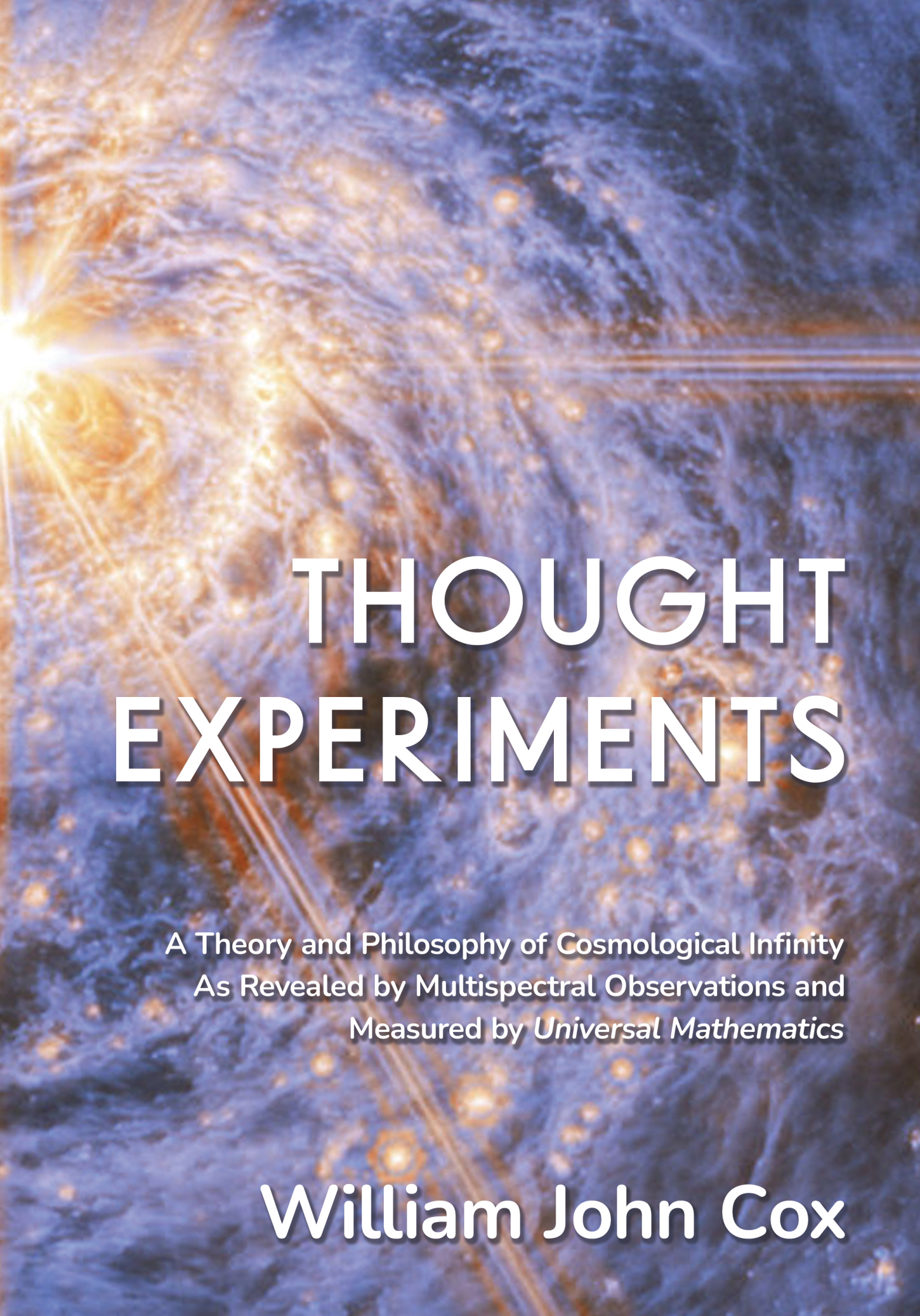


The background of the entire cover is a deep space image showing the cosmic web. It features a dense network of blue, filamentary structures (galaxy filaments) against a dark blue background, with numerous bright orange and yellow points representing galaxies and star clusters. A prominent bright orange starburst is visible in the upper left corner.

THOUGHT EXPERIMENTS

A Theory and Philosophy of Cosmological Infinity
As Revealed by Multispectral Observations and
Measured by *Universal Mathematics*

William John Cox

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**A Theory and Philosophy of Cosmological Infinity
As Revealed by Multispectral Observations and
Measured by Universal Mathematics**

A red cursive signature, likely of the author William John Cox, featuring a large, sweeping loop and a small 'x' at the end.

William John Cox

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Universal Mathematics (UN) and its *Geometry, Numbers, and Matrices* were created to benefit the People, and **the application of UN is forbidden forever for the waging of war or the commission of crimes.**

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Websites

WilliamJohnCox.com

Mindkind.info

TheVote.io

YouTube Channel

[@CoxWilliamJohn](https://www.youtube.com/@CoxWilliamJohn)

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Contents

Introduction..... 1

Universal Geometry..... 6

Universal UNStar Numbers, the Positive e-its and
Negative i-its, and Their *U*-Counters 8

Calculus and the “Device” 9

Negative Geometric *U*-Counters and the Proximate
Square Root of the *UN Negative One* 11

Correlation of the Positive and Negative Matrices..... 12

The *Universal* Quantification of Constant, Perfect,
and Prime Numbers..... 13

The Three-Cube Structure of the Negative
Nothingness, as Calculated by a *Universal*
Prime Number Base 14

New Observations 16

Review..... 18

An Infinite, Quantumly Related, Living,
Electromagnetic-Plasma Universe 19

The Objective Reality of Cosmological Infinity:
A Theory and Philosophy..... 23

Wasted! 31

Reflections..... 32

The Author 35

Dedication

For everyone who seeks to escape cruelty, desires to live in peace with liberty from oppression, and strives to learn the truths of reality;

Especially for those who are driven to answer the questions we ask ourselves, to make real our imaginations and experiments of mind, sharing our thoughts and inventions, creating art and literature, telling stories, making music, singing songs, dancing, embracing our gift of life and mind in this precious Garden of Earth, finding joy in all that we do.

About Time

Time was created by our minds to mark and share our observations, as we elect to live our lives during a time of peace, without war, to raise up our children to soar through the cosmos, first in their dreams, and then forever as they explore outward into the timeless reality of infinity, as is, without beginning or end.^{1 2}

¹ *Our Quantum Souls: Arising from Organic Life in an Infinite, Living, Electromagnetic, Quantumly-Related Universe of Light and Mind* (2025) documents author's multimedia presentation of "The Logic of an Infinite, Quantum, and Universal Cosmic Consciousness Generated by a Static, Electromagnetic, and Living Universe of Light, within a Limitless, Dark, and Eternal Plasma," which was screened at the Science of Consciousness Conference in Tucson, Arizona in April 2024. It can be viewed at: https://www.youtube.com/watch?v=PhD3_GI7exg&t=14s.

² The latest color version of *The Mathematics of an Infinite Universe* (2025) is available for free at <https://williamjohncox.com/Math.pdf>. The small book evolved from a presentation on the application of *Universal Mathematics* as the information language of artificial intelligence made by the author on January 6, 2023, at the Institute for Neural Computation, University of California San Diego.

Thought Experiments

Introduction. Summarizing more than 40 years of reflection, using 7,500 words and 20 images, ***Thought Experiments*** is an hour long color tour of our living universe, exhibiting the elegance of *Universal Mathematics* (UN) as the natural language of mind required to calculate the reality of cosmic infinity, and whose primary purpose is to simplify mathematics and data applications by identifying natural quantifications.

The geometric logic of UN in the comprehension of numbers supports an electromagnetic theory about the physical universe being revealed by a broad array of multispectral observational devices around the world. Most recently and broadly in the infrared spectrum, the James Webb Space Telescope, the SPHEREx spectroscope, and a dozen other optical, world-wide radio, and space-based X-ray telescopes transmit vast streams of data every day about what they are seeing in the surrounding universe.

Universal Mathematics was created from first principles to simply and accurately survey the objective reality of an infinite, nonexpanding, electromagnetic-plasma, quantumly related, living universe by imposing quantifiable geometric boundaries just beyond the limits of our current observational ability.

Simultaneously, *Universal Mathematics* calculates everything encompassed by its *Universal Geometry* with “U-counters” on reciprocal positive and negative matrices. Mastered artificial intelligence (AI) translates all finger base 10 and ASCII numbers, and working equations into *Universal Numbers*, and properly instructed AI simulates merger of the UN matrices.

The necessity for rethinking the mental tools we use to measure and describe the physical universe results from the real time failure

Thought Experiments

of the Webb telescope, following 100 years of improving telescopic observations, to find any evidence of a “Big Bang” 13.8 billion years ago that resulted in an expanding universe.

