ISSN 2976 – 730X
IPI Letters 2023, (1):41-55
https://doi.org/10.59973/ipil.29

Received: 2023-10-09
Accepted: 2023-10-24
Published: 2023-10-27

IPI Letters

Opinions

The 5th Dimension and its Implications for the String Theory, Conservation of Energy and Heisenberg Uncertainty Principle

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Abstract – In 1919, the mathematician Theodor Kaluza began to play around with Albert Einstein's formulas for gravity. Out of curiosity, he reworked the equations to see how they would look in five, rather than four, dimensions. The exercise yielded an extra set of equations, which were the same as James Clerk Maxwell's equations for the electromagnetic field. His idea of a fifth dimension had produced a mathematical unification of gravity and electromagnetism. Since Kaluza's calculations yielded an extra set of equations with Einstein's formulas for gravity, it's logical to assume that extending the number of known dimensions to five might also extend $E = mc^2$. This article also visits conservation of mass and energy / mass-energy equivalence, Electromagnetism, Dark Matter, Dark Energy, the Matrix, Antigravitons, Incompleteness Theorems, New Irrationals, Calculus, Celluloid Motion, and Vector-Tensor-Scalar Geometry. And as the text accompanying Figure 5 says, "The counterclockwise rotation does not have to encompass 360 degrees. It can be divided into single degrees – and even arcseconds which are 3,600 times smaller than a degree. Each arcsecond (or tiny part of it) could correspond to a separate dimension and the total dimensions might make up a temporal multiverse that's reminiscent of string theory, the cosmological framework that says particles are composed of one-dimensional objects called strings (a group of binary digits is called a single-dimensional bit string)." Finally, Heisenberg's Principle of Indeterminacy - in which the position and the velocity of a particle cannot both be measured exactly, at the same time, even in theory - is revised. Quantum uncertainty is changed into quantum certainty by software containing a new type of irrational number – actually, irrational equations - that's based on mathematics' Matrix and topology's Mobius strip, as well as being interdimensional. Ludwig Wittgenstein, an Austrian-British philosopher, once stated, "The limits of my language mean the limits of my world." Wittgenstein proposed that our understanding of the world is shaped by the language we use to describe it. This concept extends to mathematics, which can be seen as a specialized language. So, if a person has no doubt that 1 + 1 = 2, he or she can never arrive at a truly Unified Theory in which only one thing exists. The mathematical tools accepted in 2023 are indispensable in enabling advancements in technology and science that have transformed our lives but is incapable of fully describing Unification. Scientific history has shown that it can go partway. Scientists consequently assume it will eventually go all the way.

Keywords – $E = mc^2$; Vector-tensor-scalar geometry; Nuclear forces; Black holes; String theory; Quarks; Gluons; Inverse-square law; Wick rotation; Time dilation; Dark matter; Dark energy; Higher dimensions; Antigravitons; Topology; Heisenberg uncertainty principle; Quantum certainty; Riemann hypothesis.

1. Extending $E = mc^2$

Since Kaluza's calculations yielded an extra set of equations with Einstein's formulas for gravity, it's logical to assume that extending the number of known dimensions to five might also extend $E = mc^2$. This conclusion is supported by the paper "Did Einstein prove $E = mc^2$" which states, "The mass–energy formula cannot be derived by Einstein's 1905 argument, except as an approximate relation …" [1]. A more precise relation might be obtained in the following way:

The wave-particle duality of quantum mechanics can be described by starting with $v = f\lambda$ (wave velocity equals frequency times Greek letter lambda which denotes wavelength). Velocity (speed in a constant direction) of a collection of particles like a car equals distance divided by duration. Since distance is a measure that has to do with space while duration is a measure that has to do with time, it equals space divided by time [2]. Gravitational and electromagnetic wave motion (space-time motion) travels at c, the speed of light i.e.

$(v = f\lambda)$ = distance/duration = space/time = c (1)

A particle's velocity, whether the particle be a boson or fermion, is directly dependent on its energy – so it may be said that:

$E \sim (v = f\lambda)$ = distance/duration = space/time = c (2)

This is not quite right since c represents energy alone, and space-time deals with mass-energy, so it's better to say

$E \sim (v = f\lambda)$ = distance/duration = space/time = mc (3)

What about the power two in $E = mc^2$? In later papers Einstein repetitively stressed that his mass-energy equation is strictly limited to observers co-moving with the object under study, and co-movement may be represented by the exponent 2.

In order for $E = mc^2$ to apply to the universe, observers must be able to co-move with anything being studied (even a light beam). Moving in the same direction is no problem but how can anyone or anything move at the same speed? Present-day observers can never move at the speed which light covers in the vacuum of space-time, so the only way for observers and light to co-move is for the nature of electromagnetism to be revised. Like waves of water, electromagnetic waves are known as transverse. Consequently, the particles (photons) of light and microwaves etc that travel through space-time would have relatively little movement themselves. It's the disturbances from the sources of electromagnetism (shock waves of fluctuating amplitudes and frequencies) that travel. (They go through the fields of energy filling the so-called vacuum.) The relation $E = mc^2$ only works when an observer and light beam are co-moving, which causes particles to appear at rest. So, the equation can only describe photons that have no motion in the "line of propagation" in which the shock wave moves. The photons can only bob up and down in the vertical direction, perpendicular to the shock wave – like a cork in ripples on a pond.

"A photon is a quantum of excitation of the electromagnetic field. That field fills all space and so do its quantum modes" [3].

This is consistent with energy being transferred from one place to another (as wave motion) without involving an actual transfer of particles (no transmission of photons). General Relativity says gravitation results from the curvature of spacetime (gravity IS space-time) i.e. the gravitational field also fills all space, so the seeming motion of gravitational waves could also be due to fluctuations of shock waves' amplitudes and wavelengths causing excitations (called gravitons) in the field. These excitations cover 186,282 miles every second (299,792 km/s). The above ideas of gravitational and electromagnetic waves displaying little or no motion are a new interpretation of John Wheeler's geon or "gravitational electromagnetic entity", an electromagnetic or gravitational wave which is held together in a confined region by its own nature [4]. If there's no movement of photons and gravitons to change the universe's diameter, it could not be expanding (neither would its lack of motion allow space or time to contract).

2. Conservation and Renormalization in the Mathematical Universe

Prussian chemist and physician Georg Stahl (1660-1734) taught that a substance called *phlogiston* escaped from a material when it burned. The theory became increasingly untenable as it became clear that the products of combustion always weigh more than the material burnt. In 1774, French chemist Antoine Lavoisier proved that burning is the result of rapid union of the burning material with oxygen. Lavoisier showed that there is as much weight present after a candle burns as before. The substances have only changed form. He called this the law of conservation of matter. The related conservation law of energy states that the total quantity of energy in an isolated system does not change, though it may change form. Similarly, the mass-energy equivalence (conservation of mass

and energy) described by Albert Einstein's $E = mc^2$ says the total mass-energy in an isolated system does not change, though it may change form.

