**SUPER SCIENCE:**

**Insightful Intuitions of the Future's Super-science, as Different from Today's Science as That is From Superstition and Myth**

By Rodney Bartlett

Look! Up in the bookshelf! Is it science? Is it science-fiction? No, it's Super Science**:** strange visitor from the future who can be everywhere in the universe and everywhen in time, can change the world in a single bound and who - disguised as a mild mannered author - fights for truth, justice and the super-scientific way.  Though I put a lot of hard work into this book, I can't take all the credit. I believe that the whole universe - everything on Earth and in space plus everything in the past, present, and future - is entangled and unified. Everybody is part of this unity, so anybody could have written the ideas in this book. It turned out to be me simply because I've got intense curiosity about the book's contents, enough persistence and imagination to combine science with topics like religion and philosophy, and enough spare time to assemble all the pre-existing pieces in space and time (my contribution to the book is like putting together the pieces of a big jigsaw puzzle).

This book, with its vast collection of scientific fact and study results, presents some fascinating theories and is an expansive journey through my research. The topic will appeal to the science-minded reader who is open to speculating on how conditions may evolve in the future, perhaps questioning the very foundations of our place in the universe. This book is not written as a single story but is a collection of 9 articles written in the first half of 2022. Each chapter of this book is presented as a research paper. There's the abstract, the introduction, the keywords, the body of the work divided into sections, and a reference section. Though this might turn some readers off, I'm a member of ResearchGate, a community of researchers. So it isn't surprising that I've presented this book this way. Each article is meant to be self-contained and well explained in plain English. As a result, some explanations appear in several of the articles.

Please be patient when you encounter jargon and mathematics - I've tried to keep these to a minimum but they're bound to put in an appearance in a book that's largely about science (and I have compiled an enormous amount of intricate research for this project, hopefully impressing with the organization). Quotes from a range of scientists and icons in the industry should add further fascination to the descriptions, inspiring the reader into more of an openness to speculating on the distant future. There's a lot to absorb here but understanding the future**. . .**  It Don't Come Easy (just ask Ringo Starr who once dreamed he was an alien living on another planet in the future).

(Each article has its own abstract / intro and is meant to be self-contained)

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**1) Special Relativity's Consequences For General Relativity, Quantum Mechanics And Quantum Gravity (Can Science And The Paranormal Coexist?)**

by Rodney Bartlett

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**INTRODUCTION / ABSTRACT**

Principle points addressed by this article –

1. According to Special Relativity, experiments are overrated by modern science since the truths revealed by experimentation are necessarily restricted to one frame of reference.
2. According to the summary of vector-tensor-scalar (VTS) geometry, interaction of gravitation and electromagnetism produces a momentum in gravitons and photons (and a pressure which is known as mass).
3. 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 in order to explain the Higgs, the electroweak force, and the nuclear forces.
4. Formation of planets and black holes is directly related to VTS geometry.
5. Dark matter and dark energy are related to quaternion functions in Wick rotation, producing a universe that neither expands nor contracts.

**KEYWORDS**

[**Special and General Relativity, Quantum Mechanics, Quantum Gravity, vector-tensor-scalar geometry, gravitation, electromagnetism, graviton, photon, the Higgs, the electroweak force, and the nuclear forces., planet formation, black-hole formation, dark matter, dark energy, quaternions, Wick rotation, static universe**](https://zenodo.org/search?q=keywords%3A%22Special+and+General+Relativity%2C+Quantum+Mechanics%2C+Quantum+Gravity%2C+vector-tensor-scalar+geometry%2C+gravitation%2C+electromagnetism%2C+graviton%2C+photon%2C+the+Higgs%2C+the+electroweak+force%2C+and+the+nuclear+forces.%2C+planet+formation%2C+black-hole+formation%2C+dark+matter%2C+dark+energy%2C+quaternions%2C+Wick+rotation%2C+static+universe%22)

**ARTICLE**

According to Special Relativity, experiments are overrated by modern science since the truths revealed by experimentation are necessarily restricted to one frame of reference. Regarding the question of length contraction in Special Relativity - Einstein wrote in 1911 that "It doesn't 'really' exist, in so far as it doesn't exist for a co-moving observer; though it 'really' exists, i.e. in such a way that it could be demonstrated in principle by physical means by a non-comoving observer." (1) Demonstration "in principle by physical means by a non-comoving observer" is the same meaning as "demonstration by experiments performed by scientists not moving at the speed of light".

Now relate the previous paragraph to this quote - “While an observer stationary with respect to an electric charge will see it as a source of electric field only, a second observer moving relative to the first will see the same charge as a source of both electric and magnetic fields in a way dictated by special relativity.” (2)

The observer stationary with respect to an electric charge is co-moving with the charge and does not see electric-magnetic duality but only an electric field. Non-comoving scientific experiments detect not only length contraction but also electric-magnetic duality (the presence of both electric and magnetic fields, or the propagation of electromagnetic waves by an electric field producing a magnetic field which produces an electric field). This cycle keeps repeating. The equations of 19th-century Scottish physicist James Clerk Maxwell predict the existence of waves of [oscillating electric and magnetic fields](https://en.wikipedia.org/wiki/Electromagnetic_radiation) that travel through empty space, and suggest this type of propagation. But according to this article, saying light travels is merely convenience, like saying the sun rises and sets when we know Earth is rotating. If we shift our understanding of the universe from one based on experiment to one in which observers and objective reality are united/entangled (one in which we’re in harmony with the universe and therefore co-moving with it), electric-magnetic duality would no longer be perceived. It would then be better to say,

“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 or gravitation (anything from vibrating atoms to colliding black holes) that travel. As disturbances travel/reflect/refract/are absorbed etc, they excite the pre-existing photons and gravitons that fill space-time and matter and mass to fluctuating amplitudes and frequencies, creating gravitational waves and the different electromagnetic waves. If there is little movement of photons and gravitons, the universe could not be expanding (or contracting) but its space and time is static. The Big Bang has impressive points … leading to the idea that it’s a necessary stepping-stone. For example, the Big Bang’s supposed origin from quantum fluctuations is reminiscent of bits switching between 1 and 0.”

Non-comoving scientists also provide the information that mass is different from space-time. If comprehension of the universe undergoes a paradigm shift that enables us to co-move with it and be in tune with its unification, mass of both energy’s bosons (including the Higgs plus those of the strong and weak nuclear forces) and matter’s fermions will be seen as a product of spacetime - of interaction between its electromagnetism and gravitation, as outlined by the idea of **Vector-Tensor-Scalar Geometry** (see boxed section below). Then, in addition to electric-magnetic duality not existing, the unification of all things in space and time means wave-particle duality would not exist in all frames of reference. It would only exist for a non-comoving observer: it could be demonstrated “… by experiments performed by scientists not moving at the speed of light".

**Quantum Gravity Demands That Science And The Paranormal Coexist**

If wave-particle duality has no existence beyond our experiments and mathematics, everything in spacetime (including science and including the paranormal) would be united into one thing (a theory of **Quantum Gravity** - the fusion of **Quantum** mechanics with general relativity, Einstein’s theory of **Gravity**). We - and paranormal things like ESP, UFOs, ghosts, astrology - truly are parts of the cosmos of space-time. So there certainly exists a Theory of Everything/Theory of Quantum Gravity - but you might never find it with experiments or bodily senses, which incorrectly tell us how separated all things are.

----------------------------------- boxed section ------------------------------------

**VECTOR-TENSOR-SCALAR (VTS) GEOMETRY, WITH DARK MATTER AND DARK ENERGY AND THE HIGGS**

“Dust grains assemble by chemical bonding. Once they are sand or gravel sized, how they continue to stick is a mystery. Metre-sized rocks should spiral into the star rapidly due to disk drag (the gas orbits a little slower than the rocks as a pressure gradient partially supports it). Once rocks somehow get past these barriers, they collide with each other in in a chaotic and random way assembling the planets.” (3)

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. (4)

![Chart, line chart

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**Fig. 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).**

Explanation of geometric display of mathematics’ vectors, scalars, and tensor calculus adapted from (5)

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. (6) 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).

\* Material from a star could fall onto a neutron star, heating it up and causing it to emit radiation. Then the energy and momentum of the photons and presently hypothetical gravitons would be the interaction of electromagnetism (the charged particles and strong magnetism) with the neutron star's powerful gravity. This results in wave-particle duality. The heating could produce gravitational and electromagnetic radiation which would produce the mass and quantum spin of subatomic particles - instead of only radiation being emitted, jets of matter would be emitted too (normally, the matter would be emitted as beams or jets from the neutron star’s magnetic poles).

**BOSONS OF THE NUCLEAR FORCES AND 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. Most reactions in this section may be explicable purely by the retarded\*\* portions of waves interacting. 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, (7) -

"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 round 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.

\*\* "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. (^ note by author of “Special Relativity’s Consequences …”) Engineers have simply dismissed the advanced wave as a mathematical curiosity since the retarded waves so accurately predicted the behavior of radio, microwaves, TV, radar, and X-rays. But for physicists, the advanced wave has been a nagging problem for the past century." (8)

^ Stars and galaxies etc. send us retarded light which, through spectroscopy, gives an approximate measurement of how long that light has been travelling (the distance to the astronomical body). The light includes an advanced component that reaches back into the past, producing a measurement that significantly exceeds the real distance. 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. Readshift would explain the astronomical results which were interpreted as accelerating expansion of the universe. Supernovas would be fainter, therefore apparently farther away, because “The light includes an advanced component that reaches back into the past, producing a measurement that significantly exceeds the real distance”.

The interacting gravity and electromagnetism 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.

Diagram

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**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.” [Figure and quote from (10)]

Quaternions were first described by Irish mathematician William Rowan Hamilton in 1843. Hamilton defined a quaternion as the quotient of two vectors. (9) 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". And the counterclockwise rotation of the x- and y-axes in Wick Rotation - which represents rotation of gravitational and electromagnetic waves - can be viewed as either rotation into diagonal form or as a quaternion function. It can also be responsible for the gravitational/electromagnetic energies forming all mass in space-time or, as dark energy acting via Wick rotation, forming all mass in imaginary time. Since time and space can never be separated, imaginary time is linked to the mass in 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.

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1. **Intergalactic Travel and Riemann Hypothesis - featuring Dark Matter, Dark Energy, Higgs Boson, Higgs Field, Electroweak Interaction, No Big Bang, Other Dimensions, Plus Other Physics and Mathematics**

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**Keywords**

Riemann hypothesis, intergalactic travel, dark matter/energy, Higgs boson/field, electroweak interaction, static universe, quaternions

**Abstract**

Using a scientific method that permits arrival at destinations in the universe to occur instantly is not only much more efficient but it avoids dangers like accumulated damage from years of exposure to micrometeorites and cosmic radiation. This article proposes such a method since it's based on an engineering experiment conducted at Yale University and reported in a science journal in 2009. It proposes a mathematical universe - again based on the work of well known scientists but extended into details developed by the author. A universe that is mathematical in its foundation is required since the gravitational-electromagnetic unification spoken of in connection with the Yale experiment is proposed to function topologically (using the Mobius strip and figure-8 Klein bottle). Admittedly, this proposal is based on technology which has not yet been developed - except for the Yale experiment - but since the first step in developing this technology may already have been taken 13 years ago, determined efforts should see its fulfillment in 50-100 years. And of course, the technology is not limited to travel within the solar system - say, to Jupiter’s moon Europa or to Mars where instant travel would save astronauts and cosmonauts from many months of isolation/threats to muscles and bones/radiation etc. It could also be used for interstellar and intergalactic exploration, and even for investigations into Earth's past and future if the potential for time travel is realized.

Most people aren’t accustomed to thinking that the universe is literally composed of mathematics (binary digits, Mobius strips, figure-8 Klein bottles, Wick rotation). The author developed these ideas after reading about several professors - John Wheeler, Max Tegmark, Erik Verlinde, Ed Fredkin, and Rafael Sorkin. The Introduction will provide understanding that 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. When applied to the universe, it explains the static universe, dark matter, dark energy, the Higgs boson/field, and aspects of particle physics like the electroweak interaction.

The long preface primarily focuses on three topics – a) Since the Klein bottle is 2-dimensional, the statement in the file [in the section BITS AND TOPOLOGY] about a couple of two-dimensional Mobius strips uniting to form a three-dimensional figure-8 Klein bottle needs further explanation, b) other large-scale dimensions, addressed via what is termed the Mobius Matrix, and c) antigravitons - and their extension, dark energy - can thus be mistaken for "repelling gravitation" which causes the universe to expand from a Big Bang.

**PREFACE**

***Immersing (not embedding) the figure-8 Klein bottle in the 3rd dimension + Imaginary time makes the 4th dimension both space and time + Time travel into the past and into the future***

Since the Klein is 2-dimensional, the statement in the file [in the section BITS AND TOPOLOGY] about a couple of two-dimensional Mobius strips uniting to form a three-dimensional figure-8 Klein bottle needs further explanation -

A manifold is a collection of points forming a certain kind of set, such as those of a topologically closed surface or an analogue of this in three or more dimensions.

(https://www.bing.com/search?q=meaning+of+manifold&FORM=QSRE7)

A Klein Bottle is a 2-dimensional manifold whose inside is its outside. It can only exist in 4-dimensions! A Klein Bottle cannot be embedded in 3 dimensions, but you can immerse it in 3-D. A photograph of a stapler is a 2-dimensional immersion of a 3-dimensional stapler. (An immersion may have self-intersections; Embeddings have no self-intersections.)

(https://www.kleinbottle.com/whats\_a\_klein\_bottle.htm#:~:text=A%20true%20Klein%20Bottle%20live)

Since the figure-8 Klein bottle referred to in this article can only exist in 4 dimensions, it can be termed a structure of 3 space dimensions which includes the 4th (time) dimension described by Wick rotation. The bottle's immersion in 3 dimensions means its self-intersection allows it to possess only one surface - its inside is its outside (other 3-D objects like wine bottles, for example, have both an inside and an outside). Self-intersection is possible because the 4th dimension of time unites the present with the past and future (explained in the downloaded file) and permits its surface to, in words borrowed from quantum mechanics, occupy more than one location at once i.e. to occupy the position which the bottle's hole would if it were a 3-dimensional object manufactured by the company "Acme Klein Bottle" (mentioned in the website above, "What's a Klein Bottle?") The implied motion from being in more than one place at once is a result of Klein bottles being ultimately composed of the BITS or binary digits of 1 and 0, and switching between those states. These 3+1 dimensions may also be called "an analogue of a topological surface in three or more dimensions".

Of course, the 4th dimension can be thought of as spatial instead of temporal. Mathematically, imaginary time (the text explains why it isn't merely mathematical trickery) is real time which has undergone a Wick rotation. Popularized by Stephen Hawking is the fact that measuring time with imaginary numbers, such as i^2 = -1, makes the distinction between space and time disappear completely (self-intersection by means of a 4th space dimension, rather than the previous paragraph's time, is familiar in topology - but we should remember that both apply in reality since we live in space-time). If a figure-8 Klein bottle is analogous to 3+1 dimensions, what is the reality behind the analogy / similarity / correspondence? All of the information in the universe is contained in two-dimensional packages trillions of times smaller than an atom (in this case, the 2D package is the Mobius Strip) - see Afshordi, N. & Corianò, C. & Delle Rose, L. & Gould, E. & Skenderis, K. From Planck Data to Planck Era: Observational Tests of Holographic Cosmology. Phys. Rev. Lett. 118, 041301.

https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.118.04130 (2017).