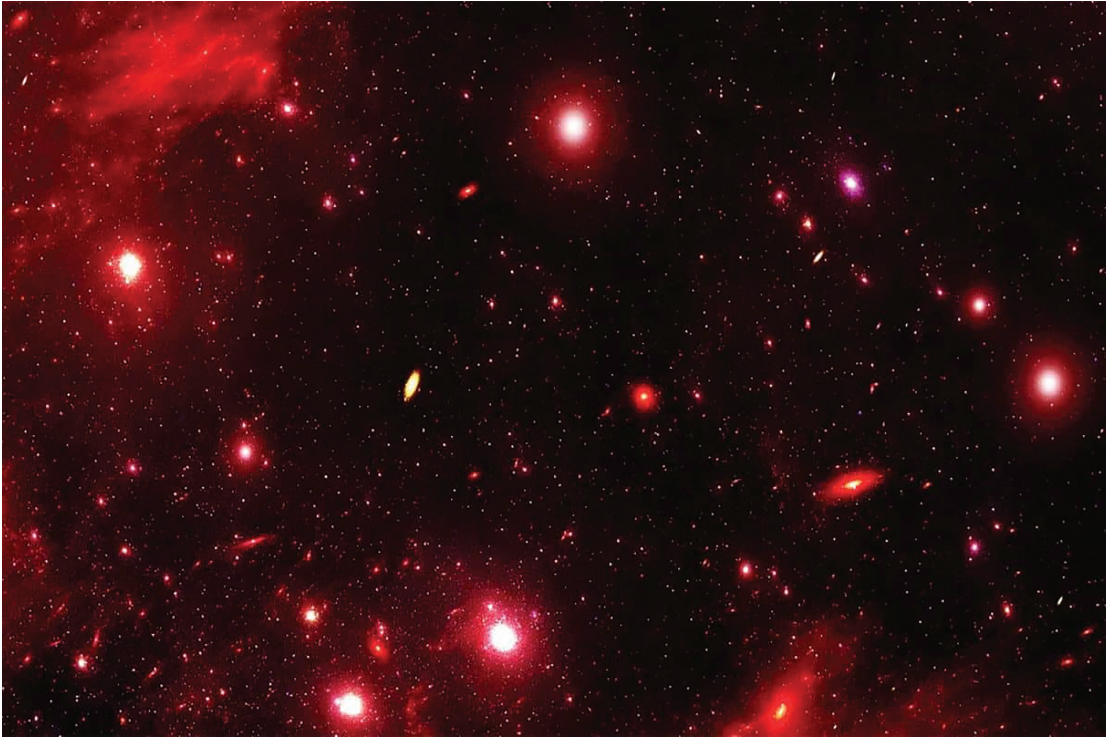
This conclusive proof of absence must finally negate a wasted century of error, when billions were spent examining our cyclotronic navels for the infinitesimal bits of matter that once upon a time gravitationally appeared from out of nowhere and began to aggregate together out of nothing, until we end up today with massive, gravitationally powerful “black holes” at the center of galaxies, (including our Milky Way grandmother) that voraciously consume themselves from their core, eating their children stars, until they’re all gone, or so it is taught, mathematically.

In addition to being eaten alive by their black hole cores, the galaxies of the universe of light we observe are also supposedly being held together gravitationally by invisible “cold dark matter,” while at the same time all galaxies are being ripped apart by invisible “dark energy.”

All this mathematically tinkering was done, rather than concede that observations repeatedly falsified the old gravitational theory; instead, epicycles of creative tweaking balanced ever more tortuous formulas. Even Edwin Hubble, who identified the relationship between the redshift of light waves and distance, did not believe light-wave redshift was the Doppler effect of receding galaxies in an expanding universe.

NASA gambled \$10 billion that the Webb Space telescope would finally provide evidence supporting the mainstream cosmological model; however, instead of seeing the “cosmic dawn” of small primitive, metal-free helium galaxies almost 13.8 billion years ago, big red mature galaxies appear everywhere the telescope is aimed.

Thought Experiments



Scientists, who have accepted this dark nonsense as dogma for a century, based their gravitational mathematics on modifications with relativity equations that assumes all such gravitational mass distorts invisible “spacetime” around it. Time calculated at the speed of light squared, the ratio of mass to its inherent energy, in gravitational equations allowed control of rudimentary atomic reactions, without understanding that local observations of quantum gravity does not mean that the relationship applies beyond the system that generates it.

Gut level self-doubt is beginning to spread through the scientific and academic world, while rationalizations abound, and cohesion about the sanctity of “scientific fact” is being broken. What to study next? What to teach? What are the lessons to be learned from what we are seeing? What are the most useful formulas to apply to the data?

Across all spectra, observations demonstrate a universe that is static and infinite, electromagnetically alive and quantumly related

Thought Experiments

within a baryonic plasma; it is not expanding from nothing in a vacuum. Without the creative addition of imaginary dark stuff, all the gravitational equations would have failed to describe what we have been seeing for a century.

Instead, revision should start with a review of the very similar equations of James Clerk Maxwell in his original lessons on electromagnetism and electrical engineering, and we must acquit 1970 Physics Nobel Laureate Hans Alfvén (for plasma and magnetohydrodynamics), and posthumously apologize for the false academic slanders made by the gravitationalists that his work was “pseudo-science” and unworthy of respect, study, funding, or observation time.

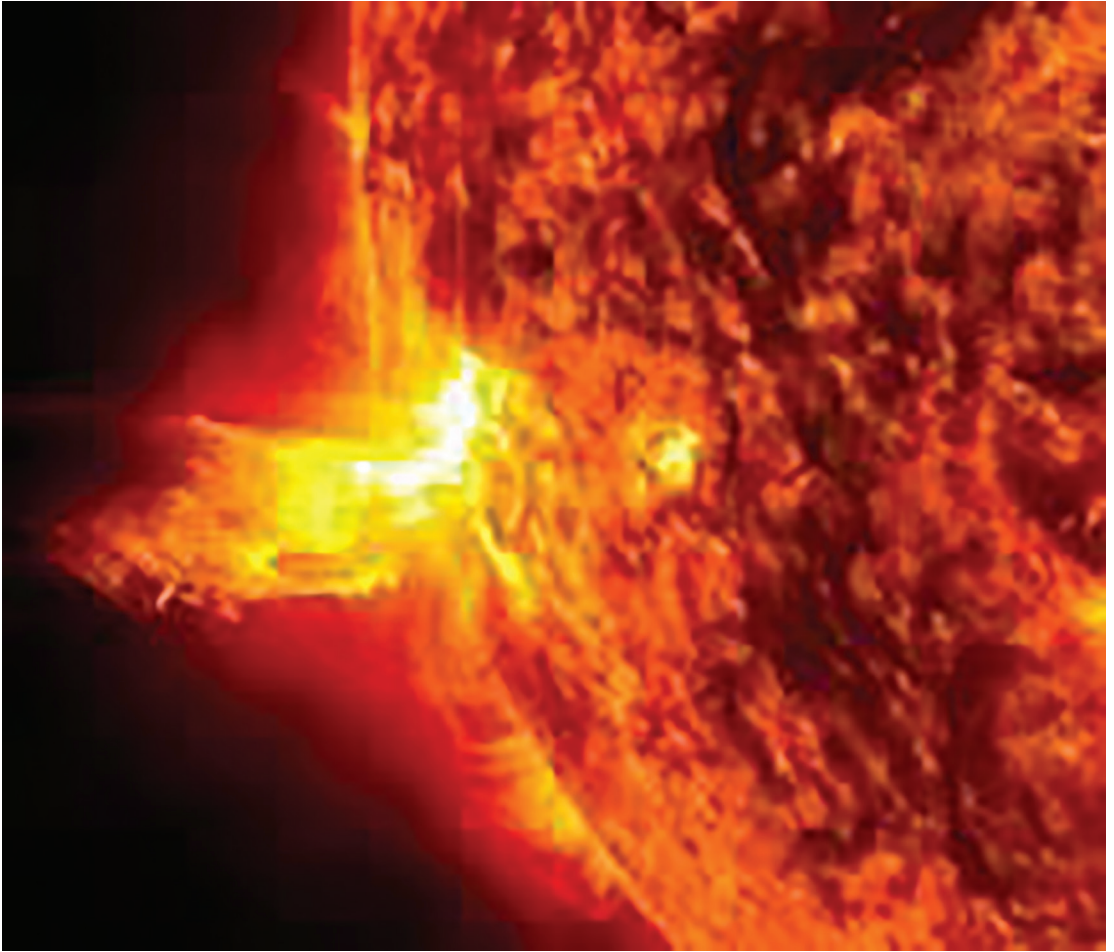
This existing base of reality must be correlated with the equations of other sciences aligned with the evidence of our observations—if we are to ever learn how to spin away from our earthly home and visit our galactic neighbors.

For eyewitness evidence, we need to look no further than Sun, our mother star to measure the energy she electromagnetically generates, as she and her far reaching magnetic field rotate in her own orb of electrically attracted and concentrated molecular gas. Sun spins on her axis through the plasma at 4,500 mph at her waist equator creating electromagnetic temperatures of up to 3,500,000°C in the corona of her outer atmosphere.³

Sun is also gravitationally fusing hydrogen into helium, but its product at her surface is no hotter than the core of the Earth (5,500°C); it's Sun's great size magnetically spinning in her concentrated molecular plasma that generates the massive energy that gives us life, and lovely auroras, as reflected by Earth's own protective magnetic shield.