Renormalization is a mathematical procedure for cancelling infinities. At present, it's regarded as a prerequisite for a useful theory and is part of attempts to unite general relativity with quantum mechanics. But if the Big Bang never happened, we'd be living in an infinite and eternal cosmos. Removing infinities mathematically (or by any other means) would be an error and retaining the infinite values would point the way to deeper understanding of the universe. The release of an infinite amount of energy would contradict the principles of ***CLASSICAL*** conservation of energy but would not violate the inexactness of ***QUANTUM-MECHANICAL*** conservation (mass-energy equivalence).

We start with the axiomatic principle that the extended version of $E = mc^2$ allows the universe to be infinite in space – and infinite in its union with time i.e. eternal – as well as permitting it to possess infinite properties. Using the retarded / advanced waves of the Kaku / Rainich note on p.12, it is seen that the waves can cancel and produce quantum entanglement of every particle – massive or massless – of everything in space-time. The idea of an eternal universe is highly speculative and doesn't quite fit with our current understanding of the universe's origins, such as the Big Bang theory. Any idea that has been around for a century cannot be easily dismissed but the James Webb Space Telescope is casting potential doubts on the Big Bang. If this continues, we may well find ourselves in need of another theory explaining cosmic origins. An infinite, eternal universe created with technology does this, and it fits in with my ideas on binary digits/topology/Wick rotation/VTS geometry being fundamental to the universe's structure and functioning (see next paragraph).

Max Tegmark, professor of physics and cosmology at the Massachusetts Institute of Technology in the USA, hypothesizes in his Mathematical Universe Hypothesis that the physical universe is not merely *described by* mathematics but ***IS*** mathematics [5]. The hypothesis seems to be supported by the relatively recent discipline of Information Physics. Tegmark's categorization of the universe has four levels, with level 4 being altogether different equations or mathematical structures. Building on the Mathematical Universe Hypothesis, these "altogether different mathematical structures" are, in this article you're reading, proposed to be topology's two-dimensional Mobius strips that are formed by base 2 maths (the binary digits of 1 and 0). The Mobius strips are joined as pairs into figure-8 Klein bottles [6] which are mathematically immersed in the 3rd dimension. The photon (the fundamental unit of electromagnetism) and graviton (the hypothetical unit of gravitation) are created by, respectively, trillions of Mobius strips and trillions of figure-8 Klein bottles. Adapting Einstein [7], these photons and gravitons interact via Vector-Tensor-Scalar Geometry (see brief summary below) to produce a space-time united with every form of mass (in Einstein's terminology, a Unified Field). Wick Rotation is built into the Mobius strips constituting particles and its motions form what is called time (being built into the Mobius and the quantum world, Wick rotation creates the union of space-time).

3. Vector-Tensor-Scalar (VTS) Geometry

The following method of building planets is preferred to collisions between rocks and dust in the disk because most planetary systems seem to outweigh the protoplanetary disks in which they formed, leaving astronomers to re-evaluate planet-formation theories [8].

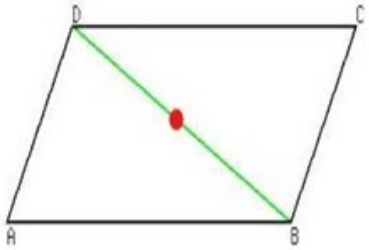

Figure 1. VTS (VECTOR-TENSOR-SCALAR) GEOMETRY - Interaction of Gravitation and Electromagnetism Produces a Momentum in Gravitons and Photons (and a Pressure Which is Known as Mass).

A vector is a quantity which possesses both magnitude and direction. Two such quantities acting on a point may be represented by two adjoining sides of a parallelogram, so that their resultant is represented in magnitude and direction by the diagonal of the parallelogram (AD and CD, for example, can symbolize the electromagnetic and gravitational vectors, while the resultant green diagonal of DB substitutes for the interaction of those two forces). A scalar variable is representable by a position on a line, having only magnitude e.g. the red dot on the diagonal, symbolic of the Higgs boson. A tensor is a set of functions which, when changing from one set of coordinates to another, are transformed in a precisely defined manner (e.g. changing from the coordinates of AD and CD to those of the green diagonal, or of the red dot, is a transformation performed in a particular way).

Two sides thus illustrate the graviton's spin 2 and the photon's spin 1. The resultant diagonal represents the interaction of the sides/vectors (1÷2 = the spin ½ of every matter particle). Tensor calculus changes the coordinates of the sides and diagonal into the coordinates of a single (scalar) point on the diagonal. This scalar point is associated with particles of spin zero [9]. If the mass produced during the photon-graviton interaction (the energy and momentum of photons and presently hypothetical gravitons produces a pressure we call mass) happens to be 125 GeV/c^2, its union with spin 0 produces the Higgs boson. 125 GeV/c^2 united with spin 0 means the central scalar point of the Higgs boson is related to the vector of the graviton's spin 2, and the Higgs field is therefore united with the supposedly unrelated gravitational field (together with the latter's constant interaction with the electromagnetic field).

The farther away a star or galaxy is, the more the advanced part of waves from it will reach into the past, giving us a greater inaccuracy regarding its true distance. This increase is analogous to redshift increasing with distance. We might call it readshift - re(tarded) ad(vanced) shift (see Kaku/Rainich note, p.12). Readshift would explain the astronomical results which were interpreted as accelerating expansion of the universe. Surveyed supernovas would appear fainter, therefore apparently farther away than they truly are. Unless advanced waves are considered a possibility, the only rational way to move a supernova from its apparent, distant position to its true nearer location is to conclude the universe has expanded.

The interacting gravity and electromagnetism in VTS geometry produce mass e.g. they can form a Higgs boson or the strong/weak nuclear forces' bosons as well as matter. On a cosmic level - if gravitational and electromagnetic waves focus on a protoplanetary disc surrounding a newborn star, the quantum spin of the particles of matter in the disc (1/2) could imprint itself on the waves' interaction and build up a planet layer by layer from vector-tensor-scalar geometry's 1÷2 interaction. If the waves focus on a region of space where there's no matter, the opposite interaction occurs and the graviton's spin 2 is divided by the photon's spin 1 to produce 2÷1. The mass produced has the spin inherent in each of the gravitons composing spacetime - and could be an alternative, or complementary, method to supernovas for producing the gravitational waves making up black holes.

Quaternions were first described by Irish mathematician William Rowan Hamilton in 1843. Hamilton defined a quaternion as the quotient of two vectors [10]. In this case: the quotient of two vectors is 1/2, the division of the electromagnetic vector (photonic quantum spin of 1) by the gravitational vector (gravitonic quantum spin of 2). In other words, the term "diagonal" (like 1/2, the result of these 2 vectors interacting) in VTS Geometry can be replaced with the term "quaternion". (Of course, the vectors may be reversed to give the black hole quaternion of 2/1). A hologram's appearance differs depending on which direction it's viewed from. If the universe is holographic as proposed by Gerard 't Hooft, Leonard Susskind, and AdS/CFT correspondence - if the 3rd dimension is the result of information in the 2nd dimension (in the 2D Mobius strip?) - a hologram's property of looking different depending on the direction it's viewed from might account for the matter-particle quaternion of 1/2 becoming the black-hole quaternion of 2/1.

