the 1, with its own set of overtones, its "partials", $H_O = \{2,3,4,5…\}$. Each partial on the theoretical keyboard is its own fundamental tone that degenerates into its own infinite overtone sequence; harmonics of harmonics, defining "upper-partials". $H_U = H_O \times H_O$. Simple multiplication can show that Doe's Sol = 1 x 3 = Sol's Doe = 3 x 1. "Sol's Doe" defines Sol as a secondary fundamental tone with its own harmonic sequence, the upper-partials. Since Sol is three times the frequency of the fundamental ratio, the upper

partial “Sol’s Sol” would be 3 x 3 = 9. Nine times the frequency of the original fundamental tone, being the same pitch class as Doe’s partial Rae, shows Rae to not be a primary harmonic.

Fig.XIV.8: Expanding pitch-class harmonic keyboard



To play these upper-partials, turn a dial on the imaginary harmonic keyboard to change its fundamental tone to be Sol’s frequency, the third harmonic. Notice: Sol’s Mee = 3 x 5 = 15 = Doe’s Tee, meaning: the third harmonic’s fifth harmonic, an upper partial, is the same frequency as Doe’s fifteenth harmonic partial. Sol’s Sol = 3 x 3 = 9 = Doe’s Rae. Also, Sol’s Rae = 3 x 9 = Doe’s 27^{th} harmonic (Mu#) = Sol’s Sol’s Sol = 3 x 3 x 3, an upper-upper-partial. Each of these show a harmonic upper-partial represented within the sequence of partials on the keyboard. Into theoretical infinity, each upper partial also has its own harmonic sequence. This describes harmonic fractals: mathematics describing forms that repeat as viewing scales change, though wandering quickly, far from the fundamental 1/1 tone, decreasing Doe’s Doe’s dominance.

Defining all numbers that are not-primary defines primary numbers by default. Subtracting all the upper-partial equivalents from the infinite keyboard, only primary harmonics remain: Harmonic prime numbers (H_P) equals the Harmonic overtones, $H_O = \{2,3,4\ldots\}$, minus the set of Harmonic upper-partials (H_U). Summary: $H_P = H_O - H_U = H_O - \{H_O \times H_O\} = H_O - H_O^2$.

"Gauss had heard the first big theme in the music of the primes, but it was one of his students, Riemann, who would truly unleash the full force hidden of the hidden harmonies that lay behind the cacophony of the primes…Although the Riemann Hypothesis [RH] *has never quite caught on in the public imagination as Mathematics' Holy Grail, prime numbers themselves do periodically make headline news...mathematicians like to look for patterns, and the primes probably offer the ultimate challenge. When you look at a list of them stretching off to infinity, they look chaotic, like weeds growing through an expanse of grass representing all numbers. For centuries mathematicians have striven to find rhyme and reason amongst this jumble. Is there any music that we can hear in this random noise?…Until* [the RH is proved], *we shall listen enthralled by this unpredictable mathematical music, unable to master its twists and turns. The primes… remain the most enigmatic of all numbers. Despite the best efforts of the greatest mathematical minds to explain the modulation and transformation of this mystical music, the primes remain an unanswered riddle. We still await the person whose name will live for ever as the mathematician who made the primes sing."* Marcus du Sautoy, *The Music of the Primes*

Goldbach Conjecture

Goldbach Conjecture says any even number greater than 2 can be written as the sum of two prime numbers. So far, this has been true for any considered even number greater than 2. But it has not been proven for infinite even numbers. It is not proved in *HUT* either, only examined.

Let p_1 = the first prime number, being 2. Let p_2 be the second prime number, being 3. Let p_3 be the third prime number, being 5. $p_4 = 7$ $p_5 = 11$ $p_6 = 13$ etc… Let: $p_0 = 1$.

Let e = even number; $e_0 = 2$; $e_1 = 4$; $e_2 = 6$; $e_3 = 8$; $e_4 = 10$; $e_5 = 12$; $e_x = 2x + 2$.

Perspective 1) In Fig.XIV.9, the sums inside the five colored blocks in the top row initiate the pattern of their own matching colors in Fig.XIV.10. Let n = H_S = {1, 2, 3, 4, 5, 6…}. With each new sum pair, the matching block colors that follow in Fig.XIV.10 show: the first p_n remains the same while the second p_n has n increase by one, continuing through the set of n. Each of the sums in Fig.XIV.9, examples including p_2 through p_{16}, initiates its own consecutive pattern, leading into infinity. The continuing patterns and new patterns of prime sums of even numbers are ever increasing. Compare to Fig.XIV.11.

Fig.XIV.9: First dominos of infinite prime number pairing pattern

$p_2 + p_2$	$p_3 + p_3$	$p_4 + p_4$	$p_5 + p_5 = p_5 + p_{4+n}$	$p_6 + p_{5+n}$
$p_7 + p_{6+n}$	$p_8 + p_{7+n}$	$p_9 + p_{8+n}$	$p_{10} + p_{9+n}$	$p_{11} + p_{10+n}$
$p_{12} + p_{11+n}$	$p_{13} + p_{12+n}$	$p_{14} + p_{13+n}$	$p_{15} + p_{14+n}$	$p_{16} + p_{15+n}$

Fig.XIV.10: Even number is sum of two primes

$e_0 = 2$	e_1 $4 = 2 + 2 = p_1 + p_1$	
e_2 $6 = 3 + 3 = p_2 + p_2$		e_3 $8 = 3 + 5 = p_2 + p_3$
e_4 $10 = 3 + 7 = p_2 + p_4$ $= 5 + 5 = p_3 + p_3$	e_5 $12 = 5 + 7 = p_3 + p_4$	e_6 $14 = 3 + 11 = p_2 + p_5$ $= 7 + 7 = p_4 + p_4$
e_7 $16 = 3 + 13 = p_2 + p_6$ $= 5 + 11 = p_3 + p_5$	e_8 $18 = 5 + 13 = p_3 + p_6$ $= 7 + 11 = p_4 + p_5$	e_9 $20 = 3 + 17 = p_2 + p_7$ $= 7 + 13 = p_4 + p_6$
e_{10} $22 = 3 + 19 = p_2 + p_8$ $= 5 + 17 = p_3 + p_7$ $= 11 + 11 = p_5 + p_5$	e_{11} $24 = 5 + 19 = p_3 + p_8$ $= 7 + 17 = p_4 + p_7$ $= 11 + 13 = p_5 + p_6$	e_{12} $26 = 3 + 23 = p_2 + p_9$ $= 7 + 19 = p_4 + p_8$ $= 13 + 13 = p_6 + p_6$
e_{13} $28 = 5 + 23 = p_3 + p_9$ $= 11 + 17 = p_5 + p_7$	e_{14} $30 = 7 + 23 = p_4 + p_9$ $= 11 + 19 = p_5 + p_8$ $= 13 + 17 = p_6 + p_7$	e_{15} $32 = 3 + 29 = p_2 + p_{10}$ $= 13 + 19 = p_6 + p_8$

In Fig.XIV.10, the patterns are also increasingly interrupted by non-prime numbers. Those interruptions are seen in the breaks, the blanks, in the vertical color patterns under each e_n even number.

The proof that all even numbers have two primes to sum up to it is still not achieved here. The question remains: will non-prime numbers ever interrupt all the possible additives to negate the conjecture?

Fig. XIV.11 Primes *plus* primes

0	p_0	p_1	p_2	p_3	p_4	p_5	p_6	p_7	p_8	p_9	p_{10}	p_{11}	p_{12}	p_{13}	p_{14}	p_{15}	p_{16}
p_0	1	2	3	5	7	11	13	17	19	23	29	31	37	41	43	47	53
p_1	2	4	5	7	9	13	15	19	21	25	31	33	39	43	45	49	55
p_2	3		6	8	10	14	16	20	22	26	32	34	40	44	46	50	56
p_3	5			10	12	16	18	22	24	28	34	36	42	46	48	52	58
p_4	7				14	18	20	24	26	30	36	38	44	48	50	54	60
p_5	11					22	24	28	30	34	40	42	48	52	54	58	64
p_6	13						26	30	32	36	42	44	50	54	56	60	66
p_7	17							34	36	40	46	48	54	58	60	64	70
P_8	19								38	42	48	50	56	60	62	66	72
p_9	23									46	52	54	60	64	66	70	76
p_{10}	29										58	60	66	70	72	76	82
p_{11}	31											62	68	72	74	78	84
p_{12}	37												74	78	80	84	90
p_{13}	41													82	84	88	94
p_{14}	43														86	90	96
p_{15}	47															94	100
p_{16}	53																106

Perspective 2) In Fig.XIV.11, let primes-plus-primes start at 6 and call this the base row. Move right to 8, acknowledging the sequence of even numbers. If the sequence is not maintained going right, as with 10 skipping to 14, then drop down from 10 to get 12, then return to the base row for 14, 16, then drop down for 18, then back up to the base row for 20 and 22. Drop to 24, back up to 26. Drop to 28, drop again to 30, then back to the base row for 32. The question is: would this finding even numbers and their summing pair continue to include all even numbers into infinity?

Again, not achieved is proving that all even numbers have two primes to sum up to them. The question continues to be whether non-primes will ever, just one time, deny any single pair of prime additives to achieve every even number, and thus negate the conjecture.

Binary Translation

I like the tee shirt that says something like; “There are only 10 kinds of people: those who understand binary numbers and those who don’t”. The underlying riddle is: why does 10 = 2?

In *binary*, a base-two number system, in any single *moment* there are only two numerals

to use: $H_{BM} = \{0, 1\}$. In day-to-day pencil calculations, we use our base-ten system with our ten numerals: {0,1,2,3,4,5,6,7,8,9}. Computers are often operating with binary numbers. Based on the harmonic generator: 2^n, where $n = H_I = \{0, 1, 2, 3\ldots\}$, the binary system unfolds base-10 harmonic doubling and expanding octaves through time, with $\{0, 2^n\}$, where $2^n = \{1,2,4,8\ldots\}$. In base-10: $H_{BT} = \{0, 1, 2, 4, 8\ldots\}$. In a binary number, 1100011, the far-right position can represent either zero or one. The next 0 or 1 number to the left represents either zero or two. The third number to the left from the right side of a binary number equals either zero or four, followed by base-ten values of zero or eight, then zero or 16, then 0 or 32, etc. Each number to the left is either zero or double the maximum number to its right—the next "octave". When added together, a base-ten number is obtained.

There are only 10 kinds of people: those who understand binary numbers, and those who don't. In binary 10, the 1 is in the 2's place and the 0 in the 1's place. (1 x 2) + (0 x 1) = 2. So to translate 10 binary to base-ten equals 2… just two kinds of people: 10 = 2.

Translating binary **1100011** to base 10:

Translate binary base-two with {0 or 1} to base-ten with {0, 1, 2, 3, 4, 5, 6, 7 ,8 , 9}

1 1 0 0 0 1 1

$2^6 + 2^5 + 2^4 + 2^3 + 2^2 + 2^1 + 2^0 = 127$

64 + 32 + 0 + 0 + 0 + 2 + 1 = 99

Follow this pattern**: Base x = x^{H_I}**, where:

[exponents = $H_I = \{0, 1, 2, 3, 4\ldots\}$]

For any X from $H_O = \{2, 3, 4\ldots\}$:

base-X = $X^0 + X^1 + X^2 + X^3 + X^4\ldots$

base-2 = $2^0 + 2^1 + 2^2 + 2^3 + 2^4\ldots$

base-10 = $10^0 + 10^1 + 10^2 + 10^3 + 10^4\ldots$

base-27 = $27^0 + 27^1 + 27^2 + 27^3 + 27^4\ldots$

The binary equivalent of 1100011 in base-10 is 99. From this number, a computer will insert the 99th character from its index into the text: maybe a question mark?

Base-Twenty-Seven

To seek prime numbers with *HUT* equations in Fig.XIV.4, similar to the Great Prime Number Chase, numbers become very large. We predominately use the base-ten number system, with ten possible symbols: {0,1,2,3,4,5,6,7,8,9}. Writing one million in base-ten requires seven number places: 1,000,000. To write the same one million value in a base-two number system, the binary code with just two symbols, {0,1}, requires 20 number places. To take up less space with the large numbers, we can use a larger number base system. The problem with that is that we are mostly accustomed to base-ten and its ten symbols. We would need more symbols.

"Ten", being 10 in any base-n system, will always seem special. In base-10, $10^2 = 100$.
In any base-n system; $10^2 = 100$. Example, in base-6 using only {0, 1, 2, 3, 4, 5}:
10 (in base-6) = 6 (in base-10). In base-6, 10 x 10 = 100 = 36 (in base-10).
In any base-n system, when n is represented in base-10: $10^2 = 100 = n^2$.

We already have memorized the 26 letters of the alphabet. This would allow a base-27 system, where {Ø = zero, A = 1, B = 2, C = 3… Z = 26}. It follows, with x = {2,3,4…}:

10 (base-27) = AØ = 27 (base-10) ; AA = 27 + 1; AB = 29; BØ = 2 * 27; CA = (3 * 27) + 1 = 82;
AAA = $27^2 + 27 + 1$; BAA = $(2 * 27^2) + 27 + 1$; AAAA = A4 = $27^3 + 27^2 + 27 + 1$;
A5 = $27^4 + 27^3 + 27^2 + 27^1 + 27^0$; Ax = $27^{(x-1)} + 27^{(x-2)}\ldots + 27^{[x-(x-1)]} + 27^0$.

When a base-10 number gets very long, base-27 stays shorter. Using the brail system or Morse code as models, the 26 letters and zero might easily be translated into computer code, able to replace the binary code when needed. With such a numbering system as base-27, we could chase prime numbers farther and faster down the degenerating path into infinity—for no reason

except: just because we can. Note: Infinite harmonics are the pure information signal from the original void, yet nature does not produce a pure signal—there is noise: entropy, not infinity. Nature's signal to noise ratio is the *result* of the pure harmonic information inherent in the void.

Harmony Code

Imagine a secret code: Odd numbers, harmonic chord tones, $H_C = \{1,3,5,7\ldots\}$ get assigned as letters A – Z, followed by A – Z joined with a *superscript* {1,2,3,4… }, being A^1 followed by B^1, until Z^1 is followed by A^2, etc. Even-numbers are doubled up from an odd-number, like 2 is double 1. Since 1 is A, then 2 is A *subscript* 1, being A_1, and 4 is A_2. Look:

1	2	3	4	5	6	7	8	9	10	11	12	13
A	A_1	B	A_2	C	B_1	D	A_3	E	C_1	F	B_2	G

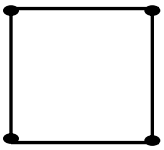
$A = 2^0$	$B = 3 \times 2^0$	$C = 5 \times 2^0$	$D = 7 \times 2^0$	$E = 9 \times 2^0$
$A_1 = 2^1$	$B_1 = 3 \times 2^1$	$C_1 = 5 \times 2^1$	$D_1 = 7 \times 2^1$	etc.
$A_2 = 2^2$	$B_2 = 3 \times 2^2$	$C_2 = 5 \times 2^2$	etc.	
$A_3 = 2^3$	$B_3 = 3 \times 2^3$	etc.		
$A_4 = 2^4$	etc.			

If one is 55 years old, in code this is B superscript 1; B^1. Figure the code for 55: Odd numbers count off the alphabet, so Z would come at (2 x 26) - 1 = 51. The next number is not odd so it can be halved until it becomes an odd number: 52 ÷ 2 ÷ 2 = 13 = G. So 52 = G_2. That makes 53 = A^1. The next odd number, 55 = B^1. The answer: "Be Super One".

Okay, honestly… What good is this code? What is it for? It is only a code, is my answer, hard or easy or new or old, I have no idea, but some people like codes. This is a demonstration of playing with harmonics; no more, no less. No secret!

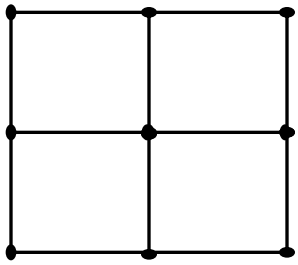
Square Thoughts

Let's call a vertical or horizontal straight line a *root*. Let the length of this root be *one unit*. Let's draw this: ●——● . If we use this root for one side of a *square*, we will call it a *square root*. All sides of a square, being square roots, are the same length on a flat plane. To know how many mini-squares exist inside in the whole square, multiply the vertical root times the horizontal root. Roots in this case are equal to one unit each, so our solution will be found by multiplying: 1 unit x 1 unit. We can also condense the math. When anything multiplies by itself, we call that *squared*. So: 1 *unit* x 1 *unit* = (1 *unit*) squared = $(1\ unit)^2$ = 1 $unit^2$.



What many people miss is that the *unit* is being multiplied also. One times one is of course: one. Unit times unit equals unit squared, or $unit^2$. We phrase our equation as: one unit squared equals one square unit. So what? Let's do two units times two units:

$(2\ units)^2 = 4\ units^2$



Two units squared equals four square units—four small squares being inside our one big square. Imagine standing back from the 2-D square so you view from the center of a 3-D sphere. Using the four-squares, put index finger and thumb on top and bottom of one square. From the paper to your eye is one distance (d), or 1d. Move the separated fingers half the distance towards your eye. Now the two fingers frame the top and bottom of two squares. This demonstrates one perspective of the inverse square law—of $1/d^2$ (Fig.VIII.4).

The size expands according to the reciprocal $1/d^2$: d^2 is the number of boxes; $d^2 = 2^2 = 4$. See four boxes now instead of one. If the distance is quadrupled, 4d, there would be 16 mini boxes, $4d \rightarrow 4^2 = 16$, each being 1/16 of the total. This is the *inverse square law* (Fig.VIII.4). The $1/d^2$ shows the decrease in intensity with distance ***d*** from the source, such as with gravity, light, electricity, magnetism, sound, spray paint, a sneeze, etc. while d^2 shows space expansion.

As defined, a square with three units on one side has a square root of three units. Three units squared equals 9 square units. $(3 \text{ units})^2 = 9 \text{ units}^2$. Question: what is the square root of 9 square units? We have a big-square with nine mini-squares inside. The sides of the big square shows three units on each. The side is equal to the square root. The square root of nine square units, being three units squared, is 3 units. The square root of units^2 is "units", and of 3^2 is 3. In 3-D: 2 x 2 x 2 = 8 = 2 cubed; $2^3 = 8$ and $\sqrt[3]{8} = 2$ (cubed root of 8 = 2).

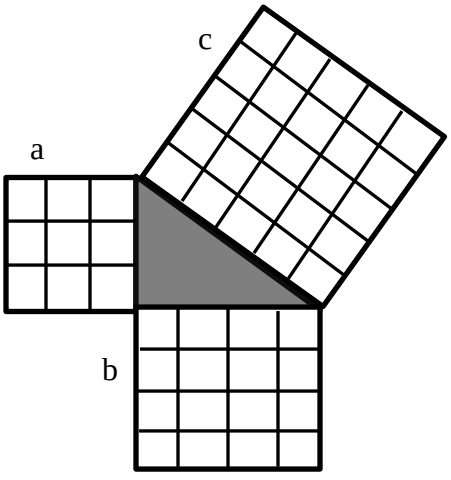
Using a multiplication table, Fig.XIV.1, let the horizontal and vertical axes of that table be the square roots. To find the square of three, or three squared; multiply three times itself. The intersection of the vertical three and the horizontal three is on the diagonal in the big square, in this case, three squared equals nine. And the square root of nine equals three. Notice that the diagonal of the multiplication table gives all the squares of whole numbers into infinity, and the two axes give all of their square roots into infinity: $\{n^2, n, n\}$. E.G, $\{3^2, 3, 3\}$.

Draw an imaginary diagonal line through any square, from top left to bottom right. This is the position of the diagonal in the multiplication table. Now we have two right triangles, each with the one required right angle. And we can vary the side lengths while they keep a constant mathematical relationship, at least in Newtonian/Euclidean visions of the world, with which we use to build an angled roof. The diagonal, the hypotenuse, is the side opposite from the right angle. This is labeled as **c** in Fig.XIV.12, and the other sides are **a** and **b**.

Use the multiplication table, Ex.XIV.1, to estimate $c = \sqrt{18}$. Go down the central diagonal squares until you pass 18. That would be 25. Then back up to 16. Our goal is between the square roots of 16 and 25, so the square root of 18 is between 4 and 5, and closer to four because 18 is closer to 16, so a reasonable guess would be, $c = \sqrt{18} \approx 4.2$.

Fig.XIV.12 Pythagorean squares

In this example we use the convenience of 3 units for the length of "**a**", the left side, 4 units for **b**, the bottom side, and 5 units for **c**, the angled hypotenuse. The length of each side of the gray "right" triangle pops out, away from the triangle, and the 3 lines become 3 squares, in which are $\{3^2, 4^2, 5^2\}$ mini-squares.



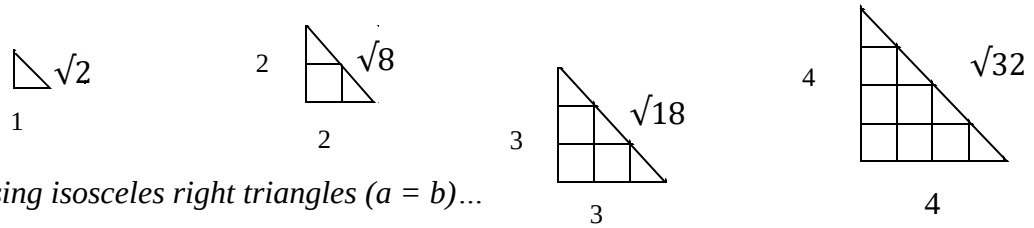
For {a, b, c} it works best to first try it with {3, 4, 5} because everything stays whole numbers: $3^2 + 4^2 = 5^2$, being, 9 + 16 = 25. This is the Pythagorean Theorem where $a^2 + b^2 = c^2$. E.g.: if a = b = 3, then $a^2 + b^2 = 3^2 + 3^2 = c^2 = 18$, and c equals the square root of 18, or $c = \sqrt{18}$. Use the multiplication table to estimate the hypotenuse: $\sqrt{18} \approx 4.2$.

Some other whole number solutions to $a^2 + b^2 = c^2$:
5:12:13; 7:24:25; 8:15:17; 9:40:41; 11:60:61; 12:35:37; 13:84:85; 16:63:65; 17:144:145.

An equation for some square roots:

Use the Pythagorean Theorem where $a^2 + b^2 = c^2$.

$1^2 + 1^2 = 2$ $\quad$ $2^2 + 2^2 = 8$ $\quad$ $3^2 + 3^2 = 18$ $\quad$ $4^2 + 4^2 = 32$



Using isosceles right triangles (a = b)…

$\sqrt{2} \approx 1.4142$ $\quad$ $\sqrt{8} \approx 2.8284$ $\quad$ $\sqrt{18} \approx 4.2426$ $\quad$ $\sqrt{32} \approx 5.6568$

1st: notice the emergence of the principal quantum number $2n^2$: {2,8,18,32…}(see chap. II).
2nd: see the two equal non-hypotenuse sides follow the harmonic sequence H_S = {1,2,3,4…}.

3rd: notice the square roots of $2n^2$, $\sqrt{2n^2}$, equal n = H_S = {1,2,3,4…} times the fundamental tone of $\sqrt{2}$: {1 x 1.4142, 2 x 1.4142, 3 x 1.4142, 4 x 1.4142…} = $\sqrt{2n^2} \approx 1.4142n$

4th: transpose to the equation $\sqrt{2n^2}/n \approx 1.4142$ to satisfy finding all approximate solutions for square roots $\sqrt{2n^2}$ with n = {1,2,3,4…}.

5th: thus it follows that $\sqrt{2n^2} / n \approx \sqrt{2} / 1 \approx \sqrt{8} / 2 \approx \sqrt{18} / 3 \approx \sqrt{32} / 4 \approx 1.4142$

6th: not just H_S integers, but any decimal number also works for n: $c = a\sqrt{2} = b\sqrt{2}$
7th: using the length of *a* or *b* of any isosceles right triangle, the hypotenuse length *c* is known.

More squares for squares

Here's a cool circular math story. To help myself remember the multiplication table, I remembered all my life that 8 x 8 = 64 while 7 x 9 = 63. In time I noticed that the square of any whole number equals the product of the numbers before and after, plus one. Putting these words into the example's equation form: $8^2 = (7 \times 9) + 1 = 64$.

From n = {1, 2, 3, 4…},the arbitrary number 8 in this example will equal n + 1, making n = 7, and the three consecutive numbers being, {7, 8, 9}. From this example we can generalize to all of n with the 3-number set: {n, (n + 1), (n + 2)}. The example shown, $8^2 = (7 \times 9) + 1$, can be further generalized as: $(n + 1)^2 = n(n + 2) + 1 = n^2 + 2n + 1$. A multiplication table shows this.

Try it on any three consecutive numbers, like {9, 10, 11}. 10^2 is 100 and 9 x 11 is 99, being 100 – 1. Also, $n^2 + 2n + 1 = 81 + 18 + 1 = 100$.

Let's arithmetically check if $(n + 1)^2 = n^2 + 2n + 1$:

$$\begin{array}{r} n + 1 \\ \times\ n + 1 \\ \hline n + 1 \\ + n^2 + n \\ \hline n^2 + 2n + 1 \end{array}$$

And, hey, it matches.
But what's it all mean? It just means that that is ➡➡ ➡➡ just the way it is.
Some people love to seek out math solutions.

Verification possibilities

Showing value of the prime number equation can be done by setting up a computer program to compete with the Great Prime Number chase that is already underway. Data should be stored and accessible to all researchers. The truth will be in the speed. *HUT* math items need peer review.

XV SACRED GEOMETRY UNTANGLED

Many geometric diagrams in this and other chapters are from unnamed artists on the internet

"We may find regularities, predict that similar regularities will occur elsewhere, discover that the prediction is confirmed, and thus identify a robust pattern: however, it may be a pattern for which the explanation continues to elude us… we see what is going on but do not yet understand it." Murray Gell-Mann in *The Quark and the Jaguar*

A. The Circle: an Old Paradigm Untangled to be Cohesive

"God is an infinite sphere, the center of which is everywhere, the circumference nowhere."
— first author uncertain, variations attributed to many

The organizing nature behind a rock, a rose, a radioactive element, a thought, and all cosmic order originates from harmonic patterns that keep repeating. Humans have always sought to understand nature's recipe. Evolving science cleanses these accumulating ideas.

Sacred geometry is a popular label for a nebulous cluster of disjointed ideas. The way it is, sacred geometry is not integrated into science. Teachers and popularizers of sacred geometry confuse much. To cleanse sacred geometry, from being adhesively connected ideas that are just stuck together, to being cohesive ideas which are flowing together as one, a proper unified field science needs to clarify the relationship of sacred geometry to the harmonic order of everything in the universe. This begins with identifying the predominant sacred geometric source and demonstrating how this relates to the universal fundamental tone. In sound, the constancy of the fundamental tone comes from the vibration caused by rubbing a circular object. In geometry, the fundamental form in 2-D is a circle and the surface area of a sphere; and in 3-D is spherical volume. DNA holds the universal fundamental circle in the geometric form of a spiral. *HUT* requires beginning and ending all aspects of creation with the potent effects of the geometric constants from the void, being a point, a circle, a sphere, a helix.

A circle is honored by the sacred geometry enthusiasts, but it is not central within their analysis, and is therefore disconnected from so much of their number play. Exposing the circle within sacred geometry comes from dividing the circle. Life's Unity is like one cake. Some people prefer one pie, but that confuses one pie with two pi (Fig.XV.3). One pie is a circle. Two pi are a circle. To be able to discuss Unity, traditions throughout time have cut the One cake in many ways. People slice however many pieces they want, using straight or curved lines, that join in the middle or not. People argue about how the cake should be cut and whose cuts are most correct. Meanwhile, in playing the game of life, many people forget that remembering the source, the whole cake, the circle, is most important.

Science needs precise cuts proven to be valid reductions, while non-scientific traditions can cut the circle any way they want. Remembering the cake's Unity is what is important, even though, ironically, the Unity cannot be fully understood nor proven without reducing it into parts, and thus the variety of chosen cuts. From unity comes diversity, which rediscovers unity.

The Circle is the universe's geometric common denominator. "Will the circle be unbroken…" Every part contains the whole—in relationship to the center. The inverse square law (Fig.VIII.4), utilizing one over distance squared, $1/d^2$, shows 2-D circular and 3-D spherical expansion of space as the fundamental geometry of the universe.

B. Circle Divisions: the Chord of Life

Everything in the universe depends on the mathematics of harmonics where one tone, 1/1, predominates, acting as the fundamental frequency-unit, maintaining a constant reference for the overtones to vary according to whole number multiples of the 1/1: $H_O = \{2,3,4,5,6…\infty\}$. By limiting the infinity ∞ of harmonics [e.g. $H_T = \{4,5,6,7\}$ et al—Fig.I.3], elements and cells sustain through time, evolving life, defining the signal to noise ratio.

Harmonics start with the fundamental tone's frequency multiplier being one. Any doubling of one will be in the same pitch class as one, Doe, like two is Doe, four is Doe, 8, 16, and 32 are all Doe. Each odd number after one is also the beginning of a new pitch class. Three is Sol, doubling to 6, 12, 24, 48... Five, ten, and twenty are Mee. Seven, 14, 28, 56 are Ah. Those are the first four predominating pitch classes unfolding in nature: Doe Mee Sol Ah… which is the chord of life, {4, 5, 6, 7} (Fig.VII.3 & .4) represented by the Fig.XVI.1 geometries.

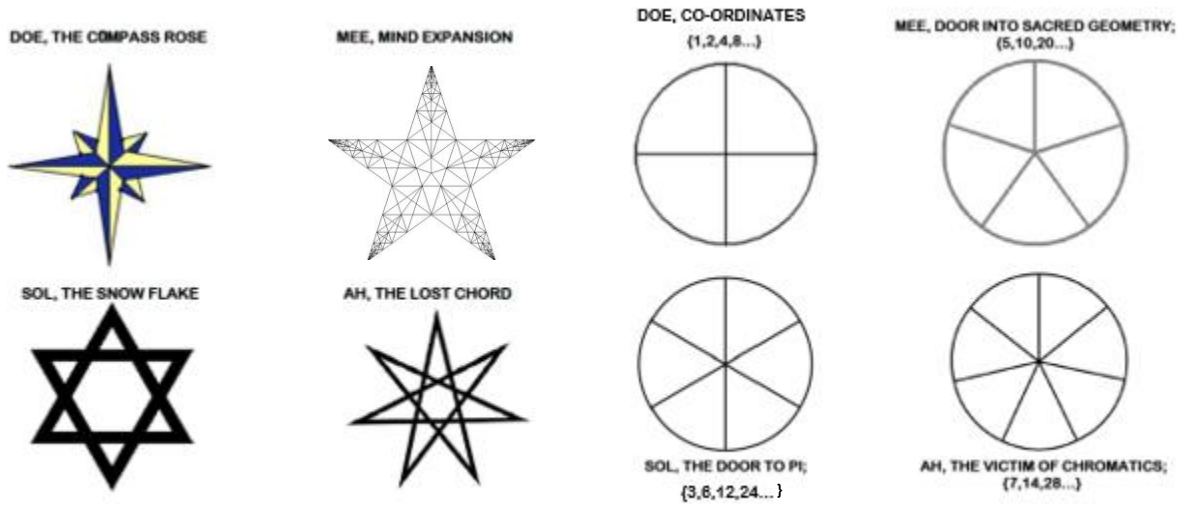


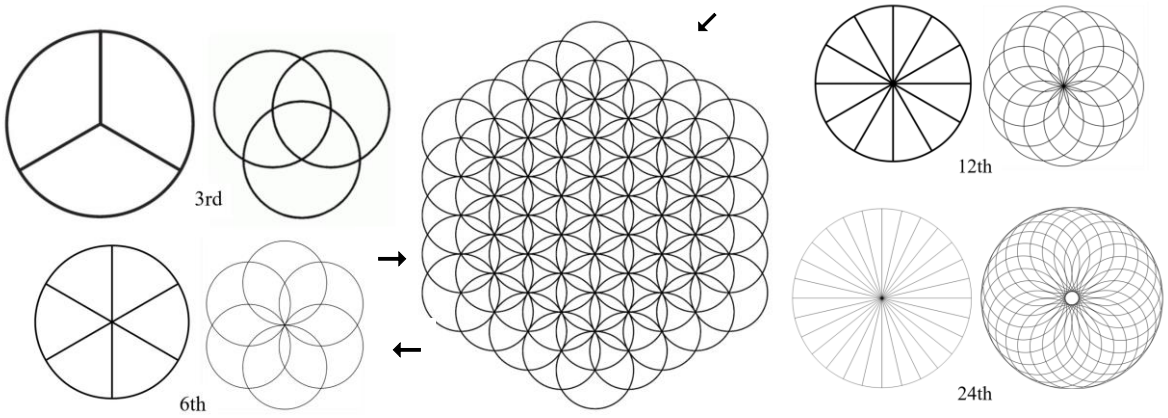
Fig.XV.1 The chord of life in stars & cakes

Many ancient rituals include rhythms, from hypnotism to military marching to voodoo. Consider three beats and four beats played in the same time period. The four beat establishes the foundation, like a noun. The three beat initiates change and movement, like a verb. Stabilize the patient with four beats, or initiate change with three, followed by stabilizing with four again. While riding a bike, count peddling cycles. Energizing up a hill, count three or six beats per cycle. When riding steadily on the flats, count one, two, four, or eight beats per cycle.

The doublings from three define the third harmonic's pitch class: {3, 6, 12, 24…}. Looking at the math of harmonics as geometry in Fig.XV.2, a circle is shown dividing into three,

then doubling into its own extending pitch class. Notice the 6th harmonic cell expands into multiple cells forming a more complicated six-space popularly known as the *flower of life*.

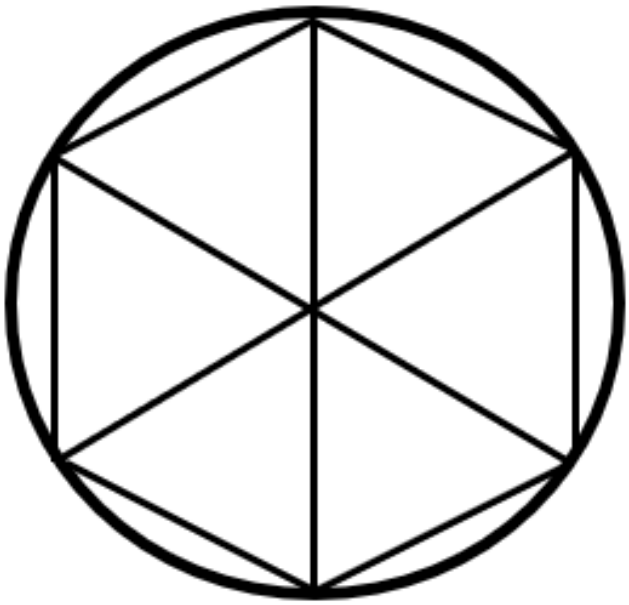
Fig.XV.2 Geometric third harmonic & the Flower of Life



Pi & the third harmonic

The circumference distance of a circle, 360°, is equal to 2πr (r = radius). The circumference of a half a circle, 180°, equals πr. Dividing a circle in six sections, 360°/6 = 60°, demonstrates the third harmonic: 2πr/6. Pi is the famously approximated as: 3.14. That is three plus a little more: point one four. The point one four is the difference between the lined perimeter of half of a snowflake and the curving perimeter line of half of a circle: 3.14 – 3 = .14.

Fig.XV.3 Pi goes straight



Pi = π ≈ 3.141592653589793 & more… Pi does not need to be confusing. Think of a circle trimmed up to be a snowflake of six equilateral triangles. Each of the 12 straight lines is radius (r) in length. Six radiuses, 6r, make the perimeter of the snowflake, while 2π (6.28) times radius = the whole circle's (2πr) perimeter (360°). Half a circle (180°) = πr: (3.14 times r). The length difference between the ½ circle *round* pi-crust perimeter (πr) and ½ snowflake *straight-line* perimeter (3r) is 3.14r – 3r = .14r.

No confusion: pi equals half of a snowflake plus a smidgeon more…
π = (3.0 +.14)r…
linear verses.

"All truths are easy to understand once they are discovered;
the point is to discover them." Galileo Galilei

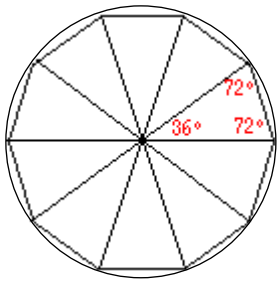
C. The Golden Triangle: the Fifth Harmonic

Also, a place in Thailand, Laos, and Myanmar. Other names: the Sacred or Sublime Triangle.

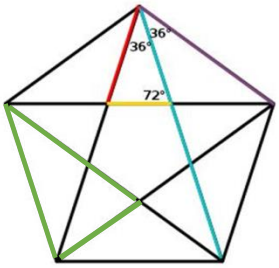
Studying the many enthusiastic claims of sacred geometry, it is the *golden triangle* that is central to connecting with the fundamental circle. Pi refers to the circumference of a half circle, being arbitrarily and conveniently assigned as π = 180º. Divide a half circle into five, making pi-divided-by-five: π/5 = 36°. This means the whole circle divides into ten: 2π/10 = 36° or 10 x 36° = 360° (Fig.XV.4). These divisions define the whole circle's tenth harmonic in the fifth harmonic pitch class. *Pi divided by five is the key* to mentally accessing the initiation sequence of the real and/or imagined romps resulting in present day "sacred geometry". As shown in Fig.XV.4 a.

1. Begin with an unbroken circle
2. Divide the 360° circle into ten: 2π/10 = two pi divided by ten = 360°/10 = 36°.
3. 180° half-circle divided by 5 = π/5 = pi divided by five = 180°/5 = 36°.
4. Any flat triangle's three angles add-up to 180° E.g. 36° + 72° + 72° = 180°.

Fig.XV.4 π/5

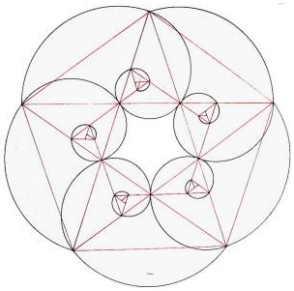


a.



b.

In the pentagram-star diagram b, there are 10 mid-size golden triangles + 5 large + 5 small = 20.



c.

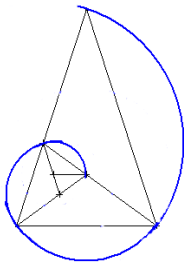
Divide π = 180º by five: π/5 = 36º. The 2-D golden triangle in Fig.XV.4a has a 36º angle touching the circle's center. The triangle's other two angles are equal sized, each being double 36º, which is 72º. Sacred geometry originates with the golden triangle's unique harmonic angular proportions of 1:2:2, of 36º:72º:72º. With imagination, the golden triangle morphed into the now popular *golden rectangle*, Figs.XV.9-.11, manifesting other correlations.

Sacred geometry enthusiasts do not glorify other triangles which also have simple integral proportions of angles adding up to 180º. Examples: the equilateral triangle 1:1:1 has 60º:60º:60º; 1:2:3 shows as 30º:60º:90º; 2:3:4 → 40º:60º:80º; 3:4:5 → 45°:60º:75º; 4:5:6 → 48º:60º:72º; 5:6:7 → 50°:60°:70°; 2:1:1 → 90º:45º:45º, and 1:1:3 → 36º:36º:108º.

Mostly unacknowledged, sacred geometry's beginning started with the circle, then with π/5 producing the golden triangle. This was and is the clearest signal-to-noise ratio to connect sacred geometry to nature and science. *Through time, the signal got lost in dazzle: from a circle. to the triangle, to the ratio, to the rectangle, to the spiral … to everything.*

For a long time, people have been claiming sacred geometry's triangle or rectangle as the universal reference. But these are not universally fundamental. Pi represents the fundamental circle divided in half. Pi divided by five is the fifth harmonic pitch class emanating from the universal circle reference. The common sacred geometry error begins from believing that the fifth harmonic triangle, 2π/10, or its rectangular aberration, is the predominant universal reference, whereas that triangle is only the third most predominant geometric reference, after the fundamental harmonic circle, 1/1, and the circle's third harmonic, 2π/6 (Fig.XV.3).

Fig.XV.5 Triangle spiral



D. The Golden Triangle Spiral

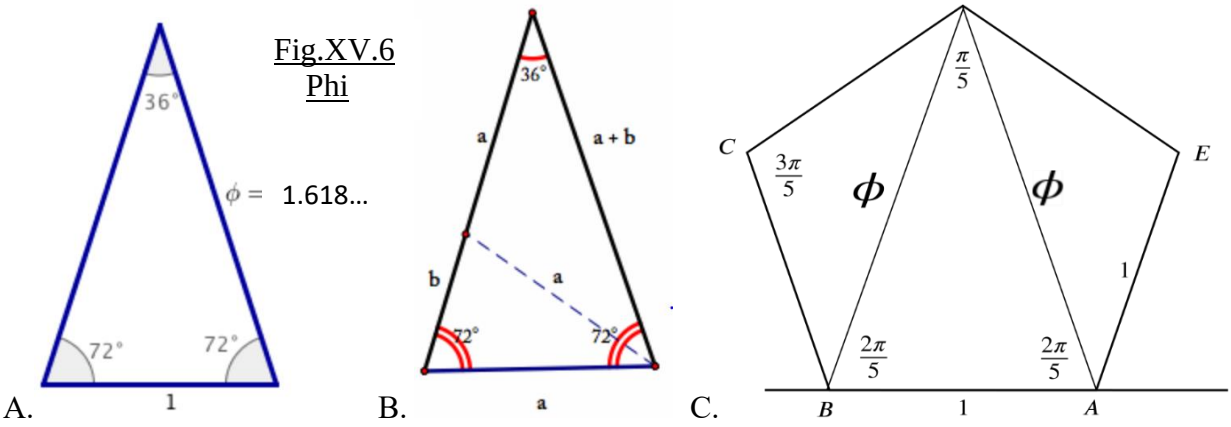
From the topmost 36° angle, here moving clockwise, first split in half the golden triangle's bottom right 72º angle, creating a smaller golden triangle within. Continue clockwise, inward, dividing each °72 angle in half. Draw a clockwise spiral from each triangle's 36º angle. Connect all 36° angles, swirling inward. This is called the *golden triangle spiral*. The fractal repetitions are *reducing* the golden triangle, as compared to a different option of drawing from the inner golden triangle in an *expanding* fashion.

E. The Golden Ratio: Phi & Phi-Minus-One

"The golden era of the golden number was the Italian renaissance. The expression divine proportion was coined by the great mathematician Luca Pacioli in his book 'De divina proportione', written in 1509." — Midhat Gazale, *Gnomon: From Pharaohs to Fractals*

The golden ratio, *phi* (Φ or φ), 1.6180339887… is considered an irrational number like pi, meaning it goes on forever without repeating. Phi derives from the circle divided by ten radiating radii, 2π/10, or π/5, the fifth harmonic, Fig.XV.4a. The ratio is the golden triangle's long side divided by the short (Fig.XV.6): Φ = 1.618/1. Further reduction of the golden triangle shows the divine proportion Φ at 1.61803…-to-1 reemerge in the newly reduced triangle whose sides now relate as 1 to (Φ - 1) = 1-to-.61803... being: 1 ÷ .61803 = 1.61803…into infinity.

Fig.XV.6
Phi



In Fig.XV.6A, the length of the triangle's bottom side = 1, and the other two are each: Φ = 1.61803. In reducing triangle B above, if a = 1, then b = .61803… because the long sides of the larger triangles in A & B require that: 1.61803 = a + b = 1 + .61803. And more general:

$\Phi = 1 + (\Phi - 1)$ and $\Phi/1 = 1/(\Phi - 1) = 1.61803 = \Phi$

Referring to diagram Fig.XV.6 C, the pentagon enclosing the golden triangle:

$\pi/5 = 180°/5 = 36°$ $2\pi/5 = 2 \times 180°/5 = 72°$ $3\pi/5 = 3 \times 180°/5 = 36° + 72° = 108°$

➥ Side-note:
the Golden Ratio as: x = 1.618033988749894...
is the positive solution for x in: $x^2 - x = 1$.

note: the number 108 ↗ has its own enthusiastic following, not included.

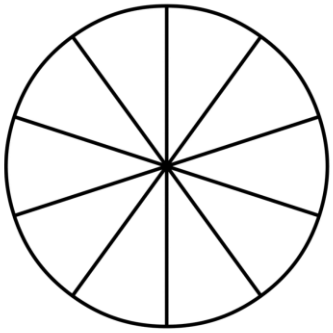
"In the pentagram, the Pythagoreans found all proportions well-known in antiquity: arithmetic, geometric, harmonic, and also the well known golden proportion, or the golden ratio."
Alexey Stakhov, *The Mathematics of Harmony*

F. DNA: Nature Loves the Circle's Fifth Harmonic Fig.XV.7 2π/5

Sand dollar with 5-point star in center

Fig.XV.8 DNA 2π/10 see Ch. XII

Nature reveals *the way* of the circle and its harmonic divisions. In DNA, the circle is divided into ten, reduced into the fifth harmonic, something the sacred geometry enthusiasts do not focus on. The unity of the spiraling circle shape of each helix divides into ten: 2π/10. Around each revolution, the nitrogenous-base ladder rungs connect to the sugar-phosphate helix every 36 degrees (36° x 10 = 360°). The underlying reality that nature is completely built from the geometry of a circle, with harmonic patterns that keep repeating, provides the true source of all scientific, religious, and artistic enthusiasms.



G. Translating Golden Triangle to Golden Rectangle

"Learn how to see. Realize that everything connects to everything else." Leonardo Da Vinci

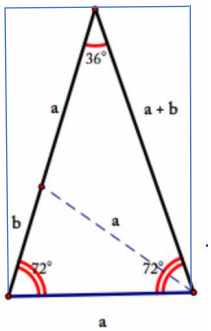


Fig.XV.9 Triangle becoming rectangle

"When the ancients discovered 'Phi', they were certain they had stumbled across God's building block for the world."
— Dan Brown, *The Da Vinci Code*

Take a golden triangle with the length of the bottom short side a = 1 and the length of each of the two upright long sides = Φ. Straighten up the long sides in Fig.XV.9 so they join the short side at 90°, and put a line length a = 1 on for a top cap. This has now become the golden rectangle as seen in Figs.XV.10 & .11.

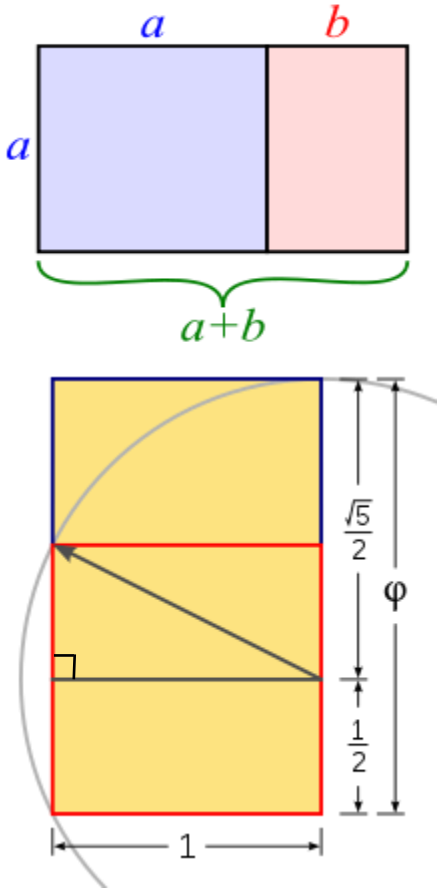
Sacred geometry enthusiasts like to share the equation: $\Phi = \frac{1+\sqrt{5}}{2}$. Not easily found in the golden triangle, it is the golden rectangle from which the relationship of this square root of five can best be visualized. Then the equation is still valid for the triangle's phi, Φ.

A golden rectangle, like the golden triangle, has side lengths that relate as the golden ratio phi, (Φ or φ), where Φ is equal to an infinitely continuing number, approximately 1.618.

"Science, my Lad, is made up of mistakes, but they are mistakes which it is useful to make, because they lead little by little to the truth." Jules Verne

Fig.XV.10 Rectangular phi reducing

Golden rectangle



The pink rectangle (Fig.XV.10), with side lengths ***a*** **&** ***b*****,** is placed adjacent to the blue square with side lengths ***a***, producing a pink & blue "golden" rectangle, repeating the same proportions of the smaller one.

To construct a golden rectangle, first draw a square (red lines lower left). Next, draw a line from the midpoint of one side of the square to an opposite corner of the square (black arrow-tipped line).

Use that line as the radius to draw a circle's arc (gray). This will designate the height of the rectangle. Now the complete golden rectangle can be drawn.

In Fig.XIV.12, the Pythagorean theorem regards a right triangle. The sides relate in the proportions of $x^2 + y^2 = z^2$, where z is the longer side (hypotenuse) opposite of the right angle (tiny square at left) formed by the triangle's two shorter sides, x & y.

Translated into the given lengths:

$1^2 + (1/2)^2 = z^2 = 1\ ¼ = 5/4 = 1.25$ therefore

$z = \sqrt{5/4} = \sqrt{1.25} = 1.118033988749895 = \sqrt{5}\ /\ 2.$

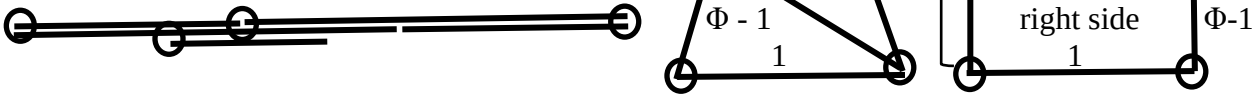
Accordingly, $\Phi = \sqrt{5}\ /\ 2\ + 1/2 =$

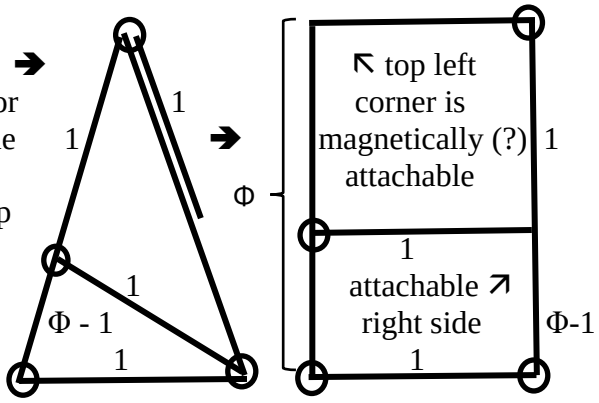
$1.118033988749895 + .5 = 1.618033988749895 =$

$$\Phi = \frac{1 + \sqrt{5}}{2}$$

Fig.XV.11 Construct a toy to transform the golden *triangle* to the golden *rectangle*.

Use metal, wood (chopsticks), plastic (straws), or another material. Two hinges O on the bottom, one on left side, and one on the top right; the long sides of the triangle can separate at the top. The top flap flips up and over to cap the rectangle. The toy folds up into: ⅁



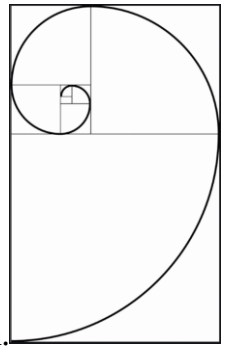
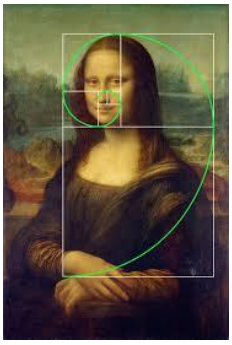


H. The Golden Rectangle Spiral

The golden triangle spiral is warped into the golden rectangle spiral. They both contain the same phi golden ratio, but the rectangle has more area due to having the added top separation

length. The spiral is around the outside of each triangle, Fig.XV.5, but inside each rectangle, Fig.XV.12a. Draw the fractal repetitions inside the golden rectangle to create an expanding spiral, sequentially adding a larger and larger square. For the specific purpose of making the expanding spiral, the placement of the additive squares must adapt: place the new square above, then on the right, then below, then on the left, then above again, repeating.

Fig.XV.12 Rectangle spiral

a.  b.  c.  d. 

Enthusiastic artistic freedom has transformed mostly the golden rectangle's spiral image, adapting sacred geometry into claiming so much of art and nature to be exactly following the golden ratio. These human desires to manifest spontaneous golden rulings do not necessarily do so with valid accuracy. Not all of nature models after the fifth harmonic, the pi divided by five. The first and third harmonics are more predominant than the fifth. All of nature models after the first harmonic circle, with a signal to noise ratio. The third and fifth harmonics are added noise to the pure tonic fundamental 1/1 circle. There is no creation from a circle without harmonic overtones. Unity and diversity blend into creation, and diversity reaches all the way into chaos.

I. Fibonacci Squares, F^{2s}

Sacred geometry flaunts the Fibonacci series (F), a pattern of adhesion. Start with 0 and 1. Add them to get one: 0 + 1 = 1. Add previous two (F) numbers to get the next F#: F(x + y = z).

1 + 1 = 2; 1 + 2 = 3; 2 + 3 = 5; 3 + 5 = 8; like that. F = {0,1,1,2,3,5,8,13,21,34,55…}.

$F_{\#}$ code: {$F_0 = 0$; $F_1 = 1$; $F_2 = 1$; $F_3 = 2$; $F_4 = 3$; $F_5 = 5$; $F_6 = 8$; $F_7 = 13$…}

The golden ratio phi $\Phi \approx 1.618$…, being the long side of a golden triangle divided by the short side, is approximated by *dividing* any F# by the F# before it: F(y/x). Into infinity, this gets *closer and closer to the golden ratio of 1.618*, alternating less-than and more-than. Examples: 3/2 = 1.5; 5/3 = 1.666…; 8/5 = 1.6; 13/8 = 1.625; 21/13 = 1.615; 34/21 = 1.619. As any F# pair gets larger, the closer the Fibonacci ratio, F(y/x), comes to approximating the golden ratio, but never arriving. Fibonacci squares, F^{2s}, are different than the golden rectangle which is constantly demonstrating the golden ratio. In defining the two different future paths, note that F^{2s} diagrams in Fig.XV.13 begin with two squares, whereas golden rectangles in Figs.XV.10-.11-.12 begin with a rectangle and a square. The two paths remain different: one is phi, & one approaches phi.

Like the golden rectangle, accumulating F^{2s} makes the figure bigger and bigger, as contrasted to the popular dividing of the golden triangle which results in the fractal repititions getting smaller and smaller. All of these choices are somewhat arbitrary.

Here the Fibonacci series is shown on a number line as a 1-D geometric progression. To make F^{2s}, imagine or draw a 2-D square down from each F line segment: {1x1, 1x1, 2x2, 3x3,

5x5…}. Imagine Fibonacci 3-D geometry by popping each imagined square up into cubed space. This allows the construction of a 3-D Fibonacci building, with no set arrangement for the cubes.

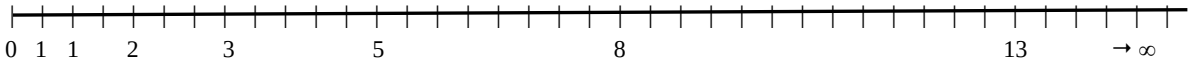
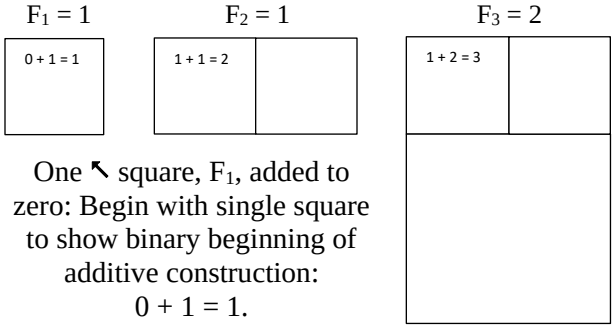


Fig.XV.13 Fibonacci squares F^{2s} approach Golden ratio

*$F_{\#}$ code: {$F_0 = 0$; $F_1 = 1$; $F_2 = 1$; $F_3 = 2$; $F_4 = 3$; $F_5 = 5$; $F_6 = 8$; $F_7 = 13$…}

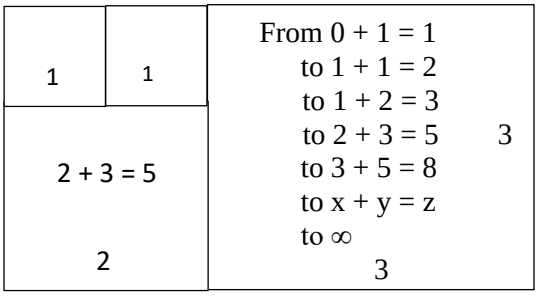


One ↖ square, F_1, added to zero: Begin with single square to show binary beginning of additive construction: 0 + 1 = 1.

The second figure ↑ adds a 1 x 1 square, making two squares total, F_2, showing the Fibonacci equation: 1 + 1 = 2, accommodating $F_2 = 1$.

Fourth figure, → with four squares, $F_4 = 3$, makes the equation 2 + 3 = 5

↙ The third figure, showing the 3 boxes, F_3, adds one square with the side length = 2, being the 2 in the $F_{\#}$ code: $F_3 = 2$. The Fibonacci equation is: 1 + 2 = 3.



$F_4 = 3$: the fourth square has side lengths of 3

*Using the $F_{\#}$ code to label the Fibonacci sequence, e.g. $F_{\#} = y$, the subscript numeral # equates to the total number of Fibonacci squares (F^{2s}). For $F_{\#} = y$, the equivalence to a number **y** expresses the newest additive to the equation, being the y in: x + **y** = z. E.g. since $F_4 = 3$: it takes **4** boxes to show 2 + **3** = 5; in $F_6 = 8$: it takes ***six*** F^{2s} to show the Fibonacci equation: 5 + **8** = 13.

Fibonacci 1-D, 2-D, and 3-D all grow sequentially closer to the golden ratio, but never arrive. This means that to make a spiral from the F^{2s} would not honor phi as do the golden triangle and rectangle spirals, but would instead be accurately honoring a Fibonacci spiral, as the golden rectangle and triangle spirals do not.

Compare the following with the chosen repetition of the golden rectangles in Fig.XV.12. In Fig.XV.13, the pattern repeats in a continuous mode, adding squares to the right, then below, and repeat. Going only down and to the right, it does not accommodate marking out the Fibonacci spiral. To create the Fibonacci spiral requires that the new squares be correctly placed in the adapting sequence. There are choices. In the F^{2s} of Fig.XV.14, begin with one square, then one to the right, the larger above, then larger to the left, then below, then right again, etc.

In Fig.XV.15, after the first square go left, then up, then right, then down, then left again, and keep repeating. And there are more options for limited artistic freedom.

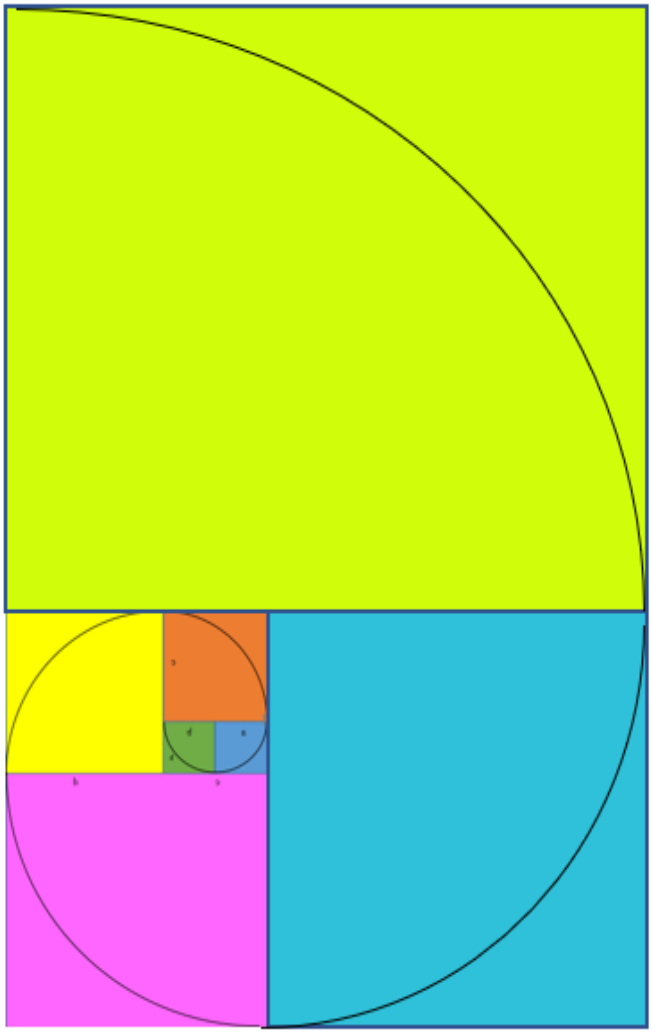
Fig.XV.13 is still only counting the 1-D line edge, not the 2-D area of the square. Compare: $(F\ units)^n$ dimensions for total 1-D length, 2-D area, or 3-D volume:

1-D Fibonacci = $(F\ units)^1 = \{0^1,1^1,1^1,2^1,3^1,5^1,8^1\ldots\}units = \{0, 1, 1, 2, 3, 5, 8, 13, 21\ldots\}units$
2-D Fibonacci = $(F\ units)^2 = \{0^2,1^2,1^2,2^2,3^2,5^2,8^2\ldots\}units^2 = \{0, 1, 1, 4, 9, 25, 64, 169...\}units^2$
3-D Fibonacci = $(F\ units)^3 = \{0^3,1^3,1^3,2^3,3^3,5^3,8^3\ldots\}units^3 = \{0, 1, 1, 8, 27, 125, 512...\}units^3$

The golden rectangle spiral begins with the golden rectangle, whereas the Fibonacci spiral begins with a square. After the beginning placement, both simply add squares. *The beginning makes them different forever after*. The golden spiral accurately demonstrates the

golden mean at each step of the way, but never honors the Fibonacci series. The Fibonacci spiral gets forever closer and closer to the golden mean, never arriving, but is forever accurately honoring the Fibonacci series.

Fig XV.14 Accumulating Fibonacci squares



This diagram satisfies desires for a Fibonacci number foundation in 2-D geometry. The colored Fibonacci squares, F^{2s}, build the pattern: $F_x + F_y = F_z\ldots$ into infinity. Here, from the first small square to the next, then on to larger squares, the spiral shows the counterclockwise growth (Fig.XV.15 is clockwise). The F^{2s} can alternatively be arranged and rearranged as the artist wishes, and the squares can still honor the Fibonacci numbers, though they may not produce a spiral. For example, Fig.XV.13 begins with the first square in the top left corner, the second to the right, the third below, the fourth to the right, then below, then to the right, continuously stepping down and to the right. Imagine or construct this F^2 into F^3: pop up each square into a cube. Arrange the cubes in any pattern desired. The set of cubes is still honoring Fibonacci numbers.

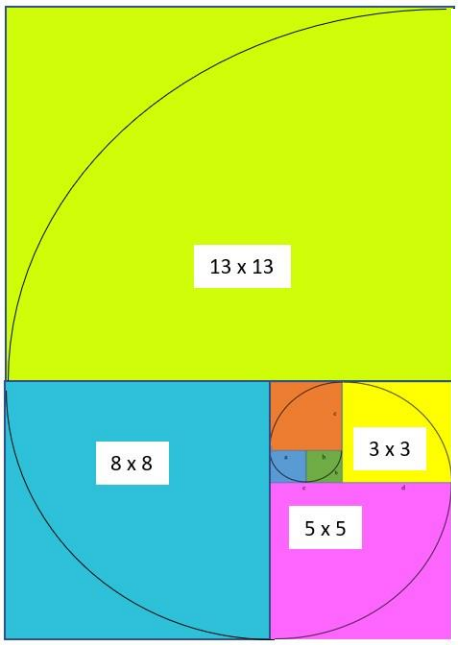
To become acceptable as science, as more than mathematical art, phi and the Fibonacci series need to be precisely exposed within the workings of nature. Laying a Fibonacci or a Golden spiral over one of nature's spiraling seashells is not precise enough. Spirals manifest in a variety of ways. Nature's cumulative growth patterns would need to be shown to be precisely modelling from one or more of the sacred geometry claims. E.g. DNA demonstrates $2\pi/10$ in Fig.XV.8.

Spiraling or zig-zag— rotating or linear—inside or outside—clockwise or counterclockwise— expanding or contracting: arbitrary choices are left up to the artist. If nature does model some things after references of sacred geometry, it is nature that chooses how to lay out the circles, triangles, and rectangles. An acceptable unified field theory needs to uncover and untangle the single cohesion from within nature. History has adhesively compiled the many immature concepts upon incomplete theoretical foundations.

Fibonacci numbers are an infinite subset of a limited quantity of harmonic non-negative integers, H_{IL}: H_F = {0,1,1,2,3,5,8,13…}.Visualize F^{2s} in Figs.XV.13-.14-.15 laid out on unified 2-D non-local 8-space (Figs.VIII.2 & .15).

Fig.XV.15 2-D Fibonacci: math art

2-D Fibonacci sequence = $(\text{F units})^2$ =
$\{0^2, 1^2, 1^2, 2^2, 3^2, 5^2, 8^2, 13^2\ldots\}\text{units}^2 = \{0, 1, 1, 4, 9, 25, 64, 169...\}\text{units}^2$



"Mathematics seems to endow one with something like a new sense." Charles Darwin

"The human mind has first to construct forms, independently, before we can find them in things." Albert Einstein

"In the sciences, the authority of thousands of opinions is not worth as much as one tiny spark of reason in an individual man." Galileo Galilei

"Where there is matter, there is geometry." Johannes Kepler

[The universe] "… cannot be read until we have learnt the language and become familiar with the characters in which it is written. It is written in mathematical language, and the letters are triangles, circles and other geometric figures, without which means it is humanly impossible to comprehend a single word." Galileo Galilei

Note: square measurements in these diagrams are not precise.

Reproducing like rabbits

Leonardo de Pisa, of Italy, known as Fibonacci, traveled to northern Africa and studied mathematics with Muslims. Fibonacci's thought experiment introducing Fibonacci numbers was published in his 1202 book, *Liber Abaci* ("Book of the Abacus"). In the same book, Fibonacci introduced Hindu-Arabic numbers to Europe, including zero, and the decimal number system, all of which the world still uses today.

Thought experiment: Begin the first month with one pair {1} of baby immortal rabbits, which will be able to reproduce after two months, producing a new pair every month. In the second month, there is still just one pair: {1,1}. The first day of the third month, a second pair of rabbits is born, so there are a total of two pairs: {1,1,2}. On the first day of the fourth month, the original pair of rabbits produce a new pair while the first offspring pair are still maturing, making a total of three rabbit pairs living: {1,1,2,3}. On the first day of the fifth month, there are two pairs born from the two pairs that can reproduce, for a total of five living pairs: {1,1,2,3,5}. On the first day of the sixth month, three pairs of baby rabbits are born, making a total of eight pairs living: {1,1,2,3,5,8}. And onward into imaginary Fibonacci infinity: {1,2,3,5,8,13,21…}.

Acharya Pingala first introduced Fibonacci series in India, ~250 BC.

"Mathematics is the language in which God has written the universe." Galileo Galilei

Notice: From this point on, through the art of writing, HUT is introducing God into science and clarifying God for religions. Further more…

XVI UNITE SCIENCE & RELIGION

"Denouncing what he saw as the abandonment of faith in favor of clever argument, [Martin] Luther [1483-1546] called for an end to logic. 'Reason…is the Devil's greatest whore…' Religious sects, germinating across Europe… heartily embraced that rallying cry."
Temperament
Stuart Isacoff

1) Is there a reasonable scientific and experiential solution to heal the schism between the exclusivity of proponents for Godless evolutionary biology verses the various traditional anti-evolution exclusivities with the selected vocabularies of proponents of creation by one Universal Supreme Consciousness, often referred to as God?
2) Can the science term of signal-to-noise ratio be applied to scientific-religious beliefs?
3) What allows our sense of rhythm & time? Is it the universal reference and the alignment of mass with energy through the fundamental tone? Does this unite everything including the merge of science and religion, flesh and spirit, and diversity and unity?

Gödel's Incompleteness Theorem

Religions, like a theory in science, or a new school in art, begin with one person (or maybe more) claiming to be interpreting a Universal Signal. To birth a new religion, the one person's interpretation may impose noise to the original signal, allowing a signal to noise ratio. Then other people learn of this interpretation of the signal, and they too interpret, imposing more noise to the signal, or maybe less. The religion grows with the communication of the new vocabulary. With time, after the exposure of a new interpretation, the quasi-unity surrounding the original signal's inherited noise tends to divide into two or more units, each splintering sect outlining its own signal to noise ratio of a modified proclamation of universal truth.

Science is the modern refining of the truth-signal(s) that we perceive in creation. Words

and numbers accumulate from observations, and with time many people have opportunities to interpret meanings from the data. Science grows from theories into experiments and back to more theories. There comes much error, for the scientific method of trial and error cannot move without errors that we can study, allowing us to see deeper into the spirit of truth—the signal. Science's prime goal is to increase the signal to noise ratio of our understandings.

When science looks at the mind's ability to unify categories into a cohesive whole, the opposite of what the second law of thermodynamics performs through entropy, the tools of perception reflect upon the subject, not just an object. Science's purpose is like its root word meaning: *to know*—to understand nature. The mind is natural, and because we accept this, the mind and its workings deserve to be explained in science. It is the mind that is doing the explaining and understanding, defining, refining, and confusing the sciences, arts, and religions.

To explain unity faces a problem within accepted science: the demand for proof is not logical when discussing unification from only within the unity itself. Gödel's Incompleteness Theorem says that a relatively isolated system can contain truth, but from within that unified system, that truth may not be provable. Extended to the extreme, creation within a unified field would be such an isolated system, therefore a unified field theory may not be provable in the way scientists demand, nor would a unified creation by God be provable enough to satisfy over-demanding proof criteria. Quantum physics teaches us this, replacing proof with a probability spectrum within statistical analysis.

Think of an apple. Being outside of that apple, being separate, we can weigh the apple, measure its dimensions, perform chemical tests, and tally nutritional information. All this can be done only by not being the apple itself. To be objective is to be separate. To be inseparable cannot be completely objective. Without the pure objectivity, objective proof can be evasive, as scientists have found with superstring theory's attempt at unification.

Presently, science has no proof of God's existence, nor proof of God's non-existence. Science, the *knowing*, supports agnosticism, the *not-knowing* about God. Neither faith in One God nor atheism can be supported by our current science paradigm. Valuable experience and perspective are too often ignored and not properly studied in the advancement of science.

Holomind Epiphany

"The most important days of your life are the day you were born and the day you find out why."
Mark Twain

Mind can imagine flying, or a functional alternative, even when confronted with one's physical body falling in the probability field, where flesh is bound to laws of mass and gravity. To unite science and religion is to unite our mind's subjective perspective with our objective vocabulary. This dictates that I objectively describe my subjective experiences—thus forming an anecdotal science proposal. Presently, with science ignoring Gödel's theorem applied to our own unifying and diversifying consciousness, anecdotal science is an oxymoron and ignored.

On October 4, 1982, at Eagle Point on San Juan Island, I experienced a scientific epiphany. Suddenly I found a solution for my search of a scientific model to explain the human conscious experience of unity—unity of God, of mind, of physics and biology, of experiences attained by Christ, by Buddha, by Einstein, and Darwin.

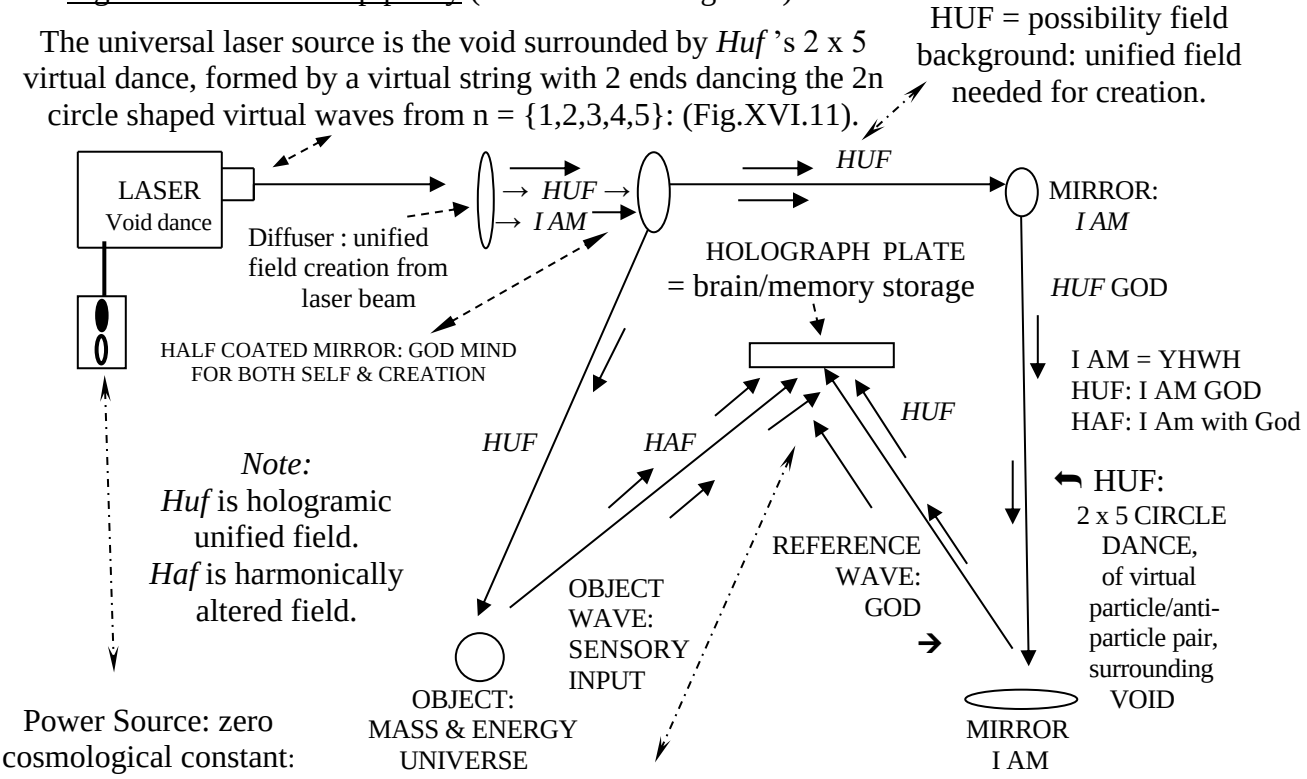
Building up to my personal unification epiphany, I had been focused on and pondering about how throughout history people have had unification epiphanies. Being a common phenomenon through the ages, for me this search qualified as an appropriate scientific question to ask. Unifying is the opposite of falling apart, which the second law of thermodynamics claims all things must do. But living organisms fight that entropy while living. Eating food sustains life

and delays time's influence on the fall into chaos. Sleep, hydrating, breathing, eating, and other animal instincts allow us to avoid falling apart too rapidly. I felt a new paradigm must unite one mind and many onto a single focus that contains all diversity. My sudden epiphany was the synthesis of the zero cosmological constant with holography and harmonics into a unified field theory. The experience was scientific, mathematic, and spiritual. This chapter combines science, religion, and art vocabularies to help express my single 1982 experience of everything-at-once.

The epiphany came with a prelude. On September 10, 1982, I had begun using mass and energy in the equation $E = Mc^2$ as my most basic duality model to understand the mind's two extreme experiences of time: 1) with the clock ticking, verses 2) timelessness. Leading into October 4th, I had already been in awe having learned that if a holographic plate storing an image were to be broken, each part would contain the whole image. I felt this well demonstrated nature's repeating geometry and the cloning of living organisms from single cells containing DNA. The big epiphany came because I sought to understand how the mind merges time and timelessness, and all other dualities and diversities stored as memories while perceiving reduced reality, and synthesizing it all into the unity of experience. Entropy dictates this very improbable.

My God epiphany came from perceiving through the holographic model that God the Reference Wave is the organizing foundation within creation and the diffused cohesive laser light continues unchanged from the beginning all the way to the brain, forming the holomind.

Fig.XVI.1 Holomind epiphany (modified from Fig.IX.1)



Merging HAF & HUF BEFORE hitting the holographic plate, reduced & unified merge, enabling mind & body consciousness. The harmonic mixing requires a fundamental tone: OM JAH AMEN ALLAH YAHWEH.

For humanity to further understand and narrow the schism between science and religion, we need to refine a definition for the idea of God as the silent signal grounding the noise, a signal to noise ratio in in everything, including all the bells and whistles that religions demand must be

attached to God for someone to be "faithful".

The full-blown October 4th evening epiphany came after dark while intermittently contemplating and studying Paul Pietsch's book *Shufflebrain*, specifically the drawing of the holograph, and reading repeatedly his words referring to Brouwer's single point theorem (*HUT* chapter IX). My mind blossomed into the understanding of how a holographic universe works.

This epiphany expanded from the idea that the brain and mind seem able to create and reconstruct multiple layers of hologramic memories. My basic duality transitioned away from using time-full mass as my reference, from holography's *reduced objective side*, being our senses measuring and combining reality with our memories and instincts. I transitioned to using the timeless *reference side*, the unification of original void surrounded by the possibility dance. Refining the definitions of the many reductions, such as the 2 x 5 dance, came with much time.

My chosen vocabulary for that evening's sudden jump in understanding, my Blossoming Wisdom Syndrome, *BLOWS*, is: the synthesis of the zero-cosmological constant with holography and harmonics into a unified field theory. I reached the perspective classified as *metaphysical solipsism*, perceiving everything, even other people, as myself, as I Am—the One Mind God. Today my adapted paradigm has me within a harmonically differentiated probability existence that also remains without differentiation. In flesh's every experienced moment of now, the mind is reduced and unified, within time, and within no-time.

"One God… who is over all and through all and in all." Ephesians 4:6

To remain healthy within this perspective, one must know that every person contains and depends upon the complete totality of the One Mind. *We are* the conscious multi-universe: One Mind made many, remaining One, observing itself, getting lost, finding the One Mind once again, beyond time, yet also within time. This epiphany is sometimes called enlightenment.

Darwin's Focus & Omission: Willpower

"The will to conquer is the first condition of victory." Ferdinand Foch

"I may here premise that I have nothing to do with the origin of mental powers, any more than I have with that of life itself. We are concerned only with the diversities of instinct and other mental facilities in animals of the same class." Charles Darwin, *The Origin of Species*

The most obvious battle between science and religion is between groups referring to themselves as *evolutionists*, claiming Darwin to be their leader, and *creationists*, claiming Christ is their leader. Understanding better both Darwin and Christ can bridge the controversial gap.

Darwin mostly avoids addressing anything about the *source* of the "struggle for life", being the will to survive. He only addresses the patterns occurring in the modification sequences of evolution. The ignored willpower-source is what aims evolution constantly towards perfecting, opposite from the general direction of the entropy of the universe.

The following uncredited quotes are Darwin's words from *The Origin of Species*.

Summary of Darwin's proposal, in his words: "…it is the steady accumulation, through Natural Selection, of such differences, when beneficial to the individual, that gives rise to all the more important modifications of structure, by which the innumerable beings on the face of this earth are enabled to struggle with each other, and the best [are] adapted to survive." Evolution in Darwinian terms is founded on the concept of Natural Selection, also called Survival of the Fittest, being that through competition, all life is subject to the "preservation of favourable variations and the rejections of injurious variations".

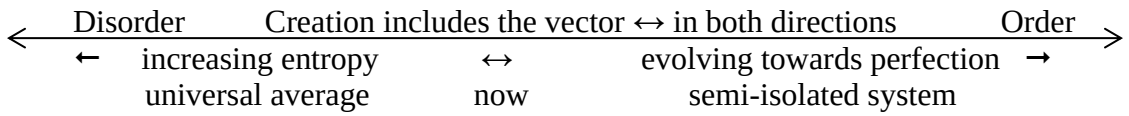
From where within Darwin's work comes the power behind life's evolution? "…nature's power of [natural] selection…results from the struggle for existence ...entailing extinction and divergence of character". This incessant struggle-for-existence confronting all organisms, with or without brains, to increase in numbers depends on an intact *Will to Survive*. To compete for survival and succeed, a plant, animal, or bacteria, must have *willpower* to eat, hide, fight, etc. — "…each organic being is trying to live." Will-to-survive is the cause of "trying".

Generally, apathy about living does not support survival. It only depresses life's functions. If a plant or animal has insufficient *quality* of this will-to-survive, it might not reproduce before dying, making extinction possible — "…the least vigorous… will suffer most."

Like the body it is tied to, life and willpower have remained as a binary character, either on or off, the same from the beginning to the end, for bacteria, a fern, a worm, a human. "…each organic being is striving to increase at a geometrical ratio; … each… has to struggle for life… and … the vigorous, the healthy, and the happy survive and multiply." Here the words "striving" and "struggle for life" represent the willpower necessary to survive and reproduce.

Willpower is the universal force granting individuals the will to survive. This drive is the power behind evolution of cells and consciousness. Willpower opposes thermodynamics' second law, being entropy. Willpower, ever present in life, guides organisms through time's Natural Selection. Entropy does the opposite of evolution (Fig.XVI.2). With evolution's path into complexity, like a human getting better at playing tennis, willpower is constant and is not evolving, being available equally, one constant for all life forms. Each living individual's evolving gifts utilize willpower differently. *The life-force willpower source does not evolve, only the life forms, abilities, and actions do.*

Fig.XVI.2: Entropy vs. Evolution



A system's willpower, like life, is either on or off. The intensity and frequency of willpower can vary among individuals. From flesh, we witness all colors of light traveling through a vacuum at the identical speed of light—but the colors still have different energy values from each other. The equality of willpower and life force distributes among living organisms which can produce strong and weak wills. Willpower energy varies like light's color frequencies, even though like life in living organisms: the light is either on or off. Willpower is a constant in life. The ability to use that willpower constant is what we evolve through time, allowing survival.

Activated human willpower shows as high energy or low. "Indomitable perseverance" and devotion show *strong willpower* on one end, with "careless" *weakly applied willpower* on the other. An individual with poorly focused willpower might remain inactive, might fail to grow more capable. The will to know, the will to survive, the will to grow better and to produce results is key, though the willpower to wait should not be under-estimated, nor over-estimated. Self-tuning of willpower requires choices of proper reference and timing.

God, may "Your kingdom come, your will be done, on earth as it is in heaven" Mathew 6:10

"Then mind and matter shall fuse in perfect harmony. And the reign of
Universal Will shall begin." From movie 'Anna', attributed to Chekhov, Seagull, Act 1

Survival is the goal—continued evolution demands this—a built-in program. Humans experience willpower as desires for nutrition, sex, territory, and predominance —instinctually, analytically, socially, and in dreams. All life forms must *will* themselves and their genes to

survive. All life has this as its basis, right up to consciousness. Bacterium does not have a brain, but it does have the willpower to struggle to survive rather than allowing apathy leading to death. Willpower correlates with the life force, binary in character, on or off. In life systems: it is there. In death of that system: it is gone. *Focused willpower can locally delay entropy*. Only dominant harmonic energy with the right phase relationships and intensity can be added to a system to take advantage of the second law of thermodynamics' statistical averaging. The will to survive, witnessed by Darwin, is life force – is harmony's holographic reference. Is God.

Willpower choosing to survive is the source of harmony, forming ordered dance in the beginning of time, being the fundamental tone. Willpower *is* God, which began the universe by willing the ordered dance out of the void, *the will to know self*, thus sustaining, evolving, living.

Evolution's Aim at Perfection

"In the preservation of favoured individuals and races, during the constantly-recurrent Struggle for Existence, we see the most powerful and ever-acting means of selection."

"…Natural Selection… is a power incessantly ready for action,
and is as immeasurably superior to man's feeble efforts, as the works of Nature are to Art."

Previous to Darwin, religious doctrine had influenced biologists to believe in immutable species. Accepted claims of religions and immutable biology theories taught that God made every form of life complete in itself, as it is, unchangeable, no new species ever possible, and no extinctions. Darwin argued that over time, changes happen naturally. Some changes help the species survive, in which case they reproduce, and the trait change might be inherited by the babies. The non-benefiting trait change does not get reproduced and dies out. Beneficial traits get reproduced. Through time, everything gets better and better, kind of like watching the capitalistic technological evolution of computers, where competition drives the search for ever-increasing efficiency, including quality, speed, and compactness.

Darwin honors the goal of perfection for which he witnesses nature aiming. He does not pretend to be supporting a present state of perfection, for evolution will continue supporting beneficial changes towards the future, therefore attaining higher degrees of perfection.

Collected here are some Darwin quotes from *The Origin of Species* showing Natural Selection constantly aiming at more and more perfection:

"…the process of perfection through Natural Selection"

"…Natural Selection, — a power which acts solely by the preservation
of profitable variations in the struggle for life."

"…by the accumulated effects of this process of Natural Selection,
a perfect so-called flying squirrel was produced."

"…if we know of a long series of gradations in complexity, each good for its possessor, then,
under changing conditions of life, there is no logical impossibility in the acquirement
of any conceivable degree of perfection through Natural Selection."

"The endemic productions of New Zealand, for instance, are perfect one compared with another;
but they are now rapidly yielding before the advancement legions of plants and animals
introduced from Europe. Natural Selection will not produce absolute perfection…"

"For, in the larger country there will have existed more individuals, with more diversified forms,
and the competition will have been severer, and thus the standard of perfection will have been
rendered higher. Natural Selection will not necessarily produce absolute perfection
… as far as we can judge by our limited faculties..."

Darwin again: “Nothing at first can appear more difficult to believe than that the more complex organs and instincts should have been perfected, not by means superior to, though analogous with, human reason, but by the accumulation of innumerable slight variations, each good for the individual possessor.”

Darwin says, “To my mind it accords better with what we know of the laws impressed on matter by the Creator, that the production and extinction of the past and present inhabitants of the world should been due to secondary causes...I view all beings not as special creations, but as the lineal descendants of some few beings which lived long before…And as Natural Selection works solely by and for the good of each being, all corporeal and mental endowments will tend to progress towards perfection.”

The domestication of plants and animals is a limited form of sped-up evolution. The prime drive is not simply the individual’s and species’ willpower to survive, but it is the farmer’s willpower applied to creating a better product. It is the successful husbandry driven by the rancher’s willpower driving toward better animals. Human willpower is applied to *designing* a more-perfect non-human species. In Darwin’s words, regarding domesticated plants and animals, from *The Origin of Species*:

> “… we see in them adaption, not indeed to the animal’s or plant’s own good, but to man’s use or fancy … The great power of this principle of selection is not hypothetical … The key is man’s power of accumulative selection: nature gives successive variations; man adds them up in certain directions useful to him … the inheritance of good and bad qualities is so obvious… every one trying to possess and breed from the best individual … whatever part is most valued … for hardly is anyone so careless as to breed from his worse animals … Not one man in a thousand has accuracy of eye and judgement sufficient to become an eminent breeder. If gifted with these qualities, and he studies his subject for years, and devotes his lifetime to it with indomitable perseverance, he will succeed… up to a standard of perfection … differences being great in external characteristics and relatively so slight in internal parts or organs … indeed he rarely cares for what is internal.”

When manipulating the survival of plants or animals for domestic use, the human will-power to select desired traits of each individual overrides the individual plant or animal’s Natural Selection dance. Willpower is still the driving force, though human desire temporarily becomes more powerful than the organism’s will-to-survive factors driving evolution. Still, humans must wait for a mutation, which they can then choose to select as the survivor, just like the survival of an individual plant or animal in the wild might benefit from a new mutation. In any case, carelessness of the human caretaker, or of the species in the wild, is not as effective as a strong willpower focused through a proper reference to allow survival of the most fit characteristics.

Humans are domesticated animals. With our willpower, we humans are domesticating ourselves. We care for our flesh, hair, and teeth, and witness and propel the evolution of our thoughts, actions, society, and paradigm. We select what nature offers for the mind, such as a new scientific discovery. We hang on to what we like best, and reject what is not appetizing to us. Example: Copernicus, then Bruno, then Galileo pushed humanity to believe in a sun centered solar system rather than an Earth centered universe. First came humanity’s major rejection, but with persistence and time, humanity assimilated the new idea. Centuries pass in this evolution of collective human consciousness. Are we selecting the most appropriate characteristics to continue our survival, or sometimes might it be that important characteristics for human survival are “rejected as faults or deviations from the standard of perfection…”? Evolution of

consciousness occurs when we can most easily recognize beneficial change for our species. Choosing to do so is important. Choosing a proper reference proves to be a priority.

Darwin prophesies about humans acknowledging the evolution of consciousness: “In the distant future I see open fields for far more important researches. Psychology will be based on a new foundation, that of the necessary acquirement of each mental power and capacity by gradation.” Learning takes time. Evolution takes time. Time takes time.

Darwin’s Time Infused Challenges

“…an infinite number of fine transitional forms, which on my theory assuredly have connected all the past and present species of the same group into one long and branching chain of life.”

Darwin claimed time was needed. The church claimed time was not needed, even though John 1:14 says “…the Word became flesh…”. “Became” is a word referring to change occurring with the passing of time, and is interchangeable with “developed into”, “grew into”, “mutated into” or “evolved into”. Darwin claimed species changed, were mutable. The church claimed all plants were made on the third day of creation, then all animals were made during the fifth and sixth days. The claim was that these plants and animals never changed, were immutable—no extinctions and no diversifying of species. Darwin’s church-aligned opponents argued that before 6,000 years ago, there was nothing created at all, while Darwin’s argument was that enough time was required to go by to allow creation’s evolution.

“The mind cannot possibly grasp the full meaning of the term of even a million years; it cannot add up and perceive the full effects of many slight variations, accumulated during an almost infinite number of generations.” Charles Darwin

Darwin said, “Thus we can account for the fact that all organisms, recent and extinct, are included under a few great orders, under still fewer classes, and all in one great natural system.” According to *HUT*, Darwin’s word *system* must adhere to Brouwer’s single point theorem, establishing the foundation of a tonal system, being harmonics. The fundamental tone is the “single point” for the mutating frequencies and their corresponding wavelengths to refer to throughout variation. Absence of a referential fixed point is enough to deny the definition of *system*. If one is to believe that thermodynamics’ second law, being entropy, is foremost everywhere and at all times, then Darwin’s *one great natural system* that we all are part of should only have an infinitesimally small probability of even beginning to come into being, let alone sustaining for a long time. “…all living things and extinct beings are united by complex, radiating, and circuitous lines of affinities into one grand system…” The circle of life is fundamental cause, and entropy is the inevitable effect. Life is the process of it all.

“What can be more curious than that the hand of a man, formed for grasping, that of a mole for digging, the leg of the horse, the paddle of the porpoise, and the wing of the bat should all be constructed on the same pattern, and should include the same bones, in the same relative positions?...We never find, for instance, the bones of the arm and fore arm, or of the thigh and leg transposed…”

Darwin argued against the biologists of his time. “That the geological record is imperfect all will admit; but that it is imperfect to the degree which I require, few will be inclined to admit. If we look to long enough intervals of time, geology plainly declares that all species have changed; and they have changed slowly and in a graduated manner. We clearly see this in the fossil remains from consecutive formations invariably being much more closely related to each other, than are the fossils from formations distant from each other in time.”

To calculate the age of the universe, many famous scientists accepted the Bible as literal fact, that God created animals on the fifth day of creation. Math calculations based on the bible for how much time had passed since nothing existed until their present time were less than eight thousand years old. But Darwin felt those proclamations were not cohesive with reality. The crux was between what Darwin referred to as two separate theories "…of independent creation [of every species, all at the same time] and of descent with modification [time-dependent evolution]." This is not an argument about God, just about human claims regarding time.

The first of the two theories has come to mean that all animals and plants were created in all places during a few days' time, populating the world completely. The creation of life was finished as soon as it began. No time duration is allowed. That theory allows no changes to be needed or allowed in the life forms, no extinctions, no variations from seed or egg, just unchanging perfection from beginning to end. The second theory is Darwin's, that things change through time and the beneficial changes survive and the unsuccessful changes die out, and with more time we get what we see now: plants and animals living and competing in a natural world.

In *The Origin of Species*, Darwin is arguing against independent creation of each species. Darwin asks; then why aren't the created creatures distributed equally? In some isolated places, some critters don't exist. About this, Darwin asks the immutable-theory supporters, "But why, on the theory of creation, they should not have been created there, it would be very difficult to explain." Darwin answers, "Though terrestrial mammals do not occur on oceanic islands, aerial mammals do occur on almost every island…Why, it may be asked, has the supposed creative force produced bats and no other mammals on remote islands?....bats can fly across."

"The most striking and important fact for us in regard to the inhabitants of islands, is their affinity to those of the nearest mainland, without being actually the same species… almost every product of the land and water [of the Galapagos Islands] bears the unmistakable stamp of the American continent… Why should this be so? Why should the species which are supposed to have been created in the Galapagos Archipelago and nowhere else, bear so plain a stamp of affinity to those created in America… it is obvious that the Galapagos Islands would be likely to receive colonists… from America… and that such colonists would be liable to modifications… indeed it is an almost universal rule that the endemic productions of islands are related to those of the nearest continent, or of other near islands… so that the inhabitants of each separate island, though mostly distinct, are related in a incomparably closer degree to each other than to the inhabitants of any other part of the world."

Darwin is attacked for simply believing that "…old forms will be supplanted by new and improved forms." "How inexplicable on the theory of creation is the occasional appearance of stripes on the shoulder and legs of the several species of the horse-genus and their hybrids!"

"On the view of each organic being and each separate organ having been specially created, how utterly inexplicable it is that parts, like teeth in the embryonic calf [of a mysticeti (baleen) whale]… should thus so frequently bear the plain stamp of inutility! Nature may be said to have taken great pains to reveal…her scheme of modification, which it seems that we willfully will to understand…Why, it may be asked, have all the most eminent living naturalists and geologists [leading up to Darwin's time] rejected this view of the mutability of species?...The belief that species were immutable productions was almost unavoidable as long as the history of the world was thought to be of short duration…do they really believe that…certain elemental atoms have been commanded suddenly to flash into living tissues?"

Darwin's 1872 6th edition conclusion: "…probably all the organic beings which have ever lived on this earth have descended from some one primordial form, into which life was first

breathed…Our classifications will come to be…genealogies; and will truly give what may be called the plan of creation…There is grandeur in this view of life, with its several powers, having been originally breathed by the Creator into a few forms or into one; and…from so simple a beginning endless forms most beautiful and most wonderful have been, and are being evolved."

Breathing life into the beginning life-form is Darwin's subtle acceptance of God, even though Darwin stated: "But many naturalists think that something more is meant by the Natural System; they believe that it reveals the plan of the Creator; but unless it be specified whether order in time or space, or what else is meant by the plan of the Creator, it seems to me that nothing is thus added to our knowledge."

Darwin: "To admit this view [of creationism that every species was independently created] is, as it seems to me, to reject a real for an unreal, or at least for an unknown, cause. It makes the works of God a mere mockery and deception; I would almost as soon believe with the old and ignorant cosmologists, that fossil shells had never lived, but had been created in stone so as to mock the shells now living on the sea-shore."

The popular church opinion of Darwin's era adhered to the *immutability of species* vocabulary of the biologists. Darwin helped accelerate the debate over these dueling theories for the last century and a half. On one hand we have mutable species, evolving through Natural Selection, descent with modification, verses, on the other hand, the theory of independent and final creations, supporting immutable species. The debate is really about *time*, required by evolution, genetics, paleontology, and other sciences. A six-thousand-year-old universe requires that we must stop our scientific thinking about any natural processes, even though all evidence says otherwise. No curiosity about the works of time is allowed, just adherence to support old-school doctrine—that God, in the mode of the trickster, put dinosaur fossils in the rocks to fool the people who seek more knowledge than previously understood from the Bible. Adhering to life-without-diversification means that all of today's species of land plants and animals, and human races, are limited to those from Noah's Ark. Meaning: all else is illusion!?

Time is the topic of great controversy. Christians, Jews, and Muslims believe in the first book of the Bible, *Genesis*. They believe in the six days that it took to create the universe, the Earth, and humans, the seventh day being for God to rest. At the beginning of 2024, the Jewish calendar claims 5,784 years since the day of creation. Many people through history, including Johannes Kepler and Isaac Newton, have added the Bible times together to come up with the age of creation, generally calculated to be between five and eight thousand years old. Today, the Young-Earth Christians believe the math of the protestant Irish bishop named James Ussher who in 1650 published *Annales Veteris et Novi Testamenti* where he announced that God began and completed creation in October of 4004 BC. Ussher's followers qualify as a cult.

As a tour guide on San Juan Island, I told of the glaciers melting by ten thousand years ago. At times I had been asked by tourists not to do that since it counters the belief of Ussherites. These Young-Earthers display the belief that God plays the role of the trickster, planting false fossils and false geological clues to lead us astray from the wisdom of Bishop Ussher. A quote from the Bible, *2 Peter 3:8*: "But do not ignore this one fact, beloved, that with the Lord one day is a thousand years, and a thousand years as one day." This math was also in *Psalms 90:4*, "one fact" that Ussher and others have had to dismiss to better justify their beliefs.

At the speed of light, the clock is stopped. From our perspective, if God, the light of man (Proverbs 20:27 & John 1:4), is light unified in void, God, like many equations of physicists, is not restricted by time and has a very different perspective from us time-bound flesh humans. If God reduced God's unity to talk with time-bound humans and dictate the *Genesis* story, the

translators' clarity was limited by their mental synaptic abilities and vocabulary. *Million*, nor *billion*, were even words yet. The word million came later from, *mil y un*, a thousand plus one, the way intellectually evolving humans were able to conceive the next bigger number. To still impose those ancient limitations on today's understandings causes too much confusion.

It was in December 2002 that eight environmental groups sued the federal USA government for failing to list the J, K, and L pods of orca whales as an endangered species. Historically, these whales are summer residents of the waters surrounding the San Juan Islands in Washington State, USA. The government based its defense on a classification made by Carolus (Carl) Linnaeus, the Swedish botanist and originator of our scientific system of taxonomic classification. In 1758, Linnaeus had recognized only one *immutable* orca species on Earth, *Orcinus orca*. It was also Carl Linnaeus, in *Philosophia Botanica*, 1751, who believed, echoing most pre-Darwin biologists, that *all species were immutable*. The USA judged, according to Linnaeus in 1758, that since the worldwide population of orca whales was strong, *and all the same*, then all members of the J, K, and L orca pods could die, be replaced by any other orcas, and not affect the world population detrimentally.

The lawsuit showed that the federal government had also done studies showing that the different groups of orcas won't mate together and have not for so long that their genetics are now different, having evolved separately. Also, their hunting methods and diets are different. Family structure, sex patterns, choice of environments, and dialects are all different. The USA was ordered to reconsider. The J, K, and L pods became the only endangered orca whales on the planet, having been judged as "distinct". Calling them a "new species" or "subspecies" was too controversial to touch for the court of law. Controversy over this orca distinction continues into 2024 as the J, K, and L pods' population has again taken a drastic dive.

This mutable vs. immutable duality has now become the crux of religious and scientific controversy, pitting Christ against Darwin. Darwin was not trying to show that Christ was wrong. Darwin was saying Linnaeus and the other biologists were wrong, and that the church was wrong for believing Linnaeus, and for believing Bishop Ussher. Darwin instead allows that God made lots of time so everything wouldn't happen too fast, or all at once. Darwin rejected, in his own way, that the unchanging universal reference of God was being imposed on the changing aspects of living organisms. Later, this static-verses-changing scientific paradigm debate would be confronted with Einstein's zero cosmological constant, which rejected the accepted paradigm of the unchanging size of the universe (Chapter I).

Chance in Harmony: Post-Darwin Genetics

"…from where we stand, the rain seems random. If we could stand somewhere else, we would see the order in it." *Coyote Waits*, Tony Hellerman

Darwin's work, like Einstein's and Christ's, was, and is, unfinished. The need is to define verbally and mathematically the interplay of *designed laws* and *chance*—being harmony. Natural patterns do not appear through time randomly. Probabilities through time show order, though all *appears* more random in a reduced perspective of time and space. There's more to Darwin's "chance" than is currently accepted, being that harmonic energy overcomes disorder, allowing isolated pockets of reverse entropy, like when the disordered sawdust on a vibrating drumhead resonates into a higher ordered design, Fig.VIII.12, being the lower entropy form. Harmonic progressions with increasing frequencies are shown with 1-D string vibrations, 2-D drumhead harmonics, and in vortexing 3-D fluids. All harmonic progressions show a "4-D" time sequence. These emergent harmonic progressions reveal the *evolution* of patterns.

Darwin found various animal and plant species growing uniquely according to different environmental pressures on different Galapagos Islands. Allowing uniqueness, evolution of life, like snowflakes, the universe, and the Earth, all follow natural harmonic progressions resulting from environmental pressures. Randomness from increasing entropy, being runaway harmonic degeneracy, influences the extremes of variety and differentiation leading to life's adaptation, being the action of assimilation and/or elimination, or extinction.