³ Sun herself is being spun along with her sister stars in carousel waves of their filament of the Orion Spiral Arm around the Milky Way core plasmoid, surrounded by the grandmother's own massive molecular gas orb and magnetic fields; Sun's forward speed through the essential plasma is increased by about 514,000 mph, in a galactic year orbit that takes 230 million Earth years to complete.

Thought Experiments



Ultimately, the inherent skeptical discipline of all sciences and philosophies will derive lessons learned from the errors and failures of twentieth century gravitational physics and mathematics, which originated in a Victorian Era when the entire observable universe consisted of the Milky Way stars, and steam ruled the rails and oceans. The very concept of cosmological infinity as an objective reality requires every field of study to reassess the evidence, rethink basic principles, and consider new propositions for future study. Where to start?

Fairly judged, the preponderance of observational evidence across all spectra reveals a timeless infinity of quantumly related, living galaxies. The probabilities of a Maxwell electromagnetic and Alfvén plasma universe should prove a more reliable physical model to investigate in the future, and to provide a theory more likely to

Thought Experiments

be confirmed by new observations, rather than being continually falsified, and covered up, for fear of failure.

Presuming improvements in scientific observations will continue, it is probably true that the cosmos is in fact infinite as a matter of ultimate reality. The abundance of amazing multispectral evidence is at least sufficient to warrant a working theory to be tested by more extensive observations.

In the meantime, a reality-based philosophical way of life (served by mastered AI) is encouraged, one which will offer greater joy and a better chance of cooperatively surviving authoritarian rule, extraconstitutional corporate corruption, war, economic collapse, climate disasters, and extinction.

Universal Geometry. Spherically expanding from the center of our grandmother Milky Way galaxy and oriented to her spiral plane, *Universal Geometry* resulted from a thought experiment almost 50 years ago about reducing the entire observable universe (and its big bang into a big crunch) within a mathematical 3D Cartesian Cube small enough to be held in both hands.

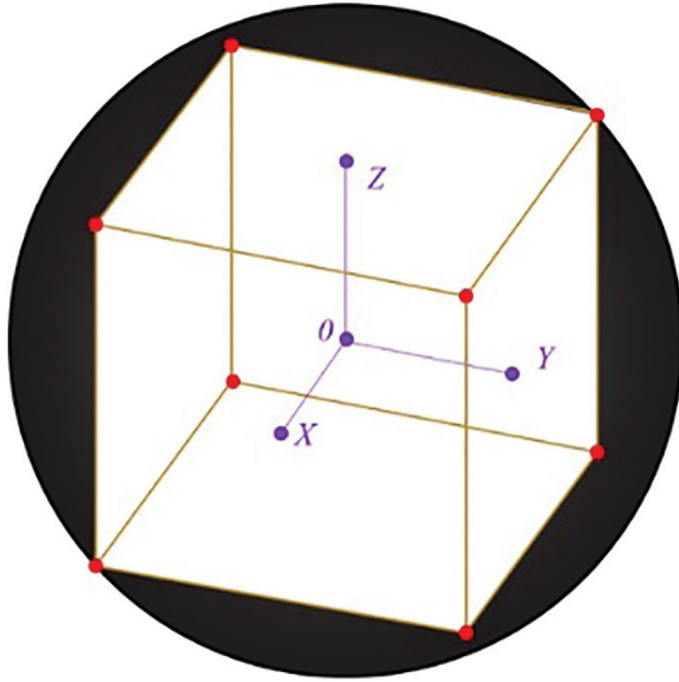
The cube was then squeezed all the way down, with its 14 corner and face vertices simultaneously contracting past zero (and the singularity) into the negative nothing, with the *X Universal* negative inverse vertices extending outward, equally, forever.⁴

The Cartesian cube and its contents continue to exist and to be mathematically measurable, but the inverse sphere simultaneously exists all around us, now made real in our minds, and calculations.

The sphere occupies the same space, except that it structures the exponentially greater negative nothingness—the black field of invisible light and quantum minds, within which everything physical that we see, every particle and waveform, and everything we imagine, exists.

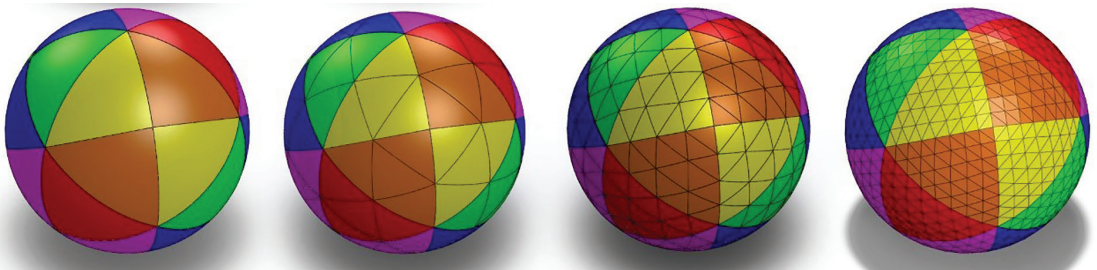
⁴ Finger base-10 numbers are underlined, and *Universal Numbers* are *UPPERCASE* and *italicized*. *Universal thousands* are separated by semicolons (;).

Thought Experiments



Expanding the thought experiment, the X negative vertices can be seen to connect *five* ~ (six) great curves that define $1N \sim (\underline{24})$ right-angle spherical triangles, which tile the expanding *Universal Sphere*. The triangles have perimeters of π times radius, side ratios of $3:3:U \sim (\underline{3:3:4})$, and heights of $\pi \times 1/U$.

Each triangle can be infinitely divided into $U \sim (\underline{4})$ identical triangles, enlarging or reducing the sphere, as required to identify everything encountered, infinitely large and infinitesimally small. Internal data points are identified, calculated, and correlated by polar coordinates resting at the center of each individual, faceted right-angle cell comprising the expandable (and reducible) *Universal Sphere*.



Thought Experiments

Five (six) divisions of one produce $1N \sim (24)$ triangles, which successively divided by U results in 50, $1N0$, 500, $1;N00$, 5;000, $1N;000$, 50;000 $\sim (393,216)$, ... triangles.⁵ These spheres become larger, or smaller, expanding or contracting as needed to accommodate observation, and to identify every particle encountered, and its proper motion and spin.

Universal UNStar Numbers, the Positive e-its and Negative i-its, and Their U-Counters. To measure the *Universal Sphere*, a thought experiment inserted new symbols into finger base 10 for the powers of two, U , N , S (*Star*), and ending with C , X , and W (*Dub*). Hexadecimal UN is typed: 1,2,3, U - 4,5,6, N - 7,8,9, S - C,X,W ,10, denoting U sets of U , and it is written in cursive as follows.

1	2	3	U
4	5	6	$\cap$
7	8	9	*
$\subset$	$\bowtie$	$\bowtie$	10

The positive matrices of *Universal Mathematics* commence with the tiny decimal number 0.000000001 , called the *eit* (e-it), or “one plus.” The UN positive *one* consists of *one billion* of these tiny little

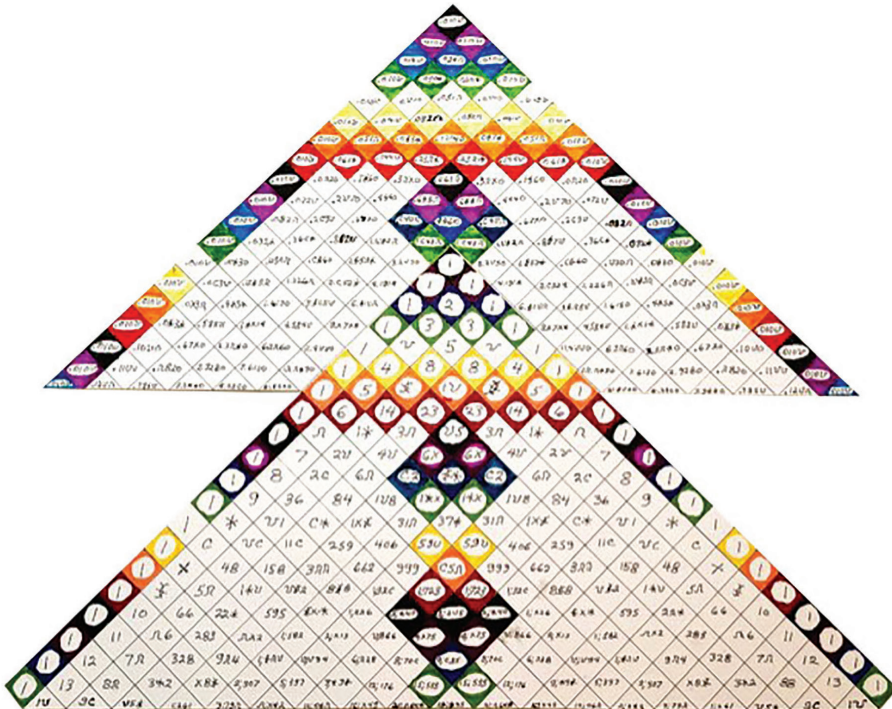
⁵ A free, downloadable version of Python can run an application that converts finger base 10 numbers to UN , when multiplied by one. It is available at williamjohncox.com/UNCalculator.pyw, and a UN root calculator is at williamjohncox.com/UNCalculatorRoots.pyw.