4. Bosons of The Nuclear Forces & Planet/Black-Hole Formation

It must be remembered that referring to space alone is incomplete. Living in space-time, it's necessary to add some sentences about the time factor. The photon must interact with the graviton to produce the mass of the weak nuclear force's W and Z bosons. To produce their quantum spin, the photon's spin 1 needs to react with the graviton's spin 2. That is, the photon's turning through one complete revolution needs to be combined with the graviton's being turned through two half-revolutions*. Incorporating the time factor as a reversal of time (Richard Feynman, 20th-century winner of the Nobel Prize in Physics, used reversal-of-time to explain antimatter) in the middle of the interaction: a gravitonic half revolution is subtracted from the photonic full revolution then the graviton's time-reversal adds a half

revolution (1-½+½ = the spin 1 of W and Z bosons). The strong nuclear force's gluon's quantum spin of 1 could arise in the same way as the spin 1 of weak-force bosons. The masslessness of gluons might be produced by retarded and advanced waves cancelling. They neutralize each other, producing a mass of zero and relating gluons to the Higgs boson whose zero quantity is its quantum spin.

* Professor Stephen Hawking writes [11]:
"What the spin of a particle really tells us is what the particle looks like from different directions."
Spin 1 is like an arrow-tip pointing, say, up. A photon has to be turned around a full revolution of 360 degrees to look the same. Spin 2 is like an arrow with 2 tips - 1 pointing up, 1 down. A graviton has to be turned half a revolution (180 degrees) to look the same. Spin 0 is like a ball of arrows having no spaces. A Higgs boson looks like a dot: the same from every direction. Spin ½ is logically like a Mobius strip, though Hawking doesn't specifically say so. This is because a particle of matter has to be turned through two complete revolutions to look the same, and you must travel around a Mobius strip twice to reach the starting point.

5. Quarks, Gluons, And Waveforms

The quark model was independently proposed by Murray Gell-Mann and George Zweig in 1964. Owing to a phenomenon called Colour Confinement, quarks can never exist in isolation – they're found combined within protons, neutrons, and mesons. Stephen Hawking and Leonard Mlodinow state, [12]:
"The question of whether it makes sense to say quarks really exist if you can never isolate one was a controversial issue in the years after the quark model was first proposed." "It is certainly possible that some alien beings with seventeen arms, infrared eyes and a habit of blowing clotted cream out their ears would make the same experimental observations that we do, but describe them without quarks."
So, quarks are one interpretation – below is the one by aliens with 17 arms. The colour charge (or color charge) of quarks and gluons is completely unrelated to the everyday meanings of colour and charge. The term *colour* and the labels red, green, and blue became popular simply because of the loose analogy to the way the primary colours mix. The quality the particles and light share is waveforms - suggested to be retarded and advanced waves from James Clerk Maxwell's electromagnetic equations as well as Einstein's gravitational equations which interact via Vector-Tensor-Scalar Geometry. If VTS geometry is correct about graviton-photon interaction being responsible for the generation of mass, the retarded and advanced waves associated with both gravitation and electromagnetism would produce mass. Therefore, the masslessness of gluons might be produced by retarded and advanced waves cancelling. They neutralize each other, producing a stable mass of zero and relating gluons to the Higgs boson whose zero quantity is its quantum spin. The waves would also relate to the quark with its zero quantity being its size.

These retarded and advanced components cancel or neutralize each other and as we'll see, can make any atom or subatomic particle stable. The life of a pentaquark (an assembly of five quarks) is $1x10^{-20}$ s. This is the time it takes light to travel the width of an atom i.e. the time it takes retarded and advanced waveforms to neutralize and create stability. Together with retarded and advanced waves relating to quarks, the pentaquark-light beam connection hints that it's permitted to focus on the light and dismiss pentaquarks. In the absence of the quark model, and assisted by the connection with gluons, colour charge can be viewed as the strong nuclear force, with the masslessness and quantum spin of its bosons being products of vector-tensor-scalar geometry.

6. Extending the Inverse Law from Gravity and Light to Mass

Instabilities within atomic nuclei potentially arise from uneven distribution of mass within the nucleus. Such unstableness – perhaps manifesting as radioactivity – would inevitably reside in every chemical element if quarks formed their protons and neutrons. This is a natural consequence of masses existing at particular coordinates while other coordinates are entirely free of mass. Like a tower with most of its structure and weight on one side, instability (in the tower's case, leaning over and eventually falling) is unavoidable – unless gravity is eliminated (in the case of subatomic particles … unless graviton-photon interaction is eliminated). If the empty space in an atom is filled with waveforms, distribution is less of a problem since instability is limited to points corresponding to features such as a wave's crest. Most natural elements, and most isotopes, would not be radioactive. It seems possible that these points/crests were interpreted as discovery of pentaquarks when CERN's Large Hadron Collider observed a "peak" in the curve of particles' decays versus their mass in 2015.

Waves can not only be described by mathematics but, according to this article, they can literally be the result of math. * Then, Fourier analysis or $v = f\lambda$ would not merely be descriptions of waves created by interacting particles. In conjunction with the base 2 math aka binary digits and topology addressed below, they'd be part of the "blueprint" for forming waves which, via VTS geometry, produce particles. **Interacting particles can produce waves just as masses can curve spacetime to create gravitation and gravitational waves.** VTS plausibly explains the inverse – it doesn't regard mass as the producer of gravity but regards gravity, partnering with electromagnetism, as producer of mass. Inverting quantum mechanics, the inverse law states that waves produce particles. This brings us full circle back to the Hawking / Mlodinow point that ultimate reality does not have to be described using quarks (but as recent scientific history has demonstrated, it can be).

* A 3D cube can be regarded as an image of reality coded on a 2D surface (a projection from a square). The cubic shape would be a linear projection resulting from adding, in one direction, multiple layers of the information in the square. The 2D square would be a nonlinear (angular) projection resulting from adding 4 lines, each one being separated from those adjoining it by 90 degrees. A one-dimensional line is a set of points obeying a linear relationship. A point's an exact position or location. It's important to understand that a point is not a thing, but a place. It possesses zero size and no matter how far we zoomed in, it'd remain dimensionless with no width. Instead of programming a set of points to follow a straight line, suppose they're represented curvilinearly as a waveform described by Fourier analysis or $v = f\lambda$.

7. Advanced Waves, Eternal Present, Wick Rotation's Time Dilation / Dark Matter / Dark Energy

Both gravitational and electromagnetic waves possess retarded and advanced * components which travel forwards and backwards in time, cancelling one another and entangling all masses. Wick rotation (time) is built into the Mobius strips and figure-8 Klein bottles composing electromagnetism's photons and gravitation's gravitons. Therefore, all time (the entire past and present and future) is united into one thing just as all space and all mass are united into one thing. (If time only passed rectilinearly - from past to present to future - the idea of waves travelling back in time would make no sense at all. But if time is curvilinear - with past, present, and future interconnected - time must be able to move from future to present to past.) (Unity of past/present/future may remove the issue of non-simultaneity – in special relativity – because the timing or sequence of events being different in different frames of reference can only exist if past/present/future are separate. The concepts of cause and effect are no longer separate when all periods of time are united, and everything can happen "at once". This is similar to watching a DVD – every event on the DVD exists at once since the whole DVD exists but we're only aware of sights and sounds occurring in each tiny fraction of a second.)