Therefore, the 3rd dimension (and the distances within it) wouldn't objectively exist but would be the way our perceptions and expectations interpret information contained in the Mobius strip. The implication is that the universe we live in needn't be described as 3 spatial dimensions plus one temporal dimension (3+1 space-time) but, in keeping with the theory of a holographic universe's 3 spatial dimensions being a projection from 2 dimensional information, as 2+1 space-time. Also, using future technology, it should be possible for the time it takes a spacecraft to reach its destination to be the same amount of time as reaching the launchpad from the craft’s position on the launchpad (travel may oneday be instant - the distance to the ship's destination and the time to arrive both equal zero.) If the spacecraft travels through the 4th space dimension, that is equivalent - thanks to imaginary time making the distinction between space and time disappear completely - to taking a trip through time and visiting any point in the past or in the future.

Above, it was stated that "self-intersection by means of a 4th space dimension, rather than the previous paragraph's time, is familiar in topology - but we should remember that both (the 4th space dimension and the 4th dimension of time) apply in reality since we live in space-time". It was also stated that "If the spacecraft travels through the 4th space dimension, that is equivalent - thanks to imaginary time making the distinction between space and time disappear completely - to taking a trip through time and visiting any point in the past or in the future." The conclusion from these statements is - A trip through the 3-dimensional space we're familiar with must also be capable, like 4th-dimensional space, of producing time travel. The figure-8 Klein bottle's self-interaction resulting from its immersion in the 3rd dimension gives us things like the union of space and time into space-time via the imaginary time built into the Klein bottles making the difference between space and time vanish. And it gives us time travel via existence at right angles to length, width and height simultaneously\* (see the several paragraphs below).

\* Compare all of the universe's space-time and mass to the contents of an infinite, eternal DVD with consciousness and brains being substituted for the DVD player's laser. Everything, including the entire present and future and past, would exist at once but we'd only be aware of the objects and events taking place in the immediate vicinity of our brain (this is our present). As long as we remain NOT at right angles to all 3 of our perceived dimensions, we're compelled to follow the track from past to present to future which the laser/brain traces, and are doomed to follow the "arrow of time" and only directly sense the present (the past would be gone ... the future would not exist yet). When gravity/spacetime (General Relativity teaches that gravity is the push caused by the curves in spacetime) is warped in such a way that we're perpendicular to all 3 dimensions simultaneously, we're liberated from time's arrow with the entire future and past being accessible to the senses and actions.

Chart

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**Figure 1 – MOBIUS MATRIX (Mobius equals a,b,c,d,e array)**

Mathematics has three types of numbers - real, imaginary and complex. Real numbers are exemplified by 0, the positive numbers used in counting, and negative numbers. On a two dimensional "Complex Plane", Real Numbers are on the horizontal plane and Imaginary Numbers such as i=√(-1) are on the vertical plane. Complex Numbers can be easily identified as a combination of Real Numbers and Imaginary Numbers. Retarded gravitational and electromagnetic waves that go forwards in the horizontal plane of space-time can be termed real. Advanced waves that go backwards in space-time may be considered complex. The imaginary numbers of the vertical direction could describe waves in an "imaginary spacetime" - spacetime above the horizontal plane might be called Superspace or Hyperspace while spacetime below that plane would be Subspace.

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).

90+90=180 corresponds to the familiar composition of space-time (the presently hypothetical graviton) and 90+90=90 corresponds to the antigraviton. That is, shock waves from space-time disturbances excite already-existing gravitons and antigravitons (and their photonic counterparts) to various frequencies. 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 (the antigraviton described by 90+90=90, the graviton by 90+90=180). 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.

**Main Text**

**Introduction**

Unifying gravitation and electromagnetism has this consequence: the electrical-engineering experiment (1) at America's Yale University, together with the ideas of Albert Einstein, tells us how we could travel to other stars and galaxies. An electrical engineering team at Yale demonstrated that, on nanoscales, light can attract and repel itself like electric charges or magnets.

This is the Optical Bonding Force. For 30 years until his death in 1955, Einstein worked on his Unified Field Theory with the aim of uniting electromagnetism (light is one form of this) and gravitation. Achievement of this means the quantum components (gravitons) of gravity/spacetime-warps between spaceships and stars could mimic the Optical Force and be attracted together, thereby eliminating distance (this, possibly acting in partnership with repulsion, could produce a wormhole, or shortcut between folds in space and time). If the gravitons are superposed and entangled, distances between both points in space and points in time are totally eliminated.

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. This text refers to imaginary numbers. “Imaginary” does not mean the numbers don’t really exist. Imaginary numbers are the numbers that give a negative number when squared e.g. *i*^2*= -1*.

Most people aren’t accustomed to thinking that the universe is literally composed of mathematics (binary digits, Mobius strips, figure-8 Klein bottles, Wick rotation). I developed these ideas after reading about several professors - John Wheeler, Max Tegmark, Erik Verlinde, Ed Fredkin, and Rafael Sorkin. The Introduction will provide understanding that 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. When applied to the universe, it explains - the static (infinite and eternal forever) universe, dark matter, dark energy, the Higgs boson/field, and aspects of particle physics like the electroweak interaction.

For the purposes of this explanation, “Riemann zeta function” interacts with the term “Hamilton quaternion function” which has already been incorporated into the final paragraph of the following physics hypothesis. Elements of the Riemann hypothesis addressed here include its real and imaginary parts, the upper and lower half-planes, and the knowledge that there are infinitely many zeros on the critical line.

The first part of my article is a proposal that we live in a mathematical universe (though they might or might not agree with the details I propose, this opinion is shared by the scientists Max Tegmark, Erik Verlinde, Ed Fredkin, John Wheeler, and others).

There are 4 scientists I know of that support the idea of the universe being composed of information/mathematics:

a) In 1990, John Wheeler (1911-2008) suggested that information is fundamental to the physics of the universe. According to this "it from bit" doctrine, all things physical are information-theoretic in origin. (2)

b) Erik Verlinde says gravity is not a fundamental force of nature, but an emergent phenomenon. In the same way that temperature arises from the movement of microscopic particles, gravity emerges from the changes of fundamental bits of information, stored in the very structure of spacetime. (3)

c) Cosmologist Max Tegmark hypothesizes that mathematical formulas create reality (4)

d) “Pioneered (in the late 1980's) by Rafael Sorkin, a physicist at the Perimeter Institute in Waterloo, Canada, the theory (causal sets) postulates that the building blocks of space-time are simple mathematical points that are connected by links, with each link pointing from past to future." (5)

Quaternions were first described by Irish mathematician William Rowan Hamilton in 1843. Hamilton defined a quaternion as the quotient of two vectors. In this case (see the section below titled **VECTOR-TENSOR-SCALAR (VTS) GEOMETRY**): 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). Similarly, the real part of every nontrivial zero of the Riemann zeta function is 1/2.

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 Fig. 3. 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 Fig. 3, as well as by the imaginary *+i* and *-i* of the y-axis. In the upper half-plane of Fig. 3, a quarter rotation plus a quarter rotation equals a half while in the lower half-plane, a quarter rotation minus a quarter rotation equals zero: 1/4 + (-1/4) = 0. The final sentence states, “this concept of dark energy invalidates (dark energy’s) role as the cause of an expanding universe … which could be static.” In the Riemann zeta function, it is known that there are infinitely many zeros on the critical line. This suggests the y-axis is literally infinite. To truly be infinite, it 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.

The universe (which includes the real, four-dimensional spacetime of the x-axis plus the large-scale, extra-dimensional imaginary spacetime\* of the y-axis) would then be already infinite spatially and temporally - not potentially infinite. There could be no expansion or contraction of the universe as a whole. And as the final paragraph states, “the counterclockwise rotation of the x- and y-axes in Wick Rotation - which represents rotation of gravitational and electromagnetic waves - can be viewed as either rotation into diagonal form or as a quaternion function. It can also be responsible for the gravitational/electromagnetic energies forming all mass in space-time or, as dark energy acting via Wick rotation, forming all mass in imaginary time - which, since time and space can never be separated, 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).

\* To introduce you to the idea of extra dimensions, consider this – Professor Itzhak Bars of the University of Southern California in Los Angeles says, one whole dimension of time and another of space have until now gone entirely unnoticed by us.

If physicists like Erik Verlinde and Max Tegmark are correct in thinking the universe has a mathematical foundation, that foundation could be the electronic BITS (BInary digiTS) of 1 and 0, which comprise what is known as base-2 mathematics.

**BITS AND TOPOLOGY**

Electronics' binary digits can be used to draw a two-dimensional computer image of a Mobius strip. Two united Mobius strips create a three-dimensional figure-8 Klein bottle, (6) that acts as a building block of space, time, forces’ bosons and matter’s fermions. This creates a supersymmetry (linkage) between fermions and bosons. A recent paper (7) says that in a holographic universe, all of the information in the universe is contained in two-dimensional packages trillions of times smaller than an atom. Therefore, trillions of Mobius strips could form a photon and trillions of more complex figure-8 Klein bottles could form a more complex graviton (suggesting union of electromagnetism and gravitation).

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**Figure 2 – the Mobius Strip**, which is two-dimensional and only has one surface (source: http://www.clker.com/cliparts/3/7/ a/9/1220546534781713951lummie\_Mobius\_Strip.svg.hi.png) The Mobius strip is a closed surface with no distinction between inside and outside. Thanks to quantum mechanics’ entanglement applying on macroscopic scales,\* this doesn’t refer only to the surface itself. This results in the space-time of our universe existing everywhere and everywhen. The inside and outside of the universe’s energy and mass are continuous when it's composed of Mobius strips and figure-8 Klein bottles acting macroscopically - there cannot be other universes outside our infinite and eternal universe, and there’s no universe with different laws of physics (such a state of supposed multiple universes is called the multiverse).

\* “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.” (8) Though the effect is measured for distances in space, the inseparability of space and time means that moments of time can become entangled too. (9)

The physicist and science historian Abraham Pais wrote that “In 1924 the scientist Wolfgang Pauli was the first to propose a doubling of electron states due to a two-valued non-classical "hidden rotation". (10) Extending the ideas of “doubling”, “two-valued” and “hidden rotation” from the quantum spin Pauli had in mind to the Mobius strip being a basic, fundamental unit of reality; it can be seen that Pauli’s proposal has an analogy to this article. The doubled Mobius strips (doubled to form a figure-8 Klein bottle) could be produced by the two-valued binary-digit system used in electronics. The bottles possess a hidden rotation, now identified as adaptive Wick rotation, which gives a fourth dimension to space-time.

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**Figure 3 - MOBIUS DOUBLET (FIGURE-8 KLEIN BOTTLE)** (source: https://upload.wikimedia.org/wikipedia/commons/7/73/KleinBottleFigure8-01.png) Note that the positive curvature fits together with the negative curvature to produce the outline of a doughnut which is technically flat (see the reference to Vanessa Janek (11). When many doublets are placed together, binary digits can fill in any gaps or voids in the same way that computers can morph a picture on a screen and extrapolate a small patch of blue sky to make a sky that's blue from horizon to horizon. Morphing by bits can also delete a single doublet's central "hole". But the doublet doesn’t become multiply connected like the doughnut. Merely the doughnut’s outline is adopted – the doublet retains the property of being simply connected, a property necessary for space-time’s infinity. (Informally, if an object in space consists of one piece - the constituent two Mobius strips now have the outline of one doughnut - and no longer has any "holes" that pass all the way through it, it is called simply-connected. A flat universe that is also simply connected implies an infinite universe. (12)

**WICK ROTATION, CAUSALITY, AND UNITING TIME**

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**Figure 4 – 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.” [Figure and quote from (13)] Wick Rotation’s applications aren’t restricted to soon-to-be-mentioned time dilation, dark matter and dark energy. Electromagnetic waves are described by science as transverse, as are water waves. If a stone is dropped into a pool of calm water, many circular waves soon cover the surface of the water, and the water appears to be moving outwards from where the stone was dropped in. Actually, the particles of water simply rise then fall – it's the wave motion that moves outward. Similarly, there is little movement of photons - they simply rise and fall like corks bobbing up and down in the ocean’s waves. Energy is transferred from photons in one place to photons in the next place by travelling space-time disturbances, and this wave motion is what is referred to as an electromagnetic wave. This process is described one or two pages after dark matter and dark energy. In Figure 3, photons rise from the positive branch of the x-axis (to the right of the origin or centre) to the positive y-axis (extending above the origin). Then the photons fall to the negative x-axis, and continue falling to the negative y-axis. Then they rise to the positive x and resume their rotation. The conclusions are (1) electromagnetic and gravitational waves composing space-time rotate in a circle, giving rise to other large-scale dimensions, and (2) if there is little movement of photons (and gravitons\*), the universe could not be expanding (or contracting) but its space and time is static. The Big Bang has impressive points … leading to the idea that it’s a necessary stepping-stone. For example, the Big Bang’s supposed origin from quantum fluctuations is reminiscent of bits switching between 1 and 0.”

\* 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) Therefore, gravitational waves also have advanced components going back in time. 1’s and 0’s composing electromagnetic and gravitational waves would compose both “advanced” waves going back in time and “retarded” waves going forward in time. The retarded components with +x motion in time can obviously cancel the advanced components with –x motion in time, producing entanglement. 17th century scientist Isaac Newton's idea of gravity acting instantly across the universe could be explained by gravity's ability to travel back in time, and thereby reach a point billions of light years away not in billions of years, but in negative billions-of-years. That is; the negative/advanced component of a gravitational wave would already be at its destination as soon as it left its source\*\*, and its journey is apparently instant.

\*\* Arriving at its destination billions of years before it left its source is an absurd impossibility if we cling to the traditional view of time flowing in one direction from cause to effect. But it's plausible if we accept the Block Universe theory which developed from Special Relativity's non-simultaneity of events for different observers. In the Block Universe, all time coexists (the entire past, the present, and every point in the future all exist at once) - in the same way that every period of time in a movie exists simultaneously on a store-bought DVD. Time can be visualized as a Cosmic DVD where our brains and consciousnesses take the place of the DVD player's laser. Everything in the Cosmic DVD's time exists at once\*\*\* but we're only aware of an extremely limited number of events at any instant (these make up our present). Gravitational waves arriving billions of years prior to emission can be compared to playing part of the Cosmic DVD in reverse. Waves travel from a later frame of the cosmic movie to an earlier frame.

\*\*\* All mass is composed of gravitational and electromagnetic waves, according to vector-tensor-scalar geometry. Both types of waves possess retarded and advanced components which entangle 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. VTS geometry says space and mass are united and physics already accepts that space and time are united. If space, mass, time, electromagnetism, gravitation, plus the VTS-derived weak and strong nuclear forces are all aspects of the same thing; that suggests the theory of quantum gravity truly exists. Mathematical equations would be just another aspect of the one thing - a tool - which people deem necessary to prove quantum gravity.