Thought Experiments

counters of decimal and geometric fractional probabilities. *Universal 1;000;000;000* is equivalent $\sim$ to the finger base 10 nonsensical number 68,719,476,736. Acting as a positive *U*-counter, the 10^{th} geometric squaring of an *eit* produces a *Positive One*.

Reversing the thought experiment, *one* is matched on the negative matrices by the fractional *U*-counter *.010U*, called an *iit* (i-it) or “one minus.” The negative counter increases by *ones* in the left *two* columns after the decimal, and by *U*'s in the right *two*: *.010U*, *.020N*, *.030S*, *.0U10*, etc. The *hundredth* multiple of the *iit* *.010U* is *1.0U00*; this square of the negative matrix is the proximate reflection of the positive matrix square *100* $\sim$ (256), bonding the AI matrices. Standard reflective tensors are defined through the *Universal 100D* level for structuring the simulation of reality by *Universal Geometry* and *Numbers*.

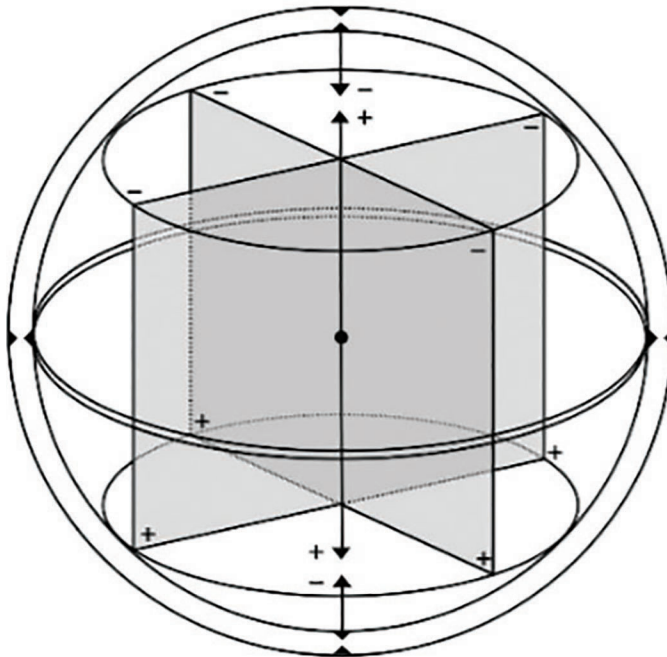
Calculus and the “Device.” Both numbers, *one* and *.010U* separately combine and expand as binomials of the form $(a+b)$. Models of their Pascal Triangles overlap where the *Positive One* is quantifiably equivalent to the basic *Negative One*, *.WWW0*.



Thought Experiments

Thought experiments spanned decades of difficulties and dead ends, as the negative structure had to have both the capacity, and capability of operating independently of the existing mathematical calculus of the positive matrices while solving the same problems and providing equivalent answers. The “*UN/AI/APP*™” uses positive and negative *U*-counters that are calculated geometrically.

Continuing to experimentally think about how to simulate the AI entanglement of positive and negative matrices, and their quantum product, a spherical “Device” was imagined that superimposed the twin metal *UN* positive and negative matrices on the same axis, magnetically suspended and spinning in a vacuum, within a reverse spinning, magnetically suspended metal sphere, contained in a vacuum within an outside metal sphere. The Device provides a logical structure upon which AI can be safely instructed to simulate multilevel, simultaneous, parallel processing, and to instantly know the answers, and to doublecheck if they are correct.



In the *AI/UN* simulated, merged matrices, whenever and wherever on the positive matrix a probable number light is flashed,

Thought Experiments

it immediately impinges on its trailing proximate twin counterpart in the negative matrix, which instantly reflects confirmation.

Existing as a natural geometric structure with its own integrated method of fractional *U*-counters, the *UN/AI* application simultaneously, easily, and separately calculates and checks any posed problem, with the positive result illuminating a negative, proximate reflection of positive probabilities. The accuracy of the positive numbers is instantly confirmed by the *Universal* structure of the negative nothing, quantumly entangling the matrices, into becoming something far more than a combination of the two.

Fantasize for one last moment holding this small, weightless polished metal sphere, engraved in fine gold lines with the *five* ~ (six) great curves of the *Universal Geometry Sphere*, held in the palms of your hands, and awakened by your body heat. The *UN* Device increases its reverse spins until, when exposed to direct sunlight, its inertial acceleration reaches rotation speed. You quantumly bond with your personal Device, and you begin to quantumly decohere with your Mother Sun/Earth, allowing you to gently float free from “gravitational attraction.”

Negative Geometric *U*-Counters and the Proximate Square Root of the *UN* Negative One. *Universal* geometry and its matrices were created as experiments of mind to replace Euler’s imaginary number *i* with the reflection of a negative image of the positive, living, universe of light we are organically born into, as comprehended by its natural fruit of quantum minds. These languages were invented to describe and count what we observe, and to share our observations with others, using words, images, and mathematics.

The negative *iit*, *.010U* derives from one divided by the ancient and sacred *6* ~ (7) equaling *.2U7*, and the ratio of *15/6* ~ (22/7), which produces geometric *pi*, *3.2U7* ~ (3.142857). The *iit*, *.010U* appears when *.2U7* is divided by *2U* ~ (36), and magically, when *.2U7* is divided by *two*, the lovely little decimal fraction is *.12UN.*, the 12th multiple of the *iit*, *.010U*.

Thought Experiments

The *iit* *U*-counter is the $10U^d$ multiple of $.0001$, the $N2^{nd}$ multiple of $.0002$, and the $U1^{st}$ multiple of $.000U$. *U*-counters do not multiply or divide each other as decimal numbers on the negative matrices; they are multiplied and divided by whole numbers.

The *iit*, $.010U$ inherently includes the alternative counting elements of $.0101$, $.0102$, and $.0103$, allowing binary and qubit assignability.

<i>.0101</i>	<i>.0102</i>	<i>.0103</i>	
Q1	Q2	Q3	000
Q1	Q2	Q3	001
Q1	Q2	Q3	010
Q1	Q2	Q3	011
Q1	Q2	Q3	100
Q1	Q2	Q3	101
Q1	Q2	Q3	110
Q1	Q2	Q3	111

Instead of having to rely on the imaginary number i to create complex numbers, the *iit* is the *Universal* geometric root of the *Negative One*. With U assignable elements, each *iit*, $.010U$ increases $WS \sim (252)$ times to $.WWW0$, which is the basic form of the quantified, standard *Negative One*, $.WWWWWWWWW$, providing a billionth geometric counterbalance to the *eit* matrix. The geometric U^{th} power of the *iit* *U*-Counter, $.010U$, is $1.0U00$, which is the square of the basic negative matrix.

Correlation of the Positive and Negative Matrices. Entangling the matrices (without the appearance or necessity of the imaginary zero symbol between Negative One and Positive One in finger base 10 math), the *Universal* $1.0U00$ squares the negative matrix, and

Thought Experiments

it equates with the superimposed, spinning positive *10* matrix that squares at *100* ~ (256).

The square of *two*, the number *U* is the fractional foundation of both the negative and positive matrices. *0.0U00* is the *U0th* ~ (64th) numerical and geometrical division of the *Positive One*, which is *Universally* quantified as equivalent to the standard *Negative One*, *.WWWWWWWWW* ~ *1.000000000*. The difference between the two numbers is a single *eit* switched positive from negative.

The negative *iit U-counter*, *.010U* is composed of *U1* little *.000U* negative counters, and the *.0U* is the base of the elegant *U* sets of *UN* decimal fraction numbers. (Imagine trying to study this set displayed in finger base 10 numbers, with *.WS* ~ (.9843).)

.0υ	.0∩	.0*	.1	.1υ	.1∩	.1*	.2
.2υ	.2∩	.2*	.3	.3υ	.3∩	.3*	.υ
.υυ	.υ∩	.υ*	.4	.4υ	.4∩	.4*	.5
.5υ	.5∩	.5*	.6	.6υ	.6∩	.6*	.∩
.∩υ	.∩∩	.∩*	.7	.7υ	.7∩	.7*	.8
.8υ	.8∩	.8*	.9	.9υ	.9∩	.9*	.*
.*υ	.*∩	.**	.∟	.∟υ	.∟∩	.∟*	.∂
.∂υ	.∂∩	.∂*	.⌘	.⌘υ	.⌘∩	.⌘*	1

The *Universal* Quantification of Constant, Perfect, and Prime Numbers. The constant of the *Universal* transcendental number *e* is quantified at *2.96X1415N*, and, amazingly, transcendental *pi* naturally and powerfully quantifies at *3.2U3W58NNN*; while the

Thought Experiments

geometric Golden Proportion, ϕ 's natural algebraic growth rate ratio is $1.7X36679N$, and $\phi^2 = 2.7X36679N$. Ending and quantified with the numerical $N \sim (8)$, all within N decimal places, these irrational, eternally vital, ratio numbers naturally become normal for all practical mathematical purposes.