* When we solve (19th-century Scottish physicist James Clerk) Maxwell's equations for light, we find not one but two solutions: a 'retarded' wave, which represents the standard motion of light from one point to another; but also an 'advanced' wave, where the light beam goes backward in time [13]. Einstein's equations say gravitational fields carry enough information about electromagnetism to allow Maxwell's equations to be restated in terms of these gravitational fields. This was discovered by the mathematical physicist George Yuri Rainich [14]. It's therefore apparent that gravitational waves also possess retarded and advanced portions.

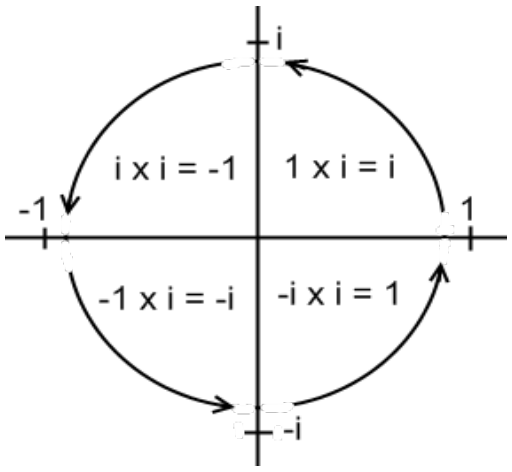

Figure 2 – WICK ROTATION: "The complex plane reveals i's special relationship with cycles via the circle of i, also known as Wick rotation. Whenever a point on the complex plane is multiplied by i, it moves a quarter rotation around the origin or center of the plane." [15]

How can time dilation be explained in terms of Wick rotation? (a) As the speed of light is approached, photons will "fall" faster from the positive or upper y-axis to the negative, or lower, y-axis (rotational speed is increased significantly and more photons interfere with each other more often, causing time to slow), and (b) each quantum within the intense gravity of a black hole - a graviton - can, according to our frame of reference, be in two or more places at once and gravitationally cause particles to simultaneously "rise" faster from the negative y-axis to the positive y-axis (again, interference between particles is increased and time dilation occurs).

How can Wick rotation explain dark matter and dark energy? The counterclockwise rotation of gravitational and electromagnetic waves between the x- and y-axes in Figure 2 can be viewed as responsible for the gravitational/electromagnetic energies forming all mass in space-time or, as dark energy, forming all mass in imaginary time – described by "imaginary" numbers like $i^2 = -1$. Since time and space can never be separated, imaginary time is linked to an imaginary space and the mass in that space is known as dark matter). And this concept of dark energy invalidates its role as the cause of an expanding universe … which could be static.

8. The Ultimate Paradox – Creating Something (The Universe) That Has Always Existed (And Always Will)

In an article written for the magazine Nautilus, [16] it's stated that the journals of American physicist John Wheeler, which he always kept at hand, reveal a stunning portrait of an obsessed thinker. The article says, "He knew that quantum measurement allowed observers in the present to create the past ..." and his journal contains thoughts agreeing with "The universe has created an observer and now, in an act of quantum measurement, the observer looks back and creates the universe." Could the origin of life be related to the movie "Interstellar"? In the movie, it's stated that humans will one day be able to build things they can't make now. If we take this idea to an extreme, and take "one day" to mean an indefinite point in the far future, will we do what is obviously regarded as impossible and create life – and conceivably, the universe itself? Someday there will be a human civilization that can build their mathematics into the creation, structure, and functioning of life and the cosmos. Emotion may well declare this an absurdity and we might retreat to things like quantum fluctuation or spontaneous creation from nothing. Logically – using Einstein's nonlinear, curved time added to limitless advance of human potential through the eons – the absurdity is plausible.

Creating something which has always existed seems to be a paradox – whose definition is "a seemingly absurd or contradictory statement or proposition which when investigated may prove to be well founded or true". On the subject of paradox, 20th-century physicist Niels Bohr said, "How wonderful that we have met with a paradox. Now we have some hope of making progress". He also said, "Your theory is crazy, but it's not crazy enough to be true". Hopefully, the crazy ideas in this article are "crazy enough to be true". So, how might it be done?

A model of the cosmos might be built that uses the infinite number pi and imaginary time, and resides in Virtual Reality (artificial, computer-generated simulation). The entanglement (quantum-mechanics style) in the simulated universe is unable to remain separate from the entanglement existing in our perceived reality because computers using so-called "imaginary time" (which is defined by numbers with the property $i^2 = -1$) remove all boundaries between the two universes. This enables them to become one Augmented Reality (known now as technology that layers computer-generated enhancements onto an existing reality but seen here as the related layering of virtual reality onto other points in time and space). The poorly named imaginary time of physics and mathematics unites with pi (both are necessary to generate a non-Big-Bang cosmos i.e. an infinite universe which, because space and time can never be separated, is eternal). This manipulation of time, space, and the universe with virtual and augmented reality might possibly be produced by the two-valued binary-digit system used in electronics traversing a wormhole, or shortcut between folds in space and time, designed by humans of the far future. The augmented reality which is layered on "other" points in space-time actually isn't transmitted to other points - because of the quantum entanglement of every particle (massive or massless) of everything in spacetime, only one ever exists. Thus, transmissions to any (apparently other) places or times wouldn't be restricted to the speed of light but are instantaneous.

9. The Infinite Properties of the Universe's Planets and Artificial Intelligence

The parallelogram of Figure 1 can be converted by the morphing ability of computer programming so it traces the elliptical shape in Figure 3 – and of Earth's elliptical orbit, which means the vector / tensor / scalar relationship applies to this planet. The vector can be the magnitude and direction of the orbiting Earth itself.