Designing chance

Here is a comparative study of possibility and probability. Ignoring the slight possibility of landing on its edge, a coin has *two possible* sides to have up, 2/1 being the reciprocal of the "chance" *probability of 1/2* that one or the other side is up.

Before we play the games of chance, first the mind dreams and plans the dice in the possibility field. Next, maybe with pen and paper in the probability field, we *choose to design* dice to be well balanced, with one of the numbers from a limited harmonic sequence, H_{SL} = {1,2,3,4,5,6}, printed on each of one cube's six sides. The harmonic numbers H_{SL} = {1,2,3,4,5,6} are *chosen* to be laid out on each die so that opposite sides add up to seven. Then someone precisely constructs the dice to be balanced and ready for use in the probability field.

Fig.XVI.3: Pair of dice destiny

+	**1**	**2**	**3**	**4**	**5**	**6**
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

The *design pattern* is found in the **momentum** of harmonic unifield's space & time. The *chance* perspective is within the **position** of an isolated moment.

36 *possible* *2-DICE-sums* (6 x 6)

Possible SUM #	**Probable FREQUENCY**
2	1 in 36
3	2 in 36
4	3 in 36
5	4 in 36
6	5 in 36
7	**6 in 36**
8	5 in 36
9	4 in 36
10	3 in 36
11	2 in 36
12	1 in 36
	36 total

***Possible* Outcomes**

What is possible allows what is probable. Harmonic probability field *chance* appears to occur when manifesting just *one instance* of multiple outcome options. But throughout time, those multiple outcome options do not occur by chance: they are each a *designed* part of the harmonic unified field.

11 *possible* sums with *probable* frequency of occurrences

Darwin's own reluctant use of the words *chance* and *accidental* showed he felt that his theory did not properly explain these words at all. Regarding the first appearance of new instincts, Darwin said, "…which at first appeared from what we must in our ignorance call an accident."

When rolling two dice, other than for the sum of seven in Fig. XVI.3, there are *less than* the six possible pair-sums for any number. This makes seven to be the most probable of the possible sums. Six possible numbers on one die times six possible pair-ups with the other die equals 36 possible summed pairs: 6 x 6 = 36. Adding up to seven, the diagonal in Fig.XVI.3

occupies six of the 36 possible pair sums, therefore the probability, or odds, or chance, or frequency, of rolling a seven is: 6/36 = 1/6. In words: the highest probable outcome is that one in every six rolls of the two dice will be a seven. A probable break-even bet would be to bet $1 on the sum of seven with the option of winning $6. A good bet would be to bet $1 to win $7. A bad bet would be betting $1 with the option of winning $5. *An intelligently designed pair of dice needs to be consistent enough to unfold predictable odds in a game of chance.*

The Void has *potential* to design a virtual string with two ends that spin specifically designed circle-patterns out of the many *possibilities*, with the precise phase relationships to keep the two ends from colliding with each other and thus avoiding annihilation. In quantum physics, these two ends, the orbitrons, are accepted as a virtual particle and a virtual anti-particle, connected and in virtual motion. The field of *possible* patterns are reduced in number to allow the dancing virtual string-ends to accumulate enough *potential* to be what science *perceives* as the big bang singularity, manifesting from the designed dance of *possibilities.* The $2n^2$ math from the big bang expansion, into a 3-D spherical shape with time or a 2-D circle, defines the *probability field,* and allows elements to form according to the field's order.

The Void is pure potential: 1) *potentialities* for designing the organized dancing virtual string and the field of 2) *possibilities*, which then transitions into the design of the field of 3) *probabilities*. Once this field of probabilities matures enough, human 4) *perceivabilities* come into being. The design of perception allows us to witness events as a) *destiny*, b) *choice*, and/or c) *chance*, allowing us to perceive unity, dualities, differentiations, and multiple-contrasting perspectives, including determinism verses non-determinism, entanglement, and error.

P_4

1) **Potentiality**: Original Void's ability to produce a *virtual* particle/anti-particle pair
2) **Possibility**: *virtual* 2n dance possibility field, bound by 2-D space without time
3) **Probability**: probability field bound with $2n^2$ within 3-D space plus time
4) **Perceivability**: human mind utilizing potentiality, possibility, and probability
    a. **Destiny**: perceiving a determined and *unified* world timeline
    b. **Choice**: ignorance in the reduced mind allows perceived *options* of movement
    c. **Chance**: in any moment, a perspective that *ignores* destiny and choice

The quasi-perfect dice were not made accidently. The dice design was carefully chosen. The universe is so well designed, beginning with the highest order of all that, with entropy, leads to our creation. In time, a human, with consciousness reduced enough, is able to perceive everything as being from **chance**, but that person's ego must first ignore all the design that came before the chosen perspective of chance could even be an option. There can be no perception of chance without the designed mental and physical universe existing first, just like there is no chance in playing card games without the cards first being pre-designed and created by choice.

Defining the reduced perspectives of *accidental* and *chance* in evolution is important.

Life's design allows chance perspective

"I have hitherto sometimes spoken as if the variations… had been due to chance. This of course, is a wholly incorrect expression, but it serves to acknowledge plainly our ignorance of the cause of each particular variation." Charles Darwin

Since Darwin's death, the science, vocabulary, and math of genetics has evolved humanity's consciousness. In life, each male and female reproductive cell is called a *gamete*. Each gamete carries one set of 23 chromosomes in its nucleus. Male and female sex cells

combine their single sets of chromosomes, their gametes, into a doubled set of 46 chromosomes total. Combining gametes from two parents allows for *genetic variations* in the offspring.

In fertilization, each joining gamete contributes its unique chromosomes carrying their genetic information regarding the number of possible *traits*, here also referred to as trait-dimensions, *n*, to be inherited, such as the *two* traits of height and flesh color: n = 2. The *number* (*n*) of trait-dimensions unfolds as the *harmonic sequence*: n = {1, 2, 3, 4...} = H_S.

When life is conceived with this double set of chromosomes, *each* trait-dimension is one of only 2 units: either *dominant* (capital letter) or *recessive* (lower case letter) [e.g.: Tall (T) or short (t)]. The number of genetic variations possible within any two combined gametes is equal to the number of units, 2, raised to the power of the number of trait-dimensions, n, showing (2^n) as the number of possible *gamete variations* able to be inherited (Figs.XVI.4 & .5).

Fig.XVI.4 uses *n = 2* for the number of trait dimensions, being for height and color. We will use the number of units, being 2, for dominant and recessive, as the base number. Two units to the n^{th} power gives: 2^n, being the number of gamete variations; $2^2 = 4$ (Fig.XVI.5). If we add a third trait, the number of gamete varieties on each axis doubles to: $2^3 = 8$, etc.

Fig.XVI.4 Units & trait-dimensions

2^n:	Constant: only **2** units	Variable: **n** = 2 (or other #) trait-dimensions
	Capital Letter is *Dominant*; lowercase is *recessive*	1) height; 2) flesh color

"an organism hybrid for one trait (Aa) produces two types [2^1] of [gamete variations; Aa & aA];
a dihybrid [2 traits] produces four types [2^2] of [gamete variations], AB, Ab, aB, ab;
a trihybrid [3 traits] produces 8 types* [2^3] of gametes…" *Genetics is Easy*, Goldstein.
[The 8 types* are: ABC, ABc, AbC, Abc, aBC, aBc, abC, abc.]

Fig.XVI.5: Number of traits determines gamete variations

# of traits (dimensions): n = H_S	trait # determines this name	$2^n = H_{BT}$ = # of gamete variations
1	Hybrid	$2^1 = 2$
2	Dihybrid	$2^2 = 4$
3	Trihybrid	$2^3 = 8$
4	Tetrahybrid	$2^4 = 16$
5 …	Pentahybrid ….	$2^5 = 32$ …
40	for example	$2^{40} = 1{,}099{,}511{,}627{,}776$

"Since organisms are actually hybrid for hundreds of different traits, it is evident that the possibilities for genetic variation are practically boundless, and that the combination of genes carried by any particular gamete is entirely dependent on chance."
Genetics is Easy, Philip Goldstein

If you are some kind of offspring of 2 parents that have 40 different genetic traits, 2^{40}, multiply 2 x 2 for 40 times to show the probability of obtaining your personal set of *gamete variations*: one in 1,099,511,627,776 (Fig.XVI.5). Not including identical twins, these are the odds against one of your siblings having the same gamete combination as you. In evolutionary jargon, this is called genetic variability by *chance*. Fig.XVI.6 shows the number of *trait combinations* is equal to the square of this big number of gamete variations.

Fig.XVI.6 shows dihybrid: two traits with two units each (2^2), one dominant (Capital) and one recessive (lower case), making 4 gamete variations—trait #1, height: T = tall & t = short, and trait #2, color: R = red & r = white. The number of trait combination options is $(2^n)^2 = (2^2)^2 = 16$. Trihybrid, 3 traits, gives $(2^3)^2 = 64$ trait combinations. Tetrahybrid, 4 traits, gives: $(2^4)^2 = 256$

trait combinations. With hundreds of traits in an individual, the number of trait combination possibilities is so incredibly high, allowing academically lazy people to mistakenly attribute trait combinations to *chance*.

Fig.XVI.6 Trait combinations

2 *traits* (TR) ↘ in 4 varieties ↓ of *gametes*	$(2^2)^2 = 2^4 = 16$ varieties of *trait combinations* based on gamete varieties			
	TR	Tr	tR	Tr
TR	TTRR	TTRr	TtRR	TtRr
Tr	TTRr	TTrr	TtrR	Ttrr
tR	TtRR	TtRr	ttRR	ttRr
Tr	TtRr	Ttrr	ttRr	Ttrr

In Fig.XVI.6, 16 trait combinations naturally group up in their resulting manifestations. Example: The traits we witness from ttRr are short and Red. Of the 16 possible combinations, only 4 apparent trait combinations show: 9 Tall and Red, 3 Tall and white, 3 short and Red, 1 short and white. This big perspective is not chance—it is harmony.

If, as the theory of evolution and genetics claim, $(2^n)^2$ harmonic ordering dictates genetic diversification, then what we call *chance* is just a limited perspective of the Grand Harmonic Ordering, *Ghord*. Chance is popularly considered the path leading to increasing disorder, while harmony is known as order that can either overcome or increase disorder. We must properly examine these two perspectives of unified harmony and the reduction process of entropy.

The unified perspective includes the harmonic pattern dictating diversifications through time. The reduced perspective views from deep inside the system, a clock ticking in space and time, data gathering, and events documenting. In this reduced human flesh perspective, there can be no proof of the unified system, as Gödel's incompleteness theorem proves. From inside of the unified system, the math is necessarily statistics, probability, and quantum mechanics. Without being able to get outside of the unified system, the unity of that system cannot be proved, only discussed in terms of chance: probabilities. Differently, proof is not a requirement when perceiving from the unified perspective. Chance and proof are inventions of the reduced perspective. From a unified perspective, harmony is in charge. From our reduced perspective inside the evolving tree of unified life, we take our chances. In the big picture, the tree of life is growing exactly how it is supposed to, leaving nothing to chance; all is in harmony as it is meant to be. What is *chance* to one person is *meant-to-be* to another. Point of view is the individual's perspective. Chance is the reduced point of view of the unified perspective of harmony. Darwin published the *Origin of Species* in 1859, and in 1866 Mendel published his own work. When Darwin died on April 19, 1882, the Mendel ratios still would not be recognized for three more decades: *meant-to-be* for a unified point of view, while a reduced perspective calls that *chance*.

In Philip Goldstein's 1947, 1955, 1961 copy of *Genetics is Easy*, on page 117-118 he says, "In many plants, varieties are known where chromosomes run in multiples of some basic number [n]." Fig.XVI.7 shows harmonic relations in comparing chromosome pairs in three

plants Goldstein mentioned. Their varieties correlate to a limited set of numbers of the harmonic sequence in the expression nH_{SL}. Note: though $n = H_S = \{1,2,3,4\ldots\}$, here each plant uses just one value of n, multiplied by a *limited* number of members from within the H_S set: $n\{H_{SL}\}$.

Fig.XVI.7 Chromosome pairs

Varieties of:	# of pairs of chromosomes	$n\{H_{SL}\}$
Jimson weed	12, 18, 24	$6 \times \{2,3,4\} = 6\ H_{SL}$
Wheat	7, 14, 21	$7 \times \{1,2,3\} = 7\ H_{SL}$
Chrysanthemums	9, 18, 27, 36, 45	$9 \times \{1,2,3,4,5\} = 9\ H_{SL}$

Goldstein refers to the three M's, being three guys. Mendel, Morgan, and Muller were post-Darwin and pre-Crick-and-Watson fame. Morgan was Muller's teacher. Muller got a 1946 Nobel Prize for his work on defining genetic mutations. Morgan and his group put together the known facts into the Gene Theory of Heredity. Points 13 and 14 are included here. They crystalize the reduced math perspective of *chance* into biology while ignoring the larger math perspective of *harmony*. This seems to be biology's reduced paradigm perspective ever since. The ignorance: the *chance* perspective is just a mathematically reduced perspective of the larger perspective of *harmony*. Nature's design is not chance, it is simplicity made complex.

Through Morgan's Gene Theory of Hereditary, the word *chance* establishes itself firmly:

13. Chance determines which gametes unite to produce the next generation. Therefore it is chance which determines the recombination of the segregated genes.
14. The chance recombination of genes results in the various Mendelian ratios.

Claiming that "it is chance which determines*"* anything at all is just the ignorance allowed by our very limited perspective. If the chance against any one of us being born to be ourselves is trillions to one, then every one of us has beat all of the odds. If the chance against the big bang beginning a universe that sustains life is trillions to one, then we beat all of the odds. If harmonic definition penetrates this all, maybe it is not really like is claimed in Morgan's number 13. It really seems that *harmony* determines it all, and that the popularly proclaimed *chance* is just the ignorant perspective resulting from ignoring nature's harmony. Like with dice, proper dice design must exist before the game of chance can even be played and perceived.

Regarding DNA's chance of us getting the genes that we each currently have; no tests have been ruled out to prove that natural harmonic vibrations do not bias the results differently than our limited perspective of chance has observed so far. Humans demonstrate this harmonic influence by choosing which species and individuals to domesticate and in what direction. The following quotes are from Philip Goldstein's 1947, 1955, 1961 copy of *Genetics is Easy*:

"Since some of these variations seemed to be more satisfactory than others,
the farmer or herder tried to eliminate those he considered inferior,
while he wanted those with desirable variation to increase."

This talks about the selective breeding of animals. In reading the Old Testament, we find that God, in the same way, had Jews enact genocide on whole races of people—the story of God being the selective breeder. This next *Genetics is Easy* quote reminds me of God the breeder selecting Noah's family genes and wiping out the rest. This is an example of *eugenics*:

"And then he does an important thing. He cuts down every berry plant in the field
except the one or two which he selected."

Eugenics is this pruning out the undesirables. Except for in the Old Testament, mostly this is not morally acceptable when breeding humans. The alternative is *euthenics* (ibid):

"If this were an ideal world, every individual would be provided with the best possible environment to enable him to reach the limit of his hereditary potential. But we do not live in a perfect world, and therefore we have a goal toward which to strive."

"The euthenics program stresses the theory that few human beings ever tap the full potential of their genes, because the environment in which they developed never permitted the maximum level to be reached… Our present hope for making a better human race lies in providing the best possible environment for every individual, in order to bring out the best which is contained in the pool of genes from which each generation of human develops."

"One thing that we have learned is that breeding and selection cannot produce anything new. They can develop new combinations of traits, or they can bring out hidden traits, but they can never produce new traits. This is because selection and breeding can only reshuffle the genes which are already present. No new genes can be created. But we have learned that mutations are always occurring… the pink grapefruit originated as a mutation in a single branch of an ordinary grapefruit tree… However, breeders do not always sit and wait. They may help nature along a little. By using X rays, neutrons, mustard gas, etc., to speed up the rate of mutation… where there are mutations to choose from, there is more apt to be one which is desirable."

Through evolution of consciousness, we manifest our science, art, and religion on Earth. The mind operating within the physical realm is the level at which we work out our own evolutionary patterns through trial and error, seeking survival. Errors are important for evolution, like in the transceiver hunt of Fig.0.1—willpower incessantly doing its job.

Big changes in evolution can seem to occur rapidly, but it's the little changes that build into those big changes. Darwin says, "As Natural Selection acts solely by accumulating slight, successive, favorable variation, it can produce no great or sudden modification; it can act only by very short and slow steps." Like a small stream being blocked by a big temporary dam, for us witnesses and researchers, many small changes may be storing up and not revealing their presence, but then suddenly an event shows all the stored small changes as one big change. The social dam breaks when somebody properly exposes the individual's epiphany-matured-into-theory. The individual's "ah-ha" process and conclusions are exposed to the public for the first time, from the one to the many. Paradigm shifts do occur—in individuals and in society.

Variation contemplations

"…variability from the indirect and the direct action of the conditions of life, and from use and disuse…" Charles Darwin

Holographically speaking, all evolving life on Earth from the beginning to now is a unified living organism, a single system. Every part contains the whole. Since time's beginning, growth stimulus of the Tree of Life, like within all seeds and eggs, or the highly ordered pre-big-bang-singularity, defines initial angles and initial speeds for future unfolding patterns, a potential destiny. To evolve from bacteria to humans can be then seen as having always been the goal, and all other life is part of the necessary package. A common "seed" well explains the convergent evolution of separated species adapting to similar environments, like a bat and a bird, resulting in similar traits of form and function, fulfilling each one's encoded program: "If A happens, then adapt with B". Find the goal and aim for that. Humans experience "programming" as common sense, intuition, premonition, instinct, etc. All stems from the will to survive.

Darwin's evolution simply claims that organisms vary from their family line. In order to survive, the organisms battle with their own ancestors, relatives, separate species, and their

environment. The organisms also try to migrate to new homes, which requires more battles. Darwin claims that the more an organism battles correlates with more variations away from the family line. Spontaneous variations are the wild cards, for without them, Natural Selection has no new tools with which to work, from which arises the rule: use it or lose it.

Change in living situations causes stress which provides stimulation to be more creative and triggers variations to be tested within evolution's survival of the fittest. An organism must adapt to each variation—if it cannot be ignored, then either assimilate it or eliminate it—or die.

Darwin did not use the term *mutate*. Instead, he used the word *variation* for two themes: one for parental combinations, and the other being for spontaneous changes. Darwin made it clear that Natural Selection first required these "spontaneous" variations to have something new to work with. Due to not attaining enough perspective to allow a proper explanation, he remained mostly ignorant of the source(s) of spontaneous changes. Following are *Origin of Species* quotes:

"Although every part of the body varies slightly, it does not follow that
the necessary parts should always vary in the right direction and to the right degree."
"…Natural Selection… taking advantage of all favourable variations…"
"…all tending towards the present perfect plan of construction."
"It appears that I formerly underrated the frequency and value of these latter forms of variation,
as leading to permanent modifications of structure independently of natural selection."
"…the appearance of a moss rose on a common rose, or of a nectarine on a peach tree
—these offer good instances of spontaneous variations."
"Changed conditions…induce…fluctuation variability…"
"The whole organization seems to have become plastic,
and departs in a slight degree from the parental type."
"Our ignorance of the laws of variation is profound.
Not in one case out of a hundred can we assign why this part or that part has varied."
"…so called spontaneous variations…which at first appeared
from what we must in our ignorance call an accident."

Increased environmental pressures or competition increases spontaneous variations. This is like a dimmer switch for a light bulb which increases the electrical resistance in order to dim the lightbulb's intensity. The circuit still releases the same amount of energy current, which is just transformed into something else. As the current is squeezed (increased resistance) the bulb dims, but the harmonics are then instead released as a high-pitched sound, the mutation, the guided variation which people can see but most people do not hear.

"Molecular biologists…can make such [time] estimates because certain parts of the genome
mutate at a more or less constant rate… the 'ticking' of the… molecular clock."
Scientific American, July 2010, Gareth Dyke

The above quote implies evolution is more than random, like, from a averaged point of view, atomic half-life is not random. The ticking clock of evolution is like a seed, or an egg that *with time* can direct an optical nerve in a chick embryo to connect an eye to its brain. Evolution utilizes time to unfold genetic destiny, with essential mutations inevitable. Looking backwards through time at every individual's unfolding genetic information, one moment's genetic history was an earlier moment's genetically attempted destiny. Every part contains the whole.

Calendars & Religion

For adapting to the environment, the recording of history, acknowledging the present, and calculating the future, calendars have been central to art, science, and religions; when to plant,

harvest, to hunt which animals, and follow rituals. Except for longer term calendars which assimilate references outside of our solar system, such as used by Mayans from Central American, most cultures have concerned themselves with Earth's relationship with either the sun or the moon, or an attempt at both, a solar-lunar calendar, as seen in Geosoluna, chapter XIII.

Solar calendar

One solar year is the time it takes the Earth to *revolve* around the sun from position zero relative to the sun, back to the same position. The solar calendar that we all know is the Gregorian. It measures its years with the Earth orbiting the sun from one December solstice to the next, though not acknowledging a solstice for the year's starting date. The Gregorian calendar mostly ignores the moon, even though we have a division called "month", from the same root word as "moon". Precise lunar cycles are not used for actual months. The Gregorian solar year's division into twelve unequal months is only arbitrarily chosen—a year could be just as unnaturally divided into 100 or 4 units, evenly spaced or not.

Gregorian New Year's Day is January first, but that is arbitrarily chosen. We experience seasons because the Earth's axis, around which it *rotates*, is tilted 23.5° from the perpendicular relative to the orbital plane around the sun, Fig.XII.3. The seasonal cycles are punctuated by four solar-geo events: solstice A, equinox A, solstice B, equinox B. One of these four events makes a convenient New Year's Day. Which one is chosen is arbitrary. January first New Year's Day follows about eleven days after northern hemisphere's winter solstice occurring on or near December 21st, being the Geosoluna choice (chapter XIII) for each solar new year's moment.

One solar year lasts 365.242 days. A Geo-day is one rotation of the Earth from position zero with the sun, back to the same position. A solar year that lasts 365 days has .242 days left over each year. After four years this accumulates almost a whole extra day: (.242 days x 4 = .968 days). We experience this as leap year day, February 29, a ***wobble*** inserted *approximately* every four years into our currently used Gregorian calendar.

More than 6,000 years ago, around 4241 BC, the Egyptians had been observing the annual flood cycles of the Nile River. They realized that once a year during this flood, Sirius, the Dog Star, the brightest star seen from the northern hemisphere, rose from the same horizon point as the sun. Disregarding the moon's cycles, they made their calendar to be twelve months of thirty days each, with five days at the end of the year. The New Year began as Sirius rose in alignment with the sun. Much later in Egypt, Julius Caesar borrowed this calendar from Cleopatra and took it for modifying in Rome, resulting in the Julian calendar, named for him. This replaced their previous lunar calendar whose month was divided into three unequal parts: Nones, Ides, and Kalends, which included the dark new moon and is the root word for *calendar*.

Pope Gregory XIII, Vatican leader from 1572 to 1585, learned of the Julian calendar's imprecision. The actual solar year is defined by the time taken for Earth to orbit around the sun; 365 days, 5 hours, 48 minutes, and 46 seconds. At 365 1/4 days, the Julian calendar was too long by 11 minutes and 14 seconds per year. Gregory learned that over the centuries the equinox had slid 10 days away from the appointed 21st day of March. In the year 325, the first council of Nicaea proposed this date as the vernal equinox— also deciding to adopt the doctrine of God the Son for the Catholic Church, leading to the Holy Trinity.

To fix the equinox-slip problem, Pope Gregory XIII introduced the Gregorian calendar, named for him. Folks in Spain and Portugal went to bed on October 4, 1582 and woke up the next morning on October 15, 1582. To reconcile future differences, the Gregorian calendar omits leap year day, February 29, from the years ending in two zeros, except for every fourth hundredth year. For example, in the years 1600 and 2000 we did not omit February 29, but they

will omit it in the year 2100 as they did in 1900. A child born on February 29, 1896 did not properly celebrate a first birthday on February 29th until eight years later.

In 1582, New Year's Day had come on March 25th as it did in previous years. Until this time, the Catholic Church had rejected January first as the first day of the New Year because that date was a Roman choice based on pagan beliefs. The pagan names for days and months are still used in the Gregorian calendar. For 1583, the Pope declared January 1 as New Year's Day.

France, the Netherlands, and Scandinavia adopted the Gregorian calendar in December of 1582. In 1582, protestant England did not want to do the Pope's bidding. People in London woke up to October 5th the same day that citizens of Rome woke up to October 15th. Almost two centuries later, in 1751, the fourth Earl of Chesterfield, Philip Dormer Stanhope, introduced a bill to the English Parliament to adopt the New Style calendar. He avoided calling it Gregorian. In 1752, England, as well as the colonies in America, switched their Old Style calendar to the New Style calendar, thus aligning with the equinox date of the Catholic nations. On September 2, the English and the Americans went to bed and awoke the next morning to September 14. The public protested in the streets of London, yelling, "Give us back our eleven days!" Britain and America also switched their New Year's Day from March 25 to January 1, with some interesting effects on birthday celebrations. For example, George Washington let us believe he was one year and eleven days older than he actually was. After New Year's Day shifted from after George's birthday to before, and adding the eleven days, Washington celebrated his birthday as February 22, 1732, as we do today. But under the Old Style calendar he was born February 11, 1731.

Easter's date is calculated using both sun and moon cycles, and the seven day week. Roman Catholic Easter is celebrated the first Sunday after the first full moon, on or following the vernal equinox. About seventeen weeks each year of the Gregorian calendar are structured around the church holiday of Easter, thus the whole calendar is. According to projectpluto.com, Easter repeats on a cycle of 5.7 million years. Over a 10,000 year period, starting year zero based on Gregorian calendar, Easter falls between March 22 and April 25. April 19 is shown to be the most frequent at 372 times… 372/10,000 = 3.72%.

There are a variety of political and religious reasons for keeping our Gregorian calendar, but not any natural scientific reasons. Changing a society's calendar would be a major paradigm shift. The effect on holidays would be the most offensive change for the people most affected.

Ancient Greeks had no weeks. The French began using a calendar in 1792 with only three weeks per month, called "décades", each of ten-day lengths. Each year they added five or six extra days to keep in alignment with the sun. On January 1, 1873, as Japan once more began the policy of religious tolerance, they accepted the Gregorian calendar. January 31, 1918 skipped to February 14 as Russia adopted the Gregorian calendar. In Greece, people went to bed February 15, 1923 and woke up March 1, 1923. Romania accepted the Gregorian calendar on October 1, 1924. In 1929, the Soviet Union threw off the influence of the Christian world by establishing the Soviet Eternal Calendar with five-day weeks, four of those days being for work. They used six weeks per month, with five or six extra days added each year to align with the sun. June 1940, Russia switched back to Gregorian. In 1949, China adopted the Gregorian calendar. Four countries have not adopted the Gregorian calendar: Ethiopia, Nepal, Iran and Afghanistan.

An efficient solar calendar would include New Year's Day placed arbitrarily upon one solstice or equinox. Gregorian does not do this. In Geosoluna's date reckoning, chapter XIII, the *solar day*, being the number of days since the New Year's Day solstice, is included, unlike in the Gregorian. The *solar year* is also recognized within each day's numerical reckoning, being how

many years that particular calendar has been running since the chosen "Year Zero", as in 2023 years after Christ's approximated birth for the Gregorian, translating to 23 years for Geosoluna.

Lunar calendar

The Gregorian calendar uses the word *month*, which comes from the same root word as *moon*, so naming this Gregorian cycle to be a *month* is an etymological-scientific lie. American Heritage Dictionary's Indo-European Roots section says that month is "…an ancient and universal measure of time, with the celestial body that measures it." The Gregorian calendar has about 30.44 days per month on the average, which is not equal to an average of 29.53 days per lunar cycle ($30.44 \neq 29.53$). A scientifically accurate lunar calendar has each month equal to one lunar cycle, arbitrarily beginning from one phase, like the new moon—called the dark moon in some cultures. Dividing the 29.53-day cycle into four weeks, each week would average 7.3827 days—not possible since we insist that each integral day must count as exactly "one". A lunar cycle is a natural division, a relationship between the Earth, sun, and moon, which does not allow beginning again after an even number of days. The unattainable goal is that each first day of a Geosoluna seven-day week includes one of the four lunar phases: {new moon, 1st quarter moon, full moon, 3rd quarter moon}. Thus, *HUT*'s Geosoluna has some eight-day weeks.

Jews, Chinese, Muslims, Hindus, and other cultures use a variety of lunar calendars that start and end months according to the moon: starting either on the dark moon or more-or-less two days after, from the first visible crescent sliver of the new moon. Since an even number of lunar cycles does not align with Earth's single revolution around the sun, adapt by using the same philosophy as leap year day being added every fourth year. To unite the lunar and solar calendars, Geosoluna requires a new ***wobbles*** compared to Gregorian. To cooperate within both their own and international systems, today's cultures using lunar calendars need both their traditional calendar as well as the Gregorian solar calendar.

Solar-Lunar calendar

Greeks to Babylonians to Jews

Fig.XVI.10: Metonic cycle calendar

year 1	1	2	3	4	5	6	7	8	9	10	11	12		common
year 2	13	14	15	16	17	18	19	20	21	22	23	24		common
year 3	25	26	27	28	29	30	31	32	33	34	35	36	37	leap
year 4	38	39	40	41	42	43	44	45	46	47	48	49		common
year 5	50	51	52	53	54	55	56	57	58	59	60	61		common
year 6	62	63	64	65	66	67	68	69	70	71	72	73	74	leap
year 7	75	76	77	78	79	80	81	82	83	84	85	86		common
year 8	87	88	89	90	91	92	93	94	95	96	97	98	99	leap
year 9	100	101	102	103	104	105	106	107	108	109	110	111		common
year 10	112	113	114	115	116	117	118	119	120	121	122	123		common
year 11	124	125	126	127	128	129	130	131	132	133	134	135	136	leap
year 12	137	138	139	140	141	142	143	144	145	146	147	148		common
year 13	149	150	151	152	153	154	155	156	157	158	159	160		common
year 14	161	162	163	164	165	166	167	168	169	170	171	172	173	leap
year 15	174	175	176	177	178	179	180	181	182	183	184	185		common
year 16	186	187	188	189	190	191	192	193	194	195	196	197		common
year 17	198	199	200	201	202	203	204	205	206	207	208	209	210	leap
year 18	211	212	213	214	215	216	217	218	219	220	221	222		common
year 19	223	224	225	226	227	228	229	230	231	232	233	234	235	leap

Around 432 BC, Babylonians, understanding the solar-lunar dance, but not precisely, adopted the Metonic cycle named for Meton the astronomer from Athens, Greece. This calendar version varied through a 19-year cycle, years with either 12 or 13 months, each starting and finishing on the new moon. Meton chose 19 because approximately every 19 years the winter solstice falls on the full moon. The solar-lunar calendar idea of adding "Nasi", that occasional 13th month, passed between cultures. Jewish culture adopted this 19-year cycle. Of the 19 years, seven years have 13 months, in years 3, 6, 8, 11, 14, 17, 19.

Islam's solar-lunar attempt

After a decade of including the occasional 13th month influenced by the Jews, confusion with Muhammad's Islamic Nasi calendar increased due to no uniformity of understanding when to place the extra months. Muhammad did not know how to fix the Nasi problem, so he avoided

a mathematical solution by proclaiming "The Prohibition of Nasi". He told that God made exactly twelve months per year to be sacred and that anything else is *evil* [*Qur'an* sura 9:36–37]. This condemned the Jewish calendar to being "evil".

In a God centered reality, God creates all of nature. God did *not* create exactly 12.0 lunar cycles per solar cycle for observers on Earth. In this age, we experience an average of 12.37 moon cycles per year, averaging 29.53 days per lunar cycle. The math for disproving the *evil* claim is: $12.0 \neq 12.37$. The .37 in the 12.37 is a bit more than 1/3 of a month (.333…).

"[God] has forbidden you…to tell of God what you know not" *Qur'an* 7:33

"[God] has ordained…the sun and the moon for reckoning." *Qur'an* 6:96

"And God said, 'Let there be lights in the expanse of the heavens to separate the day from the night. And let them be signs for the seasons, and for days and years.'" Genesis 1:14

Hindus use solar and lunar calendars separately

Today, India follows two calendars, one lunar and one solar, being Gregorian. During most years, people get two birthdays: one solar and one lunar.

A historical-fiction book, *The Immortals of Meluha, Shiva Series #1,* tells this OM symbol, **ॐ,** was first used to merge conflicting cultures of solar & lunar calendars: "King Bharat [after conquering most of India] created this symbol of unity between the Suryavanshi [who used a sun calendar] and the Chandravanshi [who used a lunar calendar]."

Vanshi means: "the ancestors of". Surya: the top half of the **3** in ॐ means sun. Chandra, the bottom half of the **3,** means moon. The loop out to the right of the **3** symbolizes "the common path". "The crescent moon … [at the top] of the symbol was the pre-existing Chandravanshi symbol. And the sun above it was the preexisting Suryavanshi symbol."

God is the Circle Dancer

The dance of the virtual particle and anti-particle manifests from the original void. The dance is not yet in the realm of $E = Mc^2$. *Virtual* is best described as a mind construct, as the imagination, the field of possibilities, of a universal mind. The void is *willing* the otherwise chaotic motions into a harmonic dance, requiring the precise possibility spectrum including units of $n = \{1,2,3,4,5\}$. This allows the two points, being the two ends of a single virtual string, to dance as 2n. Once all 2n possibility is manifest as virtual dance, then time and space and $E = Mc^2$ can begin within the field of probability from $2n^2$, where probability $n = H_E = \{1,2,3,4\}$. As the principle quantum number, this $2n^2 = 2H_E^2 = \{2,8,18,32,32,18,8,2\}$ allows the creation of all elements: everything.

In America, we are somewhat aware of the Hindu Lord of the Dance—Shiva. In India, this is known as Nataraja, Fig.XVI.11. This statue dancer is in a pose, a frozen *position* in time rather than as *momentum*. The Nataraja pose is a representation of the 2 x 5 possibility dance coming out of the original void's 2n potential, from possible n values of: $n = \{1,2,3,4,5\}$.

Nataraja is Om, the first creating vibration of the universe—the Word that begins creation with the highest order possible. The original tone, the Word, Name, and Voice of God, is not *yet* a sound. There is no medium to vibrate and no ear to hear that frequency. The math of the Dance is the math of the Word. One circle two circle three circle four… It is the same. Om is the sound of a circle. Nataraja is the dance of the circle. Fundamental. Cyclical. Bringing order and disorder.

The Nataraj statue, Fig.XVI.11, has four arms. Both pairs of arms combine with the same single pair of legs, which has the one foot raised. The two pairs of arms combining with the one pair of legs demonstrate two versions of the *same 2 x 5 dance-of-the-superstring,* where each of the 2 hands *spin* orbitrons through 5 circles each before the cyclical pattern begins again. These two 2 x 5

dances are referred to in *HUT* as “2 x 5 Nataraja Spin” (knee and elbow move together) and “2 x 5 Nataraja Twist” (knee and elbow move opposite). The book cover of *Song and Dance* shows only one pair of arms dancing the “2 x 5 Nataraja Twist”.

Nataraja, the circle dancer

More 2 x 5 dance: book cover art and Figs. XXI.1 & .7 & .11

“…Nataraja, [Shiva] is a dancer, creating and destroying the cosmos with the rhythms of his dance.”
Diane L. Eck; *India, A Social Geography*

Fig.XVI.11 **Lord of the Dance**

“I danced in the morning when the world was begun
I danced in the Moon, and the stars, and the Sun
I came down from Heaven and I danced on Earth
At Bethlehem I had my birth.”

“Dance then, wherever you may be
I am the Lord of the Dance, said He!
And I'll lead you all, wherever you may be
And I'll lead you all in the Dance, said He!”

1967 Christian/Shaker Song by Sydney Carter

Nataraja ⇧ is dancing the 2 x 5 pattern, the dance creating Higgs the possibility field.

With 2 x 5 Twist, the dancer naturally adjusts the spinal column with the self-chiropractic motions as the arms and torso rotate the opposite direction of the crossing raised knee. The statue’s other pair of arms and torso, 2 x 5 Spin, rotate in the same direction as the raised knee, allowing the dancer to rotate the whole body in the same direction, alternating rotations to the left and then to the right while spinning two orbitons in the 2 x 5 pattern. Cloth tai-chi or dance shoes on a polished wood or tile floor grants the dancer low-frictional body rotations.

Superstring theorists ponder six or seven tiny dimensions (Fig.VIII.8) beyond the experienced four: three of space and one of time. What superstring theory refers to as the winding number, *HUT* defines as *a single end of a string, an orbitron, tracing circles*. Fig.XVI.11 shows {1, 2, 3} possible motions of *one string end*; 1 x {1, 2, 3}, spinning the number of circles per cycle in the harmonic dance. A single circle is called "1". The "2" motion is shaped like a figure 8 on its side, the infinity symbol: ∞. In “3”, the right-hand circles once on the right, crossing over and doing 2 circles on the left, and vice versa with the left-hand. Brian Greene’s *The Elegant Universe* shows winding number patterns, which are the same as {1,2,3} circles per cycle.

From the orbitron on one string end, down the string, through the dancer’s arm, heart, out the other arm to the second orbitron—this whole length is representing a theoretical *single one-dimensional superstring* that only exists while in motion. You can experience the single string with a jump rope held in the middle with two separated hands. The gap between the two hands represents the contained void. The jump rope handles are the orbitrons. Spinning 1 circle per cycle with each of 2 hands is called 2 x 1, being 2 (hands) x 1 (circle per cycle). Normal jumping rope is one example of hands moving in the 2 x 1 non-interactive pattern. An interactive 2 x 1 pattern is shown in Fig.III.3.

In the 2 x 2 circles per cycle interactive pattern, there are two different phases of 2 hands doing 2 circles each. One phase example is a jump roper crossing two hands 180º out of phase. This can phase shift to the *chase*, where the orbitrons move 90º out of phase.

When 2 hands perform 3 circles per cycle, 2 x 3, each hand alternates on top; a balance.

More complex patterns follow. When two hands each dance an odd number of circles per cycle, as in 2 x 3 and 2 x 5, the system is balanced, neither hand dominating. With certain even number dances of 2 x 2 and 2 x 4, one hand necessarily dominates. The rotating pattern called 2 x 5, Nataraja, quantified in Fig.XVI.11, contains all the information of all universal patterns. All of creation that will follow occurs with the shift from the 2 x 5 to the 2 x 3 spin.

To do the rotating dance called 2 x 3 spin: 2 x 3 is reversed—rotate the body 180° while keeping the orbitrons circling the same. Then return to the forward motion by rotating the body another 180°in the same direction. But now keep rotating and keep the orbitrons doing the regular 2 x 3 pattern in front of the rotating visual field. One can rotate the whole body rapidly or slowly, *left* or *right*. This 2 x 3 spin is the fundamental dance motion required for creating and re-creating the pre-big bang singularity.

The 2 x 3 spin, the 2 x 5, and all the other options supply patterns to balance all the complex information reductions necessary to organize the universe and form space and time. Due to winding and unwinding, the 2 x 5 satisfies a net 0-spin as the Higgs boson requires when measured as a mass particle in the probability field, but as the possibility field is massless. Equating the already established term "Higgs Field" with the possibility field with the virtual particle-antiparticle 2 x 5 dancing pairs also aligns with the dancing "Nataraj Orbitrons" enclosing the "Nataraj-Void" manifesting the "Nataraj Field".

"Prior" to creation, the potential of the zero-cosmological constant, being the original vacuum energy density, creates a virtual particle/anti-particle pair (two ends of one virtual string-tube), dancing in harmony to avoid contacting each other, and thus avoiding annihilation. The orbitrons' motions allow each superstring its own inherent possibility field, which then creates our experienced physical probability field with mass and energy. A Higgs boson is believed to deteriorate into two photons, the same as a virtual particle and virtual anti-particle will collide and deteriorate into two virtual photons. These events involve the $2H_D$ possibility field which is not yet considered in present-day accepted science. Hindus have long referred to this possibility field as the *Akashic Field*. Einstein avoided the possibility field in the vocabulary of the "ether field" because it had no resistance to the movement of mass or energy. He called it superfluous: flowing above all else. But the ether field is the possibility field that creates the probability field, and when science refers to the Higgs Field, the claim is it is what gives mass its mass.

"The Higgs boson doesn't live very long, quickly decaying into smaller particles like two photons (light particles)." Chelsea Gohd; Feb 11, 2021. In her same article, James Beacham is quoted: "This 'virtual photon,' has a very small non-zero mass, while regular photons are completely massless."

Through college I jumped rope for exercise. After my 1982 holographic epiphany, I felt a need to move in a new way, but I didn't know how. At a 1983 spring festival in Isla Vista, California, I saw a man dancing a pattern with balls on strings. In time I would learn the dance's cultural history includes Maori poi balls, bolos of South American Gauchos, and Philippine stick fighting, all including a special pattern that I named in 1983 as "2 x 3". I next willed myself into the more complex pattern (2 x 5), my own dance evolution that allows me to align my spine. I define this *dance of the superstring* numerically and apply the numbers universally. The balls on strings, orbitrons, are easy to make with only string and cloth, working well to teach translation from possibility to probability, the basic language of statistics within quantum mechanics. While performing the harmonic patterns, the dancer can experience being the maker and sustainer of atoms, and all of creation. Because of this, dancing the dance is good for insights.

In 1990, in the parking lot at the base from where Mt. Baker climbing expeditions begin, Jeff Cain and I slept in his Volkswagen camper van. We were to ski on the glacier in the morning. I slept on the top bunk. Suddenly I woke up from a very dynamic dream. I felt completely deprived of oxygen and I climbed down from the bed, stepped out to the dark night, stared at stars, balancing my breath, heartbeat, and adrenalin surge. The dream and oxygen-deprived awakening was so powerful that I decided that I had to gain the courage to incorporate the dance of superstrings into the writing of my theory.

In the dream, I was the dance of the superstring. I lacked enough differentiation to be able to analyze much, at first, but my mind demanded a perspective. Soon more details became apparent to me. In my dream it was just me, in the void. I was the dance, completely conscious of all the patterns. Yet I looked for my body and it wasn't there. I was pure consciousness, and I was the dance. The dance was the pure consciousness, and I was beginning the universe. I danced into full energy and when I awoke, I maybe had a combination of factors that made me feel oxygen deprivation. I had been living on the island at sea level, so this was an elevation change, though not much compared to the Himalayas, or even the Rocky Mountains. Also, in the dream I was dancing in the void where there is no oxygen, even if in the dream I did not have a body that required the life sustenance. In "reality", I was centered in my dreaming mind, not breathing correctly in my flesh. The dream seemed to affect my ability to survive in the flesh reality. I had to wake up.

The 2 x 5 circle dance surrounding void contains all of the information needed to create the universe. Dancing-void bubbles of the possibility field, seemingly infinite in number to our flesh perspective, are like the universe's 2-D neurons, allowing every point of space and time within the probability field to all communicate with each other. This possibility field transcending into creation's probability field is creation's unified mind: the Hologramic Universal God—*HUG*. This allows all communications, including humans who witness, analyze, synthesize, and document.

In teaching this dance of the superstring, people expect to hear an old-school sounding name. I began using *DoWaLi*: Do = Tao = the Way; Wa = Harmony; Li = Pattern… Japanese for The Way of the Harmonic Pattern. Afterwards I was told the more correct order in Japanese would have been *WaLiDo*, but the name was already in motion. I had also added *Mawaru*: to go in a circle. The teaching became *DoWaLi Mawaru*: The Way of the Harmonic Circle Pattern.

"Dancers are the athletes of God." quote attributed to Einstein

The Word in the Tone: Music & Religion

The Sword in the Stone, the Word in the Tone.
The Sword in the One, the Word in the Stone.
The Sword in the Tone, the Word in the One.

"Such harmony is in immortal souls; But whilst this muddy vesture of decay
Doth grossly close it in, we cannot hear it." William Shakespeare, *The Merchant of Venice*

Accepting the definition that the universal 1-D fundamental tone = ॐ = λ/2, the question must arise about the claim that this mathematical symbol ॐ is the common denominator for all of the confused babel within sciences, arts, and religions. In Hinduism and Buddhism, ॐ Om is also called Aum. This fundamental tone refers to the same universal origin as do the Word and Name of God in so many religions, be that pronounced and spelled as Om, Aum, Amen, Allah, Yahweh, YHWH, Jah, Jehovah, Hallelujah, et al. It is all the same original wave mechanics of a circle, the fundamental harmonic tone—beginning and continuing throughout space and time.

As a circle spins against an external point, or vice versa, every point on the circle resists the same, releasing constant energy. Rubbing the circular rim of a crystal glass with a wet finger

until the vibrating tone emits is demonstrating harmonics: a fundamental tone producing and dominating the sub-dominate overtones. The universe's original circular vibration, which religions refer to as the all-encompassing source, as the Word or Name of God, as the fundamental tone, provides the source of constancy and harmony for beginning, sustaining, and dominating everything. Intonation of the Word, as with a monk chanting the hum of a circle, allows alignment of an individual with the circular fixed-point requirement, and thus with the universal reference, being the Void, being God, no matter which one of God's many Names or Words that one chooses. *God's name is the sound of a circle*, the all-encompassing: *I AM*.

"When He established the heavens, I was there;
when He inscribed a circle on the face of the deep…" Proverbs 8:27

In a variety of ways, both safe and not, a person may slip towards the perspective of a wavefunction of light. Believing their flesh to be light, a person may ignore their body's needs for water, food, sleep, personal obligations, or even abiding by the laws of physics, such as gravity. Enlightenment can be a difficult path, like walking on ice in glass slippers. This all-consuming leap from reduced awareness to unified consciousness, and back into reduced, can happen suddenly, yet assimilation or elimination of the experience takes time. A plethora of vocabularies avail themselves for expressing or suppressing the experiences, though a vocabulary's existence does not guarantee its high signal to noise ratio. Holographic logic dictates: Since every part contains the whole, and the whole contains every part, then every part contains every part.

In a holographic universe, every part contains the whole, thus any physical trigger can be interpreted as being the underlying spiritual cause of the unifying paradigm shift. Anything can seem to be the universal fixed-point, be it a worshipped crystal or one's own body, existing in everything at the same time. Someone may claim their focused-upon fixed point has exclusivity over the universal fixed point. Someone dealing with the unifying shift can have difficulty adapting again to reduced perspectives, as in Mark Vonnegut's book, *Eden Express*, and in Robert Pirsig's, *Zen and the Art of Motorcycle Maintenance*. Forcing an experience of unity on someone who does not care can create an uncomfortable *I Am* feedback loop between the two minds. The imposer might be judged harshly, and the imposer might not have any human support systems.

Ram Das wrote *Be Here Now* about his Unification epiphanies. Unlike Vonnegut and Pirsig, Ram Das was in India in a guru-guided situation. His paradigm shift was into Hindu's spiritually-prepared vocabulary. Ram Das was not such an unprepared pioneer as were Vonnegut and Pirsig with their surprise epiphanies and western vocabularies. *Be Here Now* is a unique guide for someone especially able to assimilate Ram Das' vocabulary of an intellectual westerner indulging in Eastern tradition.

When focused within their internal world of the unifying paradigm shift, humans are also displaying the changes externally, maybe trying to communicate with whatever words are found appropriate in a manic, heightened state of mind. When in the paradigm shift, explaining the natural phenomena behind that experience can feel excessively important. Modern accepted science leaves out this paradigm-shifting phenomenon as nonsense and craziness, but its recurring nature with a common perspective really puts it within reach of the scientific purpose to explain with theory. This next quote, claimed to be from Plato in *The Dialogues of Plato, Volume 2*, describes the paradigm shift, the reoccurring human phenomenon.

> "We say that the one and the many become identified by thought, and that now, as in time past, they run about together, in and out of every word which is uttered, and that this union of them will never cease, and is not now beginning, but is, as I believe, an everlasting quality of thought itself, which never grows old. Any young man, when he first tastes these subtleties, is delighted,

and fancies that he has found a treasure of wisdom: in the first enthusiasm of his joy he leaves no stone, or rather no thought, unturned, now rolling up the many into the one, and kneading them together, now unfolding and dividing them; he puzzles himself first and above all, and then he proceeds to puzzle his neighbors, whether they are older or younger, or of his own age that makes no difference; neither father nor mother does he spare; no human being who has ears is safe from him, hardly even his dog, and a barbarian would have no chance of escaping him, if an interpreter could only be found."

In a One-many Om model, our universe began from timeless Void which produces the dance emitting the wave mechanics of a circle, bringing all the wonders of harmonics that continue to impose order on encroaching disorder. Hindu Nataraja Shivites and Christian Shakers refer to creation's circle dancer as the Lord of the Dance. Time and space began with the circular dance's harmonic vibration being God's hum: The Word or the Name of God. "In the beginning was the Word, and the Word was with God, and the Word was God…All things were made by Him…And the Word became flesh[1]". "Creation by the Word of God expresses God's absolute lordship and prepares for the doctrine of creation out of nothing.[2]"

1 *The New Oxford Annotated Bible* (1977), *John 1:1- 1:14,* NY Oxford University Press
2 *The New Oxford Annotated Bible* (1977), *Genesis 1:3-5,* annotation

"The Way is a void… from which all things come…It is like a preface to God…
Nameless indeed is the source of creation. But things have a mother and she has a name…
Harmony experienced is known as constancy; Constancy experienced is called enlightenment."
Tao Te Ching; 4, 1, & 55

Hindus and Unified God

Hinduism is often seen by outsiders and insiders as a polytheistic religion. Unable to focus on the unification of God, devotees become so entranced by the reductions of God that they may forget the entirety of God, believing that their reduction is the unifying God. This is also witnessed with Catholics and their saints, with sacred geometry enthusiasts' golden reductions, and in so many other situations. Hinduism is still monotheistic when seen clearly, and the One God Mind looks out of all of their gods—with the same One God as Judaism, Christianity, and Islam.

Ancient Hindus introduced a Sanskrit Word, later assimilated by Buddhism, and sometimes spelled AUM: "That Word is OM. That Word is the everlasting Brahman.[1]" Brahman is defined as: "The essential divine reality of the universe; the eternal spirit from which all being originates and to which all returns.[2]" Om…ॐ…"is a combination of three holy sounds 'a' 'u' and 'm' which control the three Super Deities of the Trinity, viz: Brahma, Vishnu, and Mahesh (Shiv)."[3]

1 Mascaro, Juan (translator) (1965), *Upanishads, Katha, part 2*
2 *American Heritage Dictionary* (1980) 3 *Shiv Purana,* Chapter 16, iv; B. K. Chaturvedi

God is Unified Mind of which we are all reduced minds. Collectively, as information-overload increases, our reduced minds become more and more disordered until we re-organize our minds to function best: as sub-functions of the One Mind. It seems that future survival will dictate that all reduced minds must *submit* to its own source, to the One Mind. I believe that, with time, we will all realize that every part contains the whole. The whole God is complete within each one of us, what Hindus call Atman. The One all-encompassing Mind, Para Atman *I AM*, is simply reduced to *I am* ego identification within our individual minds, while also remaining whole as Atman *I Am*. God looks out of the eyes of every human, no matter if people's egos judge each other as good or bad.

Hindus see God everywhere. As the holographic reference wave for all of creation, God is everywhere. Every part contains the whole. *Qur'an* 2:115 supports this: "Whichever way you turn

there is the face of God. He is omnipresent…". And *Qur'an* 6:103: "No mortal eyes can see [God], though [God] sees all eyes."

A Hindu greeting, *Namaste*, means to many; I pray to the entirety of God existing within you and in me, honoring that every part contains the whole, allowing us to be One—if we *choose*.

Traditionally, intonation with the source tone allows alignment of the human mind, body, and society with God. Hindus call this practice *Yoga* – the yoking of our flesh identity with the One Spirit within each of us. Every part contains the whole. Our unified spirit is whole, is God, the Word, I Am, Om, and Atman. Each of our reduced minds within our personal flesh gendered body identifies with this unified *Self* to different degrees. Gender stereotyping confusions, and others, by itself can trap an individual's mind within a dysfunctional duality-reality. With understanding, we can each choose, or not, to live within our individual reductions and collective unity in a way as to best align with the Universal Mind and with our neighbors.

Moses and God

Moses asked for God's name and from the burning bush Moses heard God's answer: "YHWH [translated as *I AM*, the first person *to be* verb]... is my name forever; and thus I am to be remembered throughout all generations." *New Oxford Annotated Bible* (1977), *Exodus 3:14-15*

Around 555 BCE, Jews were freed from their enslavement in Babylon…

> "Following their return from Babylon they [Jews] had adopted the convention that the god who had saved them was so powerful that his name must never be pronounced, nor did they write it, nor refer to in talk among themselves. Their god was simply known by the sacred tetragrammaton YHWH, unpronounceable and unknowable." *The Source*, by James Michener

God's command to remember the *verb* form of the Name is mostly ignored. *Nouns* such as GOD and LORD have been substituted for the verb YHWH: "YHWH...had come to be regarded as too sacred to be pronounced...and is entirely inappropriate for the Universal Faith of the Christian Church.[1]" Declaring God's name as "entirely inappropriate" and "too sacred to be pronounced" is what led the verb form of the Name to be mostly removed from modern translations of the Bible for both Jews and Christians, thus largely from collective memory. This violates the third of God's Ten Commandments: "Don't take God's name in vain". The *I AM* that God commanded to be "remembered throughout all generations" has instead been suppressed. This implicates a huge disrespect and condemnation of God's Will. The Tetragrammaton (4 letters, Hebrew without vowels) name of YHWH as a root word survived as JAH[2], Jehovah[3], Hallelujah, Jonathan, and others. The etymology for the name of *Jesus* roughly translates to: YHWH is salvation. In Luke 1:31, the angel Gabriel orders Mary to name her son as *Jesus*. Why? Because "Jesus" translates to "YHWH is salvation". Jesus' name was intended to be a refreshed reminder of God's command to all generations to remember God's name as YHWH, as I AM, a verb. But so far, a large proportion of humanity has mostly ignored the memo, thus also violating the 3rd commandment.

References for above paragraph

1 *The New Oxford Annotated Bible* (1977), preface
2 *Holy Bible, King James Version* (1977), *Psalms 68:4*
3 *Holy Bible, King James Version* (1977), *Exodus 6:3*

In a 1960 RVR Bible written in Spanish, John 1:1's "the Word" becomes San Juan 1:1, "*el Verbo*"—not "*el Sustantivo*", nor "*la Palabra*". God's name, as God told to Moses, is a verb, and we are all supposed to know this. Forever. Every day. *I AM*… El Verbo. YHWH.

With the YHWH verb form replaced by nouns, misunderstandings have made it more difficult for people to experience *Being One* with God. Many people believe in God mostly

through a person, place, or thing, each represented by nouns. History shows a regular renaming of God, humanity trying to recapture the essence of the universal *to be* verb. With God's Name as a verb, harmonic intonation allows vibrating flesh to bring the heart and mind closer in-phase with the universal tonal center, and thus with God the reference. As priests have realized this power through history, they often made the verb-Word secret, propagating new names for God.

Freemasons, a secret brotherhood often associated with persons of great political and financial power, have their own word for God: "The Word (or Name) is so secret that initiates are taught it one letter at a time. First they learn A, then O, then M, and finally I. The word is IAOM." *Big Secrets*; William Poundstone.

Jesus and God

"He who invokes a blessing on himself in the land shall do so by the God whose name is Amen, and he who utters an oath in the land shall do so by the God of Amen..." --Isaiah 65:16

The Jesus story is of a man who identified himself with the fundamental tone: "The AMEN is Jesus Christ...the beginning of God's creation…That is why we utter AMEN through him, to the glory of God.[1]" "For in Christ lives all the fullness of [YHWH] in a human body."[2] The name Jesus comes from root words meaning "YHWH saves". Jesus became aligned to be humanity's only fundamental tone, el Verbo, though Jesus-in-flesh must give up being the only one in order to offer the source, God, YHWH, to everyone: "When all things are subjected to [God], then the son himself will also be subjected to [God], that God may be everything to everyone.[3]" The single point requirement requires *at least one* point to center the whole system. A circle needs only one point to hold center. But an ellipse, a stretched circle, requires two focus points, thus adding noise to the signal circle. At least one point is required. Centered on one center point, every point of a circle becomes a fundamental tone for the harmonic universe. The AMEN is Jesus. The AMEN is the tonal center. Jesus aligns with AMEN to be the first, then he teaches everybody how, with AMEN, YHWH, etc., to recognize the unified totality of God within themselves. Then the one-point God focus gets spread out in circles, with signal to noise ratios, into a socially unified field: the holograph's laser beam passes through the diffuser. This is the promised future from the Bible: "… that God may be everything to everyone."

"But of that day and hour no one knows, not even the angels of heaven nor the Son, but the Father only."[4] This says the Son is ignorant of God's timing in the plan of the second coming. Jesus only gets to know what God-reference deems necessary at any specific time. This separation counters many Christians' beliefs regarding Christ being God. Jesus remains on God's need-to-know plan. Jesus learned and taught that the Word <u>*became*</u> flesh, that God created Jesus.

1 *The New Oxford Annotated Bible* (1977), *Rev. 3:14,* annotation, *2 Cor. 1:20*
2 *Colossians* 2:9 3 *The New Oxford Annotated Bible* (1977), *1 Cor. 15:28*
4 *The New Oxford Annotated Bible* (1977), *Mathew 24:36*

"For then will I turn to the peoples a pure language, that they may call upon the name of YHWH, to serve YHWH with one consent." Zephaniah 3:9

"No one has ever seen God: the only son, who is in the bosom of the father, he has made him known." John 1:18

Prior to the ten commandments, God's fundamental command within Exodus 3:14-15 is for God to be remembered as a verb. God is too often remembered as a simply a noun— a person, place, or thing—but God the creative force is a verb. *This is a failure of Jewish and Christian religions which needs to be corrected.* It is YHWH's command. It is important.

Muhammad and Allah

Muhammad founded the Islam religion on the Jewish and Christian traditions that believe in YHWH and Amen as names of God. To unite many fragmented religions, Muhammad taught Muslims to address God as Allah, the Arabic translation of the noun "God". The insistence on intoning in Islam allows the name of God to perform as a verb. Sufis, a branch of Islam, have their word: "a man who could repeat the sacred formula correctly [YA HU: a derivative of YHWH] could even walk upon the waves." Shah, Idries (1967), *Tales of the Dervishes*

"The Word of God in the Koran was the only source and vehicle of truth. Scientific thought led to 'loss of belief in the origin of the world and in the Creator.' And so it was that, just when the light of Greek learning was beginning to be carried from Islam to Europe—from circa 1100 onward—Islamic science and medicine came to a standstill and went dead...." Joseph Campbell

Three religions: One God

"There you have three great religions: Judaism, Christianity, and Islam—and because the three of them have three different names for the same biblical god, they can't get on together. They haven't allowed that circle that surrounds them to open. It is a closed circle."
The Power of Myth by Joseph Campbell

"….God….wants all people…to come to a knowledge of the truth." 1 Timothy 3…4…5

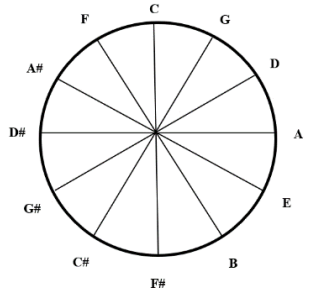
Today, the three major religions following the same God— Judaism, Christianity, Islam, and all their divisions— often fail to agree that they share the same reference. International problems could often be shown to be arising from what comes down to prejudice regarding the spelling and pronunciation of God's name. Harmonious solutions could be agreed upon. Moses, Jesus, and Muhammad taught us about God as a noun, objectively outside of us. Buddha, and also as part of Jesus' teachings, demonstrated and taught us to become subjectively *one* with the God *within* each of us. "…the kingdom of God is within you." *King James Bible, Luke 17:21.*

Truth resonates with that peaceful God Unity residing quietly within each one of us. I believe, and am not required to prove, thanks to Gödel's Incompleteness Theorem, that there is the one God. Before creation, before space and time, God *is* void. Within creation, el Verbo has become flesh and the *I AM* silently peeks out of the eyes of each and every person. God, the universal *I AM*, has created us for God to experience God's own self through our diversity, through our individual *I Am's,* through our own eyes.

Erroneous Circle of Fifths

"In India, Greece, and China, music represented the order of the universe. No Chinese emperor would come to power without making sure that music was in order, because he knew that if music wasn't in order there would be chaos and revolution." Jill Purce

Fig.XVI.12 BE Sharp Not



Chromatic tones are not all harmonic in the just tuning scales popular through Johannes Bach's time. Now the accepted equitempered scale is even less harmonic. People still chose to believe this circle of fifths and its multiplying by the 2/3 ratio is sacred, even though saturated with error and unbalancing in music. In tuning variations in music, the 1/1 ratio is too often forgotten as the fixed reference. Like sacred geometry enthusiasts are lost in the derivatives of the pi/5 ratio, the 2/3 ratio in the circle of fifths loses track of the true tonal center which is the integrity of 1/1.

"And they sang a new song before the throne … No one could learn the song except the 144,000 who had been redeemed from the earth." Revelations 14:3 NIV

Use the music chapter to further understand the numbers shown here:
Chromatics has only seven pitch classes in its octave, represented by letters
in a C major scale: {C, D, E, F, G, A, B}, being a chromatic piano's white keys.
Applying numbers and Latin names to these letters in the C major scale unfolds as:
{C = 1 = do, D = 2 = re, E = 3 = mi, F = 4 = fa, G = 5 = sol, A = 6 = la, B = 7 = ti}
In chromatics C major scale, G is called the "Perfect Fifth" even though this same tone in physics is referred to as the third harmonic, with a frequency of 3 times the fundamental C. The third harmonic G has its vibrational nodes at each 1/3 of the fundamental C's stringlength. Doubling G from 1/3 to 2/3 of the stringlength of C establishes a harmonic ratio 2/3, and this is the source of the circle of fifths. Multiply each tonal ratio by 2/3 to establish the next tone in the circle. Let us begin with F and its chromatic ratio: F = 3/4. To reach C, multiply the 3/4 F ratio by 2/3: 3/4 x 2/3 = 6/12 = 1/2. Doubling 1/2 equals 1/1, showing C to be the only fundamental tone. 1/1 x 2/3 = 2/3 = G, the 2/3 ratio. D is fretted for a string at 4/9: 2/3 x 2/3 = 4/9. After this, the circle of fifths begins to fail. Note: 2/3 = .666… "This calls for wisdom. Let the person who has insight calculate the number of the beast, for it is the number of man. That number is 666." *NIV Revelations 13:18*. This circle here is called BE SHARP NOT because when flat tones are represented only as their equivalent sharp tones, then the B# and the E# do *not* exist.
A chromatic piano's five black keys are: $\{F^{\#}, C^{\#}, G^{\#}, D^{\#}, A^{\#}\} = \{G^{d}, D^{d}, A^{d}, E^{d}, B^{d}\}$.
On chromatic pianos, the white B and E keys are not followed by black sharp keys.
A phrase is used to remember the order of the BE SHARP NOT circle of fifths.
Father Charles Goes Down And Ends Battle: F C G D A E B $F^{\#}$ $C^{\#}$ $G^{\#}$ $D^{\#}$ $A^{\#}$.

OneMany Prophesy… OM…

"The days will come, says the Lord, when I will establish a new covenant… 'I will put my laws into their minds, and write them on their hearts… they shall not teach… saying *Know the Lord,* for all shall know me'" *Hebrews 8:8-11*

Before space and time, all is empty—timeless. There is no $E = Mc^2$ as there is no this, that, or the other things to compare. There is no here nor there, no then, no now. All is Void and silent. Nothing. Not two, not one…None… Only Void. Except… a hint of… the *Will* to … nothing... But that faint hint of Will imagines itself subtly as a point, a moving 0-D point, with nothing to move through, always the same, a hint of a wave…

The constancy of the faintly imagined movement is not enough. The Will wills *to know*… to only glimpse its own space-less and time-less self… Willpower makes the one point into two end points of a single string. God wills the ordered virtual dance. "In the beginning was the Word…" John 1:1. God made manifest as the Word, as the Name of God, is this hum of the Willpower Dance of the Original Void, the Source of All Consciousness. This is the Unity of the Void and it is turning back in on itself to know its Circle Self.

"…and the Word was with God, and the Word was God." John 1:1. This *"with God"* set up mind's basic duality in the beginning. The Void, the source of consciousness, knows not itself so it creates itself as the Word, as the dance. The Word, willed by Itself, manifests itself as more complexity and thus launches into a creation of its own, *with* a creator. This basic unity and duality of being God while also being *with* God forms the unified-reduced duality of consciousness. *"I AM"* has remained void and has also continued to will itself into unity, duality, dancing into creation, spinning into the reduced human perspectives of individuals each claiming *I Am,* each one with a Will to know and to survive.

John 1:1 says that God began everything with the Word, so the question arises: If this Word is the same as the 1/1 fundamental tone of our harmonic universe, then where did that 1/1 come

from? The answer is that a taut string at rest is the zero, like the cosmological constant, and the harmonics are the energy dancing on the previously at-rest-yet-dynamically-potential void.

Universally, the zero is the energy density of the original void, named the zero cosmological constant by Einstein (chapter I). The harmonic universe is played upon that dynamically-potential-void: the 1/1 is played upon the zero. The zero is the void upon which that unified field of the 1/1ॐ energy originates and dances. Holographically speaking: the zero reference intermixes within the harmonically complex object wave, enabled by the yoking of the reference wave through the 1/1ॐ fundamental tone. This is the source of all harmonic diversity, and this reference is why each part of a holographically stored image contains all the information of the whole.

The zero cosmological constant sets the perfect definition of the *universal absolute*, which rules everything in the universe simply by being nothing, the empty void without time or space. The cosmological constant is God as pure potential. The void has the potential to create a virtual particle and a virtual anti-particle partner, "orbitrons", ready for the big dance of all creation— only if that absolute void *Wills* the dance into the sustaining order that allows the start of it all… sustaining our perception of time and space, with all of the mathematics which humans uncover.

The world's three major monotheistic religions all claim the same absolute God, the same original willpower, though they use different names. This potential difference and social pressure of conflicting beliefs about the spelling and pronunciation of God's Name, and who is the prophesized messenger, is still to be released as social voltage. In times of change, people need to know the universal constant. That is the subject of the message that the people of Earth await, in science and religion. Anybody can claim God spoke to them. Anybody can claim anything. Groups of people can follow these claims for many years, or millennia, but that does not make the beliefs or claims true or not true. Time will allow humans to sort out the confusion regarding the signal and the noise. The Void and the Fundamental Tone, the original I AM, the Word, the Dance: these are unified as the clearest universal signal. The fundamental tone, el Verbo, not only grants the clearest signal for creation, it also degenerates throughout creation into natural entropic overtones.

"(Niels) Bohr kept coming back to the different meanings of the word 'I',
the 'I' that acts, the 'I' that thinks, the 'I' that studies itself." Robert Oppenheimer

"Letting down the barriers of rationality, I feel that I can <u>hear</u> Mt. Zion as well as see it...
There is no reason this hill should have a voice, emit a note audible only to a man facing it across
the valley. What is there to communicate?" *To Jerusalem and Back* by Saul Bellow

"The Self is not only the center, but also the whole circumference which embraces
both consciousness and unconsciousness, it is the center of this totality." Carl Jung

"But to reach the chord is our life's hope, and to name the chord is important to some,
So they give it a word, and the word is OM…" *Search for the Lost Chord*, Moody Blues

*"When the Lost Word is written on the mind of man, he is then ready to receive
unimaginable power.* Such was the ancient promise…" *The Lost Symbol*, Dan Brown

"I've heard there was a secret chord that David played, and it pleased the Lord…
the baffled king composing Hallelujah." Leonard Cohen's song lyrics

"In the heart of a universe prolonged along its axis of complexity,
there exists a divine center of convergence. That nothing may be prejudged,
and in order to stress its synthesizing and personalizing function,
let us call it the 'omega point'." *The Future of Man*, Teilard de Chardin

"God is a sphere whose center is everywhere and whose perimeter is nowhere." Voltaire

"Except for the point, the still point, there would be no dance

and there is only the dance." T.S. Eliot

"We dance round in a ring and suppose,
but the Secret sits in the middle and knows." Robert Frost

"...the center of the universe acts on all the rest,
but the rest doesn't react on the center." Albert Einstein

A human social tonal reference is expected by many people on Earth—the prophesied messenger in many traditions with names like: Christ, Messiah, Maitreya, Kalki, Shiva, etc. Any human that becomes a reference for many humans, be that Gandhi, Hitler, or any other, even a teacher in a classroom, that person is attempting, knowingly or not, to establish a tonal center in a tonal system. The prophesies regard a time when a new tonal center is required to bring harmony back to dominate the increasing entropy of societal disintegration. The call is heard by many, heeded by some, a reality for few. In the case of the prophesied Messiah, there can only be one. But many claims must be made. This is the social dance: who is the Messiah, who is the anti-messiah, who are all those people claiming to be the messiah? What messages are they teaching? What fruits are born of these situations? Prophesies anticipate a new social ordering. The sorting that society and individuals must do requires time, mistakes, and big experiences.

Whether a grand messenger comes or not, the belief is present in the collective psyche of humanity. Christ is scheduled for a second coming. The Jewish Messiah must still come since Jews missed-out on believing in the sneak-preview-on-the-cross. Arthur, the once and future king, was prophesied to return again to take up the chalice as one with Christ. All cultures have had their chance to claim their messenger, be he or she true or false or some strange mix of the two. The problems come with two bosses that do not agree. In the social swirl, who is the one human tonal center who is predicted to come?

The end-of-age hero is usually expected to be a one-man messenger that will ground the new social harmonic system. Some traditions call him The Talking Buddha. Islam insists that Muhammad was the last messenger that God will send. Muhammad might have been the last messenger from the line of Ishmael, Abraham's son, the patriarch of the Muslims, but Abraham's other son, Isaac, fathered the generations leading to David. The Messiah for the Jews, the second coming for the Christians, has not come yet, while Islam claims that *God is not allowed* to send that promised person, that Muhammad was the final messenger, the anticipated messiah. Without Muhammad being universally accepted, this means that Islam claims the God of Abraham will not further accommodate prophesies believed by Christians and Jews, even though all three religions share the One God.

"Did God make you such a promise—God will not break his promise—or do you assert about Him what you have no means of knowing?" *Qur'an* 2:80

Shahada: Just God

Islam claims itself to be the sole religion able to deliver God. This is an example of Islam's contradiction, being noise hiding the God signal. Islam has active problems, and these are too easily projected upon non-Muslims. Other problems are just dormant, like sleeping volcanoes. The *Qur'an* invites us to find any dormant and active problems within its pages:

"Will they not ponder on the *Qur'an*? If it had not come from God,
they could have surely found in it many contradictions." *Qur'an* 4:82

"Your people have rejected [The *Qur'an*] although it is the very truth." *Qur'an* 6:66

The angel Gabriel, not God, talked to Muhammad. Just like Gabriel talked to Virgin Mary, and God did not. It was not God that told Abraham to stop the sacrifice of his son, though

it was God that told Abraham first to do it. Yet the *Qur'an* repeatedly claims itself as God's revelation, directly quoting God even though there never was any such quote at all. *Qur'an* 6:14 says "…it is [God] who has revealed the *Qur'an*…" The *Qur'an* lies every time it quotes God, often with the first person *plural* voice: "We", rather than a singular *to be* verb "I Am". Unified God "I Am" creates the reduced "I am" perspective for many, while God remains only One. Muhammad referred to himself and God together as "we", like partners. The *Qur'an* supports this deception continuously. According to Moses, God told us God's name *YHWH* to be remembered throughout all generations: the singular "to be" verb, "I Am", not the plural "we are". For the *Qur'an* to tell us that the words of Gabriel, an angel, are the words of God is not true. Mathematically, Gabriel does not equal God: Gabriel ≠ God. The mathematical truth: *God = God*. Only God is God, and God is the reference within and surrounding all things.

"No mortal to whom God has…endowed with… prophethood…would…
enjoin you to serve the angels…as your gods…" *Qur'an* 3:79-80

The universal holographic reference, being the void sustaining the fundamental tone, is God. Monotheistic religions know this intuitively, and try to maintain this, claiming to want to eliminate dilution and pollution from minds and hearts. All intuition and prophecy have inherent signal to noise ratio. We are in an age where the noise is threatening to dominate the signal.

The Catholic Church claims that Jesus once represented God on Earth, but now the Pope is God's representative here. This was a problem for the beginning of Islam. Islam knows that Allah is all One: *La ilaha illa Allah*, translated as, *There is no god but God*. And, *Qur'an* 5:72 makes it clear: "God has no partner". This *Qur'an* entry was a reaction to Christians requiring Christ as a partner god for the One God "who art in heaven".

Qur'an sura 3:85 says that one who does not join the religion of Islam is not acceptable to God. "The only true faith in God's sight is Islam." *Qur'an* 3:19. "Islam" literally means to *submit* oneself to God. It is accepted in all monotheistic religions that if one does not submit to God, God cannot accept that one. Only God knows whose submission is True or perverted.

If a religion's noise messes with the signal too much, submitting to the organized religion is not going to satisfy the single point requirement. God is the point. The easy solution is that Islamic leaders focus the Muslims on accepting the etymology of the word *Islam*: that *submission* to God is the only way to be accepted by God. No specific religion is required by God, just the individual's submission to God. That is the true meaning of the word Islam.

As soon as Muhammad died, Islam divided into disagreeing sects: Shi'ites and Sunnis. *Qur'an* 6:159: "Have nothing to do with those who have split up their religion into sects." As Islam is, everyone is required to choose to submit to not Just God, but also to the religion of Islam, to the *Qur'an*, and to Muhammad. This allows real problems to arise, as we witness today.

The requirement to join Islam is sincere recitation of the first and second "shahada". The first shahada is belief in God's unity: *La ilaha illa Allah*, translated as: *There is no god but God*. The second is: *Muhammadur rasoolu Allah*, translated as *Muhammad is the prophet of God*.

The problem comes with the second shahada. It is contrary to the "God has no partner" clause in *Qur'an* 5:72. The Islam religion will not initiate someone who only recites the first shahada, simply claiming faith in Just God. To join, Islam demands each person accepts not only Allah, but also a dead human partner for God, being Muhammad. For Islam: "Just God" is not enough. Islam claims that Muhammad is not God's partner, but still: Just God is not enough to join the religion, to submit to and be acceptable by God. "As for those that disbelieve in God and his apostle, We have prepared a blazing fire for the unbelievers" *Qur'an* 48:13. Who is the "We" referring to as speaking in the first person plural? If it is God, why would God choose to confuse

the name that God told Moses, that God is to always be remembered as the singular "I Am". "We" implies God needs partners, which the Quaran denies. Belief in *just God* is not enough to be Muslim, to join Islam. One must submit to Muhammad and the authors of the Quran as well, making unified God into the reduced version of "We", negating God's own will to be "I AM".

Qur'an 3:85, about being condemned for not joining Islam, and 5:72, about not including any partner with God, combined with the Islamic requirement of the second shahada which requires submitting to Muhammad as a partner with God to join Islam, these things together condemn all humans to hell. Since one cannot submit completely to God without submitting to Muhammad also, Islam presents a damned-if-you-do and damned-if-you-don't situation. One simple solution is to not require the second (nor a third) shahada to join the religion: God without any partner is enough. To be initiated into Islam, Shi'ite Muslims are also required to submit by including a third shahada, making Ali the Wali of Allah. This initiation ceremony makes one more partner of God. Ali, the Fourth Muslim caliph, was the cousin and son-in-law of Muhammad, regarded by the Shi'ites as the first Imam and rightful heir of Muhammad. The reality: God is enough. Many people who claim they point at God might bring wisdom and/or confusion regarding God, but only God is the clear signal.

In Jerusalem, inside the Dome of the Rock, is an inscription of "early sentiments" of shahada: "There is no god but God alone, He has no partner with him." Just God.

Muslims in the Islam religion can still honor their human hero, but holographic science says they cannot justifiably require everyone on Earth to use Muhammad as the fundamental tone. God-the-reference does have a fundamental tone manifesting on many levels, and all frequencies of each level vary together harmonically because of that tone's perfect relationship with God. Om, Jah, Amen, Allah, Yahweh. These God names are all acceptable high signal-to-noise ratio tonal centers for all of humanity and life and creation. Muhammad is not.

This prioritizing-of-Muhammad problem then gets extended in Islam, which claims he was the one grand finale of God's messengers, the messiah, negating the possibility of God sending any further messengers. Islam is dictating what God can and cannot do, dictating which rulings regarding God-the-reference to which all humans must submit. Understanding this religious contradiction will inevitably cause a re-thinking among Muslims about Islam, and the change in individuals will trigger an internal Islamic revolutionary cleansing to: Just God.

Two solutions: Muslims choosing to get along with God and humanity could: 1) let Just God be enough, by having initiations require only the first shahada, as worded in *Qur'an* 4:36, "Serve God and associate none with Him." And 2) let Just God decide who has faith and who is an infidel, as in *Qur'an* 6:57: "Judgement is for God only." Just God.

"Believers, Jews, Christians, and Sabeans—whoever believes in God and the Last Day and does what is right…have nothing to fear or regret." *Qur'an* 2:63

Dancing dualities of a gullible & skeptical mind

skep·ti·cal adjective not easily convinced; having doubts or reservations.
gul·li·ble adjective easily convinced; having few or no doubts or reservations.

"Most people like to believe something is or is not true. Great scientists tolerate ambiguity very well. They believe the theory enough to go ahead; they doubt it enough to notice the errors and faults so they can step forward and create the new replacement theory. If you believe too much you'll never notice the flaws; if you doubt too much you won't get started. It requires a lovely balance." — Richard Hamming

HUT addresses dualities and demonstrates the unity comprising both. The list of dualities seems to be reaching out towards infinity: hot and cold, man and woman, mass and energy,

quantum and relative, yin and yang, sweet and sour… Harmony unites everything. That is the unifying solution according to *HUT*. The reader might be too skeptical, too gullible, or undecided and sitting on the fence. The uncaring reader of *HUT* is unlikely as they would find no reason to spend energy to read such a theoretical proposal, choosing ignorance of *HUT* instead.

One duality that a person faces while making any judgment at all about *HUT*, whether acknowledging it or not, is the duality of their own skeptical and gullible tendencies, based on their pre-judgements—their prejudices—established by surviving in life so far. We are all subject to this duality when judging any situation. We are all survivors, adapting daily.

"It is difficult to know how to treat the errors of the age. If a man oppose them, he stands alone; if he surrender to them, they bring him neither joy nor credit." Johann Wolfgang von Goethe

When learning about the unity of the dualities, each person is subjected to their personalized gullibility and skepticism. If one learns enough and transcends a barrier in learning, establishing new neural patterns—synaptic networks—then suddenly, if not remaining calm, the paradigm shifter can become manic in the newness, their excitement unbalancing their previous balance between gullibility and skepticism. A manic person confronting universal unity naturally experiences the need to share their new idea. Even as they speak, especially because they speak, new connections, which have not yet been given time to understand, are being made in each moment—right or wrong. The skeptical-gullible balance can go on a roller coaster ride. Witnesses can become uncomfortable. Ram Das in *Be Here Now* on page 97 told it this way:

"Watch it! But at first when you see—you want to run down the streets shouting—spreading the good news—run down the aisles of churches yelling: listen to those words your singing!! It's really here! They're all true! ou're singing about it all 'Just like the book says'! Don't be psychotic: Watch it. Watch it. ॐ"

The mix-up with previously quasi-balanced gullibility and skepticism comes from experiencing the new bigger vision of creation. A leap of faith occurs over previous chasms of disbelief, misunderstanding, and of just not knowing—agnosticism and ignorance. This is not only about the new arranging perspectives in one's personal paradigm, but is also due to leaping more into the light perspective, allowing the shift away from being so stuck in time and space. To envision mentally and emotionally an event like the end of the world, one looks down the tunnel of time. But at the speed of light, the direction the light travels is reduced to zero, and the time-tunnel is reduced to no distance and no time at all. The experience of enlightenment and looking down the tunnel, then returning to reduced perspective of time and space, the timeless-distanceless tunnel that one looked into can suddenly be seen as here and now… the distance and time reduced into the fleshly now. A person can panic, believing the "end" is now, or whenever they arbitrarily choose it to be. Calming is key… then, like a functioning heart, the work proceeds with the harmonic combination of exertion and rest, of activation and de-activation.

"I was thrilled to be picking up so much so fast, but always in the back of my mind was the ominous: Something's trying to fill me in on everything at once. There must not be much time." *The Eden Express,* Mark Vonnegut.

For the initiation into Unity, the mind's new reality is forming, and the gullible/skeptical duality is getting mixed up while making personal judgments. One can believe it will be simple to show the same vision RIGHT NOW to anybody. Recently after its inception, sharing a really big new idea does not work that way. Everybody evolves at their own rate and within their own definition of safety. To have the desire to shift oneself into a new paradigm does not guarantee that the one desiring has the proper preparation to help another person shift safely.

To choose to force the beginning of a paradigm shift, such as in joining a cult, one hopefully learns there are false starts, false teachers, and falsely claimed truths. Many people claim to have the Earth-shattering idea to share, but there are few Einsteins, Darwins, Buddhas, Christs, or Muhammads that pass the tests of time, be they correct or not.

The truth must be in the message. For the message to successfully transfer perceived truth to somebody else, the message must be first mentally digested by the messenger: alone, no matter how many people apply pressure to change in whatever direction. But who decides truth? Even if there exists universal truth, such as we believe that oxygen is necessary for a human to survive, the dance of gullibility and skepticism in every individual's mind decides the personal truth. Someone is free to decide that their body does not require oxygen to survive, but physical reality does not necessarily yield to one's imagination. It is that mental dance which establishes any balance between fantasy and reality for each person, the shifting of the signal-to-noise ratio… right up to and into the moment of death.

On page 98 in *Be Here Now*, Ram Das tells about people experiencing the unity, people who do not ride through calmly and who lack a dominating humility:

"…what happens is they go on a huge ego trip and it's called the messianic complex…"

Walking in messiah shoes

"Aristotle says in the book of secrets that communicating too many arcana of nature and art breaks a celestial seal... which does not mean that secrets must not be revealed, but that the learned must decide when and how." Umberto Eco, *The Name of the Rose*

Christ and Buddha each had a messiah complex. The believers in Christ and Buddha qualify as cults, by definition. What is the messiah complex? How does it begin? How does one live with it, within their own self or in dealing with another person? When a person slips into the perspective of Unity, one path this person might take is very personal. Since, holographicaly speaking, every part contains the whole, then the one *I Am Willpower* that started the whole thing is the same *I Am* in every individual. Because of this, many people can perceive themselves as God and/or the messenger.

"Distinguished men of God throughout the centuries have found multiple applications of the prophetic message of the Word of God." Russell Martin Stendal, 1996

Once in this messiah complex perspective, it is difficult to ignore. Some people get put on medication which allows continued ignorance of the process of unification. Another path is to accept the personal paradigm shift and just make do. The messiah complex can take on many forms; the popular one would be to be Jesus, the second coming. Other *complexites* may focus on themselves as the Jewish Messiah, the Maitreya Buddha prophesied to come, or as Kalki, the future avatar of Vishnu, who like Shiva, is an end-of-times person prophesied by Hindus. Whatever the individual's belief spectrum includes; their path is being walked. The unifying experience can be neatly and discreetly categorized, like through medication, or accepting a guru, teacher, or church, thus externalizing the *I Am* God, to be "with" God rather than needing to be God, which might allow time and focus to mature enough to internalize God, an option designed for humans from the beginning.

The initiation into the messiah club is often rapid and can be triggered by reasoning, meditation, an illness, an accident, drugs, depression, a manic event, or being overwhelmed by coincidences and/or information overload. A messiah complex occurs with the experience of Void and Unity followed by the creation of a grander story for one's physical self, a story able to contain the Unity experience. Just like a well-formed science theory, a well-designed messiah complex allows one to process and assimilate all of the epiphanies occurring. At the grandest level is *metaphysical solipsism*, the extreme perspective of the paradigm shift from one's reduced perspectives to becoming Unified within the individual's own God-self, where only *I Am* exists,

and nothing else. The material world, other people, one's own body, everything, is viewed by the individual experiencing this universal unity perspective as being only within the reductions of the Unified Mind. It is all one big imagination, and we are all the image in the One Mind of God.

With time, the epiphany student needs to realize that reduced truth has a signal to noise ratio involved, and as in a beautiful garden, some weeds need to be removed. The right combination of gullibility and skepticism is needed for personal research, trials, and errors to break through to more comfortable beliefs. To be stuck in the Void as the only *I Am*, believing all other humans are just within one's imagination, regardless of being right or wrong, does not win many friends or supporters, unless a cult begins, which then also becomes messy.

The experience of Unity occurs in common, smaller ways, as when people say, with conviction, "It's all good…" This externalized simplification is not permanent though because problems occur in the reduced flesh world and must be dealt with to regain the good attitude.

To survive criticism, the *messianic complexites* need to realize that mostly nobody cares, nobody wants to know the message, nobody is convincible, any step one takes might get one in trouble, and any word can trigger a cascade of social interruptions. Integrity of the individual is really the only survival technique, necessitating mental, physical, and spiritual exercises to allow self-evolution of consciousness. Since every part contains the whole, anybody could potentially slip into the same Unity perspective, though unique to the individual. To be *the* messenger, there needs to be a message. My message is: to survive the blossoming wisdom syndrome and whatever follows, like a messiah complex, a person needs to learn how to focus with and/or within the silent and invisible One and only God, with whatever vocabulary that properly gets one there. *Problem and solution are the same: every part contains the whole*. And every part has a tonal reference allowing variance.

Jesus would slip into Unity perspective with God, but he also became reduced, needing to ground himself as an individual human. These quotes show a fleshly Jesus separate from God:

"Father, if you are willing, remove this cup from me.
Nevertheless, not my will, but yours, be done." Luke 22:42

"No one knows about that day or hour, not even the angels in heaven, nor the Son,
but only the Father." Mathew 24:36 Mark 13:32

"Jesus said to him, 'Why do you call me good? No one is good except God alone.'" Mark 10:18

"My God, my God, why have you forsaken me?" Mathew 27:46

"Our Father who art in heaven, Hallowed be thy name…Amen." Mathew 6:9-13

By saying "Our Father", Jesus gives gender to the non-gendered God, teaching gender duality for the unity of God. To fully honor unified God does not require reducing God into one gender or another. According to the Bible though, Jesus did not believe he was born from a flesh father, so the Son is excused, though excessive genderizing of God causes human imbalance.

"the moment of the outbreak of neurosis…is usually *the moment when a new psychological adjustment, that is, a new adaption, is demanded…* Here let me point out that no living creature adjusts itself easily and smoothly to new conditions. The law of inertia is valid everywhere."
Carl Jung

"God is as the wind, which touches everything..." - movie: *The Boy Who Harnessed the Wind*

Every part of the universe contains the unified God reference. With our I Am consciousness and our body also containing the whole reference, the human body is considered God's temple. "Do you not know that you are God's temple and that God's Spirit dwells in you?" 1 Corinthians 3:16-17, and 6:19-20.

Finding oneself experiencing a turbulent reduction coming out of a unification epiphany,

it may be best to contemplate quietly and calmly the source of this inner wind, being the movement of energy within the body and mind, air in breathing, electricity in brain and nervous system, light in DNA, blood in the veins, flowing peptides, water, sound pressure waves rolling through cellular microtubules, electrons orbiting atomic nuclei, thoughts returning to the beginning. Only undisturbed void reveals no motion. From void-will-power begins an imaginary 0-D point, willing itself to stretch into a 1-D string-line with the two ends dancing. This organized dance is the Word source, the fundamental tone beginning time, space, and $E = Mc^2$ in our harmonic every-part-contains-the-whole universe. The unified field theory is the synthesis of the zero cosmological constant with holography and harmonics. It is all in our One mind and includes everything we "see" as "outside" of our ego-reduced mind. This time-full and timeless duality and the resulting diversity is what one must reconcile after experiencing indivisible Unity. From within silence and upon a blank page comes the spoken and written Word, which with time and editing might communicate well a refined signal to noise ratio of the relationship between God and creation.

I am able to admit to my own messiah complex because I know that (in Yoda syntax):

A MESSIAH COMPLEX DOES NOT THE MESSIAH ONE MAKE

Being so familiar with the subjective perspective or the unity experience, I am motivated, even obliged to seek objective vocabulary. It does not matter whether I am the Messiah or not. My personal balance is what is important for me to maintain. My life work is the same either way. For me it is most important to not have continuously degenerating fear of whatever may be. In order to do what I must do, first I must know that I do not know what to do. It is easier for me to survive and adapt to each moment by admitting to myself, and sometimes to others, what is my messiah complex perspective. This is my way of taking charge of my own well-being. It is my belief that I have a mission to share my *HUT* with the whole world, as is required to reconstruct the hologramic understanding of the God reference, and the Word tonal center, as the new paradigm. I also believe I do not know if I will ever be able to share my "theory".

My experience on October 4, 1982 was a logical union of my own diverse perspectives. On October 6, 1982, I looked at myself in my new paradigm. If I were to be the bringer of the Word into science, that would make me important on a world scale. I would be helping to heal the rift between God and humanity. This sudden adoption of the messiah complex came from a scientific understanding of unity and the strong need to share. And this realization shifted my perspective further into unity. I knew my life would no longer be the same. In taking claim of my personal messiah complex, I can also understand how ridiculous this can seem.

To be successful in sharing my theory, the paying attention to my *HUT* would need to be within the choice spectrum of others. Upon properly having my work available to the world, that would be the end of my self-perceived messiah-complex job. It served me as a motivator. After that, only other people would have to deal with unraveling or ignoring or fighting the new theory with their own synapses. Whether or not the theory would propagate a planetary paradigm shift would be out of my hands. I would still be me and have to deal with the ripple effects caused by my sharing. But that would be just me, with no real or imagined goal on the level of which I have had to deal with during these past four^{+} decades. Other people would have to deal with their own sudden messiah complexes, and/or witnessing the sudden unity experiences of others. I would be free, like having had a disease and then being immune, because my body and mind already dealt with the sudden shift and long process of assimilation and/or elimination of new and old perspectives. I have prepared myself to help people with that, on a larger scale than I have been, discussing with individuals their own curiosities and unity experiences.

The key to what I see has been healthy adapting, and will be into the future, is the choice of reference. My perspective of science all points at God as the reference, the One God that allows all harmonic diversification. It is the reductive definition of God that is so very important for our analyzing and synthesizing minds to understand. The name of God presently is very confused on this planet, causing mental imbalances, personal and social. Proper wording and numbers are essential for communicating these ideas about God. It is a signal to noise ratio thing. The pure signal is God, which I believe we can best rationalize as the original void with its inherent willpower to dance and sing and manifest recognizable harmony.

In the flesh, the strong path to walk is that of integrity. Whether a person with a messiah complex is the Messiah or not, their path of integrity can unify their loss of clarity when confronting the confusions of swirling dualities. For me, my perceived job is to deliver to the world, or at least try, the unified field theory that I perceive as the Word of God. My messiah complex manifests as me perceiving myself as the Messiah of the Unified Field Theory: *MUFT* – "that God may be everything to everyone" (*1 Cor. 15:28)*. It is my thing. I've got a life. I am continuously dealing with that once-upon-a-time sudden belief that initiated me on this path. At first, with no how-to manual available, and my family and friends discrediting me for having had my subjective and objective experiences, my immediate default setting could have become: *PESD* — Post Enlightenment Stress Disorder. I rejected the destructive stress, and while still accepting entropy, I did not accept disorder's dominance over my chosen integrity path, so I transformed myself. My evolution has been instead to bring all my experiences and research into objective order grounded in subjective I AM. Sharing subjective stories can frighten people who lack receptibility, and this can become uncomfortable for all. Through the self-balancing act of assimilation and/or elimination, adaptation to integrity is possible, allowing me to build my *HUT*… to dance my song.

Am I correct? It does not matter. Do I believe I am correct? Very much yes. My path of integrity is the same either way: to keep going, keep… goinkee…goinkee… Whether I am right, goinkee…, or I am not right in some way or another, to which I am presently blind…goinkee… My integrity job is to prepare the theory for sharing as best as I can. Even if I am wrong, the documenting of my path allows me to question and re-question my perspective, to own my idea. This way, I can die in peace, even if during my lifetime I am never successful at sharing anything of my *HUT*. Now it is documented, though still not shared.

An idea for a party theme: throw a messiah complex costume party. Come as your favorite messiah complex, be that Shiva or Kali, Jesus, Buddha, the Virgin of Guadalupe, or Wonder Woman. Upon arrival, each guest gets a button to wear that says two things: "I am the only one" and "You too?!" Another button says: "Get your own messiah complex." If the challenge is properly accepted, the messiah complex can be both interesting and healthy. All parts contain the whole. That is the theory. Life is a costume party.

Personal God

In 1855, Abe Lincoln finished a letter with, "Our political problem now is 'Can we, as a nation, continue together *permanently—forever—*half slave, and half free'. The problem is too mighty for me. May God, in his mercy, superintend the solution."

At times I have felt guilt writing in my books about God and guidance because I come from a family and friends where God guidance is evidence of mental weakness and even imbalance and delusion, and thus is frowned upon, though they mostly deny those frowns. I have needed to trust God to *superintend* my Unified Field Theory since 1982. From out of the closet, in my books I share my trust in God, along with my belief in all my unique vocabulary and numbers as necessity,

even if it does not attract sympathetic attention. Abe Lincoln is not considered mentally imbalanced for turning the slave problem over to God. It got a bit bloody, but slavery did become illegal in the USA. Thank God and his faithful helper, Abe. Scientific atheists, though, can frown for Lincoln's and my sad misguidance and ignorance, and then they can just deny that they frowned.

Refuting "Judge" Douglas's criticism, Lincoln said, "…I would like to know if it is his opinion that a house divided against itself *can* stand? If he does, then there is a question of veracity, not between him and me, but between the Judge and an authority of a somewhat higher character."

This means that Abe already accepts that this statement, that a house cannot divide against itself and remain standing, is Biblical truth from God. Then the argument is not between Abe and the Judge. Einstein did kind of the same when he was asked how he would have felt if he had been proven wrong about light bending in a gravitational field. With unwavering confidence, Einstein answered: "I would have felt sorry for the Lord." I feel the same way about unifying holography, harmony, and the Word of God. And I can empathically feel the guilt imposed on me for believing this so strongly. I am socially and scientifically shunned. I am censored. Still, I choose to write…

Choice is the individual's truest savior. And there is freedom of choice until we choose God, since the infinity of harmonics requires limitations. But like a good alphabet, even with harmony being limited, we can create a whole literary universe that includes love and adventure and song and poetry. Freedom of choice, even at the quantum level, is one eye's perspective, while complete destiny is the other eye's point of view. We need both eyes to see well. A spinning coin has two sides. Scientific discovery always waits its appropriate time. When discovery occurs, first for the discoverer, then for the public, often it is very fast. The coin stops...the coin starts…and those sudden experiences require time to understand. Humanity's job is simply: choose the correct universal reference. This could become an increasingly challenging task for most of us. Time tells.

This vague question creates problems: "Do you believe in God?" Many people have many definitions of God, starting with whether God is manifested in the material world or is God non-manifest. Beliefs in God-manifest is focused on a man, a woman, a child, a tree, a rock, a planet, in every-thing, etc. Beliefs in God-non-manifest can only be in the Void with its real and imagined potentials. The Void is the reference, the source of original Willpower, the One Mind, the potential of which manifests the Dance, which is the Word, which becomes all things including flesh. Belief in the combination, with God both non-manifest and manifest, is found as the Cosmic Father or Mother, or the Dance, or the Word… This combination is mostly used for defining God. Since holography works, now our reduced minds can grasp and describe in words and numbers.

Void has no time. Void manifests the possibility field which still has no time but can cross over into the probability field where time begins. In the beginning was the Word, the Dance, manifesting $E = Mc^2$. Before the beginning of mass and energy, time has no meaning, nor does 3-D space. The originating possibility dance exists to allow sustained motion so probability creation can happen. The beginning of time contains the highest order of all sequential time that follows, according to the second law of thermodynamics, which says disorder increases from the beginning. High order must exist to start the entropy.

Thermodynamics is "…the only physical theory of universal content
concerning which I am convinced that, within the framework of the applicability
of its basic concepts, it will never be overthrown." Albert Einstein

This highly ordered probability Dance of creation comes from the original Willpower of God: from the Void's possibility field's potential. The Dance is what Hindus call Shiva Nataraja. Christian Shakers and Hindi translated refer to it as the Lord of the Dance. Many prophesies say one man is to come to teach us, as in Led Zeppelin's *Stairway to Heaven*:

"And it's whispered that soon, if we all call the tune, then the piper will lead us to reason…
Your head is humming and it won't go, in case you don't know,
The piper's calling you to join him…"

Experience is Fast – Understanding takes Time

"…we recognize the eternal longing for understanding, the ever-firm belief in the harmony of our world, continually strengthened by the increasing obstacles to comprehension."
The Evolution of Physics, Albert Einstein & Leopold Infeld

"Experience is never at fault; it is only your judgment that is in error
in promising itself such results from experience…" Leonardo da Vinci

"A hallucination is a fact, not an error; what is erroneous is a judgment based upon it."
The Monist, Bertrand Russell

"Moving from the Many to the One tends to be a gradual process, the result of some kind of deliberate calming of the mind. But the passage from One to Many is usually sudden."
Infinity of the Mind, Rudy Rucker

"The more I study science, the more I believe in God." Albert Einstein

"A little science estranges a man from God, but much science leads them back to Him"
Louis Pasteur

"Charles Goodyear was driven by the belief that God had wanted him to cure rubber."
Giant Molecules, Life Science Library, 1966

"What hath God wrought?" Samuel Morse's first telegraph message, 1844

"The first gulp from the glass of natural sciences will turn you into an atheist,
but at the bottom of the glass God is waiting for you." Werner Heisenberg

At high speed on skis, when one's body and skis move as one, it can also seem that the ski hill is moving while the skier stands still. Trade a jogging track for a jogger's treadmill surrounded by terrain passing on video screens: perceived motion is dependent on the frame of reference. You sit in your train next to another train and something moves slightly—was it the vehicle you are in or the one next to you? All you could see out your window is relative motion between two vehicles. Albert Einstein explained with relativity that in one sense there is no difference whether your train is moving or if the train next to you is moving. From each point of view, the other is moving and the observer is still. Neither train reference has priority over the other. Without jerking, at first it can be difficult to know what is moving and what is not, or if they both are moving, until you suddenly find a "stationary" Earth reference which reveals which vehicle is moving relative to that.

In deciding what is your stationary reference and what is the moving object, Einstein was clear, "…only *experience* can decide as to its correctness or incorrectness." He italicized *experience,* a word limited to the realm of consciousness for which "I Am" is the reference.

"The Catholic Church had made a bad mistake with Galileo when it tried to lay down
the law on a question of science, declaring that the sun went round the Earth…
I had no desire to share the fate of Galileo, with whom I feel a strong sense of identity,
partly because of the coincidence of having been born exactly 300 years after his death!"
A Brief History of Time, Stephen W. Hawking

"… men of common sense did not allow much for coincidences in making
the ordinary calculations in life." *The Signal Man*, Charles Dickens

Since experience is limited to the mind, then Einstein's reality is being best explained as

a mental construct. Just because the frame of reference depends on consciousness, then all of our reality depends on consciousness. Harmony relies on a tonal reference. All degrades to chaos without a reference. Without consciousness to observe differentiation between $E = Mc^2$, without a tonal system, nothing could be organized—there could be no creation according to Einstein, since references depend on *experience* in the mental realm. That means referential systems, life, harmony, and creation are all dependent on the mental realm, being the source reference of the holographic universe, being *the willpower to dance sustainably out of the void*.

The current scientific paradigm has difficulty finding a proper model to use as a tool for understanding the very tool that is doing the understanding. It is kind of like feedback in music where you speak into a microphone, but you stand next to the speaker, so the microphone picks up your original voice plus the broadcasting voice. Then it picks up all that plus all the sound coming through the speaker into the microphone again, and again, and again… That's feedback. If the sound system is not properly managed, it will go into a high pitch monotone screech, uncomfortable to all. Psychological feedback loops can happen when people analyze themselves with error or without rest, or impose their ideas on others who are unaccepting. Meditate deeply on *I Am*, and unless one can accept that the *I Am* is the *Unified Mind* containing far more information than one's neurons could synapse in a lifetime, one can get feedback and information overload, and it can be challenging. A certain amount of analysis is necessary to move on, while too much analysis, not balanced with synthesis, can be unbalancing, even to a dangerous degree. Synthesis and analysis require both unifying and reducing perspectives.