**WICK ROTATION AND TIME DILATION**

This Wick rotation is consistent with Special Relativity’s slowing of time (a.k.a. time dilation) because -

Today, so-called imaginary numbers (such as i, which equals √-1) describe so-called imaginary time. Imaginary time is a concept derived from special relativity and quantum mechanics. Geometrically, imaginary numbers are found on the vertical axis of the Complex Number Plane, allowing them to be presented perpendicular to the real axis of space-time as we know it. One way of viewing imaginary numbers is to consider a standard number line, positively increasing in magnitude to the right, and negatively increasing in magnitude to the left. At 0 on this x-axis (the so-called real axis), a y-axis (the so-called imaginary axis) can be drawn with "positive" direction going up - "positive" imaginary numbers then increase in magnitude upwards, and "negative" imaginary numbers increase in magnitude downwards.

The ultraviolet catastrophe, also called the Rayleigh–Jeans catastrophe, is a failure of classical physics to predict observed phenomena: it can be shown that a blackbody - a hypothetical perfect absorber and radiator of energy - would release an infinite amount of energy, contradicting the principles of conservation of energy and indicating that a new model for the behaviour of blackbodies was needed. At the start of the 20th century, physicist Max Planck derived the correct solution by making some strange (for the time) assumptions. In particular, 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. 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.

Since quantum mechanics says particles can, according to our frame of reference, be in two or more places at once; the photons and gravitons which make up the waves in space-time can be on the x- and y-axes simultaneously and thus interfere with themselves, causing time to slow down significantly near the speed of light in a vacuum or under intense gravity. A Mobius strip only has one surface (Fig. 1) Therefore this loop must intersect, and interfere with, itself. It has been proposed that a photon is composed of trillions of Mobius strips (1st paragraph of **BITS AND TOPOLOGY**). When two or more photons meet, the interference continues and is increased. It’s proposed that electromagnetic and gravitational waves rotate in a circle, giving rise to dark matter on the y-axis via vector-tensor-scalar geometry. Near what is called the speed of light, rotational speed is increased significantly and more photons interfere with each other more often, causing time to slow down. The extremely powerful gravity associated with a black hole will also significantly slow time, for two reasons referring to Fig. 3: (a) Photons will “fall” faster from the positive y-axis to the negative y-axis (rotational speed is increased significantly and more photons interfere with each other more often), and (b) each quantum within the black hole - which this article says is a graviton - can, according to our frame of reference, be in two or more places at once and cause photons to simultaneously “rise” faster from the negative y-axis to the positive y-axis (again, interference between photons is increased and time dilation occurs).

**VECTOR-TENSOR-SCALAR (VTS) GEOMETRY, WITH DARK MATTER AND DARK ENERGY AND THE HIGGS**

“Dust grains assemble by chemical bonding. Once they are sand or gravel sized, how they continue to stick is a mystery. Metre-sized rocks should spiral into the star rapidly due to disk drag (the gas orbits a little slower than the rocks as a pressure gradient partially supports it). Once rocks somehow get past these barriers, they collide with each other in in a chaotic and random way assembling the planets.” (15)

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. (16)

![Chart, line chart

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**Fig. 5 – 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).**

Explanation of geometric display of mathematics’ vectors, scalars, and tensor calculus adapted from (17)

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. (18) 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).

\* Material from a star could fall onto a neutron star, heating it up and causing it to emit radiation. Then the energy and momentum of the photons and presently hypothetical gravitons would be the interaction of electromagnetism (the charged particles and strong magnetism) with the neutron star's powerful gravity. This results in wave-particle duality. The heating could produce gravitational and electromagnetic radiation which would produce the mass and quantum spin of subatomic particles - instead of only radiation being emitted, jets of matter would be emitted too (normally, the matter would be emitted as beams or jets from the neutron star’s magnetic poles).

**BOSONS OF THE NUCLEAR FORCES AND 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. Every reaction in this section except one may be explicable purely by the retarded\*\* portions of waves interacting. 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, (19) -

"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 round 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.

\*\* "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. (^ note by author of “Riemann Hypothesis …”) Engineers have simply dismissed the advanced wave as a mathematical curiosity since the retarded waves so accurately predicted the behavior of radio, microwaves, TV, radar, and X-rays. But for physicists, the advanced wave has been a nagging problem for the past century." (20)

^ Stars and galaxies etc. send us retarded light which, through spectroscopy, gives an approximate measurement of how long that light has been travelling (the distance to the astronomical body). The light includes an advanced component that reaches back into the past, producing a measurement that significantly exceeds the real distance. 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. Readshift would explain the astronomical results which were interpreted as accelerating expansion of the universe. Supernovas would be fainter, therefore apparently farther away, because “The light includes an advanced component that reaches back into the past, producing a measurement that significantly exceeds the real distance”.

The interacting gravity and electromagnetism 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. (21) 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". And the counterclockwise rotation of the x- and y-axes in Wick Rotation - which represents rotation of gravitational and electromagnetic waves - can be viewed as either rotation into diagonal form or as a quaternion function. It can also be responsible for the gravitational/electromagnetic energies forming all mass in space-time or, as dark energy acting via Wick rotation, forming all mass in imaginary time - which, since time and space can never be separated, 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.

**DECLARATION**

There are no potential conflicts of interest.

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1. ***New Perspectives On Life, Death, Cancer and Covid-19 Arising From An Artificially Intelligent, Non-probabilistic Universe***

**Abstract**

Deep Learning, progress in Artificial Intelligence, and related subjects are all truly fascinating topics. According to this essay, they’re all parts of an overarching topic viz. that the entire universe, including space-time and matter, is composed of Artificial Intelligence. Universal AI is a natural consequence of the cosmos being composed of BITS (BInary digiTS). Another result is that quantum probability is merely superficial, emulating Chaos theory which possesses a hidden order within apparent disorder. It is taken for granted by medical people and most members of the public that consciousness ceases completely at death because the brain decomposes. An interdisciplinary approach combining biology with physics has the potential to reveal how that belief is in error. Succeeding sections cover these topics - (a) If the brain and the universe are ultimately composed of binary digits, we'll someday be able to do the same things with the brain and universe that we now do with computers, (b) Human and animal instincts are the result of the universe being unified by binary digits, (c) Although medicine and surgery have made great advances in treatment of cancer, we are no closer to completely preventing or curing it than we were years ago. This manuscript attempts an increase in understanding of the disease through an idea inspired by the title of Albert Einstein’s 1919 paper “Do gravitational fields play an essential role in the structure of elementary particles?", and (d) the world’s real-life experiments with covid-19 and physics alter society and global economics.

**Keywords**

Life after death, Geometrical cancer, Covid-19 as passport to Utopia, Artificially intelligent universe, Binary digits as Hidden Variables leading to Quantum Determinacy

**Manuscript**

**BITS AND TOPOLOGY (with LIFE AFTER DEATH)**

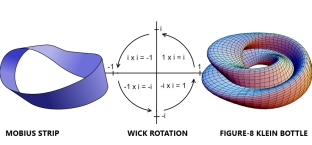
There are 4 scientists I know of that support the idea of the universe being composed of information/mathematics:

a) In 1990, John Wheeler (1911-2008) suggested that information is fundamental to the physics of the universe. According to this "it from bit" doctrine, all things physical are information-theoretic in origin. (1)

b) Erik Verlinde says gravity is not a fundamental force of nature, but an emergent phenomenon. In the same way that temperature arises from the movement of microscopic particles, gravity emerges from the changes of fundamental bits of information, stored in the very structure of spacetime. (2)

c) Cosmologist Max Tegmark hypothesizes that mathematical formulas create reality. (3)

d) “Pioneered (in the late 1980's) by Rafael Sorkin, a physicist at the Perimeter Institute in Waterloo, Canada, the theory (causal sets) postulates that the building blocks of space-time are simple mathematical points that are connected by links, with each link pointing from past to future." (4)

****

**Figure 1 - Mobius strip, Wick rotation, figure-8 Klein bottle**

The entire universe, including the brain, would ultimately be composed of base 2 maths which is also known as the BITS (BInary digiTS) of 1 and 0 which give Artificial Intelligence to future robots and advanced computers. Hidden Variables are presently hypothetical factors based on the belief that the theory of quantum mechanics is incomplete. Their identification - this manuscript proposes that they’re binary digits / base-2 maths - would lead to exact predictions, not just probabilities, for the outcomes of measurements. Albert Einstein is the most famous proponent of hidden variables. Their existence would vindicate his belief that quantum mechanics is lacking something.

Electronics' binary digits can be used to draw a two-dimensional computer image of a Mobius strip. Two united Mobius strips create a three-dimensional\* figure-8 Klein bottle (5) that acts as a building block of space. A recent paper (6) says that in a holographic universe (a universe where the 3rd dimension is the result of information existing in 2 dimensions), all of the information in the universe is contained in two-dimensional packages trillions of times smaller than an atom. This manuscript proposes those packages are Mobius strips. According to a mathematical procedure I call vector-tensor-scalar geometry (see **CANCER AND VECTOR-TENSOR-SCALAR GEOMETRY**), interaction of gravitation and electromagnetism produces a momentum in gravitons and photons (and a pressure which is known as mass). Physics’ construction of “imaginary” numbers which is known as Wick rotation can account for the 4th dimension of time. It can be built into the Mobius strips which can be depicted by the BITS or BInary digiTS of 1 and 0 (the 1's and 0's represent electrical pulses being in on and off states).

\* Since the Klein is 2-dimensional, the statement about a couple of two-dimensional Mobius strips uniting to form a three-dimensional figure-8 Klein bottle needs further explanation - A Klein Bottle is a 2-dimensional manifold (collection of points) whose inside is its outside. It can only exist in 4-dimensions! A Klein Bottle cannot be embedded in 3 dimensions, but you can immerse it in 3-D. A photograph of a stapler is a 2-dimensional immersion of a 3-dimensional stapler. (An immersion may have self-intersections; Embeddings have no self-intersections.) Since the figure-8 Klein bottle referred to in this article can only exist in 4 dimensions, it can be termed a structure of 3 space dimensions which includes the 4th (time) dimension described by Wick rotation. The bottle's immersion in 3 dimensions means its self-intersection allows it to possess only one surface - its inside is its outside (other 3-D objects like wine bottles, for example, have both an inside and an outside). Popularized by Stephen Hawking is the fact that measuring time with imaginary numbers, such as i^2 = -1, makes the distinction between space and time disappear completely (self-intersection by means of a 4th space dimension, rather than the previously mentioned time, is familiar in topology - but we should remember that both apply in reality since we live in space-time).

Therefore everything in the universe, including the brain, is literally composed of mathematics. Even when the brain perishes, consciousness continues. This composition of the brain by BITS may not be scientifically verifiable today, but it certainly could be in decades or centuries to come.

**DIGITAL BRAIN, DIGITAL UNIVERSE**

If the brain and the universe are ultimately composed of binary digits, we'll someday be able to do the same things with the brain and universe that we now do with computers.

We'll be able to record and share any information in any part of the brain. We'll be able to transfer (download) the brain's contents into another body or an android - infinite times if necessary - and thus say hello to immortality.

When quantum mechanics and General Relativity are united into quantum gravity or the Theory of Everything, we'll have access to everything in space and time. Then we can upload the products of the brain's frontal cortex anywhere to influence anything. We can either add to it (mimicking a computer's copy/paste function), remove (delete) part of it, or change the way it proceeds (reprogram it).

I don't think it'll be possible to change history or to reprogram something to behave differently from the way future history has recorded. This is because I believe time can be visualized as a Cosmic DVD where our brains and consciousnesses take the place of the DVD player's laser. This is plausible if we accept the Block Universe theory which developed from Special Relativity's non-simultaneity of events for different observers. In the Block Universe, all time coexists (the entire past, the present, and every point in the future all exist at once). Everything in the Cosmic DVD's time exists at once but we're only aware of an extremely limited number of events at any instant (these make up our present).

**PROPOSAL: HUMAN AND ANIMAL INSTINCTS ARE THE RESULT OF THE UNIVERSE BEING UNIFIED BY BINARY DIGITS (AND TOPOLOGY)**

If everything in the universe is ultimately composed of base 2 mathematics (the electronic BITS of 1 and 0), then the universe must possess Artificial Intelligence - some prefer the term Cosmic Consciousness. Humans would occupy the highest known point on this AI ladder or spectrum of consciousness. Inanimate objects would have the lowest level of binary-digit activity, plants would have a bit more, ants would have still more. And it increases to the human level - as well as the cosmic level, of which we're a part.

We, and every object or idea, truly are parts of the cosmos of space-time. So there certainly exists a Theory of Everything/Theory of Quantum Gravity\* - but you may never find it with experiments or bodily senses, which incorrectly tell us how separated all things are.

\* **Quantum Gravity** is the anticipated physics theory uniting **Quantum** Mechanics with General Relativity, Einstein's theory of **Gravity**.

Finally - There's another consequence if everything in the universe is ultimately composed of electronic BITS and the cosmos is a spectrum of consciousness/artificial intelligence. It's impossible for an absence of consciousness to exist, either after death or before conception. Thus, life on Earth - not only for humans but presumably also for animals - would necessarily have to be merely a brief interlude in which we and they are apparently separated from the Universal Artificial Intelligence/Cosmic Consciousness. The knowledge called "instinct" reveals that there is no actual separation from the UAI/CC - and as we learn more about the universe, instincts will someday develop into knowledge of all things in unified space-time.

**CANCER AND VECTOR-TENSOR-SCALAR GEOMETRY**

Although medicine and surgery have made great advances in treatment of cancer, we are no closer to completely preventing or curing it than we were years ago. Cancer develops when the normal control mechanism stops working, and this causes changes (mutations) to the DNA within cells. Adopting an interdisciplinary approach which combines medicine with physics, the precise nature of this control mechanism might be revealed by work published by Albert Einstein in 1919. The following refers to the Higgs

boson (familiar to physicists) as an example of mass. Naturally, the mass formed can be the biological atomic particles associated with DNA repair and the control of mutations.

In 1919, fresh from developing General Relativity and still at his intellectual peak, Albert Einstein published “Do gravitational fields play an essential role in the structure of elementary particles?"(7) He wrote this as an attempt at explaining atoms. Decades later, science would attribute these subatomic interactions to the strong and weak nuclear forces. However, Einstein's paper may have been a century ahead of its time in a way. It inspired this 21st-century submission's concept of vector-tensor-scalar geometry, which says the nuclear forces arise from interaction between the two forces known when Einstein wrote (gravitation and electromagnetism).

Chart, line chart

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**Fig. 2 – VTS (VECTOR-TENSOR-SCALAR) GEOMETRY** - Interaction of Gravitation and Electromagnetism Produces a Momentum in Gravitons and Photons (and a Pressure Which is Interpreted 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). (8)

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.