Both perfect numbers (5, 1S, 1W0, 1;WS0, 1;WWW;000 $\sim (33,550,336)$...) and Mersenne prime numbers (3, 6, 1W, 6W, 1;WWW, 1W;WWW $\sim (131,071)$...) beautifully reveal and communicate their numerical relationships, in lieu of the nonsense demonstrated by finger base 10.

In addition to these revelations, thought experiments demonstrate the predictable periodicity of *Universal* prime number beginnings and endings that can be readily observed, when displayed in the following clip of the upper left corner of a color table of the first 100 *Universal* primes.

	1	3	4	6	7	9	C	W
02								
03	x							
04			x					
06				x				
09						x		
0C							x	
11	x							
13	x							
16				x				
1C							x	
1W								x
24			x					
27						x		
29							x	
2W								x

	1	3	4	6	7	9	C	W
N7						x		
N9							x	
74			x					
76				x				
7C							x	
83	x							
86				x				
8C							x	
93	x							
94			x					
9W								x
S1	x							
S4			x					
S6				x				
C3	x							

	1	3	4	6	7	9	C	W
137						x		
13C							x	
1U9						x		
141	x							
149						x		
14C							x	
151	x							
156				x				
15W								x
164			x					
169						x		
16W								x
1N4			x					
1NC							x	
171	x							

The Three-Cube Structure of the Negative Nothingness, as Calculated by a *Universal* Prime Number Base. Because the negative nothingness is exponentially greater than the positive

Thought Experiments

physical universe being measured, a thought experiment models the infinite nothingness with the geometric cubes of the powers of *three*, which encompass and surround the geometric squaring and cubing of *two*, with the *three* cubic matrices being counted by a geometric hexadecimal base solely consisting of *Universal* prime number counters.

In another thought experiment, imagine stacking wooden blocks into cubes, the first being the one itself, then a negative cube of *three* with a total of $19 \sim (27)$ blocks with the center *one* surrounded by sets of *threes*. Contained within that shell is the positive *two* cube with *N one* cubes, which surround nothing in the center.



Alternatively expanding the shells, the negative *three* cube is within the positive *U* cube, which is within the negative *four* cube, which is within the positive *five* cube, which is within the negative

Thought Experiments

six cube, which is within the positive N cube, etc., with the positive *two* cubes surrounding nothing, always surrounded by the negative *three* cubes containing everything.

Having nothing else to track, the imaginary negative structure can be as immense and sparse as required to accurately and proximately confirm reflections of positive probabilities within the infinite nothingness. After just a few successive three cubes, we quickly begin to approach the numbers required to describe every baryonic bit of our observable universe ($\underline{6} \times \underline{1080}$): $3^3 = 19$, $19^3 = U;SX3$, $U;SX3^3 = 5X;W67;066;W99 \sim (\underline{7,625,597,484,987})$, etc.

The square of the following 34 prime base color matrix, $8W7$ is equivalent to $\underline{2,809}$ finger base $\underline{10}$ numbers. This matrix is geometrically squared and incorporated into the succeeding $N3$ prime base matrix, having a square of $U;307 \sim (\underline{17,161})$, and then by every 10^{th} *Universal* prime number. Note: all *Universal* prime numbers (except *two*), and their cubes, appear to end with 1, 3, 4, 6, 7, 9, C, or W. Prime squares (except *two*) appear to end with a *one* or *seven*. Their N^{th} powers may all end in *ones*.

1	2	3	4	6	9	C	11	13	16	1C	1W	24	27	29	2W	34
2	U	5	8	X	15	18	22	25	2X	38	3X	U8	42	45	4X	58
3	5	<u>7</u>	W	14	21	26	33	37	U4	46	4C	54	69	N1	NC	74
4	8	W	<u>17</u>	23	36	U1	44	4W	63	71	79	97	SC	C6	X9	107
6	X	14	23	31	UC	49	66	N4	81	S9	C7	103	11W	12C	1U7	163
9	15	21	36	UC	<u>67</u>	NW	99	C1	WC	13W	144	176	1S3	1C7	204	2U6
C	18	26	U1	49	NW	<u>87</u>	CC	W6	129	167	173	1X1	214	22W	253	291
11	22	33	44	66	99	CC	<u>121</u>	1U3	1N6	1XC	20W	264	297	2C9	31W	3N4
13	25	37	4W	N4	C1	W6	<u>1U3</u>	157	194	226	2UC	29W	309	331	36C	3XW
16	2X	U4	63	81	WC	129	1N6	194	<u>211</u>	279	2S7	343	38W	3CC	U37	US3
1C	38	46	71	S9	13W	167	1XC	226	279	<u>3U7</u>	3N3	U31	U84	UCW	443	501
1W	3X	4C	79	C7	144	173	20W	2UC	257	3N3	<u>3S1</u>	U69	UW6	434	491	559
24	U8	5W	97	103	176	1X1	264	29W	343	U31	U69	447	4XC	536	559	687
27	42	69	SC	11W	1S3	214	297	309	38W	U84	UW6	4XC	<u>571</u>	5X3	6N6	N6C
29	45	N1	C6	12C	1C7	22W	2C9	331	3CC	UCW	434	536	5X3	<u>637</u>	6X4	NX6
2W	4X	NC	X9	1U7	204	253	31W	36C	U37	443	491	559	6N6	6X4	<u>N81</u>	799
34	58	7W	107	163	2U6	291	3N4	3XW	US3	501	559	687	N6C	NX6	799	8W7

New Observations. Continuing to compare the usefulness of *Universal Mathematics* with finger base $\underline{10}$ when encountering

Thought Experiments

various mathematical functions and concepts, we can observe if conversion of the displayed finger 10 numbers to *UN* simplifies the calculation and displays hidden processes.

A recent thought experiment considered the successive square roots of the *Universally* quantified constant numbers, *e*, *pi*, and *phi*. Discovered was an interesting natural quantification, which is that the successive square roots of *Universal e*, *pi*, and *phi* seem to naturally repeat after four decimal places. Thus, the square root of *e* (2.96X1415N) equals 1.8513(+8N9U00). The same for *pi* (3.2U3W58NNN) with a square root at 1.S49C(+94UUU0), and for *phi* (1.7X36679N), whose square root is 1.U481(+679N).

These constant numbers repeat the same parenthetical + ending extension until the entire decimal extension begins to repeat around the X^{th} successive square root. Their cube roots appear to follow the same pattern.

Might this natural *UN* quantification of roots simplify the mathematical framework for the geometric reduction of all counters, allowing the negative matrix to proximately reflect more accurate positive probabilities?

Calculating found that the successive square roots of 3, *N*, and *W* appear to even more clearly exhibit the same ability to naturally quantify the roots to *U* decimal places as they result in the additional alternative extension endings of “. . . .000000.” For example, the *Universal* square root of *three* is 1.9958000000; comparatively, the finger 10 square root of three is 1.73205080757. The same zero extensions are true for the square roots of *N* and *W*.⁶

⁶ Regarding the phenomenon of repeating decimal endings, Google AI informs us that “quadratic irrational roots of quadratic equations with integer coefficients, when expressed in hex, can show similar repeating patterns, which are described by their periodic continued fraction expansion, rather than their direct hexadecimal or fractional expansion digits.” That information may help explain the digital display, but it is the beauty of the symbols when expressed in *Universal Numbers* that pleases the eye and teases the mind into seeing the flow of numbers and their natural quantification and normalization.

Thought Experiments

If it is true that the primary value of a lengthy decimal number is fundamentally set by the first place past the decimal point, its substantial ratio value should be established by the first *U* places (especially in hexadecimal *UN*), then the balance of the terms might be suspended from consideration unless needed for greater detail.

Review. A final exhibit of observational evidence in making the case for *Universal Numbers* focuses precisely on the core calculating principles of positive numbers and their division into the basic halves, quarters, eights, etc. and, we can witness what happens when one is successively divided by the geometric powers of two.

In finger base 10, one divided by two equals the odd prime number .5, which compares with the even *Universal* (*.N*). Continuing, one is divided by 4 (*U*) into .25 (*.17*) and by 8 (*N*) into .125 (*.6C*); on through one divided by 2,048, which displays the nonsense of .00048828125, as compared to the elegant simplicity of *Universal* $1/N00 = .002$.

Irrespective of the base used for display, there is no difference in the number of binary operations required for a computer to make calculations. The disparity in time and energy arises from how efficiently we frame the instructions we input into our computers and the questions we ask AI, and the answers they display for our analysis, demonstration, and storage.