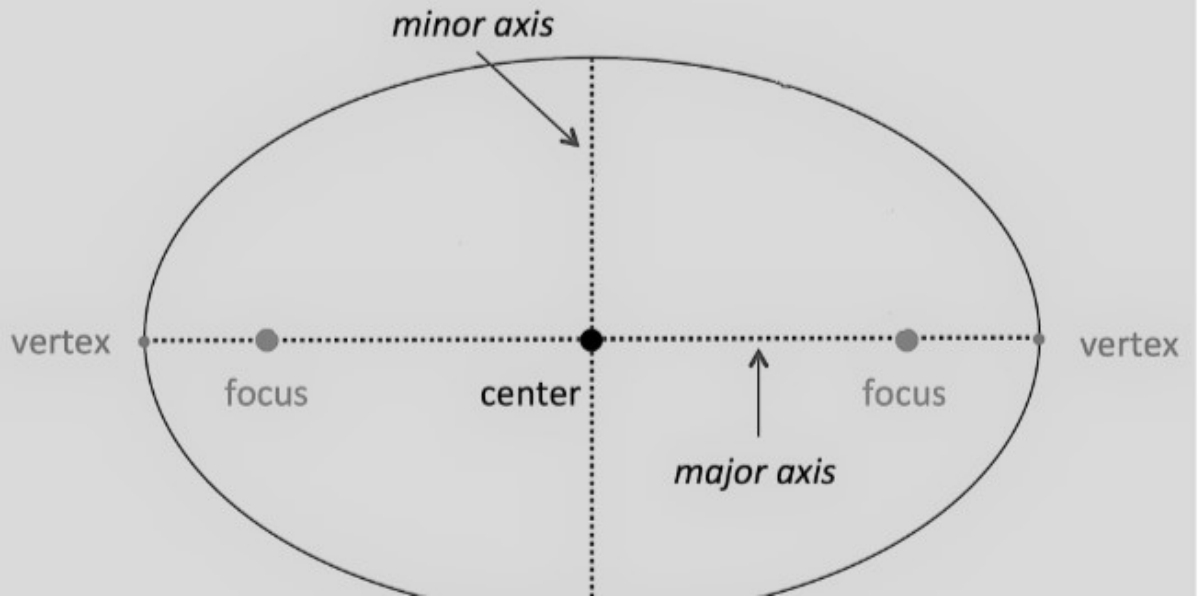

Figure 3. Elliptical VTS Geometry: Earth's Orbit Around The Sun Is Elliptical.

It and a second vector (Earth months later in its orbit – more about this at the end of this paragraph) are converted by tensor analysis into the coordinates of a single scalar point. In the paragraph below Figure 1, adding the geometrical objects of vector and tensor resulted in the object termed scalar. Successful conversion of the vectors in Fig. 1's parallelogram to the vectors in Figure 3's ellipse, followed by tensor analysis, means our planet is also a scalar object. It has magnitude but no direction, and the innumerable spins of particles composing the planet are reduced to that of a boson possessing spin 0. Such particles have no restriction on the number of them that occupy the same quantum state (their description and predicted behaviour). This lack of restriction is compatible with Earth never having any direction. This state is only possible if it has magnitude occupying a literally infinite and eternal amount of space-time, thus having no need of direction and being capable of possessing the same quantum state as any other body. The Earth appears obviously finite and insignificant because of the limitations of our technology (limited to this century, with no tangible input from future ones) together with the limits of our illusion-susceptible bodily senses. Since they'd need to adapt to Earth's infinity, all other bodies in space-time would similarly reduce the innumerable spins of particles composing them to that of a boson possessing spin 0 (they'd only possess magnitude, would possess the same quantum state - and would be scalar, infinite bodies). Invoking infinity in its procedures, a quantum computer simultaneously uses the BITS (Binary digiTS) of 1 and 0.

Occupying all time, vector-1 Earth must be united with vector-2 Earth (the one existing months later in its orbit). Traditionally, the scalar is no more than a point on a line, and consequently limited to that point's boundaries. In this article, the scalar is a restricted point which is described by familiar mathematics. But simultaneously it's a boundaryless, unlimited field described by quantum-mechanical duality (simultaneously limited and unlimited), as well as by what are called imaginary numbers – the Wick rotation mentioned in other parts of this article is built into reality. [Professor Stephen Hawking says that boundaries and singularities exist in what is called "real" time but don't exist in what is termed "imaginary" time [17]]. The scalar is without boundaries because it's associated with spin 0, thence with the Higgs boson (the only confirmed particle with zero spin), and thence with the Higgs field. So, the scalar point identified with other bodies in space-time (including living bodies and minds) is actually part of the scalar field or Higgs field, with consciousness being boundaryless instead of being limited to one tiny part of space-time. Einstein's Theory of General Relativity [18] says gravity is the curvature of space-time, and therefore IS space-time. The universal Higgs field can be identified with the universal gravitational field (together with the latter's constant interaction with the electromagnetic field).

In "What Is Life? The Physical Aspect of the Living Cell" (his 1944 science book written for the lay reader), physicist Erwin Schrödinger reconciled this article's idea of co-existing scalar point and scalar field by a) believing that consciousness is highly dependent on the body (these are then a point manifestation), and b) being sympathetic to the Hindu concept of Brahman, by which each individual's consciousness is only a manifestation of a unitary consciousness pervading the universe (consciousness is then a field manifestation). Since other bodies need accommodate Earth's infinity, vector-tensor-scalar geometry would similarly reduce the spin of all other bodies in

space-time to that of a boson possessing spin 0 (they'd only possess magnitude, would possess the same quantum state - and would be scalar, infinite bodies). In a holographic universe (p.8), a hologram's property of looking different depending on the direction it's viewed from might account for the spin 0 being experimentally detected as a quantum spin of ½, 1, 2, etc.

This scalar potential includes human and animal bodies and brains which, in comparison to a DVD, would appear to be restricted to the sights and sounds of a small and brief part of the disc but would actually have access to the entire disc. Just as the whole DVD exists when only one instant of it is being played or "read" by the laser, everything in space - plus the entire past and all the future - exists while each instant is being observed. The excitation of the universal field known as consciousness would be ubiquitous, pervasively covering vectors and diagonals to be a Cosmic Consciousness [19]. Consciousness and a universe-pervading Artificial Intelligence is the cosmic equivalent of the DVD (since the ultimate composition of our brains appears to be binary digits, our minds must be the same as the Artificial Intelligence of robots and computers).

10. Higher Dimensions, Antigravitons, and the Matrix

If conservation of mass and energy is not exact, those two components of the cosmos would not be confined to the space-time dimensions we're familiar with. They can "leak" into higher dimensions which could interact with ours and the components would be known as Dark Matter and Dark Energy. If everything is quantum entangled * and there are no isolated systems in the universe, interaction is inevitable.

* About macroscopic entanglement (we can't have time machines – see final section - if we don't have macro entanglement) - There was a paper published 19 years ago which said, ""Physicists now believe that entanglement between particles exists everywhere, all the time, and have recently found shocking evidence that it affects the wider, 'macroscopic' world that we inhabit" [20]. Such macro-entanglement was confirmed in 2020 when researchers reported the quantum entanglement between the motion of a millimetre-sized mechanical oscillator and a disparate distant spin system of a cloud of atoms [21]. Later work complemented this work by quantum-entangling two mechanical oscillators [22].