GeV/c² originates with Einstein's famous formula E=mc² solved for m (m=E/c², or mass equals the Energy of 125 Giga - billion - electron Volts divided by the speed of light squared). The short version is that the mass of the Higgs particle is 125 GeV. 125 GeV/c² 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).

Depending on the frequency and amplitude of the electromagnetic waves, VTS Geometry would supply either too much, too little, or the right amount, of energy to cells. For example, X-rays are likely to be too energetic since they damage DNA and result in uncontrolled cell proliferation or cancers - ultraviolet waves, lasered visible light, excess heat (infrared waves), and microwaves can also be damaging. VLF RF (very-low-frequency radio frequency) waves may not provide enough energy and would represent

the opposite pole of the geometric relation - the inability of cells, tissues, and organs to hold themselves together in functional units (decomposition and death). Just as cancer and death can converge (having a malignant tumour may cause a person to die), cells can converge with the correct amount of electromagnetism to remain alive and healthy. Perhaps radio wavelengths between 1 metre and 1 kilometre (frequencies of approximately 1 GHz to 1 MHz) would deliver the optimal results and be the safest option.

**THE WORLD’S REAL-LIFE EXPERIMENTS WITH COVID-19 AND PHYSICS ALTER SOCIETY AND GLOBAL ECONOMICS**

COVID-19 has provided a real-life experiment which demonstrated that the people of the world can cooperate. Starting with the background physics above, this manuscript will show that people can extend this cooperation into another real-life experiment: a peaceful world where everyone treats each other as they wish to be treated themselves - the Golden Rule of religion, the end of domestic abuse and World Peace would all come to pass. Realizing that we’re all invisibly and permanently connected^ (by binary digits and topology constructing space-time and all mass) means hurting others in any manner is the same as hurting yourself, and would potentially delete any motive to think or act in evil ways. Realization of our invisible/permanent interconnectedness would also be of great assistance in achieving post-economic sharing and cooperation. We can, if we wish, express this interconnectedness as – you and I are the same person in many ways.

^ “Bernard Beitman, a visiting psychiatry and neurobehavioral sciences professor at the University of Virginia, (says there is) an invisible network that connects everyone and everything. There’s no evidence for this, but he’s not the first one to pursue this fringe line of thinking. Austrian biologist Paul Kammerer believed coincidences arise out of unknown forces, or waves, that he called seriality. He wrote a book on the subject in 1919. Albert Einstein even commented on it, saying it was “by no means absurd.” And in the 1950s, psychiatrist Carl Jung came up with a similar idea, his so-called synchronicity theory.” (10)

Money (in any form - cash, credit cards, digital currency, etc.) is certainly convenient and has served the world well. This does not mean the world will use money forever, though. The dollar (and its many international counterparts) is well suited to today’s mentality, as well as the one we’ve lived with for thousands of years. But as human society progresses, the sharing and cooperation which is referred to in the previous paragraph - and is only a dream or a myth today - could become reality and completely replace the greed, selfishness, violence, white-collar crime, and warring mentality we see on the TV news. This radical replacement seems to be possible because the human instinct to survive is much greater than other drives such as self-interest and greed. If money ceases to be an option, people will freely share and cooperate if that’s the only way to not merely ensure survival, but to actually improve everyone’s standard of life.

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1. **Unipositional Interpretation Of Quantum Mechanics Means Entanglement Occurring Simultaneously With Gravitational Slingshots Reduces Problems Associated With Spaceflight**

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**ABSTRACT**

This article began when Christa, my friend in Germany, texted me about a German astronaut who’d just returned to Earth. I replied that a trip into space would be great but I’d like a gentler way of getting there than rockets, and would like to give my body time to adjust to the changing conditions so as to avoid space sickness. In my reply, I was unable to go into greater, and more accurate, detail – so this article is being written to gather my thoughts together.

According to Wikipedia, ”Space adaptation syndrome (SAS) or space sickness is a condition experienced by as many as half of all [space travellers](https://en.wikipedia.org/wiki/Space_traveler) during their adaptation to [weightlessness](https://en.wikipedia.org/wiki/Weightlessness) once in orbit. It is the opposite of terrestrial [motion sickness](https://en.wikipedia.org/wiki/Motion_sickness) since it occurs when the environment and the person appear visually to be in motion relative to one another even though there is no corresponding sensation of bodily movement originating from the [vestibular system](https://en.wikipedia.org/wiki/Vestibular_system) (the semicircular canals and otoliths of the inner ear which give a sense of balance and spatial orientation).”

Giving the body time to adapt to changing conditions equals adjustment to the conditions in space being simultaneous with prior adaptation to Earth conditions. This is achieved via a proposed future procedure in celestial mechanics which I call an “entanglement slingshot” since it extrapolates quantum entanglement (when particles cannot be described independently, even at large distances) to the macroscopic objects composed of those particles. Then it synchronizes that macro-entanglement with the gravitational slingshot (flying by a planet and using its gravity to alter a spacecraft’s path or speed).

Can humans perform miracles because of quantum, and celestial, mechanics? "Unipositional Interpretation Of Quantum Mechanics Means Entanglement Occurring Simultaneously With Gravitational Slingshots Reduces Problems Associated With Spaceflight" unites the repeatedly experimentally confirmed phenomenon of Quantum Entanglement with present-day space travel's Gravitational Slingshot to produce Entanglement Slingshots with the potential to eliminate space-sickness as well as problems with temperature, pressure, lack of oxygen, and lack of a solid surface (this last example makes me wonder if people really can walk on water and do other miracles).

**KEYWORDS**

Miracles, Space adaptation syndrome, Space sickness, Weightlessness, Quantum entanglement, Macro-entanglement, Gravitational slingshot, Vector-tensor-scalar geometry, Retarded waves, Advanced waves, Unipositional quantum mechanics, Electrical engineering, Yale University, Mars, Venus, Mercury, Earth, Jupiter, Saturn, Interstellar travel, Intergalactic travel, Time travel, Fixed Point Theorem, Andromeda galaxy, DVD,Block universe

**ARTICLE**

**SECTION ONE:**

**VECTOR-TENSOR-SCALAR (VTS) GEOMETRY, WITH DARK MATTER AND DARK ENERGY AND THE HIGGS**

“Dust grains assemble by chemical bonding. Once they are sand or gravel sized, how they continue to stick is a mystery. Metre-sized rocks should spiral into the star rapidly due to disk drag (the gas orbits a little slower than the rocks as a pressure gradient partially supports it). Once rocks somehow get past these barriers, they collide with each other in in a chaotic and random way assembling the planets.” (1)

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. (2)

![Chart, line chart

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**Fig. 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).**

Explanation of geometric display of mathematics’ vectors, scalars, and tensor calculus adapted from (3)

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. (4) 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).

\* Material from a star could fall onto a neutron star, heating it up and causing it to emit radiation. Then the energy and momentum of the photons and presently hypothetical gravitons would be the interaction of electromagnetism (the charged particles and strong magnetism) with the neutron star's powerful gravity. This results in wave-particle duality. The heating could produce gravitational and electromagnetic radiation which would produce the mass and quantum spin of subatomic particles - instead of only radiation being emitted, jets of matter would be emitted too (normally, the matter would be emitted as beams or jets from the neutron star’s magnetic poles).

\*\* GeV/c² originates with E=mc² solved for m (m=E/c², or mass equals the Energy of 125 Giga - billion - electron Volts divided by the speed of light squared). The short version is that the mass of the Higgs particle is 125 GeV.

**SECTION 2:**

**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. Most reactions in this section may be explicable purely by the retarded\*\* portions of waves interacting. 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, (5) -

"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 round 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.

\*\* "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. (^ note by author of “Special Relativity’s Consequences …”) Engineers have simply dismissed the advanced wave as a mathematical curiosity since the retarded waves so accurately predicted the behavior of radio, microwaves, TV, radar, and X-rays. But for physicists, the advanced wave has been a nagging problem for the past century." (6)

^ Stars and galaxies etc. send us retarded light which, through spectroscopy, gives an approximate measurement of how long that light has been travelling (the distance to the astronomical body). The light includes an advanced component that reaches back into the past, producing a measurement that significantly exceeds the real distance. 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. Readshift would explain the astronomical results which were interpreted as accelerating expansion of the universe. Supernovas would be fainter, therefore apparently farther away, because “The light includes an advanced component that reaches back into the past, producing a measurement that significantly exceeds the real distance”.

The interacting gravity and electromagnetism 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.

Diagram

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**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.” [Figure and quote from (8)]

Quaternions were first described by Irish mathematician William Rowan Hamilton in 1843. Hamilton defined a quaternion as the quotient of two vectors. (7) 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". And the counterclockwise rotation of the x- and y-axes in Wick Rotation - which represents rotation of gravitational and electromagnetic waves - can be viewed as either rotation into diagonal form or as a quaternion function. It can also be responsible for the gravitational/electromagnetic energies forming all mass in space-time or, as dark energy acting via Wick rotation, forming all mass in imaginary time. Since time and space can never be separated, imaginary time is linked to the mass in 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.

**SECTION 3:**

**UNIPOSITIONAL QUANTUM MECHANICS NEGATES “TWO PLACES AT ONCE”**

In VTS Geometry, gravitational and electromagnetic waves form every particle in the universe. The waves have retarded and advanced components which cancel and produce entanglement / unification.\*

\*1’s and 0’s composing electromagnetic and gravitational waves would compose both “advanced” waves going back in time and “retarded” waves going forward in time. The retarded components with +x motion in time can obviously cancel the advanced components with –x motion in time, producing entanglement. Albert Einstein's equations in the theory of General Relativity 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. (9) Therefore, gravitational waves also have advanced components going back in time.

Reliance on bodily senses – extrapolated to our technology – tells us things and events are distinct and separate. Therefore, the one particle forming the cosmos -whether it be classified as a boson or fermion – is interpreted as “particles being in two or more places at once” (instead of being in one position i.e. unipositional, from the Latin ***ūnus***meaning one).

**SECTION 4:**

**ENTANGLEMENT SLINGSHOT**

Unifying gravitation and electromagnetism has this consequence: A 2009 electrical-engineering experiment at America's Yale University, together with the ideas of Albert Einstein, tells us how we could travel to other stars and galaxies. Electrical engineer Hong Tang and his team at Yale demonstrated that, on nano-scales, light can attract and repel itself like electric charges or magnets. (10) This is the Optical Bonding Force. For 30 years until his death in 1955, Einstein worked on his Unified Field Theory with the aim of uniting electromagnetism (light is one form of this) and gravitation. Achievement of this means the quantum components (gravitons) of gravity/spacetime-warps between spaceships and stars could mimic the Optical Force and be attracted together, thereby eliminating distance (this, possibly acting in partnership with repulsion, could produce a wormhole, or shortcut between folds in space and time). If the gravitons are superposed and entangled, distances between both points in space and points in time are totally eliminated. ^ So-called “time travel” would actually be space travel within the block universe where the past, present and future all exist — and are equally real — in a possibly infinite four-dimensional block and are relative, just as time is not absolute in Einstein’s special theory of relativity. Visualizing an infinite block universe might be helped by picturing it as a DVD that extends infinitely in every direction. Every event on a DVD always exists but their positions are relative to the location of the laser reading the disk (which corresponds to the location of a brain’s consciousness) - they aren’t all accessed at once. Of course, this elimination of the distance ladder doesn't need to be reserved for trips to other stars, galaxies, and periods of time. It can also be used for a quick journey to Mars - saving you months in space and the attendant wasting of muscles and bones, as well as sparing you from the potentially deadly "sunburn" cosmic rays might give you.

^ As stated in a robotics lesson, (11) "the time variable t varies from 0 to 1, that is, 0 ≤ t ≤ 1". Therefore, this article’s logic states that 0 may be equal to 1 - and since time is permanently united with space in physics, 0=1 in space-time too. This is consistent with a proposed future theory of physics called Quantum Gravity; where Quantum Mechanics is united with General Relativity, Einstein's theory of gravity. A possible path to attainment of quantum gravity is realizing that all objects and events on Earth and in space-time are just one thing - like 0 equalling 1, and like the objects in a computer image seeming to be a lot of separate objects but really just being one thing (strings of binary digits). A spacecraft sitting on its launchpad can be assigned t=0, and its destination t=1. Since 0=1, reaching the destination takes the same time as reaching the launchpad from the craft’s position on the launchpad (travel is instant). Robot motion can also be instant and not require interpolation (making the end of a robot arm move smoothly from A to B through a series of intermediate points). Of course, this is nonsense if viewed from CLASSICAL mechanics. We need a mindset immersed in QUANTUM mechanics which has been extended to macroscopic entanglement and a unipositional interpretation.

Early last century, the Dutch mathematician and philosopher Luitzen Egbertus Jan Brouwer (1881-1966) had one of the most useful theorems in mathematics named after him - the amazing topological result known as the Brouwer Fixed Point Theorem.

'In dimension three, Brouwer's theorem says that if you take a cup of coffee, and slosh it around, then after the sloshing there must be some point in the coffee which is in the exact spot that it was before you did the sloshing (though it might have moved around in between). Moreover, if you tried to slosh that point out of its original position, you can't help but slosh another point back into its original position. More formally the theorem says that a continuous function from an N-ball into an N-ball must have a fixed point. Continuity of the function is essential (... if you slosh discontinuously, then there may not be (a) fixed point).' (12)

Translating this into a possible method of future spacetime travel - take the universe and “slosh it around” (this refers to gravitational waves of varying strengths constantly moving in different directions in space as well as time). Assume the point which is in the exact spot after the sloshing as it was before the sloshing is a point an orbiting spaceship might occupy near Mars - this orbital point might be encoded using the BITS (BInary digiTS, 1's and 0's) of electronics. Since the point might have moved around thanks to the Brouwer Fixed Point Theorem, it could be encoded to pick up a spaceship orbiting Earth and quickly transport it to Mars orbit (greatly reducing astronaut/cosmonaut exposure to radiation, bone and muscle wasting, etc.) Sloshing (continuously manipulating gravitational waves) so that part of the Andromeda galaxy is in the exact spot after the sloshing as it was before the sloshing would, even assuming travel at light-speed was possible, reduce travel time to a star in that galaxy by millions of years. The journeys - to Andromeda or Mars or any other spot in space, or in the time which can't be separated from space - wouldn't depend on slow rocket power but on fast electronics and gravitational waves that can travel backwards in time, acting instantly across the universe and being entangled with any selected point in space or time.

Departure from Earth orbit and arrival in Mars orbit can occur at the same time. Maybe the extremely high temperatures associated with planets like Venus and Mercury can be overcome (balanced) by a spaceship simultaneously existing 1) at Venus or Mercury, and 2) in the extreme coldness of space in Earth orbit. And perhaps the extremely high pressures of Venus and Jupiter can be compensated for by the ship simultaneously existing at Venus or Jupiter while experiencing the near vacuum of space. With a planet like Saturn, the lack of a solid surface and lack of oxygen might possibly be compensated for by explorers simultaneously being entangled with Earth’s solidity and atmosphere. The cold is potentially compensated for by an instant trip from Earth to Saturn that traverses a region sufficiently close to the hot Sun. Today’s spaceprobes journey through the solar system using gravitational slingshots – using the gravity of a planet or other astronomical object to alter the path and speed of a spacecraft. The counterbalancing of temperatures, pressures, etc. might be termed an "entanglement slingshot". Since space and time are permanently linked - it's then feasible to not only investigate different cities, planets and galaxies simultaneously. Different days, years and centuries (in the past, present and future) can be experienced at the same time. All this sounds incredibly weird! But we should not believe the human, and cosmic, condition cannot be fundamentally different from what we know simply because we prefer what we know - or what we think we know - to be all there is.