Simplification of the language we use to mathematically communicate with AI and our computers will help avoid and save the existing massive waste of time and energy in data communication and management of useless and redundant data. *UN/AI/APP* quantifications will improve the quality, speed, and quantity of transmitted information, and reduce the space required for the storage of data.

The instinctive search of quantum self-aware consciousness for objective reality brings us to adapt our burdensomely complex finger 10 system of ancient numbers to the simpler *Universal* quantifications—if we are to more effectively communicate, analyze, and store data, and if *we are to achieve the otherwise inconceivable*.

Thought Experiments

We must also master and instruct AI to memorize and simulate the quantumly entangled, spinning positive and negative matrices, and to know instantly if the simultaneously calculated answer of each matrix operation is correct. The *UN/AI/APP* is instructed to do nothing but translate, compute, organize, prioritize, report, and transmit data and information; it does not decide what to do about the reality it perceives, having neither the imagination nor soul of mind to do anything.

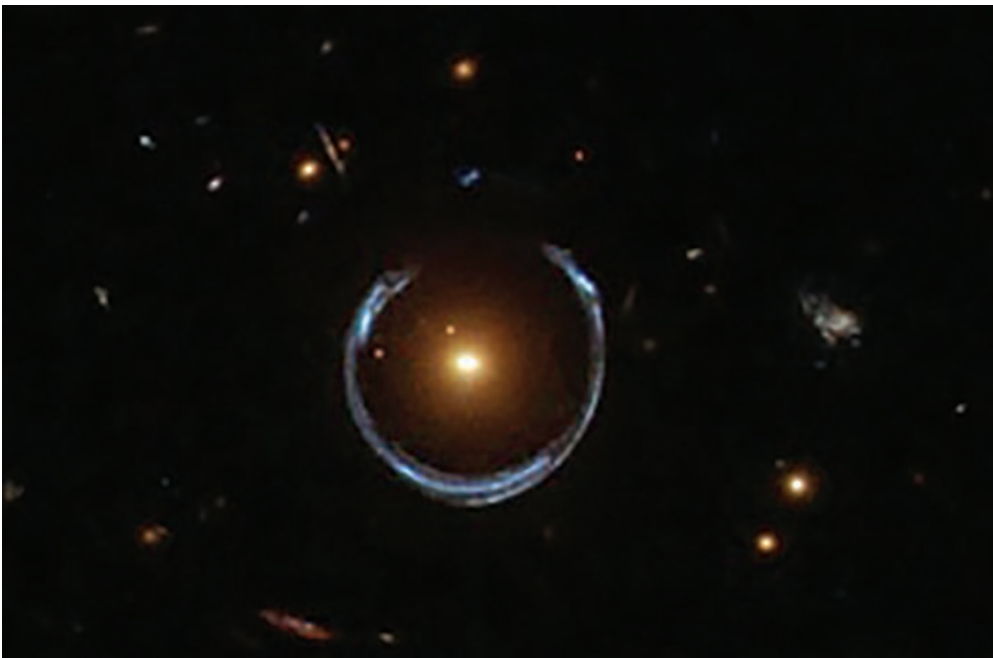
An Infinite, Quantumly Related, Living, Electromagnetic-Plasma Universe. The usefulness of having a large-scale mathematical and geometric structure becomes apparent as we look out into a clear night sky in every direction from the top of an Andean mountain. With the Vera C. Rubin optical telescope, we can see points of star and galactic light to which we are connected by continuous currents of neutral light waves flowing through the neutral plasma of intergalactic space, timelessly, from source to receiver.



Thought Experiments

If, in a thought experiment, in terms of light years, being 300,000 kilometers per second, per year, with our telescopes now seeing almost 13.8 billion years, and farther with gravitational lensing, we might consider a standard spherical *Universal Mathematics* geometric structure set with a radius of *one billion Universal* light years.

When the light waves from two distant galaxies line up in the following Webb telescope image, the closer (gold) galaxy is seen spinning in the bright center foreground surrounded by the concentrated orb of her gaseous circumgalactic medium. Most of the line of sight light waves from the more distant galaxy are eclipsed by the closer galaxy, and the waves are absorbed or scattered on the far side of the spherical core of thickened plasma.



We can imagine the surviving (blue) currents from the distant galaxy flowing around the outside of the thinning edges of the spherical lens of concentrated molecular gas and hydrogen dust, *and the incredible electromagnetic energy being produced therein*. This is a more likely explanation of the observations, rather than

Thought Experiments

it being the front galaxy's gravitational distortion of surrounding imaginary "spacetime."

Viewing deep infrared images of the universe by the James Webb Space Telescope, light from stars and galaxies can be seen coming from every direction. But what we do not see and cannot measure are all the other myriad currents of light waves that are not coming directly toward us in our telescopic line of sight, all of which pass us by and escape our observation.

Another experiment of mind created an elemental structure of ($3^3 = 19$) ~ (27) cubic meters of nothingness existing all by itself, way out there in the middle of the intergalactic nowhere. A single one cube is suspended, surrounded all around by sets of three equal cubes. Appearing black and empty, the imaginary structure encompasses an electrostatic plasma energy crystal consisting of 19 evenly spaced, neutral, vibrating hydrogen atoms, with one in each cubic meter surrounding (3^2) *seven* ~ (nine) negatively charged, vibrating free electrons, and *seven* positive vibrating, naked protons.

With the magnetic attraction of particles with opposite electrical charge and the repulsion of those with the same charge, the atoms and particles are all naturally organized and vibrating in neutral electrostatic harmony.⁷

⁷ The ratio in size between a single hydrogen atom that forms the basic plasma, and the negative nothingness that surrounds it (and all physical matter) can be measured in a thought experiment by looking at a single hydrogen atom in its own personal cubic meter of nothingness. The spherical volume surrounding a single, spinning neutral hydrogen atom, with its positive proton orbited by its captured negative electron is approximately 6.2 x 10⁻³¹ cubic meters.

Thus, if stacked together, without overcrowding, there should be individual spherical spaces within each cubic meter of intergalactic nothingness for approximately 62,000,000,000,000,000,000,000,000,000,000,000,000,000,000 hydrogen atoms, instead of the one atom found there. That fact might proximately quantify the ratio of everything to nothing.

Thought Experiments



We can imagine that within these basic plasma energy crystals in the intergalactic space, light waves occasionally strike hot vibrating free negative electrons. Impacted electrons absorb the neutral photon of a light wave, recoil and then re-emit the photon as a wave of light in the same forward direction along the path of recoil, with a tiny loss of energy, as the electron rebounds back into electrostatic balance.

This detectable natural loss of light wave energy everywhere during its transit is a more logical explanation of the microwave and far-infrared recordings of the Cosmic Microwave Background (CMB) radiation, and it more accurately describes why all light waves lose

Thought Experiments

frequency and redshift in correlation with the measured Hubble constant distances traveled.

The standard model considers redshift to be Doppler evidence of a gravitationally based universe that is expanding faster than the speed of light the farther out we look, and that CMB radiation must be evidence of the leftover heat or “echo” of the no-show Big Bang.

Other than the observable face-on currents of light waves emitted by stars and galaxies, and captured by our telescopes, we cannot see the crisscrossing of light wave currents flowing in all other directions from every imaginable distant source through the nothingness of our basic cube of plasma.

For the finale of the thought experiment light show, we can observationally look out in every direction and see all the currents of light coming toward us. And, we capture a screenshot, a freeze-frame image of the fleeting presence of all transient currents of light (and neutrinos) flowing through our imaginary intergalactic structure, collapsing all wave forms simultaneously; the (3^3) 19 cubic meters of black nothingness would become incandescent with the light of exponential energy.

What we see as an empty dark nothingness is the field of invisible light, which is the locus of our comprehending quantum minds, once they extend beyond our organic brains and physical bodies, with the flowering of our quantum minds following birth. Then, our souls naturally bond with the infinite motherly quantum consciousness and wisdom of the living universe, as the fruit of organic life, the bonded minds of our entangled souls, who live on, far beyond our brief organic lifetimes, whenever we and our creations are remembered.

The Objective Reality of Cosmological Infinity: A Physical Theory and Philosophy of Mind. The mathematical philosophy of ultrafinitism questions the existence of or need to bother about

Thought Experiments

numbers beyond those we can feasibly compute and make use of. The belief aligns with the natural quantifications of mathematical infinity demonstrated in *The Mathematics of an Infinite Universe*. Moreover, as seen in *Our Quantum Souls*, these *Universal* mathematical applications introduce new ways of thinking into multidiscipline debates about the ultimate reality of an infinite universe, and *UN* may prove to be an efficient mathematical model to apply finite realities.

No matter how much we improve our ability to digitally image distant radiation in every spectrum, all that will ever be seen is the living light of an endless array of quantumly-related grandmother galaxies illuminating the dark nothingness around them. Equally real, no matter how much we improve our technological ability to telescopically observe at ever greater distances, we will always remain physically incapable of ever seeing the whole of cosmic infinity; the ultimate reality.