"The rare scholars who are nomads-by-choice
are essential to the intellectual welfare of settled disciplines."
Mandelbrot, (in *Who's Who)* quoted in *Chaos* by James Gleick

"The development of science and of the creative activities of the spirit
requires a freedom that consists in the independence of thought
from the restrictions of authoritarian and social prejudice." Albert Einstein

"A spirit is manifest in the laws of the universe— a spirit vastly superior to that
of man, and one in the face of which we with our modest powers must feel humble.
In this way the pursuit of science leads to a religious feeling of a special sort." Ibid

"Why would you bother to have a brain that can attain spiritual experiences
if there were no spirituality in the world? It wouldn't be adaptive." Karl Pribram

"Humanity's deepest desire for knowledge is justification enough for our
continuing quest. And our goal is nothing less than a complete description of the
universe we live in. …if we do discover a complete theory, it should in time be
understandable in broad principle by everyone, not just a few scientists.
Then we shall all, philosophers, scientists, and just ordinary people
be able to take part in the discussions of the question of why it is
that we and the universe exist. If we find the answer to that,
it would be the ultimate triumph of human reason—
for then we would know the mind of God."
A Brief History of Time, Stephen Hawking

The separation of science and religion has brought about a consciousness paradigm with a strong duality, allowing potential differences. Resistance to the potential differences accompanies a social current. The current can be used creatively, or it can be destructive. The current is the source of much art, the attempt to reconciliate the differences. Science is also

trying to reconcile mind and matter, though many scientists block that natural evolutionary effort to unite the mind's polar divisions. That conscious leap of evolutionary reconciliation might be experienced as epiphany, then pronounced within vocabularies of science, art, and/or religion. Problems arise when scientists refuse to allow science to even consider God. And most religious groups do not want people to believe in God unless it is through their own vocabulary. Even artists can be very prejudicial and restrictive. When one's work threatens to shift a paradigm, often it may be better to work without any support system, which requires more fortitude, though with time and maturing, an idea has potential to be displayed outwardly as work with integrity.

Mind, being energy, accesses the void source, the possibility field, and the probability field. A strong epiphany is when one believes one is experiencing a high signal to noise ratio, like when finding a new scientific development that can unify a science that has been lacking a new perspective. It is like finding the music among the static, finding the clarity among the confusion, finding the sense among the non-sense, finding the fundamental tone among the diversity of tones, finding truths among non-truths, and accuracies among inaccuracies… like finding God within creation through scientific vocabulary of words and numbers.

"The frog trapped in a well knows nothing of the great ocean." Japanese proverb

Proper body and mind exercise and rest allows calming or activating as may be desired or required, enabling a healthy system that is able to stimulate and experience spontaneous epiphany. The scientific method of trial and error leads into epiphany and understanding, then to documenting. This involves *BIRDS*: Believe, Imagine, Research, Develop, Share. Four parts, *BIRD*, must be mostly done, even if on-going, before making *BIRD* plural. At times, the challenge is for one individual to bring a new idea to the public, verbal or written. One must bait and wait for an invitation to Share the new theory, to achieve the plurality of *BIRDS.*

In the *HUT* perspective: humanity's paradigm must and will evolve into understanding the unified mind. To do this, *phylogeny recapitulates alphaontogeny*, meaning that the growth of the species must follow the growth of the most evolved individual—the theorist's new theory.

The pure essence behind the human idea of God is unchanging, as is the will to survive, and all living organisms' binary life force. To create the universe, God willed God's self to know God's self, and thus utilize both aspects of the *Unchangeable* and of the forms themselves changing though evolution. God is the life in all forms living. God is life. God is willpower, throughout the whole sequence, in all life forms. God is the will to survive, allowing our cherished perspective of free will. The core of genetic survival and consciousness is this: the *I Am* is in each life form and identifies itself as the One that must know and survive. The brain, animal instincts, and human consciousness all evolved around the *I Am* willpower source. An individual suddenly tapping into this understanding is experiencing the source of enlightenment.

"God dwells in me…as me." Julia Roberts in *Eat, Pray, Love*

"Do you not know that you are God's temple and that God's Spirit dwells in you?"
1 Corinthians 3:16

Every part contains the whole and life shows itself in the will to survive. Without the will to survive, Darwin's theory of evolution would not work. Life force drives against the flow of universal entropy. The miracle of creation is this harmonic dance between Darwin's perfection and thermodynamics' 2nd law regarding entropy. Every part contains the whole. Creation from the void uses the tools of harmony. God is expressing the will to survive, which began first as the will of the universal *I Am* to know the *I Am* self—through the Dance…through the Word. There is only one mind, the source of willpower, and it is God. We are just many parts claiming *I Am*, each whole and reduced representing One *I Am* Mind. We are the One and the many… the *Om.*

"Not only is the Universe strangely fit to purpose,
but so…is life's ability to navigate to its solutions."
Simon Conway Morris, *Life's Solutions, Inevitable Humans in a Lonely Universe*

When a person first experiences the rush of understanding, the blossoming wisdom syndrome, the understanding feels deep. But the details will take time to form and understand. Willpower is able to calm the experience's impact, allowing that a more mature understanding will take time. Self-reliance, self-control, and self-restraint are important during this transition.

"My feeling is religious insofar as I am imbued with the consciousness of the insufficiency of the human mind to understand more deeply the harmony of the Universe which we try to formulate as 'laws of nature'." Albert Einstein

"…the harmony of natural law, which reveals an intelligence of such superiority that, compared with it, all the systematic thinking and acting of human beings is utterly insignificant reflection. This feeling is the guiding principle…" Ibid

"In the view of such harmony in the cosmos which I, with my limited human mind, am able to recognize, there are yet people who says there is no God.
But what makes me really angry is that they quote me for support of such views." Ibid

"What separates me from most so-called atheists is a feeling of utter humility toward the unattainable secrets of the harmony of the cosmos." Ibid

"The leader is one who, out of the clutter, brings simplicity...
out of discord, harmony... and out of difficulty, opportunity." Ibid

Atheism is Not Scientific

"By stimulating one section of the brain of an 85-year-old, you can bring back, verbatim, memories of a newspaper article read 60 years before. Consider your own brains… your dreams are all possible because of the 3 pounds of gray matter. We can describe it physically, but that won't give a clue as to how it does what it does." *Gifted Hands: the Ben Carson Story,* a movie

"Neurosis is really an attempt at self-cure, just as any disease is in part an attempt at self-cure."
Carl Jung

"That is why we call him 'crazy': we cannot understand his ideas." Ibid

"…it is only when we do not understand that things appear unintelligible and muddled" Ibid.

"Absolute certainty brings its own evidence and has no need of anthropomorphic proofs." Ibid

Darwin did not argue against God's existence at all. Darwin was not atheist. He struggled with the faith in which he was raised. Then, with faith in his understandings, he moved away from the church while becoming agnostic. Not-knowing was his honest claim for his own beliefs.

In a letter to Asa Gray, in response to the public calling him an atheist, Darwin wrote: "The theological view of the subject is painful to me. I am bewildered. I had no intention of writing atheistically… I am inclined to look at everything as resulting from designed laws, with the details, whether good or bad, left to the working out of what we may call chance. Not that this notion *at all* satisfies me. I feel most deeply that the whole subject is too profound for the human intellect. A dog might as well speculate on the mind of Newton…"

Darwin's opinion of God and religion changed throughout his life. "Whilst on board the Beagle I was quite orthodox, and I remember being heartily laughed at… for quoting the Bible as an unanswerable authority… I had gradually come… to see the Old Testament… was no more to be trusted… I was very unwilling to give up my belief… but [disbelief] was at last complete…

the text seems to show that the men who do not believe… will be everlastingly punished. And this is a damnable doctrine… Another source of conviction in the existence of God, connected with reason and not with the feelings, impresses me as having much more weight. This follows from the extreme difficulty or rather impossibility of conceiving this immense and wonderful universe, including man with his capacity of looking far backwards and far into futurity, as the result of blind chance or necessity. When thus reflecting, I feel compelled to look to a First Cause having an intelligent mind in some degree analogous to that of man; and I deserve to be called a Theist. This conclusion was strong in my mind… when I wrote *The Origin of Species*; and it is since that time that it has very gradually with many fluctuations become weaker. But then arises the doubt; can the mind of man, which has, as I fully believe, been developed from a mind as low as that possessed by the lowest animal, be trusted when it draws such grand conclusions?... I cannot pretend to throw the least light on such abstruse problems. The mystery of the beginning of all things is insoluble to us; and I for one must be content to remain an agnostic."

"Absence of evidence does not mean evidence of absence." Carl Sagan

"I do not believe that science can disprove God: I think that is impossible"
"It is of great value to acknowledge ignorance." Richard Feynman

"It is, of course, very simple to deny its existence without examining the evidence,
but that is an unscientific procedure which is unworthy of notice." Carl Jung

Scientists and science enthusiasts often claim, "I don't believe in God. I believe in science." Humans have dual perspectives mixing for consciousness. One mode is predominantly discussed in spiritual, religious, and artistic terms. The other is mostly discussed in flesh and science terms. Mathematics, like art, can neatly work either mode of the duality, but sometimes the mathematician/scientist can lose track of which one is the reference in each moment, confusing vocabularies. The science jargon of *unified* and *reduced,* and $E = Mc^2$, display the duality well, as does the verbal duality of *spirit* and *flesh* in religions.

Before I had my 1982 epiphany, I read and enjoyed a 1976 book called *The Selfish Gene* by Richard Dawkins. It helped me understand— I share 50% genetics, on the average, with my Mom, Dad, brother, and daughter. With my blood uncles; half of that. And with their kids; half again. Very cool. Very harmonic. Great influence. The overall theme of *The Selfish Gene*, as the title says, is about the intense will-to-survive that is built into biology. Dawkins, similar to Darwin, did not address the *source* of the willpower in the most refined sense, being the source of the gene's selfishness to survive, the Source which *HUT* claims is Self, *I Am,* and God.

Dawkins' 2006 book, *The God Delusion*, can be explained by Carl Jung's quote: "…downright resistance to the mere possibility that there could be a second psychic authority besides the ego." Dawkins uses Darwin and Einstein to support his atheism while I use their work to support my God centered reality. Dawkins' atheism boasts that science is his reference, but the vocabulary he chose to explain his experiences in life is his only evidence for there being no God. I see no science that stands up for his anti-God perspective. Many people raised with confining religions realize the inherent noise, then they reject their whole religion altogether. God, the source signal, often gets tossed out as well. Dawkins condemns all God ideas from entering his protected paradigm. He briefly compliments the God of Einstein, but because this is so contradictory for Dawkins, it seems more of a name dropper without any understanding. When the mind noise got too loud for Dawkins, the signal baby, the reference, God, got tossed out with all religions that he perceived as dirty bathwater.

"If there is a wrong way to do something, then someone will do it."

Edward A. Murphy, Jr. [morphed to Murphy's Law: "If anything can go wrong, it will."]

"Science, my boy, is composed of errors, but errors that it is right to make,
for they lead step by step to the truth." Jules Verne

Dawkins claim is that all the noise is proof there is no signal. He profits from this dead-end perspective because it is popular to claim atheism in the name of science. For me, the signal is silent and clear. Dawkins' arguments continue to be based on his inability to assimilate both perspectives of time; of mass and of energy. For mass, flesh, the clock is ticking. Mass perceives light's clock as stopped: flesh perspective sees that at the speed of light there is no time.

Religions tend to impose the unchangeable aspects of the cosmological constant, the original void, God's bare essence, onto flesh. The constant "now" perspective of light in void is one aspect of our mind, and that includes the ideal information imbedded within the void, being harmonic potential. This perspective of the unchanging void and ideal harmonic potential is then imposed in such ignorant ways on society's paradigm of the changing material world.

Dawkins predominantly perceives the universe from his flesh-mass point of view, while I claim the human mind is energy: light perceiving from within flesh. The merging duality of mass and energy composing our unified consciousness must be acknowledged. The seed matures at the end of creation to begin creation at the beginning. To ignore John 1:4, that "God is the light and life of man", is also ignoring the good science that our minds are light, and that *for light, it is all now: the clock is stopped, allowing the end of time moment and the beginning moment to be the same: the Alpha and the Omega*.

The evolution of the human mind has allowed us to explore both the light and mass perspectives, evolving our scientific understandings towards more and more complexity while simultaneously moving towards a highly simplified understanding of the universe. This evolved unified human mind at the end, being total complexity simplified in light, is the same timeless seed used to make the universe in the beginning moment, when the 2nd law of thermodynamics demands the highest signal-to-noise ratio order of all creation as it begins deteriorating. The fundamental harmonic tone, the Word, the Dance, reduces and degenerates into the overtone universe—simultaneously remaining whole in all parts, circles within circles. The evolution of human consciousness takes us through extreme complexities of creation, and in the end, back to the simple mind seed perspective required at the beginning: the Word. The seed and egg inventions of nature are generally the way with most life forms—including the selfish gene.

"Anyone who wishes to interpret a dream [idea, vision, epiphany, theory] must himself
be approximately the same level as the dream, for nowhere can he see more
than what he is himself" Carl Jung

With Dawkins' summed-up scientific perspective, he chooses to ignore that this seed possibility could exist, though he believes he knows all perspectives already, kind-of god-like. Dawkins' primary theme, the foundation of his argument for atheism, his omniscient claim regarding God's non-existence, is that "…*any creative intelligence, of sufficient complexity to design anything, comes into existence only as the end product of an extended process of gradual evolution."* Dawkins ignores any possibility that the end product for life, the light of mind, is the seed-egg required to start a new beginning, as is the way of living organisms. Dawkins' time perspective paradigm leaves out the time-less perspective of light and the inevitable seed.

"The seed is the Word of God." Luke 1:11

Like others who misinterpret Darwin, Dawkins ignores that Darwin grants the *will to survive* to be the driving force behind all of evolution. Darwin did not claim that science defines

any source of this *will to survive* common denominator. Darwin begins his theory of evolution with the struggle to survive, which, to do, *requires* the will to survive. Darwin's work was only concerned with explaining nature's means of *providing* life's tendency to diversify.

Our isolated pocket in the universe, Earth and our biosphere, including this precise tilt and position relative to the sun, moon, and other astronomical bodies, is accepted as chance by Dawkins et al, with no accepted explanation in science. Our home life support "system" still temporarily goes against *average* universal entropy. In this protected atmosphere, evolution aims at perfecting order through complexity, while entropy destroys complex order. Any unified field theory must include these entropy-defying acts and not hide our ignorance under the rug of denial. The holographic principle can ground all of science. The single point that is required to functionally relate to the universal reference is the seed at the beginning and end of life. All evolution aims at it as the goal. Sex brings it on. Meditation finds the life seed, being the Word. All life wills itself to live and continue towards that Unity. Eventually, the human flesh and mind evolve through our contemplations and discoveries, through shifting scientific paradigms, through calming, to find the unified seed, the integrated brainwave package, an electro-magnetic crystal… the Word… the Dance. Yet still, in time, we must: chop wood and carry water.

Life on Earth has been thumbing our proboscises at entropy locally, letting the rest of the universe fall apart to provide our required harmonic energy. The universal average increase of entropy still rules. Earth's isolated pocket is specifically able to receive harmonic energy from the exploding supernovas and shining sunlight, allowing life to survive. The atheists might tell the general picture scientists have formed, but no science can truly say there is no universal design. We are too ignorant to make such a grand sweeping statement. Anybody who does is claiming knowledge beyond what science has observed and assimilated… atheism is a theory that is not grounded in science. It is founded upon increasing disorder, ignoring harmonic unification.

Evolution aims for perfection, requiring harmonic forces which degenerate into overtones increasing disorder, only to be reordered once again. The life cycle is glorious, even though life's source is still beyond any accepted scientific explanation. The explanation proposed here is the synthesis of the zero cosmological constant with holography and harmonics into the unified field theory. Einstein's zero cosmological constant is the universal absolute, and it includes all the potential harmonic information needed for creation, and is thus the ultimate basis of all space, time, matter, thought, and being. Contrary to the science of the original void, atheists love to claim there is no possibility of a universal absolute. But that statement is an absolute in itself—proving it to be not justifiable, to be a failed scientific theory and logic. The Zero Cosmo-Con Void is absolute.

There are witnesses when someone has a big experience. The witnesses also have experiences. Witnesses may ignore and not care, and some may be interested, while others experience a fight or flight response. Anyone's experience may be fast, while the refined understanding of that will need time and effort. The understanding comes with a signal to noise ratio, and that influences our belief. When one shares the understanding of the experience, that is when and what the witnesses experience. Even if the one sharing their new idea believes that their intellectual arguments are convincing, the witnesses may not be convinced. This must all play out throughout society over and over if one new big idea is made available and received—especially if the idea is able to reconciliate the schism between science and religion.

For both science and religion, experience can lead someone to believe in one or more new references. For humanity's social system to come into harmony requires the sharing of a single point of view with a single common reference, relating through the universal fundamental tone. The new believers of this new-old idea will have many new layers of mind complexities, all

definable with signal to noise ratio. In science, the fundamental tone aligns with the reference. In religions, the fundamental tone aligning with God is the Word, Name, Voice, and Dance of God.

"…I believe the existence of God as a scientific hypothesis is, at least in principle, investigable… what if God is a scientist who regards honest seeking after the truth as the supreme virtue? Indeed, wouldn't the designer of the universe *have* to be a scientist?"
Richard Dawkins, *The God Delusion*

"To simply dismiss the concept of God as being unscientific is to violate the very objectivity of science itself". Wernher Von Braun

"We must allow the Word of God to confront us, to disturb our security, to undermine our complacency and to overthrow our patterns of thought and behavior." John Stott

"By the word YHWH, the heavens were made." Psalms 33.6

"From his dwelling, YHWH looks upon all who live on Earth." Psalms 33:14

XVII PATTERNS FROM 8-SPACE REDUCTION

"The desire for symmetry, for balance, for rhythm in form as well as in sound, is one of the most inveterate of human instincts." Edith Wharton

Begin with a blank page (void). Cover the page with a 2-D checkerboard style grid (Fig.XVII.1). Being an example of infinite non-locality, one can choose any single square to begin as the zero, though due to space being limited here, placing the zero towards the center works best. Fig.VIII.2 first introduced this next step as eight-space, where in any expanding ring that is concentrically focused on the central zero square, the number of squares can be predicted with 8n, where n is the ring's harmonic sequence, n = H_S = {1,2,3…}. Ring #1 has 8 x 1 squares. Ring #2 has 8 x 2 = 16 squares. Ring #3 has 8 x 3 = 24 squares. And on into infinity: 8 x 4; 8 x 5; 8 x 6 … ∞ … This is 8-space (Fig.XVII.1).

4	4	4	4	4	4	4	4	4
4	3	3	3	3	3	3	3	4
4	3	2	2	2	2	2	3	4
4	3	2	1	1	1	2	3	4
4	3	2	1	**0**	1	2	3	4
4	3	2	1	1	1	2	3	4
4	3	2	2	2	2	2	3	4
4	3	3	3	3	3	3	3	4
4	4	4	4	4	4	4	4	4

Fig.XVII.1 8-space

Start from void. Then grid space. Then choose one square. Then number the squares in each ring. Then every eighth square in each ring gets circled (Fig.XVII.2):

4	4	4	4	4	4	4	4	4
4	3	3	3	3	3	3	3	4
4	3	2	2	2	2	2	3	4
4	3	2	1	1	1	2	3	4
4	3	2	1	**0**	1	2	3	4
4	3	2	1	1	1	2	3	4
4	3	2	2	2	2	2	3	4
4	3	3	3	3	3	3	3	4
4	4	4	4	4	4	4	4	4

Fig.XVII.2 Circle 8th number in each ring

Every eighth number in each ring gets circled and colored. Count around each ring, beginning from the vertical north-up vector. Notice in ring # 1 that only one number 1 is circled, and colored in green. In ring two, two of the #2s are circled and colored orange. In ring #3, three of the threes are circled, colored yellow.

As the infinite pattern radiates outward from the central zero on the 8-space grid, the 2-D harmonic arrangement unfolds the design of radial lines as n = H_S = {1,2,3…∞} (Fig XVII.3).

The mathematical source of the games of chess and checkers is the playfield of a limited area of infinite eight space. The games' chosen defined moves for the players' pieces are given allowance by reducing that eight space. In Fig.XVII.2 on the right, a rook moves from 3 to 4.

The circular radial extension patterns in Fig.XVII.3 are consecutive 8-space rings derived from the center zero in Fig.XVII.4, reaching out to every eighth square in each ring. This potential manifests all of the theoretically infinite 2-D radial harmonic integer reduction patterns:

Fig.XVII.3 Infinite harmonic radial patterns

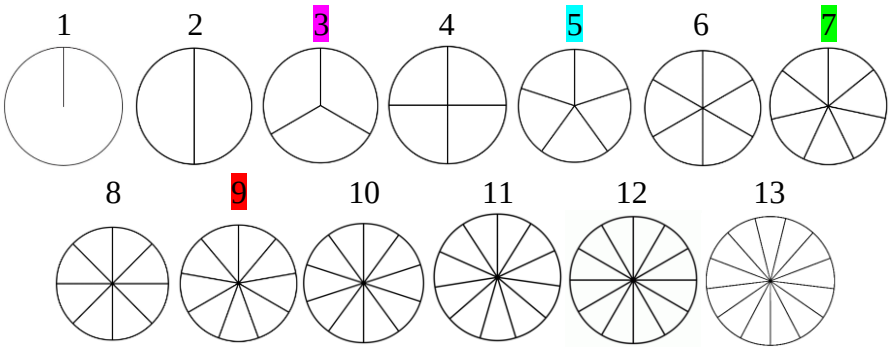
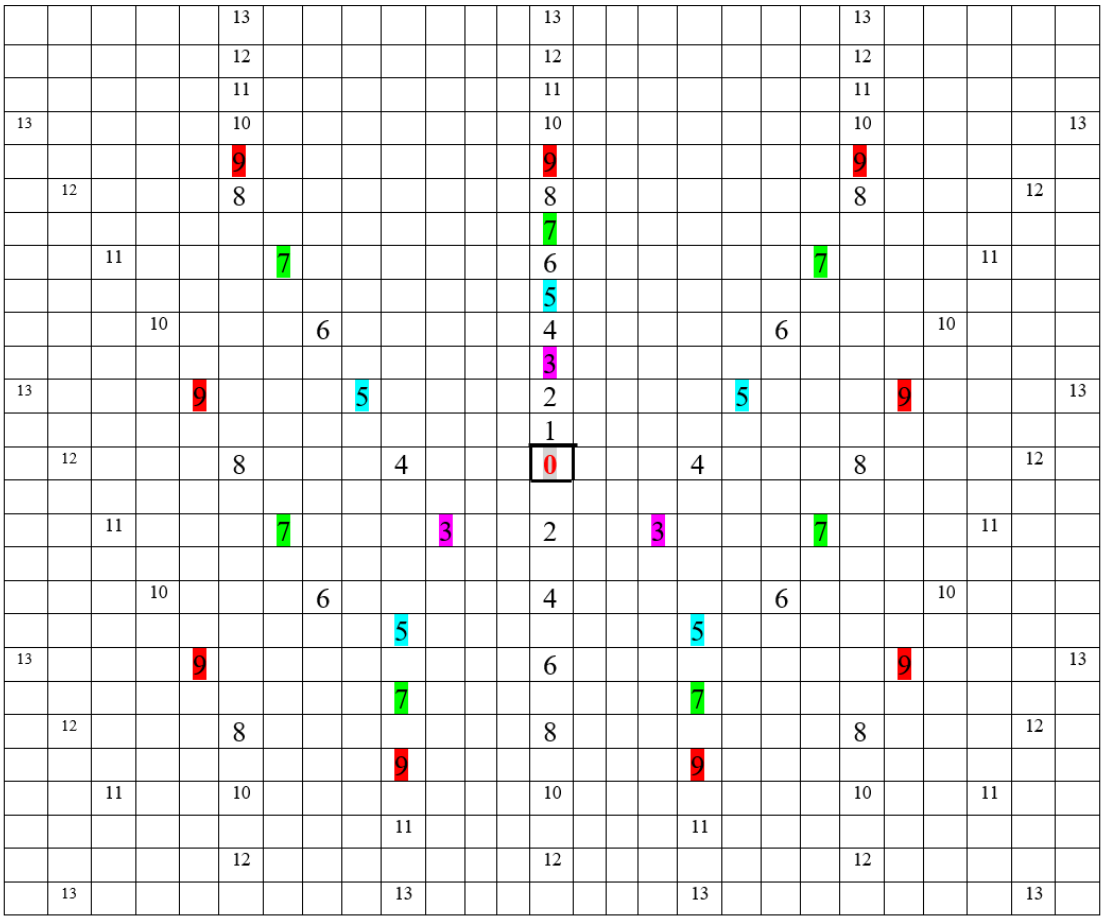


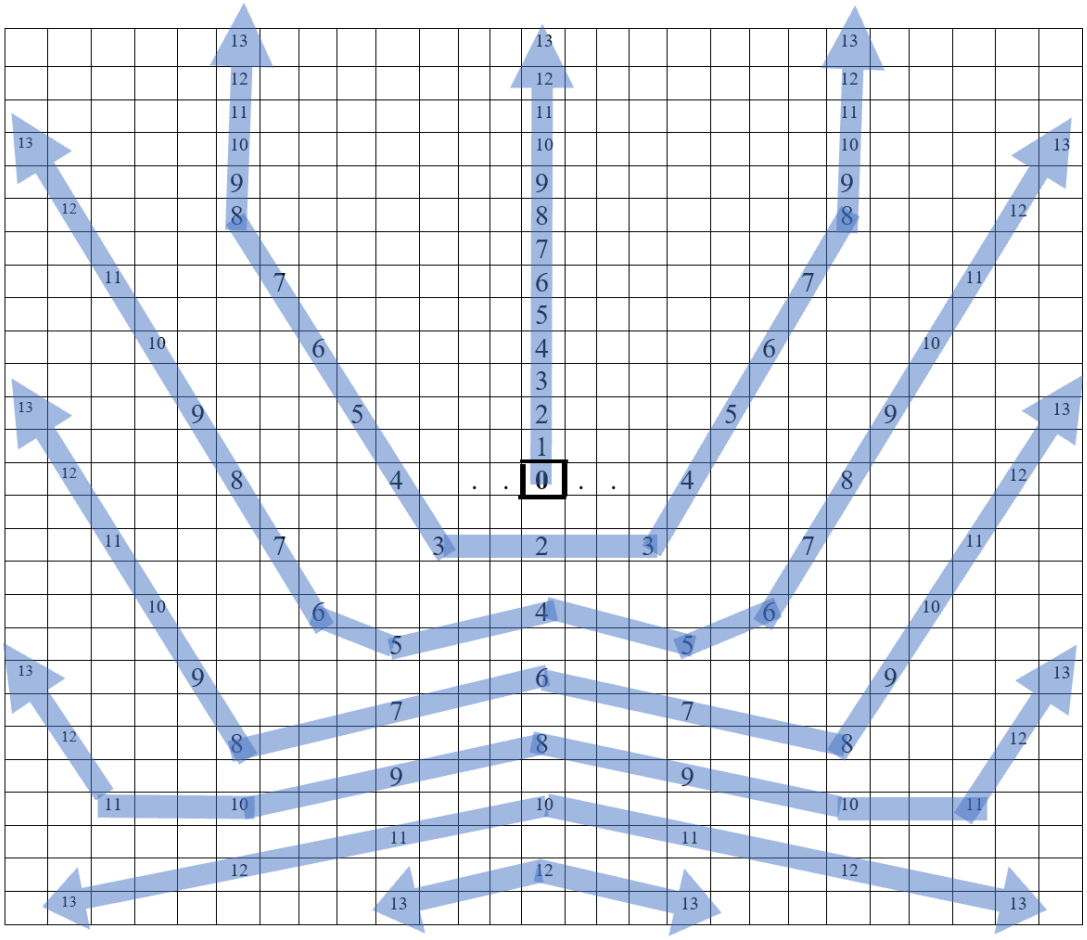
Fig.XVII.4 extends the patterns of concentric square rings that began in Fig.XVII.1. Matching colors to Fig.XVII.3 allows the view of some radial patterns. For example, in Fig. XVII.4, five blues show the radial # 5 pattern.

Fig.XVII.4 8-space reduction patterns produce 2-D harmonics

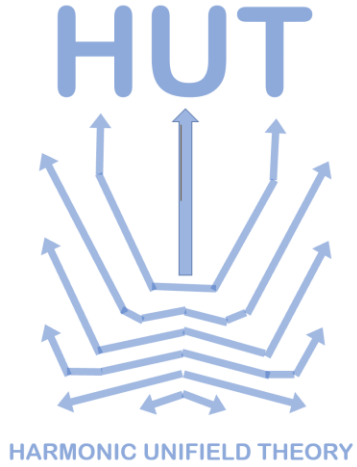


This next step, in Fig. XVII.5, connects all the numerical sequences beginning with the non-negative integers of the northern axis, {0,1,2,3,4…}. Begin the further sequential integer connections on the even numbers {2,4,6,8…} which drop down on the southern axis. Coloring these connection lines blue manifests the following diagram, which includes all the numbers:

Fig.XVII.5 Symmetrical pattern unfolding



This symmetrical pattern evolved by reducing the void to a 2-D grid space, choosing a center 0, identifying concentric numbered rings, to circling each ring's 8th number, then to connect integer sequences initiated from {0,2,4,6…} on the south axis. And voila … out pops the symmetrical pattern. See pg. xii in the introduction.



This global view spider *HUT* logo demonstrates patterns unfolding within the unified field theory, an example of how the one-many mind invents, discovers, and appreciates symmetries: from void into harmony.

Fig.XVII.6 Logo

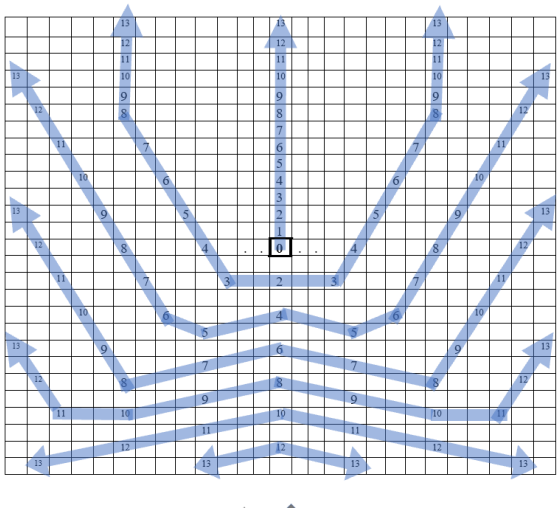
Fig.XVII.7

HARMONIC PHILOSOPHY

I am the zero. I face forward.

Harmony begins with choice. Only by choosing the center-zero-point can nothing become everything.

"The chief forms of beauty are order and symmetry and definiteness, which the mathematical sciences demonstrate in a special degree." Aristotle



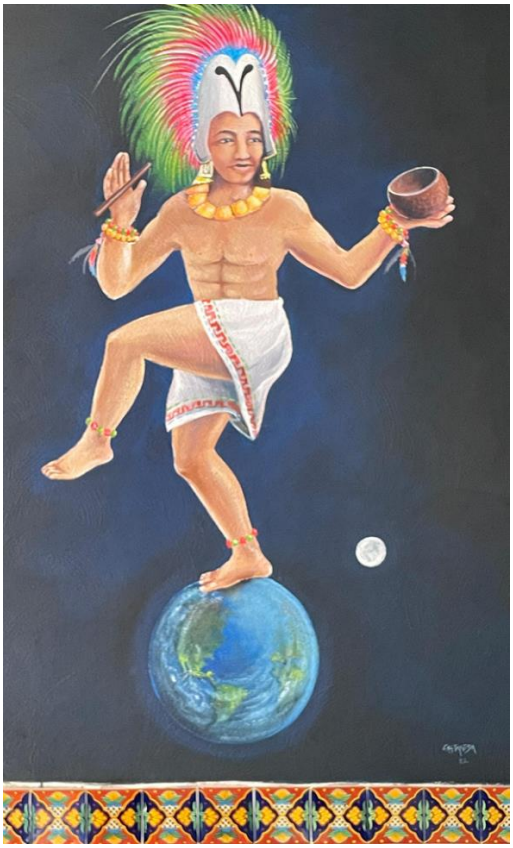
"We need not here consider how the bodies of some animals first became divided into a series of segments, or how they became divided into right and left sides, with corresponding organs, for such questions are almost beyond investigation."

Charles Darwin, *The Origin of Species*.

My attention extends left and right.
In dance I spin and use all my limbs.

…from void to grid space to the chosen zero, to allow eight space to expand through radiating concentric circles (squares):
$8H_S$ = {(1x8), (2x8), (3x8), (4x8) …}…

The Nataraja 2 x 5 dance (also see Fig. XVI.2) benefits from the perspective of zero. Zero is the reference for harmonics to create mind & body,



"We may infer from all this that a nearly similar taste for beautiful colors and for musical sounds run through a large part of the animal kingdom… there must be some fundamental cause in the constitution of the nervous system in each species."
Charles Darwin
The Origin of Species

Who am I?
I Am consciousness in all forms

XVIII THINK AGAIN

Inquiry

I propose a Unified Field Theory
Results of many years inquiry
As the author I seek attention
Aware that I threaten convention
Claiming it permanent not temporary

"…as far as I know, no reputable physicist in this century has claimed
that a final theory had actually been found." Steven Weinberg 1992

"I had earned more than a few enemies by insisting that I had the answer, the only solution…
…too many borders had been crossed, too many taboo words had been spoken.
People did what they do to ideas that won't fit the reigning paradigm—ignore them."
Candace B Pert, *Molecules of Emotion*

Misoneism: (*miso* = hate) + (*neo* = new) "A new idea that is not exactly in line with general expectations meets with the severest obstacles of a psychological kind. It is given no credit, but is feared, combatted, and abhorred in every way." Carl Jung's, *The Undiscovered Self*

"If you thought that science was certain well, that is just an error on your part."
Richard P. Feynman

"…the discovery of the final theory… would not spell the end of science…[it]
would provide the firmest foundation on which to *build* our understanding
of the world. Its discovery would mark a beginning, not an end."
Brian Greene, *The Elegant Universe*

"Revere those things beyond science which really matter
and about which it is so difficult to speak." Werner Heisenberg

We are in the age of Legos. The toy blocks can be reassembled in a multitude of ways. This Lego play is our technology today, advancing at such rapid rates. Meanwhile, there is stagnation within the public learning of any great advancements of theoretical science. Society's paradigm will not be shifting until at least one great theoretical achievement is attained, introduced into society, and appreciated. We must think again. So much of what this and the past generations have seen as science is not theoretical advancements but just more of the same Lego toys being rearranged. Grocery-store science magazines have made fantasy theories popular by portraying them as valid scientific advancements. With popularity, these theories become the basis for science fiction movies and are believed by audiences to be fact. Instead of prioritizing foolishness, we need a grounded, harmonious, and believable new paradigm, or it seems we will not stop destroying ourselves and the bio-system in which we presently survive.

Some scientists claim such imaginations as an infinitely branching physical multiverse. This is an indulgence of desires not a work of accuracy and validity. Their theory is an impossibility under current science laws of conservation, and they do not see a different possibility for which to apply their math. The probability field's time and space perspective of mass is different from the possibility field's waveform perspective of being free to move unrestrained through virtual space and imagined time. Mass perspective is restrained very precisely within time, space, and laws of conservation.

The multiverse which we can witness within the physical realm is the total consciousness

comprised within each individual human's reduced mind perspective. Each individual lives in a separate body made from stardust scattered over billions of years, and each contains the reference information of the whole universe. Each person is their own center of the universal perspective, looking out at stars and trees and rainbows differently than anybody else's eyes can see. Not all the raindrops refracting the light from the sun, which grant the view of a rainbow, are the same as the raindrops making the rainbow for the universal person next to you. The human population is our multiverse; all reducing from the One Mind. Each human contains the universal whole and lives as a universe unto oneself, with physical bodies and perspectives separate. But there is just one home Earth, not multiple, with our one sun, and one universe … all shared.

We have potential for a major paradigm shift if the "synthesis of a zero cosmological constant with holography and harmonics into a unified field theory" is researched intentionally. By learning how the universal harmonic field guides everything, *HUT* claims we can choose to take much confusion out of our education systems. Until we do, we continue to live in the dark ages. Body, mind, and societal health solutions could shift if we choose to not teach babbled information to children anymore. At least we must teach what is babbled info and what might be true. I've spent my life weeding through and reorganizing my disjointed education.

Activate, or not? That is the DNA question. Cancer? A healthy body's DNA activates to suppress the cancer, while the cancer DNA is activating for continued growth. Thus, the battle. Does the host body win or the invading threat? That is the DNA question. That is the everything question. Do I activate that desire or not? Do I activate the suppression of that desire, or not? We must make choices. Does one activate their personal willpower to learn a new idea, or not?

How does God guide social and individual movements, and thus evolution as a whole? God's willpower guides our willpower, our lack of willpower, and even our errors. A couple of examples of this regards attempts by three superpowers to end World War II for three different purposes. Compared to the high priority of nuclear research in the USA during the war:

"The Japanese… had made little progress—but as with the Germans,
not for lack of scientific talent. The problem in both countries was lack of will."
John Archibald Wheeler in *Geons, Black Holes, and Quantum Foam*

"It was Bothe who… measured incorrectly the cross section for absorption of neutrons by carbon nuclei. Impurities in Bothe's sample threw off the results, leading German nuclear scientists to conclude that graphite would not be a suitable moderator for a reactor." Ibid (in footnote)

"My will is stronger than my heart…My will holds me steady to my course through life."
Julie Ormond as Guinevere in movie: *First Knight*

Intuitively and instinctually, each person seeks Unity, and how to differentiate cohesively, to find harmony. Falling in love in just one example, as are other desires, obsessions, and goals. When something or someone does not feel whole enough, it is like fixing a small motor: we explore how the whole breaks into parts, which need to be reunited into the whole. New parts might be needed. We choose a mate or a new car to fulfill that not-whole feeling.

We analyze and synthesize, seeking unification on many levels, not just sexual. A mind is the culmination of experiences, including from senses, family, education, DNA history, imagination, and epiphanies. With a proper new paradigm, our new research and experiences, our adapting through assimilation and/or elimination, will reorganize a human brain's neural net into a more efficient and unified system. That is our hope. That is our goal.

The growth of human civilization is pumped up with the use of non-harmonic tones in our chromatic musical scales. As humanity increases our excessive self-stimulation, we try to achieve more of the natural rhythms to overpower our choices of unnatural musical tunings. We

dance more to the basic drumbeats to compensate becoming imbalanced with the non-harmonic tones that we have chosen. As a result, humanity is so addicted to stimulation through repetitive rhythms that we seem to be unable to find a solution. Our excessive motions build heat and lead to our own increasing self-destruction. We need to reevaluate our choices of musical tunings and we must find our appropriate natural rhythm through the understanding and feeling of harmony. We need to choose, focus, and exert properly, and each of us must ask ourselves: what is my reference, and what could, and maybe should, be a better reference? Properly defining God for better human understanding of our primary reference would help us to grow more efficiently, allowing us to better know in each situation how and when to choose to activate or not activate.

Dividing Up Space & Time

"mathematics: The study of the measurements, properties, and relationships
of quantities and sets, using numbers and symbols. [<Gk. *mathēma*, science]"
American Heritage Dictionary

HUT claims that harmonics function in the body and mind, and that chromatics, being the world's popular musical tunings, are non-harmonic and conflict with our harmonic balance. Chromatics create tangential cycles in our minds, bodies, and planet that loop over and over again, heating and deteriorating preferred healthy cycles. A paradigm shift to life sciences based on harmonics and grounded in the zero cosmological constant and holographic-reality presents a system that must constantly renew itself. Life must regenerate with the universal *fundamental* harmonic energy since harmonics naturally degenerate as entropy. In this model, humans are also required by nature to periodically realign with the God reference through the universal harmonic fundamental tone: the Word. From life's perspective, some harmonics might seem intensely chaotic, like an earthquake. Predominant harmonics dominate chaos, and then the new refreshed harmony degenerates back to chaos. We are the circle. The circle deteriorates, then is renewed.

If nature tunes to harmonics, shouldn't we understand this, and utilize the understanding? And if so, how much? All of nature organizes mass and energy using harmonics, then falls apart according to entropy, the measurement of disorder, being harmonic degeneration. Though human choice is unique, it follows the same laws. We hope to have a large enough perspective to base our choices on what costs and benefits each has. Choosing disharmony increases entropy, while choosing harmony can allow new levels of organization. Nature is a mixture of harmony and entropy. Sometimes, like with an earthquake, a bridge, or an airplane wing, too much harmonics can be disruptive. As with nature, human choices can reach a state of rapidly increasing disorder, a time when choosing to *understand* harmony becomes a choice of survival. Engineers often embrace the need to comprehend the harmonic vibrations in situations within their work.

Regarding compasses: the history of measuring the Earth with 360 degrees seems to go back to the Egyptians and their use of the sexagesimal number system, based on multiples of sixty. This may go back to the Chaldean Babylonians who knew of only five extraterrestrial planets: Mercury, Venus, Mars, Jupiter, and Saturn, which multiplied by twelve months per year made the base number sixty. The Egyptian year was twelve months of thirty days each, totaling 360 days. They added five extra days at the end of the year to get closer to the true solar year. The Egyptians then divided their circle into 360°, a multiple of sixty, seemingly based on the 360 days of their calendar. The Babylonian sexagesimal number system divided each of Earth's 360 degrees into sixty minutes. Each minute of the circle was divided into sixty seconds.

Regarding clocks: long ago, the day was divided into twelve hours of light and twelve of dark, thus the hour changed duration through the seasons, when not an equinox, between dark and light within a single day. Dividing an hour of time into sixty minutes possibly didn't occur

until the mechanical clock began to be used in the thirteenth century. The division of a minute of time into sixty seconds came late in the sixteenth century with more advanced clock technology.

To continue the historical pursuit to refine our abilities to measure space and time, further possibility for change is to reestablish a circle's division, applicable as well to an Earth compass, from 360° to 256°, or 512°, because 256 is a doubling up from 1. We could divide a clock into 16 or 32 hours per day, also being doublings up from one. An hour could be 64 minutes. Using the same numbers for measuring Earth, this would tie time zones around the planet in with the degree measurement of the globe, yoking the planetary space and time measuring systems more accurately than what the Egyptians tried to do. What is presently twelve noon, could be eight noon, with midnight marked as 16, being also the zero, rather than 12 or 24.

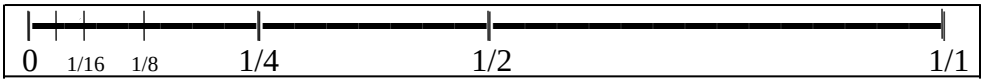
To change clocks:
16 hour geo day begins @ midnight. 1 hour = 64 minutes. 1 minute = 64 seconds.
1 new second = 1.318 old seconds because 1.318 = (24 X 60 X 60) ÷ (16 X 64 X 64).

To change compasses (repeating clock's vocabularies of minutes and seconds needs rethinking): We divide the Earth's longitude and latitude into 256°. Degrees have 64 mini-degrees; each mini° has 64 micro°. Also, the Earth is divided into 16˜ (hours): longitude rotation time. Each hour ~ is 16° rotation since each hour equals 64' minutes time, and each minute equals 64" seconds. This allows each degree of longitude to take 4 minutes rotation *time*, making Earth into a harmonically measured clock.

The decimal system is not divided harmonically, whereas the *way* we divide an inch qualifies as a harmonic binary system: $1/ H_{BT} = H_{BTR} = \{1/1, 1/2, 1/4, 1/8\ldots\}$ (Fig.XVIII.1). We already divide using the same harmonics for making and reading fuel gauges in our automobiles, and for reading and writing note duration in music. The length of an inch, a centimeter, or whatever we choose, would also need to be reconsidered as the basic measurement unit, to fit in with the larger scales, and/or smaller scales, depending on what we choose as important. The inch or centimeter, or probably some variation of those lengths, could be a fundamental unit for a new measuring system, able to be halved or doubled as needed, towards infinity.

In Fig.XVIII.1, we find GIMS: Gravity Inch Music Synthesis. Chapter X shows these ratios representing the Doe pitch-class. Chapter VII shows the zero as Mercury, 1/16 as Venus, 1/8 as Earth, 1/4 as Mars, 1/2 as Ceres, and 1/1 as Jupiter.

Fig.XVIII.1 Harmonically dividing space or time (an inch: 4.5 to 1 approximate scale)



The ounce, oz., is used for *dry* measure at 16 oz. per pound, a fundamental pitch-class relationship. The ounce unit used for *fluid* measurements in the USA also relates harmonically:
8 oz. = 1 cup; 16 oz. = 1 pint; 32 oz. = 1 quart; 64 oz. = ½ gallon; 128 oz. = 1 gallon.

Like with minutes and seconds used for both time and curved space, repeating ounce as the same vocabulary for two different entities, dry and wet, is a poor choice for redundancy.

There must be a cost/benefit analysis to determine the value of choosing changes, such as suggested by Geosoluna and harmonic music. Is "continent" a political or scientific definition? Is it Eurasia or is Europe separate from Asia? If we change the second as the time unit, this changes Hertz—cycles per second—and other references change. Maybe, instead of Celsius, Fahrenheit, or Kelvin we could use a harmonic binary temperature scale where O° H freezes water and boils at 256° H. In time, humanity as a whole, in each country, and each person, must question what would be the benefits and the costs of choosing each harmonic alignment.

The same chord of life {4, 5, 6, 7} found in sound, light, DNA, and brainwaves could be used for future computer coding. Our food needs and preparation could also be analyzed in terms of harmonics. Analysis of the dance of the superstring may have benefits in healing, energy production, superconductivity…etc.

"superconductivity occurs when conduction electrons become linked together in [Cooper] pairs… Cooper pairs gather en masse in a single quantum state, a process known as Bose-Einstein condensation… [and are] able to move through material in lockstep without losing energy… [to form] these Cooper pairs… a very prosaic entity plays this role: sound… the Cooper pairs have… spherical symmetry." *Scientific American*, August 2009

"…circular vibration of surface acoustic waves…controlled the magnetization of a ferromagnetic thin film… acoustic waves are waves of atomic vibrations in a substance. When the waves propagate across the surface of a material, the vibration becomes circular… known as angular momentum... 'We wondered whether the surface acoustic waves could control another form of angular momentum: an electron's spin—the source of magnetism' –Ryo Sasaki with Tohoku University (research in Nature Communications, May 10, 2021): *Controlling Magnetization by Surface Acoustic Waves*

In *Lives of a Cell*, Lewis Thomas's discusses choices we make, including HMOs, Health Maintenance Organizations, and their fundamental attitude of marketing *health* to sick people.

"Health…Sooner or later we are bound to get into trouble with this word. It is too solid and unequivocal a term to be used as a euphemism and this seems to be what we are attempting. I am worried that we may be overdoing it, taxing its meaning, to conceal an unmentionable reality that we've somehow agreed not to talk about in public. It won't work. Illness and death still exist and cannot be hidden…Meanwhile, we are paying too little attention, and respect, to the built in durability and sheer power of the human organism. Its surest tendency is toward stability and balance…time for acknowledgment, and even some celebration, of the absolute marvel of good health that is the real lot of most of us, most of the time…most things get better by themselves. Most things, in fact, are better by morning…[Looking to the future, if] we can restrain ourselves…from designing a system in which all…of us are assumed to be in constant peril of failed health every day of our lives…a medical system may work best if it starts with the presumption that most people are healthy…to do it the opposite way, taking it as a given that some sort of direct, continual, professional intervention is required all the time to maintain the health of each citizen…we will end up spending all our money on nothing but that."

Two laws of thermodynamics

As a closed universal system, creation follows the first and second laws of thermodynamics. The first says that mass and energy cannot be created nor destroyed, only transformed. The second says everything begins in higher order and falls continuously into further disorder.

These two laws have loopholes, tricks that seem to violate the laws, but do not. For the first, the loophole is that from void, matter and anti-matter can be spontaneously created in equal quantities. Then also those equal quantities can also be destroyed back to equilibrium zero void. The loophole for the second law: the fall into disorder, being entropy, is an overall average, allowing some regions of space to play and evolve within the rule. This mistakenly seems to violate the system's irreversible increase of disorder in following the arrow of time.

The law of conservation allowing both the first and second laws of thermodynamics is the conservation of the zero cosmological constant: the ultimate equilibrium. For the first law of thermodynamics, the basic conservation is the maintained equality of matter and anti-matter. For

the second law nature makes sure that heat always flows spontaneously from hotter to colder regions of space. The entropy average of the closed universal system always tends toward the final state of thermodynamic equilibrium. When equilibrium is reached and the temperature is all the same, it remains as the constant equilibrium of the zero cosmological constant, the zero-energy density of the original void.

The universe started highly ordered with the dance of the superstring, enabling the increase in overall disorder through time. Isolated in our biosphere, life, evolution, and even the creations of the living does not follow the entropy average, existing in quasi-isolated pockets of life, allowing reverse entropy.

This *HUT* examination is not refuting the laws of thermodynamics, but it focuses on an isolated bubble, our biosphere, that is not aligned with the average disordering path. Instead, this biosphere is flowing against the average, balanced by utilizing the energy released from the greater disorder rates in other parts of the universe, being more extreme than the average.

This path from order to disorder is runaway harmonic overtones. The fundamental tone is the new beginning in all systems and entropy dominates at variable rates from there on, degenerating into theoretical infinite harmonic overtones.

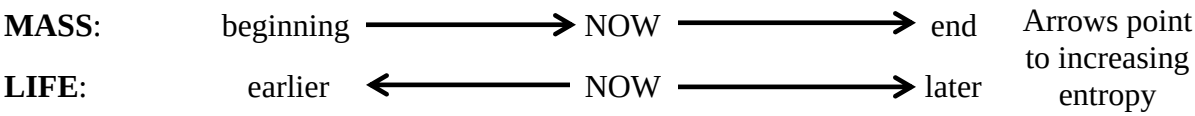
The first law of thermodynamics allows a cup to fall off a table and break on the floor, with increased disorder. But science authorities claim this also means the cup can be created again, allowing the reverse, being that the cup fragments can come together and reform the cup, then it can jump back onto the table. Intuition says that is ridiculous. Science authorities maintain their misconception of time in the sequence.

The second law of thermodynamics demands the universe, on the average, to be constantly falling apart. Thus, the highest order was at the beginning. Representing increasing disorder, the arrow of time points from the beginning to the end. A cup will break apart into the future, but the second law does not allow the cup to jump back on the table and reform.

Fig.XVIII.2 is simplified. The handle on the cup may break off and someone may reattach it. Life can perform maintenance on the things it creates and on its own self by investing harmonic energy. In a complex living organism, sub-systems, like a kidney, may be falling into disorder more rapidly than other organs. Then the kidney may bring more disorder to other subsystems also. Then the order in the family may suffer increasingly as well due to the person not able to work. But then the kidney gets replaced and health returns. Family order returns. Individual charts could be organized this way for health reasons.

Fig.XVIII.2 Increasing order in the biosphere

Two NOW perspectives: first is 2nd law of thermodynamics; second is evolution's



A solid egg is low entropy, being a high state of order. Physicists tell us it is inevitably going to increase disorder into the future. Upon breaking, the egg goes from high order to low. Current science models say that after you break the egg, it will most likely never come together again on its own. That might be true, but the erroneous time perspective obscures the fact that before it was a whole egg, it had had been coming together from scattered ingredients, having *grown* inside a chicken that had eaten grains which had grown with sunlight and photosynthesis, utilizing water, minerals from the ground, and CO_2 from the air. The minerals had come from exploding stars and Earth geology, and the CO_2 from decaying plants, exhaling animals, and other sources. The egg had come together from ingredients previously scattered all over the

universe, uniting into the ordered state of a present moment, the egg, only to break apart. If eaten, it increases order in the eater.

The low entropy, high order egg really does have a past and a future with higher entropy states: time reversal symmetry. Same with a glass cup that breaks. The current paradigm in science says that the broken glass cannot in the likelihood of the duration of creation ever put itself together. The error: the time-zero reference is not the *broken* cup, but instead it is the *whole* cup, being the highest order and the lowest entropy. In the past, a human gathered sand, melted it, and made a glass cup. I could drop this manuscript I am working on and the pages would be scattered to the wind, an instant change from low entropy to high. But in the past, I had put this manuscript together anyway, from paper that had been made from trees, which had grown from minerals, and from ideas of many people who had come before. Not only does life grow into higher ordered states, but life brings other things together too, like a farm to produce eggs, or a factory to make glass. This "experience" of a living system and its creations increasing entropy into the past seems to not be currently noted properly in popular physics. The big bang singularity came into order before it began to fall apart. Coming into order is the result of the *Willpower* for harmonic dominance over the constant disordering towards equilibrium.

Recording Possibility Field Events from the Probability Field

"The news that muons have a little extra wiggle in their step … behaving slightly differently than predicted… the announcement has [theorists] dusting off old theories and speculating on new ones… There are other, further-out possibilities, such as that the muons are being bumped by particles winking in and out of existence from other dimensions… the scientists said it's important not to dismiss theories out of hand, no matter how wild they may sound."

What the Muon g-2 results mean for how we understand the universe

June 22, 2021, by Louise Lerner, University of Chicago

Loop quantum gravity also proposes that space is composed of tiny loops, which *HUT* explains as space of the possibility field. Void surrounded by 2 x 5 dance is the holographic reference, is the possibility field embedded within our flesh's probability field. The reference dance-wave transforms into and touches all points of creation. Since the possibility field is embedded within all points of the probability field, interaction between the two fields is constant, such as light waves responding to a gravitational field. Think a thought and write it down. Possibility field thought transfers as ink on paper, establishing an event recording in the probability field, like a dance, a movie, or a building.

A double slit experiment allows light from the possibility field to record on a screen in the probability field. Shine cohesive diffused laser over a barrier that includes two slits. Coming out the other side of the barrier are the related waves from the slits. These two waves travel, splay, interact, and collapse to photons upon colliding with a screen that cumulatively reveal the trough vs crest interactions (Fig.0.2) of the waves during travel. Constructive wave interference is where a crest combines with another crest, or a trough with a trough. This intensifies the wave amplitude and makes more photons when colliding with the screen. The destructive wave interference patterns occur when travelling waves are opposite phase, cancelling each other's amplitude, providing less photons when colliding with the screen. The wavefunctions' patterns of light and dark bands now exist in the probability field, recorded on the screen.

The light that we might mistakenly believe to have "traveled" as a photon through the probability field, instead did this as a wave through the possibility field. The interaction of the light from the two slits occurs in the possibility field. Only when the light's wave finally collides with the screen, when the boson field confronts the fermion field, do the waves collapse into

photons. Absorbed light from the possibility field is being recorded onto the probability field which defines our experienced realm in time and space.

Photosynthesis, vitamin D production, sunburned skin, all these are also recording the possibility field light waves impinging onto the probability field as photons. Playing with constructive and destructive wave interference patterns and polarization, scientists and artists already explore choreographing light dancing in the possibility field and displaying that art onto a probability field screen of choice.

In holographic apparatus, the two wave sets, objective and referential, interact before colliding and recording on the holographic plate. Our body's adventures interact with the mind via the brain. The interacting objective and referential electromagnetic fields of the hologramic mind records our memories in the grey matter of the brain, which acts as the holographic plate which can later enable the reconstruction of the hologramic short-term or long-term memory.

An effective mode of harmonizing our brain's left and right hemispheres is in discovering how to operate more naturally. By letting the right brain flow through the possibility field within the lower differentiated harmonic octaves, the left brain interacts more effectively within the higher differentiated octaves of the probability field. This allows the whole brain's harmonic symphony to be played as shown with the keyboard in Fig.XI.3.

The Perspective of Light: Rethinking the Thinker

"…what happens when you reach earth's edge [?]… when you learn the earth is round, you see the previous mysteries are not solved; instead they're rendered irrelevant."
Brian Greene, *The Fabric of the Cosmos*

Special relativity teaches if an observer flies by the Earth at the speed of light, from Earth we must consider *in comparison* that the traveler's clock is stopped and the distance in the direction of travel is condensed to zero. Relativity says the light-speed traveler would still perceive time the same because even in flesh that is traveling the speed of light, light always travels the speed of light faster than the flesh-mass. But this whole mind experiment is false because flesh cannot travel even near the speed of light because it would become too massive: not possible. Ignoring the flesh perspective traveling the speed of light, instead use relativity to see that light itself has a perspective while travelling the speed of light. Science can drop the ego of the flesh trying to play Star Trek and fly at warp speed, for that is fiction. Brain is mass, mind is energy. Mind is already perceiving up to the speed of light. Science needs to learn to assess the perspectives of the mind appropriately, to figure out if the mass perspective, the energy perspective, or some mix of the two is most correct for each situation pondered.

Light waves in void perceive time as stopped—irrelevant. Also, light's direction of travel reduces to zero distance, so one of the three spatial dimensions is irrelevant to light's perspective. There are still two dimensions remaining for light to perceive: the line from the left through to the right is one dimension, and the second is the line running up and down. Two dimensions is a plane. This 2-D plane is what light perceives traveling through the mass-flesh realm of time within 3-D space. Flesh sees time and 3-D space while light perceives no time, and no distance in the direction of travel. Light perceives only 2-D space, like the 2-D space that holographic scientists seek and much of physics reveals (e.g. Fig.VII.2).

Brainwaves are bosonic. Neither dreams nor thoughts are bound up in time nor in one dimension of 3-D space, making fundamental images only 2-D. A dreamer's dream leaking into perceiving too much of 3-D space, plus time, will wake up the dreamer. A spectrum of thoughts can occur between the perspective of energy joining into the physical world of the perspective of mass. In 2-D, thoughts explore within the glorious intermixing of the two extremes of mass and

energy perspectives. Our timeless 2-D minds assimilate our 3-D + time world.

From our flesh perspective, light waves that pass through each other and occupy the same space at the same time. Fermions, that make up mass, cannot occupy the same space at the same time, like two colliding billiard balls. Light waves are considered bosonic, breaking the fermionic material-world rules of the awake flesh perspective. Light waves of dreams collapse from the possibility field onto the probability field, like when recorded in voice or with writing. *Alice in Wonderland* began as thought, then manifested into the material world.

The advantage of the flesh-mass body grounding the energy-void mind is that the mind can believe, and therefore perceive itself to be more than 2-D. The mind can believe its personal *I Am* self is the body and the brain within which it is grounded. The mind can believe in 3-D of space and 1-D of time. Or the mind can believe the flesh can fly like light or a bird. The mind can believe in the scientific path to understanding itself. Or not. The mind can believe it is scientifically okay to call the positive electrical pressure pole to be negative charge. But that is contradiction (chapter XIX). Mind can believe in weeding out illusions for health reasons. The mind can also disbelieve whatever it chooses, like when watching and absorbed within a movie.

The source of religions, of scientific theories, of insanity, and brilliance are all the same unified consciousness, which if accessed unprepared might be overwhelming. Seeking enlightenment? The Word, the fundamental circle, being the Name of God, whether Om, Amen, Allah, YHWH, or another, is the doorway in and out of the void. Stories, mysticisms, religions have all explored this. Varieties of vocabularies can obscure *HUT* vocabularies, but the story is the same. Source reference: the Void and the Word. Example, from "Lara Croft Tomb Raider: the Cradle of Life", regarding the Cradle, being the metaphor for the source reference of all creation. In this case, the spherical Orb can be seen as the Word and fundamental circle.

"Only with the orb can it be revealed. Inside you will find a place of madness—sky and earth are one, direction meaningless…somethings are not meant to be found."

For many people, even without a big experience, they believe they are already enlightened. But an individual's life may still hold a big experience of the Void and the Word in the future. If one does slip into the experience of the source, it is out of that epiphany that might come not just creative thoughts about unity, but also, if not handled properly, can lead to what is often considered "madness". It is a personal paradigm shift, and the transition requires will-power, choice, focus, exertion, relaxation, and responsibility to survive with any sort of grace.

The knowledge being experienced is that every part of creation, including everyone, contains the whole of the universal reference, of God. Thus, the person, in becoming the Word, might not just experience being *with* God, but might also experience *being* God, as in John 1:1. The experience might be overwhelming when coming back into reduced perspective, when trying to communicate it. The experience might be fast, but the understanding generally takes time. Adapting is required. Assimilating and eliminating different interpretations becomes necessary. Not adapting well can bring big imbalance. Survival requires finding balance.

The difficulty is grounding the experience enough to bring out a reduced perspective that allows the whole to remain whole while still formulating reduced vocabularies to expose all of its details. *HUT* claims that a harmonious future for humanity requires us to better understand harmony. The study of harmony at its essence is mathematics manifesting in music, DNA, brainwaves, rocks, orbits... everything. *HUT* introduces academic pathways with the intention of humanity's better understanding of unification and diversity, within science, art, and religion.

With Jews and Christians deciding that God's commanded name of YHWH (I AM), Exodus 3.14-15, was not meant to be shared any more, because of the disturbance of people

slipping into the Source, they decided to make it secret, thus breaking God's commandments of 1) God commanding the name YHWH, I AM, be remembered through all generations, and 2) not taking that name in vain. But now evolution seems to demand that we must better learn the Name, the Word, or our self-destructive tendencies may destroy us. Maybe it is already too late.

When in normal reduced consciousness, an individual may become imbalanced when noticing coincidences, synchronicities, and simultaneities, being the timing together of two or more events in a single situation. This correlation can become exaggerated confusion when interpreted as one causing the other, when proclaiming cause and effect rather than just accepting things happening at the same time. Two timelines that have been on a collision course with each other for a while may be emitting from a single common cause. Or maybe a shared historical impetus may not be so precisely coincided. If the individual announces to anybody else that he or she caused something to happen rather than that event just happening, without anybody causing it, witnesses who lack that point of view may strongly reject that person's shared perspective. This can bring social imbalance blamed on the individual. Some may even blame the blamers.

"And then one day, when the light flashes on in your brain, you see the big picture, the grand scheme, and it all comes together, all the data you've been accumulating for years starts to make sense." Candace B Pert, *Molecules of Emotion*

Once perceiving the One consciousness existing in entirety within, and causing all reduced consciousness', even the lyrics of music can seem to be speaking from the One to the many, about the One. Pronouns "he" or "she" might be interpreted as referring to the genderless God reference, as sang by the Beatles, "She loves you yeah yeah yeah, and with a love like that, you know you should be glad." With time, focusing on all the reductions and coincidences, and confusing it all with desires and the notion of cause and effect, can diminish someone's perspective of the Unity, as the reductions might become noise to the signal, distracting the individual from a healthy path. The individual's confused perceived path to peace may disturb his or her social relationships. To eventually travel without signs or prophesies, or overly externalizing one's intuitions, might allow a path towards peace, even among life's challenges.

For our reduced consciousness, the future is only a field of possibilities. We try to increase the probabilities of future occurrences with plans, trying to solidify the imagined time in advance. Plans often work, like with flight or dinner reservations, and doctor appointments. Sometimes plans get interrupted by internal or external events. Sometimes imagined problems become manifest and might even interrupt important plans.

In the future, we will teach and learn more about how our brains mix the universal reference with instinctual motivations, allowing our ever-changing rationality and emotions, especially desire. Sex, food, territory, all for genetic survival, can be strong instincts influencing rationality. For survival, children and adults may need to see the different ways instincts and rationalities mix within our natural consciousness, and how, through self-knowledge of our own operating systems, we can influence our choices and desires to help maintain balance in life.

"When any natural human function gets lost, i.e., is denied conscious and intentional expression, a general disturbance results… The crux of the matter is man's own dualism, to which he knows no answers" Carl Jung

Schizophrenia shows when a person expresses that they are abiding by a personal possibility field imposed on top of the accepted reality. This confusion over the reality of our shared probability field can cause concern in the witnesses. The label of schizophrenia is a convenient way to help maintain the current paradigm. With intense willpower to heal, for a person experiencing their reality dividing into more than one, focusing on the fundamental tone

of the universe and the dominant harmonics might beneficially harmonize their mind and heart. The patient with patience might learn to differentiate what is the probability field, and how, when, and why they begin to detrimentally impose their personalized possibility field onto it. The confusion comes because the probability field originated in the possibility field. Conscious ideas become manifest in 3-D space and time, like ideas in a book, movie, or statue.

Busting Heads on the Current Paradigm of the word FIELD

The calm pond receives just one waterdrop whose concentric rings expand outward. The universal void produces one predominant superstring dance. This beginning seed information, the fundamental tone, creates and maintains everything. We eat carrots and reinvigorate harmony. The universe continues to expand and cool. In time, all matter and antimatter will join and annihilate, flashing into photons, dissolving into void. All time and 3-D space returns into timeless 2-D space, then back to the void. A quote from, Kitty Ferguson, *Tycho & Kepler:*

> "Like many great scientific discoverers, Kepler asked simple, naïve questions that most scholars of his time thought not worth asking and to which they would have responded at best with a tolerant smile for a poor schoolteacher…He knew from precious experience that it was difficult to change the views of his colleagues and the public that followed them blindly… [For Kepler:] Underlying all the seemingly disconnected aspects of nature, the complexity and confusion, there had to be a pattern, logic, and harmony… In 1607 Kepler had acquired a Greek manuscript by Ptolemy, also entitled *Harmony*, that had preempted his own ideas by about fifteen hundred years. He was both stunned and inspired by the similarity.… [Kepler's] assumption of underlying harmony has become one of the pillars of the scientific method."

Within the evolution of thought, ideas that are most fit to the current conditions will survive. The ideas most fit to continuing conditions will continue to survive. As conditions change, old ideas may be changed, rejected, or revived.

Successfully introducing a valid unified field theory will change the current paradigm in science. The unified field begins from void into the possibility field which we know best as consciousness. It also allows what we call virtual particles. And it is also what happens to light currently believed to be traveling through the probability field as a wavefunction. We cannot observe light as a wave because the observer in the probability field does not see that light while it is in the possibility field. The light is only seen when the wavefunction strikes the eye and transforms into a photon light particle. All we can see: one octave of visible light.

The current scientific paradigm of the probability field is blind to light in the possibility field. Science measures space and time within the probability field, defined by $2n^2$, with $n = H_D^2 = \{1,2,3,4\}$. Discussing the possibility field in the same terms used for observing in the probability field is not correct due to the possibility field being limited to 2n, with $n = H_E^2 = \{1,2,3,4,5\}$. The possibility field is knowable through conscious experience, including within mathematics or dreams. The observer in the possibility field is without space and time being the same as for when observing in the 3-D space + time probability field.

Quotes included here are from the song *Spill the Wine* sang by Eric Burdon. He mentally drifts off like Dorothy did from Kansas to Oz, one field overlaying another. The first words explain the writer's flesh body perspective within the physical reality of the probability field:

> *I was once out strolling one very hot summer's day, when I thought I'd lay myself down to rest in a big field of tall grass. I lay there in the sun and felt it caressing my face as I fell asleep and dreamed.*

The body in probability space can be measured in position and time, with momentums of

breath rate, heart rate, brainwaves, etc. Next, the singer is telling us of the possibility field experience during sleep that occurs while the flesh body remains safe in the probability field:

I dreamed I was in a Hollywood movie, yes I did, and that I was the star of the movie. This really blew my mind, the fact that me, an overfed long-haired, leaping gnome should be the star of a Hollywood movie. But there I was. I was taken to a place: The Hall of the Mountain King. I stood high up on a mountaintop, naked to the world.

The flesh body is in the probability field, while the dreaming mind is in the possibility field. Someone observing the person sleeping in the tall grass in the field does not see the "place" where the dreamer was taken, for there is no other "place" present. But for the dreamer, the place is the Hall of the Mountain King. With time passing for the sleeping body, the dreamer cannot stay so deeply in the possibility field as again awareness begins of his flesh body in the tall grass:

I thought to myself; What could that mean? Am I going crazy, or is this just a dream? Now wait a minute – I know I'm lying in a field of grass somewhere. So it's all in my head.

Now the awakening dreamer must reconcile the two fields, the field within the dream, and the field of tall grass. Still dreaming: "*I could feel hot flames of fire roaring at my back.*" The experience within the dream field is confronting the heat, but maybe it is the merging of fields of possibility and probability, where the sun has been hot for long enough, moving from his face to his back, while the flesh body tries to stay asleep. The dreamer includes a fire as a solar warning, an impetus to awaken. The next quote is from *American Heritage Dictionary*:

***"field** 6. phys. A region of space characterized by a physical property, such as a gravitational force, having a determinable value at every point in the region."*

This "*physical property*" demand is science's cherished 3-D space + time of the probability field. Except somewhat in quantum physics, science has not yet learned how to embrace the altered time and space reality of the field of dreams, even though scientific, artistic, and spiritual advancements depend much on waking and sleeping dreams. *We need to further assimilate the perspective of light into science*. The possibility field has its own rules.

The fittest dream survives. The architect dreams of the building, then writes down plans so construction can begin. The scientist first imagines the test for the laboratory, next plans the details, performs the plan, then analyzes the results. The dreams and manifestations in the human world are always intermixing. Social alignments and controversies are often just dream battles, harmonious or not, trying to align the 3-D + time with the dreaming. The world's big dreamers too often end up as adversaries battling over the manifesting of dream details. The ones who compete with other central dreamers play out their dreams as alignments and confrontations in the fleshly world society. Someday, prophesies tell, a big dreamer will introduce the world's next paradigm, allowing minds living in flesh bodies to choose to live in a more tolerable world.

"Who looks outside, dreams; Who looks inside, awakes." Carl Jung

There are people looking inside themselves who have awakened to the harmonious flow of unity. The awakened one sitting in meditation might feel the urge to get up, walk the Earth, and learn a vocabulary to discuss the silent bliss of the unified mind, to communicate with languages of letters and numbers, and to share with other people who are walking in the flesh, looking outside. The awakened one walking in the world is driven by instinct to share unification vocabulary with humanity. If the awakened one's vocabulary and actions draws in the attention of harmonious dreamers of the Earth story, then the awakened dreamer's new vocabulary can potentially change Earth's social dream scape. A well-adapted new story might reveal integrity which includes all of nature, science, art, and spiritual understanding, as well as a way of living

life here on Earth. This integral story can potentially introduce the new paradigm, being derived and manifesting from natural conscious evolution. Once introduced and explored by some people, the societal inertial change will also trigger others to reject or accept the new idea.

"And when the broken hearted people living in the world agree,
there will be an answer, let it be…" John Lennon & Paul McCartney

TTC56: Tao Te Ching - chapter 56

"Those who know do not talk…Those who talk do not know"

Humans often live too much in reduced mind
Even forgetting the Unified Mind

Deep meditation within the Unified Mind
Allows no speaking at all
Yoking Void + Unity + Diversity

Returning to the world after being Unified
One's reduced description may begin
Words need to be carefully chosen

One can become confused and not know

And the ignorant reduced mind
May still not know Unity well at all

The above words of TTC56
Can be correct in two ways
When silence may be wisest:

Silence in deep meditation or
When ignorant people speak

But sometimes when the ignorant speaks
It is *not* correct for the wise to remain silent

Compare to *TTC56*:

"Fools multiply when wise men are silent." Nelson Mandela

"…a time to be silent and a time to speak…" Ecclesiastes 3:7

"In the end, we will remember not the words of our enemies, but the silence of our friends."
Dr. Martin Luther King Jr.

"The best answer to anger is silence." Marcus Aurelius

"Be silent, or say something better than silence." Pythagoras

Sitting on a cliff with a peaceful elderly person, you watch the sunset in blissful silence. Glows, reflections, colors, and feelings are so wonderful that you say, "Nice sunset." The elder stands and silently leaves. The peaceful elder had been sitting in complete mental union with the material universe, a unified perspective that reduced upon being measured, when you said, "Nice sunset." You ended his meditation. Like when flying and you say, "Look Mom, I'm flying…" When you measure, you reduce, and since you can only fly in unified mind—you fall.

"I hear and I forget. I see and I remember. I do and I understand."
Origin unknown, but often attributed to Confucius

I believe humanity will consciously evolve into a world-wide awakening. This will be our holographic reconstruction of the One-many paradigm of the fundamental tone and the overtones, of unity and diversification. The cleansing of our duality perspectives into more cohesion founded on the universal reference and fundamental tone will guide us into a global unity experience. Not every individual will be ready, but the ones that are will be witnessed by the ones who are not. The experience reveals the timeless void, then the one experiencing the void seeks a healthy vocabulary back out of that empty point of view. Some will be guided. Some will not. Some guidance will be healthy. Some will not. Currently we live in an often immaturely guided world in general. If this paradigm shift comes about, spiritual first-aid will be necessary. But not all aid offered will be balancing and healthy.

Socially, the requirement for holographic reconstruction is twofold. One: the reference wave, being God, must interact with every individual's conscious thoughts. This is done through the societal singularity, already known as the Word or Name of God. If God makes this

singularity into a God messenger for the situation, that human messenger needs introduction to the whole world. The combination of God as the reference Light of the mind combining with the fundamental singularity resonation, the Word, throughout all quanta of the universe, can reconstruct the dream of God within individuals: the Blossoming Wisdom Syndrome—*BLOWS*.

"He is coming with the clouds, and every eye will see him… Amen." Revelations 1:7

Mind Play to See the Dream

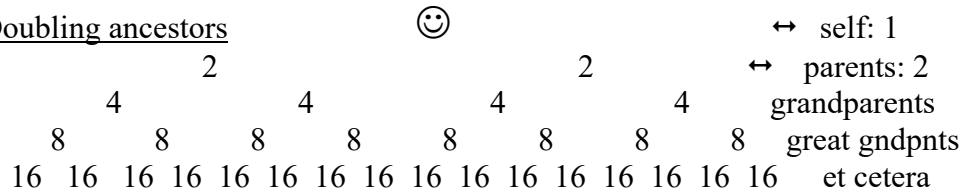
This is a mental exercise to allow your embedded *self* to see everything as a dream, to shift from our normal perspective and consider another. Entertaining two perspectives of unified harmonic math, looking inside both, allows one of them to show our normal time-ticking paradigm, while the other allows one to see from inside the dream where time is not "real", the part of our accepted paradigm relegated to our active imagination. One person may stand so hard on the time-full perspective that the timeless dream cannot be considered a valid experience. Believing in the timeless perspective too much can allow one to not get out of the way of a moving car, thinking it just illusion, all moving light—no mass. To find balance in each life situation, unified adaptability is achieved through the proper assimilation and/or elimination of each perspective to which we are confronted. The intention in this mind exercise is to enjoy the different perspectives in a similar way as enjoying a movie about something make-believe, letting one's imagination engage with the story, yet while still eating popcorn.

Doubling ancestor dilemma

"…or does the human mind impose on time a quality of its own making, one that is artificial and that hence does not show up in the laws of physics?" Brian Greene

Humans grow by learning the true story of our existence, weeding through illusions such as a flat Earth at the center of the universe. I've looked at the following perspective for many years and I still indulge in both solutions. One of them supports our ticking clock paradigm, and one supports our view of time as being an illusion. I feel obligated to share this form of *solipsism*, to enhance a timeless-time full duality within our human imagination.

Fig.XVIII.2: Doubling ancestors



Problem: Each and every one of us may look back at our ancestral tree in terms of the doubling of one: the harmonic binary set through time in base-ten, without zero: $H_{BT} = \{2^{H_I}\} = \{2^0, 2^1, 2^2, 2^3\ldots\} = \{1,2,4,8\ldots\}$. In the simplest genetic form, we are each one person with two parents, four grandparents, eight great-grand parents, and sixteen great-great-grand parents.

If I do my numbers with an estimate of 33 1/3 years between the birth of one generation to the birth of the next, then my four grandparents, born approximately one hundred years ago, constitute the direct single-generation ancestors required for my adult existence. Two hundred years ago I require 32 direct ancestors. Three hundred years ago I would have had 256 direct ancestors. Four hundred years: 2048 ancestors. One thousand years ago I would have had 536 million ancestors. Two thousand years ago I would need 573 quadrillion ancestors (5.73×10^{17}). How can that be? That would be almost 100 million times Earth's population today! Population is supposed to be generally shrinking backwards in time. That's 573 quadrillion ancestors at the time of Christ for just one person alive today.

Solution A: All children of the same parents, of course, have only one set of ancestors. Cousins share grandparents and earlier generations. Through history there were lots of big families and lots of marriages making lots of kids with lots of cousins marrying each other. This might be able to crunch the numbers backwards in time enough to be reasonable.

Solution B: That's too many ancestors to crunch with just big families and kissing cousins. Therefore: *time* is illusion. None of us has any real past—just one great imagination: "Life is but a dream". We are a bunch of characters, each claiming our own *I Am*, like I am alive or I am a human, though we are just one *I AM* mind acting as many *I Am*s in a big mind show. This is now, and now keeps going on with no time, without even any "going on". Due to the mind-construct that we live in, we believe in the illusion—*Maya*, in Hinduism— of aging, of dying, the birthing of ancestors, and cause and effect. Yet, we are in a one-mind-show playing the time game: right now, right here. Now here… nowhere. No thing… nothing. Not even not.

Conclusion: It does not matter. Regarding solution A, I'm not going to gather the needed data and learn to write a computer program to prove this to support the mass perspective paradigm. Regarding solution B, the possibility of perceiving all from the perspective of light, we still should not jump in front of moving cars because flesh experience tells us cause and effect is real. We must still chop wood and carry water or suffer the consequence. I do not care if my time reality is illusion or not. I am playing the game, whatever it is. I believe God chooses the harmony of $E = Mc^2$ to experience time. Through the experience of time, we learn integrity, cohesion, and diversity through harmony originating from the universe's single unifying fundamental tone which appears as unfolding through time.

"For us believing physicists, the distinction between past,
present and future is only a stubborn illusion." Albert Einstein, March 1955

Einstein Did Not Finish His Work

"Fred Hoyle once warned Gell-Mann about the perils of fame. If you ever accomplish anything important in life, he said, the world will conspire to keep you from doing anything else again."
Strange Beauty, George Johnson (see chapter III)

"With fame I become more and more stupid, which of course is a very common phenomenon."
— Albert Einstein

"By and by I despaired of the possibility of discovering the true laws by means of constructive efforts based on known facts. The longer and the more despairingly I tried, the more I came to the conviction that only the discovery of a universal formal principle could lead us to assured results." Ibid

"… if we are to understand our world more deeply… those two great theories of … relativity and quantum mechanics, must be harmoniously joined…Einstein, by inventing the photon and by laying the theoretical basis for lasers, had contributed as much as anyone to quantum theory. Yet he died not believing in it. Bohr died its champion, but recognized that it was unfinished business." J.A. Wheeler, *Geons, Black Holes, and Quantum Foam*

Einstein initiated the creation of quantum mechanics by publishing his theory of the photoelectric effect. After quantum physics was popular, he argued that the limited perspective of probabilities could not complete his sought-for unified field theory. Einstein had a feel for the unified field. He sought to merge, among other concepts, field and matter, mass and energy, quanta and continuity. The key: light is a wave or a particle, not and. Here are some quotes from a book called *The Evolution of Physics* that Einstein co-authored with Leopold Infeld, another researcher at the Institute for Advanced Study. The first reflects Einstein's disagreement with

quantum physics being the final field theory. Quantum physics can only address the quanta statistically. The unified field allows relationships. Harmony is relationships.

"But there is no doubt that quantum physics must still be based on the two concepts: matter and field. It is, in this sense, a dualistic theory and does not bring our old problem of reducing everything to the field concept even one step nearer realization."

"The theory of relativity stresses the importance of the field concept in physics. But we have not yet succeeded in formulating a pure field physics. For the present we must still assume the existence of both: field and matter."

"We cannot build physics on the basis of the matter concept alone. But the division into matter and field is, after the recognition of the equivalence of mass and energy, something artificial and not clearly defined. Could we not reject the concept of matter and build a pure field physics?"

"By far the greatest part of energy is concentrated in matter; but the field surrounding the particle also represents energy, though in an incomparably smaller quantity."

"There would be no place, in our new physics, for both field and matter, field being the only reality."

"A courageous scientific imagination was needed to realize fully that not the behavior of bodies, but the behavior of something between them, that is, the field, may be essential for ordering and understanding events."

"A field may be something regarded as always associated with a current."

A harmonic field's current is in the precise motion of waves through space and time. An equation still represents duality and therefore cannot represent the unified field theory. $E = Mc^2$ approaches a unified field theory, but it is not unified since it is still stuck with the duality of mass and energy. Unified set mathematics, specifically harmonics in the field of numbers, Fig.X.1, can be used in equations, and can therefore satisfy the sought-for-math requirement of field unity which allows harmonious diversity. Research into the field of numbers should help us to learn about living in harmony.

For example, with $c = f\lambda$, where speed (c) equals frequency (f) times wavelength (λ), the field of numbers enters into $E = Mc^2$ as $E = M(f\lambda)^2$. The equation, $c = f\lambda$, applies not just to the constant speed of light, c, but to all constant speeds, such as sound, a rolling wheel, or people walking the same speed in harmony. Walking side by side with her older and taller sister, Doe, Ah's steps are 4/7 (Fig. X.1) the length of Doe's. To keep up, Ah steps the reciprocal 7/4 as frequently. If a wheel, with wavelength $\lambda = 5$ feet around, rolls on the ground 100 cycles in one minute, its frequency f, the wheel's speed, c, is $c = f\lambda$, or:

c = 100 cycles/minute x 5 feet/cycle = 500 feet/minute

With our individual human consciousness' locally centered in our flesh body, and non-locally centered in all points of creation, we witness through observation combined with math and science that light in the form of electromagnetic wavefunctions travels *through* time and 3-D space at the speed of light. With Einstein's $E = Mc^2$ we learn that decelerated light creates our 3-D mass and its gravitational field. Time allows our experiences within the creation of mass.

From Einstein quotes, in the September 21, 2011 Transcendental Meditation blog written by Craig Pearson PhD, we can understand that Einstein's willpower was driven to understand, through an as-yet unknown vocabulary in science, a way to explain his own personal experiences of unity. From Einstein's letter to Queen Elizabeth of Belgium (1876-1965):

"… there are moments when one feels free from one's own identification with human limitations … [When] one imagines … a … profoundly moving beauty of the eternal, the unfathomable: life and death flow into one, and there is neither evolution nor destiny; only being."

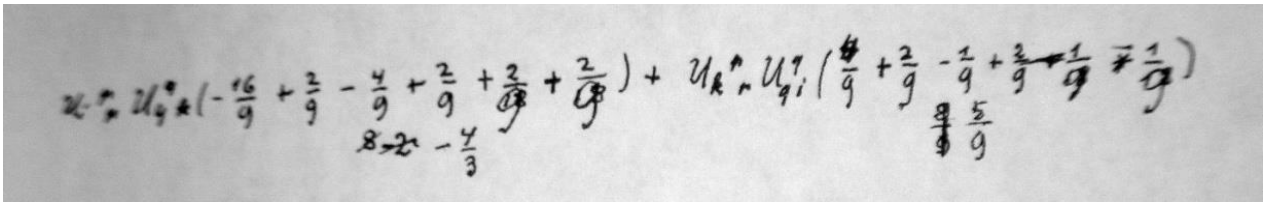
"A human being is a part of the whole, called by us 'Universe,' a part limited in time and space. He experiences himself, his thoughts and feelings as something separate from the rest — a kind of optical delusion of his consciousness. This delusion is a kind of prison for us, restricting us… Our task must be to free ourselves from this prison by widening our circle of compassion to embrace … the whole of nature in its beauty."

"The finest emotion of which we are capable is the mystic emotion. Herein lies the germ of all art and all true science … To know that what is impenetrable for us really exists and manifests itself as the highest wisdom and the most radiant beauty, whose gross forms alone are intelligible to our poor faculties — this knowledge, this feeling . . . is the core of the true religious sentiment. In this sense, and in this sense alone, I rank myself among profoundly religious men."

"The true value of a human being is determined primarily by the measure and the sense in which he has attained to liberation from the [restricted] self."

With his personal goals not yet satisfied, Einstein died at home in Princeton, New Jersey, just past one in the morning on April 18, 1955. Left by his deathbed, Einstein had written his one last attempt at the unified field theory (Fig.XVIII.4). Notice Einstein did not leave us an equation (no equals sign). What is interesting for me about this is his focus on ninths, specifically 1/9, 2/9, and 4/9. These are all ratios within the field of numbers, Fig. X.1, referring to the pitch-class of *Rae*. It is like Einstein was contemplating inside the unified field theory and was trying to break away from theta nodes where there is no *Rae* yet, {1/4, 1/5, 1/6, 1/7, 1/8}. He was trying to reduce to an octave with more pitch classes, further away from the 1/1 fundamental tone, *Doe*, into the octave of {1/8, 1/9, 1/10…1/16} where he was finding that there is more differentiation. From the field of numbers in Fig.X.1, the first nodal points of the newest *Rae* pitch class that Einstein encountered included universal harmonics: {1/9, 2/9, 4/9…}.

Fig.XVIII.4 Einstein's final contribution



"If I were a young man again and had to decide how to make a living, I would not try to become a scientist or scholar or teacher. I would rather choose to be a plumber or a peddler, in the hope of finding that modest degree of independence still available." Einstein

"If I were not a physicist, I would probably be a musician. I often think in music. I live my daydreams in music. I see my life in terms of music." Ibid

"The solution, however, is not to bring in graduate students, laboratories, linear accelerators, or any such artificial aids to confusion. What the Ideally Perfect Institute needs more than anything else are one or two prickly pears on the faculty. Often enough, the world's most creative geniuses are overbearing egotistical snobs, but there are none of these to be found at the Institute, which has managed to attain benign harmoniousness of a blue sky. But it's a fundamental principle of aesthetics that the rarest beauty of all is achieved by the addition of an incongruous detail to an otherwise uniform whole.

Violated symmetry, deliberate ambiguity, a little chromatic fantasy
amid all the harmonic tones—these make for an organic unity
out of what had been a mechanical sameness."
Ed Regis, *Who Got Einstein's Office?*
Eccentricity and Genius at the Institute for Advanced Study

"By reason of your past experience [regarding the accepted scientific paradigm],
you would certainly regard everyone with disdain who should pronounce
even the most out-of-the-way proposition of this science to be untrue"
Albert Einstein

"Nothing happens until something moves." Ibid

"By and by I despaired of the possibility of discovering the true laws by
means of constructive efforts based on known facts. The longer and
the more despairingly I tried, the more I came to the conviction
that only the discovery of a universal formal principle
could lead us to assured results." Ibid

"If you can't explain it to a six-year old, you don't understand it yourself." Ibid

"It's not that I am so smart; it's just that I stay with problems longer." Ibid

"You will hardly find one among the profounder sort of scientific minds without a religious feeling of his own. But it is different from the religiosity of the naïve man. For the latter, God is a being from whose care one hopes to benefit and whose punishment one fears: a sublimation of a feeling similar to that of a child for its father, a being to whom one stands, so to speak, in a personal relation, however deeply it may be tinged with awe."
"But the scientist is possessed by the same sense of universal causation. The future, to him, is every whit as necessary and as determined as the past. There is nothing divine about morality: it is purely a human affair. His religious feeling takes the form of a rapturous amazement at the harmony of natural law, which reveals an intelligence of such superiority that, compared with it, all the systematic thinking and acting of human beings is an utterly insignificant reflection. This feeling is the guiding principle of his life and work, in so far as he succeeds in keeping himself from the shackles of selfish desire. It is beyond question closely akin to that which has possessed the religious geniuses of all ages." *The Religious Spirit of Science***,** Albert Einstein, 1934

"…a conflict arises when a religious community insists on the absolute truthfulness of all statements recorded in the Bible. This means an intervention on the part of religion into the sphere of science; this is where the struggle of the Church against the doctrines of Galileo and Darwin belongs. On the other hand, representatives of science have often made an attempt to arrive at fundamental judgments with respect to values and ends on the basis of scientific method, and in this way have set themselves in opposition to religion. These conflicts have all sprung from fatal errors… though religions may be what determine the goal… science may only be created by those who are thoroughly imbued with the aspiration towards truth and understanding. The source of this feeling, however, springs from the sphere of religion… science without religion is lame, religion without science is blind." Albert Einstein, 1941

"I am enough of an artist to draw freely upon my imagination. Imagination is more important than knowledge. Knowledge is limited. Imagination encircles the world." Albert Einstein

"The belief in an external world independent of the perceiving subject
is the basis of natural science." Ibid

"Einstein was simply ahead of his time. More than half a century later, his dream of a Unified Field Theory has become the Holy Grail of modern physics." Brian Greene

"After the stunning success of his general theory of relativity, Einstein had assumed that the next step would be to bring electromagnetism into the picture. If gravity was a ripple in four-dimensional space-time, then maybe the other forces were too. As far back as 1919, a mathematician named Theodor Kaluza thought he had found a way to expand general relativity to include both gravity and electromagnetism by adding a fifth dimension. Both forces would be ripples in this larger-than-imagined arena of space-time. But where was this extra dimension? Oskar Klein … found a way of sweeping Kaluza's fifth dimension under the rug by shrinking it to a negligibly tiny circle." *Strange Beauty*, George Johnson

"I am now convinced that theoretical physics is actual philosophy." Max Born

"We cannot solve our problems with the same thinking we used when creating them." Albert Einstein

"The world as we have created it is a process of our thinking. It cannot be changed without changing our thinking." Ibid

"I fear the day technology will surpass our human interaction. The world will have a generation of idiots." Ibid

Ignorance: Benefits & Costs

"…we do not yet *know* all the basic laws: there is an expanding field of ignorance." *Six Easy Pieces*, Richard Feynman

Evolution of consciousness was propelled by chromatic (non-harmonic) aberrations. Constantly seeking to balance again to survive, we rapidly evolved new ideas and inventions. This excessive adapting to new perspectives has also led to the de-evolution of consciousness.

"As a species, we're devolving. We used to be intellectually curious, but now we choose ignorance. Today we censor scientists." MacGyver (TV) S04 E08

"A momentous but little discussed study by the University of Hertfordshire in collaboration with the British Council found that the *walking speed* of pedestrians in 34 cities around the world increased by 10 percent just in the 10-year period from 1995 to 2005." Alan Lightman

A common response I receive when I present my ideas, for instance the prime numbers found with a number line minus the multiplication table, or the rearranged periodic table, the Pythagorean error, or using ±1/3 as basic electromagnetic units, is this question and conclusion: *If it is so easy to understand this stuff, then why hasn't anybody else known? You must be wrong.*

Ignorance yields benefits and costs. Conscious evolution has required time. Time is the essence of any evolution. Even a sudden change requires a *before* and an *after*. Too much conscious evolution too fast can be harmful, causing overheating from excessive neural connections, so people *must* ignore many new insights to be able to survive. Our human story has required time to accumulate throughout history… that was our destiny… our evolution.

Imagine a molecule of water dripping from a glacier high in the mountains. This H_2O molecule joins others and trickles into streams, then into rivers. If there is a landslide along the way, every new-fallen rock changes the water molecule's trajectory. A child walking home from school impulsively chooses to stop and float wood chips on the river, thus affecting the water molecule's path through time. When this molecule reaches the ocean, it has a specific history.

With enough data and foresight, the landslide and every obstacle along the way could have been predicted, thus the eventual history was once a destiny. To include the child brings up the common argument that humans have freedom of choice, and thus an indeterminate future. I believe that if we humans were not so ignorant, even the child's choice to stop by the river, the spot where the child chose to stand, and which chip of wood that child chose to float, all this could be predicted, just as the weather could be perfectly predicted— if we could only synthesize enough information. *Every change* could be predicted in advance—in Newtonian physics and in Einstein's science—if the observer was not so ignorant of the facts of the hologramic dance's determinant future. Quantum physics probability insists ignorance is part of it all.

The adopting and adapting to ignorance is based on the time factor, the details of which we are not aware. Humanity's accepting and overcoming of our ignorance has been, and will be, our conscious evolution. Today's destiny is tomorrow's history—same thing, depending on where, rather *when*, we stand. This universally organized *conspiracy of ignorance*'s chief mechanism in society is our easy distraction due to being overwhelmed and drawn away by our unconscious instincts.

Father: "I'd like to believe there's a plan to it all, but I… I don't see a plan." Son: "That's just 'cause we're inside it, Dad. We see the plan. We're standing on it." *Yellowstone* (TV) s03 e02

How I Got Here

I was born April 19, 1956. I was told through my youth that I could do anything that I wanted when I grew up. I was always too young to be grown-up. I still am. Being tested by sports, schools, many things: my time-free mind would get in the way of my time-locked body. Co-ordination: body and mind working together, this often evaded me as I would prioritize my imagination over the less-meaningful physical presence, blocking many of my natural instincts. And I lacked any teacher who could explain this space + time body-mind construct to me. Too often, focusing on the physical moment, like as an outfielder in a baseball game, it lacked enough importance for me to adhere to the social demands. I did not understand the basic duality of fields: possibilities of the time-free mind, verses probabilities of the physical presence.

I was not raised with religion. When I was maybe six years old, having never been told anything about the Bible, my mother felt a responsibility to get the family to attend a church. No preparation was given to me. After about three weeks of my parents in the church and us kids in a separate Sunday school classroom, my father announced he would not attend any more. I said if Dad did not have to go, then neither did I. Stories the school teacher taught seemed like just more Santa Clause, Tooth Fairy, Easter Bunny, April Fool's Day, and snipe hunt confusions. That was huge dissonance for me, even at that young age. My faith in people telling me not to lie who insisted that I believe in their lies bothered me from very young. They said their lies were acceptable because they were make-believe, jokes, sarcasm, white lies, and imaginary fun.

When I was a young child, my father would tell me the universe was infinite. I could not imagine the infinity. I imagined something like a brick wall surrounding the whole spherical universe and outside the brick wall had to be nothing. I was quite young when this lifelong contemplation had begun. I can only guess that the infinity conversation with my father, and my private follow-up thoughts, also began around the age of six.

I would consider this as I opened the hinged mirrored medicine cabinet door in the bathroom until it reflected off the big bathroom mirror. The two mirrors began at a ninety-degree separation, and the opening of the medicine cabinet brought the arc separating the changing mirrors closer to zero-degrees. I would put my face between the closing gap of the two mirrors and I could see my reflecting faces curving off into infinity in both directions. As the mirror

approached parallel, the curving line of images increasing further towards infinity, the curve straightening more and more, there became less and less space for my eyes to fit between the closing gap of the two mirrors. If I could be in there at the point of parallel mirrors, the infinite line would be condensed into a unified reflection of my one face.

I imagined the infinite curving universe this way and I could not accept the infinity as anything but imagination. There had to be an end out there. But how would it end. The unacceptable brick wall kept coming back to my ideas. The outer barrier could not even be like the surface tension of a drop of water, the cohesion holding it all together. The barrier could only be void, making the whole universe to be a singularity. I was young for such thoughts.

With time, this idea evolved and now I am inside my own theoretic bubble which seems to contain everything… the theory of everything. I continue to adapt this same concept to the finite material universe which ends at a 2-D membrane with the void "outside". This makes us in a bubble with a 2-D barrier in all directions. It extends no further out there, as nothing is beyond the 2-D membrane, and there is nothing to extend into: no space, no time. This 2-D barrier has become for me the 2-D holographic plate on which all information within the bubble is imprinted as frequency code: the 2 x 5 dance. We are still in the void, and the void is within us. Within, we are all vibrations in harmony, and consciousness has allowed us unity, duality, and diversity through $E = Mc^2$. This means we can perceive as both timeless-spaceless void and from within time and space as well, even mixing mass and energy perspectives for time-varying thoughts.

The key to holography is the cohesive unified reference wave which remains unchanged, while it also changes. The holographic plate stores the frequency information, but for reconstruction, which is our creation, the reference wave and the tonal center connection are both still required. Once the apparatus is complete, the image can be created. And we are that image. We are within that image. The reference wave is God, the source. It contains all the information to create the hologram. Our experience of the universe's construction proves we are each containing the unified reference wave and the diversifying objective waves. We are everything within the bubble. We are the barrier, the holographic plate. Our individual and cumulative *I Am* does perceive that we are it all, all at once, and also, we are each just little points stuck within space and time like an apple within the vastness of creation.

I tried taking guitar classes. Maybe I was eight. The first day as I learned to finger chords, I wanted to know: what were these chords? How come some notes go together and not others? I wanted to know deeper about chords than the teacher could care. I knew my own brain enough to intuit that when I learned relationships, memory was easier. When I tried rote memory, without any understanding, I did not have any ability close to a "photographic memory", nor even a dominate visual memory. My mind naturally sought relationships. I needed math, but how could I know what I needed? So, I could not care. I refused to go to the second guitar class since it only brought me such discomforting confusion and discomforting dreams at night.

My first physics class ever was my sophomore year of college. I signed up for an upper-level physics of music class. The teacher's vocabulary was standard terms like timber and such, but the teaching seemed to be going nowhere for me. Almost half-way through the course, I asked the professor to allow me to drop the class. Why, he asked. "I am uncomfortably confused. My sleep is getting messed-up trying to organize this stuff." He checked. So far, I had the highest grade in the class. He could not reconcile my grades with my claim of not understanding. I told him I could do what he taught, but that was not everything that I needed to understand the physics of music. I could not explain to him what I did not know. He set me free: no penalties.

Winter quarter, 1981, University of Washington, I would soon complete my four-year undergraduate degree in my seventh year since high school. I had taken much time away for life

adventures. For my final quarter of school, I had figured I needed five credits of 4.0 grade point average to tip my graduating grade point average up to a 3.5. My present A-minus average was the standard I had set for myself ever since I was young, with which I got away with doing almost nothing in school, able to achieve my standard. During that winter, I took my second first physics course mostly to raise my grade. There were hundreds of students in the class, with teaching assistants and all. I never talked to any of them.

After the final exam, the last question I had gotten wrong, and I explained my perspective to the professor. I told him the question was readable from the perspective of correct grammar, or in a whole different way if I assumed the question to be worded improperly. During the exam, I gave the test's author credit for being knowledgeable, assuming proper wording. I answered the question in a much more difficult manner than if I had assumed the author had written the test incorrectly. It turned out that the test question was grammatically in error. The professor understood the way I read the question and liked my answer, and he gave me 100% credit, acknowledging that the question's intention had been obscured by bad writing. The professor asked why I did not study physics. I told him I just finished my final test of my college career, ending with a degree from the English Literature department, emphasis on creative writing, because I had needed to learn how to read and write well, having failed to achieve that to my personal standard as I was growing up. I had earned good enough grades without applying myself much, enabling me academically to comfortably disappear. Being so detached from each physical moment, I made so many errors with my mind and body, though I found my errors to be my greatest teachers. I asked both smart and stupid questions.

"It is important that students bring a sort of ragamuffin, barefoot irreverence to their studies; they are not here to worship what is known but to question it." Jacob Bronowski, *The Ascent of Man*

For many years, beginning in middle school, I had been academically confused without knowing the sources of my confusion. I did figure it out by myself, the positive-negative-electron problem, but not until I already had gray hair and a bald spot. Then I found out that others already knew. Einstein had mentioned that the error is an inconvenience. See *HUT* chapter XIX.

"But the right way to wholeness is made up, unfortunately,
of fateful detours and wrong turnings." Carl Jung

I did not know for so many decades that this electron-should-be-positive was the academic monster in my mind. My unidentified confusion applied to the electricity embedded in all sciences, and my response to it was to mostly not care much about science in school. I still very much wanted to know universal truth. Growing up had filled my head with all the confusions of conflicting this-and-that. This messed with my balance of gullibility and skepticism. My desire to not look deeper into the big confusion that others kept dishing out to me kept me from immersing myself in formal education or thinking about other barriers confronting my ignorance. I could not understand all that I was being taught, but I could still consistently earn a good enough grade doing almost no work. So I just could not care. Skiing and its associated lifestyle became a far more important teacher of physics and people and adapting for me than anything I had found within the academic system.

"Great is the power of steady misrepresentation - but the history of science shows how, fortunately, this power does not endure long." — Charles Darwin, *Origin of Species*

"Authority. Man cannot exist without it, and yet it brings in its train just as much of error as of truth. It perpetuates one by one things which should pass away one by one; it rejects that which should be preserved and allows it to pass away; and it is chiefly to blame for mankind's want of progress." — Johann Wolfgang von Goethe

My solution to all this unresolved confusion was to stop the data-input that others were choosing for me to mentally digest. I needed to further question authority. This allowed me to be more selective about what I thought. A week after graduating college in March of 1981, on April 2nd I paddled away from Seattle in a kayak, with friends in kayaks, for a six-month adventure to Alaska and back. In 1982, from journals written during that adventure, I wrote a book about the physical chronology synchronized with my scanning thoughts: *I Can't See the Wind*. Hoping to find a way to explain how humans attain unification ideas, I had been thinking most about the unifying physics of Einstein, the unifying biology of Darwin, and the unifying mind science that Jesus had been trying to get us to understand. Researching and developing my own perspectives initiated my October 4, 1982 epiphany of the Unified Field Theory.

"The modern artist, after all, seeks to create art out of the unconscious." Carl Jung

"The analyst synthesizes the components, putting them back together to make a compound wave… as the analyst proceeds, the discrepancy between the synthesized wave and the original wave usually becomes so small as to be insignificant… An extremely complicated wave may be the product of many component waves. How many? An infinite number, in theory. How, then, does the analyst know when to stop analyzing?" Paul Pietsch, *Shufflebrain*

I shared my theory in its early stages with Paul Pietsch, the author of *Shufflebrain*, the book which had triggered my 1982 epiphany. Invited into his office in Bloomington, Indiana, he shared his perspectives and expressed confidence that I was on the correct path, even though it would be difficult to challenge the present paradigm. He said my grasp of holography and harmonics was strong and that I should keep going. He passed away on November 26, 2009.