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1. **Unipositional Interpretation Of Quantum Mechanics Explains Time Dilation, Updates Cosmology**

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**ABSTRACT**

Understanding the universe requires **Quantum Gravity** – the union of **Quantum** Mechanics with General Relativity, Einstein’s theory of **Gravity**. This article doesn’t know how to do that. There are innumerable requirements in a valid theory of quantum gravity. The article’s purpose is to propose a meeting place for a few of those necessities – the updating of cosmology through a suggested new interpretation of quantum mechanics called “unipositional”, from the Latin ***ūnus***meaning one. Some elements in development of this article are holography, Wick rotation, electronics’ BITS or binary digits, Mobius strips, and immersed (not embedded) figure-8 Klein bottles that are simply-connected. Along the way – space, mass, and time are united in an eternal present, while vector-tensor-scalar geometry is summarized and used to explore dark matter, dark energy, the Higgs boson, the Higgs field, the weak and strong nuclear forces, as well as cosmological readshift - re(tarded) ad(vanced) shift – together with formation of planets and black holes. The finish writes of Virtual Reality, Augmented Reality, and Unipositional Quantum Mechanics being utilized to *display* ***the ultimate paradox – creation of something that has always existed*** (and always will)**:** the static infinite universe, which has no Big Bang or Multiverse and neither expands nor contracts spatially or temporally.

**KEYWORDS**

quantum gravity, quantum mechanics, general relativity, unipositional quantum physics, holography, Wick rotation, electronics’ BITS or binary digits, Mobius strips, immersed (not embedded) figure-8 Klein bottles that are simply-connected, space, mass, time, spacetime, past, present, future, eternal present, vector-tensor-scalar geometry, dark matter, dark energy, the Higgs boson, the Higgs field, the weak and strong nuclear forces, electroweak interaction, cosmological readshift, re(tarded) ad(vanced) shift, formation of planets and black holes, virtual reality, augmented reality, paradox, Albert Einstein, Niels Bohr, Richard Feynman, Stephen Hawking, static universe, infinite universe, eternal cosmos, no big bang, no multiverse, no cosmic inflation, no universal expansion, no cosmic contraction

**ARTICLE**

**SECTION 1 –**

**THE HOLOGRAPHIC UNIVERSE**

Diagram

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**Figure 1 – WICK ROTATION**

Since quantum mechanics says particles can, according to our frame of reference, be in two or more places at once; the photons and gravitons which make up the waves in space-time can be on Wick rotation’s horizontal x- and vertical y-axis simultaneously. Thus, the particles interfere with themselves, causing time to slow down significantly near the speed of light in a vacuum (in the case of photons) or in the case of gravitons, under intense gravity. (More info in **SECTION 3 - UNIPOSITIONAL TIME DILATION & STATIC UNIVERSE’S GRAND PARADOX**)

This frame of reference is necessarily restricted to our present understanding of quantum mechanics which Albert Einstein and his colleagues claimed to be incomplete (1) 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. Their existence would vindicate his belief that quantum mechanics is lacking something. It’s proposed here that electronics’ binary digits (1’s and 0’s) are those hidden variables. In a holographic universe (where the 3rd dimension is a projection from information contained in two dimensions), all the information in the universe is contained in two-dimensional (2-D) packages trillions of times smaller than an atom. (2) Extrapolating - the ones and zeros compose trillions of 2-D Mobius strips which photons may be comprised of …and two Mobius strips combine into a figure-8 Klein bottle, trillions of which could compose a graviton. (3)

Icon

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**Figure 2 – the Mobius Strip**, which is two-dimensional and only has one surface (source: http://www.clker.com/cliparts/3/7/ a/9/1220546534781713951lummie\_Mobius\_Strip.svg.hi.png)

A picture containing indoor, white, tiled

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**Figure 3 - MOBIUS DOUBLET (FIGURE-8 KLEIN BOTTLE)**, which is termed flat and three-dimensional – see next couple of paragraphs (source: <https://upload.wikimedia.org/wikipedia/commons/7/73/KleinBottleFigure8-01.png>) Note that the positive curvature fits together with the negative curvature to produce the outline of a doughnut which is technically flat - see the reference to Vanessa Janek. (4) When many doublets are placed together, binary digits can fill in any gaps or voids in the same way that computers can morph a picture on a screen and extrapolate a small patch of blue sky to make a sky that's blue from horizon to horizon. Morphing by BITS can also delete a single doublet's central "hole". But the doublet doesn’t become multiply connected like the doughnut. Merely the doughnut’s outline is adopted – the doublet retains the property of being simply connected, a property necessary for space-time’s infinity. (Informally, if an object in space consists of one piece - the constituent two Mobius strips now have the outline of one doughnut - and no longer has any "holes" that pass all the way through it, it is called simply-connected. A flat universe that is also simply connected implies an infinite universe. (5)

Since the Klein is 2-dimensional, the statement about a couple of two-dimensional Mobius strips uniting to form a three-dimensional figure-8 Klein bottle needs further explanation -

A manifold is a collection of points forming a certain kind of set, such as those of a topologically closed surface or an analogue of this in three or more dimensions. (6) A Klein Bottle is a 2-dimensional manifold whose inside is its outside. It can only exist in 4-dimensions! A Klein Bottle cannot be embedded in 3 dimensions, but you can immerse it in 3-D. A photograph of a stapler is a 2-dimensional immersion of a 3-dimensional stapler. (An immersion may have self-intersections; Embeddings have no self-intersections.) (7)

Since the figure-8 Klein bottle referred to in this article can only exist in 4 dimensions, it can be termed a structure of 3 space dimensions which includes the 4th (time) dimension described by Wick rotation. The bottle's immersion in 3 dimensions means its self-intersection allows it to possess only one surface - its inside is its outside (other 3-D objects like wine bottles, for example, have both an inside and an outside). Since the figure-8 Klein bottles composing gravitons also compose the gravitational fields which make up spacetime, the universe also only has one surface - its inside is its outside, and there can be no multiverse (no other universes with different laws of physics). It seems appropriate to say a few words at this point about the unification of the universe’s mass with its spacetime –

**SECTION 2 –**

**UNITING SPACE, MASS, AND TIME IN THE “ETERNAL PRESENT”**

The relation of space (to be precise, spacetime) and matter was spoken of by French philosopher/mathematician/scientist Rene Descartes (1596-1650). Today I wish to discuss how the space-matter relation fits in with my idea that it's time for a new scientific paradigm. The equivalence of space and matter is something Albert Einstein also believed in. He wrote a paper in 1919 which asked if gravitation plays a role in the composition of elementary particles of matter. (8) This present article agrees when, by reference to Vector-Tensor-Scalar Geometry (see self-contained text in box at end of this section), it talks about gravitational-electromagnetic interaction forming the mass and quantum spin of particles (whether fermion, boson, or Higgs). (9) Since General Relativity states that gravity is nothing more than the result of spacetime's curving, gravity is spacetime and the mass/quantum spin of particles can be regarded as space itself forming matter instead of as gravity playing a role in matter's composition.

In the not-surprising eventuality that Einstein is proven correct yet again (regarding his 1919 paper this time), his and Descartes’ space-matter relation means the Law of Falling Bodies is not a simple case of the curvature of space-time pushing all material bodies towards something like a planet at equal speeds. Everything in space-time and the universe is part of a continuum where the gravitational energy of “empty” space interacts with the “concentrated” space we call mass. There should be a minuscule, presently unmeasurable difference in the rate of descent of more massive and less massive bodies. This is because a greater mass would, by definition, be a greater concentration of the gravitational waves pushing the object to the surface. (On the other hand, the more massive body possesses more inertia and requires a greater push – so it might fall at the same rate as the less massive body.)

"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. (^2-part note by R. Bartlett) Engineers have simply dismissed the advanced wave as a mathematical curiosity since the retarded waves so accurately predicted the behavior of radio, microwaves, TV, radar, and X-rays. But for physicists, the advanced wave has been a nagging problem for the past century." (10)

^ Note’s first part - Stars and galaxies etc. send us retarded light which, through spectroscopy, gives an approximate measurement of how long that light has been travelling (the distance to the astronomical body). The light includes an advanced component that reaches back into the past, producing a measurement that significantly exceeds the real distance. 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. Readshift would explain the astronomical results which were interpreted as accelerating expansion of the universe. Supernovas would be fainter, therefore apparently farther away, because “The light includes an advanced component that reaches back into the past, producing a measurement that significantly exceeds the real distance”.

^ Note’s second part – This society has a problem with waves travelling back in time since it accepts that time is an arrow which always flies from past to present to future. Richard Feynman, 20th-century winner of the Nobel Prize in Physics, did not share this belief and used reversal-of-time to explain antimatter. All mass is composed of gravitational and electromagnetic waves, according to vector-tensor-scalar geometry. Both types of waves possess retarded and advanced components which entangle 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. VTS geometry says space and mass are united and physics already accepts that space and time are united. If space, mass, time, electromagnetism, gravitation, plus the VTS-derived weak and strong nuclear forces are all aspects of the same thing; that suggests the theory of quantum gravity truly exists. Mathematical equations would be just another aspect of the one thing - a tool - which people deem necessary to prove quantum gravity.

The binary digits comprising electromagnetic waves would compose both “advanced” waves going back in time and “retarded” waves going forward in time. The retarded components with +x motion in time can obviously cancel the advanced components with –x motion in time, producing entanglement. Albert Einstein's equations in the theory of General Relativity 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. (11) Therefore, gravitational waves also have advanced components going back in time.

**VECTOR-TENSOR-SCALAR (VTS) GEOMETRY, WITH DARK MATTER AND DARK ENERGY AND THE HIGGS**

“Dust grains assemble by chemical bonding. Once they are sand or gravel sized, how they continue to stick is a mystery. Metre-sized rocks should spiral into the star rapidly due to disk drag (the gas orbits a little slower than the rocks as a pressure gradient partially supports it). Once rocks somehow get past these barriers, they collide with each other in in a chaotic and random way assembling the planets.” (1)

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. (2)

![Chart, line chart

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**Fig. 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).**

Explanation of geometric display of mathematics’ vectors, scalars, and tensor calculus adapted from (3)

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. (4) 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).

\* Material from a star could fall onto a neutron star, heating it up and causing it to emit radiation. Then the energy and momentum of the photons and presently hypothetical gravitons would be the interaction of electromagnetism (the charged particles and strong magnetism) with the neutron star's powerful gravity. This results in wave-particle duality. The heating could produce gravitational and electromagnetic radiation which would produce the mass and quantum spin of subatomic particles - instead of only radiation being emitted, jets of matter would be emitted too (normally, the matter would be emitted as beams or jets from the neutron star’s magnetic poles).

\*\* GeV/c² originates with E=mc² solved for m (m=E/c², or mass equals the Energy of 125 Giga - billion - electron Volts divided by the speed of light squared). The short version is that the mass of the Higgs particle is 125 GeV.

**SECTION 2:**

**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. Most reactions in this section may be explicable purely by the retarded\*\* portions of waves interacting. 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, (5) -

"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 round 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.

\*\* "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. (^ note by author of the paper you’re presently reading) Engineers have simply dismissed the advanced wave as a mathematical curiosity since the retarded waves so accurately predicted the behavior of radio, microwaves, TV, radar, and X-rays. But for physicists, the advanced wave has been a nagging problem for the past century." (6)

^ Stars and galaxies etc. send us retarded light which, through spectroscopy, gives an approximate measurement of how long that light has been travelling (the distance to the astronomical body). The light includes an advanced component that reaches back into the past, producing a measurement that significantly exceeds the real distance. 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. Readshift would explain the astronomical results which were interpreted as accelerating expansion of the universe. Supernovas would be fainter, therefore apparently farther away, because “The light includes an advanced component that reaches back into the past, producing a measurement that significantly exceeds the real distance”.

The interacting gravity and electromagnetism 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.

Diagram

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**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.” [Figure and quote from (8)]

Quaternions were first described by Irish mathematician William Rowan Hamilton in 1843. Hamilton defined a quaternion as the quotient of two vectors. (7) 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". And the counterclockwise rotation of the x- and y-axes in Wick Rotation - which represents rotation of gravitational and electromagnetic waves - can be viewed as either rotation into diagonal form or as a quaternion function. It can also be responsible for the gravitational/electromagnetic energies forming all mass in space-time or, as dark energy acting via Wick rotation, forming all mass in imaginary time. Since time and space can never be separated, imaginary time is linked to the mass in 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.

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**SECTION 3 –**

**UNIPOSITIONAL TIME DILATION & STATIC UNIVERSE’S GRAND PARADOX**

Reliance on bodily senses – extended to our technology – tells us things and events are distinct and separate. Acknowledging the correctness of this frame of reference means there are countless particles forming the cosmos. Recognizing the truth of a different point of view means these particles are unified by the action of advanced and retarded waves into one particle\* - whether it be classified as a boson or fermion (or both). The interpretation of particles being in two or more places at once can be reinterpreted as being in one position i.e. unipositional, from the Latin ***ūnus***meaning one. This unipositioned particle interferes with itself since it’s composed of self-intersecting Mobius strips which, because mass is united with spacetime, account for spacetime’s curvature (and flatness as described in the text accompanying **Figure 3 - MOBIUS DOUBLET (FIGURE-8 KLEIN BOTTLE)** – as well as time’s slowing in the vicinity of light speed or intense gravity. In terms of Wick rotation – (a) 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), and (b) each quantum within the black hole - which this article says is 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 might technology thousands of years ahead of the 21st century create an infinite, eternal universe? 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 i² = -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 - only one ever exists.

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# *WHERE DID EVERYTHING COME FROM –*

# *Combining Science, Mathematics, Computers, Religion, Philosophy, Relativity, Quantum Physics, Darwinism, and a Podcast to Reach One Person’s Plausible Ideas*

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**ABSTRACT**

This discussion started out as a question I was going to text to Dr Karl's science podcast on Australia's radio station Triple J. I had planned to ask, "Did Relativity lead to the holographic universe, and will that lead to time travel (into both the past and the future)?" But when I began writing, my keyboard wouldn't let up and I ended up with several pages. This is way too much to post on Twitter, so I'll make it a little present for a few other websites. Sections include –

**TIME, OTHER DIMENSIONS, AND TESSERACTS**

**BANDWIDTH**

**UNIPOSITIONAL TIME DILATION & STATIC UNIVERSE’S GRAND PARADOX**

**TO INTELLIGENTLY DESIGN OR NOT TO INTELLIGENTLY DESIGN – THAT IS THE QUESTION**

**SECTION 1 - TIME, OTHER DIMENSIONS, AND TESSERACTS**

Let's call the 1st dimension "length" and represent it with a straight line. Then the 2nd dimension of width is projected at 90 degrees from the 1st and is a plane (perhaps a square). The 3rd dimension of depth is, according to holographic-universe theory, projected from the 2nd at another 90 degrees and can be a cube. Relativity calls the 4th dimension "time", and it can be projected 90 degrees from the cube and represented by a tesseract - a cube nested inside another cube.