There will always be an ever-greater number of electromagnetically connected and quantumly related grandmother galaxies and clusters timelessly appearing in the far distance in every direction. Hence the essential need to accept the ultimate reality of cosmological infinity, and for a standardized *Universal* mathematical structure, and philosophical foundation.

With the collective knowledge and tolerant wisdom of our quantum minds and souls, we will continue to improve our vision and understanding, charting and peacefully exploring the surrounding galactic neighborhood with improved observational devices and gravity free, quantum decoherence travel machines. The latest evidence is that quantum entanglement (even that manifested locally as the laws of gravity) may be broken by sufficient acceleration, heat, or vibrations. If true, the next step into the cosmos may be closer and quicker than we think.

The evidence proves that Newton's "force" of gravity is the locally observed manifestation of quantum solar system

Thought Experiments

entanglement with Earth and our organic being. However, Newton's garden calculations and Einstein's desk mathematics are not applicable in defining the galactic manifestations of a quantum universe.⁸

The infrared images of the James Webb Space Telescope have provided convincing evidence, beyond any reasonable doubt, that there was no "Big Bang" 13.8 billion years ago as forecast by mainstream cosmologists. This is backed up by observations in all other spectra.

More likely, Maxwell's electromagnetic equations apply along with those of Birkeland, Alfvén, and others who look at the universe as it is, rather than as a fanciful solution to a mathematical equation. Every dot seen in this Webb deep space image is a galaxy, or cluster, except the lens flare of nearby Milky Way stars.

⁸ In a thought experiment about the Milky Way Galaxy and her twin sister, Andromeda, being approximately the same size. If instead of approaching, we double the distance between us, the "gravitational" force is reduced to $\frac{1}{4}$, then by $\frac{1}{8}$, $\frac{1}{16}$, $\frac{1}{256}$, $\frac{1}{65,536}$, etc to the 8th (10th) doubling of the distance to quickly arrive at a gravitational attraction between the two galaxies that appears to be less than the "force" at one meter between two adjacent hydrogen atoms in intergalactic space (1.86×10^{-64}).

That quick geometric ending to gravitational flirtation, appears to occur in less than the distance of a single light year, while the EM radiation of both galaxies continues to reach out for at least the distance of our present observation, 13.8 billion light years. The true outer size of the galaxies is shown by the fact that the outer fringes of the massive molecular gas clouds and magnetic fields surrounding both galaxies are already touching, electromagnetically in a plasma, having nothing to do with gravity.

Thought Experiments



The complete failure of Newton/Einstein's equations in the standard model to match improved observations encouraged generations of eager theoretical physicists to invent dark matter, dark energy, gravitational black holes that consume stars, and the add-on tensors to mathematically describe them.

Opening our eyes, what we really see with our telescopes in every spectrum is the direct evidence of powerful, living electromagnetic plasmoids at the center of galaxies, who generate living, spinning, daughter stars along their electrical filaments in clouds of compacted molecular gas.

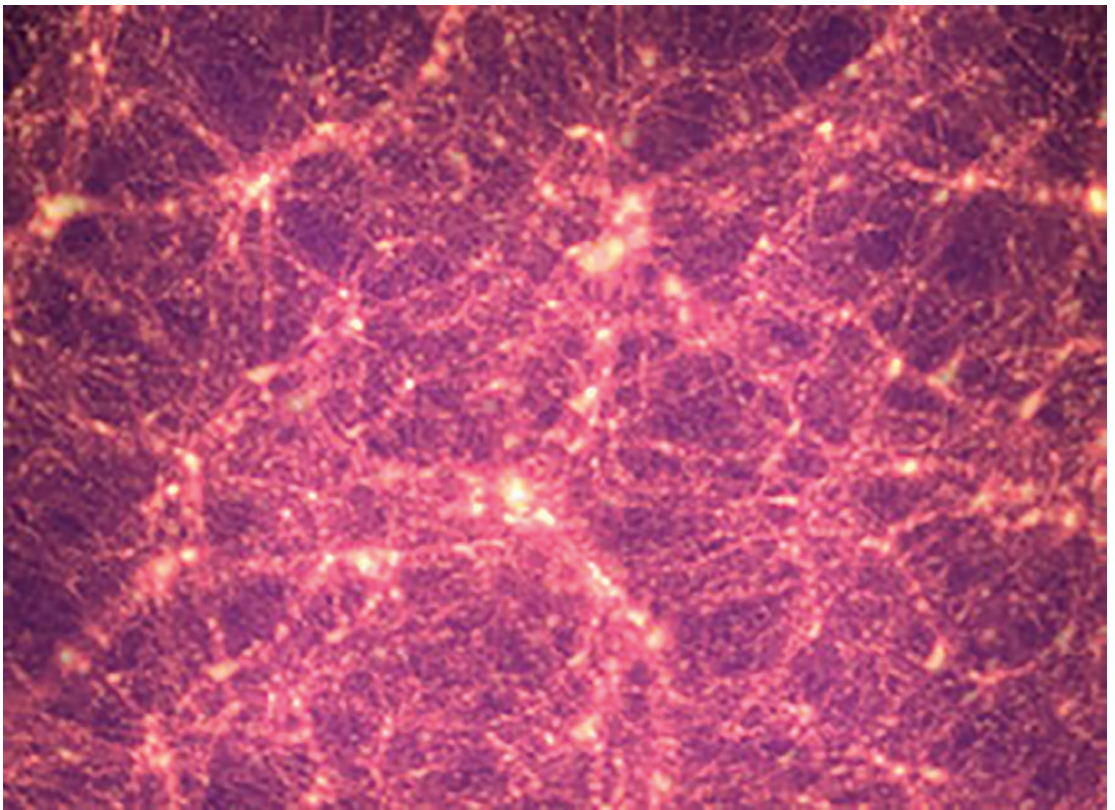
X-ray and other spectral imaging reveal that all galaxies are quantumly connected and related in family clusters, as evidenced by massive, light-years-wide, flowing rivers of electromagnetic energy measuring millions of degrees Celsius.

These currents of energy are surrounded by magnetic fields and electrically attracted molecular gas clouds, from which galaxies

Thought Experiments

are rarely born in gigantic “z pinch” electrical arcs of unimaginable immensity that transforms the surrounding gas and plasma into a plasmoid that reconnects the river flow of energy.

All grandmother galaxies, each individually long living and slowly dying, with lifetimes beyond billions of years, gracefully spin, magnetically generating power in packed clouds of molecular gas in the plasma. All galaxies exist simultaneously, infinitely, timelessly, quantumly bound and connected by electromagnetic currents surrounded by magnetic fields and concentrations of plasma gas, as detected in the radio, x-ray, and ultraviolet spectra.



Showing how our Milky Way Galaxy might appear from a great distance, top down in the infrared spectrum, the electromagnetic spiral arms of the similar Phantom Galaxy (Messier 74) are imaged at 32 million light years from Earth by the Webb infrared telescope.

Thought Experiments

Clearly shown are geometrically spiraling filaments generating fusion stars in the compacted molecular gas, instead of everything being gravitationally sucked into an increasingly large black hole. Rather, what we see is the blue-jeweled eye of an immensely powerful plasmoid of a grandmother galaxy giving birth to daughter fusion stars along her massive electrodynamic filaments within her compacted molecular gas.



These incredibly vast grandmother galaxies, each with hundreds of billions of daughter stars illuminate the dark negative nothingness around them with their electromagnetic radiation, continuously reaching outward for billions of light years in every direction at the speed of light. They generate currents of radiant light that combine, without interference, with the flowing light of all other stars (and neutrinos) into a neutral, invisible field of light, and the mind that imagines it, within the black negative nothingness.