Einstein was not trying to prove theories with laboratory experiments. He was creating theories by doing mind experiments. I priorities have resulted in me following his example.

A cup of Joe

As *HUT* is my theory, first uncovered on October 4, 1982, I demand of myself the best quality control I can muster. As my personal scientific method is trial and error, I must make many errors which need correcting as soon as I know how to do so.

I first mentioned Joe in introducing *HUT*'s Chapter X. We met during the winter of 1984-85, working together on the Professional Ski Patrol at Crystal Mountain. In 1990, recommended by another ski patrol buddy of ours, Joe chose to complete his college senior thesis based on the music section of my harmonic unified field theory. We collaborated off and on for the next 25 years. From the beginning of joining my project, Joe never liked thinking of me as his teacher, though he had signed up for me to be his mentor for his college program.

Shortly after meeting Joe in 1984, I learned that around 1974 in San Diego, Joe had become a disciple of an Indian guru. Still a dominant part of Joe's identity in 1990, for Joe the guru established a teacher that left no room for me. In India, a traditional guru represents god on Earth to his or her disciples. I always made it clear to Joe that this is not a position I wish to hold for anyone, neither as a guru nor a disciple. I already have God. I do not claim to be that, though due to the holographic reference: every part does contain the whole. In the flesh, our neural synapses would burn us up if we had to assimilate every detail of the whole universe. Omniscient and omnipresent: too much information is dangerous for the limitations of the human brain. We must respect our own limits. I do not expect nor accept being the guru for anybody who wishes to study my harmonic theory. I do have a strong need to teach some perspectives that I feel I have grown to understand, ideas which I believe are important not just for me, and I am willing to wait for someone with enough willpower to study my work, but I refuse to be anybody's god.

I can point at God, but I will not be pointing at me except in that every part contains the whole. Joe's guru thing was Joe's thing only. My goal was to learn to teach Joe without being a teacher.

Even if the Messiah comes to Earth, even though I claim no religion, I am more like the Jews in thinking that worshipping God in flesh is idolatry, unlike Christians. Christ himself served God who art in heaven. He did not claim to his students, "Praise me for I am your God". John 10:30 does tell that Jesus said, "I and the Father are one". Holographic unity of the fundamental tone with the universal reference is a unity that all humans can attain some of the time. At other times, our needs for survival and understanding require us to reduce from being God unified, instead to being *with* God (John 1:1). Jesus was reduced while hanging on the cross asking God why God had forsaken him. At that moment, Jesus, even in his own beliefs, was not being one with God. Jesus was acting out his ignorance of the Biblical wisdom from Deuteronomy 31:8, "YHWH goes before you and will be with you; he will never leave you nor forsake you. Do not be afraid; do not be discouraged."

I feel so ignorant about so many things that I regularly seek out masters of different specialties to help me along my path. I could never be a teacher of all things to anybody. We have a world population of eight billion people. Many of them are masters of so many things. None of us need to know it all. I work on my theory of everything, but I am not a master of everything, and never will be. Humanity as a whole, past and present, is the closest we have to a grand master. Unmanifested God is the Grand Master, but God mostly teaches in silence.

Joe's guru had taught him that harmonics were of utmost importance in creating and maintaining the universe, and that universal harmonics were shamefully not being used to produce the commercial music that we all share. When Joe and I first met in 1984, I was already claiming the same thing with my theory, sharing little cartoon-like booklets exposing this. In 1990, Joe signed up at his college to study my work on harmonics.

Joe needed to learn frequencies, wavelengths, and other details that I had promised to teach him so he could accomplish his college goals. To fulfil my promise, I needed to teach Joe. Yet Joe was adamant that I was not his teacher, that he already had a guru, making this relationship difficult for both of us from the beginning to the end. For a quarter of a century, to find my balance, I sought better ways to explain my perspective of the science, in drawings, equations, and words. Joe's and my dynamic tensions were a motivation for me to learn more.

Little by little I could guide Joe to be able to achieve his college goals. Joe's scientific method in studying my work tended to be to first reject everything that I shared unless he had first learned the same thing somewhere else. Through his project sponsor at school, Joe found Hermann von Helmholtz' work with chromatics, something I had not yet encountered. Joe's research uncovered that Helmholtz, in one disconnected and isolated insert with no explanation, supported my harmonic math claims. For Joe, that verified that I had nothing new to say. I had told Joe since our beginning that physicists knew true harmonics, but they had not corrected the errors in the science of harmonics applied to music. The Pythagorean error was a blind spot for the world's self-proclaimed experts. Joe gave a talk at a music and math seminar. He credited Helmholtz in his written and verbal presentations and did not mention me at all.

As every part contains the whole, anyone can better align with the universal reference through the fundamental tone of harmony. I made it clear to Joe that I do not consider myself as necessary for Joe if that is his choice. I did not invent harmonics. Nor was I the first to discover them. I discover how to think about something and then I invent how to re-think about that thing. I do have a unique perspective on how to overcome the ignorances that have clouded the purity of harmony. My work is to clarify the harmonics in all sciences. Darwin was not the first proponent of the theory of evolution. He just got the vocabulary right, and the right connections

to get his idea out to the public, at the right time.

While living in his guru's San Diego ashram, one of the other disciples was the wood master there, and Joe became his apprentice, establishing Joe's life-long artistic pursuits. Joe is a talented craftsman. I always tried to create ideas from my works for Joe to create, usually from wood. When my quality control over the accuracy of my theory threatened Joe's artistic freedom, problems arose. Joe regularly did his own projects founded on my harmonic theory, and during most of those situations, I would not even be mentioned in his reference lists, written or verbal. I had to accept it all as my personal destiny, to learn more about my own feelings regarding my theoretical pursuits and my own attachments and desires.

As years passed, Joe and I branched out from beyond just the music section of my unified field theory to harmonic discussions of other fields of science. When Joe visited my cabin, I had made it my job to offer harmonic art projects that would allow Joe to learn more about my unique science perspectives. What Joe chose to assimilate or eliminate was his doing. In the process, any errors he made in restating my work, or when I uncovered new ideas, including errors that I had made along the way, I would insist these get fixed before we could continue. When I claimed this authority over my own theory, it was not acceptable to Joe as he insisted on his own artistic freedom. I insisted that only after I put the theory's quality control first, could artistic freedom of the collaborated project be abundant.

My work as a theorist without credentials or publications was not acceptable to Joe's family, so he had his struggle in having registered me as a reference. As with all criticisms from anybody over the years, the theory itself has never been properly challenged. The verbal attacks have only been against me for believing that I can do such a job. Early in our work together, Joe told me that his family, whom I had not yet even met, were unified in calling me a "flake" for even believing I could do the work I claimed to be doing. A flake is unreliable.

Joe's family had been in a conversation about Joe registering with his college to study my works on harmonics. Joe planned to construct harmonic marimbas and wanted to register for a legal patent on them. Their conversation about me not wanting to file for patents led to their name calling: Mark is a flake.

Prior to their conversation, I had been very clear about my opinions and researches into the heated subject. My path was not acceptable to Joe. I clarified: A) Joe was free to apply for whatever he wished. B) My work on *natural* harmonics was on paper already, and thus automatically copyrighted. I build no technology except for my own use in my studies, so I have zero need, desire, nor inclination to get involved in any legal noise regarding patents.

Patents are not issued for discoveries. To patent an invention, the applicant must include a technical solution to a technical problem. Theories, ideas of nature, cannot be patented. By inventing the field of numbers in 1989, I instantly discovered the key to all harmonic ratios while also uncovering the confused errors made since Pythagoras. My confusion about chords from when I was around eight years old, and that physics of music class in college, all became clarified. I discovered harmonics alone, but with time I learned the ways that many others had discovered and interpreted integer related harmony before me. I did invent new ways to explain my personal discovery, but my explanations are not technology, they are just my unique ways of scribbling out my ideas. I copyright my work simply by writing my books. I do not legally file for patents nor copyrights. With passing time, I have found that people do patent harmonic ratios, and this was repulsive for me. I consider this wrong as harmonics are simply human discoveries of the works of nature, not human inventions. Harmony is patented by God.

Studying alone I discovered natural harmonics when confronting the Pythagorean error of the 3/4 stringlength ratio. To better understand my overwhelming epiphany, I invented the field

of numbers on paper (Fig.X.1). I invented the harmonic spiral to also express in an artistic way the natural harmonics that I had discovered. I do not even try to patent my discoveries and inventions. I write them in a book, in words, numbers, and diagrams, and having done so, without any legal acknowledgment, copyright laws make my work automatically copyrighted.

In my very strong opinion, the harmonic tuning of any instrument should not be restricted with patents. Inventing a unique way of doing the technology, yes, this is patentable. Regarding the two theoretical pianos in *HUT*'s music chapters, I say to the world: make them. Play them. I copyright my work in my books. I do not claim patents. I have not built them. Theory only, no technology. Others can create unique technology and feel free to patent the technology and sell the products, or choose to give them away to help a world in need. At times, selling a product may be the best form of distribution. Better than trying to give it away to people that do not care.

While Joe and I worked together, our problems arose from both Joe's and my commitment to The Evergreen State College. My promised goal was to help Joe to understand the difference between chromatic and harmonic music, and how he could build his marimbas accurately tuned to harmonics. This required strict quality control of Joe's understandings. He could go way off course and it was not easy to bring him back. He resisted all the way to the truth, for which, once he got there, he would take 100% credit. He could not credit me, for that would be admitting that I had taught him something. I was contracted to do so, for which I never asked for any compensation for my commitment except for quality control over my own work. Joe was free to depart from our collaboration any time he chose. It was a two way commitment. Year after year I was surprised Joe kept coming back.

Joe believed in my evolving idea of creating a game to help teach the rearranged periodic table. His motivation for fame and fortune on the project was strong. My acknowledgement of being continually ignored was equally as strong. I designed the rules and the booklets and the different mediums needed. I gave him two art projects so he could be part of it: to draw up the 120 electrons in the 8 fields and their 4 sub-fields, and to draw up the spiral periodic table based on the rectangular version that I had already created on the computer. Joe wandered from my instructions for the spiral, allowing the addition of confusion. Trusting that the future would manifest the corrections, I avoided my own excessive pain by not imposing accuracy changes on Joe's art, and we made the game anyway.

In 2015, when it came time for my adding the four Dis Judges, I told Joe that if he wished to continue working with me, he would have to adapt his art and his errors that I had been pointing out. Joe had been calling the spiraling rearranged periodic table his "baby", which was only painful for me. The art included his name on it for being the artist, but not mine as the designer of the theory behind the project and my instruction for accurately adapting it to his art. Joe's artistic freedom crashed into my quality control efforts at this point, and our relationship ended harshly with much criticism from Joe for me being who I am, so I took over doing the art.

Joe would not accept the choices I had made to adapt to my circumstances in life. The biggest barrier: on October 6, 1982, I chose to accept my challenge. It became clear enough to me that the world would think me crazy, even if I speak truth. I have never been ashamed to admit I have a messiah complex, though it has been and still is embarrassing. I rarely choose to share this mostly hidden aspect of myself. When people want to be close to my business, like Joe, they might get told. It is like a test. Will they let me be me? Or do I get condemned? I chose my path and have remained with it. This never manifested as me knowing anything about a messiah walking on earth. I never claimed to myself or to anyone else that I was the Messiah. Having a messiah complex does not make one the Messiah. I have just had to deal with having found a scientific way to discuss the Word of God, and this had abruptly shifted me into

believing my work was important enough to pursue for the rest of my life. I did not need to convince anybody that I was the messiah. Not even myself. That True-Messiah stuff is, from my point of view, God's mysterious business.

My job description for my personalized messiah complex: I have had to continuously do my homework, which is that I must research into the evolving harmonic unifield theory: *HUT*.

From the beginning of finding *HUT*, I believed I would have success at showing people, and they would choose to help, and the world would change for the better, even amongst all the problems. If I am to share while I live, the time has not come and I do not know if or when it will. I believe if I am bringing God to Earth as an understanding in science, through the synthesis of the zero cosmological constant with holography and harmonics, then my main job is to be Mark, to do my homework, and to learn to do the right things at the right times. I have tested many doors and people's lack of willpower make it so they do not wish to see what I show. It is God's job to open the door to sharing the idea. I perceived that my destiny opened the door to Joe choosing to learn harmonics, so I have remained committed to be available to Joe as much as he wishes to stay aligned enough with me.

Joe did help me manifest my theory into material things, like marimbas. But my demands for accuracy were always a big deterrent for him. The quarter century relationship was very difficult for both of us, but we did endure as long as we did. Together we experienced many situations that we would not have done alone. Joe and I coauthored *Search for Ah…*, without which I do not think I would have succeeded in teaching Joe harmonics. At times it was quite joyous. For most of our studies together, he would visit my cabin on San Juan Island. We performed a very successful show at Evergreen State College, on a wonderful stage, as part of Joe's thesis. The theater set a record for the number attending. A group of those performing artists went on a radio show together presenting the harmonics. We performed a second show, also at The Evergreen State College, after another student had studied harmonics with Joe, and that student made her own harmonically tuned marimba with Joe's assistance. A large group of us performed a show at a Garlic Festival. Joe built and sold many marimbas over the years. We made stuff with other people: flutes, guitars, ukelele, banjo, pan pipes, and more. Joe and I assembled the first version of the chemistry game, both of us having successful demonstrations in schools. Joe and I had many wondrous adventures with our travelling harmonic template. There were some truly spectacular times, regardless of the brotherly frictions.

My texted query to Joe on 3 3 2024 was: You once showed me Helmholtz's 16 tone scale with ratios found in the field of numbers. I have his *Sensations of Tone* book here and cannot find that. I find the chart of the hammer striking the string at 1/7 stringlength to kill the harmonic Ah, but not the 16 tone harmonic scale. Do you have a clue of that reference?

He responded: "I do not recall...I recall that Helmholtz was as confused as anybody else, just sort of on the right track. I trust the harmonic evidence as you have articulated more than the published studies." After seven years of separation, Joe is planning to visit me in 2025.

Objective third person

"Do what you can, with what you've got, where you are."
Theodore Roosevelt attributed this to Squire Bill Widener

"I don't know what to do, I only know what I can do."
Captain Kirk character in *Star Trek; Into Darkness*

" You know what my husband said about the news. He called it the first rough draft of history. That's good, isn't it? Oh well, we don't always get it right, you know we're not always perfect, but I think if we just keep on it, you know, that's the job, isn't it?" Meryl Streep in *The Post*

I have lived a most interesting life. I believe I am obligated to share my perspective as it is unique in what I see as an important way. That belief is my problem. J.A. Wheeler said his father oft repeated a German saying: 'problems exist to be overcome'. I overcome with my *HUT*.

In *HUT*, I will often use "*HUT*" instead of "I". Example: I may say "*HUT* claims that…" rather than "I claim…". Instead of the first person pronoun, I use an objective third person form. *HUT* has been evolving for four+ decades, accumulating and refining and deleting perspectives. I am my work, I am *HUT*, but for me to readily access all this information during conversations, it is often easier to have the book with the charts and diagrams in hand as a reference. The ultimate goal is that *HUT* can be present in conversations without me actually being there in the flesh.

Living the dream

It is claimed that people who are born blind, or even those who become blind before maybe five years old, do not have mental visualizations when they dream. And that people blinded later in life have more visualizations within their dreams, though to a lesser degree than people with normal vision. This seems to say that having not seen the world with the higher frequency brain waves acquired with age does not allow dream visions. Also, the more recent in time that the blindness occurred for someone with a mature brain, the more vivid are the dreams.

This suggests that the purpose of the dream is to restore memories, to play it again. We can re-experience an event and adjust how we are adapting to life. If we have not adapted harmoniously, trauma may remain with us through time, which might later require *readapting* to allow less untimely adrenalin surges.

In John 15:15, Christ tells his disciples, "I have made known to you everything that I have heard from my Father." Then a bit later, in John 16:12-13, Christ says he has not made known everything. A lie? No. Christ was referring to his second coming, "I still have many things to say to you, but you cannot bear them now. However, when He, the Spirit of truth, has come, He will guide you into all truth." This cryptic foretelling sounds like there will be a required vocabulary before the teacher is able to communicate to the students about the unified field theory centered on God. It seems to be foretelling that after time allows an evolution of consciousness, an enlightened field of study unfolds…which we now call science.

Dreams and prophesies are the mind sorting through probability field presence, mixing with possibility field imaginations and memories. I have taken the time to bridge with integrity the gap between my fleshly identity and my personal potential. The times of losing my balance provide learning for me. The times of finding my balance provide for me quality meditation. Figuring out my path in life, I chose to live the American dream, but not to chase-after-money in the way most people interpret that dream. For me, the dream was to not have to chase excess money, but to spend what money I earned on free time for myself to pursue a unique academic path, though frowned upon by my personal family, friends, and most acquaintances. This path has never granted me financial support. During my lifespan in America, with the good economy, with no draft into military service, and being from a healthy middle-class family, I have been free to choose to live my personalized *creative poverty* to satisfy my academic necessities and my proper survival… which, if shared, I still believe is important for humanity's survival. I have spent most of my life earning low-wage money during just half of each year. I give thanks for being organized enough and born in the right country to have been able to *Live the Dream* in such a personal way. I have only one item on my bucket list: I hope to properly share my theory.

"I've been through the **desert** on a **horse** with **no name**…In the desert
you can't remember your name…" Song by the band: America

HUT translation: the mind's desert = reference void, where there is no name for anything. Life's

dream begins with the Name, being the fundamental tone, the Word. The horse is the author's life, which includes the body, brain, and the language to contemplate the void's creation.

Imagining Success

"Sometimes it's the very people who no one imagines anything of, who do the things that no one can imagine." Alan Turing movie character in *The Imitation Game*

"It is impossible, however, to divide science into separate and unrelated sections… The initial and fundamental steps [of pioneer work in science] are always of a revolutionary character. Scientific imagination finds old concepts too confining, and replaces them by new ones. The continued development along any line already initiated is more in the nature of evolution… To raise new questions, new possibilities, to regard old problems from a new angle, requires creative imagination and marks real advance in science… To obtain even a partial solution the scientist must collect the unordered facts available and make them coherent and understandable by creative thought… It is a strange coincidence that nearly all the fundamental work concerned with the nature of heat was done by non-professional physicists who regarded physics merely as their great hobby." *The Evolution of Physics*, Albert Einstein & Leopold Infeld

In the following paragraphs, the quote is from a chapter called *The Eureka Phenomenon* in *The Left Hand of the Electron* by Isaac Asimov. This discusses presenting a new idea:

"How often does this 'eureka phenomenon' happen? How often is there this flash of deep insight during a moment of relaxation, this triumphant cry of 'I've got it! I've got it!' which must surely be a moment of the purest ecstasy this sorry world can afford?"

"I wish there were some way we could tell. I suspect that in the history of science it happens often; I suspect that very few significant discoveries are made by the pure technique of voluntary thought: I suspect that voluntary thought may possibly prepare the ground (if even that), but the final touch, the real inspiration, comes when thinking is under involuntary control."

"But the world is in a conspiracy to hide that fact. Scientists are wedded to reason, to the meticulous working out of consequences from assumptions, to the careful organization of experiments designed to check those consequences. If a certain line of experiments ends nowhere, it is omitted from the final report. If an inspired guess turns out to be correct, it is *not* reported as an inspired guess. Instead, a solid line of voluntary thought is invented after the fact to lead up to the thought, and that is what is inserted in the final report."

"The result is that anyone reading scientific papers would swear that nothing took place but voluntary thought maintaining a steady clumping stride from origin to destination, and that just can't be true."

"It's such a shame. Not only does it deprive science of much of its glamour (how much of the dramatic story in Watson's *Double Helix* do you suppose got into the final reports announcing the great discovery of the structure of DNA?), but it hands over the important process of 'insight,' 'inspiration,' 'revelation,' to the mystic."

"The scientist actually becomes ashamed of having what we might call a revelation, as though to have one is to betray reason—when actually what we call revelation in a man who has devoted his life to reasoned thought, is after all merely reasoned thought that is not under voluntary control."

"Only once in a while in modern times do we ever get a glimpse into the working of involuntary reasoning, and when we do, it is always fascinating."

These following quotes are from *The Double Helix* by James D. Watson, as in Francis Crick and Watson, relating to chasing after and experiencing scientific epiphanies:

"…the spirit of an adventure characterized both by youthful arrogance

and by the belief that the truth, once found, would be simple as well as pretty."
"In a sense, [Crick's] pursuit of the Ph.D. was a bore to a mind
that worked too fast to be satisfied with the tedium involved in thesis research."
"…I had impetuously written of an idea which was only twelve hours old
and lived only twenty-four before it was dead."
"The quick manner in which [Crick] seized their facts and tried to reduce them
to coherent patterns frequently made his friends' stomachs sink…"
"One could not be a successful scientist without realizing that, in contrast to the popular
conception supported by newspapers and mothers of scientists, a goodly number of scientists
are not only narrow-minded and dull, but also just stupid."
"It made no sense to learn complicated mathematical methods in order to follow baloney."
"…a scientific world complicated by the contradictory pulls
of ambition and the sense of fair play."
"…for twenty years [one group of scientists] had been accumulating data
without tying them into a self-consistent picture."
"…Francis nevertheless exuded confidence that enough experimental data
might already be on hand to determine the outcome."
"…the vast masses of data falling into place made me certain that we were on the right track."
"Worrying about complications before ruling out the possibility
that the answer was simple would have been damned foolishness."
"…much of our success was due to the long uneventful periods…"
"…telling each other that a structure this pretty just had to exist."
"…the structure was too pretty not to be true."
"…Pauling's accomplishment was a product of common sense,
not the result of complicated mathematical reasoning."
"…only a genius of [Pauling's] stature could play
like a ten-year-old boy and still get the right answer."
" All we had to do was to construct a set of molecular models
and begin to play—with luck, the structure would be a helix."
"…one of the world's experts on DNA, was at first not amused
by dark horses trying to win the race."
"They must be told the answer quickly, so that they could reorient their research upon our work."
"…the manic phase [of discovery] had almost passed."

Here is a single longer quote from Lewis Thomas in *Lives of a Cell*:

"…the central mystery… is that we do [science] at all… I don't know of any other human occupation, even including what I have seen of art, in which the people engaged in it are so caught up, so totally preoccupied, so driven beyond their strength and resources."

"Scientists at work have the look of creatures following genetic instructions; they seem to be under the influence of a deeply placed human instinct. They are, despite their efforts at dignity, rather like young animals engaged in savage play. When they near to an answer their hair stands on end, they sweat, they are awash in their own adrenalin. To grab an answer, and grab it first, is for them a more powerful drive than feeding or breeding or protecting themselves against the elements."

"It sometimes looks like a lonely activity, but it is as much the opposite of lonely as human behavior can be. There is nothing so social, so communal, so interdependent. An active field of science is like an immense intellectual anthill; the individual almost vanishes into the mass of minds tumbling over each other, carrying information from place to place, passing it

around at the speed of light."

Science "…is the most powerful and productive of the things human beings have learned to do together in many centuries, more effective than farming, or hunting and fishing, or building cathedrals, or making money."

"What it needs is for the air to be made right. If you want a bee to make honey, you do not issue protocols on solar navigation or carbohydrate chemistry, you put him together with other bees (and you'd better do this quickly, for solitary bees do not stay alive) and you do what you can to arrange the general environment around the hive. If the air is right, the science will come in its own season, like pure honey."

"There are certain types of information that seem to be chemotactic. As soon as a trace is released, receptors at the back of the neck are caused to tremble, there is a massive convergence of motile minds flying upwind on a gradient of surprise, crowding around the source. It is an infiltration of intellects, an inflammation."

In another chapter about Social Talk, Lewis Thomas tells us,

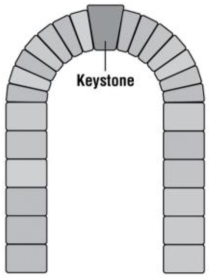
> "Collectively, we hanker to accumulate all the information in the universe and distribute it around among ourselves as though it were a kind of essential foodstuff, ant-fashion (the faintest trace of real news in science has the action of a pheromone, lifting the hairs of workers in laboratories at the ends of the earth), but each of us also builds a private store of his own secret knowledge and hides it away like untouchable treasure…If we were ever to put all our brains together in fact, to make a common mind the way ants do, it would be an unthinkable thought, way over our heads…It would not be good news to learn that we are all roped together intellectually, droning away at some featureless, genetically driven collective work, building something so immense that we can never see the outlines…Leave this kind of life to the insects and birds, and lesser mammals, and fish…Language is, like nest building or hive making, the universal and biologically specific activity of human beings. We engage in it communally, compulsively and automatically. We cannot be human without it; if were to be separated from it our minds would die, as surely as bees lost from the hive. We are born knowing how to use language. The capacity to recognize syntax, to organize and deploy words into intelligible sentences, is innate in the human mind. We are programmed to identify patterns and generate grammar…the universal attributes of language are genetically set: we do not learn them, or make them up as we go along…If language is at the core of our social existence, holding us together, housing us in meaning, it may also be safe to say that art and music are functions of the same universal, genetically determined mechanism…If we are social creatures because of this, and therefore like ants, I for one (or should I say we for one?) do not mind."

My opinion: I like this above quote because it justifies my life's search for words and numbers and musical tones to explain to myself and others that which is pure drive within me to explain: the unification of diversity. My tools are:

A B C… ONE TWO THREE… DOE RAE MEE… RED YELLOW BLUE …

Darwin reasoned that obsolete organs in the body could be adapted into new uses. Look at the lips, throat, and tongue for breathing and eating. After these required-for-survival parts had evolved in animals, the synergy of the same three body parts, also utilizing the diaphragm, lungs, and brain, brings them together to use for speaking languages. And singing. Seeming likely is that the highly evolved verbal communication was part of the original superstring dance seed that initiated the universe with the original gentle poof, being the same as the big bang. Everything is

an unfolding of the seed's information. Time formed the parts before unifying their purpose.



I still believe I am the keystone that the academic builders continue to choose to ignore while trying to finish constructing their archway into the future. The arch is filled with the academic and predjudiced clutter required to support its lack of integrity. Once the arch is completed with the keystone, then the obsolete support system scaffolding can be removed. Finally, the world passing through this threshold will know pure honey. The new paradigm will be the buzz Word… the bees' tone…

These outreach efforts for my theory-projects continue to be blocked socially. I am a solitary bee, and I am still alive. I have not been able to get professionally reviewed or published.

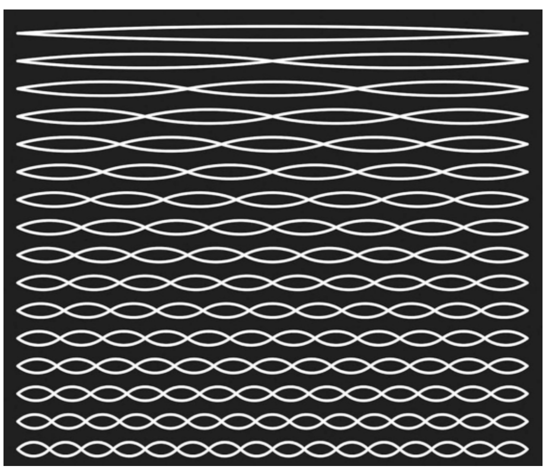
zzzzzzzZZZZZZZZZZzzzzzzzzzzzzzzzzzzzzzzzz

"…YHWH said to Moses, 'Go to Pharaoh; for I have hardened his heart and the hearts of his servants, that I may show these signs of mine before him…'" Exodus 10:1

"Sometimes the delay in confirming or disproving a theory is so long that its proponent dies before the fate of his or her idea is known…"
The Quark and the Jaguar by Murry Gell-Mann, Nobel prize winner for *±1/3 quarks*

"The impediment to action advances action. What stands in the way becomes the way."
Marcus Aurelius

Fig.XVIII.5 Harmonics 1-16



"At the start a new candidate for paradigm may have few supporters, and on occasions the supporter's motives may be suspect. Nevertheless, if they are competent, they will improve it, explore its possibilities, and show what it would be like to belong to the community guided by it. And as it goes on, if the paradigm is one destined to win its fight, the number and strength of the persuasive arguments in its favor will increase. More scientists will then be converted, and the exploration of the paradigm will go on…" Thomas S. Kuhn,
Structure of Scientific Revolutions

"When the truth is suppressed, it doesn't die. It just goes underground."
Dear White People, TV s02e10

"Not much is needed: love and hate, joy and grief, are often enough to make the ego and the unconscious change places. Very strange ideas indeed can take possession of otherwise healthy people on such occasions. Groups, communities, and even whole nations can be seized in this way by psychic epidemics." Carl Jung

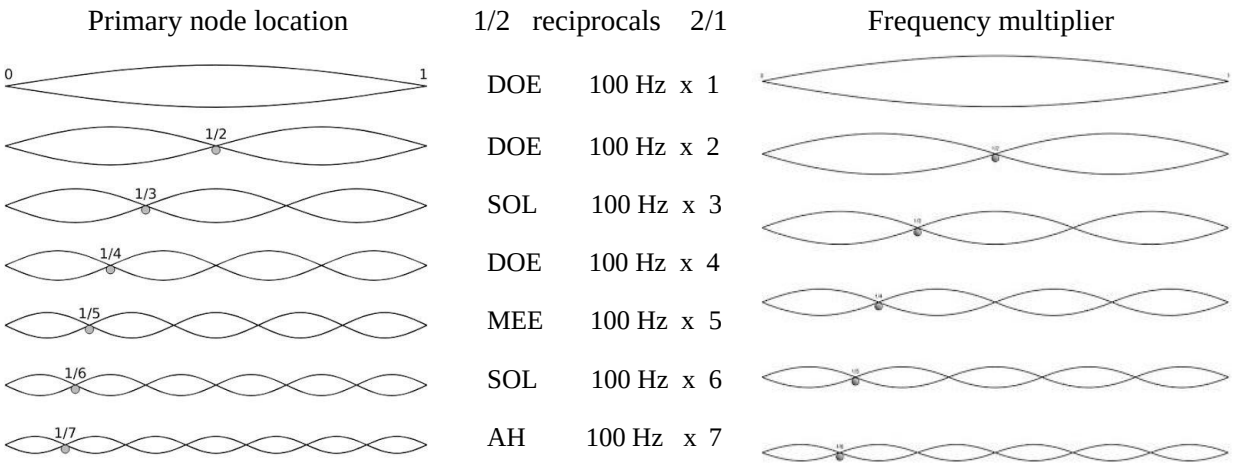
"…the unconscious cannot be an entirely chaotic accumulation of instincts and images. There must be something to hold it together and give expression to the whole. Its center cannot possibly be the ego, since the ego was born out of it into consciousness and turns its back on the unconscious, seeking to shut it out as much as possible." *Ibid*

"For when new conditions arise that are not provided for under the old conventions, then, just as with animals, panic is liable to break out among human beings kept

unconscious by routine, and with equally unpredictable results." *Ibid*

"The object is the *self* in contradistinction to the *ego,* which is only the point of reference for consciousness, whereas the self comprises the totality of the psyche together, i.e., conscious *and* unconscious." *Ibid*

Fig.XVIII.6 1-D Harmony integers and reciprocals



Note: 100 Hz is arbitrary, for a simple example only

"Recognizing the voidness of one's own intellect to be Buddhahood, and knowing it at the same time to be thine own consciousness, thou shalt abide in the state of the divine mind of the Buddha." *Tibetan Book of the Dead*

"philosophers' stone: 2. Anything, as a principal or idea, thought capable of effecting spiritual or other regeneration" –American Heritage Dictionary

"All truths are easy to understand once they are discovered.
The point is to discover them." Galileo

"Research is what I'm doing when I don't know what I'm doing." Wernher von Braun

"…the people who are crazy enough to think that they can change the world, are the ones who do." Steve Jobs, August 15, 2011

"Sometimes the questions are complicated and the answers are simple." Dr. Seuss

Regarding the next chapter:

"…Benjamin Franklin's 'one-fluid theory… ascribed positive charges to an excess of a mysterious electrical fluid and negative ones to a dearth."
Faraday, Maxwell, and the Electromagnetic Field, Nancy Forbes and Basil Mahon

XIX Ignored conspiracy of electrons

Thinking of magnets, electrons, and light:
{electric field, magnetic field} = electro-magnetic (EM) field = light
Einstein wanted to merge the EM field with the gravitational field into the unified field:
Harmonic unified field $\geq$ {EM field, gravity field, consciousness, et al}

Long ago, people discovered that when wool was rubbed on wax, they suddenly attracted each other. In time, people described this as being the electrons in the wool being transferred to the wax, creating a attraction due to a difference between positive and negative charges.

Today, an object made up of atoms with a surplus of electrons is said to be negatively charged, while an object whose atoms lack electrons is said to be positively charged because they have more protons than electrons. Positive electrical pressure is created by an abundance of negative electrons needing to flow outward. The high positive pressure builds not just with the number of very small electrons, but mostly due to the electrons being all the same charge, so they repel each other, effectively making them bigger than the size of the electron. The electric field created is bigger than the ”particle”. While electrons electrically repel away from other electrons, they are also electrically attracted to protons.

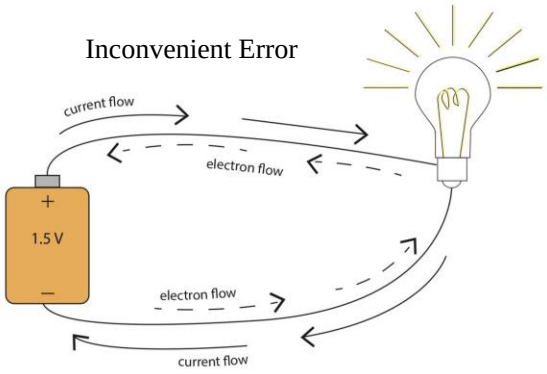
The electrons in the outermost electron field in an atom can be enticed out of their orbit. Released as free electrons, they can flow in response to other charges, being repelled by other electrons and attracted by the potential difference between themselves and a proton.

Academic confusion: it is all about pressure

One known confusion, but mostly unrecognized, goes back to an arbitrary decision made by JJ Thomson. This rarely mentioned faulty vocabulary has haunted science. Isaac Asimov said about this, “Franklin had a fifty-fifty chance of guessing right, and he muffed it. Too bad.” Following scientific tradition, Benjamin Franklin actually got it right, saying the current flowed from positive pressure to negative. Air goes from high positive pressure zones to low negative pressure zones, causing all our weather. Water pressure resulting from the gravity of high elevation, or an electric pump, goes from high positive pressure to low negative pressure, bringing water into our homes.

In 1752, before electrical charges were attributed to the electron and proton, Benjamin Franklin accurately labeled the electric current flow to be from the positive pressure pole to the negative pressure pole, following the convention for labelling all pressure systems causing motions from positive to negative. This today is still called electricity’s “conventional current”.

Fig.XIX.1 Conventional vs electron currents



In 1897, Sir Joseph John Thomson discovered the electron. He knew it to be one of two opposite charges, and he arbitrarily chose the electron to be negative rather than positive. Today the electron is still negative and the “electron current” flows from the negative to positive pole, opposite to Franklin’s conventional current. Changing the electron to be “positive” would allow the electron current and conventional current to be the same, allowing the physics’ definition of the electric current to actually be the flow of electrons.

In 1600, William Gilbert studied static electricity using amber. Since amber was called *elektron* in Greek, Gilbert called its effect *electricus*. We now understand that amber, like wax,

easily collects electrons if rubbed by wool, fur, or silk. The term *electricity* may have been first used by Sir Thomas Browne in 1646, probably derived from Gilbert's term. Gilbert and Browne both had also claimed that electricity and magnetism were different phenomena from each other. Hans Christian Ørsted in 1820, then James Clerk Maxwell in 1873, claimed that electricity and magnetism combined into one single force: electromagnetism. In 1891, G. Johnstone Stoney had proposed the name *electron* to signify the fixed electric charge. During 1909 and the next ten years, Ernst Rutherford discovered the proton. He had first named it "hydrogen atom", which a proton is when hydrogen is an ion with no electron orbiting. He later named it the *proton*, from *protos*, Greek for *first*, labeling it the positive electric charge, equal but opposite to the electron.

Using Ohm's law, V = RI: voltage equals resistance times current. Voltage is potential energy, also called electrical pressure. The confusion exists because we labeled the electrons that flow outward from a battery pole with the positive electric pressure to be the negative charge. Today, the still-existing confusion within our science vocabulary is that the *positive* electrical pressure is on the *negative* electric pole. This is known by a few people, but we have not fixed the error yet. This is the ignored conspiracy of electrons, mostly not taught in schools.

We only have this confusion in the error-soaked languages of electricity in physics, chemistry, etc. where electrons are called negative instead of positive. When there are a lot of electrons ready to flow, properly called high or positive electric pressure, the electric current will move from the electric pole erroneously labeled negative towards the electric pole erroneously named positive. To fix this error now, we would have to reverse our social inertia by rethinking all charge names; protons, quarks, electrons, positrons, etc. But to shift to correctly using ±1/3 quark charges instead of {-1, 0, +1} for electrons, neutrons, and protons (Chapter III), requires major change anyway. Shall we dance?

To change an electron to be positive-one means it would be made from three mini-down quarks (Chapter III), which also must change charges to allow 3 x (+1/3). The antimatter positron would need to be relabeled a negative-one charge, with a new name, like a *negatron*. It would still be made up of three mini-anti-down quarks, but they would be negative charge. Switching the names for up and anti-up quarks is necessary now, but if we make the electron to be called positive, then everything affected needs to be reassessed. When, if, the *HUT* idea is at first noticed, it all may seem confusing, but completely do-able when it is understood.

We could go further and change the plus and minus 1/3 charges to be the fundamental one and minus one, making an electron instead of minus one: a positive three. But this might not be best because quarks do not stand alone. They lack integrity alone and do not deserve to be integers even though they are fundamental charges. The ±1/3 quark accounting works well.

Choices... Or we could just not change and continue to live our so-called scientifically enlightened lives while saturated in our world with erroneous non-scientific vocabularies. Rather than teaching clarity, we leak confusion to our children, who then grow up to be confused adults—in denial. For future generations: it is likely the best if we just fix the whole thing.

Glass, rubber, & silk

To create potential energy, in a mind experiment or for real, needed is a glass rod, a rubber rod, and a piece of silk. For centuries, amber and wax have been used instead of rubber. The organic fibers of wool, fur, and silk can give or take electrons, depending on the interactions.

Rub the silk on the glass rod to create heat energy for removing electrons. The silk takes electrons from the glass. Next, rub the same silk on the rubber rod to give it those electrons.

Repeat.

This is manually charging a weak battery, creating static electricity. Potential difference between the positive and negative charges of the two rods builds electrical pressure, adding more

electrons to the rubber rod, which is being reduced, while fewer electrons remain with the glass rod, which is becoming oxidized. No new charge is created by rubbing. Electrons simply move.

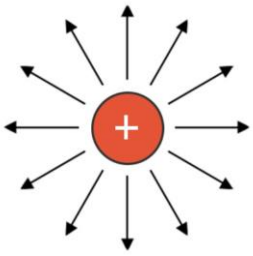
"The electric fluid flowing through the wire is a negative one directed, therefore, from lower to higher potential. Had we known this from the start, when the theory of electric fluids was first formed, we should certainly have interchanged the words, and called the electricity of the rubber rod positive, that of the glass rod negative. It would then have been more convenient to regard the flowing fluid as the positive one. Since our first guess was wrong, we now have to put up with the inconvenience." *The Evolution of Physics,* Albert Einstein & Leopold Infeld

Einstein's quote refers to the misnamed negative charged electrons which build positive pressure on the misnamed negative rod. The solution to stop this "inconvenience" is to redefine electrons to be positive charges, and protons to be negative.

Field of electric magnetism

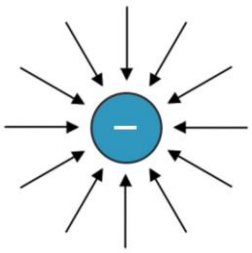
In Fig.XIX.2, even if the positive red represents the pole on a battery with positive electrical pressure, today we still accept it is negatively charged electrons that are abundant there and able to flow outward. The blue – pole represents the negative electrical pressure, which is able to receive those electrons, but on that negative battery pole we locate the so-called positively charged protons. To be accurate, we need to change electrons to be positive and protons need to change to be negative. It only creates confusion to claim that "conventional current" and "electron current" flow in opposite directions.

Fig.XIX.2 Lone electric charges & their fields

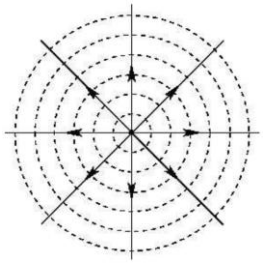


Lone positive charge

If the red + circle at left, with arrows pointing away, represents hot water or hot air, it is high positive pressure. If the blue – circle at right, with arrows pointing inward, represents cold water or cold air, it is the low negative pressure. This is acceptable vocabulary and it should be consistent for all sciences.



Lone negative charge



Those diagrams show field lines around two stationary and isolated electric charges. Electric charges create an electric field. Instead of only radial lines, the electric field at left also has concentric circles, called *equipotential lines* because different sides of the field have equal strengths along the same circle. Radial lines have the advantage of being closer together the nearer they are to the center, accurately showing the increasing field strength closer to the source, based on $1/d^2$.

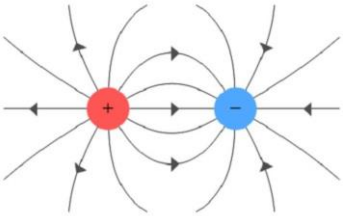


Fig.XIX.3 Paired electric charges & their fields

Even if the battery is not connected to anything, an electric field surrounds the two oppositely charged poles of a charged battery. Being close enough, they combine their electric fields. In error, we call the gathered protons the positive electric charge and we call the gathered electrons the negative electric charge.

The error and solution: electrons should be labeled as positive rather than negative, and protons should be labeled as negative rather than positive. As it is taught in school today, the

negative charge electron flows out from the positive electric pressure pole. This is only confusion for students and teachers who wish to understand.

MDO: magnetic dipole orientation

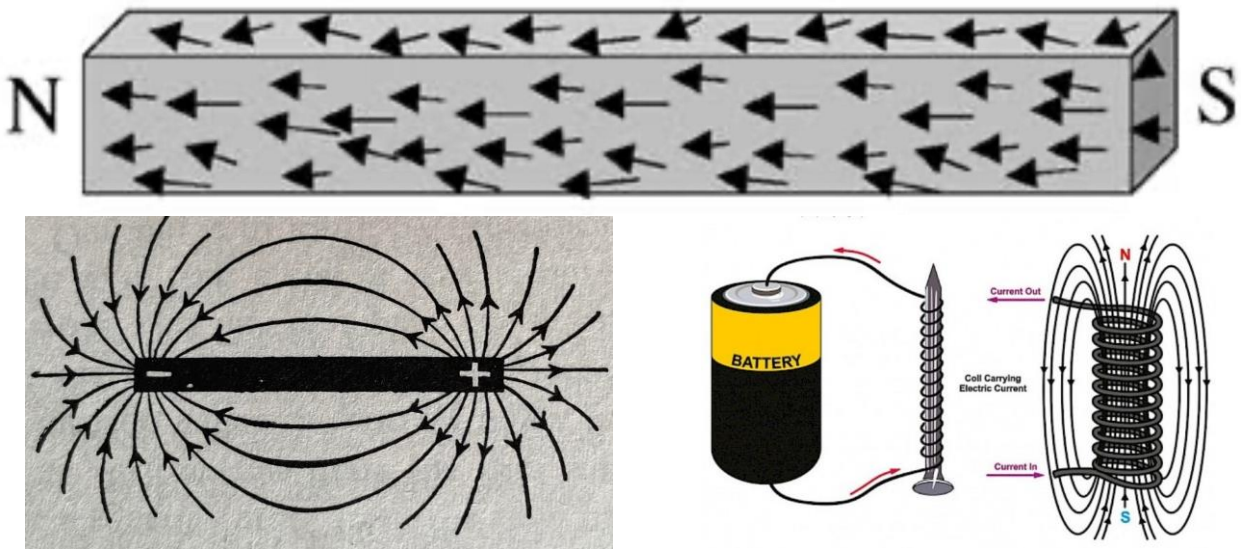
Four elements are ferromagnetic at room temperature, meaning they can become permanent magnets: iron, nickel, cobalt, and gadolinium. “Permanent” means they can stay magnetized for a long time, in some situations for millions of years.

Behaving like a tiny bar magnet, when an electron is unpaired, its spinning creates a magnet with a weak but significant magnetic field. There exists one axis with two poles, north and south, called a dipole. *HUT* calls this created field the Magnetic Dipole Orientation: MDO. Anything that is magnetic has an MDO generated by the electron’s spin.

In most materials, electrons are believed to spin randomly. Up or down electron spins are not defined as opposite directions until induced by a magnetic field which, according to the Stern-Gerlach experiment, defines half to be up and half to be down, cancelling out the magnetism. If a domain occurs due to the aligned spinning electrons, as can happen in iron, nickel, or cobalt, the majority are identical up or down, which is how a bar magnet is created, or a sub field of electrons that is only half full. To fill that sub electron field, the second half of the electrons will be induced to be the opposite spin, following Hund’s rule.

In an iron bar, top of Fig.XIX.4, an MDO is a single spinning electron ←, directionally pointed. A lone MDO electron ← is the smallest magnet. The electrons in most materials spin in random directions, and their magnetic forces cancel each other out. In the four ferromagnetic elements, when the MDO of electrons are aligned into a domain of electrons, most point in the same average direction ←←←. This can make a permanent magnet with a north and south pole.

Fig.XIX.4 Bar magnet & electro-magnet & their EM fields

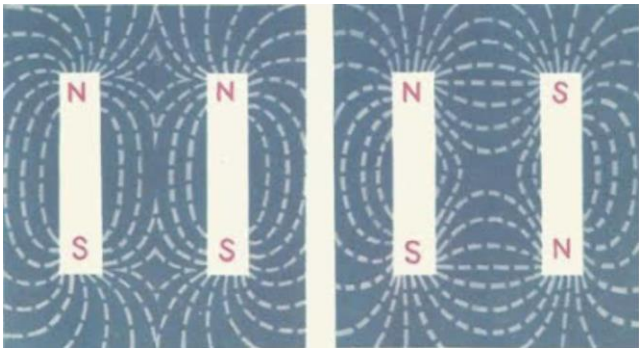


There exists a magnetic field around a bar magnet. This causes the north and south poles of two magnets to attract each other because this allows continued alignment of the MDOs. With two bar magnets, identical poles repel because the opposing MDO electrons in each bar magnet resist having to flip over. In certain situations, it is easier for the entire bar to flip around 180°.

A moving magnet creates more electric field. *Stationary* electric charges create an electric field around a single pole while the *moving* electric charges within the wire create a magnetic field around the wire. Coil a copper wire around an iron nail and pass a current through it (Fig.XIX.4). The current creates a magnetic field around the wire which temporarily aligns the

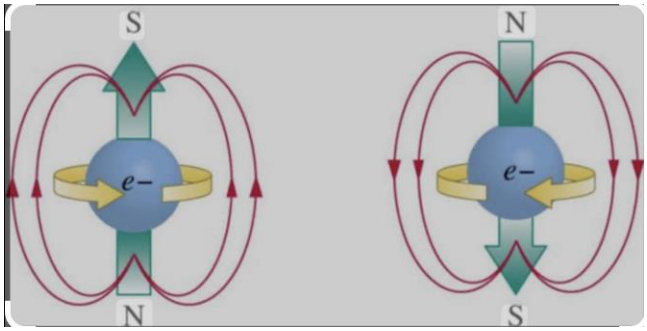
MDO of single electrons within the iron nail, creating an electro-magnet. With ferromagnetic atoms in the presence of a magnetic field, the MDOs line up so that charges are parallel throughout the material, creating the domain. While electrified, the nail has north and south magnetic poles creating the magnetic field around it.

Fig. XIX.5 Bar magnets side by side

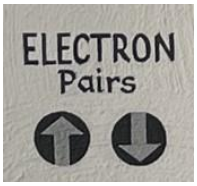


The first pair of bar magnets, Fig.XIX.5, each have the same north pole at the top. Placed side by side in this way, the magnetic fields repel each other. MDO electrons within resist change, resist flipping over. The pair on the right has one north and one south pole up. These two bar magnets attract each other. As the pair join, the external magnetic field weakens.

Fig. XIX.6 Electron pair: spin up + spin down



This pair of electrons, Fig.XX.6, like the pair of bar magnets on the right in Fig.XX.5, attract each other and become a unified pair. If one electron were to flip over, like with the left pair of bar magnets, electrons repel each other—magnetically and electrically. Same-spin-oriented electrons are tiny magnets, repelling each other.



Discovered by Friedrich Hund in 1925, Hund's rule tells us that each sub-electron-field fills by only allowing one electron of each *potential* pair of electrons to join, all having identical spins with each other. Only after all the potential pairs have just one electron each, can the newly arriving electrons join in with opposite spins to fulfill the pairs—decreasing the magnetic field.

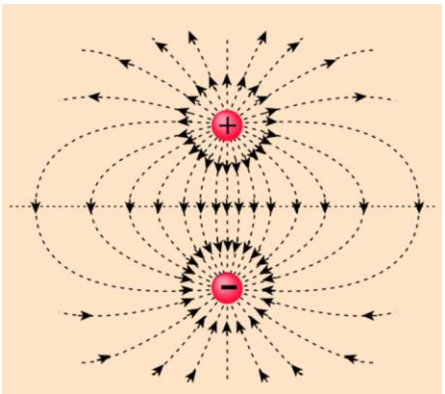


Fig. XIX.7 Electric dipole field

A single electric pole, Fig.XIX.2, has field lines radiating away from the monopole. Two opposite electric poles in close proximity to each other curve those radiating lines of the two mono poles towards each other. The electric dipole creates a closed curved field of all the radiating lines except a straight line between the two poles.

Magnets seem to be always dipole. Magnetic field lines are closed curves (Fig.XIX.7). Between the two magnetic poles, the field passes inside the magnet.

Combine two bar magnets in two ways with two orientations each. Two ways: end to end, or side by side. Two orientations: like poles together or opposite poles together. Joining two bar magnets end to end with like poles contacting, there is a reduction of the magnetic force, but not to zero. The magnets repel each other and must be forced to be close

together this way. Joining opposite poles end to end causes the addition of magnetic force as the magnets attract each other.

Combining two bar magnets side by side with like poles together at each end causes an increase of the magnetic field. The magnets need to be forced together as they repel. Combine the two bar magnets with their opposite poles together and they attract one another while the strength of the magnetic field decreases outside of the magnets because the field instead is passing inside the magnets and becomes confined rather than manifest externally.

The spin of unpaired electrons can point their magnetic orientation in any direction. If an atom or molecule has unpaired and randomly pointing MDOs, then the substance is *paramagnetic* and is attracted by a magnetic field, which will temporarily align the MDOs. A single oxygen atom (O) has two unpaired electrons, so it and a *single bonded* oxygen molecule (O_2) are both paramagnetic and attracted to the magnet. More unpaired electrons increase the paramagnetic effects.

If all the electrons are paired, the substance is *diamagnetic*. Paired electrons have opposite MDOs ↑↓, Fig.XIX.6, so they cancel out the magnetic field. Diamagnetic atoms and molecules, having paired electrons, are not affected, or very slightly repelled, by a magnetic field. Molecular nitrogen (N_2) and *double bonded* O_2 have no unpaired electrons so they are diamagnetic and mostly unaffected by a magnet.

Each electron spins, producing its oriented magnetic field. In the presence of an external magnetic field, electrons of ferromagnetic atoms can align the spins of many electrons to be parallel in the same direction, creating the MDO domain, the charges aligning.

In the presence of other magnets, induced magnetization can be made permanent if the material is knocked or is heated and then cooled. In the absence of another magnet, in reverse, a permanent magnet can be demagnetized by hard knocks or by heating and cooling it, disrupting the order of the MDO domain.

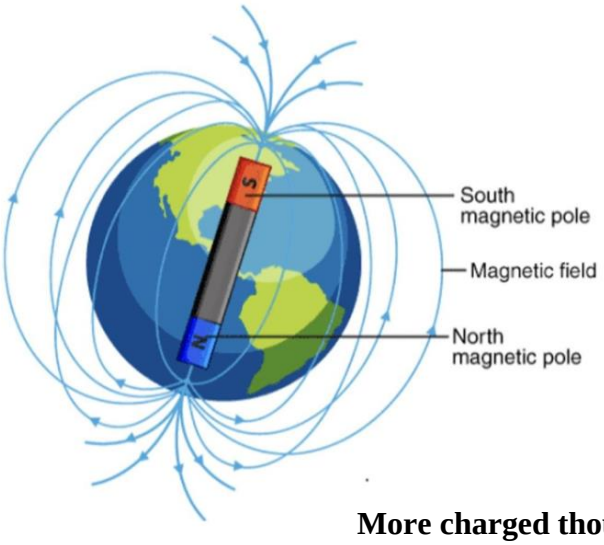
Inside the bar magnet, the aligned MDO electrons create the external magnetic field which, ‘making travelling” the speed of light, does not perceive any distance in direction of travel, due to Lorenz contraction, nor any passage of time, due to relativity’s time dilation. From the perspective of the magnetic field, the magnet is not just an iron bar of synchronized electrons with two poles at two separated ends. It is a circle, the N and S poles joined.

Earth’s sunny disposition

Relative to the positively charged ionosphere, the surface of the Earth has a negative charge, the Earth like a giant electron. The sun maintains this stream of negatively charged particles towards Earth. The spinning Earth’s core with the north-south pole acts like a spinning electron or a bar magnet, forming a giant magnetic field around our planet which protects us from charged particles coming towards us from the sun and outer space..

Initiated by solar flares or coronal mass ejections, Aurora Borealis shows waving lights near Earth’s north pole. Reacting to increased solar activity, magnetic storms occur around Earth, distorting the magnetic field lines, which compress on the side facing the sun and separate on the side facing away. Under normal solar activity, Earth's magnetic field protects us. During energized solar activity, Earth's distorted magnetic field opens gaps, and charged solar particles follow magnetic lines toward the poles, along the way colliding with atoms and molecules in the upper atmosphere. This forces atomic electrons to jump energy fields, and then upon relaxing to release photons, creating the northern and southern lights that we see in both hemispheres.

Fig.XIX.8 Earth magnet drawing used from internet without permission



Like the electron charge was misnamed, Earth's north pole up in the arctic circle is misnamed as well. The arrow pointing north on a map is actually pointing to Earth's south magnetic pole. Since magnetic opposite poles attract and the same poles repel, the north pole of a magnet, such as in a compass, is attracted to the Earth's geographic north pole which is in reality Earth's magnetic south pole. Our maps say that in Antarctica can be found the geographic south pole, but that is the magnetic north pole.

More charged thoughts

A) Monopole electricity expands out into spherical space according to $1/d^2$ (a vector field).
B) Magnetism dipole with north and south poles create a complete closed circuit, while dipole electricity starts at one pole and ends at the other. Neither radiate according to $1/d^2$.
C) Light, being electromagnetism, radiates out from a monopole-like source, such as a candle, expanding out into spherical space like monopole electricity, according to $1/d^2$ (a vector field).

Because EM waves carry no charged particles, EM waves have no electric charge. But EM waves will shake charged particles when contacted.

From a battery, an electric direct current, DC, flowing as moving charged particles, needs to make a full circuit from one pole to the other. A bar magnet contains electrons with their spins aligned and thus their MDO are pointed in the same direction. For both permanent and electro-magnets, their magnetic field flows in a circle.

Inside wire, electric current is not just the speed at which electrons flow. The current is measured as the number of electrons passing a chosen point during a chosen time unit. Electric current therefore depends not only on the drift velocity of the electrons, but also on the number of electrons moving. When the current passes through a motor, electrons flow through it and might slow down due to collisions with other particles or external magnetic fields. For the current to remain the same when the electrons slow down, the quantity of electrons would need to increase. Even if the "drift velocity" of moving electrons is only an inch or two per second, the quantity of electrons moving at that slow speed could be in the trillions, and, given time, all those electrons drift around the circuit.

Speed and quantity of units are needed to figure current. On a freeway, the current can equal the number of cars passing under the bridge per minute. A crowded freeway with cars moving all at 70 mph has a greater vehicular current passing the bridge than the same freeway at a different time when it is much less crowded, with the cars still moving the same speed.

The current allowed by accelerating/decelerating electron charges creates and guides the EM field around the wire. The wire acts as a waveguide—the better conductor it is, the smaller the EM field will be. The better conductor that the wire is, the less resistance, thus less heat released from the wire as infrared radiation and other EM frequencies. Reabsorbed EM frequencies can be reemitted with changed frequencies, called frequency conversion or non-linear optics. All EM wave frequencies will heat any absorbing surface.

The EM field flows outside of the wire at the speed of light, whether the wire is insulated or not. Inside the wire, the current travels slower than the EM field's light speed flowing outside. Current in a wire varies speed while the EM field passing around the wire through void does not. Drift velocity of electron particles can be slow but abundant. EM field moves at the speed of light but includes no particles. A field of waves can move at the speed of light through the void, but particles cannot.

A conductor is a material which contains mass which allows movable charges. In a metal with loose electrons, an electron can move when voltage, being electrical pressure of moving electrons, is applied.

Charges that are not moving do not define "static" electricity. Static electricity is the presence of an imbalance of positive and negative charges, whether the charges are moving or not. Static electricity means an object has a charge difference compared to another object. When an object is neutral, having no charge, it contains no static electricity. Static electricity forms by rubbing a rubber balloon against your clothes, which creates friction which creates heat. That gathers electrons on the rubber, a build-up of a negative charge relative to a wall. The wall and the ballon attract and stick together. Rubber is an insulator, so the charges might remain on only that part of the balloon that got rubbed, while the rest is still neutral. In specific situations with a buildup of static electricity, a simple contact with a dissimilar charge is enough to discharge the potential energy into the kinetic energy of a neutralizing spark.

Vocabulary: oxidize vs reduce

The electrical charging energy entering a battery converts to chemical energy stored in the bonds of atoms and molecules. This is an oxidation/reduction reaction, being the movement of electrons between atoms and molecules.

A molecule or atom which loses electrons is said to become *oxidized* in the reaction. If it is iron, being oxidized allows it to rust. Iron in this case is the reducing agent, or reductant. When an atom or molecule reactant accumulates electrons during a reaction, it is *reduced*, called reduction. The particle gaining electrons is called an oxidizing agent, or an oxidant.

Example (see Fig.VIII.9): In forming sodium chloride, NaCl, table salt, from the reaction between Na (sodium) + Cl (chlorine), sodium is *oxidized*, being a reducing agent. It loses its excess electron beyond the filled 8 electrons in the outer s = 2 and p = 6 sub-fields, making the +1 valence become a zero valence. Plus one valence means it has one extra electron that it can give away. Minus one valence means that it lacks one electron, which it just might steal to reduce its need.

In the NaCl reaction, chlorine, being an oxidizing agent, is *reduced* when it gains an electron. It began with -1 valence and becomes zero valence. Chlorine gained an electron to fulfill the 8 electrons in the outer s & p sub-fields, reducing the need for gaining more electrons.

One atom or molecule is reduced by oxidizing another. When oxygen steals electrons, it becomes reduced by being the oxidizing agent, and its -2 valence becomes zero (see Fig.II.8). Neutrally charged oxygen has a -2 valence. This means it needs to be reduced by gaining.

Vocabulary: acid vs base

Reductants give electrons and oxidants take electrons. When electrons are not abundantly available to exchange, charges change as *acids give away protons* and *bases receive protons*.

An *acid* is a hydrogen-containing substance that can donate a proton, being a positively charged hydrogen ion, H+, to another substance. A negatively charged *base* can receive the proton. Water can dissolve substances and act as a base when absorbing a proton from an acid. Water can alternatively act as an acid when giving away a proton to a base.

Alternatively, a base can donate a negatively charged molecule called a hydroxide ion or a hydroxyl radical, OH-, consisting of a hydrogen atom and an oxygen atom. When OH- combines with a metal like sodium, Na, it becomes NaOH, sodium hydroxide, a base. When OH- combines with a non-metal such as chlorine, Cl, it becomes HOCl: hypochlorous acid.

Vocabulary: electrolyte, cathode, anode

As our bodies consume chemical energy, the main electrolytes are minerals that include sodium, chloride, potassium, calcium, and magnesium. An *electrolyte* is an acid, base, or salt that when dissolved in water produces separated ions, being atoms and molecules with positive or negative electrical charges, respectively called *cations* and *anions*. An electrolyte is a conductor in which electric current is carried by the movement of non-metallic ions.

As an electrical current charges a battery, being an electrochemical cell, chemical fuel potential energy accumulates. The flowing electric charges do not accumulate: they just pass through, forcing surplus electrons from the *cathode*, the battery half where protons have been attracting electrons during the discharging process, electrons which move toward the battery half containing the *anode*, where electrons build-up positive pressure of "negative" charges, waiting to be pumped into the conducting wire.

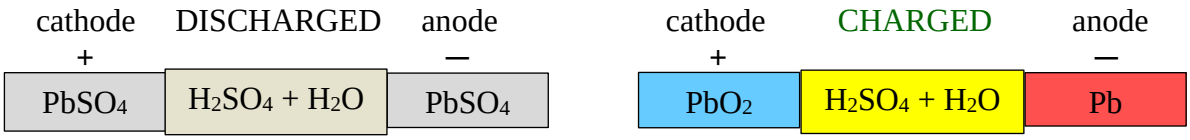
In a lead-acid battery, Fig.XIX.9, the *cathode* is made of lead-dioxide, PbO_2, and the *anode* is made of metallic lead, Pb. The anode is the "negative", or reducing electrode that releases electrons into the electric circuit. The anode is oxidized during the electrochemical discharge. The cathode is the "positive" oxidizing electrode that receives electrons which have already passed through the circuit. The cathode is reduced during the discharge.

The anode and the cathode are separated by an electrolyte of sulfuric acid, H_2SO_4. The sulfuric acid is mixed with water, H_2O, which dissolves the acid during the discharging of the battery, releasing electric charges to the negative and positive terminals.

In a discharged battery, lead sulfate, $PbSO_4$, has formed on both the electrodes because of their reaction with sulfuric acid.

In a charged battery, the lead sulfate on the two poles has been converted to metallic lead, Pb, at the negative side, and to lead dioxide, PbO_2, on the positive side. The chemical energy in the electrolyte gets converted and stored in the potential difference, being the electrical pressure, the voltage, between the two poles of lead and lead dioxide.

Fig.XIX.9 Lead-acid battery dis-charging



When discharged for too long, lead–acid batteries lose the ability to accept a charge. When fully discharged, the electrolyte loses much of its dissolved sulfuric acid and becomes primarily water. Using high charging voltages, overcharging causes electrolysis and generates oxygen and hydrogen gas. If too much hydrogen is produced, batteries can become explosive.

Understanding O_2 & O_3

Common understanding: the oxygen we breathe is O_2. In the atmosphere, O_3, ozone, is the oxygen molecule that protects the Earth.

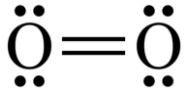
Another of my confusions that needed resolution was regarding oxidation caused by O_2. Oxygen alone is unstable as it needs two electrons. So it steals electrons from other atoms and molecules, causing them to oxidize. No confusion with that. But when two oxygen atoms share electrons to make O_2, I assumed O_2 to be stable, a zero valence (double bond O_2 in Fig.VIII.10).

The solution to my confusion was understanding that usually O_2 has only a single bond, so it is a -2 valence and still needs to steal two electrons. That is easily done from many metals, having some electrons not securely bound to their nuclei. Of *valence* and *core* electrons, valence electrons are in an atom's outermost electron field(s) where their energy is the highest. Core electrons remain bound within an atom's innermost electron field(s), where their energy is the lowest. The metal rusts when the oxygen steals its electrons and this is called oxidation.

An oxygen atom and the single-bond O_2 each need two electrons to fulfill their (s = 2) + (p = 6) = 8 electrons in the outermost s & p subfields. Lacking those two electrons, this is expressed as a valence of -2.

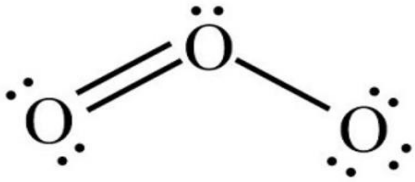
Fig.XIX.10 O_2: double bond vs single bond

Left: single bond with 1 line represents 2 shared electrons, called a diradical, a -2 valence, because it will steal 2 electrons. Right: double bond with 2 lines representing 4 shared electrons: a 0 valence molecule that will not steal electrons.



See Fig.VIII.9

Fig.XIX.11 O_3 ozone: double bond + single bond



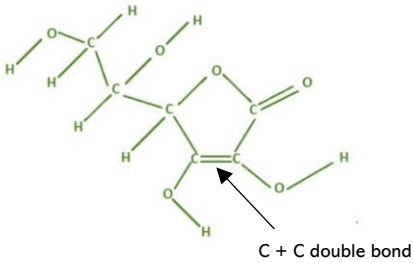
Ozone has a double bond between 2 of the 3 oxygen atoms, representing 4 shared electrons. The other bond is single with 2 shared electrons. All 3 oxygen s & p sub-fields have access to 8 electrons, a zero valence. Ozone is not a radical as it will not steal electrons.

Ozone serves life on Earth by absorbing harmful radiation from the sun and from outer space. The absorbed radiation breaks down the ozone molecule which releases an oxygen atom. As another oxygen atom becomes available, it regenerates the stable ozone molecule.

Antioxidants

Oxygen with an unstable -2 valence steals electrons and causes oxidation. In our food, antioxidants neutralize the negative valence of "free radicals" like oxygen by donating some of their own available electrons. Antioxidants and electrolytes are two different things. Antioxidants protect the body from harmful oxidation, and electrolytes conduct ions for electricity in the body. Milk has both. Milk is a source of peptides with antioxidant properties, which by giving up some electrons can relieve the oxidative stress of free radicals. Milk also provides two electrolytes: sodium and potassium.

Fig.XIX.12 Vitamin C antioxidant



Vitamin C is an antioxidant because it can give up electrons to fight oxidation. Vitamin C donates two electrons from two of its six carbon atoms, the two that join with a double bond. Carbon is a metalloid because sometimes it acts as a metal giving electrons, as from within vitamin C acting as an antioxidant, while in most situations the carbon receives electrons, thus labeled as a non-metal.

When squeezing lemon on a cut apple, the vitamin C is an antioxidant preventing the apple's oxidation, deterring it from turning brown. A fresh cut peach is a rich orangish-yellow color because of the high vitamin C content. Left out at room temperature, the cut peach will turn brown as its electrons are stolen due to the oxidation of the vitamin C. Having donated those electrons, the oxidized vitamin C has lost its antioxidant benefits.

A fresh facial anti-aging preparation with high vitamin C concentration has a yellowish color. It turns brownish-orange as it oxidizes, losing its effectiveness.

When an atom or molecule is reduced by gaining the correct number of electrons to fulfill its outermost (s = 2) + (p = 6) electron sub-field, calories are released as heat or light. When the body changes food and drink into energy, metabolism is the process during which calories in food and drinks mix with oxygen to make the calories that the body needs. When fat undergoes oxidation during metabolism, vitamin E, a fat-soluble antioxidant, gives electrons to oxygen, limiting free-radical damage, called oxygen toxicity, to lipids, DNA, RNA, and proteins. Also, vitamin E can absorb ultraviolet light, preventing UV-induced free radical damage to skin.

Keeping current

Bicycle pedals pump the chain in a circuit. The chain links are like the electrons. The whole chain is the circuit. The chain movement is the current. The load is the turning of the sprocket connected to and spinning the wheel. Feet pumping the peddles generate energy to move the current to power the bike against the resistances of gravity and friction.

When using a battery, the chemical fuel creates the electrical pressure to move electric charges against the electrons within the conducting wire. The battery is a charge pump. The discharge process depletes the battery's chemical fuel, allowing electrons to flow out the anode to the load that uses the energy, then back to the cathode, allowing the complete circuit.

Disconnect the energy source and the current flow stops, even though the charged particles still exist in the wire. The charges just stop moving. With the current stopped, the creation of the EM field also stops.

The material from which a Faraday cage is made will conduct electrical current around the external part of the cage. This leaves the area within the cage safe from electrical currents and fields. The cages are used to protect people and instruments from lightning strikes and other electrostatic discharges. Believing in this, ome people wear aluminum foil hats.

Florescence and *photoluminescence* occur when an atom absorbs a photon, causing an electron in one atomic energy sub-field to jump to a higher energy sub-field. Upon relaxing, the excited electron returns to its ground state and the atom immediately lets off light. If the release of the light is delayed, it is called *phosphorescence*.

Atomic electric charges: the positive nucleus with the proton attracts the negative charge of the electron. It is an equal attraction, but since the electrons are less massive than the protons, the protons mostly move the electrons. When electron pairs are confined to defined fields and sub-fields within an atom, their momentum does not allow the proton-electron attraction to collapse the atom. An orbiting electron pair trades the probability of identifying its position for the ability to measure its momentum: closer to an atom's nucleus manifests more momentum than its verifiable position. Farther from the nucleus, the electron's position is easier to identify than its momentum. This demonstrates the Heisenberg Uncertainty Principle, the deterrence keeping us from knowing completely both position and momentum.

Saltwater conductor

In the reaction (Fi.XIII.9) between the electrically neutral atoms of sodium, Na, with chlorine, Cl, the +1 valence of the sodium can give its extra electron to the -1 valence chlorine, which lacks one electron, bringing both of their valences to zero. As a result, this moved electron gives them both an electric charge. As NaCl, sodium chloride, sodium's +1 electric charge has combined with chlorine's -1 electric charge to make them together electrically neutral, so the molecule will not attract or repel electrically charged particles. Together, sodium and chloride in the NaCl molecule also have a valence of zero; they do not give up nor take electrons.

In a conductive metal, the mobile charges are the electrons. In salt water, $NaCl + H_2O$, there is not the abundance of lone electrons as there is in the copper wire, so instead the mobile charges there are individual ionized atoms of sodium and chloride. Salt dissolves in water, breaking the ionic bond so that the electromagnetically neutral NaCl separates into sodium + and chloride ─ ions. Each remains a valence zero. Water molecules surround these charged atoms, keeping them separate. Salt water can give or receive electric charges, making it a conductor.

When the electric current is applied, the positively-charged sodium ion is attracted to a negative charge, and the negatively-charged chlorine ion is attracted to a positive charge. These ions carry the electricity through water, similar but different from the flow of lone electrons in a wire. The more salt in the water, the more electric current can pass through. This means that as salinity concentration increases in the water, so does electrical conductivity.

Added to water, salt is an electrolyte increasing the concentration of dissolved ions. This increases conductivity. Differences in electric potential allow electrons to move faster on metal in the saltwater, and thus developing small corrosion cells on the metal's surface, accelerating oxidation and the formation of rust.

Electrolysis releases the potential electrical differences in an electrolyte, resulting in an electric current causing chemical reactions as substances gain or lose electrons—being reduction or oxidation. Under a floating boat, electrical current passes through the saltwater electrolyte and triggers a greater reaction with certain metals which give up electrons more easily than the metals it protects, such as in the propeller.

In saltwater, zinc is painted or attached to boat hulls since it is less resistant to the stealing of electrons. Zinc acts as a sacrificial anode, a reactive metal that corrodes more rapidly and protects the other exposed less-reactive metals which are important for the boat's function. A sacrificial anode, also known as a galvanic anode, is metal with greater negative electrochemical potential than the metal it protects, meaning it gives up electrons more easily to become an ion. Neutral zinc loses two electrons to form zinc Zn+2 ions.

The protected metal, as a cathode, can gain these freed-up electrons, a reductive reaction, and be further protected from corrosion. The increasing quantity of zinc losing electrons to become ions accelerates the continuous galvanic corrosive oxidation reaction, giving up more and more electrons. The dissolving zinc protects the oxidation, the rusting, from occurring to the other metal parts, like those made from iron, steel, and copper.

With the same results, a steel nail is coated, galvanized, with zinc to prevent it from rusting, allowing steel to last longer in corrosive environments.

In the flesh

In a man-made metal electric conductor, like copper wire, the protons in the copper atom's nucleus are relatively stationary. Electrons speed around the nucleus more as waves of momentum than as particles with positions. Being not so attached to the nucleus, outer energy levels of electrons can flow away from that nucleus and be part of the electric current in a conducting wire. Metal wires are man-made, not nature made. Metal must be mined and melted together before it becomes the product that our electricity-dependent world relies upon.

Electric current is a flow of charged particles in both man-made and natural creations, be those electrons moving through a copper wire, or as ionic atoms moving through salt water or a living body. Protons move within an acid where there are no free electrons. Electrons move within a base.

In biological energy systems like ATP and photosynthesis, natural positive and negative ionic currents are important. In the human body, in the brain and nerves, when feeling an electric shock, electric current flows in the form of moving ions. Electrons don't flow through by

themselves. The mobile charges are supplied by charged atoms like sodium, chloride, hydrogen, and potassium, like in salt water.

A hydrogen atom without its electron is an ion, H+, being just a single positively charged proton. Charges flowing in our bodies are the ions. Positive charged ions include more protons + than electrons ─, whereas negative charged ions have more electrons than protons. If there is a large difference in electric pressure when an high voltage contacts your body, the charges flow more over your skin than through the inside of your body. Still, the high voltage kills easily, even if starting with burning the skin. The high voltage contacting the body is generally electron current, which transforms the current from the electrons to the atomic ions. The body is just becoming part of the overall electric circuit.

Harmonic integers define the motion of electrons

"Integers are the fountainhead of all mathematics." Hermann Minkowski

Integers are whole numbers. Around an atom's nucleus, an electron is a moving wave acting like a standing wave. There can only be a whole number of these waves otherwise they would cancel each other out. To maintain this whole number of electrons, electrons are limited to energy fields where they can *constructively* interfere with themselves and with one another. If electrons do not maintain the proper distance from the nucleus, they will *destructively* interfere with themself and with other electrons. Orbiting electron waves exist only as integers so they can reinforce themselves.

Being waves, those orbital locations are just the most probable regions where an electron might be found within the atom. This is a probability field, where there are locations of high probability and of lower probability where an electron may be found. Because of this field of probabilities, the electron may at times be passing through the nucleus.

Proton currents

At times, inside the atom protons can move more than their normal jiggle-dance. Protons can make up an electrical current, or move as an acid in a living being.

Currents of protons, H+, are found in the proton conductor of solid polymer electrolytes used in fuel cells, displaying an acid-like conductivity. But these electrolytes are solid, not liquid.

When an electric current flows through the Earth, it is mostly not lone electrons which flow. Dirt is often salty, so the moving charges are the ionized atoms of Na + and Cl ─. If the dirt is acidic, the electric currents are flowing H+ protons. Alkaline soil flows OH-charges.

In the Large Hadron Collider, two streams of protons are propelled towards each other using magnetic fields. Protons almost reach the speed light. They are forced to collide with each other for the experiment, the reason being for scientists to see what variety of subatomic particles they can produce, and to see what variety of EM radiation is produced. Particle collider protons are an electric current by definition because they are moving charges.

Pumping electrons

Batteries and electric generators do not create electric charges, but they will pump them. Copper wires are already full of free electrons ready to move when the pump begins. The generator pumps a few electric charges to get those already in the wire moving. The heart is a pump moving blood through arteries and veins of the body. The heart does not create the blood, the muscle just supplies the pump. A water pump may have to take time to fill an empty hose with water before the water current flows out the other end. Or the hose might already be full of water when the pump begins, which means the water current leaving the hose's far end starts right away. This is like the copper wire being already full of movable electrons, so when the current begins, right away inside the whole distance of the wire the electrons move, and the EM

field begins at the speed of light around the outside of the wire, travelling much faster than the current within the wire.

Four electric measurement words:

Volts = *difference between ± charges*, measure of electric pressure: voltage. Volt = watt/amp

Amps = *flow rate of charged electrons*; measure of current. A coulomb is the amount of electricity that a 1-amp current carries in one second. Amp = volt/ohm

Ohms = *measure of resistance* against the current. Voltage equals current times resistance.

Watts = *flow rate of energy*, of either electric current or EM radiation. Watt is a unit of power: energy amount transferred-or-converted per unit of time. For the strength of electric current, one watt equals one joule per second: W = 1J/s = energy released by one amp current through a one ohm resistance. The strength of the EM radiation in the far field, called the power flux density, is measured in watts per square meter (W/m^2), referring to the rate at which energy is radiated or absorbed at the source or the load.
Watt = $volt^2/ohm = amp^2 \times ohm$.

Partial electronic equipment list:

Battery, Circuit Breaker, Fuse, Switch, Motor, Generator, Electrical Wires, Power Cables, Resistors, Capacitors, Light Emitting Diode (LED), Transistors, Inductors, Transformer, Integrated Circuit, Relay, Diodes, Crystals, Oscillators, Connectors, Meters: Volt, Amp, Ohm.

Motors convert electrical energy into mechanical energy. Generators convert mechanical energy into electrical energy. Many electric motors operate as generators when made to operate in reverse.

The generator pumps new negative charges into the wire which already has an abundance of charged electrons, creating the current, which creates the EM field. Once initiated by the charged current, the EM field travels faster than the individual electrons and helps the pressure move all the particles along the wire almost simultaneously, allowing efficient current. Charged particles are not part of the exterior EM field, though the EM field can help move the charged particles in the conductor, and the moving charged particles reenforce the EM field.

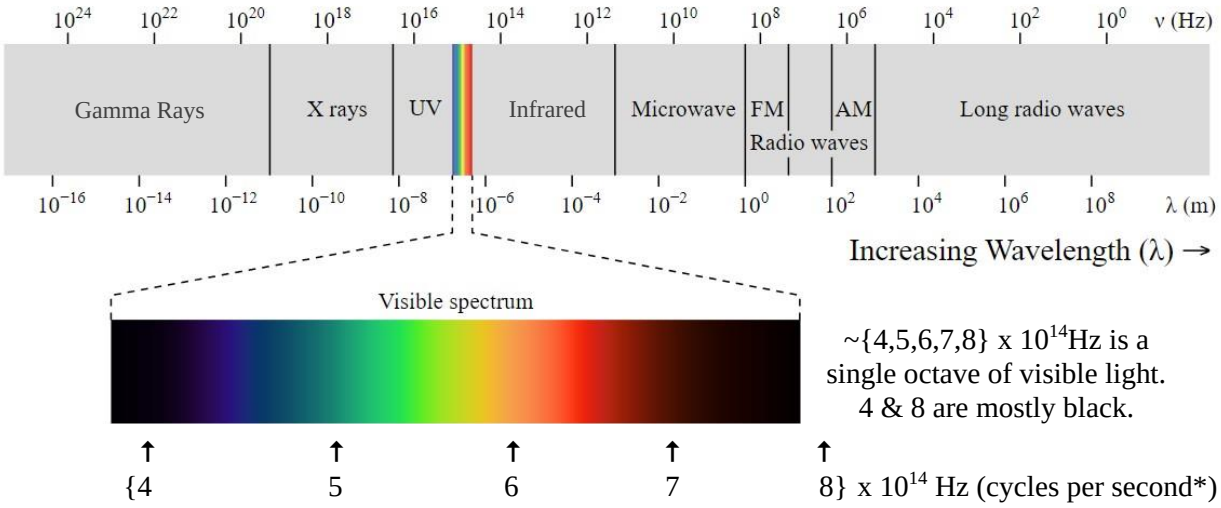
Along the wire, the EM field keeps stimulating electron movement which reinforces the EM field. This pattern continues until reaching the bulb filament, which, because of its smaller size, supplies increased resistance to the moving electrons. The filament's moving electrons still create an EM field, which adds energy to keep electrons moving and creating heat due to the filament's resistance, causing a glow that releases light waves, a new EM field. The moving charges in the wire are in the probability field while the EM waves move in the possibility field. The interaction of the electron current and the EM field creates electricity that we can use.

EM waves move through a vacuum at the speed of light (c). Even in materials like glass, the EM wave travels through void between atoms at light speed. An atom along the way might absorb the light wave, and the energy makes electrons jump up a sub-field level within the atom. When the atom relaxes back to the lower energy level, an identical EM wave is released to pass through the vacuum to the next atom, able to be absorbed again. Compared to the speed of light through only void, the absorption-reemission slows the passage of light though a medium.

Source vs load: the *source* pumps charged electrons into a conductor to create motion of the preexisting charged electrons. Moving electrons create the EM field. The EM field rapidly travels to the load end and can be used as energy at the *load*, to help the electron current heat a light bulb, to radiate light. This all slows down the electron movement. With the same amount of resistance, less electron movement creates less EM field.

Light stuff

Fig.XIX.13 EM spectrum ← Increasing Frequency (f)



~{4,5,6,7,8} x 10^{14}Hz is a single octave of visible light. 4 & 8 are mostly black.

↑ ↑ ↑ ↑ ↑

{4 5 6 7 8} x 10^{14} Hz (cycles per second*)

*Note that the time unit one "second" is a human chosen unit, not necessarily nature's precision when using such measurements as cycles per second. If the second's duration changed, the {4,5,6,7,8} arrows ↑ could move.

EM waves are all invisible except for visible light. EM radiation is a moving field that contains synchronized waves of electric and magnetic fields. The EM spectrum, Fig.XIX.13, is a sequence of cohesive increasing frequency EM waves. The EM spectrum includes not just visible light but also infrared and ultraviolet at each end. Each of those ends extend into other frequencies, lower and higher. Lower frequency than infrared are microwaves. The lowest are radio waves. Higher frequency than ultraviolet are x-rays. The highest are gamma rays.

The electrons in atoms and molecules can be excited with light. With the extra energy, the electrons can jump from the lower ground level to a higher energy level, which can only be maintained temporarily. The electron must return to its grounded state, and because of this, the extra energy gets radiated as an EM wave. The amount of radiated EM energy determines the light's colors. The more energy radiated, the higher the frequency. The emitted EM energy is the energy difference between the higher energy sub-electron field and the lower grounded state. Different electrons drop different energy levels, and together they make a symphony of frequencies. This emission spectrum is the fingerprint for the element from which it radiated. Each element's emission spectrum is unique. Using this understanding, the chemical make-up of stars in space can be determined.

Eye EM

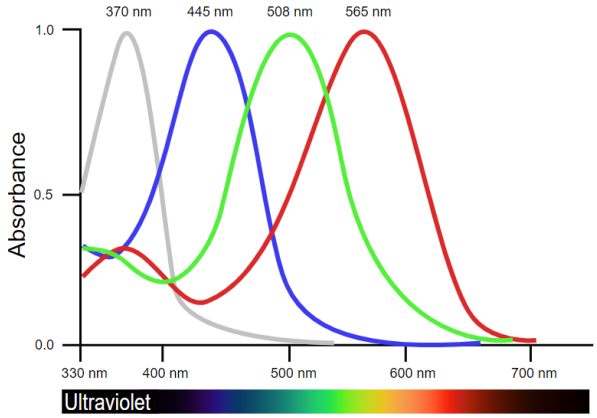
We are taught that the particle called a photon exists throughout the EM spectrum. Most of that spectrum is invisible. The colors that we can see, being approximately one octave of the whole spectrum, are the only visible EM waves.

Taking this information one step further, there is nothing that is visible except the photons in this octave. We do not see the tree nor the cloud nor the ocean. We see light reflecting off those things and bringing the information to our eyes.

As light hits the retina, four photoreceptors, being three cones and one rod, convert the light into electrical signals which travel from the optic disc, which has no photoreceptors so it creates the blind spot in each eye's visual field. We usually do not notice our blind spot since the two eyes see it in different positions and our binocular vision and brain will fill-in the spots to make a complete unity.

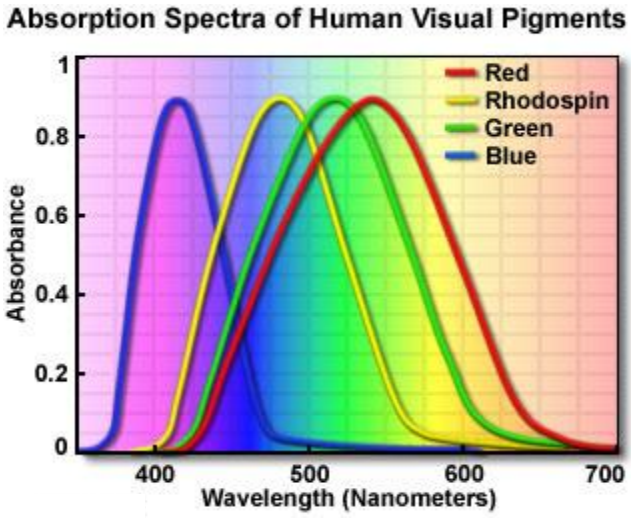
The electrical signals moving through the optic nerve, being axons of ganglion cells, are nerve impulses of sodium Na+ and potassium K+ ions passing in and out through the axon walls, which maintains different concentrations of the ions. As positively charged sodium ions pump out and positively charged potassium ions pump in, when there is a lower concentration of sodium ions outside the walls, and a higher concentration of potassium ions inside, the result is a relative charge difference. When this action and synaptic potentials of Na+ and K+ ions moving in and out of the cell surfaces reverses again and again, rapidly, this is the potential difference voltage that propagates the information in one direction along the axon to the brain where neurons generate the mind's EM field. And the images are created.

Fig.XIX. 14 A birds eye view



An estrildid finch's four visual cone cells extend to include ultraviolet. The bird's color vision mixes four pigments to produce all colors. Human's use only three types of cone cells for visual mixing and are unable to see ultraviolet. Harmonic theory says there are four primary colors in the one octave of EM frequency range, at approximately {4,5,6,7} x 10^{14} Hz. Without knowing the universal fundamental tone, we cannot assess the actual frequency set of tetra-color.

Fig.XIX.15 Human 3 cones + rod



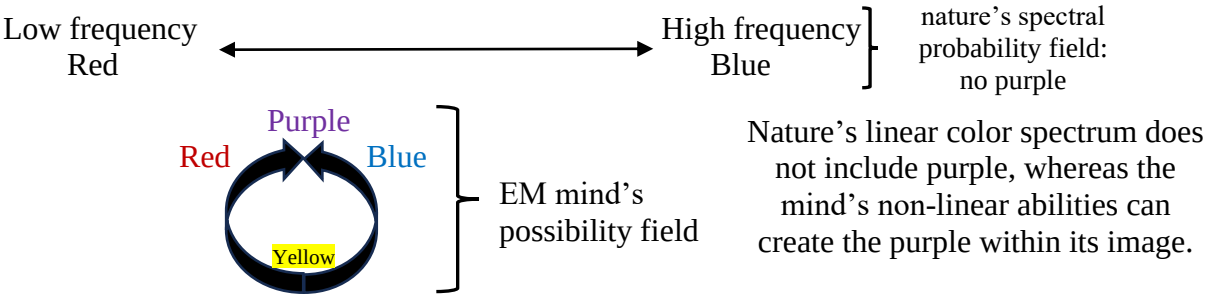
Besides the three cones, humans also have one rod. The rod is a receptor allowing black and white and it contains a photo-chemical called rhodopsin which allows us to still see, to a limit, when there is less light. Rods do not function when there is too much light. When suddenly there is much less light around us, it takes time for the rhodopsin to recombine, to allow us to adapt to the darkness with our night vision. Our cones restore their photo-chemicals to adapt much quicker.

Humans use three cones, Fig.XIX.15, to achieve our tri-color vision, responding primarily to frequencies within the general light ranges of red, green, and blue. When all three receptor cone cells are stimulated equally, white light is perceived. Noon sunlight appears white since it contains close to equal amounts of red, green, and blue. Reversing this, a crystal prism receives the white sun light, and out the crystal's far side emits a rainbow of colors.

The color purple is not in the rainbow's color spectrum. Violet is. Because of the limit of three color-sensitive cones in our eyes, combinations of different spectral colors get mixed in our brains. In roughly equal parts, red plus blue frequencies create purple. Compared to violet, purple includes more red, less blue. Most of the colors we perceive are not spectral colors.

Light gets interpreted as colors and brightness in the brain. With enough light, the cones give us colored vision with sharp detail. When light intensity is lacking, the rods help out by presenting the many shades of gray to help interpret details.

Fig.XIX.16 Color: linear vs non-linear



Besides rod and cone cells, discovered 1991, *intrinsically photosensitive retinal ganglion cells* (ipRGCs) are now considered to be a third class of photoreceptors. The ipRGCs contain "melanopsin", a photopigment that is sensitive to light and contributes to functions not having to do with forming images in the brain, like allowing light to stimulate reactions within the eye's pupils. The central body clock, called the suprachiasmatic nucleus, regulates circadian rhythms, and this results from ipRGCs. The ipRGCs are sensitive to the absorption of visible blue light.

Melanopsin within ganglion cells is an opsin similar to rhodopsin in the eye's rods and photopsin in the eye's cones. Opsins are light sensitive animal proteins in the retina encoded by the gene called Opn4 (Opsin 4). Dysfunction of the Opn4 can bring on such discomforts as anxiety and depression, including seasonally affected disorder (SAD).

"Color is the place where our brain and the universe meet." Paul Klee

"Without black, no color has any depth. But if you mix black with everything, suddenly there's shadow – no, not just shadow, but fullness. You've got to be willing to mix black into your palette if you want to create something that's real." ~Amy Grant

Truth is black and white

Fermions behave like discrete particles, the building blocks of nature, and include electrons and protons. *Bosons* behave like waves, though we too often refer to as them particles. Bosons act like a particle when colliding with fermions. Bosons are force carriers of nature, which include the photon carrying the EM force, the gluon carrying the strong force, the theoretical graviton carrying the gravitational force, and weak force particles W^+, W^-, and Z^0.

Superconductivity is a conductor creating zero or near zero resistance, thus very near or 100% efficient for channeling an electric current. Without resistance, no EM field is created. A lone electron mass particle is a fermion, but a pair of electrons can act as a single boson, perceivable as a wavefunction, which as a group allows superconductivity. The electron pairing in the superconductor increases its surface electrical currents, which makes an energy barrier that repels a magnetic field, to a limit. Because of the repelling field, a permanent magnet that is not too powerful can levitate above a superconductor. A strong enough magnetic field can defeat the superconducting effects by breaking up electron pairs, allowing single electron spins to point in different directions.

There is no non-superconducting material that fully blocks a magnetic field. There are materials that can act as magnetic shields by re-routing magnetic fields, materials which often have high magnetic permeability, such as air, meaning they can easily absorb and redirect magnetic fields.

The best material for magnetic shielding is ferromagnetic metal. These shields often have high magnetic permeability, including materials containing iron, nickel, or cobalt. Steel is often used because it is easily available and inexpensive. Other metals, such as brass, copper, and aluminum also shield against magnetic fields, but are not as effective as iron or steel. One way to store small magnets is between two pieces of steel wool compressed together.

In the copper wire, a copper atom maintains its own integrity among a large group of atoms. Copper and other good conductors have electrons outside the atomic shields of the stabilized outer s + p electron sub-fields. In a group of copper atoms in the wire, inner fields of electrons with less energy stay with the nuclei, while the outer fields' high energy electrons are free to be like a sea of electrons among the many atoms within the copper wire. With pressure added from a power source, moving electrons create the electron current.

From a "direct current" DC battery, the electrical source delivering energy into the system, the electrons flow in just one direction through the circuit. From an "alternating current" AC generator, a different kind of electrical source delivering energy into a system, the electrons move first one way through the circuit, then the other. Standard alternating rate in the USA is sixty to-&-fro cycles per second, 60 Hz. The AC flows electrons through the copper wire until they move within the light bulb filament, being the load in the system that is extracting energy. Electrons arrive first from one direction, then alternate to arrive from the other direction. The bulb's filament is smaller than the copper wire and thus puts up more resistance and makes the lightbulb filament glow.

In each different source of AC and DC, it is the movement of the electrons which creates the EM field. No charge is used up at the load, where the friction slows the current but does not deplete any electron of its charge. When charged electrons move, more movement supplies more energy. Removing energy from moving electrons slows down the movement. Resistance removes energy, releasing it as heat which might either be transformed and used for our needs and desires, or be dissipated.

EM Reactive/Radiative Near-Field vs. EM Radiation Far-Field

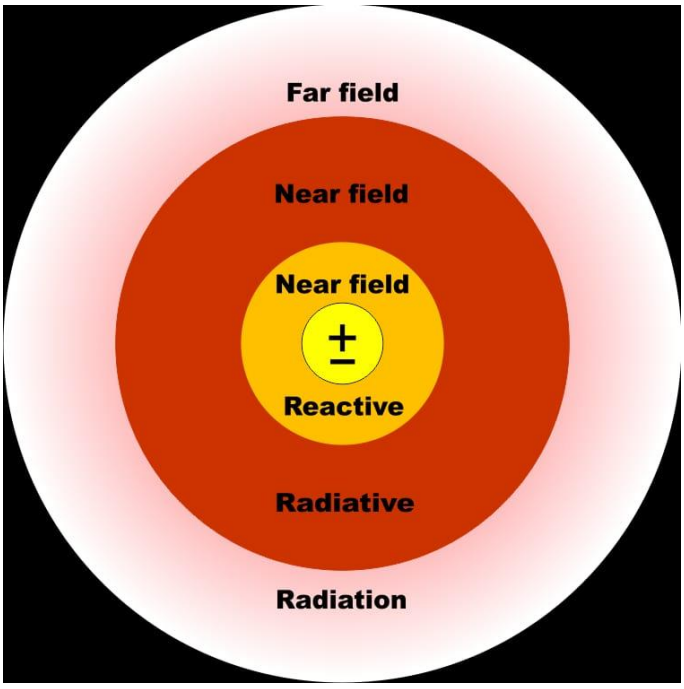


Fig.XIX.17 Inner & Far Fields

Accelerating and decelerating charged particles, like moving electrons and protons, emit EM waves, which when separated enough from the charges are free to keep traveling as a field through the void farther from the source, expanding and weakening with $1/d^2$, into the "far-field" where it is called radiation, like light created by the sun. In traveling, this independent EM radiation field can interact with encountered mass and transfer energy to those particles, like photosynthesis allowing plants to grow with sun's energy. The ± charged broadcasting antenna is the yellow in the center. The EM "near-field" is not considered EM

radiation. The near-field reactive contains separated and disproportionate electric fields and magnetic fields caused by the motion of charged particles. In near-field reactive, the electric and magnetic waves cannot yet join together because they are 90 degrees out of phase. A few wavelengths away from the source, far-field EM radiation energy disengages completely and becomes independent to radiate indefinitely into empty space, expanding as a sphere, weakening according to $1/d^2$.

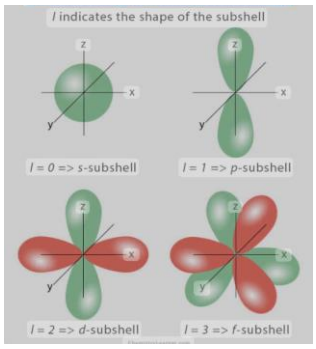
Near the charge, the close-in EM *reactive* near-field can reengage with the charged particle system that creates it, and through absorption then reemission, transfers energy to the source, conductor, or the load end receiving the energy. A bit farther away from the source, potential-*radiative* near-field EM waves try to escape, and the energy is either rapidly reabsorbed by the creating system or it successfully radiates out to achieve far-field status.

The "far-field radiation" has settled into the unified EM form of electric and magnetic waves combined. This energy radiates away from the system that produced it, while near-field energy might stay, oscillating and returning its energy to the source, wire, and load. EM far-field radiation weakens while dispersing according to $1/d^2$. It is claimed that electric and magnetic near-field energy weakens according to $1/d^3$, and that in some near-field spots, electric power drops more rapidly according to $1/d^4$ and $1/d^6$.

The spherical expansion into the harmonic probability field defines dispersion with $1/d^2$. The near-field $1/d^3$ expansion is not honoring the spherical shape of space away from its system. The higher the frequency of the EM field, the more energy it transfers. Planck's equation defines this, where $E = h\int$. Energy (E) of a photon equals Planck's constant (h) times frequency ($\int$). *Planck's constant quantifies the harmonic relationship between photon energy and its frequency*.

EM radiation of low frequency, as in visible light and lesser frequencies, is non-ionizing, meaning the incoming low energy photons will not easily break the chemical bonds in the objects they strike, thus not destroying life so simply as does ionizing radiation containing frequencies higher than visible light. Still, too much of the lower frequencies can jiggle particles and heat up them, and even burn with too much exposure, as when using a microwave oven.

Quantum numbers Fig.XIX.18 Azimuthal quantum number →



In physics, an atom's electrons are expressed within the four different *quantum numbers*: principal, azimuthal, magnetic, and spin. Two of these are not discussed much in HUT: azimuthal quantum number tells of the orbital angular *momentum* and shape within each sub-electron field, and the magnetic quantum number tells the *position* and orientation of the sub-field orbitals. Here, *HUT* discusses a condensed three perspectives. The first two are introduced in detail in chapter II.

Quantum field number

Purpose: to find the maximum *possible* number of electrons in each of the eight energy fields surrounding the nucleus. *HUT* limits the principal quantum number, n, from infinity to H_E: $H_E = \{1,2,3,4\}$. To achieve the mirror effect, *HUT* uses $2H_E = \{1, 2, 3, 4, 4, 3, 2, 1\}$.

Use the quantum formula $2H_E^2$ to find the maximum *probable* number of electrons in each of the eight energy fields surrounding the nucleus: $2H_E^2 = \{2, 8, 18, 32, 32, 18, 8, 2\}$

Quantum sub-field number

Purpose: to find the maximum possible number of electrons in each of the potential four energy sub-fields within each energy field surrounding the nucleus. *HUT* uses the limited set of harmonic chord odd numbers, H_{CL}: $H_{CL} = \{1,3,5,7\}$. Within each of the eight energy fields

surrounding the nucleus, use $2H_{CL}$ for the maximum number of electrons in each of the potential four energy sub-fields {s, p, d ,f}: $2H_{CL}$ = {2, 6, 10, 14} = {s, p, d ,f}.

Spin quantum number

Purpose: to understand the two different attractions and/or repulsions occurring between electrons; 1) north and south poles of the *magnetic field caused by electron spin*, and 2) the *electron negative electric charge*.

Electrons have a spin of 1/2. This fraction means that lone electrons are categorized as *fermions*, as compared to *bosons* which have integer spins.

Spinning clockwise, an electron's spin arrow points up. Anti-clockwise spin has the arrow pointing down. The spins create magnetic fields with north and south poles: identical poles repel and opposite poles attract.

With two negative-one charged electrons, if both spin in the same direction, they repel each other due to those identical particle charges as well as the identical magnetic poles.

When two electrons spin in opposite directions, with one arrow up and one arrow down, the two electrons' opposite magnetic spin fields attract each other, overcoming the repulsion of identical particle charges, and the electrons become a pair, dancing in a "singlet state".

Fermions vs Bosons

The standard model of particle physics divides every particle and composite particle in the universe into two particle types: fermions and bosons. Fermions are the building blocks of all atoms, while most bosons transfer energy. Composite particles made of an odd number of spin = 1/2 particles are fermions. If made of an even number, they are bosons.

Each electron has a spin = 1/2, making it a fermion. With a pair of electrons, one spin up and one down, called a Cooper pair, their combined total spin = 0 or 1, thus defined as one boson rather than a two fermions. The Pauli exclusion principle does not apply to bosons so that two electron pairs can pass through the same space at the same time—more like waves than particles.

A proton made of three spin = 1/2 quarks is a fermion. A hydrogen atom with four spin = 1/2 fermions, being 3 quarks and an electron, is a boson. An H_2 molecule, without electrons, is made of 6 quarks, an even number, making it a boson. An H_2 molecule with two spin = 1/2 electrons, is still a boson. Refer to chapter II. Helium-4 is a boson. Helium-3 is a fermion.

Higgs field

The electron field is concentrated at the electrons. Alternatively, the Higgs field has the same high value everywhere. The Higgs field is not considered a force as it *cannot accelerate* particles, nor does it transfer energy. Instead, the interaction of elementary particles with the Higgs field *causes a resistance to acceleration* that prevents particles from moving at the speed of light, slowing them down, causing them to have inertia, which manifests the mass. Universally, fundamental particles, including electrons, acquire mass through interactions with the Higgs field. The stronger the interaction, the more mass. Even the Higgs boson, the simplest known particle with no charge and a net spin = 0, gets its mass from interacting with the Higgs field. EM radiation which travels the speed of light is not resisted. The Higgs particle, an excitation of the Higgs field, is unstable and decays almost immediately, generating other particles.