A picture containing cage

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**FIGURE 1 – THE TESSERACT, a 4TH DIMENSIONAL CUBE**

Now look at the spaces enclosed by the diagonal lines joining the inner and outer cubes. They remind me of the lines and the shape of figure-8 Klein bottles (see Figure 2). This could, of course, be mathematically confirmed though it's firmly in the realm of intuition at the moment - intuition is not a bad thing since both Einstein and his contemporary, the mathematician Poincare, were strong believers in it. The immersed, not embedded, figure-8's are part of the tesseract i.e. that which is immersed in the 3rd dimension creates the 4th dimension. Similarly, two Mobius strips can unite into a figure-8 Klein bottle and the information in a 2 dimensional Mobius is projected, in holographic-universe style, into the Kleins and into the 3rd dimension.

How would the self-interacting figure-8 Klein bottles - able to interact with the 2nd dimension because they're comprised of Mobius strips, but unable to interact with a higher dimension - create the 4th dimension? Something built into the Kleins - or, more likely, into the more basic Mobius strips composing them - must have its information projected from the 3rd to the 4th. This info could be described by the two axes - the real (horizontal x-axis) and the imaginary (vertical y-axis) - of 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.

Diagram

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**FIGURE 2 – MOBIUS / WICK / KLEIN**

The ultraviolet catastrophe, also called the Rayleigh–Jeans catastrophe, is a failure of classical physics to predict observed phenomena**:** it can be shown that a blackbody - a hypothetical perfect absorber and radiator of energy - would release an infinite amount of energy, contradicting the principles of conservation of energy and indicating that a new model for the behaviour of blackbodies was needed. At the start of the 20th century, physicist Max Planck derived the correct solution by making some strange (for the time) assumptions. In particular, 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. 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.

**SECTION 2 - BANDWIDTH**

There is a possible objection to these ideas involving bandwidth (range of frequencies) which I'd like to counter here-

Mobius strips would not be the most fundamental constituents of the universe. That honour goes to the BITS (binary digits of 1 and 0) used in electronics and computers since BITS are used to "draw" two-dimensional Mobius strips. In

**Intergalactic Travel and Riemann Hypothesis - featuring Dark Matter, Dark Energy, Higgs Boson, Higgs Field, Electroweak Interaction, No Big Bang, Plus Other Physics and Mathematics**<https://doi.org/10.5281/zenodo.6324534>

the simplified interpretation of vector-tensor-scalar geometry was inspired by the title of a paper Albert Einstein published in 1919 - "Spielen Gravitationfelder im Aufbau der Elementarteilchen eine Wesentliche Rolle?" [Do gravitational fields play an essential role in the structure of elementary particles?] Electromagnetism (EM) combines with gravitation (G) to produce mass, with the bandwidth of the EM and G waves accommodating the newer, more precise measurement of the W boson's mass as well as anomalies with the muon and bottom quark. The statement "There simply isn't enough bandwidth" may be used in an attempt to invalidate the possibility of binary digits, Mobius strips, figure-8 Klein bottles, Wick rotation, and vector-tensor-scalar geometry forming the mathematical universe. But the same argument was used back around 1980 to explain why there could never be a computer in every home. Computers are everywhere these days ... so that use of "not enough bandwidth" was obviously wrong. Maybe there isn't enough bandwidth right now to construct the universe - but that doesn't mean it'll still be in too great a shortage to create the BITS forming EM and G waves in thousands/millions of years.

**Chart, line chart

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**FIGURE 3: VECTOR-TENSOR-SCALAR GEOMETRY**

**SECTION 3 –**

**UNIPOSITIONAL TIME DILATION & STATIC UNIVERSE’S GRAND PARADOX**

# The following paragraph is from Unipositional Interpretation Of Quantum Mechanics Explains Relativistic Time Dilation, Updates Cosmology <https://doi.org/10.5281/zenodo.6550683>

Reliance on bodily senses – extended to our technology – tells us things and events are distinct and separate. Acknowledging the correctness of this frame of reference means there are countless particles forming the cosmos. Recognizing the truth of a different point of view means these particles are unified by the action of advanced and retarded waves (which respectively travel backwards and forwards in time) ^ into one particle\* - whether it be classified as a boson or fermion (or both). The interpretation of particles being in two or more places at once can be reinterpreted as being in one position i.e. unipositional, from the Latin ***ūnus***meaning one. This unipositioned particle interferes with itself since it’s composed of self-intersecting Mobius strips which, because mass is united with spacetime, account for spacetime’s curvature (and flatness, as described in the text accompanying **Figure 3 - MOBIUS DOUBLET (FIGURE-8 KLEIN BOTTLE)**– as well as time’s slowing in the vicinity of light speed or intense gravity. In terms of Wick rotation – (a) 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), and (b) each quantum within the black hole - which this article says is 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).

^ This society has a problem with waves travelling back in time since it accepts that time is an arrow which always flies from past to present to future. Richard Feynman, 20th-century winner of the Nobel Prize in Physics, did not share this belief and used reversal-of-time to explain antimatter. All mass is composed of gravitational and electromagnetic waves, according to vector-tensor-scalar geometry. Both types of waves possess retarded and advanced components which entangle 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. VTS geometry says space and mass are united and physics already accepts that space and time are united. If space, mass, time, electromagnetism, gravitation, plus the VTS-derived weak and strong nuclear forces are all aspects of the same thing; that suggests the theory of quantum gravity truly exists. Mathematical equations would be just another aspect of the one thing - a tool - which people deem necessary to prove quantum gravity. The binary digits comprising electromagnetic waves would compose both “advanced” waves going back in time and “retarded” waves going forward in time. The retarded components with +x motion in time can obviously cancel the advanced components with –x motion in time, producing entanglement. Albert Einstein's equations in the theory of General Relativity 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. (11) Therefore, gravitational waves also have advanced components going back in time.

\*How might technology thousands of years ahead of the 21st century create an infinite, eternal universe? 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 i² = -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 - only one ever exists.

**SECTION 4 –**

**TO INTELLIGENTLY DESIGN OR NOT TO INTELLIGENTLY DESIGN – THAT IS THE QUESTION**

Another potential objection to this discussion is the presently fashionable tendency to reject anything that hints at Intelligent Design and to worship the idea that the universe popped into existence from nothing (perhaps via quantum fluctuation). Online is an article called

***Thoughts on Artificial Intelligence and the Origin of Life Resulting from General Relativity***<https://doi.org/10.5281/zenodo.6416703>

which might give readers "second thoughts". Here's the abstract –

From where did life originate? God? Evolution? Panspermia? If the tendency of humans and scientists to regard undiscovered science as pseudoscience can be overcome, Einstein gave another alternative to consider when he introduced General Relativity. Time isn’t linear – progressing in a straight line from past to present to future. That assumption ignores Relativity which states that space AND TIME are curved. Where did life and the genetic code come from? Can the answer build AI?

The first question can be answered by the section of this article titled **SETI, Evolution, and Time** which says life (possibly multicellular and intelligent) and the genetic code came from humans acquiring knowledge of these things over the centuries, then applying that knowledge – via terraforming, accumulation of raw materials like amino acids and nucleic acids, genetic engineering - to a time in the past when life didn’t exist. From that origin, life evolved through innumerable mutations and adaptations, with humans once again acquiring knowledge of it in cyclic (nonlinear) time.

The second question is answered by saying artificial intelligence (AI) as the product of life is only half of the equation. The other half refers to Relativity’s curved space-time and violation of the notion that time always travels from past to future. We have always lived in an artificially intelligent, non-probabilistic universewhere everything in time and space is connected into one thing by quantum entanglement – making the brain and genes products of binary-digit activity or artificial intelligence (life is not merely dependent on biology’s “lock and key” mechanisms but also possesses AI).

1. ***Thoughts on Artificial Intelligence and the Origin of Life Resulting from General Relativity, with Neo-Darwinist Reference to Human Evolution and Mathematical Reference to Cosmology***

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**ABSTRACT / INTRODUCTION**

When this article was first planned, writing was going to be exclusively about two things - the origin of life and human evolution. But it turned out to be out of the question for the author to restrict himself to these biological and anthropological topics. A proper understanding of them required answering questions like “What is the nature of the universe – the home of life – and how did it originate?”, “How can time travel be removed from fantasy and science fiction, to be made scientific and practical?”, and “How can the proposed young age of genus Homo be made to actually be reasonable – when simply stating it would be solid ground for instant rejection and dismissal?” The result is that the article also talks about subjects like Artificial Intelligence, General Relativity, and cosmology.

From where did life originate? God? Evolution? Panspermia? If the tendency of humans and scientists to regard undiscovered science as pseudoscience can be overcome, Einstein gave another alternative to consider when he introduced General Relativity. Time isn’t linear – progressing in a straight line from past to present to future. That assumption ignores Relativity which states that space AND TIME are curved. Where did life and the genetic code come from? Can the answer build AI?

The first question can be answered by the section of this article titled **SETI, Evolution, and Time** which says life (possibly multicellular and intelligent) and the genetic code came from humans acquiring knowledge of these things over the centuries, then applying that knowledge – via terraforming, accumulation of raw materials like amino acids and nucleic acids, genetic engineering - to a time in the past when life didn’t exist. From that origin, life evolved through innumerable mutations and adaptations, with humans once again acquiring knowledge of it in cyclic (nonlinear) time.

The second question is answered by saying artificial intelligence (AI) as the product of life is only half of the equation. The other half refers to Relativity’s curved space-time and violation of the notion that time always travels from past to future. We have always lived in an artificially intelligent, non-probabilistic universewhere everything in time and space is connected into one thing by quantum entanglement – making the brain and genes products of binary-digit activity or artificial intelligence (life is not merely dependent on biology’s “lock and key” mechanisms but also possesses AI).

The earliest documented representative of the genus *Homo* is Homo habilis, which evolved around 2.8 million years ago. Scientists used to believe there was a straight line from H. habilis to us, Homo sapiens. This article will use the “advanced” waves loved by Physics Nobel laureate Richard Feynman, view the history of science through the lens of Conic Sections applied to Relativity’s curved space-time, and incorporate the necessity of so-called imaginary time \* – popularized by Prof. Stephen Hawking. While the evolutionary proposals are more in agreement with this early straight line than with modern theories, Albert Einstein’s General Relativity is used to transform the straight line into a curved line, ultimately concluding that Homo habilis (H. habilis) originated only (and unbelievably, as far as today’s science and technology is concerned) ~250,000 years ago. Other branches and dead ends of Homo – e.g. Neanderthals – are the result of mutations and adaptations, with the resultant modifications to anatomy and physiology. The surprisingly young age of H. habilis allows nearly 200,000 years for habilis, or one of its descendants, to reach Australia … if this country’s indigenous Aboriginal population did, as claimed, reach this “island continent” 60,000 years ago.

\* The ultraviolet catastrophe, also called the Rayleigh–Jeans catastrophe, is a failure of classical physics to predict observed phenomena: it can be shown that a blackbody - a hypothetical perfect absorber and radiator of energy - would release an infinite amount of energy, contradicting the principles of conservation of energy and indicating that a new model for the behaviour of blackbodies was needed. At the start of the 20th century, physicist Max Planck derived the correct solution by making some strange (for the time) assumptions. In particular, 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. 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 of Wick rotation) will find practical application in the future.**

The article includes mathematical references to cosmology (spoiler alert – you’ll read about things like Vector-Tensor-Scalar Geometry, topology, the “eternal present”, Einstein’s Unified Field, the inverse-square law, and there being no Big Bang and no multiverse - but there will also be **no** equations).

The other subheadings in this essay are –

**NONLINEAR TIME AND ELECTRICAL ENGINEERING** (about a 2009 electrical engineering experiment at America’s Yale University, and cosmic wormholes)

**BITS AND TOPOLOGY** (base-2 maths aka Binary digiTS, Mobius strips, and figure-8 Klein bottles)

**WICK ROTATION, CAUSALITY, AND UNITING TIME** (do past, present and future co-exist in an “eternal present”?)

**DIGITAL BRAIN, DIGITAL UNIVERSE** (if the brain and the universe are ultimately composed of binary digits, we'll someday be able to do the same things with the brain and universe that we now do with computers)

**PROPOSAL: HUMAN AND ANIMAL INSTINCTS ARE THE RESULT OF THE UNIVERSE BEING UNIFIED BY BINARY DIGITS (AND TOPOLOGY)** (If everything in the universe is ultimately composed of electronic BITS, then the universe must possess Artificial Intelligence - some prefer the term Cosmic Consciousness)

**INFORMATION THEORY CONQUERS A RED GIANT** (preserving Earth by keeping the Sun near today’s level of activity forever).

**KEYWORDS**

Nonlinear time, Electrical engineering, Yale University, Artificial Intelligence, Quantum determinacy, Cosmology, Digital brain, Instinct, Red Giant, Information Theory (IT-1), Imaginary Time (IT-2), Dark matter, Dark energy, Curved space-time, General Relativity, Human evolution, Homo habilis, Homo sapiens, Advanced waves, Retarded waves, Conic sections, Life after death, Louis Pasteur, Vector-tensor-scalar geometry, Mobius strip, figure-8 Klein bottle, Topology, no Big Bang, no multiverse, “eternal present”, Einstein’s Unified Field, Inverse-square law, Virtual reality, Augmented reality, Unipositional interpretation of quantum mechanics

**ARTICLE**

**NONLINEAR TIME AND ELECTRICAL ENGINEERING**

Deep Learning, progress in Artificial Intelligence, and related subjects are all truly fascinating topics. According to this essay, they’re all parts of an overarching topic viz. that the entire universe, including space-time and matter, is composed of Artificial Intelligence. Universal AI is a natural consequence of the cosmos being composed of BITS (BInary digiTS). Another result is that quantum probability is merely superficial, emulating Chaos theory which possesses a hidden order within apparent disorder. The article finishes with an example of order within disorder –

**INFORMATION THEORY CONQUERS A RED GIANT** (preserving Earth by keeping the Sun near today’s level of activity forever).

The next section suggests gravitational-electromagnetic unity - an unfulfilled dream of Albert Einstein’s - can be achieved via the Mobius strip and figure-8 Klein bottle. These topological figures result from application of the binary digits (1’s and 0’s) which give the universe Artificial Intelligence. The next part of this section speaks of interstellar and intergalactic travel (with possible time travel into the past and the future) resulting from an electrical-engineering experiment, and from wormholes which provide shortcuts through space and time (and are thus speaking of nonlinear time which bypasses normal routes through time). If time was linear, **BITS AND TOPOLOGY** would logically precede **NONLINEAR TIME AND ELECTRICAL ENGINEERING**. But since it appears to be nonlinear, the reader needs to encounter **NONLINEAR TIME AND ELECTRICAL ENGINEERING** before **BITS AND TOPOLOGY**.