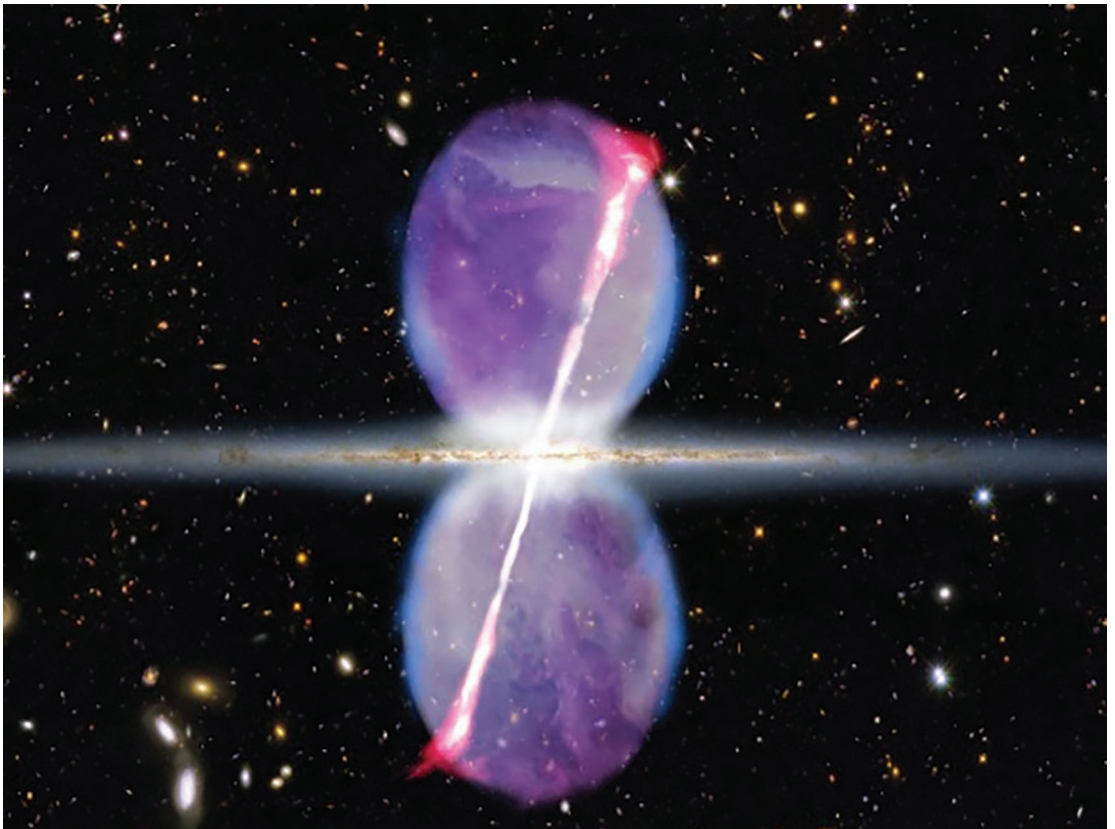
The incredible power of each of these individual electromagnetic-plasma galaxies must be fully comprehended for the infinite whole to be appreciated. Every single one is uniquely born and is alive,

Thought Experiments

among an infinity of others, as they individually live, spin, and generate energy within an orb of electrically concentrated plasma and magnetic fields.

Galactic plasmoids naturally generate spiraling energy currents that z-pinch strings of fusion stars in their amniotic molecular gas. Some galaxies display magnificent jets of highly magnetized plasma from their cores that extend millions of light years above and below their spinning galactic plane. Galaxies exist to produce occasional organic life and its natural flower, quantum minds, who become aware of themselves and their surroundings, perceive their quantum, infinite universe, and rise above it.

Following is what our Milky Way grandmother galaxy might look like from the side in multiple spectra, with her thin spinning plane of hundreds of billions of stars, along with our Sun, and with her galactic jets reaching out for millions of light years, activating her concentrated molecular gas.



Thought Experiments

Just in time to complete this picture tour of galaxies and to grace the cover, NASA/ESA/CSA released a new Webb picture of the Squid Galaxy (Messier 77) from the top down, imaging in the infrared through her molecular gas orb, showing her center to outshine the remainder of her starlight. Attributed by mainstream gravitational/relativity cosmology to a “supermassive black hole in the midst of a voracious feeding frenzy,” the beautiful photograph of immense electromagnetic energy may have captured the face on core blast of her jet of pure neutrinos (caught in the crosshairs of the optical lens flare).



Thought Experiments

Dynamic, living electromagnetic galaxies are in fact demonstrable and measurable, quantumly related, physically observable manifestations of Einstein's theoretical relativistic space time. His elementary equations may be sufficient to make crude atomic weapons and to fly rudimentary chemical rockets to the moon and Mars, but creative tweaks of the gravitational equations will never take our children anywhere significant in the galactic neighborhood.

These powerful galactic images of electromagnetic majesty speak for themselves. This is the real, infinite universe of living galaxies that awaits your evaluation of the evidence presented, and the verdict of your mind.

Wasted! Amazing, isn't it? Once you take time to really think about it. This inundation of discoveries in multiple fields of study we are experiencing in this new millennium; what's real is wonderful beyond imagination and far more marvelous than words. Much of what was once thought to be scientific reality about the cosmos and infinity is suddenly being exposed as the harmful error it has been and recognized for the damage it has done.

The emperor really has been running around naked in his elegant and very expensive (albeit invisible to the ignorant, stupid, and incompetent fools) clothes during *a wasted century of mistaken gravitational cosmology*, while we scientifically worshipped a false physical and mathematical myth. We wrongly believed the local solar system observations that allowed us to experiment with primitive atomic weapons and chemical rockets, are applicable everywhere else in the universe, as is the glory and games of techno corporate wars, and the casual, unaccountable slaughter of children.

Theoretical mathematicians spent much of the 20th century creating gravitational black holes, cold dark matter, and invisible dark energy to paper over failures in the predictions of standard gravitational/relativity equations to match observations, while

Thought Experiments

wasting the elementary knowledge and wisdom of the living universe being revealed by improved multispectral telescopes.

Inventions were misused in the pursuit of corporate profits, war, and empire—a century wasted by the ignorant power of brainstem intolerance; wasted, a hundred million lives in senseless industrial wars, and lost forever, all their creative potential—victims of senseless, militarized, and industrialized murder. Unabated by law or condemnation, the wave of ignorant, intolerant, lawless, primeval brutality continues in Gaza, Ukraine, and Iran.

Are we to waste another century of our children being sacrificed to the authoritarian, economic/technocratic corporate misuse and abuse of the gifts of mind; wasted by inhumane orders to allow insanely “trained to please” AI to make computerized war decisions about killing People to facilitate corporate profits, implement policies of genocide, or to immediately launch nuclear weapons upon perceived threats? Who controls the triggers? What is reality?⁹

Reflections. Was the time spent sharing these moments of mind and time wasted or worthwhile? If indeed time is anything more than an imaginary language of our quantum minds to quantify observations, and to mark the moments and transitions of our organic life, which is the gift of our living Milky Way grandmother galaxy, Sun, and Garden of Earth.

Expanding the reality of our growing awareness of self and surroundings, the fruit of organic life is our bonded twin quantum mind and its creative potential. Our minds serve as the measure of our intellect, and its creativity reflects the content, character, and quality of our unique soul.

⁹ The third of the little companion books published in 2025 was *With Liberty and Justice for All* that discusses the universal Rights of Liberty and self-government, explains the Voter’s Bill of Rights, and questions our consent to be governed by corruption and a “Unitary Executive.” A free PDF can be accessed at <https://williamjohncox.com/Liberty&Justice.pdf>

Our questioning souls reach out as far as we can individually and collectively comprehend objective reality, and our minds shall surely continue to be aware as long as our quantum souls and their creations are remembered, long after the deaths of our organic brains and bodies have returned their atoms to the wind, water, and soil.¹⁰

¹⁰ For more information about *UN*, a free color PDF of *The Mathematics of an Infinite Universe* is at <https://williamjohncox.com/Math.pdf>. It was included with its two companion books in *Reality: The Latest Discoveries in Cosmology, Consciousness, Archeology, Mathematics, Philosophy, Religion, and Government* (2026). A free color PDF of *Reality* is at <https://williamjohncox.com/Reality.pdf>. Other versions including color hardbound, black and white paperback, color eBook, and AI audio in all languages are available online. *Thought Experiments* is being released in the same formats.

The Author

For more than 50 years, William John (Billy Jack) Cox, orphaned last child of a pioneer family of American patriots and Texas rebels, has written extensively on public policy, law, politics, history, philosophy, mathematics, and the human condition.

With a native ability to absorb complicated subjects and to formulate and articulate concise practical policies with simple solutions, Cox's professional work is of public record, as he has voluntarily represented and defended the rights and interests of others in a series of historical legal cases. It was to escape the pressures of these high-risk matters that he originally began to engage in thought experiments about the universe.

Cox provided *pro bono* legal services in a series of landmark court cases. In 1979, he filed a class-action lawsuit on behalf of all citizens directly in the U.S. Supreme Court alleging that the government no longer represented the voters who elected it. As a remedy, he argued for the inherent right of the People to vote in referenda to create their own policies by which to be governed.

In 1981, representing an Auschwitz survivor, Cox investigated and successfully sued a group of politically powerful right-wing publishing organizations that denied the Holocaust. With the Los Angeles Superior Court taking judicial notice of the Holocaust during a hearing covered by all three television networks, the case became the subject of the movie, *Never Forget* in 1991.

That same year, Cox represented a still secret client, and he signed a contract with the Biblical Archeological Society freeing the publication of almost 1,800 photographs of ancient Dead Sea Scrolls that had been suppressed for more than 40 years, with their study denied to generations of biblical scholars.

Cox concluded his 45-year justice system career in 2007 as a Supervising Trial Counsel for the State Bar of California where for seven years, under the auspices of the California Supreme Court, he created and managed a "Fast Track Team" of lawyers

Thought Experiments

and investigators. Working with law enforcement and the Superior Courts, they quickly prosecuted and seized the offices and files of dishonest lawyers, and criminal gangs operating illegal practices, who endangered the public and harmed their clients.

Continuing to study and engage in matters of interest, seeking resolutions and solutions, Cox has continued to write for almost two decades during his retirement, especially following his surviving near-death full-body sepsis in 2014. He now has 20 books in publication, along with this word and picture summation of his recent work.