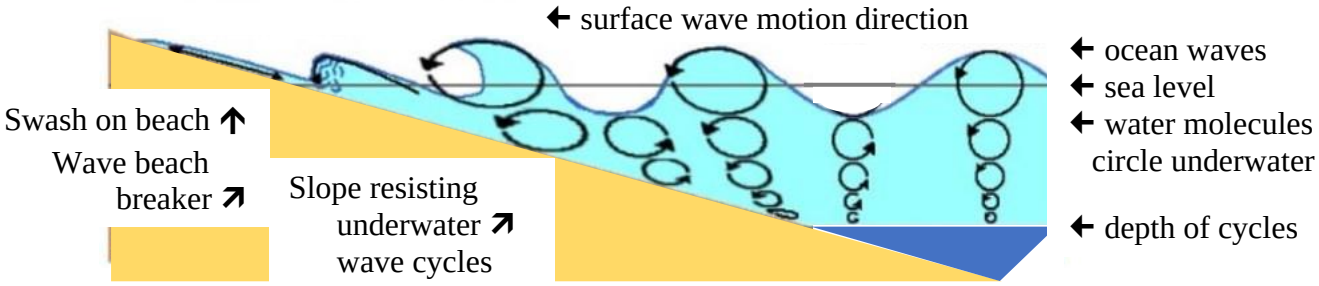
Mechanical waves vs EM waves

I was told that the electric current was the motions of electrons, even though the current and electrons, they taught, moved in opposite directions. That never made sense. I was also confused from a young age in thinking that charged electron current and the EM field were the same. They are not. The electron current is a mechanical wave moving with the particles in a

wire at a speed less that light speed. The EM field is an EM wave moving at the speed of light through void.

Being told that sound waves moved at 1100 feet per second did not confuse me into thinking that the motions of air molecules are the same as sound reaching the ear. My eardrum, and my whole body, would not survive a wind moving that fast. A tsunami wave from the west coast of America travels across the ocean to Japan, crashing on the shore. This is the same energy wave moving across the ocean, but not the same water particles (Fig.XIX.19).

Fig.XIX.19 Ocean waves



A vibration can push sound through air, traveling as longitudinal waves. See page xiv in the introduction. Wind blows transverse waves over the surface of water. Both are examples of mechanical waves. The air molecules and the water molecules cycle and bump into each other.

With a row of dominos standing on their ends, ready to fall, the line is loaded with potential energy only waiting for a push. When the first domino is pushed, it falls no farther than its own height, but the energy continues knocking down domino after domino. Each domino has potential energy because it can easily fall, and this manifests as kinetic energy from the small amount of energy used in the original push. The transformation of potential energy into the wave of kinetic energy pushing down domino after domino is the mechanical energy. And it continues for as long as dominos get set-up in advance.

A flute is full of air even when not being used. Blow into the flute. This pressures air molecules to bump other air molecules so the sound waves move over and beyond the molecules. To play a flute it needs a constant kinetic energy source to maintain the mechanical wave. This is like bicycling over pavement: without adding more energy, the bike will coast only so far before friction and gravity dissipate the energy of momentum.

One jolt of electrical pressure into a wire is like a finger pushing the first domino. But the domino-electron only travels enough to pass momentum to the next domino-electron. The electron potential energy is not sufficient to keep the current moving with just one push, so the electrical pressure source needs to be constantly supplying pressure. This electron current is a mechanical wave traveling much slower than the speed of light.

Electric current is moving as charged electrons. Sound waves are waves of energy moving over movable air molecules (or water, etc.). The transverse surface waves on the ocean move over the rotating areas of water. The energy waves flow much faster than the movable mass particles. The water and air molecules may not move very far from their original position, but they do at least move locally, allowing the current to flow. It is the locally moving particles under the ocean wave that cause erosion along the shore. The surface wave motion increases the particles' movements. The particles of water crash on the shore, eroding.

Harmonic unified field ≥ {EM field, gravity field, consciousness, $E = Mc^2$, et al}

"The spirit of exploration was strong, so why had nobody else [until H. C. Oersted] thought of placing a compass near an electric circuit to see if anything happened? … none but a few

scientists thought there could be any connection between the forces of electricity and magnetism, and those few were regarded by the others as airy-fairy metaphysicians … Since ancient times, electricity and magnetism had been obscured by a fog of superstition, mysticism, and quackery."
Faraday, Maxwell. And the Electromagnetic Field, Nancy Forbes and Basil Mahon

The 1) electric current is the moving electrons within the wire, while 2) through void, around the electrons and the wire, an invisible EM field flows, warping 3-D space along the way. These two different phenomena move in and around the same wire at different speeds. EM fields move at the speed of light when in a vacuum. Electron current flows much slower.

Mental EM waves mixing in the consciousness possibility field allows the discovery, invention, and even unification of dualities that we all experience in mind and body. Personal and societal confusions come from the blur created by our lack of integrity and control over our dual perspectives. The primary cause is our lack of understanding that our consciousness is an EM field. Our minds, being light, perceives in 2-D space with no time.

Mixed with the sensory input of the body in 3-D space + time, our 2-D EM mind can interpret itself as flesh. The current paradigm is each person saying I Am, often believing that "I Am this flesh body". We can believe: "I Am …" whatever one chooses to believe. We are evolving to understand that humans have the combined dual consciousness of the body's ticking time and the mind's stopped time. In the ever-present "now", the mind can look ahead. A gymnast plans her flesh routine through time in advance, with a rhythm. But the flesh routine has not happened yet except in the imagination. The mind, not being bound in time, can make plans, and remember past experiences, which helps to avoid mistakes and to repeat successes, to enable attaining the proper timing for the soon-to-be flesh routine.

"Gymnastics is something that I do, and it's not who I am as a person and I think it took years to realize that. It's kind of nice to break out of that shell." Simone Biles

Traveling at the speed of light, the EM field perceives no time except now, nor distance in the direction of travel. The flesh observer outside of the EM field sees it taking time to travel forward over distance. This is the fundamental duality of our consciousness' perspectives: 1) Our minds perceive as light with no time and no forward movement through the void. 2) From flesh we perceive the 3-D + time probability field, believing our individual "I Am" is the flesh body. The body is more like a tool from which the I Am consciousness must learn to operate, like we drive a car. Learning how to work efficiently with this fundamental duality is humanity's purpose: the path towards untangling the confusion of personally and socially chosen dualities.

EM perspective experiences Lorentz contraction in the direction of travel, which shrinks the distance to zero, and with special relativity's time dilation, time passing also reduces to zero. From within our body mass, we live within 3-D with time, while as mind energy we perceive timeless 2-D. In flesh we perceive that mass takes time to travel distance. For light perspective, it takes no time to travel no distance. It is not that time ceases to exist at the speed of light, it is that mass has decelerated from the speed of light and this *creates* the perspective of time. Mind as an EM field creates and mixes with the perspective of mass, of flesh. A human mind can *believe* its E.M self is the flesh body.

Two photons entangle then separate in opposite directions. Flip one photon and the other photon entangled with it flips simultaneously, like two sides of the same coin. It does not take the information time to travel because, from the light's perspective, the distance of travel is reduced to zero, so the particles are not separate at all and do react simultaneously without violating the laws of relativity. Light perspective has only the 2-Ds of up + down and left + right. This is the possibility field in which we can experience ourselves in a sleeping dream.

HUT claims that the void must have willpower to be able to organize the origin dance into an order sufficient to continuously increase the average of disorder throughout the duration of the universe, unfolding from original void to the final equilibrium after all matter and anti-matter finish annihilating into the original void.

Everything is created from nothing and annihilated back to nothing—the fundamental violation of any law of conservation that does not respect the zero cosmological constant's absolute rule over everything. Only the void cannot be created nor destroyed.

The *HUT* claim is that the void's willpower is the same as the void's tendency to manifest order for the connected virtual particles of matter and antimatter. Before the beginning of time, willpower changes the option of the dance away from moving without order.

"There is nothing in the world except empty curved space. Matter, charge, electromagnetism, and other fields are only manifestations of the curvature of space." John Wheeler, 1957

In 1955, physicist John Wheeler proposed that spacetime is made up of quantum foam: bubbles in motion within themselves. Now his quantum foam is accepted as an actual phenomenon. Bubbles of dancing virtual particles and antiparticles are constantly being created and instantly destroyed due to their being connected as two ends of the cosmic string, which has them inevitably collide, annihilating them. To avoid this constant annihilation, only by original willpower manipulating these orbitrons into dynamic patterns can the harmonic universe begin creation that includes entropy in which beginning order can, for creation's duration, become increasingly disordered—on the average.

Theory of quantum gravity now predicts that space and time is compatible with this *HUT* proposal of the 2 x 5 dance containing void points multiplied into the field we call empty space. The expanding original dance which contains void, and allows time and cooling, allowing harmonic sub-fields of electromagnetism, gravity, etc. These sub-fields spread throughout the universe, interacting with one another, creating us and everything within and around us. We are the unified field in harmony. Like God and Popeye say: I Am what I Am. God is the dreamer and Popeye is a dream within the dream. Every part contains the whole.

The harmonic unified field is everything, composed of, controlling, and greater than or equal to, $\geq$, all the fields of creation: electric, magnetic, EM, nuclear weak, gravity, nuclear strong, consciousness, everything. There is nothing that is not part of the unified field. Every part contains the whole. From the unified perspective of non-duality, the *whole* simply is…

"The speed of transmission [*of electromagnetic or gravitational waves*] comes down to the question of how fast the shape of space can change." *The Fabric of the Cosmos*, Brian Greene

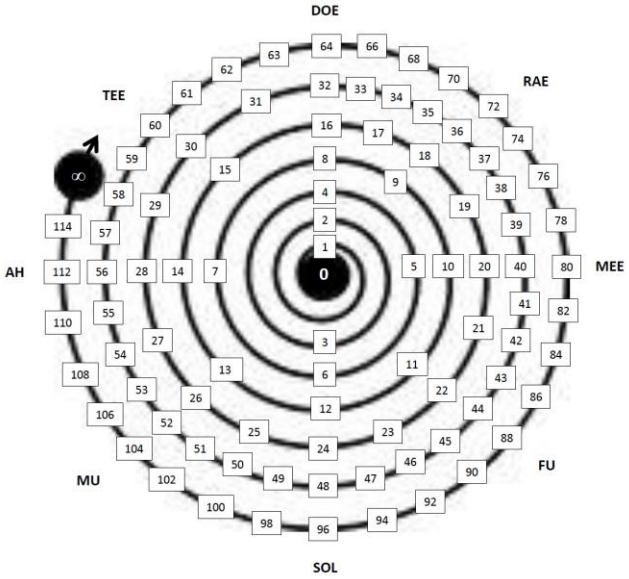
XX New Education System Theory

"A society's competitive advantage will come not from how well its schools teach the multiplication and periodic tables, but from how well they stimulate imagination and creativity."
Albert Einstein

Envisioned here, the harmonic theory for our new education system begins as is presently done, with the youngest children learning their own language plus the international language of {1,2,3…}. Music language of {Doe, Rae, Mee…} = {8,9,10…} begins rapidly in the system, motivating each child up through the grades, adding complexity right through college, masters and doctorate programs, research, professionals, politicians, religious clergy… everybody.

Goal: among the universe's math underlying everything, in each situation identify the fundamental tone {1} and its ensuing harmonic overtones, H_O, where H_O = {2,3,4,5,6…}.

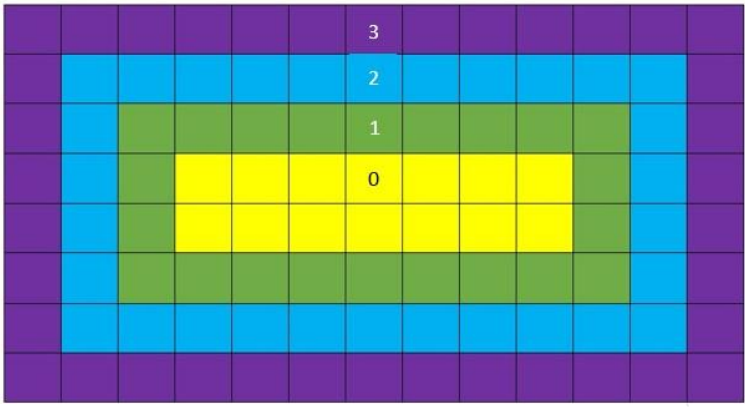
Fig.XX.1 Harmonic Spiral



Defining pitch classes and octaves, Fig.XX.1 is a full page in Fig.X.17. Kids already learn the harmonic sequence when counting H_S = {1,2,3,4...}. Next, like their parents will need to, they will learn doubling, beginning with the fundamental pitch class DOE = {1,2,4,8...}. Numbers between these doublings reveal the octaves, as with 4-8 & 8-16 etc. Odd numbers, as with 3, never having been doubled, are tones beginning new pitch classes, e.g., SOL = {3,6,12,24…}. In this chapter, each pitch class from one to 64 has a name. In time and through various ways, these basics reduce into the diversities of creation. Also see FigXI.1.

"Before it [the scientific paradigm shift] occurs, a number of schools compete for the domination of a field. Afterward, in the wake of some notable scientific achievement, the number of schools is greatly reduced, ordinarily to one, and a more efficient mode of scientific practice begins."
Thomas S. Kuhn, *The Structure of Scientific Revolution*

Fig.XX.2 2-D Floor Tiles Equation



For any 2-row H_S number:
$x = 2H_S + 8H_I$
where: x = # of squares in each ring numbered H_I
H_S = {1,2,3,4…}
H_I = {0,1,2,3…}

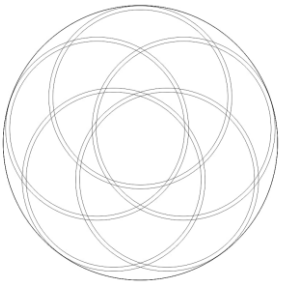
See Figs.XIII.1 &.2 to see the zero center count as zero, but still requires space. Here the yellow zero center counts as 2 x 7.

HUT's goal is to find harmonics in each thing studied. Fig.XX.2 follows simpler harmonic patterns of six and eight space from Figs.VIII.1 & .2, each having one middle square, counting as zero. This figure has its zero yellow space filled and the squares must be counted in the equation. The central yellow squares here are: 2 x 7 = 14. The 7, from the harmonic sequence, H_S = {1,2,3,4,5,6,7…}, defines the figure's pitch class, 7 being Ah. This figure is Ah (2 x 7) grounded in 8-space, being in the fundamental pitch class of Doe, as do all harmonic overtones ground in Doe {1}.

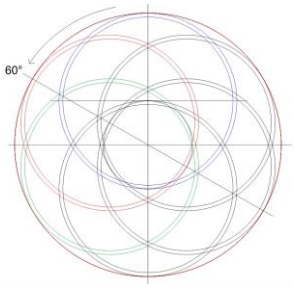
Find: x = $2H_S + 8H_I$ = predicted number of boxes in each consecutive ring H_I, where H_I = {0,1,2,3,4…}. Specifically for yellow, x = (2 x 7) + (8 x 0) = 14. Around the 14 yellow squares of ring #0, the 22 green squares of ring #1 are predicted from (2 x 7) + (8 x 1) = 22. Blue ring #2 around green has (2 x 7) + (8 x 2) = 30 squares. Purple ring #3: 14 + 24 = 38 squares. The harmonic equation predicts the number of boxes in each ring into imagined infinity.

Fig.XX.3 2-D crescents: 5-Space & 6-Space

Fig.XX.4 Toño Circles



360°/5 = 72°



360°/6 = 60°

In the top two diagrams of Fig.XX.4, five circles are placed 72° apart, and six circles at 60° apart. Erasing specific curves, the crescents are automatically displayed in position. Below are divisions of the circle into crescents 4,7,8,9,10,11,12.

360°/4 = 90°

360°/7 = 51.43°

360°/8 = 45°

360°/9 = 40°

360°/10 = 36° 360°/11 = 32.73° 360°/12 = 30°

Toño Castañeda is the artist working with me. The front cover art of this book is his work. I asked him to design art for tiling a circular table, to display the five crescents of Fig.XX.5, but I was not sure how he would do this. His solution for drawing this 2-D harmonic pattern was so elegant that I expanded it to be a harmonic formula: 360°/n. In this case: 360°/5 = 72°, defining 5 circles within one fundamental circle, each 72° apart. I then asked him to diagram 360°/6 = 60°. I asked him next to diagram circles divided by 4 through 12 sub-circles to create those crescent diagrams. Toño used the computer program: CorelDRAW.

Harmonic orbital frequencies: Laplace resonances

Chapter VII shows gravity in a harmonic planetary equation relating orbital *distances* from our sun. Different, but still based on harmonics, are Laplace resonances. Pierre-Simon Laplace discovered a patterned relationship between orbital *frequencies* of the Galilean moons of Jupiter. The spherical Galilean moons, named after Galileo Galilei, who reported observing them around December 1609, are comprised of the four largest moons named: Io, Europa, Ganymede, and Callisto. These remained the only known moons of Jupiter until 1892, when the fifth largest moon, Amalthea, was discovered.

The Laplace resonance exposed the 1:2:4 orbital period ratio of Jupiter's closest three moons: Io, Europa, and Ganymede. The three Jupiter moons are in an inverse relationship when referred to as a 4:2:1 resonance, being the ratio of number of orbits completed in the same time interval. This is seen with Io, the closest to Jupiter, completing four full orbits for every two orbits that Europa makes, and for every single orbit that Ganymede makes, the third most distant moon. The resonant system of these three moons is claimed to be self-correcting due to elliptical orbits and gravitational drag, allowing stability.

There is an orbital period ratio of 2:3 between Neptune and Pluto, meaning that Pluto completes two orbits in the time it takes Neptune to complete three. This is one of the few other of these resonances in the Solar System that includes planets, dwarf planets, asteroids, planetary rings, etc. Examples: 2:4 with Saturn's moons Tethys and Mimas; 1:2 with Saturn's moons Dione and Enceladus; and 3:4 with Saturn's moons Hyperion and Titan. These resonance patterns repeat after each conjunction of the planets or moons as they go around the sun or planet in a rhythmic dance.

As harmonic frequency multipliers have names, the 1:2:4 pattern are three octaves of Doe. The 2:3 pattern displays the harmonic tonal relationship between Doe and Sol.

Looking further out in space, the solar system referred to as TOI-178 has revealed these harmonic resonances. The discovery was published January 25, 2021, of an exoplanet whose mass equals 1.5 Earths, which orbits a K-type star every 1.9 earth days. They count six exoplanets total, of which the orbital frequencies of the outermost five synchronize in harmony, with a resonance of the orbital ratios being 18:9:6:4:3. The inner planet of those five makes eighteen revolutions while the next planet completes nine orbits. The third planet in this resonance chain completes six orbits in the same time, and the next completes four revolutions.

The final planet completes three orbits during the same time. Reversing these numbers reflects orbital period ratios of 3:4:6:9:18, equating to harmonic tonal names of Sol:Doe:Sol:Rae:Rae. This is also considered to be a chain of Laplace resonances.

Other sources claim the successive TOI-178 planetary conjunctions form a different repeating pattern expressed as 2:4:6:9:12. These integer ratios still display ratios of different octaves of harmonic tones within the pitch classes of Doe, Sol, and Rae. The ratios relating {Sol, Doe, Rae} allow the popular three-tone harmonic progression of harmony matching the chromatic tones of {fa, do, re}, being the so-called "1-4-5" foundation of rock-and-roll, blues, jazz, etc. See paragraph following Fig.X.15.

Published November 29, 2023, as told in Phys.org, another six planets orbit a star known as HD110067, are also claimed to be honoring Laplace orbital frequency resonance.

Some scientists believe that planets around stars originally formed in resonance but the patterns were easily interrupted by maybe impact events or influence by other high gravity objects passing nearby. The planets that are currently displaying this resonance are believed by some to have been repeating this harmonic dance for billions of years. Multi-planet systems which do not display resonance may have once been in resonance but have been disturbed.

It is claimed to be possible that many entire solar systems originally formed planets in single long resonant chains, but with much time the resonance of the planets was altered.

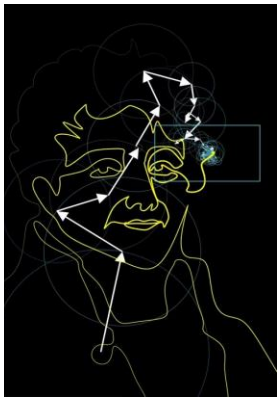
Into the future; forever now

HUT shows the 1/1 circle as the one fundamental geometric figure that unfolds the whole universe. Verifying this theory is the first step towards our refined academic future. The fundamental tone, the shapes of sound, light, and matter produced by the geometry of a circle, and proceeding harmonics, are the basic tools for the creation of nothing into everything.

A Fourier Analysis separates the multiple wave cycles from a single composite wave. Imagine a very complicated composite wave made up of many smaller parts, all made up of even smaller parts, down to the simplest wave cycles.

Fig.XX.5 Fourier YouTube Video

There is a video on YouTube showing spinning vectors marking out circles which make up more complex pictures. To witness a spinning vector centered in your hand, grasp a piece of string with some wadded cloth on the other end, and spin a circle. Multiple strings all flow in harmony. The video titled "But what is a Fourier series? From heat flow to drawing with circles | DE4", is identified as, "3Blue1Brown series S4 E4", found at "https://www.youtube.com/watch?v=r6sGWTCMz2k".



In the video, multiple spinning vectors with different lengths and speeds all combine into the big picture. From the big picture it is often difficult to see all the component circles. The whole universe is the biggest picture of all; all composed of circular momentums and positions, with the required signal to noise ratio.

Universal fundamental tone

The ancient Chinese version of Hindu's OM in India, of science's universal fundamental tone, was translated to Yellow Bell. Though Red Bell would be more accurate. The term Yellow Bell was used for not just music's fundamental tone, but also for universal order, and to signify the ruler of China, the social harmonic center point.

"In their experiments, Kaminer … used a prism … to slow down the light waves in the proximity of an electron. By precisely matching the angle at which the electron was illuminated, they were able to slow down the velocity of light waves to the point where it matched that of the electron. This match in their velocity produced an effect known as phase matching."
November 12, 2020 by Ingrid Fadelli , Phys.org

As in the quote, harmonic phase matching also occurs with photosynthesis (chap XII), allowed because light and electrons share a common fundamental tone, allowing the harmony.

Harmony is the voice of the silent void singing out through science, art, and religion. Humanity not choosing to better understand harmony is a life-threatening error. Engineers understand that ignoring the possible vibrations of their constructions, such as a bridge or a jet plane, could have detrimental effects. This awareness should be expanded into all fields of study.

An imaginary ceiling propeller-fan spins around, cooling the room. The fan has five speed settings. On the first it rotates two full circles each second. The fan is harmonically tuned: the first setting is the fundamental tone, being two cycles per second, or 2 Hz. The fundamental tone frequency of 2 Hz must be the difference between each of the five overtone settings:

$2H_{SL}$ Hz = {1 x 2Hz, 2 x 2 Hz, 3 x 2 Hz, 4 x 2 Hz, 5 x 2 Hz} = {2,4,6,8,10} Hz.

To be mono-harmonically tuned, when one harmonic tone plays at a time, a mono-tone sequence, this makes a harmonic melody. With three fans spinning together, one set on speed #3, one on #4, and one on #5, we have the visual poly-harmonic "chord" made up of { Sol, Doe, Mee}, meaning that more than one tone plays at one time. If there is a harmonically tuned audio beat or tone accompanying each fan, we have an audio-visual poly-harmonic chord.

"...the equations of waves can describe a swinging pendulum; a vibrating drum head; flapping butterfly wings; cycling hands of a clock; beating hearts; planets orbiting the sun, or electrons circling an atom's nucleus; the thrust and return of an auto engine's pistons; the spacing of atoms in a crystal; the rise and fall of the tide; the recurrence of seasons..."
Shufflebrain by Paul Pietsch

A universal harmonic model requires a fixed wavelength and frequency, the universal fundamental tone (*Uni-Fun-Tone*), ॐ, through which other frequencies vary. When anyone first discovers this mystery, the understanding is possibly based more on opinion than valid data. Separate individuals and groups already claim precise, and conflicting, knowledge of this tone, and this has the potential to cause much more social friction in the future. Universally, this tone must be a low frequency with a long wavelength since overtones sequence into higher frequencies and shorter wavelengths. The same Uni-Fun-Tone's DOE pitch class re-creates throughout creation within different octaves, and with different intensities.

As society is transitioning into a new harmonic paradigm, we can begin new research for the Uni-Fun-Tone. We will likely argue over many possible answers, even about the many people each claiming *to be* the fundamental tone. It may all seem like World War III.

A harmonically tuned universe requires a Uni-Fun-Tone. This fundamental tone {1} begins its own DOE pitch class, of one and its frequency doublings: {1,2,4,8…}, enabling sub-systems to imitate the predominant universal system. Going smaller in size, the Uni-Fun-Tone wavelengths would be halved down to find planetary orbits, sound, DNA, brainwaves, light, and everything else of the same pitch class, all the way down to the tiniest we know: Plank's length. Whatever the Uni-Fun-Tone really is, it is that which aligns the harmonic universe. To tune humanity's musical instruments together to the universal harmonics, our musical Doe fun-tone should be in the same fundamental pitch class as the Uni-Fun-Tone: Doe 1/1.

Possible small places for the Uni-Fun-Tone's pitch class: Planck's length, quarks, and hydrogen (Figs.XXII.16 & .17 & .18). Before Max Planck, physicists claimed atomic vibrations

to be a continuously sliding scale that could vibrate at any frequency. Planck claimed atoms could only vibrate at whole number multiples of one base frequency, being the definition of harmonics. That fundamental tone for the *atomic* harmonic scale he called *h*, known now as Planck's constant. Since wavelength decreases and frequency increases, to achieve the overtones' effort to reach from extremely big into extremely small, the fundamental tone must have begun as the longest wavelength, with the lowest frequency, the deepest tone of the universe.

"BOOMERANG (Balloon Observations of Millimetric Extragalactic Radiation and Geophysics) reveals that the temperature fluctuations in the microwave background are the greatest when measured over patches of sky of a certain size. This size, theorists say, corresponds to the longest sound wave that existed when the universe was 300,000 years old. If the inflation theory is correct, the microwave background must exhibit a series of such peaks corresponding to shorter wavelengths, just as a musical instrument plays several overtones." Cowen, Ron, 'Balloon sounds out the early universe', *Sci News*, 4-29-2000

In a related study, DASI (Degree Angular Scale Interferometer):

"The early universe rang like a bell. Although scientists have known that for many years, they've been deaf to the full richness of that ancient ringing… Their discovery was like finding a lone musical note without a single overtone… Now, the cosmic symphony is beginning to be heard… a second peak and even a third… The ratio of the second peak to the first, for instance, yields the density of ordinary matter, or baryons, in the cosmos…" Cowen, Ron, 'Sounds of the universe confirm big bang', *Sci News*, April 28, 2001

"…Fabian's team found circular ripples in the cluster's gas, similar to those created when a rock is dropped into a pool of water. The team attributes the ripples to sound waves generated when jets emanating from Perseus' central black hole plow into the cluster's intergalactic gas…The ripples are separated by about 35,000 light years—which produces a B-flat 57 octaves below middle C… The note is the deepest ever detected in the universe…" Cowen, Ron, 'A low note in the cosmos', *Science News*, Sept. 13, 2003

"…sound waves travel through the stars like earthquakes on Earth, causing them to oscillate. While these oscillations were previously known, their importance for distance measurements was missed… [Richard I. Anderson:] '…the older stars oscillate at lower frequency— just like a baritone sings with a deeper voice than a tenor.'… Red giants…are aging stars. They adopt a reddish hue as they exhaust hydrogen in their cores and use outer hydrogen, which makes them larger and cooler…" *The 'baritone' of red giants refines cosmic distance measurements* by Nik Papageorgiou, Ecole Polytechnique Federale de Lausanne Mar 15, 2024

In both the quantum and the relativity universe, the harmonic universe inter-connects with one Uni-Fun-Tone, with frequency and wavelength not yet publicly proven. Whatever it is, we should tune our musical scale and many other things to it, and at times dampen or avoid it when too much fundamental vibration is harmful—such as with earthquake resistant homes, shock resistant sport shoes, and stabilizing cables on bridges.

I sing with my brass musical bowl which is tuned to the equitempered pitch class of C at 523.26Hz. I choose 524 Hz to simplify the math. Halving 524 Hz down to 32.75 Hz, I use that as my fundamental tone multiplier for tuning musical instruments.

A quick search on the internet shows people trying to corral others around their chosen fundamental tone. Examples of attempts to claim a fundamental frequency, in Hertz, include: 10; 60; 285; 396; 417; 432; 444; 528; 639; 741; 852; 963; and more. Without satisfactory proof of exactly what is the frequency/wavelength of the Uni-Fun-Tone, I have chosen for myself based on my beliefs. I only use the singing bowl to establish the pitch class for singing my fundamental

tone. If anyone cares enough to allow me to play music with them, they too will need to choose the same fundamental tone and use the same harmonic overtones. My choice is a simple beginning: one can tune harmonic instruments by borrowing a C tone from any equitempered-tuned instrument. I use my musical bowl as the Fun-Tone tuning fork with which to sing the harmonic scale.

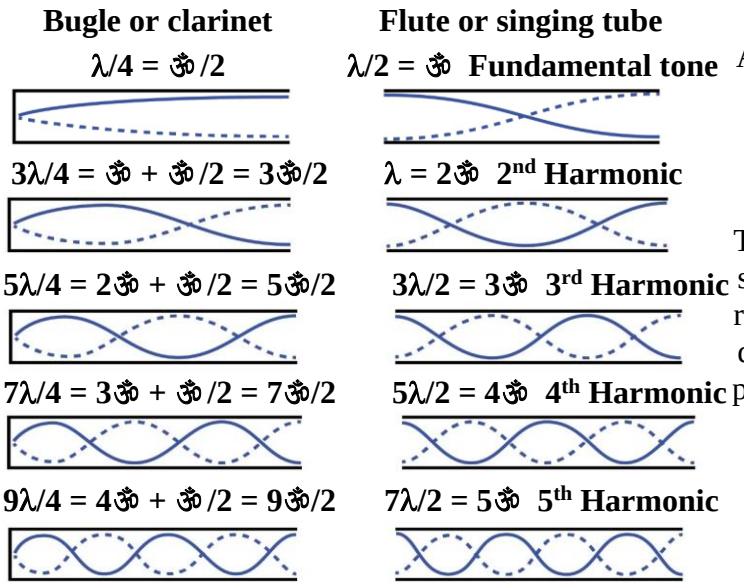
In 1955, to get musicians to tune to the same scale, an international standard frequency, still used today, was chosen: A = 440 Hz. This number is still bound up within a Nazi conspiracy theory. Some people argue that A = 432 Hz brings music to a more universally beneficial level, an argument reaching into vocal cords, mathematics out of obscure histories, and New Age enthusiasm. When I use my chosen fundamental tone and the harmonic scale, not only does "A" not exist, but neither do 432 nor 440 Hz as any reasonably predominant tone. Some people claim that the diameter of Earth is the wavelength of the fundamental pitch class of the Uni-Fun-Tone. I believe that .3 A.U. would be one number with which to begin research (Fig.VII.1). One push for the Uni-Fun-Tone uses the space between Earth's surface and the conductive ionosphere, effecting such phenomena as lightning, called Schumann [cavity] resonance (SR).This claims the fundamental frequency is 7.83 Hz, with overtones at 14.3, 20.8, 27.3 and 33.8 Hz. The SR overtone numbers are not whole number multiples of 7.83 Hz, yet they are mostly 6.5 Hz apart.

Further Uni-Fun-Tone research is needed. Until I see good evidence for the Uni-Fun-Tone, I remain fixed to my singing bowl, tuning personal instruments to this fundamental musical pitch class of 32.75 Hz. My best possible evidence is at the end of chapter VII regarding the solar system's fundamental tone.

Come blow your horn

A bugle has no holes to define set tones. The bugle plays harmonic overtones, specifically the second to sixth natural harmonics. The five playable tones are: {Doe, Sol, Doe, Mee, Sol} = {2,3,4,5,6}. If the bugle is tuned to C, compared to the closest e and g tones in the non-harmonic equitempered scale, those harmonic tones are *almost*: c–g–c–e–g.

Fig.XX.6 Single vs double open-end tube



Standing waves

A standing wave occurs when two in-phase waves with the same frequency travel in opposite directions. An ocean wave hits a cliff and its reflection reverses the wave's direction to confront the incoming wave. The two join in a superposition which is the standing wave, the wave crests and troughs remain in the same place, oscillating up and down. Standing waves can occur when two people shake the opposites ends of the same rope. Electron orbitals around an atom's nucleus form standing waves, with nodes where there is zero displacement, and antinodes where there is maximum displacement.

A bugle is a tube with a mouthpiece at one end. Covering the mouthpiece with the mouth makes the tube qualify to be one closed end, and the other end open. A musician blows in the bugle's mouthpiece to create the overtones series of stationary sound waves with a node at the

mouthpiece and an antinode at the other end, Fig.XX.6. A clarinet is a tube like a bugle, with only one open end, whereas a flute is considered to have two open ends (discussed by Fig.X.16).

The point here is that harmonics on a bounded string, Fig.X.8, and within a double open ended tube follow the field of numbers, Fig.X.1. For the single open ended tube, the fundamental tone wave gets cut in half, and then adds $\lambda/2$ = ॐ for each consecutive harmonic. This is caused by the reflection off the closed end, causing a node rather than an antinode.

Arbitrary pitch class names

"...the frequency ratios of a note and its various harmonics are represented by the complete sequence of numbers 2,3,4,5,6,7... most of these harmonics are not represented by notes on the Pythagorean scale at all." - Sir James Jeans; Science *and Music*

Toño the artist and I talked about the eight names of the most predominant pitch classes in the harmonic scale. Joe (see beginning of chapter X) and I first used these names {Doe, Rae, Mee, Fu, Sol, Mu, Ah, Tee} in our modern mythology called *Search for Ah…* showing an imagined societal shift from chromatics to harmonics. From the chromatic tradition of {do, re, mi, fa, sol, la, ti}, for four of those seven pitch classes, (do, re, mi, ti), we kept the traditional pronunciations but changed the spelling. Sol only changed by becoming capitalized from sol. For the other two of the seven old names, fa and la, we invented three new two-letter names: Fu, Mu, and Ah.

The presently accepted seven pitch class names of (do re mi fa sol la ti) began with a monk named Guido of Arezzo around 1040 A.D, using the first syllables of each half line in a Sapphic hymn to John the Baptist. Joe and I used our own translation to English:

"Ut queant laxis Resonare fibris	Ut Re	In order that the Family may Become
ira gestorum egan around Famuli tuorum,	Mi Fa	Quiet enough to Resonate with the
Solve polluti Labii reatum,	Sol La	Loose Cord & All Wonderful Things
Sancte Iohannes."	Si	Done, we need to Purify our Polluted
		Lips & remove our Guilt, O Saint John.

Guido also proposed, for writing music, the five-line "staff", extending this accounting method to the five fingers of a hand. Fig.X.15 uses the five lines and fingers to teach harmonics.

Fig.XX.7 Choosing harmony

Doe	Schooo	Rae	Lao	**Mee**	Flaaa	Fu	Sthee	**Sol**	Coo	Mu	P	**Ah**	Chew	Tee	Wa	**Doe**
1 x																**2 x**
32.75 Hz.																32.75
2								**3**								**4**
65.5								98.25								131
4				**5**				**6**				**7**				**8**
131				163.5				196.5				229.25				262
8		**9**		**10**		**11**		**12**		**13**		**14**		**15**		**16**
262		294.75		327.5		360.25		393		425.75		458.5		491.25		524
16	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**
524	556.75	589.5	622.25	655	687.75	720.5	753.25	786	818.75	851.5	884.25	917	949.75	982.5	1015.25	1048
32				**40**				**48**				**56**				**64**
1048				1310				1572				1834				2096

Toño led me to realize that in Spanish to properly pronounce the four new name spellings {Doe, Rae, Mee, Tee} messes-up the intended pronunciations: vowels are pronounced differently, and the Spanish pronunciations made the four name changes into two syllable words: not acceptable. To pronounce correctly in Spanish, the original Latin names worked perfectly well. The Latin name "do" is pronounced in Spanish like bread *dough* is in English, which

pronounces ‘do’ like: *do* your chores. With harmonics being different mathematics than chromatics, we chose new spelling changes to be important.

To show Toño the ambiguity of naming tones, I pointed out in Fig.X.10 the names the Hindi language uses for the same seven erroneous chromatic ratios. For Toño, I proposed a possible naming solution. Begin with the harmonic numbers in the eight pitch-class octave: {8,9,10,11,12,13,14,15}. In Spanish, use just the sound of the first syllable of the translation of those numbers. From, {ocho, nueve, diez, once, doce, trece, catorce, quince} comes: {och, nu, di, on, do, tre, ca, qui}. These new names are less arbitrary since they represent frequency multipliers. With these eight names, there is almost no confusion created by the crossover spelling of chromatics’ do, re, mi… to the harmonic pitch classes of Doe, Rae, Mee… In time, if humanity chooses an international conversion to harmony, the “e” in Doe might just be considered a training wheel that can be removed for {do, re, mi, fu, sol, mu ah, ti, do} to be the accepted tonal names.

Investigating Theta

The fundamental tone, 1/1, by itself can only play a monotone. To create the universe, there needs to be more tones than just 1/1. Harmonics in theory are infinite and need to be limited to sustain creation. Diversity is required: more than one and less than infinite. When producing a musical symphony, a chromatic piano is generally limited to seven octaves. In using the harmonic sequence, $H_S = \{1, 2, 3, 4, 5…\}$, the chosen fundamental frequency is represented by the {1} times the chosen frequency. But an infinite harmonic sequence diversifies beyond order into disorder: entropy. A limited harmonic sequence is required. One common natural limitation of infinite harmonics is found in physical and mental sciences. The Harmonic theta chord H_T, expressed as frequency multipliers, $H_T = \{4, 5, 6, 7, 8\}$, is an important tonal sandwich—two octaves of the Doe tone with notes in between: {Do, Mee, Sol, Ah, Doe}. See chapter XI. Theta needs to be researched thoroughly. The H_T is found in the following:

Fig.XX.8 Comparing Theta Chord

Name of pitch class	Sound tone	Light color (approx) frequency ≈ 2nd rainbow angle	RNA (DNA) angle (approx.)	Brainwave theta
Doe	4 x 32.75 Hz	Red ≈ 4 x 10^{14} Hz ≈ 50°	Uracil (Thymine) ≈ 50°	4 Hz
Mee	5 x 32.75 Hz	Yellow ≈ 5 x 10^{14} Hz ≈ 51°	Adenine ≈ 51°	5 Hz
Sol	6 x 32.75 Hz	Blue ≈ 6 x 10^{14} Hz ≈ 52°	Cytosine ≈ 52°	6 Hz
Ah	7 x 32.75 Hz	Violet ≈ 7 x 10^{14} Hz ≈ 54°	Guanine ≈ 54°	7 Hz

Harmonic variation through harmonic generations

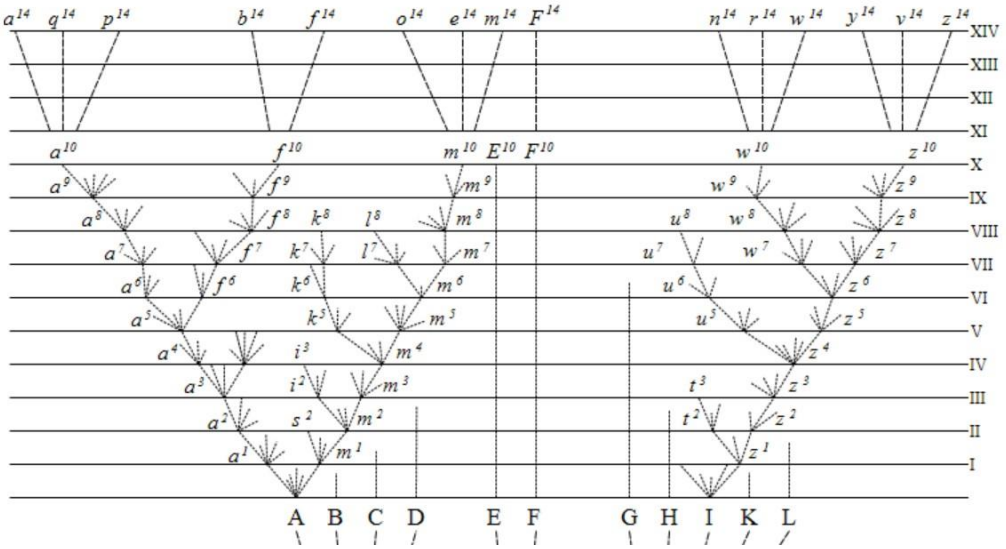
“ My mind seems to have become a kind of a machine for grinding general laws out of large collections of facts.” Charles Darwin

Earth is populated with arbitrarily named groups: kingdom, phylum, class, family, genus, species, and other varieties. Unified with diversity, the whole universe evolves in harmony. In *The Origin of Species*, chapter four, Darwin includes his Great Tree of Life, Fig.XX.9, with thousands of generations passing. These condensed non-specific variations died off or survived through time. HUT’s Fig.XII.8 represents the tree differently, making explicit the continuing parental lines.

I condense some Darwin quotes to elucidate Fig.XX.9: “… the tendency to variability is in itself hereditary… the most divergent of their variations will generally be preserved during the next thousand generations… [and with] the more geographical environments they will be enabled to seize on… their modified progeny will increase… [and will] often take the place of, and so destroy, the earlier and less improved branches… small differences distinguishing varieties are

increased into the larger differences distinguishing species… the competition will generally be most severe between those forms which are most nearly related… [their]intermediate forms between earlier and latter states… will generally tend to become extinct… Hence, very few of the original species will have transmitted offspring to the fourteenth-thousandth generation."

Fig.XX.9 Darwin's "Great Tree of Life"



The fundamental willpower to survive diversifies through harmonics into instincts and intelligence. The tree of life is self-pruning. Stability requires adaptability. Survival might allow reproduction of genetics and ideas. Inability to survive lessens chances of reproduction.

Harmonic evolution, Fig.XX.10, mutates frequencies from the fundamental tone's family line: vertical column under Doe. One, the Doe pitch-class, is the fundamental tone multiplier unfolding evolution. The next generation shows the number two representing the Doe family line. In the same generation is the mutation into a new pitch-class: the three, Sol. In the third generation, number four is Doe. Number six is the next generation (double) of number three, the matriarch of the Sol pitch class. New vertical family lines begin with odd numbers five and seven. In each new generation, the number of pitch classes doubles, increasing complexity.

Fig.XX.10 Harmonic's frequency mutations

Doe	Rae	**Mee**	Fu	**Sol**	Mu	**Ah**	Tee	Generations: Doe ←Pitch-classes
1								2 ←One pitch-class per chord
2				3				4 ←Two pitch-class chord
4		**5**		**6**		**7**		8 ←**Four pitch-class theta chord**
8	9	10	11	12	13	14	15	16 ←Eight pitch-class chord
16	18	20	22	24	26	28	30	32 ←Sixteen pitch-class chord
32…	36…						…	64 ←Thirty-two pitch-class chord

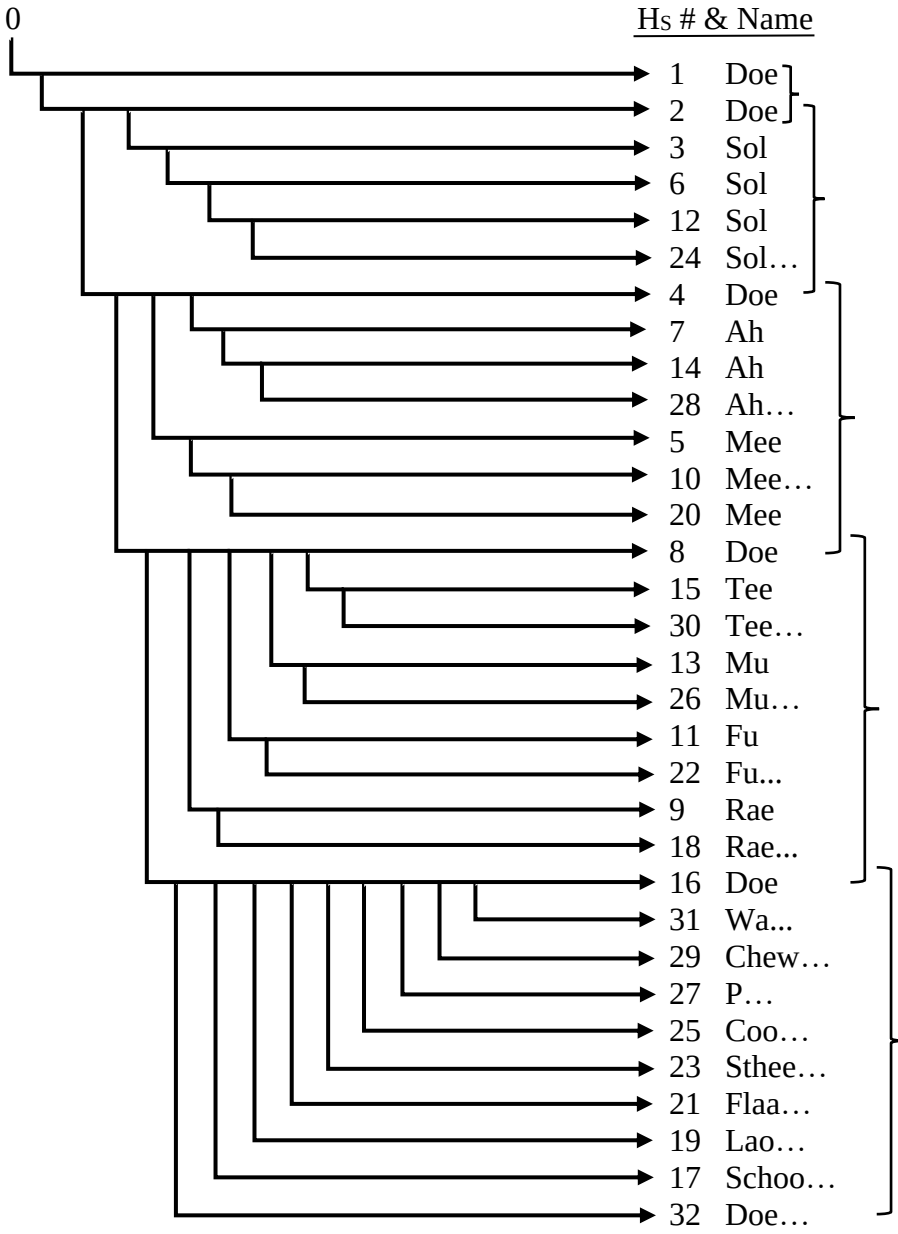
Fig.XX.11 uses the binary evolution method used in HEP, Fig.XII.8. See that two comes from one. Then four from two, and eight from four. Notice that three comes off two. And any doubles of three will come off three and its doubles. Five and seven come from four, but notice that from the left is the smaller number: first five, then seven, affecting the tonal ordering on the right side. See in the {1-32} diagram of Fig.XX.12 that 9 is from 8, like 17 will come off 16. This pattern follows into theoretical infinity.

Fig.XX.11 Binary harmonic evolution: H_{SL} = {1-8}

"Ignorance more frequently begets confidence than does knowledge: it is those who know little, and not those who know much, who so positively assert that this or that problem will never be solved by science." Charles Darwin

Fig.XX.12 Binary harmonic evolution: H_{SL} = {1-32}

Void to Fundamental Tone Diversifying as Overtones Decreasing Signal to Noise Ratio



Compare to Fig.XII.8

Binary Harmonic Evolution
Rules of Engagement

1. Binary{0, 1}:
   No change = {0} →
   One change = {1} ↳
2. Doublings from one:
   2^{H_I} = {1,2,4,8…}
   = Doe pitch class
3. Doe octave =
   2 consecutive Doe #'s with whole #s between:
   e.g.: {2,3,4}
4. To draw the H_{SL}:
   Any odd #s are followed by its personal pitch class:
   Sol = {3,6,12,24}
5. Odd #s in each Doe octave enter in order from left side.
   E.g.: {4,5,7,8}, obscuring the order of the vertical integers on the right side.

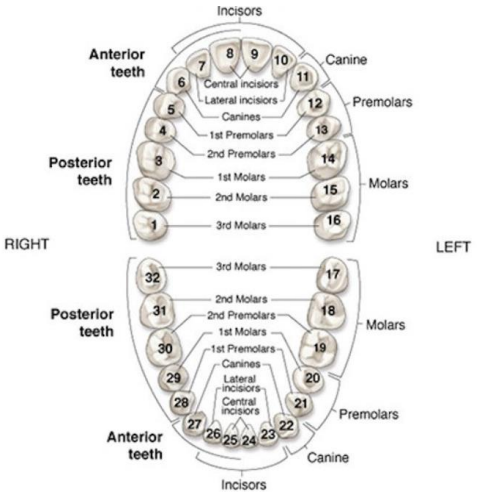


Fig.XX.13 Bites of harmony

← The normal quantity of healthy adult human teeth is 32. This does not seem to be founded on a 32-tone octave. Instead, it seems to be repeating four octaves with eight unique pitch classes in each.

"Our greatest human adventure is the evolution of consciousness. We are in this life to enlarge the soul, liberate the spirit, and light up the brain" Tom Robbins

Oxford Languages; Evolution:
2) the gradual development of something, especially from a simple to a more complex form."

Harmonics Pitch Class Names {32/32 → 32/64}

32 Doe; 33 She; 34 Schoo; 35 Ree; 36 Rae; 37 Lee; 38 Lao; 39 Moe; 40 Mee; 41 Flew; 42 Flaa; 43 Fee; 44 Fu; 45 Stoh; 46 Sthee; 47 Sah; 48 Sol; 49 Goo; 50 Coo; 51 Row; 52 Mu; 53 New; 54 P; 55 Chi; 56 Ah; 57 Day; 58 Chew; 59 Bee;
60 Tee; 61 Saw; 62 Wa; 63 See; 64 Doe

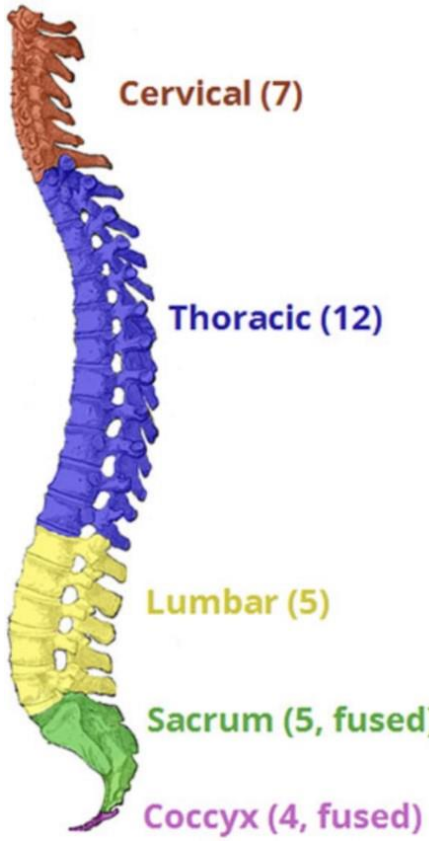
Doe C-1

Mee T-1

Sol T-9

Ah L-5

Doe Co-4



Spinal harmony

Fig.XX.14 One octave spine

The question arises: where in nature might we find a 32 pitch-class octave? Harmonics 32-63 holds 32 pitch-classes. Adding harmonic 64, Doe, being the same pitch class as harmonic 32, Doe, shows that the octave 32-64 has 33 tones.

Suggested here is that the spinal column with 33 vertebrae is demonstrating one 32 pitch class octave within the 33 bone tones, being Doe to Doe, 32 to 64. There are 32 nodes between the 33 bones.

For {Doe, Mee, Ah, Sol}, the chord of life, let the first cervical vertebrae, C-1, be Doe, the 32nd harmonic, supporting the head. Let T-1 be Mee, the 40th harmonic, supporting arms and hands. Let Sol be T-9, the 48th harmonic, where the nerves for the adrenal gland connect to the spine. Let Ah be L-5, the 56th harmonic, supporting legs and feet. And the final vertebrae, the 64th harmonic, is Co-4. Nine tailbones are usually fused due to the evolution of our primate clan dumping our tails.

Theta spine

C-1 is the first of 33 vertebrae. Harmonics 32 to 64 = 33 tones, the first and last being the same pitch class, making 32 different pitch classes. To emphasize the dominant four pitch classes of {4,5,6,7} from {32,33,34…63,64}, divide (multiply) by eight: {4,5,6,7} = {32,40,48,56}. This translates to the {1st, 9th, 17th, 25th} vertebras, named {C-1, T-1, T-9, L-5}.

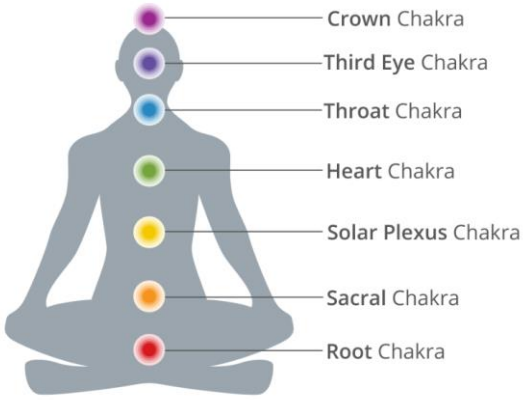


Fig.XX.15 Old school spine

The spine divided using just the 33 vertebras does not follow the most famous traditions from India, from Sanskrit, being Chakras, meaning "wheels". Three main differences: First is that traditional chakras are usually arbitrarily imagined to be seven power centers. Second, chakras extend above the spine to the "crown chakra", above the head. Third, *HUT* vertebrae system begins with the fundamental tone, Doe at the top rather than at the bottom.

The commonality of the *HUT* and chakra systems is they both focus on important energy centers, being consciousness levels, aligned with bundles of nerves and major organs.

People will want to see how this new labelling of "chakras" relate to the mind, heart, and sex. Cutting 32 in half to 16, then again to 8, then again to 4, we can discuss the four tonal centers as *Theta spine*: **Doe Mee Sol Ah…** (Fig.XX.14)**.**

Doe C-1: BRAIN

The brain, Doe, controls all the body's functions. The brain stem, specifically the *medulla oblongata* at the base of the brain, connects the brain with the spinal cord, making it the key conduit for nerve signals to and from the body. It helps control heartbeat, breathing, hunger, thirst, swallowing, coughing, and blood pressure.

The spinal cord contains threads of nerve tissue dropping down from the brain into the spine, and relaying messages to organs and body parts. This is the central nervous system.

The top of the cervical spine, specifically C-1, called the atlas, supports the head's position and weight. C-2, called the axis, below C-1, has a peg entering a hole in C-1, allowing C-1 to pivot on C-2, so the head can turn. The C-1 and C-2 vertebrae have spaces through the bone, allowing vertebral arteries and veins to supply blood to the brain. The C-2 peg can push too deeply into C-1 and increase pressure on the brain stem.

The *vagus nerve* starts in the medulla oblongata, then divides into many separate branches which extend from different areas of the brain through the neck, and to the heart and gastro-intestinal organs. The vagus nerve and its nerve *bundle* sit in front of and above the C-1 vertebra, not within the spinal cord. Spinal injury does not directly affect the vagus nerve bundle, though instability within the C-1, C-2, and C-3 vertebrae can cause it to malfunction.

Mee T-1: HEART

From the brain, nerves connect to the heart, T-1. Two branches of the autonomic nervous system, being involuntary, control the rhythm of the heartbeat. The two systems of nerves are referred to as parasympathetic and sympathetic fibers. These exit from the vagus nerve, from the medulla oblongata in the brain stem. Besides the rhythm of the heart, the medulla oblongata is responsible for such autonomic functions as breathing, digestion, diameter of blood vessels, the immune system, and reflexes.

The sympathetic nervous system regulates "fight or flight" responses. The parasympathetic system regulates "rest and digest" functions. The two can be antagonists to each other: one trying to increase activity and the other trying to decrease activity.

The sympathetic nervous system releases neurotransmitters, which are chemicals used to communicate. These are epinephrine and norepinephrine, which can accelerate the heart rate when stressed, perhaps by an emergency, or with intense exercise.

The parasympathetic nervous system releases the hormone acetylcholine to decelerate the heart rate, as during meditation.

In response to stress, the sympathetic nervous system can enlarge the pupils in the eyes, increasing availability of light to improve vision. The stimulus may increase the heart rate and improve the availability of oxygen to the body. The response may relax airway muscles, improving oxygen delivery to the lungs. The digestion system may slow down, allocating energy elsewhere. Also, energy stores in the liver may be released more rapidly.

The sympathetic nerve fibers connecting specifically to the heart originate from the upper thoracic spinal cord segments of T-1 to T-5. Originating in the spinal cord between segments T-1 and L-3, sympathetic nerve fibers connect to other organs. The sympathetic nervous system is constantly active at a basic level to maintain homeostasis, which is the self-regulating and constantly adapting process through which the body can maintain internal stability while adjusting to changing external conditions. The sympathetic nervous system stimulates the body's fight or flight response, preparing the body for strenuous physical activity.

When starting to exercise, the body suppresses the parasympathetic system, enabling an increased heart rate. Intense exercise further stimulates the sympathetic system, accelerating the heart rate. The sympathetic nervous system can accelerate the heart rate, constrict blood vessels, raise the blood pressure, enable more efficient breathing, decrease movement within the large intestine, cause pupil dilation and sweating, and activate goose bumps.

The parasympathetic system can bring the needed relaxation after prolonged and intense activation of the sympathetic system—a balancing act.

Sol T-9: Adrenalin gland

Adrenal glands produce hormones that control sex, that help in responding to stress, that help in regulating blood pressure, and help balance salt and sugar in the blood. Adrenalin affects the metabolism, the immune system, and other functions.

The adrenal medulla, the inner part of an adrenal gland connected to T-9, releases adrenalin, being epinephrine, and it also releases noradrenalin, which is norepinephrine. These travel throughout the body through the circulation of blood, initiating the flight or fight response. Within the cardiovascular system, epinephrine has more effect on the heart while norepinephrine has more effect on blood vessels.

Within the sympathetic nervous system there is *continuous* low dose of noradrenaline being created and released into the blood circulation.

The adrenaline secreted by the adrenal medulla *increases and decreases* according to stress levels and responses. Adrenaline increases the heart rate, facilitates breathing, increases blood pressure, and blood sugar. Some people with allergies carry an “epi pen” for an emergency, to avoid anaphylactic shock. This pen is for injecting epinephrine, adrenalin, in case they have an allergic reaction to an allergen such as bee stings or accidentally eating peanuts.

Caffeine is humanity’s number one used drug. In the first hour after use, caffeine’s strong effects excite neurons in the brain, which the pituitary gland perceives as an emergency and stimulates the adrenal glands to release adrenaline. We are a species addicted to chemically induced stimulation.

Ah L-5: Sex

A pinched nerve can be caused by a slipped disc in the spinal column. A slipped disc in the L-4 and L-5 region can cause loss of control over the bowel or bladder. It can cause impotence and reproduction problems.

“We must not be afraid to follow the truth, wherever it may lead.” Thomas Jefferson

SCP connecting heart & brain

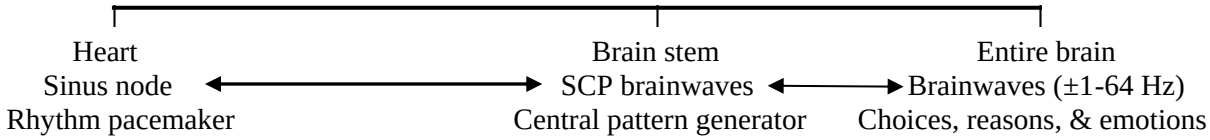
"…two experiments were conducted where researchers presented brief events either during a heartbeat (the systolic phase of the cardiac cycle), when the heart contracts and sends signals to the brain, or between heartbeats (the diastolic phase), when the heart relaxes and does not send information to the brain…When events were presented at diastole, this led people to perceive time to be longer… At systole, people perceived the same event to be shorter."
Royal Holloway at the University of London, March 13, 2023

Our EM mind does not know time. Our mass body is locked in time. The brain registers time from the heart beat. The heart's exert-rest rhythm affects the timing registration.

When time seems shorter, and shorter more, at one point it stops; at the speed of light, as in mind's deep sleep. Without registering the signal from the heart, time would not exist for our pure energy mind. Our consciousness is like a spinning coin, the blurred mixing of two alternating perspectives: timelessness at rest, and time-full during exertion.

The idea introduced in *HUT* is that there seems to be a connection between the sinus node pace-setter in the right atrium of the heart, introduced in Chapter XII, and SCP, being the slow cortical potential brainwaves in the brain stem, discussed in chapter XI, which also connects with the entire brain: Fig.XX.16.

Fig.XX.16 Heart-brain connection



Here is a passage from Neil Shubin's *Your Inner Fish*: "Our brain can control our breathing without any conscious effort on our part. Most of the work takes place in the brain stem, at the boundary between the brain and the spinal cord… Consequently, this part of the brain stem is known as the 'central pattern generator.' This region can produce rhythmic patterns…" See Fig.XI.3; SCP*.

Further research would be into the possibility that SCP registers for the brain the balance within the heart rhythms, and visa versa. The SCP brainwave (±.125 Hz) might be the fundamental pacesetter for all the brainwaves (±1-64 Hz). At .125 cycles per second, SCP is one beat every 8 seconds. This seems to be a feedback system which we know about intuitively but mostly ignore in science. We already understand that the heartbeat, whether fast or slow, in harmony or not, dictates the balance within our heart, brain, and whole body.

In the heart's right atrium is found the sinus node. This creates an electrical rhythm that communicates to all the heart's cells, coordinating the unified thump thump heartbeat. *HUT* proposes this electrical rhythm also reaches the brainstem as SCP, which can properly ground our brainwaves if we pay attention.

When we do not pay attention to balance in the brain, the balance in the heart is affected—and vice versa. The brain making bad choices imbalances the harmony between SCP and other brainwaves, and the balance of the heart's beat. Triggered by any dominating external or internal stimulus, the changing SCP rates affect frequencies and phases, and thus affecting the base *emotional* responses to and from the heart and brain.

The SCP allows the brainwaves and heartbeat to compare notes. With proper training, such as with calming meditation or proper stimulation, controlling any imbalanced emotions can guide the heart rhythm, thoughts, choices, and actions back into a comfort zone. This allows harmony between brain and heart, a proper phase relationship among rhythms. Humanity's

lifelong goal has been, is, and will be to train our brains to better monitor our proper heart rhythm. Constantly aligning the brain and heart is important. Laboratory SCP training of human subjects with self-control problems has produced good results, allowing:

"…an increased cortical sensitivity to failures and errors after SCP-training. This finding is strengthened by the improved behavioral- and aggression- inhibition…" 24 March 2015; "Brain Self-Regulation in Criminal Psychopaths"; Lilian Konicar, et al.

The definition of *fortitude* tells the story: Strength of *mind* to overcome pain and adversity with courage. Note that the root word of courage is: *heart*. Fortitude. 42. For two.

Training ourselves, outside of any laboratory and technologically dominated situations, should begin with basic nutrition, mental and physical stimulating and calming exercises, and proper choices into a more balanced lifestyle, which includes enough but not too much sleep. *HUT* claims that chromatic music makes it harder to keep the brainwaves and heartbeat rhythms in harmonic phase relationships. Harmonic music needs to be researched. We need to align our brains and hearts to be in proper harmony, i.e. phase relationship, to be healthy. Lingering fear clouds the mind, polluting the mind's signal with noise. The heart responds.

"Even in our sleep, pain which cannot forget falls drop by drop upon the heart until, in our own despair, against our will, comes wisdom through the awful grace of God." ― Aeschylus

The choreography of mind dance

"…theta waves can be considered a marker of emotional regulation…we…found that alpha waves are not sensitive to either emotional induction or emotional regulation… this could lead to new treatment options for people whose emotional regulation process is perturbed, which is the case in severe anxiety and schizophrenia, for example."- Inès Zouaoui *Theta waves: A marker of emotional regulation,* Martin Lasalle, University of Montreal, 6/22/22

"They found that certain brain waves underwent pronounced variations when the mice interacted socially with one another. Specifically, brain waves at the frequency band of theta (4-7 Hz) and gamma (30-60 Hz) decreased and increased, respectively, during socializing." *Researchers uncover brain waves related to social behavior*, Tohoku University, 6 24, 2022

HUT interpretation is that theta brainwaves bring a mind's focus inside of one's own thoughts, internalized, separated from the world, introverted, while gamma brain waves allow one to interact with the world outside oneself, to externalize: extroversion. Marijuana, for example, stimulates for some people strong theta waves, bringing them to focus more inside their minds than on their external social world, with costs and benefits varying with the situations.

Baby brain

Our brains have preconfigured networks of neurons that exist prior to being born—from time in the womb and from instincts prior to conception. After birth, with exposure to environmental stimuli, neurons activate through time.

Humans do not remember details well from the first years of life, an amnesia due to lower frequency brainwaves having been less detail oriented, the baby living more in the present time of its body's new explorations, barely able to experience time at all. We all began life restricted to the lower frequencies on the left side of our brainwave keyboard (Fig.XI.3).

Neural connections are needed to allow greater frequency modulations of the infantile brain. Newborn babies still only perceive void and possibility field circling around the fundamental tone. Psychological shocks are quite regular. All allows a healthy baby's brain to

mature into mapping out space and time, by activating and assimilating the preconfigured networks of neurons with the sensory input.

Researchers track the birth of memories, by Bill Hathaway, Jan 10, 2019, YaleNews:

Yale scientists measured brain activity in the hippocampus of newborn rats and found at the beginning of third week of postnatal life there was no evidence of neural activity that would allow the animal to link sequential events either in time or space. “They are constantly in the present,” explains George Dragoi, senior author of the study.

Early in the fourth week of postnatal life, the rat brains showed beginnings of network activity that would allow them to record “the singularity of an experience in space and time for long-term,” Dragoi said.

The following study exposes a physical distribution in six layers of the brain’s cortex of the six octaves shown on the brainwave keyboard from Fig.XI.3. Article title:

Study reveals a universal pattern of brain wave frequencies across mammalian species: brain waves are slower in deep cortical layers, while superficial layers generate faster rhythms.

Anne Trafton; MIT News; January 18, 2024. This is the article:

Throughout the brain’s cortex, neurons are arranged in six distinctive layers, which can be readily seen with a microscope. A team of MIT and Vanderbilt University neuroscientists has now found that these layers also show distinct patterns of electrical activity, which are consistent over many brain regions and across several animal species, including humans.

The researchers found that in the topmost layers, neuron activity is dominated by rapid oscillations known as gamma waves. In the deeper layers, slower oscillations called alpha and beta waves predominate. The universality of these patterns suggests that these oscillations are likely playing an important role across the brain, the researchers say.

“When you see something that consistent and ubiquitous across cortex, it’s playing a very fundamental role in what the cortex does,” says Earl Miller, the Picower Professor of Neuroscience, a member of MIT’s Picower Institute for Learning and Memory, and one of the senior authors of the new study.

Imbalances in how these oscillations interact with each other may be involved in brain disorders such as attention deficit hyperactivity disorder, the researchers say.

“Overly synchronous neural activity is known to play a role in epilepsy, and now we suspect that different pathologies of synchrony may contribute to many brain disorders, including disorders of perception, attention, memory, and motor control. In an orchestra, one instrument played out of synchrony with the rest can disrupt the coherence of the entire piece of music,” says Robert Desimone, director of MIT’s McGovern Institute for Brain Research and one of the senior authors of the study.

The human brain contains billions of neurons, each of which has its own electrical firing patterns. Together, groups of neurons with similar patterns generate oscillations of electrical activity, or brain waves, which can have different frequencies. Miller’s lab has previously shown that high-frequency gamma rhythms are associated with encoding and retrieving sensory information, while low-frequency beta rhythms act as a control mechanism that determines which information is read out from working memory.

One study, led by André Bastos when he was a postdoc in Miller’s lab, showed that as animals performed working memory tasks, lower-frequency rhythms generated in deeper layers regulated the higher-frequency gamma rhythms generated in the superficial layers.

All I AM

I AM is a spectrum from the decelerated speed of flesh, being composed of mass, and the speed of Light. Mind is light activated as synapses. The mind monitors the body and the environment, from the perspective of mass to the perspective of energy. Between those two extremes is monitored by the I AM. All the way from the personal "I Am" to the God mind "I AM". It is a unified spectrum. There is only One I AM which with creation was made into many. Empathy is connecting one's personal I Am with the same I Am in somebody else's body. It is all in the MISP: The Mind Spectrum. The spectrum is spread out like the harmonic keyboard in Fig.XI.3: within the brain's cortex, where neurons are arranged in six layers (see article above).

Hox genes

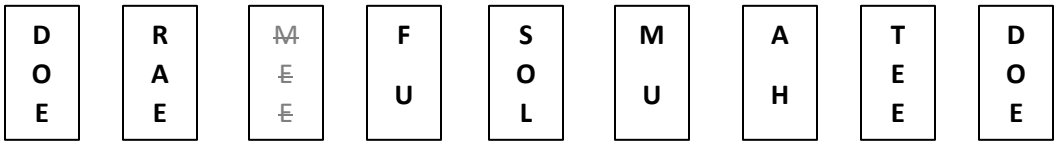
"…the structure of every organic being is related, in the most essential yet often hidden manner, to that of all other organic beings, with which it comes into competition for food or residence, or from which it has to escape, or on which it preys." Charles Darwin

"Whole batteries of genes are turned on and off during fly development, and this pattern of gene activity serves to demarcate the different regions of the fly." "The biological processes that make these different organs are versions of the same thing. When you see these deep similarities among different organs and bodies, you begin to recognize that the diverse inhabitants of our world are just variations on a theme." Neil Shubin's *Your Inner Fish*

I am first introduced to Hox genes when I look at the diagram on page 109 of *Your Inner Fish*, then I research on the internet to only speculate this harmonic perspective. From *Your Inner Fish*: "…versions of the Hox genes appear in every animal with a body."

Hox is an abbreviation of *homeobox*, the name of a region of DNA containing 180 nitrogenous base pairs, which were introduced in Fig.XII.1. Divide 180 by three and that makes 60 codons for 60 amino acids on each helix, coding for a protein domain called homeodomain, with similarities in every species. Hox genes carry the codes, called transcription factors, for proteins. These bind to DNA and are able to regulate the binary potential of other genes to activate or not, which in turn can activate or not-activate more genes, and all joins into the expanding series of events required in the formation and differentiation of tissues and organs, all combining into each individual body—the grand symphony of life.

Fig.XX.17 Fruit Fly Hox



Compare Hox genes in fruit fly larva to Hox genes in a human embryo. Fig.XX.17 shows the only Hox sequence in the larva of fruit flies, which is very similar to just the first, basic, Hox sequence in human embryos. *HUT* shows this as an 8-16 harmonic octave: Doe to Doe in 9 steps. The human embryo has all nine *tones* while the fly larva has the Mee missing from the sequence: {DOE RAE ~~MEE~~ FU SOL MU AH TEE DOE}. Notice the relating of calcium-20 to the MEE pitch class (5 x 2 = 10 & 10 x 2 = 20) in Fig.XII.7. Since bones would be too heavy, a fruit fly's exoskeleton has less need for calcium, Mee, as have mammals with spines.

Hox genes are considered highly conserved across most animal species. A spineless fruit fly can function normally with the Hox gene of a chicken with a spine, but not vice versa.

Hox genes are spatially expressed on the chromosome like our nerves are within our spinal cords. This means that genes on one end are for the head on the top, genes in the middle

are for the abdomen, and genes on the other end are for the body's bottom end. DNA sequences specify the activations and positioning throughout the growth of the limbs, nose, eyes, etc.

The big difference is that the fly's Hox genes are laid out on just one chromosome, while the human embryo has not just the fundamental beginnings of life all the way back to the fruit fly, but also has three more sets of Hox genes contained in chromosomes, laid out like four 8-pitch-class octaves, {Hox a, Hox b, Hox c, Hox d}, rather than just the one, {Hox a}, in the fruit fly (Fig.XX.17). Evolution has supplied the quartet of DNA data-octaves to differentiate and develop into more complex life forms. But the basic Hox layout of the anterior-posterior axis of humans, "Hox a", looks much like the whole Hox organism design for the fruit fly.

"*What came first, the chicken or the egg?*"

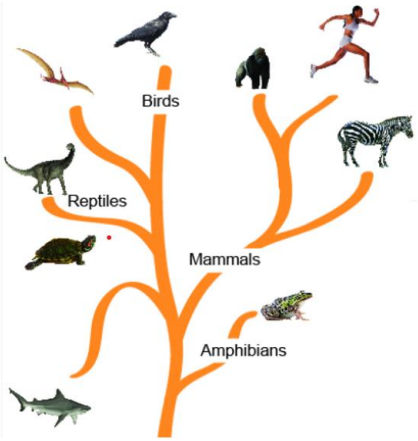
In evolution, the chicken evolved from earlier ground-nesting birds that laid eggs. One of the pre-chicken mothers laid an egg which contained combined and/or mutated DNA for the first chicken. The first chicken mutation had already occurred before the hatching of the newly evolved chicken egg, before the first chicken was born. The first chicken looked at its cosmic clock from inside the shell, then that baby-clucker cracked the first chicken egg & marched out.

Evolution's answer to the question is: the chicken egg came before the chicken itself.

Binary magnifications: not-mutated vs. mutated

"It is not the strongest of the species that survives, nor the most intelligent,
but the one most responsive to change." Charles Darwin

Fig.XX.18 Bifurcation dysfunction



← One example of a macroscopic scale of evolving animals. It shows the popular academic pattern of the *bifurcation dysfunction* (see the introduction to Fig.XII.8). Without the continuing line representing the ancestral family, and a branch from that family line to show the mutated species, as proposed in Fig.XII.8, how can we know the common ancestor? The solution: information can be better communicated. Repeating the proposal from chapter XII: we should form a synergistic international collaboration to create an ongoing binary tree of life chart with increasing or decreasing magnifications.

The most basic level of a DNA/RNA mutation is the change from one nitrogenous sequence to the next—in one step. Example: according to Fig.XII.4, UUU = phenylalanine, a specific amino acid. If the first U mutates to A, the amino acid phenylalanine mutates to AUU = isoleucine. This is the most basic definition of a binary {0,1} DNA/RNA mutation: from zero changed (UUU) mutating with one change to AUU. The mutation may be "neutral" to the living organism, meaning having no apparent effect, but cumulative mutations (e.g. from UUU to AUU to AUA to AAA) might add up to a detectable mutation in the organism. A pure neutral mutation: UUA leucine mutates to CUA leucine, both identifying the same amino acid.

Binary magnifications can show as many changes as needed in each situation. For example, backing away from examining those most basic changes, all orca whales might be considered roughly the same. Examine the nitrogenous base mutations closer and one orca group is transient and another is residential. To put the J, K, L residential orca pods on the endangered species list in a legal court required increasing the magnification enough to show the successful

mutations that differentiate residents from transients. Examining too many of the basic mutations would have been too much for the court situation—like whether the residents or the transients could be labeled as the family line, and which is the mutated offspring. This was not important for the court case, though it is for science. Now those three pods are Earth's only orca whales listed as endangered. Even calling the resident orcas a "sub-species" of all orca whales was too much for the court's argument. Deciding to magnify more or less can be valuable in different situations.

The most accurate science perspective we can gain should influence political ignorances, but too much detail would have only confused the court. In the study of science, magnifying mutations from dolphins to resident orcas to transient orcas is important to study. Magnify any life even more, and of course every individual has genetic mutations different from every other. Situational convenience is part of ongoing research.

"If evolution can happen so fast, then why do most species on Earth continue to appear the same for many millions of years? ... Stroud said, 'We often saw that selection would completely flip in direction from one year to the next. When combined into a long-term pattern, however, all this variation effectively canceled itself out: Species remained remarkably similar across the entire time period.'"

Long-term lizard study challenges the rules of evolutionary biology
by Catherine Barzler, Georgia Institute of Technology, Oct. 9 2023

Evolution checks left, checks right, adapting at times only to discover the first way was better. Always moving yet sometimes giving up the new experimental changes for a previous way that simply allowed greater day to day adaptability. Evolution establishes relative stability over time, even though the constant changes keep occurring.

Scientific method verses politics

"…. It has been calculated that a temperature rise corresponding to a 10 per cent increase in carbon dioxide will be sufficient to melt the icecap and submerge New York. ... this....is more serious than most people tend to believe." Edward Teller, 1959

The wisdom spouted by children can amaze us. Only with the holographic model of creation, where every part contains the whole, does any of it become clear. Clinging to outdated errors is not the proper path for guiding children towards uncluttered wisdom, into being mentally and physically healthy leaders of the future.

Global warming is an important example of our ignoring the science and not adapting our irrational desires accordingly. We require the unified field theory to have a chance of dominating our ignorances. Every part contains the whole.

Overpopulation imposed by religions and other institutions aiming at world domination, must be addressed by science that better explains the international confusion over the word "God". Holography with harmonics does that beautifully: every part contains the whole. God is that whole, the reference. Yet wars are fought over our confused concepts of God. As we evolve consciousness with science, the communication must include increased access to everyone.

Trial and error: assumptions (theories) are inevitable and necessary, both false and true. Assumptions must be tested (experiments). That is the scientific method.

"It is common sense to take a method and try it. If it fails, admit it frankly and try another. But above all, try something." ― Franklin D. Roosevelt

Hawking Radiation

Laboratories working with photons in 2010, then with phonons in 2016, phonons and

photons both being "particles" measured within the probability filed, claimed they had reached the social event horizon of proving Hawking radiation as being true. The debate is whether any mass or energy can escape a black hole, and Stephen Hawking claimed that Hawking radiation allows this evaporation of energy. His claim focused on the paired virtual particle and virtual antiparticle that naturally and spontaneously emit from the original void as vacuum fluctuations.

HUT claims the virtual pair are two ends of a virtual string within the possibility field, partially echoing string theory. The pair is comparable to quarks not being found alone, only in pairs or triads, called "confinement". This is in contrast to a pair of electrons that can be separated or united. Quarks and anti-quarks are matter and antimatter and must be confined together, yet kept separate or they can collide and annihilate.

The vibrating virtual string's confinement contains nodes calculated as virtual particles and antiparticles. But the separating of the nodal particles from the unifying string is not something to be pronounced so causally as does the theory of Hawking radiation.

Hawking radiation claims that just *outside* the event horizon of a black hole, the virtual particle and virtual antiparticle pair gets an energy boost by the black hole's intense gravitation, resulting in the *virtual* pair becoming a *real* pair of particles, and that the pair can then casually become separated, with one of the pair falling into the black hole and the other one of the pair escaping the black hole as Hawking radiation. An alternative perspective of the Hawking radiation theory claims that the virtual pair manifests *inside* the black hole's event horizon, and one unit of the pair escapes to become a real particle, while the other remains virtual, inside.

HUT questions the authority of this casual breaking of the virtual string which then allows the separating nodal particle and antiparticle to remain intact. It also seems the two separated real particles that close to the black hole would both fall in. *HUT* questions the validity of Hawking radiation, that energy can evaporate from a black hole simply by ignoring the essential string confinement of the virtual pair. One possibility which might rescue Hawking's theory is that the breaking of the string is then creating two new ends, thus two separate strings can each still adhere to confinement, one inside the boundary, and one outside.

> "…if you try…to pull apart…(a quark and an anti-quark) the force needed increases as…[they] are pulled apart…until there is enough energy to create a new quark-anti-quark pair… out of the vacuum… like trying to pull apart two ends of a piece of string…the string breaks…but…[what] you have…are two pieces of string, each which has two ends."
> Steven Weinberg, *Dreams of a Final Theory*

A second possibility is the virtual particle and antiparticle collide and produce two photons which might separate with one on each side of the event horizon. The one on the outside would still have to escape the black hole's attraction, whose name means that no light escapes.

Continuing research

With $E = Mc^2$, the c is the constant speed of light as measured in relation to mass as the reference. This means that from our body's mass perspective, we witness light pass us at the speed of light. But with the mind being light, our consciousness is an interplay between mass and energy, not always with mass as the reference. This allows the mind to play within the possibility field where light is the reference for itself and light is not registering itself as the same constant speed in comparison to flesh. Without perceiving the distance in the direction of travel, nor time, light does not perceive speed. Only mass-flesh perceives speed. From the flesh, measuring light speed passing through material with an index of refraction, like a crystal, light slows from its measured motion passing through only void. Our mind mixes together extreme perspectives of timelessness and timefullness, allowing us to perceive with variations of the "c" in $E = Mc^2$.

The blur

"The boundaries which divide Life from Death are at best shadowy and vague.
Who shall say where the one ends, and where the other begins?" Edgar Allan Poe

"…the transition from quantum to classical behavior is gradual; there is no sharp dividing line."
J.A. Wheeler, *Geons, Black Hole & Quantum Foam*

A grain of sand is called solid particle. Much sand together flowing through an hour glass is considered a liquid. Elementary particles make up water which is a liquid.

Heat can make water change from solid to liquid. Honey can be solid when cold enough but flow as a liquid when warmed. Sand becomes a fluid in a large population of sand grains, and so can humans as a large population moving. Cars too. One is solid while many moving can flow like a liquid. Ice cubes are solid. But many can flow like a fluid when moving together.

When teaching the definition between liquids and solids, sometimes, without enough precision. there is a gray area. Maybe precision is difficult to achieve but can minimize the blur.

Shown by the Schrödinger's Cat experiment, the exact timing of the decay of individual atoms is unknowable—vague…a blur. But as statistics measure many decaying atoms, knowing the average atomic half-life of a large group of atoms is quite precise.

Since the mind itself is light, imagination is playing in a field allowing variations of the speed of light. Wandering from our fixed flesh perspective enables us to experience flying in dreams and visions. Upon slowly awakening from a dream, for a few moments our "normal" experience can be less than clear, of the constant speed of light as always compared to mass. With research in the laboratory, virtual particles exist in time long enough as to blur for scientists the difference between virtual verses real, between massless and with-mass. There is the blur we experience between the cross-over between the possibility field and the probability field. With our imagination, this blurring occurs between the body and brain which are mass, and the mind which is energy. This boundary blur between all dualities is where we live, and it inspires us… and exhausts us. We need to be aware of the blur to have some self-control. This learning about dancing in the blur is our natural conscious evolution which we need to continue to study.

Wave-particle duality in the real world

The blur: particle or wave; position or momentum. From flesh, light as a photon particle shows position, whereas a wavefront of light shows its momentum though time. The more accurate that position is measured, the less accurate momentum can be, and vice versa.

When our measurements interrupt a wave and it becomes a particle, the rule is that it is a particle or a wave. Not a particle and a wave. For a light wave there is no time. A light particle strikes a fermion and that instant of time is measured. But the particle is instantly absorbed and transformed as momentum to the fermion. If the light wave does not collapse and get absorbed, but instead is continues unobstructed, it does not collapse to a particle. It remains a wave. Quantum physics confuses people when they think the light particle can travel at the speed of light. It does not. It only travels as the wave.

Light is a moving wave manifesting momentum, present in the possibility field, until colliding with mass, where it manifests position as a photon particle point in the probability field, able to transfer its momentum energy to an electron. Using mass to measure the momentum of light will shift the wave momentum to a photon in position. To measure the momentum of the light wave, provide interference with another wave of light and let that collapse on a screen.

In quantum physics, observing changes the observed. A pair of electrons act as a boson traveling as wave momentum. To interact with the momentum of a light wave, the electron wave and the light wave can both become their alternative particle forms in position, losing their

wavefunction momentum. The light wavefunction that is lacking amplitude will not shift the bosonic electron pair to its particle form. But with enough frequency intensity, both light and electron wavefunctions will collapse, defining them as having been observed.

Fig.XX.19 Light wave becomes photon colliding with carbon tetrahedron

A light wave in 2-D possibility field becomes a light particle upon contacting the fermions of the carbon atom.

"…nobody could figure out a way to measure the position and the momentum of anything—a screen, an electron, a billiard ball, anything—with any greater accuracy."
Six Easy Pieces Richard Feynman

Not just light and other EM radiation can be considered as either particles or waves, but also electrons, protons, and neutrons. And even entire atoms. In Fig.XX.20, wave-like and particle-like properties are also shown to be displayed by a skier and the moon.

Fig.XX.20 Skier & moon as particle & wave

The skier is the particle's position. The ski tracks show the wave momentum through time past. The photo measured the skier's precise position, but taking the photo itself abruptly stopped the recording of the skier's momentum. The possible-probable future momentum of the photo-frozen skier is still ponderable, but with no guarantees of precision.

The moon is a particle in position, and its path over time is its momentum wave. Future momentum is predicted to tell us possible-probable future positions. These predictions manifest as tide tables, crop schedules, eclipses, and full moon parties.

Time variation system

Mind experiment: this is the famous double slit experiment modified: use a laser + diffuser. See Fig.IX.1. Shine the unified field of light coming out of the diffuser on a light barrier which has two slits in it, to only let two beams of in-phase light through.

Put a crystal in front of one slit to slow down the light passing through. On the far side, coming out of the two slits, the light beams splay and those two wave fields interact before striking the display screen.

The same light arrived at the two slits as a unified field. But as the light field passes through the two slits, the light passing through the crystal slows according to the crystal's index of refraction. So the two slits of light emit non-identical light waves, but now, instead of a spatially initiated phase shift, the time variation of one field changes, and the two interacting wave sets have a new temporal phase relationship.

A time-variant system depends on the time lapse between the moment the light field simultaneously enters the two slits until the two emitting fields of light combine and get observed on the screen. Adjusting distances, the type of crystal, and other chosen factors would have importance. This time variation-shift likely changes what shows on the display screen compared to if no crystal was involved.

This article quote may be discussing the same idea in a more advanced situation:

"While photons would be expected to go through each other without any interaction, by triggering a time interface the scientists were able to demonstrate strong photon-photon interactions and control the nature of the collision."

No longer ships passing in the night: These electromagnetic waves had head-on collisions
by CUNY Advanced Science Research Center 14 August 2023

I do not know the details of how this CUNY research was done. I do not know if my thought experiment would have value if modified into a lab experiment. But I believe my thought experiment helped me to understand the CUNY lab experiment.

It would be interesting to combine a photon entanglement experiment with the photon time-variant experiment. After one photon experiences time variation, would the two photons still be entangled in the same or a different way, or not at all?

When we travel rapidly in a jet plane, east or west, and cross through several time zones, our body's relationship to the daily accustomed sun cycle changes. Our bodies' adaptation to our normal location on the Earth confronts rapid time variation after flying to a new time zone. The relationship of the two times, the accustomed one from inside our bodies, sometimes called our circadian rhythm, and a radically shifted sunrise time from outside our bodies, get out of temporal phase with each other. Our internal constancy, which has been adapted to one sunrise time, has suddenly come in conflict with our new external sunrise time.

In science, causality is fundamental concept. It means that A causes B which causes C. Einstein's special relativity theory combined with quantum theory shows that different observers might see the temporal sequence of events reversed, one of them witnessing B causing A.

EM discoveries

"In the story of the electromagnetic field, Maxwell was a lone actor in his time, just as Faraday had been within his. Not until the following generation did anyone else truly understand what Faraday and Maxwell had been trying to tell them." "…scientific theories rarely spring fully formed from the minds of their originators… Not only was [Maxwell's] mathematics difficult, but its whole approach was based on Faraday's theoretical vision, which still seemed bizarre to most physicists." *Faraday, Maxwell, and the EM Field,* Forbes & Mahon

Michael Faraday envisioned his ideas and shared them as written words. James Clerk Maxwell put Faraday's visions into mathematics with 20 equations, which he condensed to eight. Oliver Heaviside condensed Maxwell's equations down to four, known today as Maxwell's four equations. Independently, Henry Poynting reached the same conclusions and beat Heaviside to

publication, receiving the credit, though Heaviside's work went more in depth. These combined equations show that energy is located in space, with both positions and momentums, which according to Heisenberg later, could not both be accurately measured at the same time—only position ***or*** momentum could be.

In 1888, Heinrich Hertz provided proof of Maxwell's EM waves. In 1889, Oliver Heaviside shared his formula, $\sqrt{(1 - v^2/c^2)}$, with v = velocity and c = speed of light, showing the amount that a point charge and its field will contract in the direction of motion. At the speed of light, that direction shrinks to zero distance. George Francis Fitzgerald showed that all mass and energy contract in the direction of travel. Simultaneously, Hendrik Antoon Lorentz made the same claim, and also included clocks slowing until time is stopped at the speed of light.

JJ Thompson discovered the electron in 1897. Max Plank, in 1900, explained how light waves needed to be considered as whole numbers of discreet quanta, and Einstein, in 1905, took that further by proclaiming the EM quanta to be the photon. Einstein also summarized all these perspectives into his special theory of relativity, with the photo-electric effect, and $E = Mc^2$.

Each photon's energy varies with the frequency of light. Photons of the same frequency have the same energy. Brighter light, being increased intensity, increases the number of those photons. Planck's constant, h, relates the particular photon energy, E, to its associated wave frequency, f : $E = hf$ (for a single photon) or $E = nhf$ (for multiple photons, where $n = H_s = \{1,2,3,4\ldots\}$). This energy is extremely small compared to the scale of life in which we live.

Changing the equation to address wavelengths rather than frequency, with frequency f, wavelength λ, and the speed of light c relating with the equation, $f = c\backslash\lambda$, the relation can be expressed as $E = hc\backslash\lambda$.

Poincare published his equation: $m = E/c^2$ before Einstein. Other parts of the special theory of relativity were also published before Einstein, but those thoughts had not been well clarified before Einstein published his clarity in 1905 and after. He claimed the laws of physics, mostly briefly noted by scientists before him, were the same for all observers in uniform motion and direction, but also that space and time changed with the observer's acceleration.

Albert Michelson and Edward Morley failed to find ether because they looked for the speed of light to change. In relative motion, light's frequency will change, wavelengths shorten in the direction of travel. But light speed is constant to mass according to $E = Mc^2$. For two observers (in the flesh) no matter their situations, the speed of light always remains the same. At constant speed, time and space remain constant for the flesh-encased observer. At changing speeds, time and space measurements can change. Yet for any motion, constant or changing the speed of light always remained the same for a fleshly observer.

The problem with the ether is that the speed of light is the universal reference manifesting 2-D possibility field as the background foundation of 3-D + time probability field. But scientists try to make the 3-D + time from our flesh perspective to be the reference in too many situations. Our minds, being EM waves, perceive 2-D without time, which is closer to the universal zero cosmological constant reference.

When flesh observers are changing from constant to changing motion, this produces different perspectives of space and time while the relative speed of light remains the same. But ether dominates as a reference, not the flesh. Thinking the ether must abide by our perceived dominant flesh perspective creates scientific confusion that needs to be repaired. Relativity laws of do not rule the ether. In the ether, universal laws such as $E = Mc^2$ collapse. The ether grounds the laws of relativity, not vice versa. Maxwell had used thought experiments of springy spinning cells making up the ether, what *HUT* refers to as the 2 x 5 dances containing void.

Now *HUT* proposes that $E = Mc^2$ explains our duality of consciousness of mass and energy, with the clock ticking verses the clock stopped. This duality extends into unified and reduced consciousness', reflecting on the duality of the spirit and the flesh. This introduces the three levels of the manifestation: A) 3-D + time probability field; B) 2-D with no time possibility field, allowing ether; and C) the void.

Light thinking

The biggest problem in understanding quantum physics comes from the way the duality of light is taught. When light moves at the speed of light it is not a particle. When light collides with mass, it shows itself as a particle. Here the confusion is shown in *QED* (Quantum Electrodynamics) by Richard Feynman:

"I want to emphasize that light comes in this form—particles. It is very important to know that light behaves like particles, especially for those of you who have gone to school, where you were probably told something about light behaving as waves. I'm telling you the way it does behave—like particles… every instrument that has been designed to be sensitive enough to detect weak light has always ended up discovering the same thing: light is made of particles."

Feynman is ignoring the fact that when his instruments are not collapsing the light wave into its photon form that the light travels as 2-D momentum through space, not as a 3-D + time particle in position. He's very strong on emphasizing his ignorance. In the same introduction:

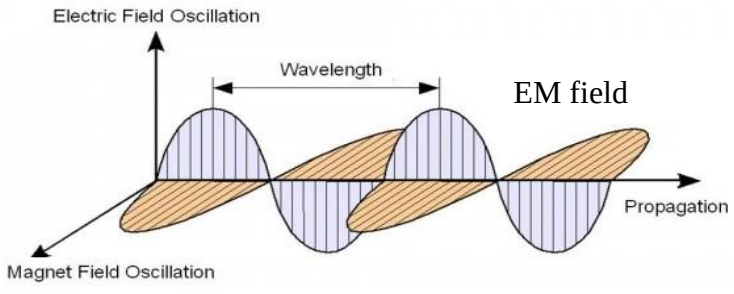
"…there is this possibility: after I tell you something, you just can't believe it... A little screen comes down and you don't listen anymore. I am going to describe to you how nature is…"

We must all question authority… In considering light as only particles all the time, photons can only be described as probability position without wave momentum. This is why Einstein rejected quantum physics, saying that God does not play dice. Solution: light is waves at the speed of light, in full momentum, in the possibility field, while light reduces to a particle when stopped in position, in the probability field. More words from *QED* by Richard Feynman:

"Quantum Electrodynamics 'resolves' this wave-particle duality by saying light is made of particles… but the price of this great advancement of science is a retreat by physics to the position of being able to calculate only with *probability* that a photon will hit a detector without offering a good model of how it actually happens."

"Two tiny holes… in a screen… between a source… and a detector… let nearly the same amount of light through… when both are open, 'interference' occurs… if we put instruments in to find out which [slit] the light goes… the interference effects disappear… if we don't have instruments… the interference effects come back!"

Fig.XX.21 Magnetic field + electric field = electromagnetic field

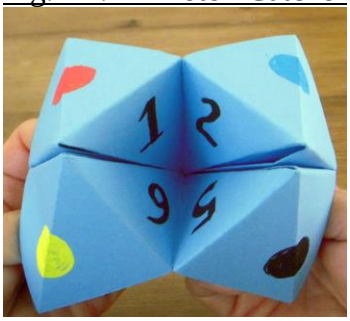


A changing electric field produces a magnetic field. A changing magnetic field creates an electric field. The energy storing capacity of the magnetic field is much higher than the electric field. Electric and magnetic fields join into an electro-magnetic (EM) field.

"Thus, the photons which constitute a ray of light behave like intelligent human beings: out of all possible curves they always select the one which will take them most quickly to their goal."
Max Planck

Shown in Fig.XX.21 is the EM wave that is composed of an electric wave and a magnetic wave, perfectly in phase with one another, though they vibrate at right angles to each other and to the direction of travel. The direction of travel in the diagram, shown with the arrow which says "propagation", from the perspective of the EM wave itself, has that length contracted until at the speed of light, its distance is zero. One of three spatial dimensions is no longer part of the perspective of the system. Only the vertical and horizontal axes remain to represent the 2-D space. Also, time is no more. This creates the problem of spatial configuration being determined from our flesh perspective of 3-D + time. This also causes the present scientific rejection of the ether, the medium through which light "travels". Light traveling through the ether as pure energy has its own perspective and cannot be limited by the perspective of the flesh, of mass.

Fig.XX.22 Photon Catcher



Children make Cootie Catchers, also called Paper Fortune Tellers (Fig.XX.22). These can represent a photon, which is a light particle made of the electric wave and the magnetic wave, each 90° apart (Fig.XX.21). Opening the Cootie Catcher in one direction, as seen in this internet photo, one of two composite waves is demonstrated. We can call it the electric wave. Opening the paper toy in the opposite way, a 90-degree difference from the first, the other composite wave is demonstrated. We can call it the magnetic wave. This allows visualization to understand an EM wave better.

For the necessary continuation of defining light, the following quote demonstrates another way of how what are considered to be the massless photons reveal mass equivalence.

Note… the definition of *ion* is: an atom with an electric charge due to the loss or gain of one or more electrons. This quote refers to a gold ion with all electrons missing:

"An ion is essentially a naked atom, stripped of its electrons. A gold ion, with 79 protons, carries a powerful positive charge. Accelerating such a charged heavy ion to very high speeds generates a powerful magnetic field that spirals around the speeding particle as it travels…

"'If the speed is high enough, the strength of the circular magnetic field can be equal to the strength of the perpendicular electric field,' Xu said. And that arrangement of perpendicular electric and magnetic fields of equal strength is exactly what a photon is…" [see Fig.XX.21]

"…two photons…from the electromagnetic cloud surrounding the ions can interact with each other to create a matter-antimatter pair…

"At RHIC, the scientists measured how the polarization of the light affected whether the light was 'absorbed' by the magnetic field."

"This is similar to the way polarized sunglasses block certain rays from passing through if they don't match the polarization of the lenses, Yang explained. In the case of the sunglasses, in addition to seeing less light get through, you could, in principle, measure an increase in the temperature of the lens material as it absorbs the energy of the blocked light. At RHIC, the absorbed light energy is what creates the electron-positron pairs."

Collisions of light produce matter/antimatter from pure energy
by Karen McNulty Walsh, Brookhaven National Laboratory, July 29, 2021

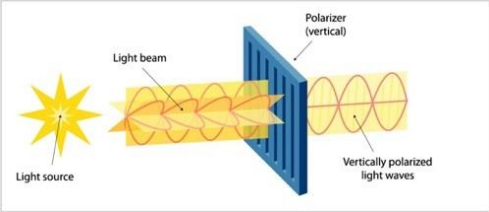
Light is electromagnetic (EM), though it does not have an electric charge nor a magnetic pole, so it will not attract nor repel anything. The EM wave does not qualify as a force, though EM constituents include both oscillating fields emitted by electric and magnetic objects created by mass. Mass particles from the sun convert completely to light wave momentum when departing. EM waves are not mass and do not attract nor repel each other— instead their kinetic energies will pass through one another unaffected, except with constructive or destructive

interference patterns. EM waves are kinetic energy, not representing the particle aspect of light. As a light wave strikes a fermion object, light becomes a photon boson particle. Still, light can exert a force on the fermionic objects because of its radiation pressure transforming from wave to particle and transferring that kinetic energy.

Polarizing light

Throw a flying disc at a picket fence. Thrown flat it will not pass through the vertical slats. Thrown with its rotating plane vertical, the flying disc can pass between two pickets of the fence. Light polarizes too, and polarized sunglasses take advantage of the picket fence idea.

Fig.XX.23 Polarized light



Rather than letting all of the light pass through freely, the glass absorbs 1-D of the light, either the horizontal or the vertical plane, converting it to heat. As the glass heats up, the eyes looking through polarized glass deal with fewer light waves, providing for the eyes less brightness and less heat.

Scattering vs absorption: a brief summary.

Light scatters by 1) reflection, 2) absorption & emission, 3) refraction, or 4) diffraction.

1) The term light scattering might be used for simple *reflection* where the angle of light's approach, called incidence, is equals the angle of reflection. Depending on the material, the wave's frequency, and the type of wave, reflection effects a change in the direction of light waves as they bounce off something that acts like a mirror. Neither the wavelength nor the frequency of the incident wave changes after reflection, however, the Doppler effect can cause a frequency change when the reflecting surface is in motion. A multi-faced object reflecting light waves is demonstrated by a big, spinning ball covered with tiny mirrors above a dance room floor reflecting points of light in many directions, called diffuse reflection.

2) *Emission* is not light reflecting off the outer surface of an object. Light energy penetrates deeper into an object and can be absorbed by an atom, transferring its energy to the particle and influencing an orbiting electron to jump to a higher energy level. When the atom's electron energy relaxes again, there occurs the emission of light. The wavelength of the incident wave can change after being absorbed and reemitted.

3) *Refraction* changes the waves' directions while passing from one medium to another, depending on the frequency, like white light passing through a crystal and coming out a rainbow.

4) *Diffraction* effects a change in direction as light waves pass through an opening, like in a double slit experiment, or around a barrier in their path, like the bathroom light can bend into the hallway and permit indirect lighting.

Three types of absorbed-emission: A) Rayleigh, B) Mie, and C) Non-selective scattering.

A) *Rayleigh* scattering occurs when particles are very small, like nitrogen and oxygen, compared to the wavelength of the radiation, causing light's shorter wavelengths and higher frequencies, like blue, to be absorption and emission much more than longer wavelengths, like red. Thus the sky is blue because atmospheric nitrogen, N^2, comprising 78% of air, and oxygen O^2, 21%, have short wavelengths and thus scatter more blue light.

B) *Mie* affect occurs when the wavelength of the light and the particles are close to the same size. Like with smoke or dust, or pollen, or water vapor. Mie scattering affects light's longer wavelengths more than those affected by Rayleigh scattering. Thus we see a red sunset or sunrise when accompanied by some clouds on the horizon.

C) *Nonselective* scattering occurs when light's wavelengths are much smaller than the absorbing particles, as with large dust particles and large water drops. The red, green, and blue

cones in our eyes (Fig.XIX.15) combine those wavelengths of light about equally for our brains, making fog, clouds, ocean spray, and snow storms to be observed as white light.

Absorption: Atmospheric molecules absorb energy at differing wavelengths.