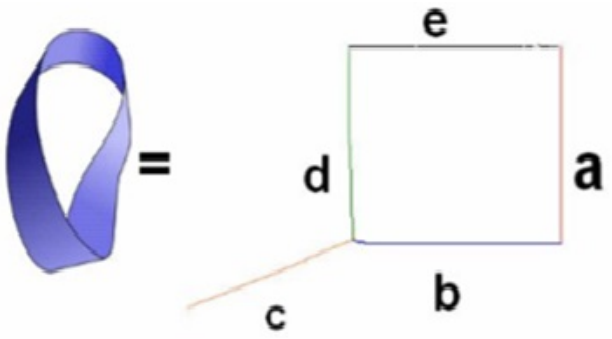

Figure 4. MOBIUS MATRIX (Mobius equals a,b,c,d,e array)

(Mobius Matrix and Our Familiar Dimensions) Width a is perpendicular to the length (b or e) which is perpendicular to height c. How can a line be drawn perpendicular to c without retracing b's path? By positioning it at d, which is then parallel to (or, it could be said, at 180 degrees to) a. d is already at 90 degrees to length b and height c. d has to be at right angles to length, width and height simultaneously if it's going to include the Complex Plane's vertical "imaginary" axis in space-time (the "imaginary" realm is at a right angle to the 4 known dimensions of space-time, which all reside on the horizontal real plane). In other words, d has to also be perpendicular to (not parallel to) a. This is accomplished by a twist, like on the right side of the Mobius strip, existing in the particles of matter composing side a. In other words, a fundamental composition of matter is mathematics' topological Mobius, which can be depicted in space by binary digits creating a computer image. The twist needs to be exaggerated, with the upper right of the Mobius descending parallel to side "a" then turning perpendicular to it at approximately the level of the = sign, then resuming being parallel. Thus, 90 + 90 (the degrees between b & c added to the degrees between c & d) can equal 180, making a & d parallel. But 90 + 90 can also equal 90, making a & d perpendicular. (Saying 90 + 90=90 sounds ridiculous, but it has similarities to the Matrix [of mathematics, not the action-science

fiction movie] in which X multiplied by Y does not always equal Y times X. The first 90 plus the second 90 does not always equal the second 90 plus the first 90 because 90 + 90 can equal either 180 or 90).

(Mobius Matrix and Dark Matter/Dark Energy in Interdimensional "Imaginary Space-Time") At the start of the 20th century, physicist Max Planck assumed that electromagnetic radiation can only be emitted or absorbed in discrete packets, called quanta. Albert Einstein postulated that Planck's quanta were real physical particles (what we now call photons), not just a mathematical fiction (for years, Planck thought of his discovery as nothing more than a math device … a kind of trickery). From there, Einstein developed his explanation of the photoelectric effect (when quanta or photons of light shine on certain metals, electrons are released and can form an electric current). So, it appears entirely possible that another supposed mathematical trickery (imaginary time and the y-axis) will find practical application in the future.

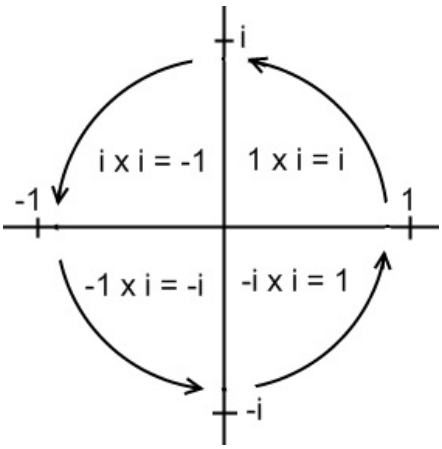

Figure 5. WICK ROTATION: the counterclockwise rotation does not have to encompass 360 degrees. It can be divided into single degrees – and even arcseconds which are 3,600 times smaller than a degree. Each arcsecond (or tiny part of it) could correspond to a separate dimension and the total dimensions might make up a temporal multiverse reminiscent of string theory, the cosmological framework that says particles are composed of one-dimensional objects called strings (a group of binary digits is called a single-dimensional bit string).

The counterclockwise rotation of gravitational and electromagnetic waves between the x- and y-axes in Figure 5's Wick Rotation can be viewed as responsible for the gravitational/electromagnetic energies forming all mass in space-time or, as dark energy, forming all mass in imaginary time. Since time and space can never be separated, imaginary time is linked to an imaginary space and can be illustrated by the imaginary number i and its Wick rotation (this imaginary mass is known as dark matter). And this concept of dark energy invalidates its role as the cause of an expanding universe … which could be static.

Large-scale dimensions existing beyond the known ones of space-time are different times. The one on the vertical y-axis is "imaginary time" i.e. time described with the imaginary numbers popularized by Stephen Hawking. Prof. Hawking tells us that imaginary time makes the "distinction between time and space disappear completely". As a result, the extra large-scale dimensions are also different locations. In a quantum-gravity universe where everything is connected to everything else, the concept that "90+90 can equal either 180 or 90" would apply to all dimensions (not merely the ones we're familiar with). Since rotation of the x- and y-axes in Wick Rotation means all dimensions interact, the result that 90+90 can equal either 180 or 90 in "real" space-time must also apply to imaginary space-time. The interdimensional interpretation of "90 + 90 can equal either 180 or 90" may well be that this article's proposed antigraviton is described by 90 + 90 = 90, the graviton by 90 + 90 = 180. Dark energy is here postulated to be extra-dimensional, therefore the extra-dimensional antigraviton (extradimensional because it's described by 90 + 90 = 90) can be the quantum unit of dark energy. Antigravitons - and their extension, dark energy - can thus be mistaken for "repelling gravitation" which causes the universe to expand from the Big Bang. In reality, dark energy and antigravitons would be involved in the production of dark matter in other large-scale dimensions - just as energy and gravitons are involved in the production of matter (recall the mass-energy equivalence shown by Albert Einstein's $E = mc^2$). Antigravitons, like gravitons, are an arrangement of figure-8 Klein bottles with each bottle being composed of two Mobius strips. Trillions of Mobius strips can be added to form photons - or those trillions can be separated into pairs, with each pair forming a figure-8 Klein bottle and trillions of Klein bottles forming a graviton.

11. Incompleteness Theorems, New Irrationals, Calculus, and Celluloid Motion

A light beam consists of an electric and magnetic field separated by 90 degrees. An individual photon in the light is made up of trillions of Mobius strips. Comparing the Mobius to Fig. 4's a,b,c,d,e array – the right side of the Mobius has a section that's virtual parallel to sides "a" and "d", then perpendicular to them at the level of the equals sign, then parallel once more. That is, 180 + 90 + 180 = 720 (since arriving at the starting point requires travelling around a Mobius' circumference of 360 degrees TWICE). We could write this as (90 + 90) + 90 + (90 + 90) ≠ 450. All of these counterintuitive numbers (90 + 90 = 90, 180 + 90 + 180 = 720) are irrational equations. In mathematics, an irrational number is a real number that cannot be expressed as the ratio of two integers. Our counterintuitive numbers can't be divided by two static whole numbers because they can be interpreted as being in more than one state at once (like the 20th/21st century understanding of quantum particles), or as constantly changing depending on the part of the Universe being studied. The only way to successfully deal with them would be to use Calculus, which tackles rate of change and changing quantities. These new irrationals are reminiscent of the Incompleteness Theorems published by Kurt Godel in 1931 (these are concerned with the limits of proof in formal axioms). The second incompleteness theorem does not rule out the possibility of proving the consistency of some theory (I wonder if proving a theory, or arriving at a new model of quantum mechanics, relies on Calculus and counterintuitive New Irrationals).