Unifying gravitation and electromagnetism has this consequence: the electrical-engineering experiment (1) at America's Yale University, together with the ideas of Albert Einstein, tells us how we could travel to other stars and galaxies. An electrical engineering team at Yale demonstrated that, on nanoscales, light can attract and repel itself like electric charges or magnets.

This is the Optical Bonding Force. For 30 years until his death in 1955, Einstein worked on his Unified Field Theory with the aim of uniting electromagnetism (light is one form of this) and gravitation. Achievement of this means the quantum components (gravitons) of gravity/spacetime-warps between spaceships and stars could mimic the Optical Force and be attracted together, thereby eliminating distance (this, possibly acting in partnership with repulsion, could produce a wormhole, or shortcut between folds in space and time). If the gravitons are superposed and entangled, distances between both points in space and points in time are totally eliminated.

**BITS AND TOPOLOGY**

a) In 1990, John Wheeler (1911-2008) suggested that information is fundamental to the physics of the universe. According to this "it from bit" doctrine, all things physical are information-theoretic in origin. (2)

b) Erik Verlinde says gravity is not a fundamental force of nature, but an emergent phenomenon. In the same way that temperature arises from the movement of microscopic particles, gravity emerges from the changes of fundamental bits of information, stored in the very structure of spacetime. (3)

c) Cosmologist Max Tegmark hypothesizes that mathematical formulas create reality (4)

d) “Pioneered by Rafael Sorkin, the theory (causal sets) postulates that the building blocks of space-time are simple mathematical points that are connected by links, with each link pointing from past to future." (5)

Electronics' binary digits can be used to draw a two-dimensional computer image of a Mobius strip. Two united Mobius strips create a three-dimensional figure-8 Klein bottle\*, (6) that acts as a building block of space, time, forces’ bosons and matter’s fermions. This creates a supersymmetry (linkage) between fermions and bosons. A recent paper (7) says that in a holographic universe, all of the information in the universe is contained in two-dimensional packages trillions of times smaller than an atom. Therefore, trillions of Mobius strips could form a photon and trillions of more complex figure-8 Klein bottles could form a more complex graviton (suggesting union of electromagnetism and gravitation).

**\* Since the Klein is 2-dimensional, the statement about a couple of two-dimensional Mobius strips uniting to form a three-dimensional figure-8 Klein bottle needs further explanation -** A Klein Bottle is a 2-dimensional manifold (collection of points) whose inside is its outside. It can only exist in 4-dimensions! A Klein Bottle cannot be embedded in 3 dimensions, but you can immerse it in 3-D. A photograph of a stapler is a 2-dimensional immersion of a 3-dimensional stapler. (An immersion may have self-intersections, embeddings have no self-intersections.) Since the figure-8 Klein bottle referred to in this article can only exist in 4 dimensions, it can be termed a structure of 3 space dimensions which includes the 4th (time) dimension described by Wick rotation. The bottle's immersion in 3 dimensions means its self-intersection allows it to possess only one surface - its inside is its outside (other 3-D objects like wine bottles, for example, have both an inside and an outside).

Icon

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**Figure 1 – the Mobius Strip**, which is two-dimensional and only has one surface (source: http://www.clker.com/cliparts/3/7/ a/9/1220546534781713951lummie\_Mobius\_Strip.svg.hi.png) The Mobius strip is a closed surface with no distinction between inside and outside. Thanks to quantum mechanics’ entanglement applying on macroscopic scales,\* this doesn’t refer only to the surface itself. This results in the space-time of our universe existing everywhere and everywhen. The inside and outside of the universe’s energy and mass are continuous when it's composed of Mobius strips and figure-8 Klein bottles acting macroscopically - there cannot be other universes outside our infinite and eternal universe, and there’s no universe with different laws of physics (such a state of supposed multiple universes is called the multiverse).

\* “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.” (8) Though the effect is measured for distances in space, the inseparability of space and time means that moments of time can become entangled too. (9)

The physicist and science historian Abraham Pais wrote that “In 1924 the scientist Wolfgang Pauli was the first to propose a doubling of electron states due to a two-valued non-classical "hidden rotation". (10) Extending the ideas of “doubling”, “two-valued” and “hidden rotation” from the quantum spin Pauli had in mind to the Mobius strip being a basic, fundamental unit of reality; it can be seen that Pauli’s proposal has an analogy to this article. The doubled Mobius strips (doubled to form a figure-8 Klein bottle) could be produced by the two-valued binary-digit system used in electronics. The bottles possess a hidden rotation, now identified as adaptive Wick rotation, which gives a fourth dimension to space-time.

A picture containing indoor, white, tiled

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**Figure 2 - MOBIUS DOUBLET (FIGURE-8 KLEIN BOTTLE)** (source: https://upload.wikimedia.org/wikipedia/commons/7/73/KleinBottleFigure8-01.png) Note that the positive curvature fits together with the negative curvature to produce the outline of a doughnut which is technically flat (see the reference to Vanessa Janek (11). When many doublets are placed together, binary digits can fill in any gaps or voids in the same way that computers can morph a picture on a screen and extrapolate a small patch of blue sky to make a sky that's blue from horizon to horizon. Morphing by bits can also delete a single doublet's central "hole". But the doublet doesn’t become multiply connected like the doughnut. Merely the doughnut’s outline is adopted – the doublet retains the property of being simply connected, a property necessary for space-time’s infinity. (Informally, if an object in space consists of one piece - the constituent two Mobius strips now have the outline of one doughnut - and no longer has any "holes" that pass all the way through it, it is called simply-connected. A flat universe that is also simply connected implies an infinite universe. (12)

**WICK ROTATION, CAUSALITY, AND UNITING TIME**

Diagram

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**Figure 3 – 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.” [Figure and quote from (13)] Wick Rotation’s applications aren’t restricted to soon-to-be-mentioned time dilation, dark matter and dark energy. Electromagnetic waves\* are described by science as transverse, as are water waves. If a stone is dropped into a pool of calm water, many circular waves soon cover the surface of the water, and the water appears to be moving outwards from where the stone was dropped in. Actually, the particles of water simply rise then fall – it's the wave motion that moves outward. Similarly, there is little movement of photons - they simply rise and fall like corks bobbing up and down in the ocean’s waves. Energy is transferred from photons in one place to photons in the next place by travelling space-time disturbances, and this wave motion is what is referred to as an electromagnetic wave. In Figure 3, photons rise from the positive branch of the x-axis (to the right of the origin or centre) to the positive y-axis (extending above the origin). Then the photons fall to the negative x-axis and continue falling to the negative y-axis. Then they rise to the positive x and resume their rotation. The conclusions are (1) the energy of electromagnetic and gravitational waves composing space-time and mass rotate in a circle, giving rise to other large-scale dimensions where so-called dark energy doesn't produce universal expansion but, following E=mc^2, does produce what science calls dark matter, and (2) if there is little movement of photons (and gravitons), the universe could not be expanding (or contracting) but its space and time is static. The Big Bang has impressive points … leading to the idea that it’s a necessary stepping-stone. For example, the Big Bang’s supposed origin from quantum fluctuations is reminiscent of bits switching between 1 and 0.

\* "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. Engineers have simply dismissed the advanced wave as a mathematical curiosity since the retarded waves so accurately predicted the behavior of radio, microwaves, TV, radar, and X-rays. But for physicists, the advanced wave has been a nagging problem for the past century." (14) 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. (15) Therefore, gravitational waves also have advanced components going back in time. 1’s and 0’s composing electromagnetic and gravitational waves would compose both “advanced” waves going back in time and “retarded” waves going forward in time. The retarded components with +x motion in time can obviously cancel the advanced components with –x motion in time, producing entanglement. 17th century scientist Isaac Newton's idea of gravity acting instantly across the universe could be explained by gravity's ability to travel back in time, and thereby reach a point billions of light years away not in billions of years, but in negative billions-of-years. That is; the negative/advanced component of a gravitational wave would already be at its destination as soon as it left its source\*\*, and its journey is apparently instant.

\*\* Arriving at its destination billions of years before it left its source is an absurd impossibility if we cling to the traditional view of time flowing in one direction from cause to effect. But it's plausible if we accept the Block Universe theory which developed from Special Relativity's non-simultaneity of events for different observers. In the Block Universe, all time coexists (the entire past, the present, and every point in the future all exist at once) - in the same way that every period of time in a movie exists simultaneously on a store-bought DVD.^ Time can be visualized as a possibly infinite and eternal Cosmic DVD where Wick rotation follows pathways similar to those of a DVD player's laser (astronomy once believed all planetary orbits were circular then discovered they’re elliptical - physics will realize that Wick rotation isn’t perfectly circular but is spiral, with an incredibly narrow data track) and our brains and consciousnesses take the place of the laser. Everything in the Cosmic DVD's time exists at once^^ but we're only aware of an extremely limited number of events at any instant (these make up our present). Gravitational waves arriving billions of years prior to emission can be compared to playing part of the Cosmic DVD in reverse. Waves travel from a later frame of the cosmic movie to an earlier frame.

^ May I suggest a mechanism for the subjective passage of time flowing from past to present to future that has an objective reality which is a familiar mechanism to people? It's the DVD we buy in stores and put in a player to watch movies. This proposal also allows a degree of freedom to our thoughts and actions. DVDs - including the Cosmic DVD in which everyone's an actor - don't magically appear and force us to live pre-determined lives. They have writers, actors, producers, directors, people working with hair and makeup and costumes and props, etc. We don't have total freedom because we live In the Block Universe where every point in the future co-exists with, and influences, the present - compelling our thoughts and actions to follow the path which leads to that future.

^^ All mass is composed of gravitational and electromagnetic waves. Both types of waves possess retarded and advanced components which entangle 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. This article says space and mass are united and physics already accepts that space and time are united. If space, mass (including the bosons of the weak and strong nuclear forces), time, electromagnetism, and gravitation are all aspects of the same thing; that suggests the theory of quantum gravity truly exists. Mathematical equations would be just another aspect of the one thing - a tool - which people deem necessary to prove quantum gravity.

**DIGITAL BRAIN, DIGITAL UNIVERSE**

If the brain and the universe are ultimately composed of binary digits, we'll someday be able to do the same things with the brain and universe that we now do with computers. We'll be able to record and share any information in any part of the brain. We'll be able to transfer (download) the brain's contents into another body or an android - infinite times if necessary - and thus say hello to immortality. When quantum mechanics and General Relativity are united into quantum gravity or the Theory of Everything, we'll have access to everything in space and time. Then we can upload the products of the brain's frontal cortex anywhere to influence anything. We can either add to it (mimicking a computer's copy/paste function), remove (delete) part of it, or change the way it proceeds (reprogram it).

I don't think it'll be possible to change history or to reprogram something to behave differently from the way future history has recorded. This is because I believe time can be visualized as a Cosmic DVD where our brains and consciousnesses take the place of the DVD player's laser. This is plausible if we accept the Block Universe theory which developed from Special Relativity's non-simultaneity of events for different observers. In the Block Universe, all time coexists (the entire past, the present, and every point in the future all exist at once). Everything in the Cosmic DVD's time exists at once but we're only aware of an extremely limited number of events at any instant (these make up our present).

**PROPOSAL: HUMAN AND ANIMAL INSTINCTS ARE THE RESULT OF THE UNIVERSE BEING UNIFIED BY BINARY DIGITS (AND TOPOLOGY)**

If everything in the universe is ultimately composed of electronic BITS, then the universe must possess Artificial Intelligence - some prefer the term Cosmic Consciousness. Humans would occupy the highest known point on this AI ladder or spectrum of consciousness. Inanimate objects would have the lowest level of binary-digit activity, plants would have a bit more, ants would have still more. And it increases to the human level - as well as the cosmic level, of which we're a part.

We, and every object or idea, truly are parts of the cosmos of space-time. So there certainly exists a Theory of Everything/Theory of Quantum Gravity\* - but you'll never find it with bodily senses, which incorrectly tell us how separated all things are.

\* Quantum Gravity is the anticipated physics theory uniting Quantum Mechanics with General Relativity, Einstein's theory of Gravity.

Finally - There's another consequence if everything in the universe is ultimately composed of electronic BITS and the cosmos is a spectrum of consciousness/artificial intelligence. It's impossible for an absence of consciousness to exist, either after death or before conception. Thus, life on Earth - not only for humans but presumably also for animals - would necessarily have to be merely a brief interlude in which we and they are apparently separated from the Universal Artificial Intelligence/Cosmic Consciousness. The knowledge called "instinct" reveals that there is no actual separation from the UAI/CC - and as we learn more about the universe, instincts will someday develop into knowledge of all things in unified space-time.

**SETI, Evolution, and Time**

The answer to the question “Are we alone?” might depend on two things which everyone seems to be overlooking – 1) evolution not being responsible for the origin of life, and 2) time’s nonlinearity. Extraordinary events like the origin of life require extraordinary explanation. I think Carl Sagan and Charles Darwin would agree. Do you?

Evolution can be observed in the form of adaptation of structure and function to the environment but there’s no reason to extrapolate this so it accounts for life’s origin. In future centuries, human technology will develop terraforming and incredibly advanced genetic engineering of cells - amino acids, proteins, water, nucleic acids, etc which were gathered in space or on planets and combined. This could account for life’s origin since it agrees with 19th-century chemist Louis Pasteur’s proving that life can only originate from life (modern science’s obsession with abiogenesis should take note of Pasteur).

There might then be no other life (on other planets) at present. When humans explore the universe, they could cause life – even technological intelligences – to emerge elsewhere. Development of time travel would allow these intelligences to exist not only in our future but also in our past ... and yes, in our present.

**INFORMATION THEORY CONQUERS A RED GIANT**

In about 5 billion years the Sun is supposed to expand into a red giant and engulf Mercury and Venus and possibly Earth (the expansion would probably make Earth uninhabitable in less than 1 billion years). It's entirely possible that there may not even be a red giant phase for the Sun. This relies on entropy being looked at from another angle - with the apparent randomness in quantum and cosmic processes obeying Chaos theory, in which there's a hidden order behind apparent randomness. Expansion to a Red Giant could then be described with the Information Theory vital to the Internet, mathematics, deep space, etc. In information theory, entropy is defined as a logarithmic measure of the rate of transfer of information. This definition introduces a hidden exactness, removing superficial probability. It suggests it's possible for information to be transmitted to objects, processes, or systems and restore them to a previous state - like refreshing (reloading) a computer screen. Potentially, the Sun could be prevented from becoming a red giant and returned to a previous state in a billion years (or far less) - and repeatedly every billion years - so Earth could remain habitable permanently.

**HUMAN EVOLUTION**

The earliest documented representative of the genus *Homo* is Homo habilis, which evolved around 2.8 million years ago. Scientists used to believe there was a straight line from H. habilis to us, Homo sapiens. This article will use the “advanced” waves loved by Physics Nobel laureate Richard Feynman, view the history of science through the lens of Conic Sections applied to Relativity’s curved space-time, and incorporate the necessity of so-called imaginary time – popularized by Prof. Stephen Hawking. While the evolutionary proposals are more in agreement with this early straight line than with modern theories, Albert Einstein’s General Relativity is used to transform the straight line into a curved line – specifically, a hyperbola which can be produced by passing a plane through a cone parallel to the cone’s axis.