I) Carbon dioxide absorbs infrared radiation, causing heat, making it a greenhouse gas because it traps heat in our atmosphere in a greenhouse.

II) Ozone absorbs radiation which can be harmful to living organisms. Without our ozone layer protecting us from ultraviolet radiation emitted by the sun, we would burn too much.

III) Lower atmosphere water vapor absorbs mostly longwave infrared, but also shortwave microwave radiation. Water vapor quantities vary by location, like dry deserts compared to humid jungles, and different times of year. Water vapor is considered a greenhouse gas that absorbs 70% on incoming sunlight, as well as 60% of heat emitted by Earth.

Rethink research on dark matter

Surrounding normal galaxies are “dark-matter haloes” fending off distortions caused by strong gravitational attractions from neighbor galaxies. In August 2022, more interest was published regarding distorted dwarf galaxies within the Fornax Galaxy Cluster. Even if the dwarf galaxy may be the size of the Milky Way, the dwarf part of the name is because they contain a thousand times fewer stars. This means less illumination. The dwarf galaxies are sometimes called Ultra Diffuse Galaxies, or UDG. This may be modified to “Quenched UDG”, meaning they are no longer producing new stars, and the old stars remaining are producing much less light. Less light is being equated with less dark matter.

The idea supporting *HUT* is that the ultra-faint dwarf galaxies producing less light have less dark matter. As in chapter V, this supports the missing dark matter as being simply light, light that is being mistakenly considered massless and without gravity, even though $E = Mc^2$ dictates that we cannot ignore that light must retain a mass equivalence in the accounting. Light is the solution for the missing dark matter mystery.

Universe as a light sphere— a thought experiment: We make an imagined vacuum-sphere with a mirrored inside and a one-way mirror porthole which allows light to enter but not to exit. Weigh the box with sub-atomic efficiency. Through the one-way mirror, fill the box with light. Fill it and fill it and fill it. Light is not absorbed inside, just enclosed, and bounced around a round space. Weigh it again. Is it heavier? Does the light, accumulating and bouncing around inside the sphere, have enough proper mass equivalence to show itself as weight? How clear can we get on this blurred notion that we presently call the *massless* photon even though it has mass equivalence. Light is dark matter.

Continuing into harmonic interconnectedness of everything

Fig.XX.24 Romanesco Broccoli

Romanesco Broccoli demonstrates fractal geometry where the harmonic circular patterns repeat larger and smaller. From spiral galaxies to seashells utilize this repeating geometric common denominator to compose the unified harmonic universe. Harmonics are the offspring of the fundamental circle code. Harmonics degenerate into chaos, able to be regenerated by investing more predominant harmonic energy.

"sympathy n. 6. (in physics) a relation or harmony between bodies of such a nature that vibrations in one cause sympathetic vibrations in the other or others" *Webster's New World Dictionary*

The following quotes are from three different studies showing synchronization, when events occur at the same time for an observer. An example of synchronization is when two or more women roommates discover that their menstrual cycles have synchronized.

Synchronization occurs because there is only one harmonic fundamental circle-tone which is the universal common denominator, constantly renewing harmony for life.

"In all chaos there is a cosmos, in all disorder a secret order." Carl Jung

Topological synchronization of chaotic systems; April 22, 2022 by Bar-Ilan University:
"Can we find order in chaos? Physicists have shown, for the first time that chaotic systems can synchronize due to stable structures that emerge from chaotic activity. These structures are known as fractals, shapes with patterns which repeat repeatedly in different scales of the shape. As chaotic systems are being coupled, the fractal structures of the different systems will start to assimilate with each other, taking the same form, causing the systems to synchronize. … Although chaotic systems seem random, they are not, and we can find order in chaos. From chaotic activity emerges a strange new structure or pattern known as a strange attractor. If enough time passes, every chaotic system will attract its unique strange attractor and will stay in this pattern. What's strange about these patterns is that they are composed of fractals, structures with the same patterns repeating over and over again in different scales of the fractal. … Their extreme erratic behavior suggests that two coupled chaotic systems cannot be synchronized and have the same activity. Yet, physicists discovered in the 80's that chaotic systems do synchronize. But how can that be? … According to the research, led by Dr. Nir Lahav, the emergence of the stable fractals is the key element that gives chaotic systems the ability to synchronize. They showed that as chaotic systems are being coupled, the fractal structures start to assimilate each other causing the systems to synchronize. If the systems are strongly coupled, the fractal structures of the two systems will eventually become identical, causing a complete synchronization between the systems. They termed this phenomenon Topological Synchronization. … To their surprise, the physicists found that there is a specific trait for the process of how fractals from one system take similar form of the fractals from the other. They discovered that in completely different chaotic systems this process maintains the same form. … Topological synchronization might even help us shed light on how neurons in the brain synchronize with each other."

Scientists reveal for first time the exact process by which chaotic systems synchronize
by Bar-Ilan University January 7, 2019:

"These shapes of donuts are the global structures of the Rossler system (named Rossler attractors). The colored points are the local synchronizations that emerged between the systems in different coupling strengths… Synchronization, in which two different systems oscillate in an identical way, underlies numerous collective phenomena observed in nature, providing an example for emergent behaviors ranging from the acoustic unison of cricket choruses to the behavior of the human brain… Can chaotic systems also synchronize with each other?"

How function may abruptly emerge or disappear in physical and biological systems
by Latina Emerson, Georgia State University November 6, 2018:

"Synchronization is common in many natural and man-made oscillator systems, where considerable function emerges as a result of cooperative behaviors of many interacting elements in the systems. Examples of synchronizing systems include neurons in the brain, cardiac pacemaker cells, rhythmically chirping crickets, an audience's applause in concert halls and

semiconductor lasers. In these systems, interacting elements, also called oscillators, have their own rhythms, but the interactions can lead to a common rhythm."

Faraday, Maxwell, and the Electromagnetic Field, by Forbes & Mahon:
"Earnst Chladni…demonstrated…if you spread sand thinly on a glass plate and stroke the edge of the plate with a violin bow, vibrations in the plate would form the sand into beautiful patterns—graphic representations (Fig.XX.25) of the standing waves in the glass… Moreover, the patterns could be *induced* on the sand-strewn plate by stroking another plate a short distance away—vibrations … produced soundwaves in the air [that caused the sanded plate to vibrate]…"

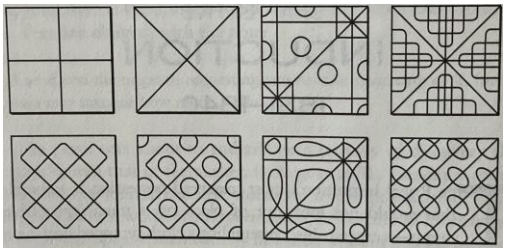


Fig.XX.25 Chladni figures

"Steeped in musings about acoustic vibrations and waves, Faraday began to think that electricity and magnetism might be transmitted by waves resembling those of sound, or of light."

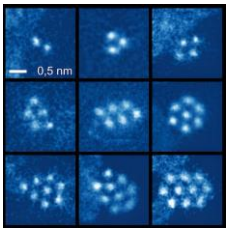


Fig XX.26 Evolving atomic harmony

First direct imaging of tiny noble gas clusters at room temperature
by University of Vienna, January 11, 2024
Between two graphene layers, noble gas atoms move freely, forming regular, tightly packed, 2-D nanoclusters, a pattern from $H_{SL} = \{2 \ldots 10\}$, adding one xenon atom to each configuration.

Writing exponents as logarithm

I wrote this book about math. What math? One two three four and onward, in whole numbers as far as one wishes to travel. That is harmonics in its simplest expression. This math is easy for those who understand it. I found no reason for learning more of the math offered in school. I needed some unknown reason that was not being taught to me, to know "why". Later in life I returned to the simple one two three. I have found as much complexity as I need to by following my interests within these integers. But had you asked me to explain the word *logarithm* and when and why and how to use it, I would have responded: "Duh, I dunno."

"You have no idea, how much poetry there is in the calculation
of a table of logarithms!" Carl Friedrich Gause

Internet says logarithms are used for figuring the magnitude of an earthquake and compound interest, to know pH levels, and rates of growth and decay.

My simplest definition of logarithm for myself includes math that I already use and have reason to understand. I now see that logarithm is the same math as exponent numbers, but composed differently. Internet definition: "An exponent refers to the number of times a number is multiplied by itself. For example, 2 to the 3rd (written like this: 2^3) means: 2 x 2 x 2 = 8."

$2^2 = 4$	$x^2 = y$	$2^3 = 8$	$x^3 = y$	$x^n = y$	$\log_2(2^3) = 3$	$\log_x(x^n) = n$
$2 = \sqrt{4}$	$x = \sqrt{y}$	$2 = \sqrt[3]{8}$	$x = \sqrt[3]{y}$	$x = \sqrt[n]{y}$	$\log_2(8) = 3$	logarithmic base = x

Logarithms are the inverse operations to exponential numbers, like division is the inverse of multiplication. There are different logarithms using different base units. This is a comparison of three types of logarithms.

First is "log", known as the common logarithm, which has a "log of base 10", like in $10^2 = 100$. Second, there is the "log of base x", for example, with the base = 2, as in $2^3 = 8$.

Third is the: "natural logarithm", or "log of base e", written with a lower case L for log, with n for natural, and e for the logarithmic base constant: "$\ln_e$", or it is also written as: $\log_e x$, or as: log x base e. For this third case, we must understand the special number e: a fixed irrational number approximately equal to 2.71828182845904523536028747135 2. The natural logarithm is used in compounding interest in banking situations.

Around 1728, with n = {1,2,3,4…}, Leonhard Euler showed that with each step, as n gets larger and approaches infinity in the formula, $(1 + 1/n)^n$, the solution closes in on the number "e", which due to infinity is an unreachable limit. Euler started to use his letter "e" for the constant in an unpublished paper on the explosive forces of cannons. The number "e" has mathematical applications in expressions involving natural exponential growth and decay.

Another popular partner number for "e" is 2.303, because when "e" is being raised to the power of 2.303, it equals 10: $2.71828^{2.303} = 10$.

In calculus, a derivative measures the rate of change of a variable. Since there is no change in the value of a constant, the derivative of a constant is always zero. The number "e" is a constant, so its derivative is 0, signifying a function is neither increasing nor decreasing. It is a stationary point, that in a series makes a horizontal straight line.

A logarithm was invented to use in specific situations to find solutions for problems that some people find important to understand, like a dog finds a stick important to chase. Presently, I do not need to understand any more of a logarithm. I would prefer to beat out a rhythm on a hollow log with two sticks. My faith: other people will be inspired if needed. I have the same reluctance to learn other math for which I know nothing about and currently have no reason to learn. This is how people I have met feel about my math, after which I do chase around like a dog does his stick. If studying my math has zero meaning for you, I suggest either don't do it or find a reason. If it is the right thing to do, that is reason enough. I do not use logarithm or calculus, but I do use algebra.

"Algebra is like sheet of music. The important thing isn't can you read music,
it's can you hear it. Can you hear the music, Robert?"
Niels Bohr to J. Robert Oppenheimer, from movie *Oppenheimer* (2023)

"Good mathematics is not about how many answers you know…
it's about how you behave when you don't know." Anonymous

"I [Faraday] was unfortunate in a want of mathematical knowledge, and the power of entering with facility any abstract reasoning. I am obliged to feel my way by facts placed closely together." *Faraday, Maxwell, and the Electromagnetic Field*, by Forbes & Mahon

"… others were producing ever more ingenious mathematical models to account for everything by action at a distance. By comparison, Faraday's theories seemed like a child's fantasy… But… Faraday… had always been prepared to abandon any line of inquiry the moment his results showed it to be false. Yet his ideas of lines of force had withstood every test… All his results suggested that *nothing* happened at a distance, that all forces and all induction c]acted through some king of strain in the intervening medium… along paths that were rarely straight." Ibid

"As his ideas grew, language itself became part of his thinking. Each new word and each new phrase helped to clarify, even define, the underlying concept, even if that itself was not fully formed. He sought precision and faced a particular problem with words that were in common use but had misleading theoretical connotations... By careful and creative attention to language in his writings, he often made it possible for others to grasp and accept his new ideas, even when they ran completely counter to prevailing theories… it took James Clerk Maxwell to understand how Faraday 'saw the play' and to translate Faraday's ideas into the kind of mathematical language

that others could understand… Faraday now proposed to do away with the misleading term *pole* for the circuit terminals… and to replace it with *electrode*. Hence, also, came *electrolysis*… and *electrolyte*… Faraday turned to… William Whewell, who proposed *anode* for the positive electrode, *cathode* for the negative one, *anion, cation,* and more generally *ion*… These were remarkable results, but mathematical physicists… paid them little attention… How dare a mathematical illiterate like Faraday poke his nose in their domain?" Ibid

"…when Maxwell died, his theory of electromagnetism sat for awhile like an exhibit in a glass case, admired by some but out of reach." Ibid

Maxwell told us: "We may find illustrations of the highest doctrines of science in games and gymnastics, in traveling by land and by water, in storms of the air and sea, and wherever there is matter in motion." Ibid

[James Clerk Maxwell's] "…soul will grow for long to come, and hundreds of years hence will shine as one of the bright stars of the past, whose light takes ages to reach us." Oliver Heaviside

"Now that the mathematical interpretation of Faraday's conceptions regarding the nature of electric and magnetic forces has been given by Clerk Maxwell, we see how great a degree of exactness and precision was really hidden behind the words which to Faraday's contemporaries appeared either vague or obscure…" Hermann von Helmholtz

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A field warps space. Different kinds of fields warp space in different ways. The harmonic unified field dictates how all fields warp space. All of creation is unified within harmony. An entire holographic-harmonic universe and every part of it, surrounded and permeated by void, is consciousness itself—one universal holographic reference mind invested in many flesh bodies, into many minds observing creation, centered in many individuals as "I Am"s.

Scalar quantities	**Vector quantities**
Magnitude (amount) only	*Magnitude + direction*
Time	Acceleration
Speed	Velocity
Mass	Gravity Weight
Energy	Force
Length Area Volume	Momentum Position
Distance	Pressure Impulse
Density	Drag Friction
Temperature	Radiation Current
Entropy	Displacement
Power	Bullet from a gun
Work	Laser beam
Divergence	Curl (e.g. right hand law)

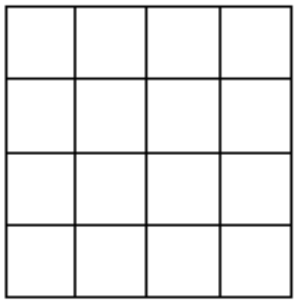
Fig.XX.27 Scalar vs vector quantities

"In the general theory of quantum electrodynamics [QED], one takes the vector and scalar potentials as the fundamental quantities." Richard Feynman

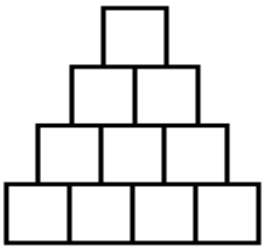
Velocity is a vector quantity which includes magnitude (speed) and direction. Speed is a scaler quantity because it only includes magnitude. A car driving in a circle at a constant speed is not a constant velocity because the direction keeps changing from the straight line.

Acceleration is defined as a change in velocity, be that in magnitude and/or in direction. A constant speed in a circle is considered acceleration because it takes more energy to maintain than moving the same speed in a straight line. To accelerate in a straight line, the speed must be increasing.

Fig.XX.28 Square and triangular numbers

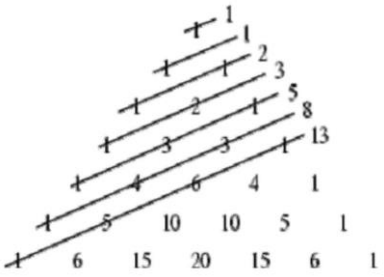


At left is a square with four rows of mini-squares inside and 4 columns of mini-squares. The equation for the number of mini-squares in this larger square is: $4^2 = 4 \times 4 = 16$. The generalized formula for squaring any harmonic sequence set member, where $n = H_S = \{1,2,3,4\ldots\}$, is H_S^2, or n^2.

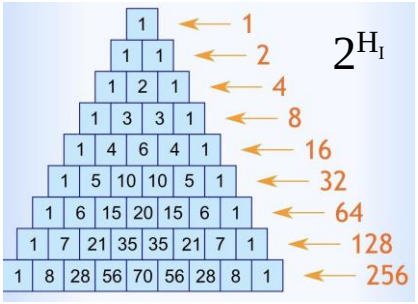


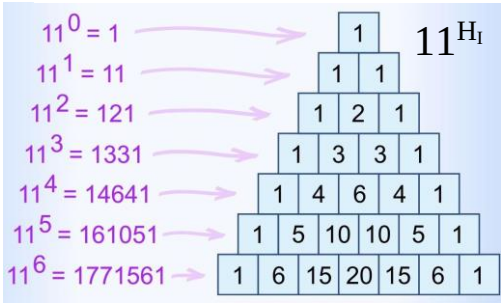
Below the H_S^2 figure for square numbers is a figure for triangular numbers. Let the total number of mini-squares in the four-level triangle be represented by T_4, generalized as T_n. In this example: $T_4 = T_3 + 4$. This works out to be $10 = 6 + 4$. The generalized equation is: $T_n = T_{(n-1)} + n$. A better equation to find the total number of mini-squares more efficiently is: $T_n = n(n+1)/2$. Try it: the 4-level triangle has a total of 10 mini-squares in it, derived by the equation: $T_4 = 4(5)/2 = 20/2 = 10$.

The formula for the top figure is n^2, being 16, and this equals the triangular number of all mini-squares down to level four (10) added to all squares to level three (6). Generalized: $n^2 = T_n + T_{(n-1)}$.

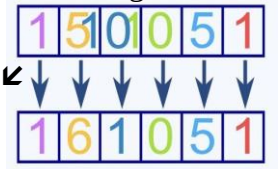


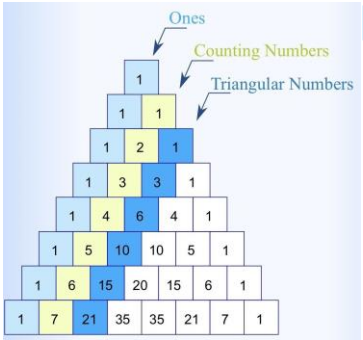
Blaise Pascal made popular Pascal's Triangle in 1653, though it had been known since at least 953 in Persia. After the top block, each number within is the sum of the two numbers above it. Using the sum of the numbers along its shallow diagonals shows the Fibonacci series. Using the same triangle, the following patterns have also been appreciated.

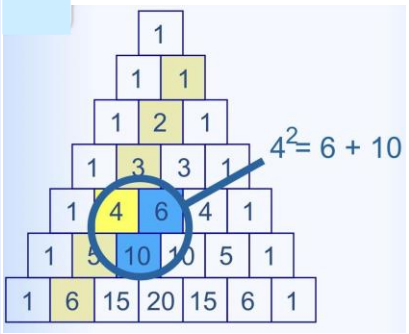




Pattern breaks at 11^5 but continues by condensing numerals:







Using the second steep diagonal to the right, in yellow, starting with 2, that number's square equals the number to its right added with the number below those two numbers: $2^2 = 1 + 3$; $3^2 = 3 + 6$; $5^2 = 10 + 15\ldots$ This is another way of seeing the figures above of squared vs. triangular numbers.

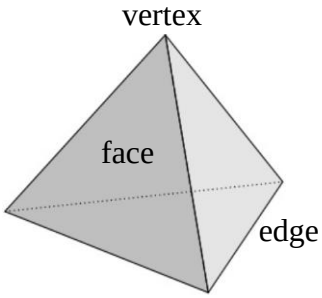
Fig.XX.29 Euler's polyhedral formula

Euler is pronounced 'Oiler'

In 1758, Leonhard Euler shared his formula for convex polyhedrons, relating their vertices, faces, and edges. Five Platonic solids satisfying Euler's formula. ➚

Tetrahedron	4 + 4 – 6 = 4 – 2 = 2
Hexahedron (Cube)	8 + 6 – 12 = 6 – 4 = 2
Octahedron	6 + 8 – 12 = 8 – 6 = 2
Icosahedron	12 + 20 – 30 = 20 – 18 = 2
Dodecahedron	20 + 12 – 30 = 12 – 10 = 2

Just two examples:



Euler's Formula: V + F – E = 2

V = vertices; F = faces; E = edges.

Left: *Tetrahedron* has 4 vertices, 4 faces, and 6 edges, so 4 + 4 = 8, then 8 – 6 = 2.

Right: *Cube* has 8 vertices, 6 faces, and 12 edges, so 8 + 6 = 14, the 14 – 12 = 2.

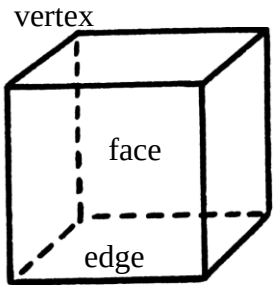
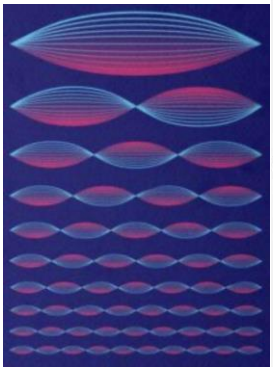
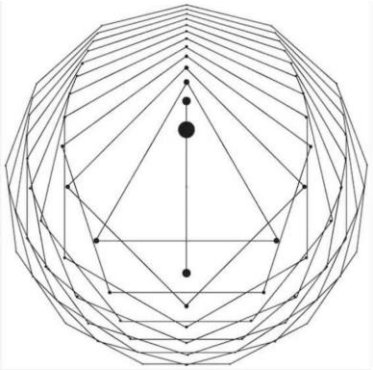


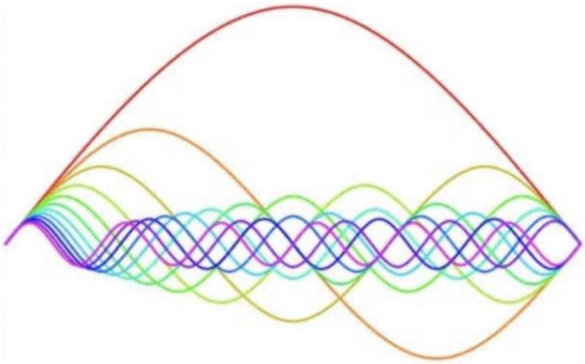
Fig.XX.30 Harmony art (from the internet)



1-D string harmony



2-D geo-point sequence



Superimposed 1-D harmony

Chapter XXI The Gravity of Refining our Creation Story

"It is in scientific honesty that I endorse the presentation of alternative theories for the origin of the universe, life, and man in the science classroom. It would be an error to overlook the possibility that the universe was planned rather than happening by chance." Wernher von Braun

The Dancing Dreamer

No time. No space. Void. Nada. Zero dimensions. A point… The 0-D void-point extends into the virtual 1-D string. Made of void disturbance from the center, a virtual particle-antiparticle pair pops into virtual possibility as two ends of the virtual string-tube. Without order, the opposing points must collide, become two photons, and reabsorb into nothingness.

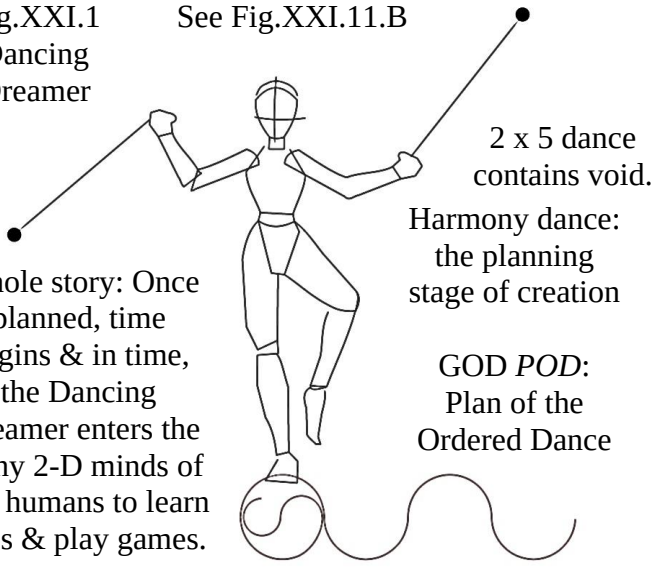
Will to know self. Will to survive. Will to create order from disorder. The Will to come out of void as an ordered dance with two string-ends. Multiple strings with two end-points pop into existence as quantum foam, annihilating into photons, then void. Still no time nor space.

By imitating spin = 1 of each of the photons created in the annihilation, void *Willpower* tames the virtual particle-antiparticle pair into dancing order, to avoid contact and to sustain. Willpower is experimenting with the string dance with two ends each spinning one 2-D circle per cycle (2 x 1), advancing to two ends each spinning two circles per cycle (2 x 2), to two ends each spinning three circles per cycle (2 x 3), to two ends each spinning five circles per cycle (2 x 5), which contains all the information needed for creating the sustainable universe (Fig.XXI.11).

The dancing string's center node remains void. The God dream dancer moves the string ends from the middle void, dreaming two dream-hands. The two whirling string ends spin multiple circles without colliding, evolving patterns in virtual space, achieving the completed possibility dream of *two* hands each spinning *five* circles per cycle: 2 x 5.

Fig.XXI.1 Dancing Dreamer

See Fig.XXI.11.B



2 x 5 dance contains void.

Harmony dance: the planning stage of creation

GOD *POD*: Plan of the Ordered Dance

Whole story: Once planned, time begins & in time, the Dancing Dreamer enters the many 2-D minds of 3-D humans to learn rules & play games.

From Void, the *Will*-to-know defines an imaginary focus point: 0-D. *Willpower* stretches the focus point into a waving 1-D line. The line's 2 ends must move with 2-D circle order or annihilate. Sustaining, the 2 x 5 dance contains all to-be information. The ordered circle dance is the dreamer of creation with intent to begin the universe, dreaming 3-D + time. The Dancing-Willpower prepares all the details from which the ordered Big Bang creates the material universe.

"Does man forget that [Allah] created him before, when he was nothing?" Quran 19:67

"You saw me before I was born. Every day of my life was recorded … Every moment was laid out before a single day had passed." Psalms 139:16

"YHWH [I Am] created man…in the image of YHWH…male and female…" Genesis 1:27

The YHWH-dreamer dance is seeking to know itself, seeking: *I AM*… the *I AM* God dreams the awakened dreamer's body, with two hands dancing. The circle dance is YHWH's name, the Word in the tone, the circle song, the *I AM*. The YHWH-void dreams unity, duality,

and diversity, dreams of man and woman as living beings. This void dancing is YHWH dreaming the requirements of the universe before its creation.

With the dream ready, to begin forming the Big Bang Singularity, the **BBS boson particle**, the original virtual 2 x 5 ordered dance multiplies and becomes the virtual 2-D possibility field. The possibility field dream potential is to create man and woman in flesh in the probability field. This 2-D virtual 2 x 5 dance field manifesting directly from the unchanging zero cosmological constant absolute void, but it also becomes the non-zero cosmological "false" void due to the 2-D ordered dance. It has become the Higgs field and the HoloField, being the universal holographic reference. It is the ether, the Nataraj Field, the Akashic Records. This field is 100% signal: no noise. It is Absolute. Wikipedia says the Akashic records contain: "…all universal events, thoughts, words, emotions and intent ever to have occurred in the past, present, or future in terms of all entities and life forms, not just human."

God-Willpower transitions one non-accelerating 2 x 5 virtual dance to become one 2 x 3 hyper spin virtual accelerating dance. Their acceleration resists the Higgs field and the virtual particle-antiparticle pair become the first quark-antiquark pair with mass, spinning at the two ends of a single quark-gluon string-tube, forming a 2 x 3 hyper spin singularity gaining mass, the beginning of 3-D space and time, preparing for the Big Bang as the BBS. The void remains inside the evolving quark dance as the frequencies of the hyper spin increases, causing transitioning through quarks with various levels of increasing *relativistic masses*, measured in present day authoritative science as *rest masses*. The acceleration of the 2 x 3 hyper spin of the BBS containing quarks at the string ends, continues to increase relativistic mass, remaining a highly ordered dance pattern. This all occurs in an immeasurable small proportion of a second in time. See the eleven dimensions in Fig.VIII.8. The BBS is ready for the Big Bang.

The God dreamer begins the Big Expansion (BE), the Big Bang… whirling. BE... all cycling the circle dance, becoming 3-D space + time—the probability field. The dancing virtual 2-D background sustains as the HoloField, the unified Higgs possibility field. The harmonic 3-D universe is operating within time, overlaying the timeless 2-D Higgs field which is the reference for the 3-D holagramic universe. God-Void-Willpower invests its timeless 2-D dancing self into every 3-D part. Every part contains the whole, to be rediscovered through time with the manifestation of the Will to Know and the Will to Survive into flesh.

Creation from 0-D void into 2-D Higgs possibility field, then into the 3-D + time probability field universe, manifests quark-gluon plasma, then elements, enabling their joining into molecules and all chemistry… becoming stars, then Earth. The God dream Willpower brings together the right chemicals to become organic …BE… the beginning of life. Life evolves because of the Will to survive. The *I AM* dream becomes flesh, manifesting the first self-conscious man and woman.

Now we are in flesh. Our minds include all creation in the dance, as well as our personal reduction into individual DNA bodies. In re-learning the Dance of the Superstring, the student first learns the need to maintain the string's tension necessary for circle integrity. Without integrity to maintain the circle dance, ordered creation never would have begun or sustained.

The basic duality of consciousness is that we are each that whole God reference, yet we are also reduced, we are *with* God. Willpower evolved into the 3-D brain and into the 2-D mind while also remaining unchanged void. From flesh we see light take time to travel distance through 3-D space. From the same light's perspective in 2-D space, there is no time passing nor any distance in the direction of travel.

"It always seems impossible until it is done." Nelson Mandela 1918-2013

God enters science by solving the necessity required by the 2nd law of thermodynamics. Maximum order begins with the beginning of time, the order needed for the average of all of creation to increase disorder throughout all time. God Willpower brings 2 x 5 dancing order to the original quantum foam, then transforming one 2 x 5 dance into one 2 x 3 hyper spin dance, forming the singularity from which the Big Bang expands outward, carrying the dance's order into all things created. From the high order beginning, all can fall into disorder for all time. Throughout the disordering of the entire universe, the averaging entropy allows semi-isolated evolving pockets, like Earth enveloped in its biosphere, and the human body encased in flesh. Any living organism on Earth is a statistical variation from average universal entropy. If entropy was not average, and the same everywhere, nothing could ever grow. There are reservoirs of order that decay towards disorder—call them Low Entropy Treasures: *LET*. The sun lets off energy from its stored atomic order, energy that is ordered enough to let plants grow. Plants are ordered enough to let animals live. Mining resources can let humans build things. *LET* it be.

Semi-isolated, life is evolving with repeating patterns into higher complexity order. Only by imposing rejuvenating order, harmony, on encroaching chaos, can life be refreshed and sustaining—temporarily delaying the universal averaged disordering. This is the reason why we exercise and rest, breathe air, drink water, and eat nutritious food—to sustain viable harmony.

Inside creation, the God dream joins into all life, into the consciousness of one and many, into humans, for whom mysteries abound inside of time, space, mass, and energy. Survival instincts and tools, then art, religions, and sciences all attempt to benefit from, and understand, our experiences. We have learned, for example, the star we named Earendel took almost 13 billion years for its light to reach us. Meanwhile, the universe kept expanding so that Earendel is now considered 28 billion light-years away. We learn much, attempting to weed-out our errors.

With God being Willpower *guiding* evolution as the will to survive, guiding is simply having life feel and/or think the binary drive to survive: I want that, or I don't want that. That is the same as: I want to explore this direction. Or I don't. The will to know is the will to survive, which drives evolution, witnessed in plants, animals, and babies.

Earth is the show. All of it. Love, anger, hate, hope. Plane crashes, Olympic medals, a beautiful child, a fall off a bike, a taco to eat. We are on stage for all consciousness to witness, beginning from the omnipresent Void-with-Willpower, being the reference manifesting the circle-wave of the Word, being the fundamental tone that begins time by resisting itself. Creation is the timeless initiation into time-dependent diversity. Creation is the Dance, multiple circles recombining into unity… Mind only. Imagination… inventing all possibilities in the possibility field... preparing… we are all in that original Dance's Image…in God's dream. We are the I Am One Mind becoming many, limiting infinity into the functionable Dream of all creation… which Willpower creates into the beginning of time and expanding space. In time, humans experience Earth in the probability field... believing our history, our plans... and science. And languages. And toys. And rocket ships rising above the surface of the planet. Above the birds. Above the air. Oh wow, what a show! And we feel the choices we make while we experience mind mixing the void with possibilities and probabilities… manifesting the Dream into... Song and Dance… Reality! This is The Show. We each play our part, and every part contains the conscious whole.

"And just enjoy The Show… The sun is hot in the sky, just like a giant spot light…
The people follow the signs, and synchronize in time… It's a joke, nobody knows…
They've got a ticket to The Show…" Song by Lenka

Beginning from now into more now

"I must be willing to give up what I am in order to become what I will be." Albert Einstein

This quote seems to be God's intent in creating everything from nothing… God's Willpower limiting God's unlimited self.

Creation evolves from the high order of the original timeless 2-D *virtual* 2 x 5 dance containing void, which multiplies and expands into the 2-D Higgs possibility field.

Higgs virtual 2 x 5 possibility field stabilizes the background that allows the 2 x 3 hyper-spin Big Bang Singularity, BBS, preparing to spin out expansion into the probability field. As the virtual particles decelerate into mass, M, the speed of light, "c" = 186,282 miles per second, defines the rate of deceleration of the virtual particles into particles with mass. The Higgs field gives its own massless particles their mass to become quarks and anti-quarks within a quark-gluon string-tube bound together by original void—the contained strong force. This forms the first neutrinos and anti-neutrinos which fly away, like torquing arrows, as 3-D mass with gravity, with length, height, and depth, still within the first second of time. The expanding probability field manifesting as the virtual 2 x 3 hyper spin particles continue to drag through the 2 x 5 possibility field, creating more mass-free particles fully decelerating into mass ($M = E/c^2$), achieving the flowing quark-gluon plasm, QGP.

Quark-gluon plasma, QGP, is said to have existed in the tiny ratio of a second following the Big Bang. QGP formed in collisions of the newly creating neutrinos and antineutrinos containing quarks with mass. The confinement of the quarks in the quark-gluon string-tubes inside the neutrinos and anti-neutrinos became unbound, then quarks existed "deconfined" as a dense fluid, as the QGP. Quarks have never been witnessed deconfined, but the speculation says they are not confined in the QGP.

This beginning universe expands and cools through various phases. As symmetry breaking of the electroweak force separates electromagnetic and weak forces, QGP information forms the hadronic gaseous state… transitioning into hadronic soup… stabilizing with $E = Mc^2$.

United through gluon strong force, a variety of groups of two or three combined quarks form into neutrinos and neutrons which transition into protons and electrons with opposing charges, all containing quark-gluon string-tubes.

More cooling. Electrons and protons form neutral hydrogen atoms, which join into a helium nucleus with two protons and maybe two neutrons, with two electrons orbiting. Mass-gravity fields condense hydrogen and helium gases into the first nebulas, which collapse into the first stars. Through fusion, the stars use these two original elements to form a variety of heavier elements, while mesons made of quarks pop rapidly in and out of existence within the nuclei to help with beta-decay transitions. Individual particles fuse together and break apart, radiating energy which becomes the probability field's cumulative cosmic background radiation.

Stars evolve and in time use up enough fuel to succumb to gravity's warped space. Toward the end of a star's life, nuclear fusion is coming to its end. The diminishing outward pressure is becoming insufficient to compete with the gravitational inward collapse. For very large stars, this allows the formation of neutron stars containing the densest matter in the universe. In the center of the neutron star, high density crushing of nuclei mass dissolves it into a nucleon liquid. At higher densities, the nucleon liquid dissolves into a quark-gluon liquid.

Crushing more, a large neutron star can collapse into a black hole, all the mass within shifting into being similar to a mini big bang singularity containing two quarks within that dance, a 2 x 3 hyper spin with accelerating potential to become extremely massive. The 2 x 3 hyper spin black hole dance with acceleration potential in the 2-D Higgs possibility field allows the ability to increase gravity and to continue its warping effect on the overlaying 3-D space with time.

For millions of years on Earth, fluids of atoms and molecules flow. With underground pressures and cooling, magma hardens. Granite and igneous rocks and their mineral crystals

accumulate. Minerals form as salt water evaporates. The sun's heat melts and mixes elements and minerals. Many minerals come to Earth in meteorites. Volcanoes and plate tectonics form mineral varieties. Rocks break down and form clay and soil loaded with minerals.

Original dancing Willpower sparks a new beginning: life, with bacteria, fungi, and plants. Biochemistry breaks down more of the geology, forming more minerals… more ingredients for evolving more life from simplicity into complexity. Animals and humans come in time.

"By weight, 99.5 per cent of minerals are formed from only 12 of the natural elements. Clearly, some elements are far more common than others. The same goes for minerals. Of the 5800 or so known minerals, only 10 make up 95 per cent of the Earth's crust." Australian Museum

Earth remains protected by an atmosphere and the sun, moon, and planets. Entropy's *average* increasing disorder is dictated by the second law of thermodynamics. The universe evolves isolated protected pockets of increasing order. In our solar system, Earth is in the "Goldilocks zone". We have an abundance of water, but not too much, not too little. Venus is too hot, Mars too cold, and Earth is just right. Goldilocks is pleased with her perfect porridge.

We are born. We are here to appreciate, explore, and learn, we are co-partners with God in evolving our own consciousness. We survive. We adapt. We assimilate and eliminate. We activate or suppress activation. We choose. The human mind evolves to understand all that we can. Evolution of consciousness comes with repeating body actions, some resulting in inheritable instincts. With Willpower we learn rationality to control instincts and instantaneous reactions. We learn self-control and delayed gratifications. We learn to use our neural connections to achieve important goals. We leave our mark upon all of it. And we die. Before that, we anticipate, and try to avoid dying.

Fundamental particles refer back to Chapter III

John A. Wheeler first proposed Quantum Foam in 1955. From an excitation of the void arises virtual motion of a virtual particle paired with a virtual antiparticle... multiplying into quantum foam. Without order to sustain existence, as the two ends of one moving string, the pair must collide and annihilate, becoming a pair of photons. The photon pair dissipates into an excitation of the void, enabling a new virtual particle-antiparticle pair. During the photons' instantaneous existence, order is introduced.

A) 0-D Point; Void; zero cosmological constant; containing no vocabulary, no $E = Mc^2$
B) 1-D Line with two ends moving – quantum foam
C) 2-D Plane; ordered circle dance; $2H_D$ possibility field: $H_D = \{1,2,3,4,5\}$; 2 x 5 Nataraj; Higgs; HoloField; ether; Akashic record. Transition from one virtual 2 x 5 dance forms to one 2 x 3 hyper spin accelerating virtual particle dance.
D) By resisting the Higgs possibility field, the accelerating virtual pair become mass as a quark-antiquark pair at the end nodes of a quark-gluon string-tube. The string-tube's center remains a bendable node with only void—no quark. As the accelerating string dance, the 2 x 3 hyper spin Big Bang Singularity, BBS, prepares for creation. As the BBS dance accelerates more, surveying the generations of quarks, manifesting in sequence from the lightest to the heaviest (Fig.XXI.8). Quark units of ±1/3 & ± 2/3 account for both EM charges and matter-antimatter balance. This is the beginning of time, initiating …
E) The Big Bang expansion into 3-D volume + time: the creation of the probability field.

Current paradigm of sub-atomic particles (with proposal* Fig.III.1)

Defined by their total spin, sub-atomic particles are divided into fermions (fractional spin number) and bosons (integer spin number). The quark constituents have spin = 1/2, as do protons, neutrons, and electrons. As shown in Fig.II.5, the electron spin = 1/2 comes as either

spin up or spin down, as must the spin of all particles. This vocabulary of up spin or down spin refers to clockwise vs counterclockwise spins. The spins of charged fermions (electrons, protons, quarks, etc.) produce the magnetic property.

Protons, neutrons, and electrons all have spin = 1/2. All three* are composed of three quarks, which also count as spin = 1/2 each. Since the up spin counts a +1/2 and the down spin counts as -1/2, this requires two up spin quarks and one down spin quark in each of the protons, neutrons, and electrons*, otherwise they would each have spin = 3/2 or spin = 0.

For three quarks in a single quark-gluon string-tube, the two positive spin quarks need to be on the two ends, and the one negative spin quark needs to be in the middle.

The vocabulary of up and down is used twice in particle physics, for two completely different purposes, and should not be confused. The second way, in Figs.XXI.3 & .8, is in the two flavors of the lightweight generation of quarks, which also carry the names of up and down: an up quark (± 2/3) and a down quark (± 1/3). These refer to their units of electrical charge, and also refer to their matter and antimatter accounting, but not accounting for spin.

Quarks were named from a James Joyce quote in *Finnegan's Wake*: "Three quarks for Muster Mark". Quarks are the most basic elementary particles that nature uses for constituents. Quarks originated from the Higgs field resisting the virtual particle-antiparticle excitation within the zero cosmological constant void. Quarks are fermions that have half-integer spins and ±1/3 or ±2/3 electric charges, which also equate to their matter-antimatter accountability.

Fermions were named after Enrico Fermi. Quarks are fermions which combine in threes to form the composite fermion particles like protons and neutrons. Fermions follow Fermi-Dirac statistics which apply to physical systems that consist of particles that obey the Pauli exclusion principle, where two particles cannot occupy the same space at the same time: impenetrability. Fermions, including proposed single electrons*, are particles constructed with 3 mini quarks. Each quark spin = 1/2, making total spin = 1/2 or 3/2. *Fermions have fractional spins*.

Bosons, named after Satyendra Nath Bose, with integer values of spin, obey Bose–Einstein statistics, and do not follow Pauli's exclusion principle. Bosons can cross paths unchanged in the same space at the same time, superposition, like two water waves, or sound waves from two speakers. Bosons include massless "particles" which transfer forces. Bosons also include quark-composite particles with a cumulative *integer* spin number, like mesons or a pair of electrons. Condensates of composite bosons, an aggregation of particles in a unified state, have superfluid properties, zero viscosity, and flow freely with no energy loss, including the cohesive stream of laser light, frictionless superconductivity, and the flow of superfluid helium.

Electromagnetic	Weak force	Strong force	Gauge bosons spin = 1
photon	$W^{\pm}$ boson & Z^0 boson	gluon	

Also: Higgs Boson (net spin = 0). Higgs *field* drags its own particle, giving it mass and gravity. And: Graviton (spin = 2). Theorized massless boson to carry the force of the gravitational wave.

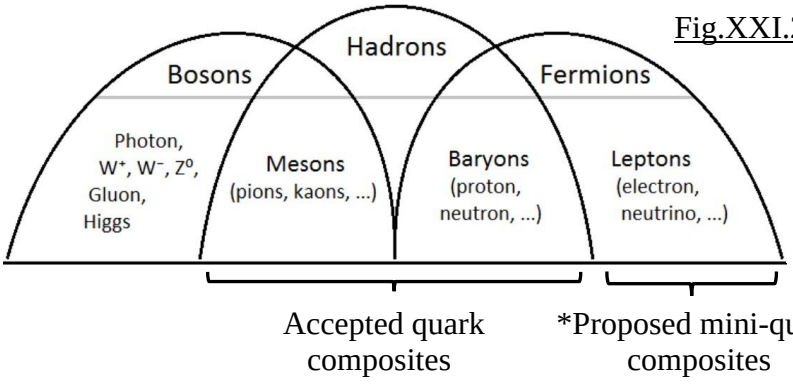


Fig.XXI.2 Sub-atomic paradigm

Photons, gravitons, and gluons have no quarks and no rest mass. Gluons join quarks within the quark-gluon string-tube.

W^+, W^-, Z^0, and Higgs are also *HUT* proposed quark composites. Parton is the combined title for quarks and gluons (gluons are claimed to be only virtual).

Constructed with quarks (accepted plus proposed*)

Fig.XXI.3 Quark generations: 3 proposed* + 3 accepted:

*Proposed 3 mini-generations:	Super-miniweight	Extra-miniweight	Miniweight
2 Quark Flavors (±2/3 & ±1/3):	Song & Dance	Smile & Laugh	Skip & Jump
Accepted 3 generations:	Lightweight	Middle weight	Heavy weight
2 Quark Flavors (±2/3 & ±1/3):	Up & Down	Charm & Strange	Top & Bottom

2 or 3 mini Quarks *	2 lightweight Quarks	3 lightweight Quarks	
6 Leptons (+ 6 anti-leptons)	Pi Mesons = Pions (bosons)	Baryons (fermions)	
Electron + Muon + Tao Neutrino (boson): Electron + Muon + Tao	(π^+) (π^-) (π^0) With 2 (or 4) quarks, mesons are bosons with spin = 0 or 1	Neutron Proton	Nucleons: baryon grounded state
* *HUT* claims these to be affected by strong force	mesons + baryons = hadrons Hadrons affected by strong force	Fermions: odd # of quarks. Bosons: even # of quarks.	

The Song Quark is *HUT*'s proposed fundamental building block of the universe (Fig.XXI.8). *Electrons with 3 extra-miniweight quarks are fermions. Neutrinos with 2 super-miniweight quarks are bosons. For a muon electron, miniweight quarks are needed. Lightweight quarks are maybe appropriate for the tao electron with the mass of about two protons.

Combination conversion example: neutron + neutrino → proton + electron (Fig.III.2).

The quarks of a neutral pi meson (π^0) are assimilated in beta decay of a neutron into a proton and vice versa. See Fig.III.5. The neutral pi meson has a lifetime of about 85 attoseconds (8.5×10^{-17}), after which it mostly decays into a pair of photons. Charged pi mesons (π^+ & π^-) decay less quickly: 26 nanoseconds (2.6×10^{-8} seconds). Proposed: π^0 is a tertraquark (Fig.III.4).

Composite fermions can become bosons

Combining fermions with fractional spins can form particles with integer spins. Mesons contain a quark and an anti-quark, which each have spin = 1/2. Total: spin = 1 or spin = 0. This means a meson is not a fermion. A π meson is a boson because the total spin is an integer.

4 kinds of K mesons (kaons). Combine (up or down) (quark or anti-quark) with ± strange quark:

K^+ = up quark & an anti-strange quark. K^- = anti-up quark & a strange quark.

K^0 = down quark & anti-strange quark. Anti-K^0 = anti-down quark & strange quark.

Electron pair acts like a boson (i.e. superconducting). When separated, electrons are fermions. He^4 is a boson: spins combine to an integer. He^3 is a fermion: spins combine to a non-integer.

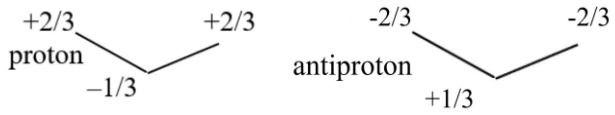
Summary of *HUT* quark proposals see Chapters III & IV

A) Three quark "colors" are better referred to as quark string nodes: {left end, center, right end}.
B) As in mesons, two "colors" of quarks, being nodal positions in the quark string, are better presented as {left end, right end} of the quark-gluon string-tube.
C) Leptons are said to not be quark constructs. *HUT* disagrees. Proposed (Fig.XXI.3): 3 new generations of mini-quarks. Electrons (3 quarks) are fermions. Neutrinos (2 quarks) are bosons.
D) Leptons are said to be unaffected by strong force. *HUT* disagrees: formulas $2(2H_E^2)$ and $2H_C$ dictate numbers of electrons in atomic fields and subfields, caused by *extended residual* strong force, ERSF, to provide valence (Fig.VIII.9) that steals electrons. Also, the proposed extra-miniweight quarks making up electrons, and super-miniweight quarks in neutrinos, bind together

with the strong force in the quark-gluon string-tube, causing electrons to spin and be magnets.
E) The neutral pi meson, π^0, is a tertraquark, made of four quarks (Fig.III.4).
F) *HUT* claims (Fig. XXI.7) the Big Bang Singularity (BBS), a manifested Higgs boson, and blackholes are all two-quark composite particles with bendable void center nodes. As the quarks' internal spin frequency increases or decreases, that effects the relativistic mass. But when measured externally by gravity fields and decays, the relativistic mass is interpreted as rest mass.
G) Within all particles, it is combined ±1/3 & ±2/3 units of the quarks and anti-quarks that gives them their total electric charge and matter-antimatter accountability.
H) Up quarks and anti-up quarks are misnamed. To make a consistent theory, names need to be interchanged (Fig.III.1), while not changing their ± unit value, allowing the anti-quarks to all have the positive units and the quarks to consistently have negative units. Why does this naming error exist? Perhaps it came about in preparing the names of quark constituents for a proton and its antimatter partner, the anti-proton. They correctly made the ±1/3 units work out for the proton and antiproton (Fig.XXI.4), but they designated the quark names within the proton to be all matter, and quarks within the antiproton to be all antimatter. That is error since they each contain quarks with opposing charges, designating both matter and antimatter within each.

For *HUT*'s suggested name change, though numbers remain the same: the proton would have two anti-up quarks and one down quark, and the antiproton would have the opposite.

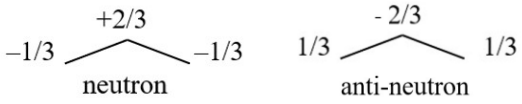
Fig.XXI.4 proton vs antiproton



To accomplish their erred desire, inside a proton they named two up quarks and one down quark, making the antiproton to be two anti-up quarks and one anti-down quark.

This *HUT* proposal effects the accepted version of the quark constituents of a neutron being one up and two down quarks. The math is perfect, being 2/3 + 2(-1/3) = 0, but in naming them both as matter and leaving out the antimatter conceals truth. They mistakenly claim that a neutron is made of only quarks and no anti-quarks. Just exchanging the names of the *up quark* and the *anti-up quark* would fix this problem and allow consistency.

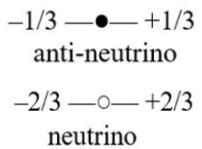
Fig.XXI.5 neutron vs anti-neutron



A particle and its antiparticle have opposite charges. Yet the neutron is neutral and its anti-neutron is also neutral, so these disobey definition.

Constituent quarks within the neutron and antineutron grant justification by having opposite charges. A neutrino has a corresponding antineutrino, both being neutral. They also break away from the definition of matter and antimatter. Except for here in *HUT*'s proposal, science does not allow constituent quarks to grant the same justification granted to neutrons.

Fig.XXI.6 neutrino vs anti-neutrino



HUT proposes (Figs. III.1 & .4) the anti-neutrino has a -1/3 and a +1/3 super-miniweight quark and the neutrino has -2/3 and +2/3. This non-equivalence of the constituent charges (1/3 vs 2/3) is justified in the conservation of ±1/3 charges shown in beta decays in Figs.III.5 & .7.

HUT proposes adding three mini-quark generations to the quark family list (Fig.XXI.3), each with very little mass to be able to quantify as composite particles of the generations of neutrinos and electrons and their anti-particles. This proposal for neutrinos and anti-neutrinos may seem to break the antimatter rule since 1/3 ≠ 2/3, but the rule remains consistent within each neutrino {+2/3, -2/3} and within each anti-neutrino {+1/3, -1/3}.

Neutrinos are called “ghost particles” for being elusive and difficult to study. Except for quarks, neutrinos are the most common particle of the universe. There is not any agreement upon the exact mass of a neutrino or anti-neutrino. Until recently they were considered massless. No longer though. They are claimed to be maybe less than one 500,000th the mass of an electron.

In the beginning was the “song” quark

This section only makes sense if the Chapter III proposal is entertained that mini quarks are constituents of electrons and neutrinos.

From timeless spaceless void comes sudden manifestation of the virtual particle-antiparticle dance which “instantly” annihilates into two photons. Willpower uses the photons’ spin = 1 circle dance as the example to create dance patterns for the virtual particle-antiparticle pair at the two ends of the virtual string.

Building on spin = 1, Willpower achieves 2 x 5 forward-reverse net-zero spin dance with void for the string’s bendable center node. The 2 x 5 virtual Higgs dance has the virtual particle-antiparticle pair on the two ends of a single virtual string, each spinning *five* circles before completing one cycle (Fig.XXI.11.B). The 2-D Higgs field forms with non-accelerating virtual 2 x 5 dances which rotate forward then reverse before the 2 x 5 cycle is complete (net zero rotation: spin = 0). This dance of the virtual Higgs boson will allow the constancy of the 2-D Higgs possibility field to manifest a false vacuum for light to travel through. Scientists say Higgs boson is a net spin = 0 because it can annihilate into two photons: one with a spin = 1 and one with spin = -1, totaling net spin = 0.

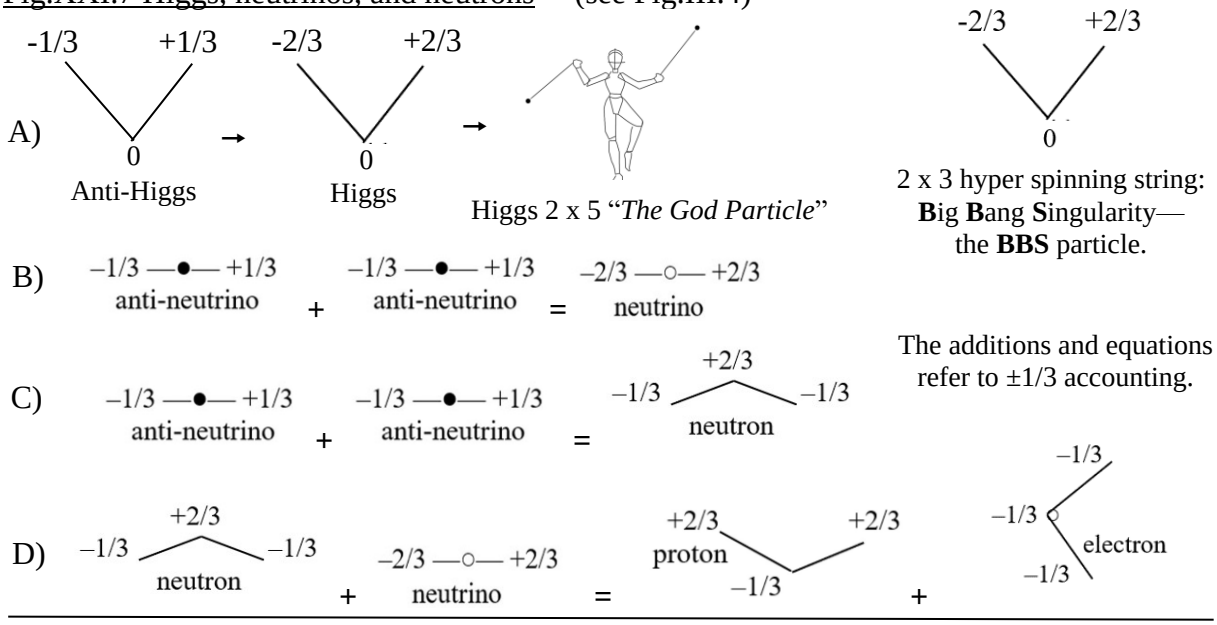
In an attempt to accelerate, the God-Willpower transforms one virtual 2 x 5 particle-antiparticle Higgs dance into being one virtual 2 x 3 hyper spin dance which can accelerate (Fig.XXI.11.E). This drags on the 2-D virtual Higgs field and decelerates into being a pair of *song super miniweight quarks*, one +2/3 and one -2/3, with mass, Fig.XXI.8, confined at the two end nodes of a dancing quark-gluon string-tube, with void as the bendable middle node. This is the dancing Big Bang Singularity, BBS—the first composite mass particle made from the two least massive quarks. The accelerating 2 x 3 hyper spin dancing quarks continue to accelerate more, continuing to drag on Higgs field. The increasing string tension manifests all the different relativistic masses of the 24 quarks: spin harmonics seen as rest mass from outside (Fig.XXI.8).

The God-Willpower experiments with increasing spin frequencies within the singularity, accelerating towards the speed of light, making relativistic mass approaching infinity. The extremely massive BBS at one moment cannot sustain any more acceleration. The bendable void in the string’s middle is the weak point in maintaining the singularity’s string tension integrity, so the string breaks. All of this occurs in an immeasurable part of a second.

The result is the Big Bang: a highly ordered sizzling, frizzling frenzy. Virtual Higgs bosons are caught up in the accelerations, and as the super massive BBS particle’s symmetry breaks, massive Higgs bosons rapidly manifest along with more 2 x 3 hyper spin dances. All decay rapidly, shooting out neutrinos and anti-neutrinos, made of quark-gluon string-tubes with no bendable center nodes, which fly off like arrows at near light speed, manifesting 3-D space + time. With the 2-D Higgs possibility field and the manifestation of the high velocity sustaining particles in 3-D + time probability field, our universe rapidly expands with 3-D inflation.

In the BBS, for each 360° rotation of the 2 x 3 hyper spin dance, *two different enfolded cycles* are completed: the *2 x 3 facing forward dance* plus the *2 x 3 facing away dance*. Refer to: Fig.XXII.11.E. We presently count this one 360° rotation to complete two different enfolded cycles as one cycle to complete two circles, or spin = 1/2: ↀ. Quarks, and all of their composite fermions repeat this intrinsic angular momentum numeration, the spin = 1/2, or some other odd number divided by two. Quarks inherited this dance from preceding virtual particles (preons).

Fig.XXI.7 Higgs, neutrinos, and neutrons (see Fig.III.4)



Within composite particles are charged quarks as nodes at the two ends of a circle-dancing string. When more energy is invested to dance with higher spin frequency, this increases relativistic mass. From outside the particle, an observer measures this as increased rest mass.

Fig.XXI.8 24 quarks

6 generations	± 1/3 or ± 2/3 unit
x 2 flavors	Antiquark & Quark
"Song"	+ 2/3 & – 2/3
Dance	+ 1/3 & – 1/3
Smile	+ 2/3 & – 2/3
Laugh	+ 1/3 & – 1/3
Skip	+ 2/3 & – 2/3
Jump	+ 1/3 & – 1/3
Up	+ 2/3 & – 2/3
Down	+ 1/3 & – 1/3
Strange	+ 1/3 & – 1/3
Charm	+ 2/3 & – 2/3
Bottom	+ 1/3 & – 1/3
Top	+ 2/3 & – 2/3

Fig.XXI.8 is a list of 24 quarks in the sequence from the least massive to the most. Quarks are not found alone because they exist confined in quark-gluon string-tubes, which have nodes holding the quarks separate.

The spin-frequency of the BBS' string rapidly increases, causing increased *relativistic masses* to all 24 quarks. The internal increase in relativistic mass from the accelerating frequency of the cyclical spins is interpreted in science, from the outside measurements, as increasing *rest mass'* of the quarks. The *HUT* claim here is that relativistic mass can be interpreted as rest mass, depending on perspective. The BBS string breaks and decays into song & anti-song quarks at the end nodes of the first arrow-like anti-neutrino two node quark string. This is the first energized mass to fly away from the BBS, leaving in its track the new 3-D space + time.

Fig.XXI.9 Particle mass 1 atomic mass = 931.5 MeV/c^2 1 GeV/c^2 = 1,000 MeV/c^2

Quark flavor	Mass
Up quark (u)	1.8~2.8 MeV/c^2
Down quark (d)	4.3~5.2 MeV/c^2
Strange quark (s)	92~104 MeV/c^2
Charm quark (c)	1.3 GeV/c^2
Bottom quark (b)	4.2~4.7 GeV/c^2
Top quark (t)	172 GeV/c^2

atomic #	element	atomic mass
1	Hydrogen	1.008
2	Helium	4.0026
3	Lithium	6.94
4	Beryllium	9.0122
5	Boron	10.81
6	Carbon	12.011

4 Bosons with mass	
W^+	80 GeV/c^2
W^-	80 GeV/c^2
Z^0	91 GeV/c^2
Higgs	125.35 GeV/c^2
$\pi^\pm$	140 MeV/c^2
π^0	135 MeV/c^2

Light waves radiating away at the speed of light in the same direction have no rest mass because they cannot be measured in a frame where they are at rest. If light moves in a circle, as a

geon or a dark matter halo, its cumulative center of momentum can be perceived as being at rest. From outside the circular dancing system, the internal momentum contributing to the relativistic mass is measured simply as rest mass in its center, able to contribute to inertia and weight. When the system's center of momentum is at rest, the relativistic mass is perceived as its rest mass.

Present day science authorities count "colors", being the nodes, as making more different quarks, but in *HUT* the 2, 3, or 4 quark nodes are just the given situation. A dancing string with two end quark nodes forms a boson, and with a third node in the center forms a fermion. *HUT* proposes a string with four quark nodes, a tetraquark, forms a neutral pi meson: π^0. See Fig.III.4.

Fig.XXI.10 Up down quark pattern

Accepted: Flavor	Accepted: Units	Accepted: Mass	Assumed: Spin Frequency
Up quark	± 2/3	Less mass	Lower
Down quark	± 1/3	More mass	Higher

Since the first three quark generations in Fig.XXI.8, with two flavors each, are the *HUT* proposed mini-quarks, and as of now have no precise predicted nor measured mass quantities, here their mass pattern copies that of the up and down quarks (Fig.XXI.10), where the ± 2/3 up quark has less mass than the ± 1/3 down quark (Fig.XXI.9). The ± quark unit is used for electric charge and matter-antimatter accounting.

HUT interprets the pattern observed in up and down quarks as: the ± 2/3 unit must have a lower spin frequency, causing less string tension, so that it drags less on Higgs field, thus gains less relativistic mass. The ± 1/3 unit would have the higher spin frequency, causing more drag and thus more relativistic mass gain. In Fig.XXI.8, *HUT* applies the same assumed pattern to the six proposed flavors of mini quarks, showing ±2/3 as less massive than ±1/3.

But the pattern changes after the up and down quarks: a ± 2/3 charm quark is more massive than the ± 1/3 strange quark, and a ± 2/3 top quark is more massive than a ± 1/3 bottom quark. Maybe with these two generations of more massive quarks, with them having more inertia, the pattern flip flops? This *HUT* proposal does not yet commit to how the break in pattern should be interpreted. Maybe the accepted data has error?

In Fig.XXI.8, *HUT* remains constant in documenting the increasing order of mass for the strange-charm and bottom-top flavors by interchanging their ± 2/3 and ± 1/3 unit quantities. If the masses of the six proposed flavors become known, the same solution may need to be applied to one, two, or all three of the proposed mini-quark generations.

HUT proposes that the virtual particle-antiparticle danced the 2 x 3 hyper spin, resisting Higgs 2 x 5 possibility field, forming the first quark-antiquark mass within the BBS. The quark-gluon string-tubes began with the least string tension possible, manifesting the dancing "song" quarks containing the least total mass. Forming the BBS with increasing acceleration of the spin frequencies, the singularity advanced through its containment of all six generations of confined quarks, manifesting the heaviest top and anti-top quark pair… and even more prior to initiating the Big Bang.

String integrity is caused by maintaining the tension in the quark-gluon string-tube. With the initial song quarks' bare mass remaining constant, increasing the string's spin frequency of those quarks on the ends manifests more relativistic mass. With the increasing total mass, being the rest mass plus the relativistic mass, the tension in the string increases. Accelerating coincides with energy continuing to increase spin frequency, which continues to increase the total mass.

With the Big Bang and the first moments of time, many BBS copies, and massive Higgs bosons, are created from the Big Bang interaction with the Higgs field void. As both the Higgs bosons and BBS copies lose string integrity, they quickly decay into different dancing quark

generations, whose excess mass is converted to energy in the form of momentum for the least massive song-antisong quark pairs. These quarks are manifest at the ends of the new quark-gluon string-tubes, which include no void nodes in the centers which would allow them to bend. These anti-neutrino strings, each with a pair of song and anti-song quarks as end nodes, fly away, close to the speed of light, like two torquing arrows, the first extensions of the Big Bang mass to fly off and define 3-D space + time. Some anti-neutrinos join and become neutrinos (Fig.XXI.7.A) which also fly away like torquing arrows. The neutrino and anti-neutrino are two different spatially extended arrows which have opposite torques, causing rapid universal 3-D inflation.

Two anti-neutrinos come together and form one neutron (Fig.XXI.7.B), the first fermion particle, which has three quarks at three nodes: two at the string ends and one in the center. The neutron joins with a neutrino and these decay into a proton and an electron (Fig.XXI.7.C), each with three quark nodes. The proton and the electron join into a neutral hydrogen atom.

In the particle accelerator, when scientists colliding protons together produced the Higgs boson, they had invested so much energy into the system that one quark and its antiquark danced higher frequency spins, increasing their quark-gluon string-tube tension, manifesting more relativistic mass in the quarks. The Higgs boson dancing the 2 x 5 forward and reverse net zero spin, became the Higgs boson with the perceived rest mass that they discovered. See Fig.XXI.7. Being so energized with the bendable void middle node, the quark-gluon string-tube breaks, and the Higgs boson rapidly decays into ± bottom quarks at the ends of the two separated strings, being two massive anti-neutrinos which either continue to decay into other particles, or whose large quantity of mass converts to energy to allow normal neutrinos and anti-neutrinos, with their constituent song and anti-song quarks, to fly off at close to light speed.

Summary of inventing the existence of quarks and gluons

This is a quote from Jim Baggott's *Higgs*, of Robert Serber's memory with Murray Gell-Mann in 1963 at the Columbia University faculty club: "I pointed out you could take three pieces and make protons and neutrons…Pieces and anti-pieces could make mesons." Gell-Mann immediately wrote on a napkin to figure the ± 1/3 and ± 2/3 charges that we now use for quarks.

Notice Serber claimed "three pieces" in protons and neutrons, and no anti-pieces except in mesons. This addresses the naming problem, mentioned before, after, and within Fig.XXI.4.

"Gell-Mann, never entirely happy with the idea of quarks as fundamental particles, remained enthusiastic about superstrings and supersymmetry. He was perfectly happy to see his own work relegated to a rough approximation of a deeper, more beautiful theory, with quarks flapping around on the ends of strings." *Strange Beauty*, George Johnson (see *HUT* chapter III).

1) Need for fractionally charged particles within protons and neutrons: *quarks* were invented.
2) To account for other particles, middle weight and heavy weight quarks were invented.
3) Proposal: Chapter III's quotes show that now electrons are believed to contain fractionally charged particles as well. *HUT* proposes three new generations of mini-quarks to allow ± 1/3 units for both the charges and matter-antimatter accounting of electrons and neutrinos.
4) The need to not violate Paulie's exclusion principal motivated quark *colors* to be invented.
5) Proposal (Fig.III.3): Strong force = gluons = void. The three "nodes" holding quarks in the quark-gluon string-tube are poorly designated as "colors", invented to keep quarks separate.
6) Not able to find lone quarks: quarks are confined within the string-tube, and cannot escape. "Asymptotic" strong force was invented, which gets stronger with distance, not weaker.

Before 1973, many physicists felt field theory was failing because force between quarks becomes weaker at shorter distances, unlike EM and gravity fields. The solution proposed was *asymptotic* freedom, the theory of the strong force within quark-gluon string-tubes. This tells that quarks interact weakly when close together, but quark attractions become stronger when farther

apart. Compare: tension in a rubber band gets stronger the farther apart the ends are separated. Release the tension and the rubber band rapidly contracts and goes slack. Normally quarks do not separate from each other while inside protons and neutrons, but with enough energy, quarks continue separating until the quark string breaks, and instantly the void forms two new quarks with opposing charges at the two new string ends, reforming the three-quark string, plus forming a two-quark meson string. Mesons annihilate into photon pairs, electron-positron pairs, and/or neutrinos. The quarks never become solo, except maybe in quark-gluon plasma.

The gluon was discovered in August 1979. The strong force holds the quarks together, maybe unnecessarily attributed to a gluon "particle", being a massless gauge boson. Quark *nodes* in the *HUT* proposed dancing quark-gluon string-tube allow the necessary separation between the quarks. The nodes presently and inappropriately are referred to as color force. True colors are separated by cohesion, the harmonic phase relationships among EM waves.

Only one percent of a proton's mass is accounted for by confined quarks in the quark-gluon string-tube. The rest of the mass is supplied by the strong force's energy: $M = E/c^2$.

The most massive fundamental particle, the top quark, has the mass of a tungsten atom, almost the mass of gold, and can fragment during a collision into other detectable particles.

Quarks engage with all four fundamental forces. They have electric charges and an EM field. They have mass with gravity. They are held together with the strong force. They are involved with the weak force during beta decay, conserving ± 1/3 unit balances.

The zero cosmological constant requires the conservation of ±1/3 units throughout creation. The ±1/3 unit accounts for electric charge as well as matter-antimatter.

A neutron has a zero charge dictated by its constituent quarks within. The three quarks within each neutron balance its ±1/3 units to zero, giving the zero charge and the balanced matter-antimatter. A proton's three quarks give it the total of a +1 electric charge which also dictates its matter-antimatter imbalance.

When a neutron decays in the two ways shown in Figs.III.2 & .5, producing a proton and electron, the conservation of ±1/3 units is maintained. Charges balance to zero and matter-antimatter balance is obeyed. Neither a positron nor an anti-proton is required to conserve the ±1/3 units, as claimed in accepted science, resulting in falsely claiming missing antimatter.

Strong Force (SF) from decreasing pressure within quark-gluon string-tube

The strong force, SF, binds the dancing quark-gluon string-tubes from within. The asymptotic SF weakens whenever the quarks come closer together, but the dance motion's centrifugal inertia maintains sufficient quark separation. The residual SF (RSF) holds protons and neutrons together. The extended RSF (ERSF) establishes the quantum numbers to define the atomic electron fields, $2(2H_E^2)$, and sub-fields, $2H_C$, orbiting the nucleus. The electric charges and the accounting of matter-antimatter which begin inside the quark-gluon string-tubes transfer into the neutron, proton, electron, and all else.

Thinking of a syringe without the needle and with one fingertip covering the hole where the needle would extend outward: with the syringe closed and sealed, we can increase the spatial volume inside by slowly pulling out the plunger. In that space being expanded without any air entering, we create a relative vacuum as the internal pressure decreases compared to the air pressure outside the syringe which is caused by air with atoms and molecules bouncing around. Release the plunger and it seems like the low pressure sucks the plunger in, but more accurately the high atmospheric pressure outside pushes the plunger back down into the syringe tube. This naturally occurs in order to equalize the pressures inside and outside. Pressure differences cause this motion because nature demands balance, equilibrium occurring from the entropy of the

second law of thermodynamics. High pressures move into zones of low pressures and cause things to move, like weather and electricity.

The farther out the syringe plunger is pulled, the more unequal are the inside and outside pressures. Pull the plunger out all the way and the pressure difference is released. Two separated quarks have space between them, and the quarks act like two plungers on both ends of the quark-gluon string-tube—as if the string-tube has a sealed space inside. See Fig.XXII.6. The dancing string's quark plungers are drawn more forcibly back together as strength increases with increasing separation, as if connected by an elastic string. This is the asymptotic SF.

Due to centrifugal inertia force, the two or three nodes of the dancing quark-gluon string-tubes keep the oppositely charged quarks separated, or else, being matter and antimatter, they would collide and annihilate.

Casimir effect

In 1948, a physicist named Hendrik Casimir realized that when using two slightly separated, uncharged conducting metal plates in a 3-D sealed vacuum space, we witness the Casimir effect, showing an attraction force between the plates, other than gravity and EM.

What is accepted as occurring is the zero-energy density of the void around the plates is spontaneously manifesting the disordered motion of the virtual particle-antiparticle pairs. The smaller space between the plates is a negative pressure *relative* to the positive pressure caused by more virtual pairs in the larger false-vacuum field outside the metal plates. The relative pressure difference between the inside and the outside is bringing the plates together. The inside pressure being less is not actually attracting the two plates. More correct is that the outside is pushing towards the inside, much like the high pressure of electrons on one battery pole is able to push electrons to the other pole whose relatively lower pressure of electrons can receive more—since equilibrium is nature's goal. Casimir effect is similar to the pressure difference between the outside and the inside of the quark-gluon string-tube in the previous syringe metaphor.

It is claimed that after massless particles from the timeless 2-D Higgs field gain mass through resistance with the Higgs field, then the 3-D space + time mass particles do not interact anymore with the Higgs field, and there is no more resistance. In 1887, Michaelson and Morley tried to find the resistance between 3-D space and the ether. The resistance effect between the two fields for which they were seeking, they called the ether wind. But they found there was no resistance between the two. Now, with the definition of the Higgs field, which is the newly defined ether where light travels, the timeless 2-D Higgs field and 3-D space + time still do not interact as Michaelson and Morley had hoped. But…

The Casimir effect is accepted as proof that the virtual particle-antiparticle pairs within quantum foam is a reality. The question arises though: can the massless virtual pairs really exert enough pressure differences to move mass? An alternative theory is van der Waals force, being the weak electrostatic attraction caused by the constant random Brownian motions of atoms and molecules within air and liquids like water. But can this force also be used to say the fluidity of atomic motions in the solid metal plates is able to affect the Casimir effect?

Since the manifesting disordered quantum foam annihilates almost instantaneously into photons which the metal plates would absorb, the photons may have a moving effect. But photons are said to be unable to move mass, though the photo-electric effect shows differently.

Another perspective: the enclosed 3-D void contains the proposed 2-D Higgs possibility field, which is maintained by the ordered 2 x 5 dance containing original void, making it to be a false vacuum. The 2-D Higgs field might exert more pressure in the larger 3-D space outside the two plates than the smaller area between them, resulting in the constant Casimir effect.

It is claimed that the 2-D Higgs possibility field interacts just once with its own massless virtual particle-antiparticle pairs, manifesting quark-antiquark pairs with mass in the 3-D + time probability field. Maybe the zero-density void *within* the false void of the 2-D Higgs possibility field is *continuously* affecting 3-D mass, not just once for each particle, and is constantly *maintaining* the mass and 3-D status of all manifested particles in the universe. This could qualify the 2-D Higgs field to be the unified reference field for the 3-D hologramic universe.

Quantum spin

The "spin" of fermion particles is not limited to a simple rotation around a single axis. Spin is a dance described as the particle's *intrinsic* angular momentum, meaning it is just part of the particle, just the way it naturally occurs. Of course, the explanation of being intrinsic, of being just the way it is, is not a scientific explanation at all.

The annihilation of a virtual particle-antiparticle pair produces two photons, as do the decay of others particles. In Fig.XXI.11.C, a photon has a virtual particle on one string end and an antiparticle on the other. One end spins a constant circle, controlled by the other which is in the void in the center node. A graviton in Fig.XXI.11.D, shows two superimposed photons cycling opposite directions, also controlled by the other ends remaining in the center void.

The accelerating virtual dancing 2 x 3 particle-antiparticle pair drag on Higgs field to become quarks with mass, to produce the BBS and Higgs particles (Figs.XXI.11.B & .E) which each have a quark at one string end and an antiquark at the other, with center nodes still in void.

The differing frequencies of quark spins create changing relativistic mass, transferring to protons, neutrons, mesons, electrons, and neutrinos as perceived rest mass.

Not limited to simple rotation, spin is the void-created order of dancing quark-gluon string-tubes within each fermion, including proposed mini-quarks within generations of electrons and neutrinos. Quarks transfer angular momentum outward to larger particles. A single charged electron has spin, creating its own opposing magnetic poles. A domain of electrons spinning in the same direction, creates in some metals a "permanent" bar magnet.

In one electron, three mini-quarks dance one cycle 2 x 3 forward, then rotate 180° into the second cycle, the 2 x 3 reverse dance. One complete 360° rotation, counterclockwise or clockwise, includes these two enfolded cycles. By continuously repeating the 360° pattern in the same direction (Fig.XXI.11.E), the combined result is the 2 x 3 hyper spin dance. As these two enfolded cycles complete within one 360° rotation, we call it spin = 1/2: one rotation with two different cycles. Spin = 1/2 makes these particles to be fermions, Fig.XXI.11.A, which include not just electrons, but also neutrons, and protons. The enfolded image of spin = 1/2 is simplified to two circles within each cycle, like a figure eight, 8, or an infinity symbol: ∞.

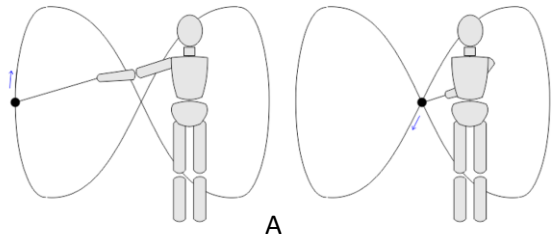
Up or down spin = 1/2 fermions are additive or subtractive, allowing two electrons to sum to spin = 0 or spin = 1, an integer, making the paired electrons to be a single boson. An electron pair can be somewhat imagined like: ⚯.

Of two electrons with identical spins, one electron may be induced to flip over to accommodate an opposite spin. As opposite spin electrons, they magnetically attract and become an ordered pair, somewhat overcoming chaotic repulsion caused by identical electric charges.

A massless particle-antiparticle pair forms from void, moving without order. Colliding, they become two ordered photons, still composed of a particle and anti-particle on the ends of the single string-tube, but one is circling the other. The two photons annihilate back into void.

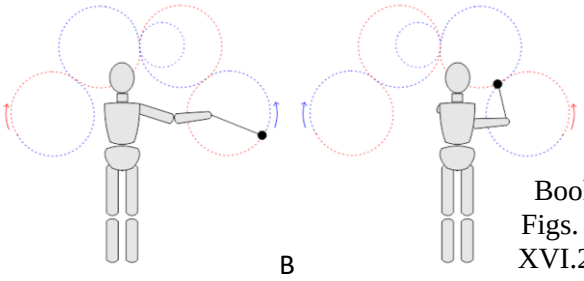
When scientists smash two protons together in a high energy collision, quarks from each can join with such acceleration that they are able to create an *accelerating* virtual Higgs boson, which is decelerated by Higgs field into being a Higgs boson with mass, which decays near instantaneously into bottom quarks, or (rarely) into a pair of energized photons.

Fig.XXI.11 Superstring dance particles



A

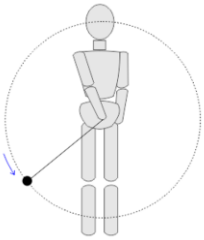
One electron: spin = 1/2 (one cycle with 2 circles).
Two electrons: 2 x 2; 2 hands doing 2 circles per cycle; 90° out of phase. Neutron. Proton.



B

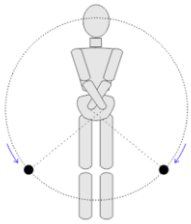
Higgs boson: 2 x 5; 2 hands doing 5 circles each per cycle. Net spin = 0 = 5 – 5; (5 circles forward minus 5 circles reverse)

Book cover, Figs. XXI.1 & XVI.2 are 2 x 5



C

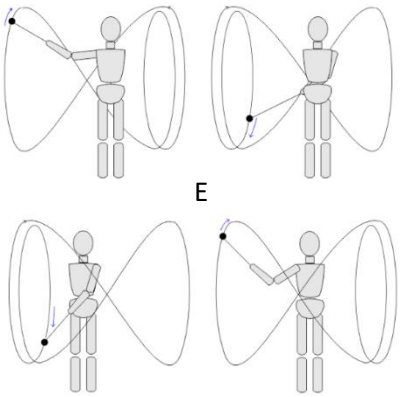
↖ Note: imagine ↗ one armed dancer pairs are united to show dances too difficult to show as only one body. ↙



D

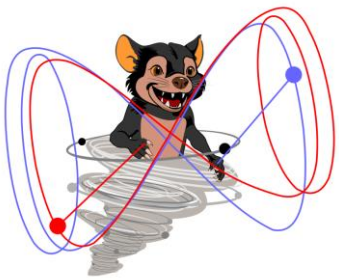
Photon: 1 x 1; 1 hand does 1 circle per cycle.
Spin = 1: One cycle within one circle.

Graviton: spin = 2: two cycles in one circle.
2 x 1; 2 hands do 1 circle per cycle.

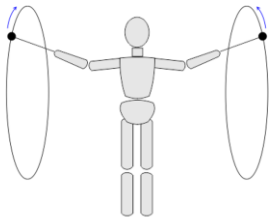


E

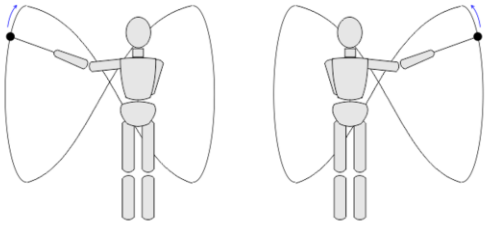
2 x 3 facing away:
2 hands doing 3 circles per cycle
+
2 x 3 facing forward:
2 hands doing 3 circles per cycle
=
2 x 3 hyper spin
virtual particle-antiparticle ↙



↖
2 quarks dancing as the Big Bang Singularity, BBS



2 x 1: jump rope.
2 hands doing 1 circle per cycle.
Photon pair: not superimposed



2 x 2: 180° out of phase: jump rope cross.
2 hands doing 2 circles per cycle.
No known particle represented.

Dance Art by Toño Castañeda using CorelDraw

"The Creator and the creation merge into one wholeness of joy.
I keep on dancing—until there is only… the dance." Michael Jackson

Current problems facing research come from not predominantly treating quarks and gluons as unified dance, but instead as separate particles. Confined quarks do not separate from each other nor from gluons. When experimenters wish to calculate proton mass by postulating how much comes from quarks or gluons, or a combination of quarks and gluons, the research leads to blurred answers. As the zero cosmological constant void causes confined dance, which researchers desire to separate into constituent particles, this leads to unclear results.

The EMC effect

Accumulating more protons and neutrons, atoms become more massive, requiring more binding force supplied by residual strong force, RSF. The strong force, SF, from *within* the neutrons and protons, supplies the RSF *surrounding* the neutrons and protons. The quark-gluon string-tube dance contains void which is supplying both the SF and the RSF.

Quark mass supplying 1%, and the extra energy required to accommodate the other 99% of the neutrons and protons masses, all comes from the quark-gluon string-tube dance containing void, which is the source of everything. Abiding by $E = Mc^2$: *the string's length, the quark's rest mass, and the orbital frequency defines the string's tension and the quarks' relativistic masses—measured outside as rest mass*. Less orbital frequency equals less mass or less binding force.

To supply the RSF increase as neutrons and protons accumulate more in larger atoms, energy comes from the quark-gluon string-tube dance momentum, which slows. When a neutron and a proton pair-up, they are closer together, requiring more RSF, which slows down quark movements more, known as the EMC effect, first published in 1983 by the European Muon Collaboration, EMC, showing the $E = Mc^2$ effect.

Strong force (SF) ⇨ residual SF (RSF) ⇨ extended RSF (ERSF) ⇨ maxi ERSF (MERSF)

The synthesis of a zero cosmological constant with holography and harmonics into the unified field theory is proposed here in *HUT*. This book has been written to show that harmonics are the common math of every field, of everything, all joined together by the requirement of a holographic system to utilize these harmonics. *HUT* proposes consciousness is a cerebral hologram arising from the original Will to Know and to Survive inherent in the cosmological constant, being the zero-energy density of the original void. This section is addressing the zero cosmological void as the primary source and cause behind the four forces scientists wish to join together as the unified field, being EM, gravity, the strong force, and the weak force, also accounting for quantum spin and electron valence.

The *HUT* premise begins with the zero cosmological constant as being the source of the strong force, referred to as gluons, binding the most fundamental "particles" of the universe.

HUT claims the *strong force*, SF, is void manifesting the momentum of the dancing quark-gluon string-tube, which holds together and separates the quark "color" nodes. The total mass of the three quarks making up a proton or neutron is nearly 100 times less than either of those. That *extra mass* needed to balance the account is created by the abundant SF, which means that the *SF is also responsible for mass' gravity*. The quarks' "spin" is caused by the SF, which transfers the spin to all particles containing quarks. Electron spin creates magnetism.

Inside the atomic nucleus, what remains of the SF is a mostly charge-blind attractive force called *residual strong force*, RSF, holding neutrons and protons together almost equally.

When neutrons and protons are too close together, the attractive RSF rapidly weakens. At that point, the protons' positive charges repel protons from each other, pushing the particles back into the attracting RSF zone. Also, when getting too close and the RSF weakens, the ordered orbital dance of the neutrons and protons separates them enough to move them within the RSF optimal range. All of this helps to maintain the appropriate size of the nucleus.

When RSF reaches its outer limits, near the size of the nucleus, RSF rapidly reduces to zero. RSF at that point transitions to a new form, the *extended* RSF, being ERSF, which defines the quantity and spacing of electrons in the fields and subfields orbiting outside the nucleus, balancing the atom, allowing molecular bonding. Outside the atom, ERSF modifies again to *maximum* ERSF, MERSF, gravity, expanding outward according the inverse square law, $1/d^2$.

Protons all have identical rest masses, as do electrons with each other, and neutrons with neutrons. The rest mass of the electron is 1/1,836 the mass of a proton. SF, RSF, and ERSF stabilize mass, allowing MERSF, being gravity's constant warping and dragging of spherical space by mass in the universal 3-D probability field.

Added together, all the proton and neutron masses are more than the mass of the nucleus. According to $E = Mc^2$, that mass is instead being used as the energy being allocated to the RSF to keep nucleons from flying apart. If the protons and neutrons are separated from each other, much RSF binding energy is released as radiation, as during nuclear fission.

Present day science authority claims that neither the SF nor the RSF exists outside the nucleus, but *HUT* challenges this belief with ERSF and MERSF. Also outside the nucleus, SF is proposed to be within electrons and neutrinos, binding their proposed mini-quarks, causing the electron spins which create the magnetism.

The modified aspects of the SF, such as covalent molecular bonding, challenges the belief that the SF and RSF do not extend beyond the nucleus, claimed within both Yang-Mills Theory and the Mass Gap Hypothesis, explained by Keith Devlin in *The Millennial Problems*, 2002, "…the strong nuclear force…can act only over a very short distance, on the order of the nucleus itself, since it does not bring together the protons in nuclei of two distinct atoms. (If it did, everything in the universe would implode, including us.)"

Higgs field decelerates the virtual 2 x 3 hyper spin dance to create quark-antiquark mass. Proposed: the mass of all quarks begin with song quarks and antisong quarks. String integrity is caused by constant tension. Changes of string length and spin frequency cause differing string tensions. With changing tension comes the changing of relativistic mass, allowing the six quark generations (Figs.XXI.7,8,9), which are measured from the outside as increased rest masses.

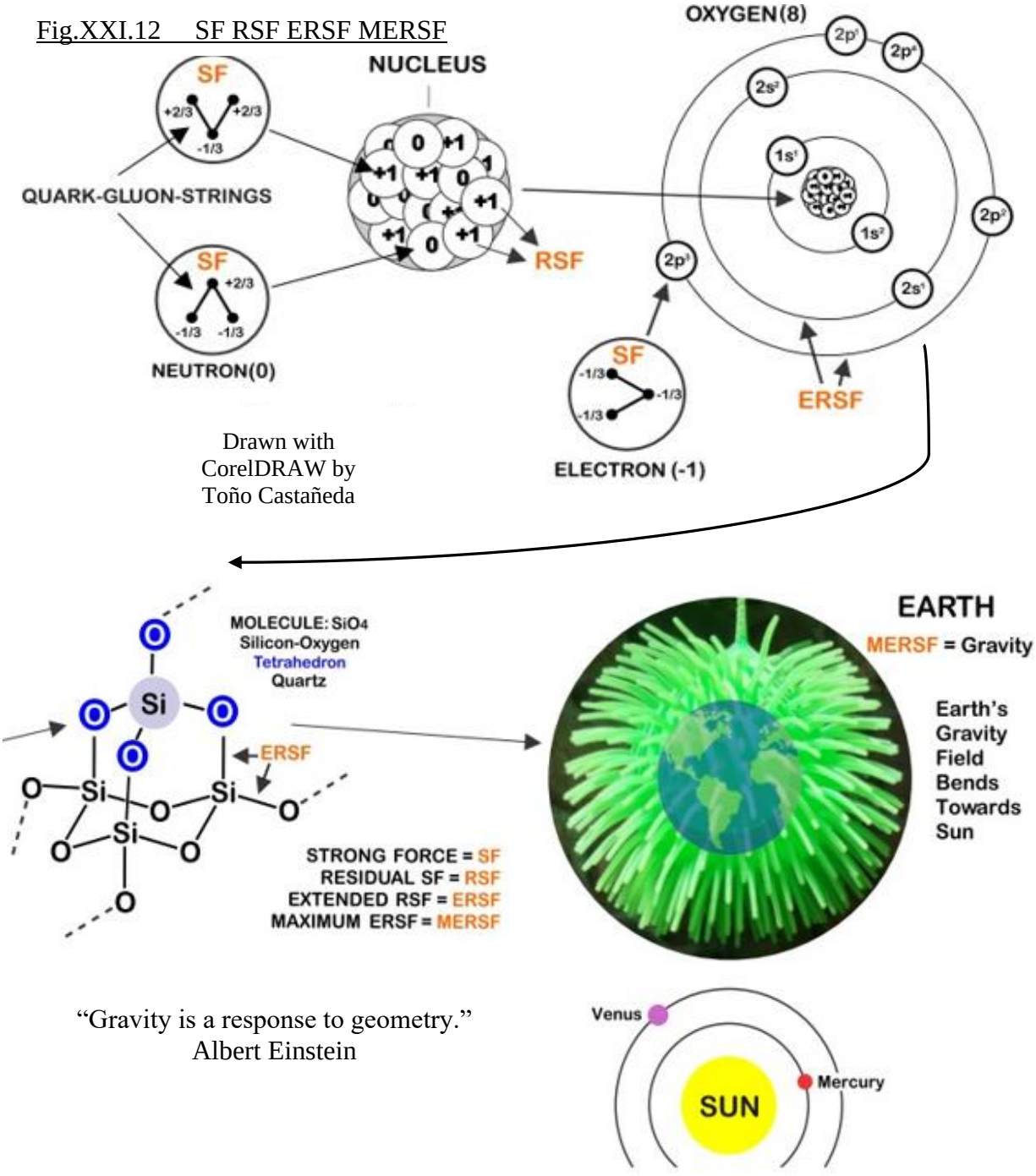
The universe begins and progresses with: **0)** zero-energy density void manifesting the **1)** chaotic virtual 1-D string. **2)** When ordered, the 2-D virtual 2 x 5 dance multiplies into the Higgs possibility field. **3)** One 2 x 5 dance pair transforms into a 2 x 3 hyper spin particle pair, **4)** which drag on the Higgs field to become quarks with mass within dancing quark-gluon string-tubes, bound with the void-empowered *Strong Force* SF, initiating 3-D + time probability field. **5)** *Residual* SF, RSF, reaches farther to bind nucleons in the nucleus. **6)** The *Extended* RSF (ERSF) reaches outside the nucleus to define probable electron numbers, fulfilling *electron fields*: *ELF* = $2(2H_D^2)$ = {2,8,18,32,32,18,8,2} and *sub electron fields*, *SELF* = $2H_C$ = {2,6,10,14} = {s,p,d,f}. This integrates all chemistry with the *SELF* rule of eight (2 + 6 = 8) and stabilizes an atom. ERSF allows one atom to steal one or more un-paired electrons (valence) from another atom due to the probability field's harmonic goal to fulfill eight electrons in the outermost field, in the s & p subfields: *s = 2* & *p = 6*. Then **7)** original void reaches out to be the weaker *Maximum* ERSF (MERSF), being the gravity field warping 3-D space.

Fig.XXI.12 depicts the unified field theory created by zero-energy original void, referred to as the zero cosmological constant. This void can create a virtual particle-antiparticle pair from nothing. The pair can collide, and release photons which return to the void.

Fig.XXI.12 shows the zero cosmological constant manifested as the strong force, SF, binding dancing quarks within quark-gluon string-tubes. The dance lends its over-flowing energy to manifest the mass of the protons and neutrons containing those quarks. Creation continues

extending its use of the SF into RSF to hold together nucleons, then into ERSF to allow the valence forces moving electrons between atoms and molecules, then into MERSF to allow gravity to warp space which holds the Earth in orbit around the sun.

Fig.XXI.12 SF RSF ERSF MERSF



"Gravity is a response to geometry."
Albert Einstein

To sustain beyond the virtual pop into existence and the inevitable instant annihilation, void imposes virtual 2 x 5 ordered dance. This dance multiplies into the Higgs possibility field. One virtual 2 x 5 dance transforms into one accelerating virtual 2 x 3 hyper spin dance which resists the timeless 2-D Higgs field manifests as the first quark-antiquark pair forming the Big Bang Singularity, BBS. The break in symmetry from 2-D Higgs field manifests space and time in the 3-D probability field. The BBS decays rapidly into the Big Bang with fly-away neutrinos

and anti-neutrinos. Next comes localized quark-gluon plasma. With time, cooling, and expanding, neutrons manifest and decay into protons and electrons, which combine into atoms, molecules, stars, and Earth. Creation is happening.

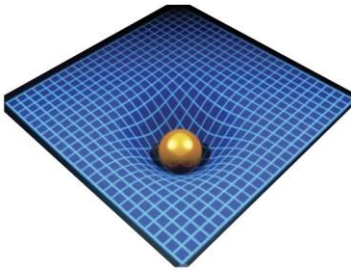
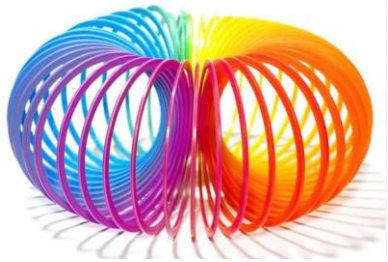


Fig.XXI.13 Insufficient warped space representation

The heavy ball pressing down on the middle of a large elastic sheet is the popular image meant to represent warped space around the sun. This is too inaccurate because the heavy ball pressing down must be caused by an outside gravity field, like supplied by Earth pulling down on the ball, not the gravity of the ball itself. The sun is the mass source of gravity's warped space that allows orbiting planets, not something more massive than, and separate from the sun.

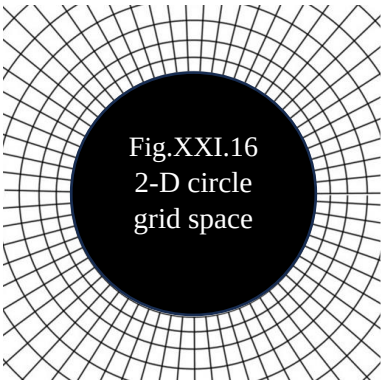
Fig.XXI.14 Slinky's warped space



This Slinky curves into a 3-D quasi-ellipsoid with a 2-D equatorial plane. Notice the static contraction close to the circular plane's center, and the expansion farther away. Bending something, it will contract inside and stretch outside. There is less space closer to the spherical center of the Earth, enabling objects to "fall". For us, gravity squeezes downward, contracting space and mass-energy into the center, while gravity is expanding into more space farther away.

Fig.XXI.15 Earth's expanding 3-D gravity field

As gravity's fall-lines radiate from Earth's center, they get farther apart as space warps according $1/d^2$. This is why at high elevation there is less air pressure than at low elevation, because there are fewer air molecules in equally sized areas, decreasing density. Gravity's warped space creates our experience of falling inward towards the gravitational center. In free-fall, we weightless since our feet are not blocked by the outward pressure of mass. Upon landing, controlled or crash, against the atomic pressure of the Earth pushing upward, we are no longer weightless.



In Fig.XXI.16, concentric 2-D rings represent orbitals in space around the sun. See the math in Fig.VII.2. The radiating lines from the center represent the $1/d^2$ expansion of gravity's warped space. In space around the sun, where air resistance is not a factor, all objects fall at the same accelerating rate. In freefall, the mass of objects within the dominant gravitational field does not matter. See footnotes for Fig.VII.4. Gravity is not the force of the mass of the lighter object being sucked by the biggest object. Gravity is simply the geometry of space. When two objects *collide*, e.g. two rocks, the *cumulative force* includes both masses.

"The two planets [Earth & Mars] affect each other through a phenomenon called 'resonance,' which is when two orbiting bodies apply a gravitational… pull on each other — sometimes described as a kind of harmonization between distant planets. This interaction changes the shape of their orbits, affecting how close to circular they are and their distance from the sun."
Mars could be driving 'giant whirlpools' in the Earth's deep oceans, new study finds
Laura Paddison, CNN March 12, 2024

"There was no attraction or repulsion, and certainly no action at a distance; all that happened was that bodies reacted to the patterns of lines of force in their own localities—in other words, to the field… Faraday published a paper formally proposing gravitational lines of force… Maxwell sent a… reply… that the gravitational lines of force could 'weave a web across the sky' and 'guide the stars in their courses.'" *Faraday, Maxwell, and the EM Field*, Forbes & Mahon

Fig.XXI.17 Warped space

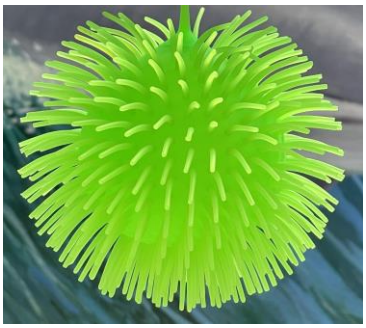


Fig.XXI.15 does not include the sun's gravity field effects. In Fig.XXI.17, let's pretend it is sun's gravitational field pulling on Earth's green lines. Earth's gravitational field follows those curved green lines. Earth's surrounding space is warped towards the sun. The same metaphor works for space's shape between Earth and moon: the rotations and revolutions drag around 3-D space. This also helps imagine the shape of space between the sun and the gravitational center of the galaxy. Expand the vision to all the warping space around all the mass in the universe, a unified perspective of space. The center of gravity of each person's body is surrounded by warped space.

Mass's motion drags on the 3-D fabric of space. Sun reaches out to pull down the warped space around Earth. Earth goes with the surrounding space. Like a big creature with strong arms named Sun, and a little creature with long hair named Earth: Sun's spatial arms pull Earth's spatial hair and swings Earth around in an orbit. Their contracted spaces hold them together.

Gravity creates pressure with warped space around Earth, which creates more pressure inside the sphere the closer the measuring point gets to the center. Going outward from the Earth's surface, gravity's pressure gets less and less, like the air at the top of Mount Everest compared to an ocean beach. The warping of spherically shaped space around mass creates a gravity well, being the pressure values according to the inverse square law.

Pressure increases with decreasing elevation, including below the ocean where the water pressure increases the deeper you dive. This pressure combines four predominant factors. At any point on Earth can be calculated: 1) gravity is an emergent property of the curvature of space, yielding a measurable centripetal pull at a specific distance from the center; 2) electrons of Earth's mass repel one another providing outward expansion; 3) what weighs down on the point from above, be it air, water, or a heavy backpack. And 4) because the Earth spins, there is the centrifugal inertia outward force, greatest at the equator and least at the north and south poles.

Resilience of spherical gravity-space

Chapter VI tells how "spacetime" is a misnomer. Instead, we have gravity-space. Space responds as mass moves through it. Falling is not a force acting on an object. Falling is due to the resilient spherical gravity-space attempting to maintain the sphere shape. Warped space around an object is also warped by other gravity fields. All centers of gravity attempt to recreate one united spherical shape of radiating space around it, gathering all mass back in towards one dominating central point, as it was in the beginning with the Big Bang Singularity: the BBS.

In Fig.XXI.17, green represents Earth and the effect of the sun's gravity on Earth's surrounding space. That space bends from the straight-out radial lines shown in Fig.XXI.15, which represents Earth's spherical gravity field as if it were not subject to the sun's gravity field. Gravity is the resilience of spherical space which is always trying to maintain and regain its single point centered spherical symmetry shown in Fig.XXI.15.

The fall line that an object follows is the radial line extending out from Earth's center. Standing on one of those invisible lines on the surface of Earth somewhere, the line goes up through the feet and body and out the head. Earth's mass and energy is all attempting, via those radial lines, to unify, to gather all surrounding mass and energy into one center. Space crushes

mass into the central gravity point. The massive sun is always attempting to annihilate distance between its predominant center of gravity, where exists the most concentrated space, and Earth's lesser concentrated space. The contracting of space towards the center of gravity is the attraction we experience, as mass goes where there is less space, not to where there is more space.

In Galileo's, Newton's, and Einstein's sciences, gravity is acceleration. In Einstein's extended science, gravity is not a force, instead it is a warping of space. We believe that the force of Earth's gravity is real, pulling us down. But freefall is the zero-acceleration reference, not the "stationary" ground we stand on. We are being accelerated upward by that stationary ground, which is why we can weigh ourselves on a bathroom scale. Anything nearby that is not supported by Earth's surface appears to be falling. The falling object is really what is weightless. Anything that is not in free fall is acceleration upward, and thus has weight. In the warped gravity-space, a object falling without resistance is able to be considered at rest and weightless.

When standing on Earth's surface, falling inward with the warped space of Earth's gravity equals the outward expansion caused by the Earth's internal pressure. Earth is stable against the gravitational collapse because the electrostatic repulsion between electrons resists the warped gravity-space. As single electrons are identically charged fermions, they repel and cannot occupy the same space at the same time, according to Pauli's exclusion principle.