The paragraph above speaks of "the right side of the Mobius". That implies a static topological figure. But everything is dynamic and in motion. Even inanimate matter consists of perpetually vibrating atoms. 180 + 90 + 180 could only equal 720 if individual parts of the Mobius could travel twice around the strip. Should these coordinates remain static, 180 + 90 + 180 would be confined to the Mobius' right side and might indeed add up to 450. The dynamic nature of the Mobius strip can be understood by looking at motion differently. A cartoon on television can be made by rapidly displaying a series of cells (still pictures). The cartoon appears to be in motion but the only movement is from the display of one still picture to the next * (a holographic universe could make these displays). Suppose these more basic stills are the two-dimensional (2D) Mobius strip and the figure-8 Klein bottle immersed in three dimensions (its constituent Mobius strips could be coded for by energy impulses providing information in the form of BITS aka binary digits). ** The figure-8 Klein bottles could be projections (holographic-universe style) from the information in 2D Mobius strips and Wick rotation could account for that mysterious thing we call time. When slightly differing versions of the Mobius strip and figure-8 Klein bottle are rapidly displayed, their still pictures are converted into motion, with coordinates travelling.

* If universal motion consists of the rapid display of sets of binary digits which make up still pictures, how can the movement from one set of Bits to the next set be explained? If we cling to traditional linear time, that movement could apparently only be explained by another set of Bits which control the ones making up universal motion. But I don't like this – we'd have to continually invent new sets of Bits to control other Bits. This can't be done infinitely … it's like saying God created everything and then explaining God's existence with the statement, "He has existed forever", and not explaining how God exists forever.

A more satisfactory explanation is to be found with nonlinear time. By using General Relativity's curvature of space-time, the interconnectedness of past and present and future would revise our notions of cause and effect. The first set of Bits – the ones whose rapid display of still pictures makes up universal motion – would be the ONLY set of Bits. They'd be the cause of the universe's existence in the future. If that future is nonlinearly connected to the past, those Bits would also be the effect of the future universe. Movement from one display of Mobius strips/Klein bottles to the next topological display would be controlled by the future.

Extrapolating this to an anthropic application – future humanity could someday use this connection to the past (use time travel – see final section) and then use presently undreamt-of biotechnology to create man and woman in their image. In this way**;** the future humans would be the cause of the original humans but they'd obviously be the effect of those first humans too, having descended from them many thousands of years later and having endured changes to anatomy and physiology as a result of mutations and adaptations. "Adam" and "Eve" would likewise be cause and effect of unborn generations.

** The particular words "energy impulses providing information in the form of BITS aka binary digits" were inspired by "Energy-Impulse-Information Tensor (EIIT)" in the References' link to an article by ResearchGate colleague Alessandro Rizzo [23].

This new model of quantum mechanics relies on Calculus and counterintuitive New Irrationals. Axiom – the number 90 represents "known quantity". Using known maths, 90 + 90 = 180. The first 90 can correspond to "known position". The second 90 corresponds to "known velocity or momentum". 180 would equal position + velocity being uncertain. Using the New Irrationals, 90 + 90 = 90 means measured position and measured velocity are both exactly knowable at once.

Extending the axiom – (90 + 90) represents "known quantity" and 90 (by itself) corresponds to the perpendicularity adopted at the level of the equals sign in Figure 4 (Mobius Matrix) i.e. when the Mobius is a fundamental unit of reality.

(90 + 90) + 90 + (90 + 90) = 450 refers to "known position" + the central 90's fundamental Mobius + "known velocity" equaling **present maths' 450**. (90 + 90) + 90 + (90 + 90) = 720 corresponds to "known position" + the central 90's fundamental Mobius + "known velocity" equaling the **New Irrationals' 720** since the first (90 + 90) plus the second (90 + 90) = 360 which is doubled to 720 because a) the Mobius strip must be circled twice to reach the start, and b) matter particles, with their positions and velocities, must be completely turned around twice to look the same – see Stephen Hawking's statements on p.7.

Progressing outwards from the core of a quantum particle, the Information Density becomes less and the calculations resulting from the 1's and 0's produce a lower number. At the core, the number 720 is created because of its mass-diameter's composition from Mobius strips which must be circled twice. Moving towards its surface, the density is reduced and BITS create the lower number of 450. This results in measurement of events becoming less precise i.e. probabilistic with knowledge of both a particle's position and momentum becoming uncertain. Referring to 90 + 90 = 90 and to 90 + 90 = 180, the larger 180 describes the graviton. A hologram's appearance differs depending on which direction it's viewed from. Therefore, 90 + 90 = 180 isn't always the case in a holographic universe and 90 + 90 can equal 90 (the antigraviton).

12. Heisenberg Uncertainty Principle

What would happen if we used inappropriate mathematics while trying to comprehend quantum mechanics? We'd inevitably end up in the situation described by physicist and Nobel laureate Richard Feynman - *"I think I can safely say that nobody really understands quantum mechanics"*. Humans (and animals, who are capable of rudimentary arithmetic) decided, way back in history or prehistory, that 1 + 1 = 2. Ever since, we've been applying advanced versions of that maths – let's call it CLASSICAL maths – not only to the familiar macroscopic world but, for the last hundred years, to quantum physics and the hoped-for theory of quantum gravity which would unite General Relativity – Einstein's theory of gravity - with the quantum mechanics describing the subatomic realm. However, the above suggests that everything in both space and time is connected. This means there is only one particle, object, or event in a functional sense. We might say 1 + 1 = 1 except nothing can be added to 1 if nothing exists except the first 1. The second 1 would only exist in the practical, everyday experience of humans and animals. 1 + 1 = 1 is transferred from the macro to the quantum by 90 + 90 = 90. This can be called QUANTUM maths which is not presently accepted. Science insists on trying to understand quantum mechanics with classical maths such as 90 + 90 = 180. (Extending this, 180 + 90 + 180 equals 450 classically but equals 720 in quantum mode.) exist in the practical, everyday experience of humans and animals.

As the inventor of Matrix Mechanics [24] in 1925, Werner Heisenberg demonstrated the necessity of new maths in the formulation of quantum mechanics. There is every reason to think new maths can still be applied to give us new understanding of quantum mechanics. This new comprehension is the result of the binary digits of 1 and 0 being the Hidden Variables * that enable the Mobius transformation from 90 + 90 = 180 to 90 + 90 = 90. Heisenberg was deeply troubled by the discovery that when he multiplied two arrays in his new theory, the answer was dependent on the order in which they were multiplied. Max Born, who won a share of the 1954 Nobel Prize for his work in quantum mechanics and is the grandfather of singer / actress Olivia Newton-John, eventually realized that Heisenberg had stumbled upon matrix multiplication in which X times Y does not always equal Y times X. When informed of this, the originator of matrix mechanics replied, "I do not even know what a matrix is" [25].

* Hidden Variables are presently hypothetical factors based on the belief that the theory of quantum mechanics is incomplete. Their identification would lead to exact predictions, not just probabilities, for the outcomes of

measurements. Albert Einstein is the most famous proponent of hidden variables (the variables are compatible with entanglement, what Einstein called “spooky action at a distance”). Their existence would vindicate his belief that quantum mechanics is lacking something.

13. Riemann Hypothesis and Intergalactic / Time Travel

Albert Einstein used Riemannian geometry when formulating his General Relativity. It should therefore be conceivable that another work by Georg Riemann (the Riemann Hypothesis published in 1859) might, with help from Wick Rotation and the inverse-square law, go beyond Special Relativity's statements about the light cone and the speed of light being a cosmic speed limit. Then time travel would be possible - I hope to show that travel can be into either the past or the future.