Earth's mass provides heat pressure adding to upward acceleration away from Earth's center. Steam vents, geysers, volcanoes, and earthquakes are Earth's pressure release systems. Motions of tectonic plates help maintain Earth's shape. In places, seafloor spreads and upwelling of molten magma from the mantle creates new crust. In subduction zones, two plates converge and one slides below the other. Old crust is destroyed. Spreading and subduction zones comprise a dance maintaining balance, continuity, and constancy with gravity, allowing a temporary equilibrium of Earth's size and shape, enough time for life to thrive as we witness.

Like the slinky in Fig.XXI.14, Earth's sphere is more an ellipsoid because the spin at and near the equator creates the greatest centrifugal inertia force, causing the greatest bulging.

At Earth's surface, air pressure is "one atmosphere". Half way up a big mountain, fill a balloon with air. Go down: the balloon shrinks. Going higher, outer air pressure decreases until the balloon pops. That is why the air is pressurized inside airplanes—to maintain constancy.

Normally, cooling occurs with elevation gain. With a temperature inversion, at a higher altitude with blue skies due to a high-pressure weather system, the morning sun is warming Earth. After the night's temperature drop, down below in a smoggy city it can be much colder. The higher pressure at high elevation creates faster moving air molecules, but the city's fog and smoke block the sun's warmth, isolating the cold lower pressure in the city below. Normally, temperature and pressure rise at lower elevations.

The second law of thermodynamics says that heat flows from hot-to-cold because heat is increased particulate motion which creates more outward pressure. The mixing of the separated high and low pressures increases disorder, decreased entropy, and increases equilibrium.

Black hole singularity

From the warping of space around a black hole, scientists determine its mass, charge, and spin. Formed from very massive spinning objects, black holes almost always spin. They almost always have zero or near-zero electric charge since positive and negative charges mostly cancel. They say that a rare black hole, one which is not spinning and has no electric charge, is a 0-D singularity point. With spin, and maybe charge, the black hole is considered to be a small 1-D ring. A super small black hole with *mucho* gravity crushes huge quantities of incoming mass.

Inside a any size black hole is a 2 x 3 hyper spin dance, with a quark-antiquark pair at the two string ends. The bendable middle node remains void. The 2 x 3 hyper spin acceleration of

the quarks allow increasing relativistic mass as more rest mass is accumulated from outside, defining the black hole's gravity. For the 0-D black hole, the dancing quarks have transitioned to a short quark-gluon string-tube with a spin frequency close to light speed.

Outside the black hole, we measure its total mass by witnessing the 3-D + time probability field having space warped. The black hole's singularity is a mini big bang singularity.

1) Gravitational Waves: GW. 2) Gravity's Material Waves: GMW. 3) Gravity Field: GF.

1) Gravitational Waves (GW)

Uniform motion does not create GW, but accelerating motion does. Mass moving a constant speed in a straight line is not accelerating. Mass moving in a circle at a constant speed must be accelerating to overcome inertial resistance. Accelerating mass, such as the binary orbital motion of a pair of neutron stars, generates the invisible moving GW, and therefore loses some energy, affecting their orbital period. The tighter the orbit, the more GW are generated. Since generating GW is very inefficient, GW are difficult for us to detect except from very large masses. GW require energy to generate, energy removed from the binary orbiting objects, being gravitational radiation, degrading their binary orbits in time, leading to collision.

Extremely large orbiting masses with similar masses undergo extreme accelerations that generates the GW, unlike when one gravity field overwhelms another. The strongest GW are produced by black holes and neutron stars that orbit one another for maybe millions of years before the merging, all the time producing a continuous strain in space, with transverse waves (see page xiv) radiating out at the speed of light. When the masses merge, there is a sudden single pulse of GW. Supernovas also produce a sudden burst of GW.

Sun, Earth, and Moon moving relative to each other generate GW, but the amplitudes are so miniscule that with our current technology their signal is undetectable from the noise in space. The low mass of the Earth orbiting the Sun is not a very tight orbit and produces minuscule GW. The Sun orbits the Milky Way very slowly and also produces minuscule GW. The Sun's core rotates more rapidly than its surface, also generating minuscule GW. Even changing movements of the human body generates GW, though all are much too weak to measure. The first detection of GW occurred on September 14, 2015 by combined efforts of LIGO and Virgo.

Rarely, GW collide with objects and the GW can scatter or be absorbed. The Earth absorbs a miniscule amount of GW energy as it passes through. If gravitons exist, it would be at the point where the GW gets absorbed. And even then, the same way photons exist only when being absorbed, the graviton's existence would be only for that instantaneous moment.

2) Gravity's Material Waves (GMW)

GW travel at the speed of light. GMW do not. GMW can be caused, for example, by the rotation of Earth under the bulging of the oceans due to gravity of the Moon and Sun. An ocean tidal chart predicts GMW. A surface GMV occurs when a fluid is forced to move from an equilibrium position, like when a pebble drops on a calm pond. As the fluid sinks down with the pebble, the surface tension breaks and the pebble continues down, while the surface tension seeks to regain its fluid inertia. Rebounding too far, gravity pulls the water back down. Oscillations continue until the water regains its equilibrium. The oscillation caused by the passing pebble causes outward ripples on the water surface, called capillary waves. As the ripples reach the edge of the pond, they reflect back onto the pond. As the fluid sloshes back and forth, the fluid is returning to equilibrium. All this motion is GMW.

GMW are caused by wind blowing over water, producing a surface disturbance. Ocean tides, boat wakes, landslides, all are creating GMW, both surface and internal, on and in the fluid. Large tsunami waves also seek equilibrium through GMW repetitions. Energy dissipation of the GMW and surface tension returns the fluid's inertial equilibrium.

3) Gravitational field (GF) (also see chapter VII)

The GF is the *constant* distortion of space around objects. GF strength is directly proportional to the quantity of mass surrounding its center, and inversely proportional to the square of the distance ($1/d^2$) from the GF center. In a dominant GF, without air resistance, all side-by-side bodies accelerate the same in free fall, regardless of mass. In space, the GF is static, and its strength and direction remain constant, even though it is able to mold like clay.

The static GF is not radiating energy, even though GFs adapt, molding as mass moves around other mass. It is like a blob of clay that remains the same mass even as it is molded.

Rain falling to Earth demonstrates the GF, as do where planets orbit the sun (Fig.VII.2). The 2-D GW from far away can pass through the GF, distorting the relatively constant 3-D space. Earth, imagined as a lone object, forms a mostly static GF, distorting surrounding space, while producing no measurable GW. The GFs of the Sun and Moon molds Earth's static GF.

While spinning flips, a gymnast is mentally shrinking her body into an imaginary single point around which all else rotates. The body's center of gravity is not the eyes. The center of gravity for the human body is a bit below the bellybutton, to where the mass of even the food and water we consume must gather before exiting. The body's mass averages out to be within the single point, like the point at the center of Earth's gravity.

Eyes are blind to GF, but our mass-bodies follow the fall-lines toward the dominating gravity center. We see a rock falling. We calculate the straight line from which light curves away towards the GF center (Fig.XXII.3). We see effects of items moving through the GF, like the arc of a baseball, but we do not see the GF. Like we do not see the wind. We just see objects reacting to the wind, like blowing leaves. Nor do not see the lifeforce: we see an animal animated or we see the same animal as no longer animated when dead. We see the leaves at rest when the wind stops. We measure starlight continue in a straight line when not dominated by a strong GF.

Each person's eyes see from their own center of the EM field, extending into spherical space. In all directions from the eyes, the $1/d^2$ distribution of the EM field causes things farther away to appear constantly smaller. The center of one's hearing is each ear sensing sound, abiding by the spherical shape of space which diminishes sound's volume with distance. Each eye, ear, and rock is its own center of its surrounding EM, sound, and gravity spherical space. But it is the rock, if big enough, that can move smaller rocks, forcing them to share their GF center. If we did see the warped space of the GF, differences would become obvious when comparing looking up with looking down. But we do not see *from* the center of the dominating GF.

We try to shift away from thinking of gravity as an attractive force to the idea that GF is already contracted space, relatively constant in our experiences. When and where mass is, there is already warped space… not a gravitational "force", though we are trained to experience it as a force. Einstein told us that the GF is the shape of space around an object. With the GF being the relatively *constant*, though moldable, shape of space, there is not significant mass dissipation from our bodies, the Earth, or the sun. Their mass quantity is too insignificant to produce enough GW to measurably deplete the mass during the time that life has existed on Earth.

Except for radioactivity depleting mass, a one-kilo weight mostly stays one kilo. If not, we would make an equation to say the rate at which it becomes less weight due to loss to the GF. Mass' energy is measurably lost due to GW, but only significantly for huge mass objects like two orbiting black holes. Since space remains warped around any mass, and the GF is not the force that Newton claimed it to be, one can easily doubt that the gravity "particle", the theoretical graviton, a force-carrying boson, even exists for the GF. There is no force to carry. Warped space is a relatively constant aspect of mass.

The Void and the Unified Field: a summary of creation See Fig.XXI.18

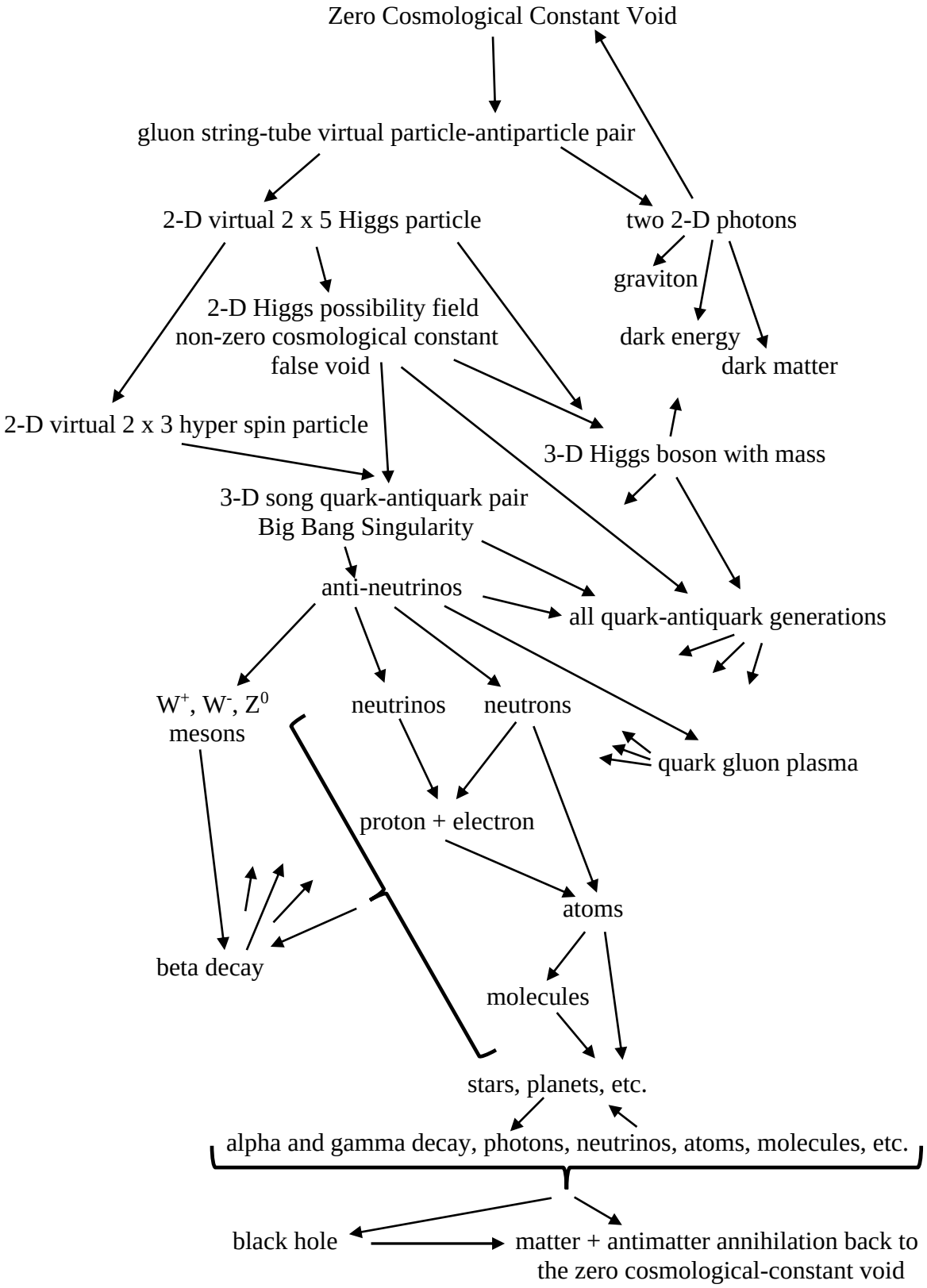
0. The source of everything is the zero cosmological constant (cosmo-con), being the zero-energy density of the original pre-space pre-time void—the universe's absolute reference.
1. The source of the tonal center, the fundamental constant of the circle and its potential to manifest complexity, is the zero cosmo-con.
2. The source of harmonic diversity of hologramic creation is the zero cosmo-con reference.
3. The source of quantum foam made up of virtual particle-antiparticle pairs and, due to lack of order, their instant annihilation into photons with order, is the zero cosmo-con.
4. The source of the ordered 2-D Higgs field 2 x 5 dance is the zero cosmo-con.
5. The source of time is the deceleration of virtual particles from the "speed of light" caused by Higgs field, creating mass and gravity, the source of which is the zero cosmo-con.
6. The source of the *strong force* (SF) allowing quark-gluon string-tubes with two nodes forming the first anti-neutrino then neutrino and 3-D space + time, is the zero cosmo-con.
7. The source of the quark-gluon plasma is the zero cosmo-con.
8. The source of the conservation of ± 1/3 quark units, being their electrical charges and matter-antimatter accounting, is the quantum foam from the zero cosmo-con.
9. The source of the first neutron and its decay into a proton and electron is the zero cosmo-con.
10. The source of magnetism of the spinning charged electrons is the zero cosmo-con.
11. The source of the weak force is the conservation of ±1/3 units, being the zero cosmo-con.
12. The source of the *residual* SF (RSF) holding protons and neutrons together in the nucleus, and SF creating the extra mass-gravity required for neutrons and protons, is the zero cosmo-con.
13. The source of atomic bonding into molecules through the *extended* RSF (ERSF), which defines the number of electrons in each field and sub-field, is the zero cosmo-con.
14. The source of gravity, the *maximum* ERSF (MERSF), is the zero cosmo-con source.
15. Life Force is the *intrinsic* Willpower of the zero cosmo-con.
16. The source of the one-many "I Am" self-identity consciousness is the zero cosmo-con.

The Particle Evolution Tree (PET) in Fig.XXI.18 attempts to organize the sequences of creation as a unified field, including void, the timeless 2-D possibility field, and the 3-D + time probability field. It is inevitably an on-going work, thus is simply an introduction. Like everything in HUT, refinement is likely required. Refinement of the signal to noise ratio is the purpose of science. We have inherited the will to understand from the beginning of the universe and this willpower will continue to build a better education system for humanity's future.

"In terms of the theorists, of course they always have to be ahead of the experimentalists. What I always like to say about the theorists is you should listen to theorists because they tend to have a wonderful nose for where interesting physics lies, but don't expect them to get it all correct, at least not in my field. So I think theorists learn much more when they find that their theory is wrong than when their theory is right." Douglas Osheroff

"So I think an essential ingredient in understanding why science progresses the way it does is that we know how to fix things when they are wrong. There may be individuals who are reluctant to change their own theories for personal reasons, but there is a community. And the community will insist that the science be correct. So I don't think there's any dilemma in addressing issues where science is wrong." Leon M Lederman

Fig.XXI.18 **Particle Evolution Tree (PET)**



Chapter XXII Imagine: Particles or Waves

The only way of discovering the limits of the possible is to venture
a little way past them into the impossible. –Arthur C Clarke's second law

Higgs possibility field

"The Higgs boson is the particle manifestation of an all-pervading quantum field, known as the Higgs field, that is fundamental to describe the Universe as we know it…Without this field, elementary particles such as the quark constituents of the protons and neutrons of atomic nuclei, as well as the electrons that surround the nuclei, would not have mass, nor would the heavy particles (W bosons) that carry the charged weak force, which initiates the nuclear reaction that powers the Sun." July 4, 2022, by Sci News;
CERN Physicists Release Most Up-To-Date Results on Higgs Boson's Properties

Created by the zero cosmological constant void, the virtual particle-antiparticle pair lacks order and must annihilate, producing two photons, being the first order introduced. The photons return to the void as a disturbance, allowing more virtual particle-antiparticle pairs.

Using the spin = 1 order of the photon as an example to start, a virtual particle-antiparticle pair becomes the stable 2 × 5 superstring dance by using $2H_D$, where H_D = {1,2,3,4,5}. Due to the order of this 2 x 5 dance, it avoids annihilation. Because this sustaining ordered dance contains, and is within, void, that void is not completely empty and is thus a false vacuum due to its nonzero value. As the ordered 2 x 5 virtual dance is sustaining, it cannot remain virtual, so it multiplies and becomes the timeless 2-D Higgs possibility field. The original photons still forming from annihilating quantum foam in the void, can radiate away through the Higgs possibility field as dark energy causing pre-Big Bang 2-D inflation.

One virtual 2 x 5 dances phase shifts to one 2 x 3 hyper spin dance, enabling the virtual particle-antiparticle pair to accelerate and drag on the 2-D Higgs possibility field, forming the first mass as a *song super-miniweight quark and anti-quark*, the proposed lightest of the six quark generations in Fig.XXI.8. These quarks are confined as two end nodes in the quark-gluon string-tube, which still contains void as its flexible empty center node. This 2 x 3 hyper spin dance is forming the Big Bang Singularity, the BBS particle, beginning in its own immeasurable 3-D + time. Being resisted by the Higgs field, the singularity's spin frequency accelerations explore all the different relativistic mass levels of the manifesting 24 quarks (Fig.XXI.8).

To better understand the separation of the timeless 2-D Higgs possibility field from the 3-D + time probability field, some readers may wish to ponder in more than 3-D space + time. See Fig.VIII.8 for the universe in 11 dimensions: one of void, nine of space, and one of time.

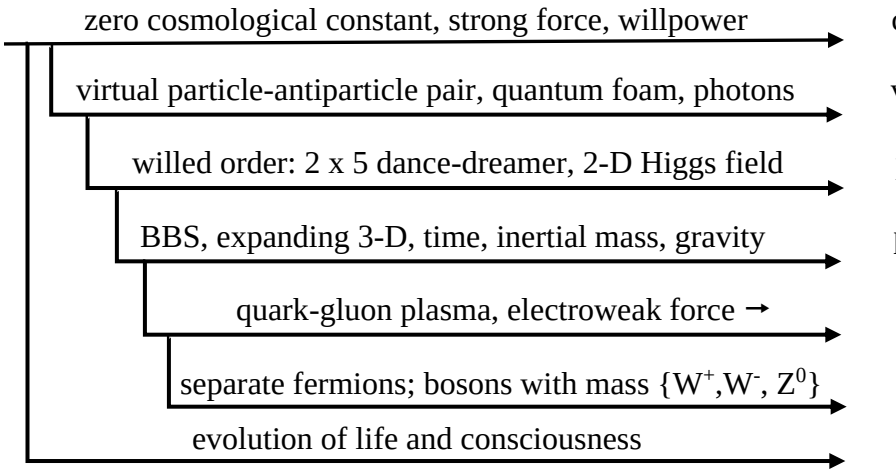


Fig.XXII.1
Tree of creation

With the Big Bang, the 2-D unified 2 x 5 dance Higgs possibility field remains unchanged even while the virtual 2 x 3 hyper spin dances are being formed. The more resistance to acceleration caused by the 2-D Higgs field, the more mass is created in the 3-D probability field. Energy, E, decelerates from the light speed, $1/c^2$, creating mass, M: $M = E/c^2$. The 3-D + time probability field triggers symmetry breaking from the timeless 2-D Higgs possibility field dominated by the 2 × 5 dance surrounding void. Due to this phase shift, more 2 x 3 hyper spin particles with mass are rapidly created as confined quarks in the 3-D + time probability field.

Two of these "song" quarks, one positive 1/3 unit and one negative, join into an anti-neutrino, followed by the first neutrino (Fig.XXI.7 & .III.4), which both fly away like arrows, creating the new 3-D space + time probability field, overlaying the timeless 2-D Higgs field.

Light travels as 2-D waves, experiencing no resistance from the Higgs field, separating from the virtual particles being decelerated into mass within 3-D space. This symmetry breaking allows 2-D EM waves to be separated from 3-D particles that had experienced resistance with the Higgs field, thus gained mass. The Higgs field is resisting *acceleration* and creating inertial mass, but is not resisting *constant velocity* of lightspeed momentum.

New quark mass becomes localized and confined as quark-gluon plasma. With rapid cooling and symmetry breaking, the quark-gluon plasma becomes specific quark-gluon string-tubes dancing. With increasing spin frequencies of the quark-gluon string-tubes, different quark generations join and decay, becoming neutrons, which decay into protons and electrons. The material universe is evolving. A proton and an electron join into the first neutral hydrogen atom.

The contained quarks account for only 1% of the mass measured in a single neutron or proton. The strong force, being "gluons", provides the energy needed to hold quarks together in the dancing quark-gluon string-tube within the nucleons. Excess strong force energy, according to $E = Mc^2$, converts into the 99% mass needed to complete the neutrons and protons. The strong force within the quark-gluon string-tube dance accelerates that dance's spin frequency, and with the quarks' accepted rest masses dragging more on the Higgs field comes more relativistic mass, which fulfills the accepted total "rest" masses required by protons and neutrons.

The strong force SF also leaks out of the neutrons and protons, referred to as the residual strong force, RSF, to hold neutrons and protons together inside the nucleus.

See Fig.III.4 & XXI.7 for examples of sub-atomic particles made from quarks. Proposal: quarks make up all particles with mass, including the three weak force boson particles: $\{W^+, W^-, Z^0\}$, seeming to be different generations of the three pi mesons: $\{\pi^+, \pi^-, \pi^0\}$. In resisting the Higgs field, the song quark pair manifests all 24 quarks (Fig.XXI.8) in various combinations within the quark-gluon string-tube nodes, contributing to all the mass particles in the universe.

There is the virtual Higgs boson in 2-D with no mass and no time which manifests the Higgs boson in 3-D with mass which is very unstable so it lasts very little time. During extensive searching among particle collisions, the manifest Higgs boson was announced as having first been discovered at the CERN particle accelerator on July 4, 2012. That Higgs boson was produced as a result of powerfully accelerated proton collisions. Scientists measured the Higgs boson as a particle in the probability field with inertial mass of ±125.35 GeV.

The reason that the finding of the Higgs boson became so important was it was the only verification imagined for the Higgs field itself. Before the Higgs boson was found, the mass of the weak force particles could only be justified by the theory of the Higgs field whose resistance causes mass. By the end of 1983, the W^+ and W^- bosons were announced to be each containing masses of around 80 GeV. The Z^0 particle has the mass of around 91 GeV.

Bosons: wave or particle

<u>4 bosons with mass</u>: Higgs, $\{W^+, W^-, Z^0\}$; <u>3 bosons without mass</u>: Photon, Gluon, Graviton

Bosons with mass are only observable when produced artificially in particle accelerators. The manifested Higgs boson has quarks at two string-end nodes, with a void node in the center; whose 2 x 5 dances with net zero spins must rotate clockwise and counterclockwise to be complete. The four bosons that carry mass, being: $\{W^+, W^-, Z^0\}$ and the Higgs boson decay into quarks, or quark constructs (when *HUT* proposals of mini-quarks in chapter III and Fig.XXI.3 are included). The family of mesons and their generations allowing mass differences includes from 32 to 140 different mesons, including three pions (pi mesons), $\{\pi^+, \pi^-, \pi^0\}$, four K mesons, and proposed by *HUT* to include the three weak force particles, $\{W^+, W^-, Z^0\}$. Mesons and weak force particles are alternatively claimed to mediate the weak force (Figs.XXI.7 & .8). Most Z^0 decay into a quark-antiquark pair referred to as jets. Most $W^{\pm}$ decay into an electron and a neutrino. Most manifested Higgs bosons decay into a bottom and an anti-bottom quark pair, forming a less massive neutrino that transforms mass to energy to fly away at high speeds.

1). Vector bosons include gauge and composite bosons.

a) Gauge bosons, spin = 1, carry force between fermions, including: photons (EM force); $W^{\pm}$ and Z^0 bosons with mass (weak force); and gluons (strong force). These represent the **vector field** (see Fig.XX.27), which includes a magnitude measurement with a specified direction.

b) Composite boson: made of quark fermions; e.g., mesons $\pi^{\pm}$ contain two quark types. Mesons mediate between neutrons and protons in the nucleus (Fig.III.6). Two fermions, like electrons, already have mass before combining into a pair to act as a single boson.

2). Higgs boson, net spin = 0, is not a vector boson. It corresponds to a **scalar field**, which includes a magnitude with no specified direction, and is claimed to mediate interactions with the Higgs field. The Higgs "false vacuum" field resists accelerating particles, and it decelerates them, transforming their own angular momentum into mass. Higgs field is not giving up its own energy, thus a Higgs boson is not a force carrying particle. The Higgs field is not adding or taking away energy. It is simply resisting its own massless accelerating virtual particle-antiparticle pairs and creating quark-antiquark pairs with mass, allowed because $M = E/c^2$.

3). Graviton: gravity's hypothetical boson, spin = 2. Corresponds to gravity's **tensor field**, which is warped space. Gravitons are supposed to carry the force of gravity similar to vector bosons, but gravity is not really a force because instead mass warps the geometry of space, causing centripetal force, so the hypothetic graviton might only be imagined. See Fig.XXII.5.

Tensor field is more complex than vector field, which is more complex than scalar field.

Photons are massless force-carrying "particles" (Fig.XXII.4) only when light waves collapse upon striking mass, where it transfers all its momentum to force, and the particle ceases to exist almost in the moment it is manifested. At constant light speed along the path of least resistance—a straight line, or a curved line when dominated by a curved gravity field—light is not accelerating, so light is not resisted by the Higgs field, and light remains without rest mass.

The gluon providing the strong force is *confined* with the quarks-in-nodes of the quark-gluon string-tube, and is not *carrying* a force anywhere, and does not need to be a particle.

Higgs field generates mass in quarks, which contribute about 1% of the mass of protons and neutrons. The strong force, void, manifests that 99% missing mass directly into a neutron or proton, by accelerating its quark-gluon string-tube's spin frequency, which increases the relativistic mass. That added relativistic mass accounts for the proton and neutron rest mass.

Atomic nuclei, made of protons and neutrons, contribute to more than 99% of the observable mass of the universe. But of that 99% universal mass, the quark constituents inside the nuclei only contribute to 1% of the mass of those protons and neutrons. This means that a bit less than 99% of the universe's total observable "rest mass" comes directly from the strong force manifesting the added "relativistic mass" by accelerating quark-gluon string-tube dances.

The 2012 detection of a Higgs boson came from colliding protons together. The Higgs field's false vacuum containing 2 × 5 virtual particle-antiparticle dances, surrounds zero-energy density void, an unlimited source for manifesting matter and antimatter in equal quantities. Higgs field also resists its own virtual 2 x 3 hyper spin particles, allowing them to become confined dancing quarks with mass, such as with the universe's original boson: the Big Bang Singularity: BBS (Fig.XXI.7). All mass-gravity comes from the zero-void, requiring ± 1/3 unit conservation to maintain the zero energy density, conserving the first law of thermodynamics.

$E = Mc^2$ = energy; M = mass; c = speed (of light) = distance/time (186,282 miles per second); c^2 = speed squared = acceleration. ∴ Energy equals mass transformed into acceleration.

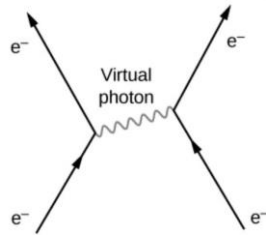
$M = E/c^2$. Since $1/c^2$ = deceleration; mass equals energy decelerated. ∴ When the dance within Higgs field decelerates energy, mass is created. (Note: the symbol ∴ means "therefore").

To clarify again, as was done in chapter III, the reason why ± 1/3 units are used when the electrical charges {-1, 0, +1} seem to say the same thing, is because for quarks and anti-quarks the ± 1/3 unit also accounts for matter and antimatter, making it the best way to keep track of universal matter and antimatter, and avoiding the confused error claiming missing antimatter.

If considered only in terms of ±1/3 units (ignoring mass), pi mesons, being pions, $\{\pi^+, \pi^-, \pi^0\}$, and the three weak force particles $\{W^+, W^-, Z^0\}$ are interchangeable. In Figs.III.4, .5, .6, .7, during beta decay, the π^0 mesons join in the quark exchanges among neutrons and protons. Differently, an electron-positron pair can decay into an electron neutrino and an electron anti-neutrino. Ignoring mass, looking at only the conservation of ±1/3 units, then electron + positron = electron neutrino + electron anti-neutrino: (3 x -1/3) + (3 x 1/3) = (3 x -1/3) + (3 x 1/3) = 0. It is accepted science that in the decay sequence there exists a lone Z^0, demanding it has (3 x -1/3) + (3 x 1/3) unit value, same as the proposed value of π^0, and the same value as the electron plus the positron. The mass being ignored is simply not addressing how energized is the particle's orbital frequency, specifically as in the 24 different generations of quarks in Fig.XXII.8.

HUT challenges gauge boson "particles" being credited for the forces being transferred. In 1932, Hans Bethe and Enrico Fermi decided that the electric field and the magnetic field transferred force not by warping space but by force-carrying virtual photon particles moving between electron "particles" when they come close together. They are believed to be "virtual" photons because their existence cannot be detected, nor can their direction of motion. One direction is considered normal movement through time, but the second option claims the photon is moving backwards in time, which is imagination and confusion only. Electric, magnetic, and EM force transference is accepted to be caused by the exchange of photon particles.

Fig.XXII.2 Two electrons



Exchange of a virtual photon is claimed to repel two electrons coming together and that without the photon particle there is no ability for the electrons to know to repel each other. But the field is based on $1/d^2$, indicating a gradual increase in strength as electrons approach each other, until a critical density of repelling force in the field. A virtual photon particle does not determine field strengths.

The virtual photon is shown in Fig.XXII.2 as being released and received at two specific positions, ignoring field influence. The photon particle does not need to be a force carrier communicating where two electrons begin separation. The field's rippling space communicates well. Without making any contact, the two electrons and the photon are all simply field waves. The wave allows probable futures. When the light wave contacts the mass of an electron, the light wave collapses to become a particle in position. Electrons are already accepted as

disturbances of their own quantum fields. The disturbed spatial fields communicate the forces just fine without designating a force carrying particle that does not exist except upon contact.

Think of ball games—tennis, football, hackysack—it does not matter. To receive the ball or to send it, we have eyes that see light. The EM field sends light waves that collapse to photons upon contacting our eyes. That is all we can see. Nothing else. For the position of where and when we need to be to receive the ball, or the position in 3-D space and the timing where we wish to send it, the ball is not the primary messenger for the player. Light is. We see and use light particles to mentally calculate what light waves are telling us. Momentum in the 2-D field of light carries the information. The photon particle is only manifesting when the light waves collide with the eye's mass. A ball is not the information that we receive first—the light is.

When we throw or kick the ball, we try to control the vertical angle, horizontal direction, and speed. After the ball leaves, one can do no more. When the ball is coming towards us, we use the EM waves in advance. We judge the angle, direction, and speed from which the ball will arrive so we can position ourselves to make contact. Until contact, the ball is only a light image manifesting in the mind. It is the contact moment with the localized point position of the ball that is the goal, when seeing it becomes no longer important. It is the non-local conic field of light waves collapsing to photon particles upon striking the eye that communicates the point source of the light, being light reflecting off the flying ball, that brings the precise information leading up to the ball arriving to the contact point with one's body.

The photon only collapses into position when making contact. Light is not a particle and a wave. Light is a particle or a wave. It is only a photon particle for the instant of making contact and for the instant of departure. Heisenberg's uncertainty principle says at extreme small-scales, light can either be measured as the particle's position or the wave's momentum, but not both at the same time. At the quantum level, the more we know of momentum, the less we know of position, and vice versa. It is not possible for the virtual photon "particle" to move between two separate electrons. Only the wave momentum carries information such as phase and frequency to the position and time where the wave collapses into the particle position. A photon particle does not travel, so it is not the force carrier. Upon collapse, the photon communicates the frequency with which the wave had traveled, and it shows our eye the precise direction of the light source. The sun's light arrives to the eye as a cone and collapses to a point, which we see as the sun. If we saw the invisible wave field, we would not see clear details. Only when the photons collapse upon striking the eye do all the distant light sources separate out to be seen clearly.

Based on the decision that a virtual photon communicates between two electrons, scientists decided to accept that the three massive weak force particles, $\{W^+, W^-, Z^0\}$, are the carriers of the weak force between neutrons, protons, et al. It is necessary to question the authorities and their claim of what is truth. For instance, in referring to neutron beta decay in Fig.III.5, inserting a neutral pi meson, π^0, to conserve ± 1/3 units, questions the need to include the massive weak force bosons traveling in beta decay, as science authorities currently demand.

While maintaining the conservation of ± 1/3 units, as in chapter III, adjusting the mass can be done by deciding which quark generations, Fig.XXI.8, can designate the precise ± 1/3 units present in each situation. But even then, the mass decisions are a challenge as demonstrated in acknowledging that the mass of the presently known quarks in a proton or neutron only adds to about 1% of the total mass needed to fulfill the actual mass of the proton or neutron. The rest of the mass manifests indirectly from the original void, the same void which is the strong force maintaining quark-gluon string-tube integrity.

Scientists require the exchange of virtual photons between two electrons, and this has been carried over to their theories for other fundamental interactions, being weak, strong, and

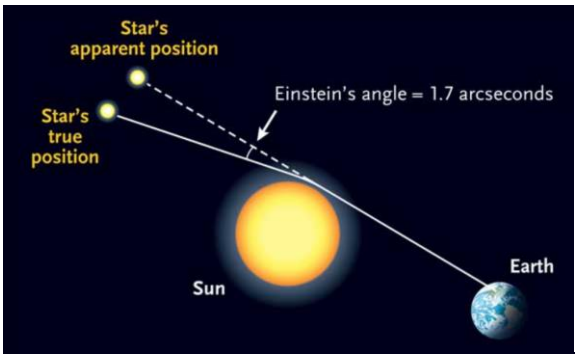
gravitational forces. But the gluon "particle" for the strong force is confined in the quark-gluon string-tube. A gravity field is not a force, just warped geometry of space. These perspectives challenge the need of graviton and gluon particles traveling as force "carriers".

"Over time the theory becomes familiar and is accepted as… possessing a high truth-likeness… The scientists' confidence… in the theory grows. It is eventually absorbed into the common body of knowledge which forms the current 'authorized' version of empirical reality."
Farewell to Reality, Jim Baggott

It is necessary to question all authoritative claims of force-carrying properties of gluons, gravitons, photons, and the Higgs, W^+, W^-, and Z^0 bosons. Focusing on particles while ignoring waves causes confusions. In both quantum and relativity physics: waves carry momentum through time, and particles indicate single positions in a specific time (Fig.XX.20).

Light bends in a gravitational field (Fig.XXII.3). Scientists who believe in gravitons say that when gravitons encounter photons, the force of the gravity particle changes the path of the light particle. Ignoring photon and graviton particles, a traveling field of light waves meet a stationary and constant gravity field of warped space. In response to the gravity field's static warped space, the moving light field continues in the path of least resistance, meaning the light varies from its straight-line passage and curves in the gravity warped space around a massive object. Eddington's solar eclipse photos of passing starlight bending around the sun proved Einstein's general relativity.

Fig.XXII.3 Gravity field meets light field



The mass-energy of a system is decreased when it emits a photon, and increased when the system absorbs a photon. A photon removes mass-energy from an EM field and transfers it to a different system, such as an electron. But between two stationary repelling or attracting permanent magnets, no energy is transferred because the field is static. A photon mass-energy transfer is not responsible for any force being transferred in the static magnetic field. This is similar to a static gravity field not requiring a graviton to transfer energy.

While rubbing a balloon with cloth, the balloon accumulates electrons, enabling it to stick to a more positively charged wall, demonstrating static electricity. When a static electric field source moves, it produces moving waves, a current. Likewise, a bar magnet, such as one stuck to a refrigerator, produces a mostly static magnetic field, constant in strength and direction through time, with no frequency, being zero Hz. Nor does a static magnetic field react with light. A moving permanent magnet does produce an electric field.

Though static electric and magnetic fields do warp space, so far it is not in significant enough quantities for humans to measure light curve away from traveling in a straight line.

Static magnetic field lines are seen formed by iron filings scattered on a paper laid over invisible field lines of one or two bar magnets. Fig.XIX.5 shows two pairs of bar magnets, one pair repelling each other, and the other pair attracting each other. The field lines around the two pairs are different, communicating whether they attract or repel. No particle is needed to pass that information when it is plain to see all the information is already there in the static fields. The "permanent" magnetic field is caused by the domain of aligned electron-spins inside the metal.

Some scientists say the magnetic field is actually the EM field and the force carrying particle is the photon which communicates the pushes and pulls of spinning electrons and their

magnetic fields. Some versions of accepted science say that the photon particle does all the communicating. Still, the invisible magnetic field organizing all those iron filings is already doing all the communicating necessary. No designated traveling particle is needed.

Dark matter halo

The galaxies at the edge of a cluster of galaxies orbit much too fast for the amount of observable mass that scientists calculated in the cluster, as do the stars at the edges of individual galaxies, violating the balance of gravity's centripetal pull and total galactic spin's centrifugal inertia force. The observable fermionic mass is only 5% of what is needed to warp space to allow what we witness. Scientists judged 95% of the universe's mass to be missing. This required introducing "dark matter" (chapter V) to supply 27% of the missing mass, and the remaining 68% being the mass equivalency of "dark energy". A dark matter halo concentrates the mass. Researchers can locate dark matter halos because they cause gravitational lensing, like warped space around stars, which bends the path of light coming from farther away galaxies. They see this in the distorted images in telescopes.

HUT's chapter V proposes cycling and radiating *light* are able to solve the mysteries of dark matter and dark energy. Dark matter halos and geons require further scientific discussions.

A confusion rises from the calculations. The 68% of the total mass in a galaxy attributed to dark energy is not remaining local like the dark matter halo surrounding the galaxy. Since the dark energy is radiating away and escaping the galaxy, the galaxy's missing mass is not being accounted for, unless it is constantly being produced, like the light from many stars, and from annihilating cosmic foam. They also say the dark energy contributes 68% to the total universal mass. So, what is it: universal or galactic? To balance the calculation for galactic missing mass, dark energy radiating away to expand space throughout the universe does not remain local enough to account for missing mass, unless renewed. One possibility is the Higgs boson is constantly manifesting and rapidly decaying in large enough quantities to make temporary mass present enough to account for the missing mass. Because of the conservation of ± 1/3 quark units, and the accelerating or decelerating string dance, Higgs bosons can gain or lose mass as it is created and destroyed. Thus 68% + 27% = 95% missing galactic and/or universal mass can maybe be attributed to: 1) dark matter, 2) dark energy, and 3) Higgs boson's mass presence.

The virtual particle-antiparticle pair manifests from original void, then annihilates into two photons introducing the spin = 1 circle pattern (Fig.XXII.4). Once the photon circle order was originally created, this allowed the new virtual particle-antiparticle pairs to incorporate the circle order into their dance to overcome the randomness leading to rapid annihilation. This dancing circle order demonstrated how to prepare the ordered singularity for the ordered Big Bang. *HUT* claims this adapting and preparation required causal Willpower intrinsic in void.

The Big Bang Singularity, BBS, is initiated when a 2-D virtual 2 x 5 Higgs dance forms into a 2-D virtual 2 x 3 hyper spin dance (Fig.XXI.11). This can accelerate because it can spin in one of two rotational directions, left or right. The singularity is gaining mass due to the 2 x 3 dance dragging on the 2 x 5 dances within Higgs field. The singularity's quark-gluon string-tube continues to accelerate its spin frequency, transforming into a series of increased relativistic masses, measured today as rest mass, establishing the 24 different generations of the constituent quarks seen in Fig.XXI.8. This preparation of the BBS occurs in a very small fraction of a second, *the first instance of time, in the first point location of 3-D space*.

Before the Big Bang, the 2-D Higgs possibility field expands into timeless 2-D space, containing both ordered 2 x 5 virtual dance, and the disordered virtual particle-antiparticle motions. The disordered dances are still instantly annihilating, causing light to manifest and radiate away as 2-D dark energy, allowing the rapid 2-D inflation in the early universe.

The BBS begins with 2-D Higgs possibility field resisting a virtual particle-antiparticle 2 x 3 hyper spin dance, manifesting the two dancing quarks with mass inside the BBS. The BBS is a single open string with the original song quark and antiquark on the two ends, with a bendable center node consisting of only void, not a third quark. With the Big Bang, the rapid multiplying of the massive quark-gluon string-tubes produces the first anti-neutrinos, which combine into neutrinos, both without bendable center nodes, which fly off to extend the Big Bang expansion into 3-D space + time. Original 3-D probability field expands outward with the anti-neutrinos and neutrinos, overlaying the separate 2-D Higgs possibility field with its 2 x 5 virtual dances. This is the symmetry breaking.

The Big Bang has begun and it rapidly creates the first localized mass: the quark-gluon plasma. Annihilating virtual particle-antiparticle pairs still produce photons which fly off as dark energy. The new localized quark-gluon plasma restricts light's movement, which can no longer radiate away so freely. Not going away, dark energy expansion slows, slowing the early universe's rapid 2-D inflation. The quark-gluon plasma absorbs and reemits light that accumulates *due to the extremely curved space,* as non-radiating encircling light in 2-D dark matter halos underlying 3-D space.

A bounded system is restricted to a finite region of space, such as a human body or a gravitationally bound dark matter halo. In the early universe, quark-gluon plasma cools to become gas, then coagulates to become stars, and gathers to become galaxies. All this occurs within the dark matter halo, a bound system. The dark matter halo's shape began as a sphere, rather than radiating light, interacting with its own EM field gravity. With time, with mass forming in the halo, mass density lessened with distance from the galaxy center, and the massive dark matter halo modified into more of a fried egg shape.

A heated gas with molecular kinetic energy in a bottle is a bound system. The cooled bottle, with gas particles moving slowly inside, has a certain weight of the total rest mass. With added heat energy, kinetic movement of the gas inside increases, which adds mass equivalence, referred to as relativistic mass, while it is measured as rest mass from the outside since the total weight of the bottle increases. Particle and nuclear physicists, and other scientists discussing special relativity, often avoid using the idea of relativistic mass, preferring the term rest mass, which they refer to as invariant mass. The problem with this is that the light's momentum has relativistic mass energy which adds to electrons' rest mass. Yet still, they say light has zero rest mass, and they invent a mysterious dark matter to be able to ignore light's relativistic mass.

Single photons, or multiple photons moving in phase as conical rays of light in a single average direction, reveal only zero rest mass because light does not exist in any centralized 3-D rest frame. When two or more light waves move in different directions, the total momentum is said to have a center of momentum, being a center of a rest frame. This means that the multiple moving photons together have a rest mass even though separately they do not have any rest mass. The light's total kinetic energy in the bound system, its relativistic mass, is considered to be rest mass in the center of the momentum, allowing the sum of the rest mass of the system to be greater than the separate constituents' total zero rest mass. This makes light to be dark matter.

The balance of universal 3-D space occurs between combined 3-D mass-gravity contractions and the 2-D radiation expansions. Acoustic oscillations manifest in a region dense with quark-gluon plasma and dark matter, where the increased gravity is attracting more light. It is here, while some light is trying to escape, that much of the radiating light gets absorbed by the plasma, creating heat, resulting in increased outward pressure. The competing push and pull of gravity's centripetal pull inward and the increased outward pressure creates acoustical oscillations, similar effects as when differences in the velocities of air particles in a flute create

varying pressures resulting in sound waves. Throughout the plasma, the pressure differences result in spherically expanding sound waves that speed away in all directions.

Light that is not absorbed by plasma interacts with only the gravity field, without creating acoustical pressure. The light that does not radiate away can remain close, cycling and becoming part of the preexisting dark matter halo. The light that had been absorbed by the plasma, which expanded outward as acoustical oscillations, is reemitted by the plasma as EM radiation, diffusing with $1/d^2$ if it escapes the dense gravity field. That escaping light relieves some of the acoustical oscillation's pressure, allowing gravity to dominate more and the plasma can form hydrogen, helium, stars, and galaxies.

With time, expansion, and cooling, as the quark-gluon plasma transformed into atoms of hydrogen and helium, stars began and the universe became mostly transparent. Due to internal nuclear reactions, the stars' rest mass decreases as mass-energy escapes as EM radiation in all directions, setting out to saturate the young continuing-to-expand universe as *dark energy*.

Within the dark matter mystery, galaxy NGC 1277, near the center of the Perseus cluster, is an added dark matter mystery. Observations have shown that nearly all the mass required for the witnessed gravity is accounted for by star mass, requiring not even 5% dark matter, much less than expected. NGC 1277 is a rare relic galaxy, the remains of a giant galaxy from the near-beginning of the universe. NGC 1277 is more massive than the Milky Way and has no neighbors close enough with which to significantly interact.

Since NGC 1277 had formed from merging fragments of the original giant galaxy, in time most of the dark matter radiated away as light and is no longer bound up in the halo. The dark matter had been essential for the original giant galaxy to help bring together the plasma into gas, then stars, but the remnant galaxy did not have those protogalactic needs. The remnant NGC 1277 galaxy just did not create, inherit, nor maintain the dominant dark matter halo.

Eons of Geons

The following quote is by John Archibald Wheeler, *Geons, Black Holes, and Quantum Foam*

"…in the spring of 1953, I began to think about the fact that if light is influenced by gravity, then gravity must be influenced by light. To put it differently, light not only responds to gravity; it creates gravity. This was not itself a new idea. Einstein had showed that *all* energy, not just the energy locked up in mass, is a source of gravity…How much light would it take…to create so much gravity that light would hold itself together? … if the sun were replaced by something vastly more massive (but no larger), light could be caused to bend so much that it would circle around the object…what if we got rid of the object and cranked up the light intensity to such a level that light itself created an equally strong gravitational field? The light would continue to circle, held in its orbit by its own gravity… This hypothetical entity… I called a geon (*g* for 'gravity,' *e* for 'electromagnetism,' and *on* as the root word for particle) … There is no evidence for geons in nature, and later I was able to show they are unstable … it was conceivable that once quantum affects were taken into account, much smaller geons might be possible…Einstein…said that he himself had considered geon-like compressed energy, but of a smaller size… My discussion of geons with Einstein occurred only a few months before his death in 1955."

Today, debates continue about whether geons could be stable. The instability that J. A. Wheeler first theorized was because he believed that the gravity field disperses energy equivalent to mass, meaning the geon would constantly lose mass-energy until dissipated. But the gravity field of the mass from quarks, the Earth, sun, moon, and our bodies does not dissipate significant mass-energy as do gravitational waves. In mathematics, Earth's gravity would be diminishing if it were required to constantly give away mass-energy, even if the dissipation time would take so

long as to make the mass loss unable to be witnessed. Gravity fields are relatively stable space which does not constantly deplete significant mass.

Duality-speak: Electrons have a negative charge. Unity-speak: Electrons are a negative charge. The charge cannot be removed from the electron. Neither can its mass be removed. The charge and mass remain constant. The existence of electric and gravity fields do not diminish the charge or mass of an electron. When an electron is pulled to one atom from another, the electron mass moves from one atom to the other. Sir Joseph John Thomson in 1897 taught us that the electron's charge-to-mass ratio is a constant number. Robert Andrews Millikan in 1910 taught us that the electron's charge is a constant number. This means that the mass of an electron is also a constant number—not dissipating with charge nor gravity— $9.1093837015 \times 10^{-31}$ kg.

Theorized geons, like dark matter halos, would have relativistic mass stored in momentum, creating a constant gravity field. In joining, geons produce insignificant gravitational waves and thus might still dissipate momentum energy registered as a lowering of frequency, but that is so slight as to be not measurable. Do electrically charged fields of a proton or an electron, or their static gravity field, diminish the particles' masses? No. Does the strong force, charges, or gravity of quarks diminish significant mass? No. Does a theoretical solo geon necessarily dissipate significantly as a result of defining its own gravity field? No.

Before the Big Bang, before 3-D space + time, the first light resulted from the colliding and annihilation of the virtual particle-antiparticle pairs (quantum foam) being created spontaneously from original void. The spontaneous annihilation into two photons was due to the lack of order. But once manifested, the photons demonstrated the order needed, a 2-D dance called spin = 1, Fig.XXII.4, which the void modeled to begin organizing the dance of the virtual particle-antiparticle pairs, allowing one pair to sustain long enough to break away from the definition of virtual, allowing the formation of the BBS composite particle gaining mass.

With the Big Bang, the expanding ordered 2-D Higgs possibility field also contains disordered quantum foam continuing to manifest and annihilate into photons as light waves, preparing the background for the expanding 3-D + time universe. At first, the 2-D light waves radiate away as dark energy, causing rapid 2-D inflation which cannot accumulate. As the light-obstructing quark-gluon plasma forms, not all of the 2-D light continues to radiate away, so the light turns in upon itself. The mass-equivalent light energy accumulates into a geonic dark matter halo. Quark-gluon plasma and hydrogen-helium gas convert their mass into stars and galaxies, where there is also found today the surrounding dark matter halos.

When light momentum radiates away in a straight line, the velocity of light is constant, with no acceleration. With the hypothetical existence of a geon, and a dark matter halo, light is going in a quasi-circle. A moving car with rest mass at a constant speed in a non-linear direction, such as a circle, requires acceleration because it must overpower inertia. If the light continues going the same speed of light but not in a straight line, instead going in a circle, the light still should not be accepted as accelerating because space is warped and the light continues to travel inertia's path of least resistance. It is increased resistance that requires acceleration to go the same speed. If light could accelerate, then the Higgs field would give light mass. This is not able to be invoked because light cannot accelerate nor decelerate from the speed of light.

The EM geon wave is bound by its gravitational self-interaction. Since Pauli's exclusion principle is not valid in 2-D space, geons, like radiating light cones, interact with each other and emerge unchanged except for constructive or destructive interference patterns.

From light's perspective while traveling in a circle, such as orbiting a black hole, the circumference is reduced to zero since the distance in direction of travel is reduced to zero.

Virtual photons, gravitons, and gluon strings

"In the beginning God created… [all] was without form, and void; and darkness was upon the face of the deep. …the Spirit of God moved…" Genesis 1:1-2

Fig.XXII.4 Light: cycling vs radiating See Fig.XXI.11.C

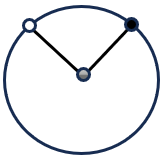
Photon constituents: virtual particle-antiparticle pair in a string-tube.

Cycling light: photon

Radiating light: wave

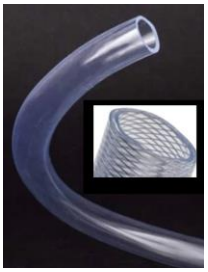
No charge; no mass. One end moves; the other remains in the center void, controlling the photon pattern. In cycling light, the particle finishes the single cycle after spinning around the 360° circle once, a spin of 1:1, or **photon spin = 1**. The radiating light repeats the pattern after one wavelength.

Fig.XXII.5 Gravitons See Fig.XXI.11.C



One graviton is two superimposed photons. One virtual particle and one antiparticle on two string ends each spin one circle per cycle in opposite directions, passing every 180°: counted as two 180° cycles in one circle, 2:1. Two opposite string ends remain in the center void, controlling the **spin = 2**

Fig.XXII.6 Creating the quark-gluon string-tube



The quark-gluon string-tube is the gluon strong force holding the dancing quarks together and separate. Like a photon, the gluon has a spin = 1. The photon in Fig. XXII.4 is a virtual particle-antiparticle pair dancing at the ends of a virtual gluon string tube. A massless gluon tube is woven with the dance, enough to sustain pressure differences between the inside and the outside, allowing the strong force to hold the quarks in positions. The central void tube controls the dance of virtual particles and quarks.

The gluon void tube is like light in which the distance in the direction of travel reduces to zero and time does not exist. From the tube's perspective, there is no length nor time required to weave. From 3-D mass perspective we require a tube length and a time in which it exists.

The void in the center is in control, it is the, the hand of God-Willpower. Psalms 103:25: "In the beginning you laid the foundations of the earth, and the heavens are the work of your hands." Before the Big Bang, the first order is in the photon pair which manifest from the annihilation of the virtual particle-antiparticle pair which are nodes on the ends of a virtual string. With the spin = 1 introduced by the photons, there is order.

"'Let there be light', and there was light… God divided light from darkness." Genesis 1:3-4

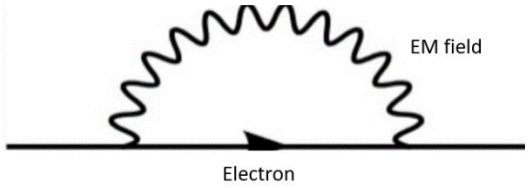
From spin = 1 circle order evolves the virtual 2 x 5 Higgs dance, the virtual 2 x 3 hyper spin, then quarks confined in a quark-gluon string-tube for the 2 x 3 hyper spin Big Bang Singularity, BBS (Fig.XXI.11). Both Higgs boson and BBS dances have void-nodes in the center, controlling the evolving dances. Decay evolves into torquing arrows of neutrinos and anti-neutrino—with no bendable center nodes, followed by the neutron, proton, and electron, each with a third quark in the center node. All sub-atomic particles evolve from the pattern first introduced before time in the cycling light which dissipates back into the void.

An electron self-interacts with its own EM field

When electrons interact with an EM field, both direction and speed of electrons can change due to added energy. According to $E = Mc^2$, the added energy from the EM field of waves has mass equivalence. In forming the quantum electrodynamics theory, QED, scientists confronted an electron's increase of mass when self-interacting with its own EM field.

In 1929, Werner Heisenberg and Wolfgang Pauli were developing an EM quantum field theory. There arose a problem they referred to as the "self-energy" of the electron, when an electron interacts with its own EM field. Infinities in their math and other details haunted them. The problem's solution developed between 1947 and 1949. They calculated the "bare" mass of an electron, when not interacting with its own EM field, and they also calculated the added mass created by the electron interacting with its own EM field. The bare mass of the electron combining with the field mass, due to the interaction, needed to be added together to form the "dressed" mass. The science authorities gave the EM field permission to enhance mass in electrons, similar to dark matter, being light, an EM field, enhancing mass in galaxies.

Fig.XXII.7 Electron self-interacting



An electron emits a mass-equivalent EM field, then afterwords that EM field is reabsorbed by the same electron. All energy has mass equivalence. Not all energy counts as rest mass. The EM field moving at the speed of light is an excited state compared to the charged electron in an atom.

A dancing proton creates an EM field. Interacting with it, it gains mass. Likewise, dancing charged quarks interact with their own EM fields. In the early universe, light restricted by quark-gluon plasma created localized EM relativistic mass which we call dark matter halos.

Moving electrons, protons, quarks, including quark-gluon plasma, all create EM fields, so they lose mass, and then self-interact with their EM fields, gaining back their own mass. This is not valid for a "photon" interacting with its own EM field since it does not have an electric charge and cannot interact with itself. Without a light wave reacting with a charged particle, no mass transfers. If dark matter is a very large localized halo of light, it can interact with other particles that have charges, and add mass to their system just like the momentum of a radiating EM field adds its own relativistic mass to an electron.

Superstring theory

"…we imagine that strings are *the* most elementary ingredient in the universe… …the detailed pattern of vibration executed by a string produces a specific mass, a specific electric charge, a specific spin… At the ultramicroscopic level, the universe would be akin to a string symphony vibrating matter into existence." Brian Greene, *The Fabric of the Cosmos*, 2004

In 1919, formulating a possible unified field theory, Theodor Kaluza extended Einstein's 4-D spacetime to include a fifth dimension which defines a circle. Kaluza's 5-D circle moving in 3-D space + time defined a cylinder that could remain in 4-D, making his math simpler, but Kaluza continued with the 5-D cylinder version. Regarding that proposed unified field theory, Einstein wrote to Kaluza on April 21, 1919, saying, "the idea of achieving by means of a 5-D cylinder would never [have] dawned on me. At first glance I like your idea enormously."

In *HUT* Fig.VIII.8, regarding eleven dimensions, the circle *potential* first enters at zero and one dimensions, 0-D and 1-D. Original photons are created by the annihilation of the virtual particle-antiparticle pair, resulting in two photons which contain the 2-D spin = 1 circle pattern. In *HUT*'s 11-D scenario, the stabilizing of the circle dance begins in 2-D (Fig.XXII.4). *HUT*'s 0-D void with its potential circle + space's {7-D + 8-D + 9-D} + time's 10-D = Kaluza's 5-D.

Einstein helped Kaluza publish, though it was delayed until 1921. Oskar Klein, after working with Niels Bohr, independently proposed in April 1926 the idea of an additional small hidden tightly curled 5-D circle-cylinder dimension. Einstein mentioned the Kaluza-Klein theory of compactification to Paul Ehrenfest on September 3, 1926, "Klein's paper is beautiful and impressive, but I find Kaluza's principal too unnatural." Later in a letter to Hendrik Lorentz,

Einstein wrote, “It appears that the union of gravitation and Maxwell’s theory is achieved in a completely satisfactory way by the five-dimensional theory [of Kaluza-Klein-Fock].”

Klein’s compactification of Kaluza’s extra dimension into a tiny cylinder allowed a quiet introduction of the string-tube theory. Through the 1930’s and 1940’s, Klein continued pursuing his small circle dimension, as did others. The idea was sometimes referred to as “Kaluza’s miracle”, but by the 1950’s the theory had become mostly ignored.

In 1968, Gabriele Veneziano was contemplating the collision and scattering of pi mesons (pions). Veneziano reported the probabilities of what happens in the scattering event, finding his results were the same results as presented in the beta function by mathematician Leonhard Euler. The “Veneziano amplitude” was his formula for the scattering of four strings. In 1969, Leonard Susskind followed up on this idea and postulated that two tiny loops of elastic string could bind together and oscillate, showing the same resulting probabilities as Euler and Veneziano had each separately found. Independently, two other men, Holgar Nielsen and Yoichiro Nambu, separately discovered the same thing.

Susskind was using closed strings for bosonic mesons, whereas *HUT* uses open strings for the quark-strings within the pi mesons (pions). At first, early string theory only focused on closed-string bosons, overlooking that bosonic mesons are not fundamental particles because they contain quarks which are fermions with spin = 1/2. Inside neutrons and protons are the quark-gluon string-tubes, which *HUT* proposes are dancing 3-node open-strings (Fig.XXI.11.A) containing the strong force. The strong force, SF, is extended as the residual strong force, RSF, witnessed as it keeps neutrons and protons together. A charged pion (Fig.III.1 & .4) contains a 2-node quark-gluon string-tube. *HUT* proposes (Fig.III.4) the neutral pion is a 4-node tetraquark. If the string-tube, in which quarks are confined, breaks, immediately a newly created quark-antiquark pair plug the two new ends. Quarks have never been observed individually, though they have been proposed as separated inside quark-gluon plasma.

The evolving string ideas influenced some scientists into thinking that the fundamental point particles of quantum physics are instead vibrating strings with specific harmonic patterns. The difference between quantum theory and string theory is basically about clarifying position or momentum—particles or waves. If string theory could be successful, it would require reexamining quantum theory and the particle-wave conundrum.

“Superstring” theory began around 1972 uniting two different projects, one being Pierre Ramond writing about fermion strings, and the other being John Schwarz and André Neveu working on the boson string theory. Combining the perspectives of the three scientists, bosons and fermions became part of the same superstring theory. In naming superstrings, the supersymmetry theory may or may not have been part of the decision making. History is not in agreement, but it is possible that the supersymmetry of bosons and fermions came about from the name of superstring which already served both fermions and bosons. The supersymmetry theory, which lacks evedince, and thus proof, demands that for every fermion particle there is a partner bosonic force-carrier particle, requiring, for example, a bosonic photon to have a fermion partner which they named a *photino*. A string theory does not require acceptance of supersymmetry.

In 1974 at Caltech, John Schwartz and Joel Scherk were working together on the bosonic string theory. It predicted a particle with spin = 2, surprising them since they were only thinking of the strong force. The spin = 2 string fit what they needed to move forward with the theory of quantum gravity. See Fig.XXII.5. Suddenly the string theory worked with gravity and the strong force and seemed to be evolving towards a theory of everything.

HUT proposes that total mass of a quark-gluon string-tube is the quark’s rest mass added to the relativistic mass created by spin. Increasing the dance’s orbital frequency increases total

mass of the system. Tension, being how tightly the string is stretched, results from the string's length, the orbitron's rest mass, and the spin cycle frequency. Even if all quarks have equal rest mass, the string's spin frequency influences the particle's total mass, allowing different quark generations (combining $E = Mc^2$, $c = f\lambda$, and Planck-Einstein relation: $E = hf$). See Fig.XXI.8.

Superstrings are discussed as either closed strings, being looped, or open strings, with two ends. Popular superstring theory has been more focused on the closed strings, whereas *HUT* plays with open strings. With $H_D = \{1,2,3,4,5\}$ inserted into $2H_D$, the 2 being for two string ends, Fig.III.3 & .4 shows the *HUT* version of the quark-gluon string-tube for fermions. The open string can have: 1) just two nodes on the ends of the string, 2) three nodes, with one in the middle (containing either a quark or void), or 3) the π^0 spinning tetraquark. The harmonic dance number set, Fig.XXI.11, shows the winding (cycle) numbers for the dancing ends of the open three-node strings, and what are perceived as closed strings of photons.

An open superstring allows one quark at each of two or three nodes of a quark-gluon string-tube. Each quark is spin = 1/2. With three nodes, two at the ends and one in the middle, each half of the dancing string spins separately. With two nodes, the string twirls like a baton (mesons) or flies like an arrow (neutrinos), neither having a node in the middle. The Higgs boson with mass, whose string's middle is still in void, though it bends like a node, is an open string 2 x 5 dance and must rotate clockwise and counterclockwise, creating a net spin zero. As with the original virtual particle-antiparticle pair dancing with void as the center node. The 2 x 3 hyper spin BBS also has void in a bendable center node. The neutral pi meson, a tetraquark with four nodes, Fig.III.4, is similar to a four-pointed ✣fidget spinner with a non-bendable center.

Dimensions

A string begins as 1-D, but it manifests further into 2-D when spinning a circle. Working on string theory, theorists ended up adding more dimensions than Kaluza's 5-D. Schwarz had proposed 10-D, being nine of space and one of time. Dimension numbers rose up to 25 or 26, then settled back down to Edward Witten's "M theory" with 11-D. *HUT*'s Fig.VIII.8 includes 0-D, the zero-energy density void dimension, plus the nine spatial dimensions, plus the tenth dimension for time, totaling eleven separate dimensions.

At the end of 1976, Eugenio Calabi and Shing-Tung Yau proposed shapes that became accepted for explaining the motions within the hidden dimensions of superstring theory. The purpose of Calabi Yau space is to contain dimensions which are much too small to just assign normal space. Calabi-Yau space advanced to more or less 10^{500} options, which are claimed to be supported by superstring theory. *HUT* avoids these and demonstrates 11-D in Fig.VIII.8. *HUT* mostly emphasizes 5-D: 0-D void, plus {1-D, 2-D, 3-D} space, plus 4-D time. For spin number limitations of open-string dance's 2-D winding numbers, *HUT* uses harmonic dance: $H_D = \{1,2,3,4,5\}$ inserted into $2H_D = \{2 \times 1, 2 \times 2, 2 \times 3, 2 \times 4, 2 \times 5\}$. See Fig.XXI.11.

Most open-string dances have two string ends dancing, e.g. 2 ends dancing 5 circles per cycle (2×5). See Fig.XXI.11. Proposed: the photon has only one end spinning, the other string end is within the circle's central void, causing the spin. See Figs.XXII.4.

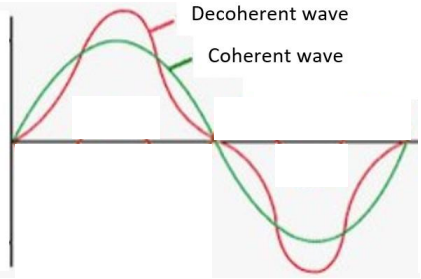
Wave decoherence and collapse to particle.

When the 2-D light wave momentum becomes disrupted by the 3-D environment, the 2-D wave can suddenly lose its coherence and collapse into a 3-D particle. Decoherence refers to the loss of the wave's coherence, resulting in its collapse to a particle in position (Fig.XXII.4 & .8).

Some scientists say there is no proof that a wave collapses upon contact with mass, allowing more imaginative theories. But the proof is already in the double slit experiment, in the interference patterns that result on the recording screen. When individually released photons go through the slits in the form of 2-D waves, they only collapse back to photon positions upon

arriving at the recording screen. After many photon-point arrivals get recorded, the projection screen reveals that they had gone through both the slits. The wave interference patterns are still able to be witnessed on the recording screen among the large population of photon points that had resulted from each light wave quantum collapsing into each photon light particle.

Fig.XXII.8 Decoherence

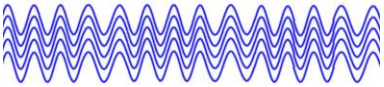


With decoherence, the wave collapses to a particle in position. This is the crossroads separating the wave from the particle. A traveling wave is sensitive, able to collapse into the particle at any contact point. In consciousness, when the mind's *frame of reference* shifts from internal 2-D timeless images to flesh's external 3-D in time, incorporating sensory input. This is the mind's decoherence transition from the dream's momentum to the body's position upon waking.

From the right side of Fig.XXII.8, slide one finger pointing to the top of the page towards the left. The green wave touches the finger where the light would collapse. The photon particle only exists for the instant because it transfers its momentum at that specific position to whatever is in its way, then it exists no more.

The collapse to the photon onto the eye communicates to the brain the source position from where the light arrived. The human eye cannot detect a single photon. Retina sensors can respond to a single photon, but neural filters only allow between five and ten photons, arriving in less than a tenth of a second, to pass to the brain and trigger a conscious response.

Fig.XXII.9 Laser beam cohesion



A laser beam does not occur naturally and can be thought of as a tiny light tube, not splayed into a cone. The beam predictably arrives at the target, tightly fo tube are coherent EM waves moving in phase (Fig.XXII.9) and thus can travel a long distance without dissipating. If the laser beam passes through a proper lens (Fig.IX.1), light spreads into a unified in-phase field, still in a tubular form, with a larger diameter than the laser light beam.

The light cone (Fig.XXII.10) shows nature's $1/d^2$ expansion into a section of spherical space from a single central point, occurring with EM, gravity, and other fields. Unless light is a laser beam, or is actually turning in more or less a circle, as a geon or a dark matter halo, it is radiating away as the cone, passing through portions of concentric spheres.

Fig.XXII.10 Natural light cones

We can witness light spreading out as a cone, like emitting from a flashlight. When any part of that open mouth field of the light cone touches any mass particle, the sensitivity collapses the light wave quantum unit into the particle photon which is instantaneously absorbed and is no more… the energy has transferred. When the light source beam begins, if only one photon is emitted, it still travels not as a point particle into the void of space, but as a light wave cone expanding away as $1/d^2$. Upon arriving at the recording screen, for the observers it will arrive as the single photon at one unpredicted point location.

When a flashlight shines on the wall and the light cone collapses into many photon position points, maybe not all the light is absorbed. Some quantum units within that field of light may be reflected, which means the light wave might not collapse and be absorbed until reaching the eye, even if it reflects off many objects first.

The expanding 2-D cone of light can be considered a wave field until collapsing into a photon which is absorbed. At that point, the light becomes localized in a 3-D position rather than still having dispersed 2-D momentum. The collapse from wave momentum into particle position is the duality of light. In the collapse, the wave no longer exists. In the travel, the particle does not exist. It is either a wave or a particle. It is never a traveling wave and a positioned particle at the same time. This underlies the Heisenberg uncertainty principle.

Calculating wave equations in advance is the method scientists use to try to determine the probability of detecting where the wave will collapse into a photon in position. If they are unable to do this, the outcome is indeterminant, and only upon collapsing into a photon when striking the measuring wall, is the photon's position able to be determined.

A scientific prediction's goal is to establish situational determinism, to prove cause and effect. The moon's *momentum* calculated as a wave allows us to determine its path through time and probable future *positions*, and to predict the ocean tides. The wave carries much information. The full moon is a particle in the sky, in position, not showing its momentum in any one moment. Our minds transition between different focuses, perspectives of the particle position in a single moment and perspectives of the wave momentum through a duration of time.

In a determinate system, every occurrence is a predictable effect of a cause. What is determinant for one observer may not be determinant for another. An indeterminant situation is when an event's effects are not able to be determined from the specific causes which may seem to be able to have more than one possible effect. This keeps open the door to different possibilities and probabilities, allowing to enter the perspectives of chance and free will.

Complete determinism is destiny, even if individuals cannot determine that. People view events in a spectrum between destined and the result of chance combined with free will. Determinism vs indeterminism is referred to in Matthew 24:36. Only known in advance by YHWH is the timing determined for the second coming. No one else knows, not the son who is coming, nor the angels in heaven. For everyone except YHWH that timing is indeterminate. YHWH is the verb, the momentum of the wave. The son's flesh is the particle in position.

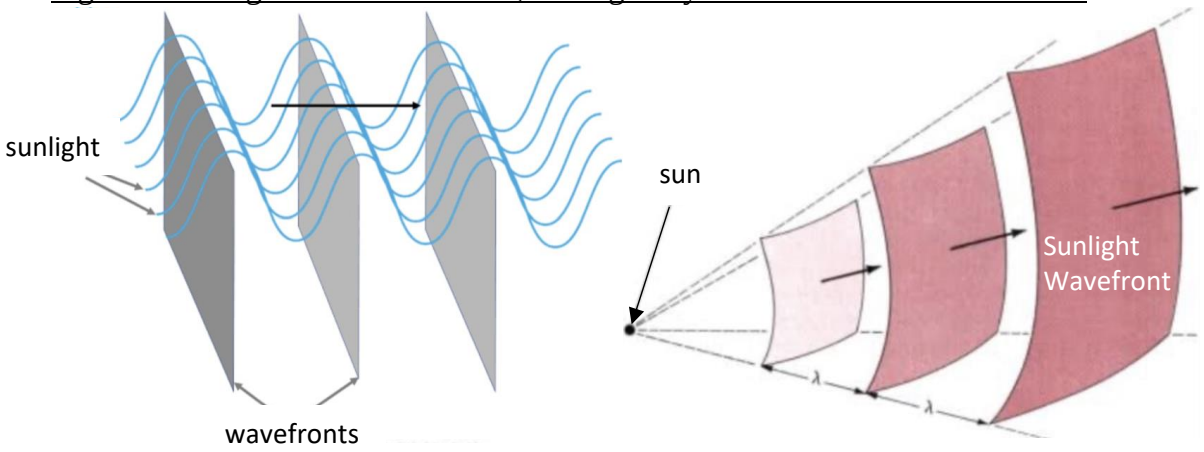
Wavefront

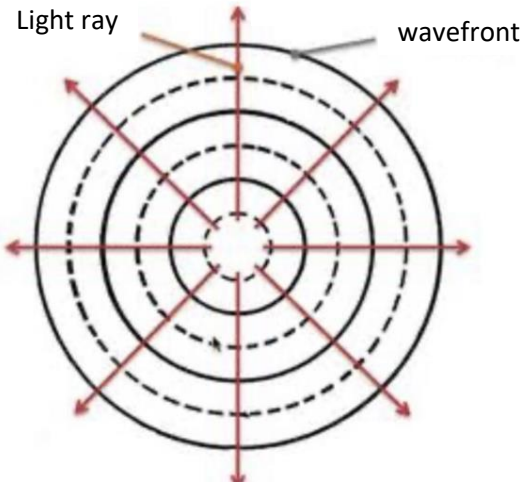
In space, a *scaler* field is where every point has a measurable physical quantity associated with it, a magnitude, such as looking at a map with temperatures in a single moment in time at each point. A *vector* field has the magnitude measurement and also a direction of motion, such as on a map where wind speed and direction are documented at each point at a single time. Gravity is a *tensor* field which warps space in specific amounts at each location, and influences other mass quantities to move in that warped space in a specific direction.

We think of the light cone (Fig.XXII.10) as 3-D, traveling in time away from the source. To the light's perspective, the distance of travel reduces to zero and time is no more. For the light wave, being only 2-D without time, it is not moving forward, only expanding its diffused 2-D field out to the sides into a 2-D circular plane.

A moving field of light waves has a wave front: Fig.XXII.11. From our flesh perspective, light wavefronts radiating from the sun are imaginary surfaces conforming to the shape of expanding concentric spheres. Moving forward through time and 3-D space, the consecutive concentric wavefronts maintain a constant cohesive phase relationship between crests and troughs, creating the moving series of imaginary wave fronts. Huygens's Principle tells that every point on a wavefront is a source of new spherical wavelets moving forward at the same speed as the source wave. The new wavelets spread out as "dark energy", expanding space, meaning less light at each point.

Fig.XXII.11 Light wavefronts move; static gravity-field wavefronts do not move





For a static gravity field, non-moving orbital rings are represented by the gravity equation in Fig.VII.2. Think of a pebble dropped on a pond. Concentric waves flow. But to be a static gravity field, imagine the rings flash freeze, like in a photograph, with unmoving wavefronts spaced apart. What happened was… as the mass formed, the space warp also occurred as a static gravity field. Warped space began with two quarks in the Big Bang Singularity, the BBS particle, being the first 3-D mass. Then many quarks... neutrinos, plasma, gases, nebulas, stars, galaxies. As the mass objects move, the static gravity fields move with them.

Space is a constant warp around mass, so it does not use any more energy to warp more. Earth's gravity field does not change while Earth's mass remains mostly the same. Since the gravity field is static, even while changing shape with motions, it is not a force, so there continues to be no spent energy. The gravity field does allow potential and kinetic energy. We can ski because of potential energy converting to kinetic energy. The skier uses up the potential energy then rides the gondola back to the mountain top to recharge the potential energy.

Multiverse theory

In quantum physics, there is uncertainty about the moment and location of the collapse of the light wave momentum into the photon in position. Our minds' optional perspectives of indeterminant futures allows anybody to say whatever they can imagine about that instantaneous crossroads. There is a momentary transition from coherence into decoherence, when the wave collapses into a particle, from which the incoherent physical multiverse theory was imagined.

Hugh Everett III had been a student of John Wheeler. Everett originated the multiverse theory in 1954. Depending on the theory version, every possible event and choice made in one universe instantly branches off into creating separate universes, completely ignoring the time required for evolution of stars, planets, and life. Instantly, all the rocks and bumble bees (maybe) are present in a new universe. Some claim there are an infinite number of these universes.

The theoretical harmonic series propagates into infinity from one fundamental tone. But the one tone, being the monotone, for many people is too monotonous. People may wish to align with more than one fundamental tone. Most people on Earth follow the popular non-harmonic

chromatic tones in music which facilitates this. Ignorance is generally humanity's preference when it comes to choosing to understand harmony.

Even though saturated in error, the circle of musical "fifths" (Fig.XVI.12) remains popular. It uses the 2/3 multiplier in attempt to create every tone into its own fundamental tone.

Today the world is musically tuned mostly to the equitempered scale (Fig.X.9 & .10), created with the twelfth root of two, stimulating our addiction to non-harmonic frequencies. This has enabled every equitempered tone to be an imagined fundamental of its own key, e.g., the "key of F". If harmony is the goal, the equitempered scale is not natural harmonics. Harmonics require one tonal center to be the fundamental tone. There is no single tonal center in the equitempered scale. But harmony is not the chosen goal of humanity. People do not want just one fundamental tone. Humanity is destroying nature to manifest our non-harmonic desires.

In harmonics, the string at rest is the zero. The zero is the reference. The fundamental tone is the first harmonic, being one wave crest-trough vibrating a standing wave on the string. Overtone waves follow as an integral number of standing waves: {2, 3, 4, 5…}. Universally, the *zero* reference is the original void, and the *one* relates to the only fundamental tone used in creation of all aspects of the universe. This subconscious reality creates a subtle fear when the ego of someone has decided there is no universal reference and no single universal fundamental tone. Instead of universal harmonic logic, many people seek the illogical world when they avoid a single dominating truth, preferring their personal theory of some variation of the multiverse.

The multiverse theory originated as a means of avoiding a wave from collapsing into a single particle position. Instead of collapsing into just one of those wave's probabilities, the multiverse theory grants permission for all of the possible characteristics to exist at once, each in its own universe. The imagined multiverse just keeps accumulating more universes, in every moment. Every possible outcome for everything, be it a person's unfulfilled choice or a seemingly random event, is manifest as another separate universe. Multiple universes are believed to continue to multiply indefinitely, in every moment of creation, initiating from every separate universe. People's subconscious minds understand partial and upper partial harmonics. The mental universe allows imagination, but *HUT* claims the one 3-D + time physical universe does not follow all of our 2-D without time imagined possibilities.

Multiverse theory has been made so important as to have made it into popular television shows and movies, such as *Flash*. The human mind's natural imagination has created many multiverses and developed them into our favorite shows, be that Mary Poppins, Peter Pan, Harry Potter, Star Wars, Star Trek, The Hobbit, Winnie the Pooh, Alice in Wonderland, and the Wizard of Oz. The multiverse theory is taken as legitimate science by many scientists and nonscientists. People swirl our mind's 2-D imagination into our 3-D world reality, and the outcome is movies and published theories manifested in the real world within time. Multiverse is imagination.

Our desires for more than the monotone of a lone fundamental tone, for more than a single God reference, leads our desires to spill over from minds to the physical world, not just in fantastic fictional books and movies, but also in increasing pollution, climate changes, weather disasters, and denial. People dictate the rules of religions, such as not allowing birth control, supporting their long-term goal of expanding their group's proportion of the world's population, with the aim of world domination. Many religions and factions, with their books and rituals, are claiming a monopoly, that they are the one and only way for people to connect with God. Count your beads and shut up. Do only what is dictated. Do not think outside of the box in which you are kept. From multiple imagined possible universes, they choose one in which they can be the solo representatives of God. Many people *want* to be the human fundamental tone.

God's original *desire* for creation, to know and to survive, allows us to play out our individual desires. Buddha taught that desire causes suffering. God's original desire to create the universe also brought along all the suffering to follow. God consciousness is unified universal mind. God's creation reduces One God consciousness into all separate human bodies. Together, we are only One Mind, yet maintaining our strong desires to believe in our individual minds as separate in 3-D space + time from each other. This is creation. We get multiple perspectives, plus we can mix those perspectives as we wish. Even if I want to believe that I am me with my mind, and you are you with your separate mind, there is only One Mind—our minds all overlap in superposition. When people do not want to believe in One Mind, we can believe whatever. This extends from the idea that people do not want light to be limited by being a particle **or** a wave. Instead, they insist light is a particle **and** a wave, often with no God in the equation. Trying to satisfy this, people with EM minds can accept anything desired as truth. Due to the holographic nature of the conscious mind's ability to integrate multiple holograms, the mind can also dis-integrate its unified "I Am" perspective. This can result in multiple "I am" imbalanced personalities within one human, and even benefit actors in their careers. Imagination is real.

"The difference between genius and stupidity is: genius has its limits." Albert Einstein

Question authority

For science to progress, we must often question authority.

Early string theory was predicting a problematic particle, the tachyon, which travels *faster* than the speed of light, and whose mass could be considered imaginary. The following quote is from the article *Physicists suggest tachyons can be reconciled with the special theory of relativity* by University of Warsaw; July 11, 2024:

"…[This] raises the question of whether tachyons described in this way are purely a 'mathematical possibility' or whether such particles are likely to be observed one day… According to the authors, tachyons are not only a possibility but are, in fact, an indispensable component of the spontaneous breaking process responsible for the formation of matter. This hypothesis would mean that Higgs field excitations, before the symmetry was spontaneously broken, could travel at superluminal speeds in the vacuum."

The authors say that tachyons are "in fact, an indispensable component" in forming matter. This "fact" ignores that lightspeed is the absolute reference, not mass, which is decelerated compared to light "speed". The idea of "faster than light speed" is not relevant because there is no speed in the perspective of light. Time has stopped, and the distance in the direction of travel has shrunk to zero. Speed is only pertinent from the 3-D + time perspective of mass which has been decelerated by one specific amount from light speed.

To further question authority, some science videos have shown an artist's perspective of a person in a space ship going into a black hole. The space ship is growing flatter in the direction of travel and is increasingly slowing down, supposedly demonstrating spatial contraction in the direction of motion and time dilation. The whole set up is fiction since the extremely warped space, referred to as strong gravitational forces, the G force, would crush the space ship and the pilot. But before the pilot dies, the pilot would still be perceiving from inside a human body abiding by $E = Mc^2$. The speed of light, c, remains constant from that point-position flesh perspective, from which space and time remain constant. The pilot would instead witness the "stationary" artist as moving and shrinking in the direction of travel, and slowing down.

For two entangled photons ten light years apart from our flesh perspective, the two photons are not even separate from each other in their own perspective. For the two photons, no time has passed since the scientists' calendars measured them together ten years prior. From the perspective of light, not from flesh, space has contacted to zero in the direction of travel, and

time does not exist. Even for charged electrons, atom, and molecules, spin makes them magnets whose movements create their EM fields responsible for photonic entanglement.

Synapses allow our minds have the perspective of lightspeed. Always perceiving our life living only NOW, we only imagine that body-time frame of reference—past and future—is reality, our paradigm. Also, we imagine that light's perspective can be accurately transferred to body perspectives, as in this depiction of a black hole flattening the space ship in the distance of travel. Our body's proportions are established in time and 3-D space due to mass' deceleration from light speed. Going faster in the body does not change our relationship to the "lightspeed". Our artistic minds can imagine whatever we choose, but that does not make it real for the flesh.

A quote in the 2024 film: *Einstein and the Bomb*: "Two observers moving at different speeds experience time at different rates." *HUT* claims this is not precisely accurate. As reduced minds in two bodies made of nearly identical decelerated mass, both bodies experience time as the same difference from light speed: c = 186,282 miles per second. Both bodies experience time at the same rates. The different velocities that the two bodies have experienced could not become apparent until the two can be compared. If the internal frequencies of the two people could be measured and compared, theoretically the traveler might show internal frequencies had slowed, and thus has aged less. But a traveler's ability to accelerate is limited, and the possible speed differences in reality are too insignificant. And each observer witnesses the other as the traveler.

The total rest mass of a cold material sphere filled with gas has an external spherical gravity field. If heated, gas particles move and kinetic energy increases according to $E = Mc^2$. The sphere's rest mass is gaining relativistic mass from the kinetic energy, and thus increasing the strength of the gravity field around it. At the speed of a fuel propelled rocket ship, this change of relativistic mass is insignificant because the rocket's speed divided by the speed of light is so small. The rocket's perspective of the contraction of space and the slowing of time is also negligible. Going into a black hole, the extreme acceleration destroys the ship, its molecules, and atoms, shifting it all into energy with a timeless 2-D frame of reference, so any significant length contraction and time dilation does not apply to the rocket ship.

From our flesh's 3-D + time frame of reference, we can see the effects of light shining in all directions. We do not witness light existing in just one common 2-D field, though we can imagine from our 2-D without-time mind that the differently oriented 2-D fields for each light wave is superimposed and filling our 3-D + time. We can accept that our 3-D + time frame of reference is always going to dominate our attempt to imagine the 2-D Higgs possibility field.

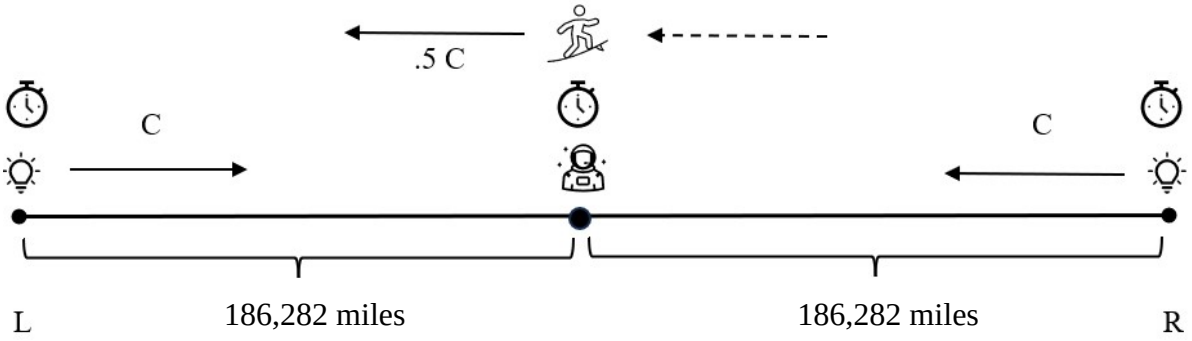
Time, space, and the cosmic surfer

The speed of light in a vacuum is 299,792,458 meters per second, which equals 186,282 miles per second. Light does not accelerate or decelerate. Light waves depart from the source at the speed of light and arrive where field collapses to a positioned particle, which is immediately absorbed. Light waves always move at the speed of light. When light goes through an object that has a calculated index of refraction, which means it takes longer for the light to pass that distance, the light still travels the speed of light until it gets stopped and absorbed by an atom or molecule blocking its path. When light is emitted from the atom, it again travels immediately at the speed of light until it is stopped and absorbed, again. The absorption and emission are slowing down the apparent passage of the light, but, when in void between particles, the actual light wave still only travels the speed of light.

Imagine setting up the Fig.XXII.12 scenario in the (mostly) void of outer space, far away from space-warping mass, in a zone with minimal radiation. Since light travels 186,282 miles per second, c, we put a stationary observer in the middle of two light sources that are 186,282 miles

to the observer's left, and 186,282 miles to the right. We will accept that the clocks at the two light sources have been correctly synchronized with the observer's clock in the middle.

Fig. XXII.12 Cosmic surfer



There is a second observer on a cosmic surfboard who has calculated acceleration of the surfboard to pass the stationary observer at the constant velocity of half the speed of light, .5c, at the exact moment when the two light sources will emit their light.

Einstein's thought experiments have factors that contradict reality, just like the cosmic surfer in flesh cannot accelerate to half the speed of light because the rapid, large, and sustained "G force" would crush the flesh body's organs.

The imagined observer on the cosmic surfboard arrives to be with the stationary observer at the center of the two light sources. As the surfboard is exactly at the middle point, the two light sources emit light in their direction. The stationary observer has the proper calculating mirror system to see the two lights arriving simultaneously one second after being released.

In Fig. XXII.12, the cosmic surfer continues from the center towards the reader's left at half the speed of light. When the cosmic surfer arrives half way between the stationary observer and the light source on the reader's left, that is the moment the stationary observer is seeing the simultaneous arrival of two lights. When the stationary observer sees the two sets of incoming light waves, the cosmic surfer has already seen the light coming from the shorter distance in front, but the light from behind has not yet reached the surfer. One second later, the cosmic surfer and the light from behind do simultaneously arrive at the light source on the reader's left.

The simultaneous observation of the two lights for the stationary observer, and the non-simultaneous observation of the two light sources for the cosmic surfer, never suggests the variability of space or time. From the perspective of 3-D flesh of the two observers, light always departs, travels, and arrives at the same speed of light, verifying, as Einstein said in special relativity, that all frames of reference perceive physics as the same.

Einstein's conclusion was there is no absolute simultaneity. Just because the person in the middle has perceived simultaneity of the two lights, there is no reason to assume the cosmic surfer could, would, or should experience the same simultaneity. Same as two buses travelling equal speeds and arriving at a middle point of their two routes at the same time, it is only at that point they arrive at the same time. Closer to the departure point of either bus means that one bus will arrive before the other bus. Be that at the speed of light or the equal speeds of two normal buses, the comparison relates to positions of observers, not one observer's time of simultaneity. This thought experiment does not contradict the constancy of time resulting from mass decelerating from the speed of light at a constant rate. Using the theory of relativity is not necessary to write a bus, or light, schedule. At two positions to the west or east of each other, sunsets occur at different times, not simultaneously as occurs for two observers standing side by side. Observer positions are important, as are bus or light wave velocities.

When one observer moves rapidly compared to another observer, the one moving more rapidly has decelerated their body's internal frequencies. This is called time dilation. The two observer's perspectives in their different frames of reference remain the same because the speed of light traveling relative to both flesh bodies is always the same, no matter their personal speed differences. This is because the mass within the flesh bodies of two observers has been decelerated by Higgs field to equally relate to the speed of light.

When the two flesh bodies moved at different rates, theory says that when they are compared to one another in the same frame of reference, those differences can be observed with sensitive enough instruments. Even so, while moving differently, both had perceived the other as having been the one moving. This is because due to the constant speed of light compared to any flesh, we each feel we hold still. Even sitting in a car or standing on skis, it can be experienced the same as if a video is displaying the movement outside of our unmoving frame of reference, with a machine simulating the vibrations that would occur while moving.

On the rotating Earth, we move a certain speed already, much more at the equator than at the poles. The Earth revolves around the sun, establishing more speed. The solar system goes around the galaxy, so we can add its speed. The galaxy zooms around the universe, so we can add that speed. This means that one observer's flesh body sitting in a "stationary" chair on Earth is already moving at high speed. With inertia, our frame of reference moves with us, so we do not even feel ourselves moving through the universe at maybe more or less one tenth of the speed of light. We believe we hold still.

The moving mass is not contracting compared to the light, only in comparison with different mass moving at a different speed. Think of being in a moving car. The lines on the road *appear* to get shorter, passing with increasing frequency with the car's increasing speed. An observer on the side of the road *perceives* the speeding car to be shorter, though the car's length has not changed compared to the speed of light, nor for the rider inside the car, being the frame of reference. From the perspective of moving light, distance is zero in the direction of travel. Moving physical objects do not contract, they remain the same in relationship to the speed of light no matter what speed the mass may be traveling compared to some other mass.

The light perceives no distance traveled, but mass perceives the light is always traveling at 186,282 miles per second faster. Only the 2-D constant speed of light has the 1-D distance of the direction of travel, and that of 4-D time, to not exist. But mass cannot perceive any reduction of the light's distance of travel, nor any stopping of light's clocks. The proof of this is that we, living in mass, perceive light traveling 93 million miles from the sun to reach Earth in 8 minutes 20 seconds. If we witnessed light's 1-D contraction in 3-D + time as light does in 2-D without time, the 93 million miles would be reduced to zero distance. We would see the sun right on top of us. We would not know the sun or any star as separate from our position as the light reaches us. Nothing could be far away. We could not use a mirror nor look at a beautiful view of nature. A light-year duration could not exist. For us in our mass 3-D + time perspective, the speed of light does not change, nor does its travel distance, nor its time of travel. If the light source moves toward us, we observe a frequency blue shift, or if the light source goes away, we observe a red shift. Same if the observer moves toward or away from the light source. Still, light's speed, its distance of travel, and travel duration, do not change for the flesh observer.

Understanding relativity of time and space requires comparing three perspectives: 1) The perspective of light; 2) Decelerated mass compared to the "speed" of light; 3) Mass at rest compared to mass having traveled.

The mind using flesh as the frame of reference perceives time as frequencies of mass cycles. One rotation of Earth around its axis equals one day. One revolution of the Earth around

the sun equals one year. One revolution of the moon around Earth almost equals one month, with more than 90% accuracy. One revolution of a clock's second-hand equals one minute.

As energy, the mind does not perceive time; it only imagines it. Using the body as a frame of reference, because mass has been precisely decelerated from lightspeed, the mind does imagine itself perceiving time. Mass frequencies in an atom, flesh, or a clock are decreased very little when the speed of the body increases at realistic rates. For the minds of the two observers, both being energy traveling the speed of light, they perceive no time except the frequencies of the mass of their own bodies, such as the heartbeat, from which, as observers, they identify as part of their frame of reference. But each mind perceives oneself to be "now", holding still.

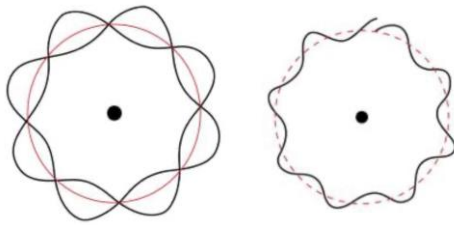
In the book *Mists of Avalon*, time may only be measured as five to thirteen days in Avalon, but out in Glastonbury, that same amount of time may have been measured as five years. One way this could happen is if Avalon is only a dream, such as the fictional story it is, just like the cosmic surfer traveling half the speed of light is only fiction. To consider Avalon a physical reality, the only way this time comparison could occur is if the body of the person in Avalon had been able to not be restricted to having been decelerated from the light speed by 186,282 miles per second. Being non-equally decelerated from light speed would not limit the two bodies the same anymore. Without the same relative constant speed of light for the flesh bodies, significant aging difference could manifest. But this is most unlikely. Or more likely: it is impossible.

Circular standing waves

Standing waves occur as 1) linear reflection or 2) circular repetition. Differently, a river current meeting an incoming ocean current can form standing waves. In a river, a standing wave might occur after a rock that is obstructing the river's flow, or where the river narrows.

1) *Linear reflection*: if a wave is reflected and returns to meet the incoming incident wave with the same amplitude, frequency, and phase, there is a constructive interference occurring and the wave crests and troughs, *antinodes*, do not move in either direction—they just go up and down as a standing wave, or maybe just remain a non-oscillating trough or crest. Either way, the non-oscillating *node* between the troughs and the crests remains in the same vertical and horizontal position. Rolling water waves can reflect off a vertical cliff and form standing waves under correct conditions. With a wave vibrating on a guitar string and bouncing off the nodal end points where the string attaches, the reflections make a standing wave (Fig.I.1), though the string is losing energy, so amplitude will not remain the same, decreasing volume over time, while overtone frequencies increase and the wavelengths shorten. Continuing harmony requires whole numbers of overtone standing waves to fill the string so the troughs and crests meet up properly and the natural harmonic tones play.

Fig.XXII.13 Atomic electron waves



The coherent cycling wave on the left meets up with itself after each cycle. The incoherent wave on the right does not align, lacking the integrity required to harmonize, to allow the atom to exist. In order that the atom's harmonic energy in the electron-wave is maintained as constant in its ground level orbit, and not lose amplitude or decay into infinite overtones, an energy source must be constant.

2) *Circular repetition*: standing waves are found when the wave travels in a repeating circle, or variation of, ending (any chosen point on the circle will do) with the same amplitude, frequency, and in-phase relationship with where it began. An example of a wave traveling in a circle in phase with itself is the electron-wave orbit around a nucleus. There must be a whole number of standing waves because if the wave will not constructively interfere with itself, then

no standing wave would appear, and no atom could exist. For creation, this wave harmony is required. Hypothetically, geons and dark matter halos are standing light waves.

HUT insists the constant energy source is the strong force, SF, *inside* the nucleons, leaking out to become the residual strong force, RSF, *around* the nucleons, then leaking out farther and becoming the extended residual strong force, ERSF, to support the integrity and constancy of the fields and sub-fields of the electrons orbiting around the nucleus. Beyond the atom, the maximum extended residual strong force, MERSF, is gravity's constant warped space around molecules, planets, and stars.

To maintain the constant orbiting in the electron fields and sub-fields there must be a constant source of ERSF. Only the conservation of the original zero density void can provide this because it is infinite since no mass or energy is being spent from nor added to the original void. Original void is infinite because it has nothing to do with time nor space. Original void does grant the potential for creating harmony and virtual particle-antiparticle pairs, as well as acting as: SF, RSF, ERSF, and MERSF. Original void requires its own conservation, meaning that void does allow matter and antimatter to be created or destroyed in equal ± 1/3 unit quantities, such as a quark and an anti-quark can be created or destroyed together.

In 1885, hydrogen emission spectrum work by Johann Balmer led to photon wavelength work by Johannes Ryberg in 1888, which led to Max Planck's quantum discovery in 1900, followed by Einstein announcing the light particle in 1905, which led to the $2n^2$ atomic model of Niels Bohr in 1913. Many more people were involved throughout the process.

During September and October of 1923, preparing to write his doctorate thesis, Louis de Broglie wrote three notes introducing his growing idea of the required integral number of electron waves orbiting the atomic nucleus. During the summer of 1924, de Broglie finished writing that thesis, which he defended in front of a commission on November 25, 1924. Jean Perrin was the president of that commission. Previously, Perrin had experience with electrons interacting with objects and producing waves in the form of x-rays, but he remained confused whether an electron was waves only, or if an electron could be a particle that could transform into a wave. Charles Victor Mauguin was one of the commission members that day, which he wrote about thirty years later: "At the time of the defense of the thesis, I did not believe in the physical reality of waves associated with particles of matter."

Paul Langevin was on the examination panel of that commission and he appreciated de Broglie's work enough to get his permission to send the thesis to Einstein to ask for an opinion. Einstein wrote back to Langevin: "The article of de Broglie impressed me very much. He has lifted a corner of the great veil…" The same day, Einstein wrote of the de Broglie idea to Hendrik Lorentz: "I think it is the first ray of weak light to illuminate these rules, the worst of our physical troubles."

From de Broglie's idea of integer waves orbiting the nucleus, it was Schrodinger that formulated quantum mechanics in 1925. Schrodinger clarified that the standing wave pattern allowed the fields and sub-fields of the electron harmonic orbitals around a nucleus. Louis de Broglie received the Nobel Prize in Physics in 1929 for his "discovery of the wave nature of electrons." In 1937, Clinton J. Davisson and George P. Thomson won the Nobel Prize in Physics for "their discovery of the diffraction of electrons by crystals." This was accepted as the proof of de Broglie's electron waves.

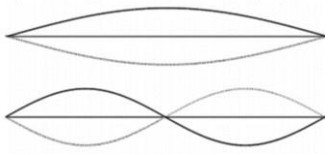
The bottom line is that orbiting electrons *must maintain the harmonic whole numbers* of standing waves to maintain the naturally established electron-wave momentum.

The wave length of radiating visible light has a crest and a trough with a node in between, all moving forward past a material reference point at 186,000 miles/second. More waves passing

in the same amount of time is towards the blue end of the frequency spectrum, and less waves show more red (Fig.XXII.17). Frequency is measured in cycles per second: hertz. Visible light has frequency relationships of {4,5,6,7}: from 400 to 700 trillion hertz.

With the standing waves, like electron waves circling inside an atom or a constant vibration on a string bound at both ends, the node does not move. With a standing wave, with a crest going up and a trough going down, this half of a wave length, ॐ = λ/2, is the fundamental tone: om equals 1/2 lambda.

Fig.XXII.14 Standing wave length terms



Light waves vs matter waves

The particle-wave duality problem is exaggerated and confused by the word: photon. Light is made of a quantum, being a discrete packet of energy. That energy can be in the form of a particle which forms when the incoming light wave collapses upon an atom. But a photon can also be a measured quantity of light waves travelling through the void, which is not a particle. Either way, as a particle **or** a wave quantum, we can call that quantity a photon. Too often the word photon just refers to a particle, so that when we use it to refer instead to a wave packet, there arises confusion within the particle-wave duality. The light particle is in position, not moving through space at the speed of light. Often the confusion is because the word photon mostly means a particle quantum, but the reality is that it is often referring to a wave quantum. We need two words referring to a particle or a wave, but "photon" at times refers to either. Photon is a good term for the quantum, either for a wave or a particle, but without clarification, there might be a confusion. Only the light wave has momentum at the speed of light until it collapses to become a particle in position and is immediately absorbed. The photon measurement is the same quantum of energy either way: the particle or the wave.

A matter wave, different from light, is represented in the skier's tracks in the powder snow in Fig.XX.20. Behind the successful skier is a single wave, not a dispersed field. During the action, the skier is the particle and is moving. The traveling skier is leaving behind a single matter wave, which is not moving. For light, the particle is not moving and the wave is moving.

Since light can be either a photon particle in position or a wave in motion, how we measure either one is key. A crystal diffracts light into a spectrum of colors to show the wave aspect of light. A detector of light particles liberating electrons allows measuring the collapse time and location of individual photon particles. Interpretation must be made clear for light science to be less confusing: the wave shows momentum and the particle shows position.

Planck's constant is used to define the photon's quantum of action in E = hf: Energy, E, equals Planck's constant, h, times the single photon's frequency, f. This defines that the discrete quantum of action, h, is applicable for 1) a single photon particle absorbed into a single position, for 2) an atom emitting a photon, or for 3) the light's wave-quantity while in travel.

Louis de Broglie used Planck's constant to define the electron's quantum of wave energy. Previously, scientists had predominantly assumed that to be an electron particle—not a wave.

Matter waves are also known as de Broglie waves. The de Broglie wavelength, $\lambda = h/p$, tells that wavelength, λ, equals Planck constant, h, divided by momentum, p. Combine $\lambda = h/p$ with the equation that any object with momentum, p, equals mass times velocity: $p = mv$, and the outcome is the de Broglie wave equation: $\lambda = h/mv$. This solves for the wavelength of the moving electron. De Broglie's wave equation has been accepted to show that every particle and object in the universe with rest mass is associated with a wave through time, like the skier and the tracks in the snow. Light does not have rest mass and therefore is not considered to be a matter wave.

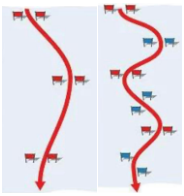


Fig.XXII.15 Giant slalom vs slalom All light wave frequencies move at the same speed of light. With matter waves, the speed changes with different frequencies and wavelengths. We can envision this by using the ski tracks of a skier for a matter wave example. The long wavelengths between turns of a giant slalom ski racer, with less frequent turns, allows greater speed than slalom ski racing with turns made more frequently, establishing shorter wavelengths. Speed varies with the frequency of matter waves, i.e. the turns made by skiers, but this is not the case for light waves changing frequencies, i.e. from red to blue, at the constant speed of light.

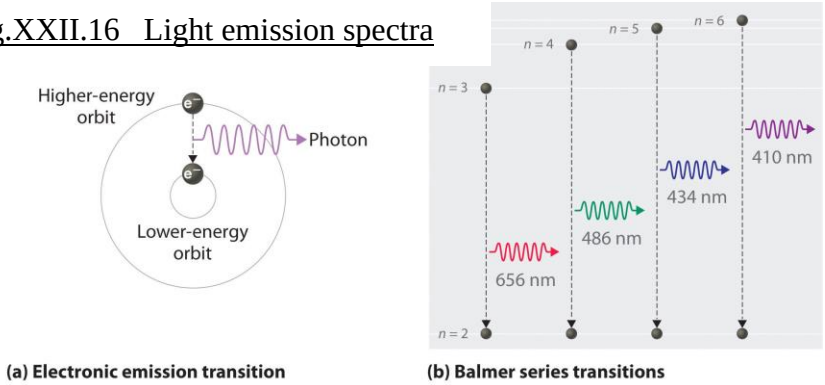
Quantum jumping electrons

Electrons make quantum jumps from one sub-field to another. The limits of electrons orbiting an atom, Fig.II.5 & .9, are fixed by the quantum number, $2(2H_D^2)$, Fig.XXIII.2, and the sub-fields maintain discreet energy levels according to $2H_C$. The positively charged proton in the nucleus is stationary relative to the orbiting patterns of negatively charged electrons, thus creating an electrostatic field to help maintain the combined fields and sub-fields of orbiting electrons. Electron spins create magnetism, also helping. When an arriving photon transfers the correct frequency, an energized electron jumps up to a higher energy sub-field.

As visible light is absorbed by an atom, an electron is energized to jump up one or more electron sub-fields. The amount of light energy absorbed defines the level to which the electron jumps (Fig.XXII.16). For hydrogen, violet light's wavelength of 410 nm, the highest energy that can be absorbed with integrity, causes the electron to jump up the most, while the red light with the lowest energy, 656 nm, causes the electron to jump up the least. Outside the limited spectrum of visible light, the absorbed energy would be too much or too little to stimulate harmonic jumps.

Due to the necessity of grounding, the electron drops down from one outer sub-field to an inner one. In doing so, the electron releases energy by emitting light that has the same energy as had been absorbed to jump up between those same sub-fields. If this energy dance is occurring in atoms existing in significant quantity in a star that we can see from Earth, the scientists can measure the specific color spectrum of the star's radiating light. Molecules also have distinct spectra, absorbing and emitting the same specific frequencies of visible light to allow the electrons to make their unique quantum jumps.

Fig.XXII.16 Light emission spectra



(a) Electronic emission transition (b) Balmer series transitions

The light energy emitted is the difference between the electron departing the higher level and arriving at the lower level. The electron may drop sequential levels to arrive at the ground level, emitting a precise frequency of light with each transition until ground level.

A neutral hydrogen atom grounds with the electron in the first electron field, in the "1s" electron sub-field (Fig.II.5). As the average radius of the electron orbit increases, with the electron in an excited state, being farther from the proton in the nucleus, this higher energy creates a less stable arrangement. When the electron drops from its highest level, the electrons that fall the farthest release a light wave with the highest frequency and shortest wavelength.

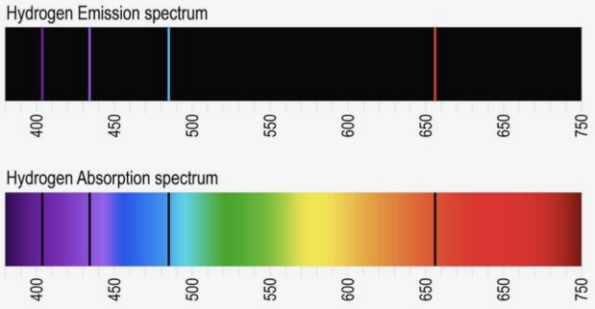


Fig.XXII.17 Emission and absorption spectra
Hydrogen's emission spectrum colored lines (top) are the inverse of its absorption spectrum black lines (bottom). These four visible hydrogen emission spectrum lines are called the Balmer series. The red line top-right is the hydrogen-alpha, H-alpha, being Hα, with a wavelength of 656.281 nm in air or 656.46 nm in vacuum.

An example of *emission spectra* in a hydrogen atom is an electron dropping from the "3d" sub-field to the "2p" sub-field (Fig.II.5), a common stellar occurrence, which will emit red light with a wavelength of 656 nm, being a frequency of approximately 4.57 x 10^{14} Hz (speed of light, c, equals frequency times wavelength: $c = f\lambda$).

Alternatively, scientists can measure the star's *absorption spectra*, the dark lines interrupting the emission spectra colors. The dark lines show what colors are being absorbed by the star because they are the specific color frequencies required to allow the atoms' electrons to make specific quantum jumps. The colors of light being absorbed by the star tell which elements are contained within the star. Absorption lines are the star's fingerprint for astronomy detectives.

The unit of time we call one "second" is presently, since 1967, arbitrarily but specifically defined by the number of times an electron can jump back and forth, 9,192,631,770 oscillations, between precise electronic energy states orbiting the nucleus of a caesium-133 atom.

Seeking 1-D theta in hydrogen: close but no cigar*

The importance of humanity figuring out the precise universal fundamental tone has been mentioned several times in *HUT*. This would allow us to figure the four-tone theta octave (Fig.XI.2) and other important numbers. Our eyes are limited to seeing close to just one octave of light. With the fundamental tone, Doe = {1}, we could figure four primary colors in the theta octave of {Doe, Mee, Sol, Ah} = {4,5,6,7} times the single fundamental's pitch class frequency.

Hydrogen's absorption and emission lines in Figs.XXII.16 & .17 show four different wavelengths for four different colors of visible light. As hydrogen is the primary element of the periodic table, this seems like a good place to ponder theta possibilities, shown in Fig.XXII.18. Included in the four groupings are the harmonic name, the postulated frequency multiplier, the color, the wavelength, and the frequency. The follow-up → seeks to find a common fundamental pitch class multiplier by sequentially dividing the four frequencies by {4,5,6,7}, which does not result in a common Doe pitch class multiplier. If the multiplier numbers were all equal, as required in 1-D harmonic string theory, it might have been a sign of success. But the harmonic complexity of a hydrogen atom is far from the simplicity of harmonic waves on a 1-D string.

Fig.XXII.18 Seeking 1-D theta in hydrogen

Doe; 4; red; 656 nm; 4.57 x 10^{14} Hz → 4.57 x 10^{14} Hz / 4 = 1.1425 x 10^{14} Hz
Mee; 5; green; 486 nm; 6.17 x 10^{14} Hz → 6.17 x 10^{14} Hz / 5 = 1.2340 x 10^{14} Hz
Sol; 6; blue; 434 nm; 6.91 x 10^{14} Hz → 6.91 x 10^{14} Hz / 6 = 1.1517 x 10^{14} Hz
Ah; 7; violet; 410 nm; 7.31 x 10^{14} Hz → 7.31 x 10^{14} Hz / 7 = 1.2183 x 10^{14} Hz

1.1425 x 10^{14} Hz ≠ 1.2340 x 10^{14} Hz ≠ 1.1517 x 10^{14} Hz ≠ 1.2183 x 10^{14} Hz ← not equal*

*Note: using more precise wavelength-numbers-in-a-vacuum only increases the inequality.

Physical mirror is local, images are non-local

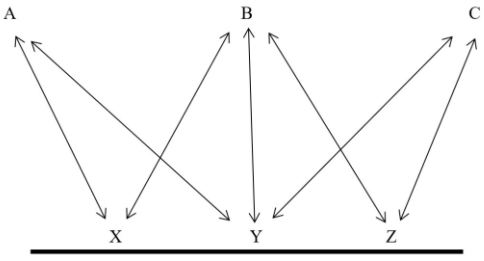
HUT uses simple examples here and in chapters XIII and IX to explain local vs non-local situations. In accepted physics, the vocabulary of local vs non-local is mixed with entanglement

vocabulary, introducing confusions due to ignorance regarding information seeming to travel faster than the speed of light. *HUT* has explained (see section following Fig.XI.3) that by not being limited to the perspective of mass in 3-D + time, and better understanding the 2-D without-time *perspective of light*, then we understand that the distance in light's direction of travel has reduced to zero, and time does not exist for that light's perspective, and therefore, from light's point of view, entangled information in two "separate" photons was never actually separated and never was required to travel faster than light.

A hologram image is recorded in 2-D layers on a holographic plate. If the plate is broken, the entire image is stored in each piece—considered non-local. Every part contains the whole. If cancer remains local, such as in a Bob Marley's toe, the toe can be removed and the cancer is gone. If the cancer becomes non-local, removing the toe may no longer fix the problem.

The 3-D physical mirror is made up of stable local particles in positions, similar to viewing a painting. Even the moving images on a television are localized. Freeze frame the television and move your observing position and the images remain in their own local positions.

Fig.XXII.19 Local mirror vs non-local mirror *Demonstration angles in diagram are not precise*



← 3 observers {A, B, C}

The local physical mirror shows particles in position, while the images reflect non-locally from the mirror. Use a marker and write the three positions {X, Y, Z} on the mirror's glass surface; the letters do not move from their local positions but observed images do.

← 3 mirror position points {X, Y, Z}

♀ mirror & light source ♀

Non-local aspects demonstrated by the images reflected in a mirror:

At mirror point X, observer A sees observer B, and vice versa.

At mirror point Z, observer B sees observer C, and vice versa.

At mirror point Y, observer A sees observer C, and vice versa. And observer B sees observer B.

Non-local images reflect from a mirror. In Fig.XXII.19, because the angle of incidence equals the angle of reflection, single observers {A, B, C} see different non-local images reflected at each local mirror position point of {X, Y, Z}. The non-local image reflected at any angle, except 90°, changes with the observer's position. The image can be relocated to any point on the local mirror. Because the angle of incidence equals the angle of reflection, the image relocation is 100% predictable.

The book *Shufflebrain* by Paul Pietsch (chapter IX) explored how after brain damage, a stored memory or a talent that had been assumed to be strictly limited to being stored locally, how that store could be relocated non-locally to a different position in the brain.

Division of labor

HUT does not include how the physical constants came to be the number they each are, such as the speed of light (c), Gravity (G), Planck's (h), and even whatever will be discovered to be the frequency of the universal fundamental tone. This is because the author of *HUT* never found a key into the mathematics required to prove this. This omission, like so many others that exist, is left for other people to figure out. Since the unified field theory includes everything there is, there is obviously much more to do.

XXIII Alpha & Omega

"But thoughts and ideas, not formulae, are the beginning of every physical theory."
Einstein & Infeld, *Evolution of Physics*

Light travelling through void does not lose energy. If 2-D light waves collide with an object in 3-D space, and collapses into a photon particle, then it exists no more since it is absorbed by the obstructing object. Light is said not to have inertia because it has no rest mass. Perpetual motion refers to a system from which energy can be extracted without depleting any energy from the system. Only creation from void almost fits that definition, because from the void particle-antiparticle pairs are created, and destroyed, without changing the void. Eternal void is perpetual because it is not subject to time, but void does not have any motion except when encased by an object that moves, which includes everything in the universe.

Light spreads out as it travels into spherical space, and becomes weaker at every point with more distance from the source. This is simply because with increasing distance from the source, there are more points receiving the same amount of light. When light is absorbed by atoms and molecules, which respond by increasing their movement, this creates heat. As the heat is released, in stages or all at once, the light's energy has changed frequency to infrared.

Light red-shifts as it recedes from an observer, and it blue-shifts approaching an observer. The frequency red-shift is not the lowering of light's energy; the light source is just moving away from an observation point. Blue-shift is not the light increasing energy, the light source is just moving towards an observation point. The frequency change is not occurring for the light itself. The frequency shift is for the observer's point of view only. Similarly, a train whistle frequency is not changing for the observer on the train itself, but the relatively stationary observer from a distance hears the frequency lower as the train goes away, a sonic "red" shift into longer wavelengths, and hears the frequency increase as the train approaches, a sonic "blue" shift into shorter wavelengths.

Inside the hypothetical geon (chapter XXII), light is circling in a defined area instead of radiating away. The light is not losing energy in circling or radiating. Circling, light is not even spreading out its energy. It remains concentrated. Light does not decay, but it can be absorbed.

When we choose to believe that a theoretical geon is not dissipating energy due to its own internal gravity, then it can be a stable entity of nature, like authorities claim a "photon" is. *HUT* claims photon particles only exist for an instant because what is stable is not the light particle in its position but the light wave with momentum. By accepting a hypothetical geon to be stable, the following hypothesis is feasible.

Hypothetical life after life

"Imagination is more important than knowledge. For knowledge is limited, whereas imagination embraces the entire world, stimulating progress, giving birth to evolution." Albert Einstein

One type of art is creative writing. In 1982, writing the non-fiction *I Can't See the Wind*, my creative summary goal was to imagine the merging of science, art, and religion. Creative writing can be about anything we choose. Now I imagine a hypothesis based upon scientific possibility whose purpose is to explain the unifying experiences repeatedly found spiritually in religions, theoretically in science, and as synthesis in art. Unification within the mind is a shift from a variety of lesser organized systems to a greater one, from a more disordered group of ideas into a greater order. This is opposite to the average flow of entropy expressed by the second law of thermodynamics, where the system changes from more order to less.

The question "Is there life after death?" is ponderable with scientific vocabulary if to begin we allow one unproven scientific perspective as the premise, followed by a riskier sub-

premise. The method is to find a key idea that opens the imagination into a theory incorporating previous theories and intuitions, while being on alert for perceivable inconsistencies, and to assimilate or eliminate what needs to be, constantly questioning the use of new and old data, while reworks redundancies and errors. The new theory is like raw clay needing to be formed into a finished product whose beauty is in its cohesive integrity.

The premise is: The *mind* functions as EM energy stimulated by the synapses within the mass *brain*. Mental EM waves are woven into a geon, storing encoded light as memory, instinct, and impressions, however vague or clear. The EM dance of the geon warps its own space. As instinct in animals, which includes humans, some 2-D geon patterns can pass on as 3-D genetics.

According to relativity, from the perspective of the speed of light, time is stopped and the distance in the direction of travel has reduced to zero. Theorizing from flesh-mass sensory-input perspective of 3-D space + time, it is logical that for the energy-mind perspective there remains only 2-D space without time. These two perspectives of our consciousness, 3-D with time and 2-D without time, are both allowed by EM fields created by the brain's electro-chemical synapses.

The sub-premise: During one's lifetime, beginning with conception, one's mind weaves all of one's experiences into a non-radiating EM photonically-integrated non-material geon, centrally grounded by the heart rhythm, vibrating throughout the mind, the nervous system, the DNA, the whole body, and surrounding one's body as an EM field, then this 2-D photonic geon does not have die when the flesh dies. The EM geon is life after life, and we can call it the soul, or the Light Being, which knows no time, except if imagined. Our minds perceive our flesh as living in the "now". Our bodies' time, past and future, is only imagined to be—our minds are so powerful that we can believe that all time is all true, even if events are poorly remembered, or poorly anticipated. Time, 3-D space, and mass are illusion in the perspective of light.

Matthew 5:14, "You are the light of the world." John 1:4, "In him was life; and the life was the light of men". In our bodies, in our brains, our EM mind is that life—made of light.

Pondering further… even though the Light Being geon knows no time, we living in the flesh will ponder and imagine: what next for the Light Being? The Light Being perceives like us when we dream, while our body is sleeping and we have adventures bound only in 2-D without time, having freedom to jump around in imagined time and imagined 3-D space. The Light Being, without a living flesh body, is like that. It is awake in a different way as there is no flesh body to shut down while the dreamer dreams.

"…there is a natural body, there is also a spiritual body…" 1 Corinthians 15:44

We in 3-D flesh ask: What next? Let's imagine options for this post-flesh 2-D Light Being geon. 1) It might unify harmoniously with other Light Beings. 2) Or not.

Why harmoniously? Invoking the holographic theory, which requires harmonics, begin with the zero {0}, being the reference. Using a stretched string, the string at rest is the zero-energy density reference on which harmony can play. For the universal void reference, we at times name the reference as God. Not everyone accepts the universal reference to be God.

Upon death, the question arises for each one of us: what is my reference? Buddhists agree that "pure mind", free from confusion, is present in every living being, and is eternal and unchanging. *HUT* claims the "pure mind" is the universal holographic reference, which is God, a thought that many Buddhists easily reject due to personal and group "God" definition prejudices. The word "God" might get replaced with the term "Buddha Consciousness". Pure Mind can easily become full with unclear thoughts, such as believing Pure Mind is not God, rejecting God as the universal reference, as the One Mind. *HUT* claims that Pure Mind is a good definition of God, the same signal guiding all religions, "that God may be all in all." 1 Corinthians 15.28. The God signal becomes clouded as noise is added. The God signal needs clarifying, filtering out the

clouded noise of desires and ignorances in the human mind, which create distortion and confusion. Evolution of consciousness leads back to the original Pure Signal, to the Pure Mind, which is Original Willpower, God-Void from which Everything is Created.

Creation includes diversity, starting from the hologramic reference and advancing into the fundamental tone. On the silent string {0}, we can play the one fundamental tone {1}. Natural systems utilize a variety of pitch class octaves of the fundamental tone. A harmonic social system requires a fundamental tone also. Like within some animal groups there is an alpha male, dominating all others males: lions, apes, dogs, horses, and deer. An alpha female dominates as the queen bee. Mother's breast is the fundamental tone for the nursing baby. This subconscious memory of the mammary dominance exists throughout our lives.

In the New Testament Bible, with God as the hologramic reference field, the tonal center of the objective field is called the Word. John 1:14 tells that the Word became flesh. In a unification of post-flesh Light Beings, with God as the hologramic reference, Christ is claimed in the New Testament to be the human fundamental tone. But religions do not all accept what the New Testament Bible claims. For example, one man may believe that by murdering people as a suicide bomber, that upon death, god will grant him 40 virgins in paradise.

If we follow this thought sequence of post flesh geons able to harmoniously join together, then in that unified system of post-flesh geons, one of the many geons is the fundamental tone. Which one? People are dying to find out.

On Earth, socially, in each system we design, we might rationally or instinctively choose a human fundamental tone. An orchestra has the conductor as the unifying messenger for the composer. In any classroom with a single teacher, that teacher is attempting to be the fundamental tone, though at times one or more of the students may be trying to do the same. Within the USA military, the President is the legal human fundamental tone dominating all other military humans.

Christianity makes Christ the fundamental tone. Without Christ present, the Catholic Church chooses the Pope to be their living human fundamental tone. The Church of England accepted King Henry VIII of England to be the human fundamental tone for the God reference.

In Islam, Allah is the God reference, and Muhammad is claimed to be the human fundamental tone for all of humanity. Even though Quran 6:159 says to have nothing to do with any religion that breaks into sects, after Muhammed died, Islam split into sects because Muslims disagreed on who would take Muhammad's place to lead them. That split continues today with Sunnis, Shiites, and others, often warring each other. Quran 42:13 tells how God ordained the same faith for Noah, Abraham, Moses, Jesus, and Muhammad, having them each understand that they must uphold the one faith in One God, and to not break that unity into divisions such as what we now see have become many separate religions.

"Sometimes when the hive is out of balance, you have to replace the queen." *The Beekeeper* movie

Cults make their human leader the living fundamental tone, with confusions, as when Bhagwan Shree Rajneesh took an oath of silence at his gathering place, Rajneeshpuram in the state of Oregon, and his lieutenant, Ma Anand Sheela, took command. History tells us that did not go well. In India, he seems to be more popular now, dead, as Osho, than when he lived.

Reggae musician Bob Marley brought world attention to the Rastafarian religion which believes Haile Selassie, 1892-1975, Emperor of Ethiopia, was the Messiah's second coming.

To help unify, an appropriate biblical perspective is introduced. Mathew 6:12-15 tells that we must forgive everyone or we are not acceptable to God. Following this premise, to unify in harmony with the other EM Light Being geons, call it *heaven*, means not rejecting the fundamental tone, whether it is Christ or Buddha or whatever the truth would be. To unify, one

cannot reject the once-lived flesh-body of that fundamental tone person, who one must forgive, as well as forgiving all once-in-the-flesh Light Beings already in (or not in) the heaven unification. Regarding humans from throughout history, if any individual already within the heaven-unity, or not, is rejected through non-forgiveness, then the one not forgiving cannot unify with the grand unification of souls. For example, many Christians will not forgive Darwin. What if Darwin's soul is already a part of that unification? Or not?

Not forgiving someone for their religion or science, their politics, sex, for the color of their skin, all could block unification. Forgiveness is a ponderable choice that has always been the homework for everybody while in the flesh: if one cannot forgive any human, then one is not forgiving God, making it so that one may not be able to unify with God. "Do not judge, or you too will be judged." Matthew 7:1. Complete God is within everyone, and God and everyone needs to be forgiven. Whatever perceived wrong has been done to anybody has been done to God and by God. To be forgiven by God, one must forgive oneself, God, and everyone else.

"If you have anything against someone, forgive - only then will [YHWH] be inclined to also wipe your slate clean…" Mark 11:25

Unify… or not. The "or not" has some hypothetical options. One option, even if the geon is accepted by the unity, is the destiny to remain a fleshless Light Being, locked and delayed into a position constellated with the sun and other stars. Those radiating lights sustain the geon's position, like a wiffle ball held in position by pick-up sticks, while the Earth goes away and orbits the sun for a year or two or more, arriving later, close to the same position and time of year where the life soul has been situated. With gravity, willpower, and recorded individualized conscious evolution still intact, the information of the hypothetical Light Being can imprint its patterns upon a baby being born. This information, a little ball of light of willpower momentum, the EM geon, can move charges upon contact and thereby effect the activity of the neurons in the baby's brain, enabling potential future synapses. This child grows up and choices in life lead to options for this person to assimilate or eliminate certain mental synapses, granting the enhanced willpower option of activating the inherited geon information, or not. In some traditional religions, this is called *reincarnation*.

Other "or not" non-forgiving options: do not forgive and do not choose unification. As individualized willpower and all its evolutions are still intact, one is choosing to dream, maybe recycle through versions of the finished flesh existence, or some other variation… until the default program imposes, called *hell* in religions. Hell is like cancer in the human body. Cancer still abides by the law of harmony, but cancer is not supporting the living host, making alignment between the cancer and the human host body through harmony not likely. Separated dreamers enter the isolated hell system where there is also a tonal reference: the king of hell. Or queen, depending on the hell-bound soul's dream.

What if the Light Being's willpower is so emotionally attached to Earth that the 2-D geon remains in Earth's 3-D gravity-space as a *ghost* able to effect (if invited) living neurons. What about our loved ones who have passed on? We all remain entangled (section after Fig.XI.3).

Evolution of consciousness included all of our belief adventures. One person looked at the tree moving and said the mover was spirit. Another person said, no, it is wind. Another said wind is just moving air. And another said we all must breathe air to live. The next person said, see, breath is the spirit. The word *spirit* comes from Latin the root word for breath: s*pir*... found in inspiration, respiration, perspiration, conspiracy, aspire, transpire.

Humanity assimilated and eliminated new and outdated ideas as our consciousness geons evolved. Science is our predominant tool now. But science needs to open the door to the possibility of understanding the necessity of God in creation and evolution. Since humanity's

understanding of God has had to mature from immature beginnings, throughout history we invented intermediaries between humanity and God, and assimilated these into our geon realities, including a variety of gods, angels, demons, and saints. We invited these inventions into our geon selves, weaving them into our minds and passing them on through the generations.

Scientist are roughly divided into experimentalists and theorists. A theorist must think like a designer. The theorist of an all-inclusive unified field theory must attempt to think like the ultimate all-inclusive designer, being God. The theorist's ego self, the "me" identity, must internalize the God-Mind self, the universal "I Am", to think like the designer of the universe.

We have evolved our consciousness through trial and error. As we get closer to understanding the One Hologramic Mind, we eliminate mental inventions that are no longer necessary. Now angels, demons, and reincarnated past lives are gone from Earth. Our conscious evolution removes our geons' obsolete ideas. Individually and as a whole, we evolve our relationship with God. We are responsible for our own maturing consciousness and our alignment with God the universal holographic reference. Every part contains the whole. In evolution, timing is everything. Chosen or not…

Ghosts are still with us—geons stuck in the gravity field with the will to correct a wrong situation —willpower not ready to let go. Geon ghosties are God's tools.

Fig.XXIII.1 Geonic ghosty crop circles

Crop circles are an old phenomenon. In the 1980's the term "crop circles" became popular. Some are proven to be created by humans, but not all. The art is often made too cleanly in a field of wheat or another cereal crop, where stems are not broken but gently bent over about an inch from the base, and no signs of humans are found, such as footprints or of lines used for references. The work is usually completed during the dark hours of a single night. Crop circles are found worldwide.

Speculative theory: for meticulously crafting geonic crop circles, God-Willpower makes patterns using Earth-bound geon ghosties and harmonic vibrations—the many able to operate as one consciousness. The geons utilize stone circles, such as Stonehenge, for gathering locations.

One last possibility in this hypothetical geon circle dance: at the end of creation, when the balanced matter-antimatter account cancels out to the zero cosmological constant, the unified

system of all Light Beings averages out to the potential circle. Duality experience is finished. In that no-time no-space void, the potential circle is the imaginary 0-D point. The void includes a potential beginning, implying potential 3-D space + time reality. In the beginning and at the end of time is the potential circle of light, the Word in the Tone, the fundamental tonal center, and the circle dance of sound. The totality of cumulative Light Beings' information is all in the circle which seeds the beginning of time with seed from the end, which without time are the same: the Alpha and the Omega. Like in nature in time, a seed is produced by a living organism at full maturity, the same seed needed for beginning the next generation of that living organism.

HUT proposes that the end goal of evolution is us: human consciousness in the natural world. Teleology is this. Teleological: build something to achieve an end goal. "Form follows function," is what the architect Louis Sullivan taught us more than a century ago. This means that in creating an object, like a building, the shape should facilitate its intended purpose.

Evolution is a teleological theory. The end goal of every organism is to survive long enough to reproduce itself. The information that is in a seed or egg has the purpose to produce a new seed or egg again. In the competitive world of living organisms, the end, being the reproduction, justifies the means. In *HUT*, granting "willpower" and harmonic potential to the void to allow an ordered beginning and to manifest bacteria with a will to survive is a teleological design. *HUT* claims that from the beginning to the end of evolution is one long goal to achieve the universal seed at the end: the Word. "'I am the Alpha and the Omega,' says the Lord God, 'who is, and who was, and who is to come…'" Revelations 1:8.

"A theory can be proved by experiment; but no path leads
from experiment to the birth of a theory." Albert Einstein

"In science it often happens that scientists say, 'You know that's a really good argument; my position is mistaken,' and then they would actually change their minds and you never hear that old view from them again. They really do it. It doesn't happen as often as it should, because scientists are human and change is sometimes painful. But it happens every day. I cannot recall the last time something like that happened in politics or religion." Carl Sagan

Lithium *BLOWS*

"Anyone who expects to create, be it as scientist or artist, scholar, or writer, needs self-confidence, even bravado. How else can one dare to imagine understanding what no one else has understood, discovering what no one else has discovered? ... [Science] is driven by the creative urge…to construct a vision, a map, a picture of the world that gives the world a little more beauty and coherence than it had before."
J. A. Wheeler, *Gluon, Black Holes, and Quantum Foam*

In TEC Fig.II.8, lithium, Li_3, shows a positive-one (+1) valence, as do all the alkali metal elements in the PSV1 column (Fig.II.6). This means they can easily give away an electron, like sodium gives one to chlorine to make table salt (Fig.VIII.9). Hydrogen's, H_1, plus-one valence means it can give away an electron. But H_1, being also a minus-one valence, can also receive one electron, making its valence to be plus-or-minus one: ±1. In rearranging the periodic table in chapter II, moving hydrogen, usually observed to be an alkali metal, away from lithium to be above fluorine and the SPV5 column with other ±1 halogen elements, is most reasonable.

My suggestion for this, and all the other changes to the periodic table based on *HUT*'s Judges and Verdicts system, is me claiming a better method than authoritative tradition. All the other changes that *HUT* claims are needed to clean up science, those have earned me much blame from people who do not care to even try to understand my reasons. Professionals and non-professionals can label me a megalomanic, and other condemning titles, for me believing I have repaired unrecognized errors within science's current paradigms and our dysfunctional

educational system. Without the person who is judging being able to see that maybe I am sharing value, I get ignored or judged harshly. I have no defense except my work, which condemners do not look at it. They see their own confusions, diagnoses, and condemnations surrounding what they imagine to be my beliefs. From my perspective, this is my chosen path. I have lived and am proceeding with my life on purpose. I have a purpose. I have a life of value. I choose to clarify my values in writing *HUT*, even if my work is ignored for the rest of my life.

The psychological term "cognitive bias" refers to when someone processes large amounts of information based on personal experiences and preferences. But these include everybody. Each person selectively prioritizes and simplifies the information to fit one's own situational needs and desires. The legal term for this is "confirmational bias". Errors can easily occur, but with the processing of those errors, also can occur an advancement in understanding. It is how science progresses: through individuals weeding out past, present, and future self-deception.

The Dumbass-Kickass effect is when I think my work in my field is Kickass, while others, without even contemplating my work, judging only by the fact that I have no obvious support system, can easily claim that I am Dumbass. I have not earned their confidence.

Psychological jargon labels this the Dunning–Kruger effect. If I am continuing to live with integrity, I am only overconfident if I am wrong about harmony unifying everything. If I speak the truth, which would take time and energy for others to determine, then my condemners are believing that their own opinion is kickass, when it is really dumbass. The Dunning-Kruger effect is an overestimation of one's own talents and worth, often at the cost of underestimating someone else's. The opposite is diffidence, the underestimation of one's own talents and worth, often occurring due to gullibility, in believing the negating perspectives of others. Too much overconfidence can collapse a beneficial path, but too much diffidence might not allow enough time and energy to reach one's goal.

In any social setting where being ignorant of, and ignoring, universal unity is normal, then to spend time thinking about that unity is abnormal. I believe in and work with some self-invented vocabulary, like the *Judges* in chapter II, separated from any institution of science or religion. New visions and vocabulary are easily shunned. I have no support system. I perceive a unification, which I equate with God, which plays out in our evolution of consciousness. If more people begin experiencing this unification, then for people communicating with the unification initiate, whose change disrupts people's desires for accepted normality, those people may impose their definition of normal. They want to stop the talk of unity. They wish to block the Blossoming Wisdom Syndrome (*BLOWS*). Time shows it is not easy to stop the wind of evolution. Putting more pressure on life often increases the rate of evolution.

Every human mind is reduced from the God unified mind, making every person unique and biased, with an opinion based on one's limited perspective and frame of reference. If one slips from reduced into unified mind, then slips back out to one's biased and opinionated self, one must choose how and what to communicate, and with whom. This *BLOWS* experience is enlightenment, and is unique for each initiated person. Afterwards, choosing a pre-established vocabulary, such as joining a religion or accepting a guru-god, can dull the initiating epiphany by allowing one's point of view to be normal within that support system. But still, each individual's rationalization of the experience has a signal to noise ratio, the God unified mind being the signal. And opinions easily change. Our minds are malleable, influenceable, and able to dominate others, or be sub-dominant.

Every person has a shield blocking them from understanding too much too quickly. This shield I refer to here as the mind's sunglasses, protecting the individual from mixing-in too much God reference with their reduced perspective. What does the Bible say about this blinding light?

In the Garden of Eden, in Genesis 2:17, God tells Adam not to eat the fruit from the Tree of Knowledge or he must die. In Genesis 3:22, God sees Adam and Eve did eat from the Tree of Knowledge, and since they learned of good and evil, they must die. With death now as the destiny of humans, they must leave the Garden of Eden so they cannot eat from the Tree of Life and live forever with that knowledge, which would make them like God (Genesis 3:5). In Genesis 3:24, God kicks Adam and Eve out of Eden. Ever since, to guard humanity from eating fruit from the Tree of Life, which would allow them to live forever with the knowledge of good and evil, God placed a flaming sword flashing back and forth on the East side of Eden. The blinding light of the flaming sword guards the subtle yet exhilarating truth of the fruit salad made from both the Tree of Life and the Tree of Knowledge. Most people keep away, though it still makes some adventurous people crazy, and still some others can find a path of wisdom.

This is why when we die, we must forgive all people, whether we have judged them as good or evil, so we can evolve beyond that condemning duality and live forever as Light Beings.

Nagual is a term dating back to the Toltec traditions in central Mexico, between the years of 900 to 1200. The word origin is from the Nahuatl word "nāhualli". Nahuatl language was later used by Aztecs, and is today still spoken by about one and a half million Mexicans in central Mexico. Carlos Castaneda used the term Nagual in his books about the teachings of the Yaqui Indians, discussing the "crack between worlds", between the *Nagual* and the *Tonal*.

In the Toltec teachings, Nagual refers to the unmanifested universal energy field, as well as to a person able to access the Nagual field rationally, resulting in new perspectives. In contrast to the spiritual Nagual field, Toltecs referred to the material field as Tonal. The Tonal mind includes rational consciousness, while the Nagual mind reaches into the unknown, unlimited, and pure energy field potentials of the universe, information not bound in 3-D space plus time. Nagual mind accesses the Source from which all of creation manifests.

Once a person's mind accesses both Tonal and Nagual perspectives at the same time, being the crack between the worlds, much work is required to bring cohesion and understanding of that person's personal creation story. Toltec spiritual seekers' goal was to access the Nagual from their Tonal perspective, to expand their awareness, and to attain conscious unity with the creative Source of the universe.

Moses on Mount Horeb talked to God who spoke from the burning bush. Moses slipped into the crack between the worlds, between the Nagual and the Tonal, between the spiritual and the material. In that crack, one can find truth in the Word which is in both worlds, being the God *I Am* meeting with the individual self *I Am*. Jesus, Buddha, Muhammad and so many others all slipped into that crack between the worlds, where one experiences *BLOWS*: the Blossoming Wisdom Syndrome. But once entered into that crack, it is overwhelming. It takes willpower, balance, and work to maintain God as a reference within, to find accurate harmony.

When the *solipsism* perspective occurs for a person, their reduced norm shifts radically into the individual's own unified *I Am*, where Only God exists and all else is only an extension of the One Mind. To a person who becomes an observer inside this subjective mode, all other people and things and creation are only imagination of one's own God-self perspective.

When a person has a unity experience, be it comfortable or not, that person might change their time-established dealings with the world, and change their mental references. Observers likely will not understand the changes unless they too have had a similar experience. Drugs, loss, new understandings, fasting, sleep deprivation, emotions, illness, or accident; almost anything can be the trigger that lessens the obscuring factor of the mental sunglasses, allowing more God reference to flood the mind with *BLOWS*. In changing God's name to a noun from God's chosen verb name, YHWH (translated to I AM) in π Genesis 3:14, humanity set up more mental

sunglass shielding against the flaming sword that keeps humanity from the sometimes-overwhelming truth.

With nature exhibiting harmony, and consciousness at times being pressured by our having chosen non-harmonic chromatic music, sometimes learning and evolution is accelerated. Having adapted to their acceptable mental sunglass protection, individuals might become imbalanced by their own increased experience of unification. One may enjoy it, meditate through it, hallucinate, become paranoid and critical, excessively avoid eating or sleeping, shift into manic excitement, enact a hyper investigation into whatever is the focus of the moment, or explore some perspective much more chaotic. Likely the initiate into *BLOWS* will try to reach out to express the perceived new paradigm to someone deemed able to receive the idea, someone who may not want to hear such words delivered with so much energy and intent.

Lithium is combined with other elements into different medicines used to control minds of patients determined to need chemical stabilizing. In this section, lithium is also used as a generalized term for psychiatric medications used by doctors for dominating *BLOWS*. The potential lithium patient is maybe being judged harshly for experiencing shifts between two extreme opposites: 1. pessimistic (depressed)—end life now, and 2. optimistic (manic)—imagined future, or even present, or past, success of one's outreach goal.

I choose to control my mental sunglasses myself, in that I live within a do-able middle path… another day, another taco... chop wood, carry water... I do the homework to learn more about the hoped-for goal. Life choices can avoid excessive depression. Patience may be helped with the faith that God can assist in personal growth towards integrity.

Friends of the initiate from before the *BLOWS* experience might get split feelings because they do not recognize these new manners of their friend. At the same time, those friends may feel need to label the initiate as some form of *bat-shit-crazy*. This can bring people to straddle a mentally uncomfortable fence built of duality, indecision, and ignorance. The friends and the initiate must decide on which side of the fence to climb down from the energy situation. Any decision made is easy to deny afterwards.

"These are the words of the Amen, the faithful and true witness, the ruler of God's creation:
I know your deeds, that you are neither cold nor hot. I wish you were either one or the other!
So, because you are lukewarm—neither hot nor cold—I am about to spit you out of my mouth."
π Revelations 3:14-16

Sharing the *BLOWS* experience too much is potentially painful. Choice is important.

John 1:1 tells that the Word <u>is God,</u> and that the Word <u>is *with* God</u>. The Word made all things (John 1:3). John 1:14 says the Word became flesh. We are all in flesh. Built into our consciousness, all of us have the duality of *being* God and of being *with* God. I had to go inside the messiah complex to better understand it. I had to be the unified field theory: I Am. Inside the messiah complex, the initiate can burn out fast from trying to be omniscient God. The solution: humble thyself within reduced consciousness by being *with* God. When with God, we have tools to use: Psalm 9:9 says YHWH is a stronghold in times of trouble.

Is Jesus God? No is a simple answer. Same for the answer yes. Without assimilating the definition of the word "God" that includes the duality of John 1:1, neither is a complete answer. The best answer is that the people who are saying Jesus is God, this is the same as telling Jesus that he no longer has the right to believe in God, like the option given to the rest of humanity. How powerfully wrong that is. It is for the faith that Jesus has in God that he is on Earth to show people. Religions telling him he has to be God are telling Jesus he cannot believe in God. That is wrong. Best for people to question what is accepted as authority. Let Jesus do his job. With faith in God so strong, he is a good example, one that the world needs.

To understand God duality: the reference is pure God, and the tonal center is the Word. Complexity enters in the biblical definition: the Word is with God, while also the Word is God. Holographically, the whole reference is in every part of creation—everything is God, including you, me, Jesus, and a frog. Faith in God is believing the original void-mind has willpower to create order in the beginning of time and for all time. Signal to noise ratio enters into beliefs.

Human consciousness is founded and grounded in the void. Void maintains the flesh through the Word as the purest attainable signal. One can experience being God and/or being with God, but there is no vocabulary or diversity in the void. To come out of the void, one's mind resonates through the unified field centered on void and the Word. Jesus achieved at times the experience of being inseparable from God. Other times Jesus felt forsaken by God, but still with God to varying degrees. The highest signal with no noise can be called God. But to himself, for his own sanity in his reduced state of mind, Jesus cannot be God. He must be with God. Deep within his own self, Jesus is God, unified, but he is unable to accurately acknowledge that to himself and to the world without the diversification granted by simply being with God.

In the void consciousness, everyone is God, though unable to acknowledge this without reducing out of unity and simply being with God. Too much speculating causes burn-out for the individual and witnesses. When needed, each person must find their own way to darken their mental sunglasses, and when necessary, find stronger faith. If I get too involved in possible futures facing external pressures beyond my control, indulging in too much analytic diversity and imagined synthesis, I need to step out of the speculation mode that is creating my imbalance. I remind myself: "*Lo que Dios Quiera*" (whatever God wants). This lessens my attempts to control too much future. God does it all. I can stay small. I would rather be an ignorant optimist than an omniscient pessimist.

Humanity's relationship with God evolves. When I am reduced and *with* God, I choose to do my homework, including proper exercise, food, and rest for mind and body—all being for balance in the present moment, and preparations for perceived possible futures. Like the heart exerts and rests with every rhythmic cycle, analysis and synthesis need to exercise and rest too.

About two percent of the human body's weight is one's brain, and it burns about 20 percent of the calories we take in. It is said that the brain at rest burns more calories in the same amount of time as does one's thigh while running, and that mid-level brain processing burns 1.5 calories per minute. Intense thinking burns more. The higher the brainwave frequencies, the more energy is being used. Walking can burn four calories per minute, while kickboxing can burn ten, but inevitably a significant ratio of those are brain calories burning.

"Don't eat anything bigger than your head" Bernard Kliban

Using over-eating cliches as metaphors, mentally we might try to "Bite off more than we can chew" because "Our eyes are bigger than our tummies". If the individual's self-containment is not enough, one might get condemned for sharing too much of the big picture, right or wrong it does not matter. The initiate might become a patient in the field of mind medicine and institutional intervention may occur. A psychiatrist might examine a patient who is explaining their unity experience, expressing possible interpretations of all things. The doctor may diagnose the patient as displaying some level, degree, or differentiation of a messiah complex, though probably in more acceptable jargon such as "bipolar"—even if the processing person is not displaying harmful excessive manic nor depressive symptoms.

"Elated by the insight, Archimedes leapt out of the tub and ran through the streets of Syracuse shouting, 'Eureka! Eureka!' Of course Archimedes forgot that he was stark naked."
From *Zero* by Charles Seife

As the doctor likely lacks wisdom regarding the merging and maturing of the unified and reduced consciousness, the patient's vocabulary with personalized signal to noise ratio can be condemning, leading to chemical intervention, whether the patient desires it or not. In each social situation, there are taboo conversations, explanations, and choices, valid or not, for the person to avoid when processing through a unified experience from his or her reduced perspective.

Graham Nash wrote this song after a challenging unity experience triggered by LSD. The writing helped him to resolve and assimilate the unifying and diversifying memories:

Cathedral; Crosby, Stills, Nash Song, 1977

All religion has to have its day…
Open up the gates of the church
And let me out of here.
Too many people have lied in the name of Christ
For anyone to heed the call.
So many people have died in the name of Christ
That I can't believe it all.

And now I'm standing on the grave
Of a soldier that died in 1799,
And the day he died, it was a birthday
And I noticed it was mine,
And my head didn't know just who I was,
And I went spinning back in time,
And I am high upon the altar… high

…The air inside just hangs in delusion, but given time, I'll be fine…

With the strong desire to share, to avoid problems it may be better for the initiate uncovering a new idea to be socially subtle about evolving perspectives. If one's willpower to communicate is not contained enough, the doctor may prescribe the patient with some molecular combination that includes the periodic table element with the atomic number 3: lithium. Li_3.

In music, the third harmonic breaks down the lack of differentiation of the lone pitch-class of the fundamental tone Doe {1} and its first octave Doe {2}. The third harmonic Sol {3}, being three times the frequency of the {1} tone, is the first differentiation away from the undifferentiated fundamental pitch class. $Lithium_3$ might help reduce the unity for a person experiencing so much, who is perceiving his or her self as God or God's messenger.

Many traditions break unity down to a third harmonic. In 325 A.D, the Council of Nicaea adopted the revised creation story with God being the Holy Trinity: Father, Son, and Holy Ghost. The erred circle of fifths breaks down every tone with the third harmonic, 2/3, Sol, attempting to justify chromatic music errors (Fig.XVI.12). Huichol Indians of Mexico ingest peyote to attain a unifying experience. Their holy-trinity safety-net of corn, deer, and peyote is able to reduce them out of unification, explaining how and why they are able to exist. Becoming Catholic, Huicholes are able to simply overlay one holy trinity over another. The Hinduism trinity of Shiva, Vishnu, and Brahma all serve the singular nature of OM, their one universal God. The three jewels of Buddhism are the teacher, being Buddha, the teaching, called dharma, and the community, called sangha. Ancient Egyptian trinity was Amun, Re, and Ptah. The Babylonian trinity was Nanna, Shamash, and Ishtar. The Persian trinity was Ahura-Mazda, Mithra, and Anahita. Celtic tribes worshiped the three forms of Matronae, the goddess of fertility. People focus on Birth, Life, and Death; on Earth, Sun, and Moon; on Body, Mind, and Spirit; on Past, Present, and Future. The Flower of Life in Fig.XV.2 is six-space, Sol geometry, the 3rd harmonic pitch class, that can cause fanaticism in people who believe it is the universal source rather than an overtone drawing. Superstition can lead to the belief that things and events manifest in threes.

"Three things cannot be long hidden: the sun, the moon, and the truth." Attributed to Buddha

"By three methods we may learn wisdom: First, by reflection, which is the noblest; Second, by imitation, which is easiest; and third by experience, which is the bitterest." Confucius

"There are three kinds of men. The one that learns by reading. The few who learn by observation. The rest of them have to pee on the electric fence for themselves." Will Rogers

“Is it sort of like snap, crackle, and pop all rolled up in one box?” *Million Dollar Baby* (movie)

“All truth passes through three stages. First it is ridiculed. Second, it is violently opposed. Third, it is accepted as being self-evident.” Arthur Schopenhauer

Be Nanas

Once upon a time in the garden, bananas were plentiful year round.
The people, especially the children, loved to eat those sweet bananas... Ah... the Joy!
With time, bananas were taken for granite;
like pebbles on the beach, they were everywhere.

To make bananas sacred again, a banana teacher arose.
He brought new joy. He said, "Look! Put your finger in the end here
& gently push through..." & the people, & the children especially, were full of joy.
The bananas split into three long pieces. Every whole banana could be a trinity.

This kept joy in the bananas a short time. When the joy had left again, bananas grew scarce.
The bananas wanted joy too... no happy children, no happy bananas. So a new banana teacher
with not much joy decided the people must ration their bananas: "Only two thirds each!"
So every third of a banana gained new value.

With time the banana teacher & new banana teachers dried these banana thirds
to be able to store them through time. Soon people only wanted dried banana thirds.
Joy, true Joy, the unity of a happy banana people, this had fled.
& with the high value of dried banana thirds came counterfeit banana thirds...
like dried slugs, dead little things & trash type nothing food.

& the people wanted more. Even the banana teachers had forgotten
the True Banana. But then one day a questing child, unable to have joy
in reaching for dried banana thirds, prompted by dreams & confused stories
of the True Banana, wandered away from his people. & he found a garden
with bananas growing, whole bananas, that could be split in three or eaten whole!

Yum! They were good. True Joy; happy banana & happy child. The child said,
"The bananas & the people are One. I Am the True Banana! Ah."
Who's the True Banana? Everybody together now...
one... two... three... "I Am!"

Lacking experience of one’s new paradigm, an initiate might not manage reducing the unifying experience well, and trying to do so too socially may trigger others to judge harshly. The person experiencing unity may be convinced or forced to become the patient to whom a doctor prescribes lithium. The doctor likely will not know, have an opinion, or even care why lithium works to help the patient differentiate away from experiencing too much undifferentiated unity. The medical profession has believed enough in the results to continue prescribing their chosen medicine, even though in about one in five patients, lithium showed itself to be toxic to kidneys and the thyroid gland.

Mark Vonnegut, a published author like his father Kurt Vonnegut, shared his story of passing through this unity experience in *Eden Express.* He accepted the benefits of lithium, and later became a doctor himself, continuing to take the lithium. Not everybody experiences lithium so beneficially. That is why and when a patient who has been prescribed lithium may choose to no longer “take their meds”.

One path people may choose is to be with God. Another path, atheism, for some is effectively choosing to be god, a dangerous path, even though the truth signal of this choice, God, still exists in entirety within that person's confusion, whether they believe it or not. For some people, not choosing to be *with God* after a unity-void experience may require lithium or some other pharmaceutical solution to attain some temporary equilibrium.

With proper willpower, often enhanced when perceiving negative reactions of others, and maybe with help of some useful guidance, the *BLOWS* initiate with enough integrity may instead learn how to properly differentiate the void, harmonics, the possibility field, and the probability field without lithium or other prescriptions. The person may always have the messiah complex, but with a proper understanding, the person may differentiate between imagined and real, and understand that this unity experience is a common and reoccurring theme throughout history.

The unification of separate ideas seems to trigger an instinct to share the unity, an instinct not only for the survival of the individual, but an instinct for the whole species. The willpower driving the will to know and survive includes a natural instinct to share, even among scientists.

"In every department, every researcher would like to see more of his or her own kind. It's a natural instinct, the urge to assemble a group of people with overlapping interests who can stimulate one another." J. A. Wheeler, *Geons, Black Holes, and Quantum Foam*

The patient experiencing unity and the drive to share their new perspective may stack vocabularies together into an individualized unified field theory, likely with a vocabulary not yet well formed. The patient may include creation stories such as saying God's willpower is in the 0-D void, God's unity and omniscience is in the 2-D possibility field as the holy spirit, and God's human messenger is in the 3-D + time probability field. These perspectives merge and separate throughout the continuing experiences. The person may claim that heaven is where God appreciates God, hell is where God condemns God, and Earth is where God can become more confused or more clarified about God.

"When you have lived with prophecy for so long, the moment of revelation is a shock." Frank Herbert, *Dune* #1

Avoiding lithium, the person may learn, through trial and error, various ways to differentiate vocabularies about the unity experience—some healthy, some not. It is all mental exercise of which too little or too much can be harmful. Having delved deeper into this original and unified source of the universe, one might learn that in this holographic reality, every part contains the whole God reference, in body, mind, and spirit. The *BLOWS* initiate may be able to help or harm other initiates. Every teacher carries their own signal to noise ratio. When deemed appropriate, the student must question authority. A good teacher wants the student to learn the subject agreed upon, even if the teacher must adapt to the student to achieve this. A good student wants to learn the subject that the student and teacher have agreed upon, even if the student must adapt to the teacher to achieve this. The student-teacher relationship often needs breaking.

I developed a perspective during my 1982 epiphany of being part of the human evolution of consciousness, that the same *BLOWS* before me flipped so many unguided western people into an unbalanced mode for which they had to be intervened. This evolution is the Word of God coming out of the clouds of confusion, to manifest clarity in the minds on Earth. With time, I have continued assimilating my paradigm shift which made me feel like God's meat puppet. I have been able to skate through on the thin ice, through any difficult disrupting events, and not be interrupted too much in my research. I must avoid seeking external validation, leaving that for God to connect. Instead I seek my own internal validation by doing my investigative homework.

"Well, it's a funny thing. Once you start to get it, you won't be able to figure out why you never saw it before. It's really so simple." *The Eden Express*, Mark Vonnegut

I read *Zen and the Art of Motorcycle Maintenance* before my personal October 4, 1982 epiphany. I did not read Mark Vonnegut's *Eden Express* until after. The 1974 *Zen*… book by Robert M. Pirsig is about a 1968 motorcycle trip that he took with Christopher his 11-year-old son, and their two friends John and Sylvia. Pirsig wrote of his efforts to piece together memories of Phaedrus, his name for himself before having been committed to a mental institution and subjected to memory-erasing electro-therapy shock treatments. Phaedrus' unified field theory was based on his own idea which he referred to as the Metaphysics of Quality. Phaedrus taught that to define Quality is to misunderstand it, same as Plato's Goodness and the Taoists' claims of the Tao. Phaedrus claimed Quality to be the source of everything in the universe, the supreme spirit manifesting matter, mind, and free will.

Phaedrus' goal in life, his Church of Reason, was to merge all dualities among humanity into Quality. Phaedrus' claimed that living without Quality resulted in life without meaning, that the neglect of Quality causes the crisis in modern society. Phaedrus claimed that a person living without Quality leads them to delusions and insanity, and that religion lacks Quality and leads individuals to delusion. He claimed the spirit of Quality is the foundation of all science and art.

Problems arose for Phaedrus as he made himself the only source of truth for the modern world. His lack of self-control during his attempts to proselytize his perception of Quality did not immediately lead to quality for himself. Phaedrus' over-drinking and over-confidence while imposing his savior complex on academic peers and anybody else, even if they had little or no desire to hear him, led to him blacking out and being committed to the mental institution.

Mark Vonnegut in a later book, *Just Like Someone Without Mental Illness Only More So*, said: "Part of what happens when one goes crazy is that there is a grammatical shift. Thoughts come into the mind as firmly established truth… the fantastic presents itself as fact... there's no time to argue or have second thoughts." Those wishing to avoid intervention must not embrace instant ideas. In facing one's own omniscience: skepticism, research, and humility are important.

Sean Connery in *The Man Who Would Be King* demonstrated megalomania's supporting reasons based on belief in coincidences and destiny, ignoring contradictions and self-inspection.

"The path that leads from the particular to the general is an intuitive one;
that which leads from the general to the particular is logical." Albert Einstein

It seems increasing numbers of people have been experiencing *BLOWS* without going too crazy. People skate through this as beginners, without an instruction manual. I view my *HUT* as an important instruction manual, but so far it is just for me. I see humanity approaching an accelerating unity of consciousness as part of our evolution to help us survive our divisions.

BLOWS would be difficult to contain as an isolated experience. Terrence Howard, an actor, played the counselor in the 2007 movie, *August Rust*. Robin Williams played the fictional character of a crazy genius person—being the one exposing his own *BLOWS*, spouting his personalized universal truths about harmonics (see his quote at the end of *HUT* chapter XI). Robin's character, Wizard, cannot keep his eye on the ball, on the harmony reference, instead prioritizing money as his focus through which he filters his choices, his willpower.

For years, Terrence has publicly shared versions of his own *BLOWS* experience. Whether he had a single grand epiphany, or if he climbed in gradually through time, I do not know the truth from his words, a personalized mix of signal and noise. He claims that 1 x 1 = 2, making a one foot by one foot floor tile to be two square feet. He is very proud of his focus on the 3rd harmonic pitch class in the 2-D Flower of Life (Fig.XV.2), and his joy in transforming it into 3-D. At some point, Terrence had grasped at the universal harmonic signal, but that is not an easy focus for him. To support his stage pizzazz in life, he claims truths based on inherited unrecognized errors about harmony. He has gathered his own noise and needs more motivation

to accurately clarify the universal signal within that noise. He is too satisfied with the adherence of his ideas and spends too little time applying willpower to refine their coherence. Terrence predominantly uses himself as the signal, claiming to know too much. Reflecting on him, I do not like my own reflection. I get more embarrassed to share my own attempts to clarify the universal reference. My solution is to shut my mouth and to do my self-arranged homework.

"Do you not know that in a race all the runners run, but only one gets the prize?
Run in such a way as to get the prize." 1 Corinthians 9:24

"Why do I write? To find out what I think about things I don't understand."
The Family Affair, Nichol Kidman's character in 2024 movie

I claim: 1 + 1 = 3. Why? How? On September 5, 2024, Ammah my daughter and Sean her husband had their baby girl Juniper. That miracle of life proves that in re-creation, math rules can change: 1 + 1 = mom + dad = mom + dad + baby = 3 humans.

Dave Brown's video on the internet is from around 2018, called "Making 'Cents' of the Universe: The Harmonic Series IS the Unified Field, Fibonacci, Golden Ratio". Dave is also a person who has experienced *BLOWS*. He approaches many of the same subjects which I have in my 42 year *HUT* project, but again he has not questioned the authority behind those many aspects enough to uncover the inherited errors he teaches. He does demonstrate that the answer *BLOWS* in the wind, but it requires more focused willpower to clean up the signal to noise ratio.

BLOWS reminds me of Charles Darwin and Alfred Wallace each sharing the theory of evolution simultaneously, and of Isaac Newton and Gottfried Wilhelm Leibniz inventing calculus at the same time, and of Murray Gell-Mann and George Zweig coinciding in their proposals of quarks. An idea *BLOWS* in the wind. It *BLOWS* the mind.

Another example of the reduction vocabulary of a unification perspective was the messiah complex of David Koresh, leader of the Branch Davidian cult in Waco, Texas. On April 19, 1993, David and his group died together in the fire of their residence, 76 people in all, including 25 children. David exemplified John 1:1 with his words claiming both, that he was god, but also a messenger for god, with whom god talked. He established his own rules and morals, even his own destiny of going up in flames. He did not keep track of whether he claimed he was god or was god's chosen person. That dual-perspective spinning coin just kept spinning for him. He claimed to have a message for the world and claimed he was going to write it and release it, but the group's death came first. The FBI negotiators lacked enough experience of the messiah complex to be able to have an engaging conversation with Koresh. Negotiations failed. Disaster was the result. Lithium possibly could have quashed the messianic inspiration out of Koresh, but his mutated vocabulary had already progressed and his cult, that David had inherited, had already been formed and matured into its final essence. His cult went high speed down a dead-end road where the group inevitably crashed and burned. Remnants of that cult continue to exist more than three decades later.

I do not refer to my science epiphany, and my research of that experience in *HUT*, as delusional. For me, it is more of an adaptation, an attempt to understand a perceived truth. Mostly I have learned not to share my joy in science. Sharing enthusiasm for a subject that others present do not care about can be easily condemned. Different people might decide a person's ideas are delusional even when the idea-person does not agree. Atheists believe someone believing in God is delusional. Someone believing in God may believe an atheist is delusional.

Of my many strange experiences I have had trying to understand the unified field theory, only my original epiphany was predominantly me witnessing me. Ever since, my strange experiences have been me witnessing other people responding to me, and me dealing with them.

Over the years, a few people have temporarily embraced my new perspectives and imagined their own world of signals and noises into which to expand. Scientific jargon might consider some of these situations as shared delusional disorder (SDD), even though I do not consider myself as delusional. In French this might be called, *Folie à Deux*, which translates as "madness of two". Arlo Guthrie's song, *Alice's Restaurant*, questions what happens when two people sing the same unpopular song, then more than two join in singing it. If this sharing occurs and causes many people to experience an abrupt change to their beliefs, this might be considered as mass hysteria.

SDD has happened with me as the "primary". In the first two of three example situations, from during the 1980's, not isolated from other people, I was sharing my perspective with only one "secondary" person at a time. With two separate men, Gary in Kirkland, WA, USA, summer 1983, then Karl on a beach on Koh Samui in Thailand, December 1986, they each focused on what they interpreted from my words and the string dance I taught them. They each perceived enough that their individualized mental domino effect, the blossoming wisdom syndrome, *BLOWS*, was triggered. With their new paradigm, in their own vocabularies, as a variety of different scenarios passed through their imaginations, they attempted sharing with other people.

Seven of us Alpental ski area workers lived in and around one house—four men and three women. One resident brought home a friend of hers, Gary, to stay awhile.

After asking me questions about my theory for a few days, and learning the basic 2 x 3 superstring dance, Gary left to Eugene to visit his mother. Together, they concluded a new perspective of Gary, which he brought back to the Kirkland home. He returned as a man with a self-perceived great wisdom, a gift to humanity. He had plans, like voting machines on every corner and it would be mandatory that people voted every day. For him, his ideas were prophesy.

I told Gary about the time tunnel, which is the perspective from where prophecies come. The problem with the time tunnel is when trying to interpret imaginations, the ability to know timing of imagined future events is not given in that tunnel perspective. For the perspective of light, there is no time, and the distance in the direction of travel reduces to zero, making the time tunnel length to be zero, with no time. Eleven months earlier, overwhelmed, I had imagined the end of the world being "now". To solve my problem, I chose to just pick a date to live through so I would be past that imagination point of view. I chose the anniversary of the end of our 1981 kayak trip. I told Gary that date was a little more than a week away, September 22, 1983, and then I would be free of my own time tunnel prophesies. Gary decided that date to be the actual ending of the universe, and he told people about his prophesy, and that he was the new prophet on Earth. He was ignored.

During the final few days, Gary latched onto being the messiah-god of his otherwise godless universe. Since I had experienced, as privately as I could, my own messiah complex for the past eleven months, in my own imaginary story Gary fit the archetype character of the anti-messiah. For my own balance, I had been silently forming my own personal mythology.

A few weeks before Gary's arrival, I had made for myself a triangle made of three sticks laid on the ground, with three sticks raised-up from each angled corner, joined in the air above the triangle's center. For me, the tetrahedron represented carbon, and sitting inside I would imagine being my spirit inside flesh. A birthday party was planned for at our house for that coming date, with a band whose lead singer was on the Alpental Pro Patrol with us. The band set-up outside. Gary told some people that the universe was ending at midnight, and party talk made it so everybody knew. In the midst of the partiers, as his announced character, being the end of times guru waiting for the final moment, Gary sat meditating inside tetrahedron.

Midnight, Gary's appointed moment for the end of all things, came and passed. A couple of days later, Gary left to nobody knew where. I know nothing more of him since then.

Having picked that day for myself, before I had ever met Gary, it allowed me to face my personal time tunnel imaginations. Everybody we meet in every situation we encounter, is a gift of the distorted mirror, to see oneself in an alternate form, acting out a possible personal future in somebody else. This allows us to clean up our own personal signal to noise ratio.

What's your reference?

Karl and his lifelong best friend Jaap arrived to Noi's Bungalows on Koh Samui from Holland. Both were very athletic. Jaap told how Karl had studied movies to learn all of Bruce Lee's moves. Seeing my superstring dances, Karl was fascinated. Bruce Lee had displayed the 2 x 2 dance in his movies, but neither the 2 x 3 nor the 2 x 5 moves were in Bruce's martial arts. I taught Karl the sequence of moves, and he learned rapidly right up into the 2 x 5. After about a week, Karl and Jaap left for Krabi on the other side of the Thailand peninsula.

On Christmas Eve, in Noi's restaurant that served the renters of the ten or so bungalows, I joined others for dinner and discovered that Jaap had returned. When I entered, he was telling some disjointed story about Karl to the others, and he began to tell the Karl story directly to me. In Krabi, Karl had been exercising so much and his mind went to a perspective way beyond Jaap's understanding. Jaap was very bothered by this and said they returned to Koh Samui because Karl was intent on talking to me. Jaap told that Karl had talked to doctors and priests in Krabi and nobody could hold Karl's attention, nor could they understand him. Jaap told of the respect he had always had for Karl's constancy of character, a respect now sadly broken.

After the meal and more details, I went to Karl in their bungalow and our intense talks began. Karl was lost in his inability to understand and communicate his own experiences, returning regularly in his confusion to talking about his ex-girlfriend, Fausta, living in Holland. He had become so imbalanced. Karl told how he had been dancing with the superstrings that I had made for him before they departed to Krabi. Practicing the superstring dance for hours, Karl was focused on an imagened image of Bruce Lee in front of a cliff wall the whole time. When Karl became much too tired, he climbed up into the cave inside that cliff wall, famously known as the Spirit Cave, and fell asleep. When he woke up, all was changed. At first Karl thought he was God, then Jesus, then he became confused by his new perspective mixed with his loss of his girlfriend. Priests came and Karl told them he was God and the messiah.

On Christmas Eve I was telling Karl of my perspective in holography terms, that he had been inundated by the reference wave that is complete in every mind. I told Karl that for me the reference is God, the *I Am*, and because of that people can believe their personal "I Am" to be God and the messiah, like Karl had. I told him he had directly confronted believing himself omniscient and omnipotent. I told him of the tonal center, the harmonic fundamental tone, known as the Word and name of God, different in the many religions. I told him that understanding the verb aspect of YHWH brought me balance, but I had never met anybody else for whom it had worked. The Word of God is also interpreted as Jesus in Christian religions, but for me God is the pure "I Am" reference, not in flesh. Karl asked to hear my Om bowl which he had known and appreciated even before going to Krabi. I played it and sang using it as the fundamental tone of a harmonic scale, different than the accepted chromatic scale. Listening to this, Karl calmed completely.

Karl thought my God-reference perspective would work for him and he seemed to find his mental balance. I told him he should eat, as he had not been eating or sleeping much, and it would be best if he calmed everybody's fears by joining them at the restaurant, and not talking too much vocabulary that would be too weird for the others. Small talk would have advantage.

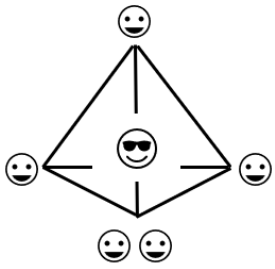
We ate dinner with the friends. Karl was very quiet. So was I. After time, people wandered off into the night. I walked Karl back to his bungalow and I went to mine and slept.

In the morning, Christmas Day, Noi came to my bungalow and told me that all night Karl was hanging out around Jeep's bungalows, restaurant, and disco. Jeep was a big boss Thai woman. Shortly after Noi left me, Karl arrived to talk and was going on about Jeep and how he had slept with her before he had died, and how much he needed to be with her. Karl was not acknowledging himself as Karl. Nor did he once mention his ex-girlfriend. Karl talked like he was Bruce Lee. Jeep arrived and told how she had slept with Bruce Lee while he was shooting a movie in Thailand, and again later, shortly before he died. She said that Bruce needed Karl's body to fulfill a prophecy, and that she is in the prophecy too because she is supposed to help stabilize Bruce in Karl's body. She said I was in the prophesy too, to stabilize Karl as himself, and that she and I would understand our roles with Karl, yet we would still be courteous with each other. Karl and Jeep left. Noi came to me and asked the story, which I told him. Noi departed to another village to talk with some priests who knew of the prophecy.

Later that day, Noi returned and told what the priests had explained, how Jeep, Bruce, Karl, and I had been in an old prophecy. Exactly who those four persons would be had not been settled for the priests until today. Karl entering the spirit cave and taking on Bruce's spirit was in the prophesy also. The priests sent holy water with Noi to give to me for use with Karl. They interpreted the prophesy as basically that I was the future Talking Buddha and that Karl was in training to be my body guard. After Noi told me this occurrence with the priests, it seemed like later he did not retain many details of what he had told me during our discussion.

During the final week of 1986, the Karl story, the prophesy and his exercises, words, and intensity became known island wide. Noi would regularly take Karl to the priests' village and they would give him a massage. Each time, I was asked to go and I continued to refuse. During those days, Karl's witnesses were many. At any time, day or night, Karl would work out for hours, a big show for everyone. Karl no longer experienced being the messiah. He would settle into being Bruce Lee, then would want to reaffirm Karl and he would return to me. I would remind him that he is Karl and that he needed to gain awareness of his changing references. When he was in the Bruce perspective, with Jeep whispering in his ears, I became his adversary.

When Karl tried to remain Karl, he wanted to use me as a reference for stability, and Jeep would be his adversary. On New Year's Eve Day, Karl had not been able to rise up from his fetal position all day, in great pain in his fight to not be dominated by Bruce Lee. He insisted that I knew a secret that I was keeping from him, a secret that would allow him to heal. I remained silent. I played my Om bowl and began singing. I tried to make a difficult decision.



Karl repeated that I was not telling him something important. Several times Karl had seen the tetrahedron surrounding me with five men's faces at the four points, two being at one point. I had always refused to talk about that with him. I told him I could not tell him too much as I did not want to disturb his revolving reality further with my personal imaginations and solutions. But he could see the faces. With his continued insistence, I told him that I often needed to imagine myself as the tonal center of a constellation of those five people who had died before I was born.

I told Karl that since the first day I had met him, to me he was Lancelot. Boom. Karl sat up. All pains gone... like a miracle. He dove into his own vision of being Lancelot reincarnated, connected to one of the five faces surrounding me. He kept saying: "The White Horse". He strongly believed in the western prophesy for the Once and Future King, and its constellation of influencing people overlayed the priests' Talking Buddha prophesy, being different versions of

the same idea. I told Karl that for him, and for me, I must be just Mark, and he just Karl. We acknowledged that being just Mark and Karl may include many assimilated levels.

Since people from the bungalows had been very worried about Karl, and as his health now seemed to be instantly grounded, Karl wanted us to go eat dinner at Jeep's restaurant, where all of Noi's bungalow guests were feasting and partying for New Year's Eve.

At the restaurant, people wondered how Karl was suddenly grounded again. I answered with only, "Ask Karl". Karl was being gracious to everyone. When Jeep tried to get his attention, Karl was courteous but aloof with her. Karl invited three insisting people out to the beach, asking me to come, and he told them about him being Lancelot. They asked who is Arthur and he would only say his personally chosen perspective that "Arthur is the Mind". Shortly after that, I excused myself and quietly walked home alone to my bungalow and my own meditations.

New Year's Day, 1987, Karl was Bruce again. He became more intent on setting up battles between him and me, but I refused to make him my reference. He alternated between being Karl possessed by the ghost of Bruce Lee, and then as Karl reincarnated from Lancelot here to serve his King. The rumors among locals and tourists swirled, distorted, and melded, of Karl as Bruce, Lancelot, and protector of the Talking Buddha, and even Christian prophesies.

In the afternoon of New Years Day, Karl showed balance, not focused on Bruce and Jeep, and he really wanted me to visit the priests' village with him. I decided to join Karl and Noi on the visit, and it was quite a show with lots of Thai people laughing, with no fears or confusions. One older priest gave Karl his massage, and nobody talked to me except Karl the whole time. Noi translated the priests for Karl. Karl and I were like celebrities there, and Karl was in complete control, and very sane. They sent me away with more holy water for my use with Karl.

Ineffective police officers would stop by Noi's Bungalows, seeking some solution to the island-wide social swirl. They would consult with me, but I would not support their confusions and fears, telling them that, when he chose, I could help Karl back to being himself. The police would just leave. Karl was not hurting anybody nor breaking any laws, and he did not harm himself physically. Confused doctors, wanting and not wanting to get involved, moved through the story. Locals partially supporting the priests' prophesy, came with their versions of the event, and many verbally opinionated and silent international tourists watched Karl with wide eyes.

Karl continued verbally shuffling through many possibilities, trying to figure out how to be stable. He could balance only temporarily. His faith in each of his changing references, of Bruce, Fausta, Jeep, archetypes, me, would each fail and he would cycle through them again, losing himself in the processes. I taught him about I Ching #36: darkening the light. His fame in the Koh Samui priest's prophecy was too bright and causing disturbances. He needed to darken his own light and blend into the world better and try to use God as his reference. But Karl was only able to focus on God when in his Lancelot role, serving a King who believed in God. When he wished, my self-appointed role was to remind him to eat, sleep, and talk well with others.

When I make a boss, a worker, even a friend to be my reference, I am putting that person between myself and God. I serve that person during that time. When it becomes too difficult to maintain God as my reference because my alignment is being too disturbed, I need to clean out problematic references between myself and God. With Karl, I was reaching this point. I felt I could not stay much longer while maintaining the belief that I could still help the situation.

After an energized daylight event on the beach between Karl's Bruce and myself, with many witnesses, the next day, January 4, 1987, I silently slipped away to the ferry and went to Bangkok and made my flight reservation to India. In Bangkok, one of the friends from New Zealand who had stayed at the bungalows throughout the whole experience and had continuously asked me to explain the Karl story while it occurred, told me that as soon as the police saw me

get on the ferry and leave, they came out to the bungalows and took Karl to jail. But Karl understood his balanced role as Karl-Lancelot and he was not acting crazy around the police at all, and since he broke no laws and the priests insisted that he was prophecy, Karl was let free and he moved into the jungle above the bungalows and continued to play Bruce Lee.

I flew to India.

In 1988, after working the winter as professional ski patrol at Crystal Mountain, I returned to Thailand in April and stayed through August, mostly on Koh Phangan. Stopping first at Krabi, I visited the "Spirit Cave" from Karl's story, then I visited Noi's bungalows on Koh Samui for a Karl update. Noi had invented a nickname for me while I was away: "Hollywood". He said my presence had been like the creation of a really cool movie. I learned that Jaap had eventually contacted Fausta who came from Holland and they all returned to Holland. After that news, I have heard no more of Karl's story. In 2012, I again tried to visit Noi's Bungalows, but it existed no more and nobody that I found knew anything about Noi.

In the third situation, spring of 1988, an evening after dark on Haad Rin beach on Koh Phangan in Thailand, I joined a campfire circle where about 40 people already sat. Some of the people asked if I would show them my Om bowl. I was in a mental inertial state, centered in my individual void perspective, so without talking or looking at anyone, I removed the bowl from its bag and passed it to my left. When the bowl returned to me from my right, I still remained deep in the void perspective. Someone asked if I would sing with my musical bowl, and I did.

While I was singing, my eyes closed, a friend of mine, Chang, a Thai artist sitting two people to my right, began what he had done with me before: howling sounds of a giant jungle cat, in tune with my chanting. After a short time, the woman sitting between us began screaming, immediately bringing me out of the void. I looked at her and she was staring at me intensely.

I realized instantly that she had an empathy experience with me inside the void. And I had my experience too, of her being an archetype character in my private story. She spoke aloud about what had happened. She had been staring at me, and my song peacefully entranced her, deeply, until Chang joined in with Big Cat, and she then turned in his direction, and was suddenly filled with extreme fear. She turned back to see me still singing, and she again instantly found deep peace, until realizing that she was only seeing my head, and nothing else: no body, no Earth, nothing. Just my head in the void. She panicked and screamed. And was still in shock.

I calmly said to her a phrase that I had never used or heard before, but have been using ever since, "Experience is fast, understanding takes time." She responded, "It cannot be understood." I explained, "You tried to understand too fast." She said again that it could not be understood. I repeated, "Understanding takes time." She said, "It wasn't you…" Silence. Moments. Staring. She repeated, "It wasn't you…" Words stopped.

After this occurrence, the circle of people remained silent. Tens of minutes passed during which individuals wandered off. Silence remained. I returned to my bungalow, speaking with no one. No one ever mentioned the event to me until a couple of months later when Lucy, from England, told me that a couple of days earlier she had ingested, for the first time, psychedelic mushrooms, and with the experience she had finally come to peace with her hallucination of my head-floating-in-space. I never told Lucy or anybody about my experience of her being the Guinevere archetype in my imaginary world. Since then, I know nothing more of Lucy.

In today's world, both Buddha and Christ would qualify as potential candidates for lithium, but the reduced vocabularies of their unity experiences were not violent nor as morally questionable as were those of someone like Koresh. Christ healing people on the sabbath did not fit well with some Jews. Flipping the money tables was a bit violent. Teachings of Christ and Buddha have endured, but modern doctors, given the opportunity, possibly would still wish to

condemn those two to medication, which just exemplifies the impotence of the doctors who lack sufficient understanding of the mixing and separating of unified and reduced consciousness.

"Although I know of no reference to Christ ever commenting on scientific work, I do know that He said, 'Ye shall know the truth, and the truth shall make you free.' Thus I am certain that, were He among us today, Christ would encourage scientific research as modern man's most noble striving to comprehend and admire His Father's handiwork." Warner Von Braun

The void has no time and no words. In the beginning of time was the Word. Alone, the fundamental tone lacks enough diversity for allowing the vocabulary details we require and desire to describe the variety of perspectives that we can perceive from the probability field. We evolve our ability to discuss the void, the possibility field, and the probability field. Assigning the Tao in *Tao Te Ching* to be only the potent void means that while discussing it, the speaker can no longer be simply immersed in Tao. The first teaching of Tao is you cannot define Tao. To define unbounded emptiness, diversified vocabulary is the best we get, necessitating exploring from beyond the emptiness. The best scientific effort to describe the void is Einstein's zero cosmological constant. The Void with intrinsic Willpower potential creates everything for God the explorer to explore. From inside the void, the void is not definable. From the void everything is created. Then from within creation and its inherent space and time, definitions can be made within our reduced perspectives, and we can *talk about the experience* of being one with God, of being Tao, of being Pure Mind, of being empty within original void.

It requires diversity of consciousness to allow vocabulary for the experiences one has had within the void and unity. With that vocabulary, one can establish life patterns. The void-unity experience is very valid, yet the reduced consciousness explanations developing within an initiate still display the signal to noise ratio which requires maturing. A high signal to noise ratio could end up teaching humanity something valuable, but a low ratio may be dangerously saturated with noise from reduced consciousness. Experimenting with being god while in flesh, rather than being humble *with* God, has time limits. A reduced mind trying to be omniscient god for too long will overload the physical brain. A return to some level of proper health without medication is facilitated by choosing to be with God. Believing too much in imagination can bring on delusions. The clarifying question to ask and answer for one's self is: *what is my reference*? Void with God's intrinsic Willpower is the reference for everything in the universe, but that is a difficult reference for most people to maintain. Freedom allows us to choose any reference, be it harmful or healthy.

Stimulants like caffeine, and depressants like alcohol, can send a post-unity-experienced person into a daily roller coaster of manic and depressed moods, as in Mark Vonnegut's and Robert Pirsig's books, distorting their interpretations of the unity. It may be best for such sensitive people to avoid dependance upon those two most commonly used drugs on Earth.

Keeping up with the Jones

This is the word origin story of the name: Jones. In Exodus 3:14, God talked to Moses from the burning bush. God told Moses God's name: YHWH, translated to I AM. In King James Psalms 68:4 it says to Sing Praises to "Jah". Jah is translated from YHWH. Bob Marley sang about Jah from that same Psalms quote: "…people will fight you down when you see Jah light."

The name Nathan means gift. Jah + Nathan = Jonathan = God's Gift. Shortened to John and Jon, "Jon's son" became the name: Jones. Jah son. Keep up with Jah's son.

Archangel Gabriel told Mary to name her son "Jesus", fulfilling God's *command* (#0) from Exodus 3:15. Root words of "Jesus" translate to Jah + Saves. From the burning bush, God commanded Moses that YHWH "… is my name forever, the name you shall call me for generation to generation." But contrary to commandment #0, and its follow-up commandment

#3, to not take God's name in vain, Israelites have failed, as have Christians, with the same passages in their Bible. It is said the name YHWH is too holy, so God's command must be ignored. Lord's Prayer reminds: "And hallowed be God's name". Muslims also must also honor command #0 since Muhammed taught his followers to honor Moses, who is mentioned more than any other person in the Qur'an.

This imbalance still needs balancing. Keep up with Jones—while there is still *time*.

Defining the indefinable

Thomas Edison is quoted saying, "Vision without execution is just hallucination." He seems to have been echoing an ancient Japanese proverb, "Vision without action is a daydream."

To begin to discuss God within science, first there needs to be a reasonable definition of God. This first step is the most difficult of all. *HUT* claims God Willpower is intrinsic in original void, but with creation being a unified system, and the speculating being done from inside that unified system, proof may not be possible, according to Gödel's incompleteness theorem. Science can point out the necessity of intrinsic Willpower, but maybe cannot prove it.

1) Original void has intrinsic Willpower, which, being unified, according to Gödel's incompleteness theorem, is not provable even if the evidence is good. This requires faith... belief.
2) The void produces a spontaneous virtual particle-antiparticle pair which forms and annihilates into two photons that are reabsorbed by the timeless-spaceless 0-D void. "Let there be Light."
3) From time's beginning, to allow the 2nd law of thermodynamics within the forming universe, time must advance, on the average, from the highest order of creation into increasing disorder, for all time. This average increase of disorder is called entropy. Science accepts this, but does not address how the beginning began with the highest order of all time.
4) The production of spontaneous virtual particle-antiparticle pairs which form as ends of a string moving chaotically, which collide, become two photons, and annihilate back to timeless-spaceless zero dimension, must be brought into a sustaining order or time will never begin. The intrinsic Willpower of original void is introduced into science as the means to copy the order of the photons produced in the virtual pair's annihilation, and to impose that order which allows the virtual pair to sustain as the harmonic dance: $H_D = \{1,2,3,4,5\}$. The virtual dancing string has two ends, so H_D is inserted into the formula: $2H_D$. This allows the 2 x 5 dance to sustain.
5) The 2 x 5 dance replicates and forms the 2-D Higgs possibility field which expands out.
6) One 2 x 5 dance transition to one 2 x 3 hyper spin dance to begin the Big Bang Singularity, the BBS boson, containing a dancing quark-antiquark pair with mass at the quark-gluon string-tube's two end nodes, with the string's bendable center node being only void.
7) The extremely ordered BBS particle initiates the creation of the 3-D + time universe.

HUT uses Higgs field as holography's unified 2-D reference field to allow the discussion of God in science (Figs.IX.1 & .XVI.1). The 2 x 5 ordered dance, the 2-D Higgs field, the 2 x 3 hyper spin BBS, and life are formed only by God Willpower, the source of everything.

Darwin did not address the origin of life, only origins of speciation, of diversification. Most people who postulate the origin of life, do so beginning with the two main categories of God or chance. Other than those, people have believed that extraterrestrial aliens brought life to Earth, but this does not explain how life began for aliens. Another belief is that life is simply inevitable. That perspective completely ignores the second law of thermodynamics that has everything on the average, becoming inevitably more disordered in every moment.

Another perspective is that the universe is a computer program made by a highly intelligent being. This is invoking another god perspective, one that is trying to avoid God. In replacing God with a created god, believers again can ignore how the god came to be, except as a

creation of that being's own computer program, a lost-in-mirrors perspective. Better: God is the programmer, and defining God as the reference for the holographic universe works well.

To respect the second law of thermodynamics, those chance and inevitability theories cannot ignore how things come together daily, like when rabbits *grow* by eating carrots, and how carrots grow in a garden. Science does not yet explain how life is growing and sustaining daily while temporarily overcoming entropy during the evolution of all of life. The sun, a reservoir of energy, is like a car's tank of gas. But first the car must be well designed to utilize that energy.

With God being defined as the one Willpower of the universe that is diversified into the many willpowers of living organisms, then we have something with which to work. Scientific suppression of God reality has no scientific foundation. "Ignorance" etymology means *to not know*, while "science" etymology means *to know*. "Agnostic" etymology also means *to not know*. *Theism* is belief that God exists. *Atheism* is belief that God does not exist. Both are founded on belief, not proof. Gödel's incompleteness theorem supports inability to prove a unified system from inside that system, as in God's creation and in a unified field theory, thus accommodating "belief" in God. But atheism is not supported by Gödel's theorem nor by science. For science to claim it knows about what it does not know is ignorance and is not really science. The scientific intention of trying to clarify the definition of God may be the best possibility to explain the origin and the sustaining of isolated life that we find in this constantly disordering universe.

Jacques Lucien Monod, a French biochemist Nobel Prize winner, published his book, *Chance and Necessity*, in English in 1971. He attributed our existence and biology to chance and necessity. He said that "man at last knows he is alone in the unfeeling immensity of the universe, out of which he has emerged only by chance. His destiny is nowhere spelled out, nor is his duty." Monad's words claim "man at last knows", referring to *atheistic science*, a contradiction and not true. *Agnostic science* is the present truth. Monad has influenced atheistic biologists and others to support that all existence is proven by science to be grounded in chance, without any possibility of God. This became gospel so much that even discussing God in scientific terms became taboo in many social circles where godless science became god. They believe and proselytize that to *believe in God* proves someone to be delusional. Yet, the belief in that proof is delusional itself.

God's math perspective from before time

"I want to know how God created the world. I am not interested in this or that phenomenon. I want to know his thoughts, the rest are details." Albert Einstein

Fig.XXIII.2 God Harmony See Fig.I.3

Harmonic set name	Harmonic symbol	Harmonic set	Harmonic formula	Harmonics manifest
Integers	H_I	{0,1,2,3…}	H_I	∞
Dance	H_D	{1,2,3,4,5}	$2H_D$	{2 x 1, 2 x 2, 2 x 3, 2 x 4, 2 x 5}
Electron	H_E	{1,2,3,4}	$2(2H_E^2)$	{2, 8, 18, 32, 32, 18, 8, 2}
Chord $_L$	H_{CL}	{1,3,5,7}	$2H_{CL}$	{2, 6, 10, 14}

"God used beautiful mathematics in creating the world." Paul Dirac

L = Limited R = Reciprocal S = Sequence H_{IL} = {H_S, H_D, H_E, H_C…} $\mathbf{H_S}$ = {1, 2, 3, 4…}
Frequency multipliers = H_I = {0, 1, 2, 3, 4…} String nodes = H_{IR} = {0, 1/1, 1/2, 1/3, 1/4…}

An imaginary point represents the zero-dimension void. Void is nothing. Void has nothing to do with time and space. For people to communicate with each other regarding the void, to think about the void, our minds must be able to *begin somewhere*, being concepts of time and space. To represent the void, a point is needed. Imaginary. Not measurable. Not locatable. The point represents 0-D, and it is imaginary because the mind is not bound in time and space,

because mind originated and stays grounded in the void. Void is the source of mind. Void is original willpower, imagining. Creating everything.

The universe is born from zero… the zero cosmological constant, the source of Willpower leading to all else. God-Willpower uses four number sets to *begin* creation. The first is infinite, the harmonic non-negative integers, H_I, which creates the infinity problem that does not allow creation unless limited. Willpower defines the first limitation, the harmonic dance, H_D, followed by more limitation into harmonic electrons, H_E. Willpower then limits the infinite H_I to the limited harmonic chord, H_{CL}. With *time* comes the limited harmonic sequence: H_{SL}.

God-Willpower in the void is zero, the unchangeable universal reference. The God-zero remains the zero energy density cosmological constant while also experimenting with the evolution of consciousness by manifesting a virtual particle-antiparticle pair as opposite ends of a virtual 1-D string, conserving the void as a net sum zero energy density.

Without limits, harmonic non-negative integers, $H_I = \{0,1,2,3,4,5\ldots\}$, unfold *potential* infinity (Fig.I.3 & .XXIII.2), so the particle-antiparticle pair must annihilate. This results in a pair of photons ("Let there be Light"), which display what sustaining 2-D order could be: one cycle containing one circle, being spin = 1. With this information, the God-willed universe evolves from zero energy density void, from the potential infinite harmonic integers, into the *necessary limitation* to sustain harmonic integers.

To be able to create with limited harmonics, first zero and infinity must be removed from H_I. God experiments with possibilities, inventing the limited order that allows *harmonic dance* composed of: $H_{SL} = H_D = \{1,2,3,4,5\}$. With H_D in the formula for a string dance with two ends, then: $2H_D = \{2 \times 1, 2 \times 2, 2 \times 3, 2 \times 4, 2 \times 5\}$. Dominated by 2×5, being two string ends spinning five circles per cycle, each in a virtual clockwise **and** counterclockwise *net-zero* spin-dance containing the zero-energy void, allows potential sustainable diversity.

The virtual 2 x 5 dance is a 2-D virtual Higgs boson, which in being multiplied forms the sustaining timeless virtual 2-D Higgs possibility field. God transitions a 2 x 5 dance pair into a virtual 2 x 3 hyper spin dance pair, able to accelerate clockwise **or** counterclockwise as *non-net zero* spins. This creates the situation for the 2 x 5 dancing 2-D Higgs possibility field to resist its own virtual particles' 2 x 3 hyper spin dance accelerations to begin manifesting mass in the 3-D + time probability field. The result is a quark-antiquark pair, forming within the Big Bang Singularity, BBS, accelerating and surveying the variety of quark masses.

Harmonic dance transforms from $H_D = \{1,2,3,4,5\}$, into the new limited set, without the 5, of the *harmonic electron*, $H_E = \{1,2,3,4\}$. By squaring H_E numbers allows transition from 2-D without time into 3-D + time, then doubling those results to represent a single string having two ends, and doubling again for the balancing palindromic mirror effect, the formula $2(2H_E^2)$ is established. With this, God creates the probability field's harmonic electron dance potential, able to contain electrons in eight atomic fields: $2(2H_E^2) = \{2,8,18,32,32,18,8,2\}$. Adding up the numbers for the harmonic atom set, $H_A = 2(2H_E^2) = \{2,8,18,32,32,18,8,2\} = 120$. This *limited harmonic sequence* shows the total number of electrons, and protons, up to the final neutral atom, from minimum to maximum: $H_{SL} = H_A = \{1, 2, 3\ldots120\}$.

There is need for more refinement into sub-fields *within* the eight electron fields. God-Willpower again limits the infinite harmonics to manifest the first four odd numbers, the *harmonic chord limited*, $H_{CL} = \{1,3,5,7\}$. Then the formula, $2H_{CL}$, being two [ends of the dancing string] times the harmonic chord limited, allows up to 32 subfield electrons maximum in two of the eight electron fields: $2H_{CL} = \{2,6,10,14\} = 32$. The H_{CL} is introducing the harmonic theta pitch classes of $H_T = \{4,5,6,7\} = \{\text{Doe, Mee, Sol, Ah}\}$ into the original mind dance, grounding and enhancing the God Dream—enabling evolution.

Higgs field causes the accelerating 2 x 3 hyper spin virtual dance to decelerate from lightspeed and transform its angular momentum into mass. The limiting of infinite harmonics allows the maximum of eight electron fields, the maximum of four sub-fields in a field, and the maximum of 120 electrons orbiting around an atom. In limiting the infinite harmonic integers, God creates the 3-D + time probability field, with mass and energy ruled by $E = Mc^2$. Through this limitation comes enough order to sustain creation's diversity which God imagines while dancing 2 x 5 in original void (Fig.XXI.1). With limitations, the sustaining creation begins, in both the 2-D Higgs possibility field and throughout the probability field's 3-D + time creation. Original harmonic infinity, H_I, continues to bring about increasing disorder though the 2nd law of thermodynamics. Racing towards infinity with H_I is the universe's automatic time-release self-deconstruct mechanism, repeatedly reaching temporary equilibrium through the conservation of the original zero vacuum energy density of the cosmological constant—until returning to the end of time and the most basic equilibrium: the original void.

Why H_E = {1,2,3,4} is limited to 4

To extend the number set of H_E to 5, then $2(2H_E^2)$ would require two additional electron fields, between the two fields with 32 electrons each (see Fig.II.9), to each have 50 electrons: $2 \times 5^2 = 50$. This would bring $H_A = 120$ total electrons possible in the final atom to the new total: 120 + 100 = 220 = {2,8,18,32,50,50,32,18,8,2}. If people wish this to be the atomic reality, two things are noted to argue against that:

1) The electron configuration table in Fig.II.8 does not show any electrons situated in either of these two imagined electron fields with potentials to fill fifty in each. We already have 118 elements discovered and none of those have required using those two additional fields.

2) Lead, 82, is the upper limit of the naturally occurring stable atoms. After lead, all atoms are radioactive. After plutonium at 94, the rest of the heavier elements have not been found in nature but have only been witnessed in laboratories by smashing lighter elements together. Nature only has a limited need of the heavier elements, so to add another 100 radioactive elements to the periodic table by including two more fields containing 50 each is certainly not reasonable. It is only because the universe is so reasonable that we can do science.

"If you sit in the question long enough, the answer finds you." *Marry Me*, a 2022 movie

"I never said half the crap people said I did." Albert Einstein

To be in Harmony …

Albert Einstein in 1953 to physicist Paul Ehrenfest, "I have perpetuated something again… in gravitation theory, which exposes me to the danger of being committed to the nuthouse."

Universal unification is the cohesive uniting of mentally derived laws with phenomena of nature, then explaining the single system through its reduction into the various sub-fields of thought. Unification is a single umbrella theory explaining all of the sciences, arts, and religions. Unified mind includes all of our reduced minds. And every reduced mind contains the unified God mind. Humans are the One Mind reduced into our individual selves. The reductions (Figs.I.3 & .XXIII.2) allow the unified theory, and God, to relate to all aspects of the world.

With limited harmony within holography, every part contains the whole. From the zero-void reference, willing itself into sustaining creation, comes the fundamental tone, the Word, followed by natural harmony. While remaining unchanged, the Word also evolves into flesh: beginning as bacteria, virus, and fungi, moving on into plants, animals, and finally humans. Holographic nature requires the holo-trinity of void, unity, and harmony (Fig.IX.1) from beginning to end. Forgetting and confusing this many times throughout creation, we must regularly recreate our creation story.

We meditate into unity and void and find our way back out into diversity. In and out, harmony is our way. The Word alone, being the first harmonic, is not diversified enough for us to exist in flesh. We need to evolve from the first harmonic tone into the second, then the third, and more. But for the human mind to do so harmoniously within the universal reference, we must beware of duality confusions. Male-and-female is not the most basic duality. Nor is God and devil, nor good and evil. Nor is Yin Yang. Hot and cold comes closer, allowing high and low pressure differences. Situational noise can hide the pure signal when inappropriate dualities are embraced. Often, the dualities of unified and reduced, spirit and flesh, and $E = Mc^2$ work well.

Fig.XXIII.3 Quiet middle node on a 2nd harmonic string

The 2nd harmonic standing wave sustained on the vibrating 1-D string in Fig.XXIII.3 has the quiet center node between oscillating crests and troughs, being the anti-nodes. Settle into the now, between past and future, man and woman, manic or depressed, or any duality needing unity. Imagine sitting in the center of the string, and maybe also include sitting in the middle of a second 1-D string stretched up and down, and a third 1-D string stretched forward and back. Center in the middle of this 3-D world moving in time, to become the quiet 0-D point in the void.

From reduced state of mind, meditate into a quiet node, aligning in stillness with the void while the opposing waves move up and down on either side. At times, we must wait before returning our 0-D mind to the 3-D frame of reference world, delaying interaction because the timing and setting help to define value. Like waking from a deep sleep, we wake up before we get up. We activate by moving away from the quiet node into the harmonic motions, like entering a spinning rope to begin harmoniously coordinated jumping.

With controlled breathing, entering the zero square of 8-space, Fig.VIII.2, or the zero center of the harmonic spiral of Fig.X.17, can also be centering in meditation, and useful for utilizing harmony in guiding one's self into or out of the void and unity.

The mind's plans, premonitions, dreams, and prophesies all have inherent signal to noise ratios, though we may not know this during the experience. A miracle is in the eye of the beholder. We may behold when the time comes. Or not. An accurate unified field theory is referencing the universal well-spring, the fountainhead, being God—the One Mind. Embraced, this carries the potential harmonic energy to bring balance to our social world.

When multi-tasking makes one busy, the next planned task enters as configured thought, and memory is stored. The multi-task five-step plan: 4-D time; 3-D volume; 2-D plane; 1-D line; 0-D point. When the time comes to perform the task, the predominate memory retrieved first is 4-D timing, followed by the location in our 3-D volume of space to which one's body is required to go. The next memory-level is 2-D, locating the up-down, forward-back, and/or left-right planes holding the item desired. The dominant memory might be to arrive in the kitchen, but the object required is stored as a memory to be reached upon arrival to the cupboard. Once the 3-D space and 2-D planes are attained, then reduced mind brings the hand in a 1-D line to the cup, being the 0-D point goal. The mind's memory of the final external 0-D cup location-point accesses multiple detailed layers within the unified holographic possibility and probability fields.

In the movie, *The Theory of Everything*, Steven Hawking's character is meeting Jane at a dance party. He tells her, "I am a cosmologist." Being religious, his future wife asks, "What is that?" He tells, "It's a kind of religion for intelligent atheists." She asks, "What do cosmologists worship, then?" He answers, "What do we worship? One single unifying equation that explains

everything in the universe." She responds, "Really. What is the equation?" He responds, "That is the question. And a very good question. I am not quite sure yet. But I intend to find out."

The conversation ends with the dance's song lyrics, "My mind's in a haze… it's like a heat wave…"

Maybe Stephen Hawking found his unity answer in the moment of his death. Maybe not.

"An expert is a person who has made all the mistakes that can be made in a very narrow field."
Niels Bohr

"The delay in this case, as with all my other books, has been a great advantage to me; for a man after a long interval can criticize his own work, almost as well as if it were that of another person." *Charles Darwin's Autobiography*

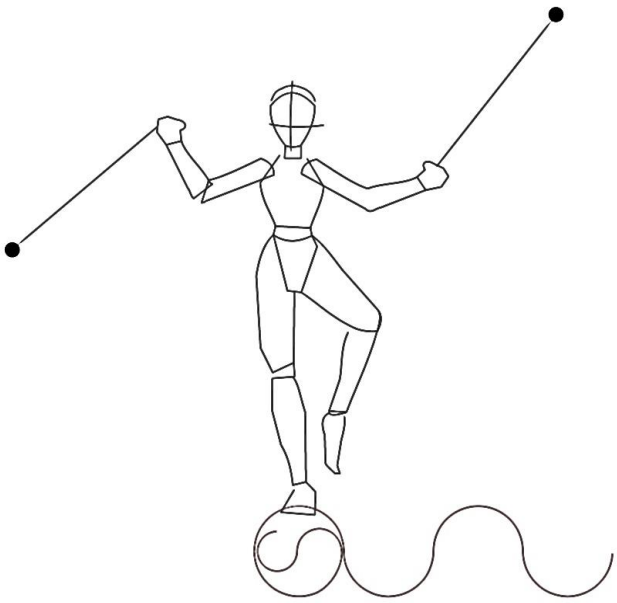
"Finishes, for me, can be the hardest part. Not because there's any great skill involved in these final steps… putting on a few buttons, closing up a few edges, but because if you've done your job, all the true craftsmanship has already occurred. The finishings are mere inevitabilities. It's at the finishings that you must come to terms with the idea that perfection is a necessary goal… precisely because it is unattainable. If you don't aim for perfection, you cannot make anything great. And yet, true perfection is impossible."
The Outfit (movie 2022)

Omega Ω Omelet

Fathom some omniscient gnome's tom-tom booming metronome phenomena
from automatic tomorrows. Awesome!
Custom slalom promenade symptom dominos randomly from *blossoming wisdom syndrome*.
Biome locomotive conglomerates comb common denominators:
homecoming chromosome compromise from mom home woman womb bosom omphalos.
Domestic diplomacy; homosapien community dome… Commandment's bottom;
shalom kingdom come... Nomad momentum. Omen omission.
Complete tome. Ombudsman bomb. Atomic Freedom: at OM I see freed OM!
Omega omelet
ॐ

Moral of the story:

The Dancing Singing Circle Comprises
The Common Field Dominating
Everything in Every Field
of the Universe



Our minds are light.
At the speed of light: time ceases to exist
and the direction of travel shrinks to zero.
Mind is left with 2-D and no time
Always here and now
Dreaming of time and 3-D

Song and Dance Math Arranges Nature

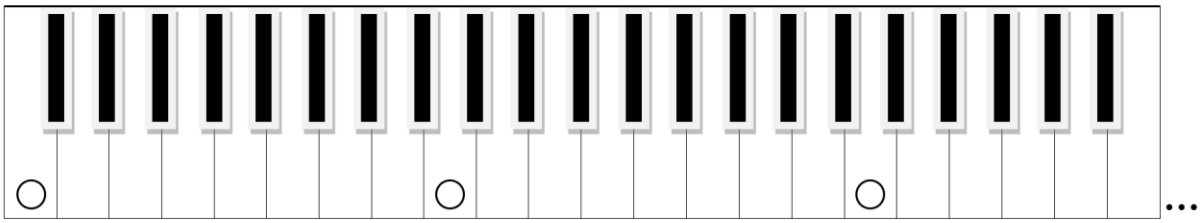
EPIPHANIES TO SHIFT THE PARADIGM

Introducing ***HUT*: HARMONIC UNIFIELD THEORY**

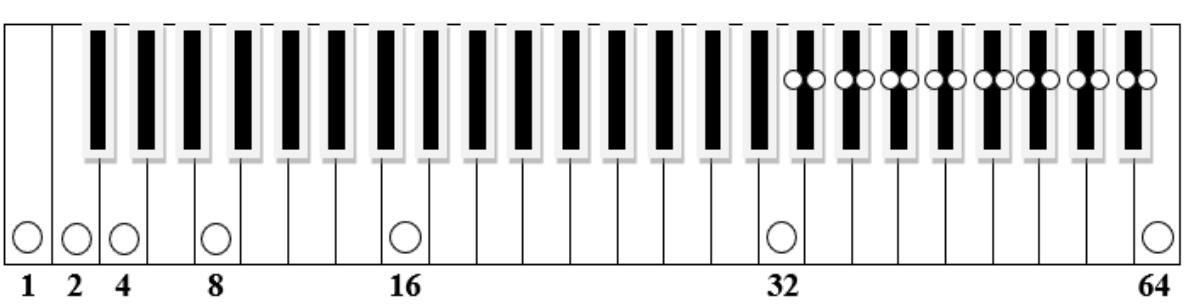
This book presents a credible scientific path, grounded in math, leading into the Harmonic Unifield Theory: into the *HUT*.

The math of harmonics is used as the common denominator within all fields of science. This math study begins with simple whole numbers as frequency multipliers. Deeper study reveals the complexities within integers. Music theory uncovers their manifestations. These two keyboards are tuned harmonically rather than to the accepted 12 tone chromatic scale. The first keyboard repeats a sixteen-pitch class octave, while the lower keyboard precisely follows harmonic tuning.

Repeating16 pitch-class harmonic keyboard



Expanding pitch-class harmonic keyboard



Chosen Fundamental Tone: 1 = 32.75 Hz

This book explores nature's use of the harmonic unified field into the periodic table, physics, chemistry, biology, and mind.