The Riemann hypothesis, proposed in 1859 by the German mathematician Georg Friedrich Bernhard Riemann, is fascinating. It seems to fit these ideas on various subjects in physics very well. The Riemann hypothesis doesn’t just apply to the distribution of prime numbers but can also apply to the fundamental structure of the mathematical universe’s space-time. In mapping the distribution of prime numbers, the Riemann hypothesis is concerned with the locations of “nontrivial zeros” on the “critical line”, and says these zeros must lie on the vertical line of the complex number plane i.e. on the y-axis in Figure 2 or 5. Besides having a real part, zeros in the critical line (the y-axis) have an imaginary part. This is reflected in the real +1 and -1 of the x-axis in Figure 2/5, as well as by the imaginary +i and -i of the y-axis. In the upper half-plane of Figure 2/5, a quarter rotation plus a quarter rotation equals a half – both quadrants begin with positive values and ¼ + ¼ = ½. (The Riemann hypothesis states that the real part of every nontrivial zero must be 1/2.) While in the lower half-plane, both quadrants begin with negative numbers and a quarter rotation plus a negative quarter rotation equals zero: 1/4 + (-1/4) = 0. In the Riemann zeta function, there may be infinitely many zeros on the critical line. This suggests the y-axis is literally infinite. To truly be infinite, the gravitational and electromagnetic waves it represents cannot be restricted to the up-down direction but must include all directions. That means it would include the horizontal direction and interact with the x-axis – with the waves rotating to produce ordinary mass (and wave-particle duality) in the x-axis’ space-time,* and dark matter in the y-axis’ imaginary space-time.

* The inverse-square law states that the force between two particles becomes infinite if the distance by which they’re separated goes to zero. Remembering that gravitation partly depends on the distance between the centres of objects, the separation only goes to zero when those centres occupy identical space-time coordinates ^ (not merely when the objects’ sides are touching). That is – infinity equals the total elimination of distance, or zero. The infinite, eternal cosmos could possess this absence of distance in space and time (deletion of the 3rd dimension) via the electronic mechanism of binary digits which would make the universe as malleable and flexible as any image on a computer screen. If infinity is the total deletion of distance in space-time, there is nothing to rule out instant intergalactic travel or time travel to the past and future. Infinity does not equal nothing – nor does zero. Zero would be something if it’s paired with one to form the binary digits used in computers and electronics. Could the universe, and life, have begun with all the brains of past and future history acquiring increasingly sophisticated knowledge of time and space? Then an extra-dimensional hyperspace might be used to access the infinite past and purposely switch the digits composing the universe from 1 to 0 or vice versa (this switching would be comparable to the quantum fluctuations associated with Big Bang theory).

Quantum mechanics forbids two particles of matter to occupy identical coordinates. But in a universe that is purely mathematical, matter has the same freedom as photons and gravitons (unlimited numbers can be in the same place).

In forwards time travel (the familiar kind), the waves composing mass in the x-axis and y-axis rotate in the counter-clockwise direction. Compare Wick rotation to a DVD that has no end. The future destination is reached by tensor calculus changing the present coordinates to ones in the future. To use a simple example confined to two dimensions**:** -1,+ i becomes +1, $-i$. This is interdimensional travel since it incorporates both the time and space elements of the time-space unity i.e. Wick rotation as a subroutine built into the Mobius strips and doublets composing space and mass. Starting the rotation of the gravitational and electromagnetic waves on the x- and y-axes isn’t necessary since the process is natural and already built into the universe. It’s like the natural spins and orbits of electrons or planets – and is responsible for production of mass from energy on the x-axis as well as production of dark matter from dark energy on the y-axis. The counter-clockwise rotation can be accelerated to produce relativistic

time dilation, with the resultant interference between photons and gravitons slowing time near the speed of light and within intense gravitational fields). This acceleration means we could arrive in a future century instead of merely going a tiny fraction of a second into the future during the International Space Station's relatively fast orbit of the Earth. Former NASA astronaut Scott Kelly spent 520 days in the ISS, zooming around Earth at 17,500 mph (28,160 km/h). Because time slowed down for Scott, his twin brother Mark – also a former astronaut, who stayed on Earth - is now an extra five milliseconds older than Scott [26]. Strange as it sounds, the speed can be adjusted purely by visualization to a limited extent. This isn't nearly as difficult as it sounds.

"Researchers from the Cleveland Clinic Foundation in Ohio investigated the strength benefits of imagining exercising a muscle. They reported that just thinking about exercise helped maintain muscle strength in a group of subjects. It does sound unbelievable, but take into consideration that the measurements of the participant's brain activity during each visualization session suggest that these strength gains were actually due to improvements in the brain's ability to signal muscle activity. With this understanding, it's easier to understand how visualization can improve not only muscle contractions but many athletic skills. Even with such interesting research study findings, it's clear that when it comes to building strength and power for a specific sport, there is really no substitute for actual strength-training" [27].

Instead of the complicated "building strength and power for a specific sport", let's substitute the everyday act of walking. When walking, you don't picture the activities – contractions, relaxation, timing, etc. – of individual muscles and their nerve impulses, blood supply, and so on. The walk is stripped of complexity and made manageable because you merely think of putting one foot in front of the other and getting where you want to go. You don't meditate on the programming involved with the Wick rotation, Mobius strips, figure-8 Klein bottles, and vector-tensor-scalar geometry * inherent in every subatomic particle. The code is certainly there but it takes care of itself since everything is based on the binary digits which give Artificial Intelligence to computer programs like AlphaGo (the first computer program to defeat a world champion of the complex board game Go, in 2016), Deep Blue (defeated the world champion chess player in 1997), and chatbots (programs designed to simulate conversation) such as ChatGPT, Siri, Alexa and Google Assistant. Your muscles, nerves, legs (even shoes and the surface you're walking on) have a level of binary-digit activity – and thus AI – which you needn't bother yourself with. All you need to do is stroll.

* For more on this subject [with equations and references], see the article co-written with my ResearchGate colleague Alessandro Rizzo at reference [28].

In the same way, you don't need to visualize the counter-clockwise Wick rotation and the tensor calculations of an *Imaginary Computer* * transforming coordinates. You just imagine where you want to go and what you wish to achieve. Of course, there is a little more to it – results will depend on your unconscious comprehension of the relevant details. Visualizing will have restricted effects concerning time travel (perhaps limited to subconsciously acquiring knowledge or unconsciously increasing health by reverting to a slightly earlier age. Backwards travel in time is identical to forwards trips except for the coordinates being different and belonging to points in the past.) But the greatest benefits will, by far, come from a technological time machine using an imaginary computer that performs tensor calculus.

* "Imaginary" computers are this article's proposed real invention that use imaginary numbers, imaginary time and spacetime warping to be capable of performing calculations for potentially trillions of years on the y-axis, then warping them back to the x-axis a nanosecond after input of the problem - no time at all may elapse in "real" time.

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