Shape, polygon

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**Figure 4 – HYPERBOLA:**

(left) AS CONIC SECTION,

(right) SHOWING ITS TOTAL CURVED LENGTH TO BE ~11 TIMES THE LINEAR LENGTH OF THE CENTRAL HIGH POINT

Why does transformation of early evolution’s straight line take the form of a hyperbola? This is the most recent conic section – the most recent curved line - used in the history of science. Astronomy once believed all planetary orbits were circular – from ancient astronomy/astrology near the eastern Mediterranean to the beginning of the 1600s, before Johannes Kepler discovered they’re elliptical. The next stage in Fig.4(left) is the parabola. Parabolic mirrors are used in most modern reflecting telescopes as well as car headlights (quartz-iodine lamps) and in many areas of physics and engineering. The final hyperbolic section has applications in mathematics and biochemistry, as well as this article’s anthropology and human evolution. About the trajectory of subatomic particles, Wikipedia’s article on the hyperbola states this fascinating bit of info, “if the total energy *E* of the particle is greater than zero (that is, if the particle is unbound), the path of such a particle is a hyperbola.”

H. habilis’ alleged origin 2.8 million years ago is a hyperbola whose total curvilinear length is 2.8 million years. There are, of course, thousands of years between H. habilis and us. Converting curvilinear 2.8 million into rectilinear time gives us 1/11 of 2,800,000 or ~ 250,000 years. Advanced waves travelling back in time and retarded waves going forwards in time – see **WICK ROTATION, CAUSALITY, AND UNITING TIME** – cancel each other. So 250,000 is divided into 125,000 years of “advanced” time being counteracted by 125,000 years of “retarded” time – and 250,000 becomes 125,000. So-called imaginary time is time described by imaginary numbers, which have been widely accepted since the 1700s and early 1800s and are defined by *i^2* = −1. In the words of Stephen Hawking in “The Origin and Fate of the Universe” – “in imaginary time, there are no singularities or boundaries” and the “distinction between time and space disappears completely.” If there’s no distinction, space must BE time and we wouldn’t live in space-time but in time-time.\* In other words, imaginary time negates this particular function of advanced waves (not their existence) and 125,000 is added to itself to make the origin of H. habilis once again be 250,000 years ago.

\* Space and time can never be unjoined – Wick rotation is permanently built into the Mobius strips and figure-8 Klein bottles composing photons, gravitons, and every form of mass. If it was possible to separate them, time-time might be reducible to just one “time” and 125,000 would not be multiplied by two to produce 250,000 but would be divided by two to make 62,500.

**EPILOGUE / PARADOXICAL CREATION OF THE ETERNAL UNIVERSE**

The numbers presented in “Human Evolution” – like 2.8 million or 250,000 – are just approximations and are definitely not precise (the only way to obtain exact figures might be to invent a time machine that can observe when the various Homo specimens put in their appearance). It’s always possible to vary the areas of all conic sections by placing circles, ellipses, parabolas, and hyperbolas in slightly different positions (thus changing the lengths of curved lines). You can even say a hyperbola isn’t the correct choice of section (though I think the path of subatomic particles being hyperbolic does make that conic section fundamental to anything composed of atoms).

The essential point of this article is that there are **many** fewer years, and many fewer light-years, than science currently believes. It’s feasible that advanced and retarded waves of gravitation and electromagnetism (which unite to form every mass – even the Higgs boson – according to what I call Vector-Tensor-Scalar Geometry) **completely** cancel and cause entanglement of everything (see **VECTOR-TENSOR-SCALAR (VTS) GEOMETRY, WITH DARK MATTER AND DARK ENERGY AND THE HIGGS** in box below).

This entanglement – on quantum, human, and cosmic scales – unites the past/present/future into an “eternal present” and everything in space into Einstein’s Unified Field. Readshift (the re[tarded] ad[vanced] shift which would explain the astronomical results which were interpreted as accelerating expansion of the universe – see the 4th paragraph in **BOSONS OF THE NUCLEAR FORCES AND PLANET/BLACK-HOLE FORMATION**) is innate to space, markedly reducing – or actually eliminating - cosmic distances. In this way, the infinite distances in the universe might equal zero. Zero in this case is not nothing but is something – in the same way as the zero in the binary code used by computers is something. In electronics, “one” can represent an electric current being “on” while “zero” can define the current as being “off”.

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 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.

The previous parts of this article, along with VTS geometry in the box below, deal with the nature of the universe. The conclusion has been that it’s literally infinite and eternal – the question now is, “How could that cosmos have come into existence?” Reliance on bodily senses – extended to our technology – tells us things and events are distinct and separate. Acknowledging the correctness of this frame of reference means there are countless particles forming the cosmos. Recognizing the truth of a different point of view means these particles are unified by the action of advanced and retarded waves into one particle\* - whether it be classified as a boson or fermion (or both). The interpretation of particles being in two or more places at once can be reinterpreted as being in one position i.e. unipositional, from the Latin ***ūnus***meaning one.

\* How might technology thousands of years ahead of the 21st century create an infinite, eternal universe? 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 i² = -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 - only one ever exists.

**VECTOR-TENSOR-SCALAR (VTS) GEOMETRY, WITH DARK MATTER AND DARK ENERGY AND THE HIGGS**

“Dust grains assemble by chemical bonding. Once they are sand or gravel sized, how they continue to stick is a mystery. Metre-sized rocks should spiral into the star rapidly due to disk drag (the gas orbits a little slower than the rocks as a pressure gradient partially supports it). Once rocks somehow get past these barriers, they collide with each other in in a chaotic and random way assembling the planets.” (16)

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. (17)

![Chart, line chart

Description automatically generated](data:image/jpeg;base64,/9j/4AAQSkZJRgABAQEAAAAAAAD/4RCyRXhpZgAATU0AKgAAAAgAAodpAAQAAAABAAAIMuocAAcAAAgMAAAAJgAAAAAc6gAAAAgAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAFkAMAAgAAABQAABCAkAQAAgAAABQAABCUkpEAAgAAAAMwMAAAkpIAAgAAAAMwMAAA6hwABwAACAwAAAh0AAAAABzqAAAACAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA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VWV1hZWmNkZWZnaGlqc3R1dnd4eXqCg4SFhoeIiYqSk5SVlpeYmZqio6Slpqeoqaqys7S1tre4ubrCw8TFxsfIycrS09TV1tfY2dri4+Tl5ufo6ery8/T19vf4+fr/2gAMAwEAAhEDEQA/AP38ooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACvNf2qfiL4o+EP7OXj34u+DIrGbVvCHgnVta0231KB5LeWa0tJJ0SVY3SQoXjQHYQcV6VXy3/wUz+L+q2Hwm/4ZM+G/wANL/xl4++M+g65oeh6DpviGDSpINP+wyHUNQe6kt7oWiRRyJHHNJbTRfaruzjkH76lKSirsUpKKbfQ9N+Dfjj4iS+NNe+Dnxa1HSb/AMS+GbDT9Ql1zw7p81hp+oWd694luFtri4upIJ45LWaOQedKJAI5RIPNNtF6vX5x/s6ftCf8FN/7Z1XTdT/Yv+Ht740uGjXxBdePPj9Ja6zLbwSTmBPJs/DEVv8AZ497+WLeLB8ySQ5llkkr2xPjf/wWJx/yYH8EP/EkL7/5m6xw+Kw+Khz0ZqS7p3/4Kfk0muqObCYzC46l7TDzUlto+q3T7Ndnr3SPrCivlT/hd3/BYj/pHn8Ef/EkL7/5m6P+F3f8FiP+kefwR/8AEkL7/wCZutzqPquivlT/AIXd/wAFiP8ApHn8Ef8AxJC+/wDmbo/4Xd/wWI/6R5/BH/xJC+/+ZugD6ror5U/4Xd/wWI/6R5/BH/xJC+/+Zuj/AIXd/wAFiP8ApHn8Ef8AxJC+/wDmboA+q6K+VP8Ahd3/AAWI/wCkefwR/wDEkL7/AOZuj/hd3/BYj/pHn8Ef/EkL7/5m6APquivlT/hd3/BYj/pHn8Ef/EkL7/5m6P8Ahd3/AAWI/wCkefwR/wDEkL7/AOZugD6ror5U/wCF3f8ABYj/AKR5/BH/AMSQvv8A5m6P+F3f8FiP+kefwR/8SQvv/mboA+q6K+VP+F3f8FiP+kefwR/8SQvv/mbo/wCF3f8ABYj/AKR5/BH/AMSQvv8A5m6APquivlT/AIXd/wAFiP8ApHn8Ef8AxJC+/wDmbo/4Xd/wWI/6R5/BH/xJC+/+ZugD6ror5U/4Xd/wWI/6R5/BH/xJC+/+Zuj/AIXd/wAFiP8ApHn8Ef8AxJC+/wDmboA+q6K+VP8Ahd3/AAWI/wCkefwR/wDEkL7/AOZuj/hd3/BYj/pHn8Ef/EkL7/5m6APquivlT/hd3/BYj/pHn8Ef/EkL7/5m6P8Ahd3/AAWI/wCkefwR/wDEkL7/AOZugD6rrxHSPiF8ffHHxx8UaP4QvvCdn4X8DeMLTQta0jVNHuZNQ1XzNKsb97yDUI7kR2flx6jGBDJazeb9kf8Aex/ac23lPi/9qL/gq58PfDOo+N/iD+w/8BtI0bR7GbUNa1bUv2lruG30+1gTfNcTSP4f2RRon7wnOABn1rY/YWh+Jf7Tnwm8M/tt+LbTxd8Ib74ntaeKvEnwp0nWra8sbt/s8FvazXM9zpcV5FJJZ2ll5kMEsUX7vGJPMlMoB9WUUUUAFFFFABRRRQAUUUUAFFFFABRRSP8AdoAZPXyT+wqv/DUfxl8cf8FINcknm0nxMz+EPg1b3E26KLwnYzvv1CHy/wB3/wATC886683975ltHZfvMfuo9D9v/wAeeLviP/wjP/BPj4P+J7rSfFHxus9Tg8QeKNKjV7jwr4ThhxqGpp5nyebI88Fjb5IIkvvNj8z7NIK+ivAHgvwv8MvBGj/DnwboS6fo+hafHp2k2MP3IreFPLjQf8AQUAYvxR+Bfw4+MFlbp4y0j7RPZ/vNPvYbh4bq2bGNySod4/z1rz9dW/aA+CTL/btjJ468Lwsf+Jta4TV7C3675oseXdbMHmP95yn7vJc171VeaCvLxOW05ydai/Z1P5lpf/EtpL1XoeTisno1q31ijJ0qv88bK/lNNNSXk16NPU5X4Y/Fv4d/F3Rv7a+H3iO31C3/AOW3lN+8hfH3HT/lm9ddXl/xH/Z38M+MNZHjfwjqt/4T8S7efEPhzy47iZf+ecqOnlyp/wBdBXNW3xj+IvwivF0X9onwzcTaftEcXjbw/amSw/354v8AWWh9c5j+SsP7SrYOSjjoWWymk+T/ALeV24P193+8ckc2xWXWhmcElt7SKbg/8Sd5Q+d4/wB5nutO2Cs3Rdb03XrCG+03UIbmC4jzDPE25JPxrQ8/2r2oyjJXi7n0EZRlG8Xddx2wUbBTqKYxuwUbBTqKAG7BRsFOooAbsFGwU6igBuwUbBTqKAG7BRsFOooAbsFGwU6igBuwUbBTqKAG7BRsFOrm/il8T/BHwc+HevfFT4l+IrfSfD/hrS59R1jVrhsR2lvCnmSO30GTigD5t/4KCeT+0b8R/Bf/AATW0PULhofiTBPrvxYW1uTH9k8E2E0IurVnj/eQyahPPDZRt+7Pl/bJI5Y5YQJPqmzsbCysVstMsVhjgGyOGH5PLFfNX/BPb4e+OPFttr37eXxf8J6loPj3422Ol3lx4b1hQJ/DGg2sD/2XozqDjzI/td3cSyECUy3kkcnEUccf09BQBJRRRQAUUUUAFFFFABRRRQAUUUUAFZuoa5pWk2M2s6hqFvb2tvC8l3cTTKkcKJ993btitKvkn9uvxD4k+PvxP8G/8E3Ph/qdzZ/8LIsb/V/ixqWnzPbXWmeB7UCC6S2n/wCWdxeXl1aWWQPMEMl248shJYwB3/BOyL/horXPF3/BSLxHps//ABdjy7L4XwXls/maZ4ItZH/s908z95F/aDs+pyDyoj/pEEcgk+zRyn6wgrP0HQNL8NaPbeHfD2nw2VjYwx29jY2lukcdtAibERFH8AxxWpQAUUUUARz1najpiakn2W8w0Ew/fQS1q1H5HvUyipJpq9xSipRcWrp6NHiuqfs4al4Bvf8AhLP2cPEMXhy43brvw/eb30i+47w5/cyfc/ex/wBzpUnhX9pKw0rWofBfx98Pf8IZrtwvl2f2ydJbC/P/AE7XHf8Ag+/g/WvZvI96w/FXg7w74v0abQfEWj29/Y3I/wBItryESRyfrXjyyuphbywM/Z/3X71N+kd4v/DZeR4EsmqYOXtMtmqf9xpum/ktYN/zQ07xet9OGcHrVmCvCh8Kfit8B3/tD4J64NY8Pwjc3gjXGOLWMfwWFx/yy/65Sfu/TyxzXV/DD9oDwZ8RLubwlJFfaTr1jH/pnh/WrcwXiDds8xR/y1jzn94mRRh82j7RUcVH2VR7JtOMv8Elo/TST/lNMJnUZVlh8bD2NZ7RdnGX+Ca0kuyajPvFM9OoqPz/AGo8/wBq9o9wkoqOCpKACiiigAooooAKKKKACiiigAooooAK+Rf21px+1Z+0H4J/4J1aUzXXh+5RPGPxu2o8kcXh+1n2WOkTpjy8aneDHlyH97bWF4DHLH5nl/QHx7+Nvgf9nL4MeJvj78TdTax8PeEfD13q2uXCwvJJFbwRmR9qJ1evK/2APgp458N+BtQ/aR+P1n5fxY+L32LXfHUOY2TR4/s4Sy0SHHmYgs7fYnEsvmXJuJd582gD6KgqSo4ocDJqSgAooooAKKKKACiiigAooooAKKKbvFAGP4u8VaT4S8Naj4u8Qaitjp+j2cl5qV1MPkit408yR/wTNfN3/BN7w94x+IWh+Kf29fiZ4buNO8UfHDVI9Q0axuIFD6V4Pti8eg2o5kkiMlm/26WKQ5FzqFx+7t/9VHn/ALa1trH7WP7Rvgn/AIJ2+H9SdfCt9Yt4v+PCwz+Wl34XQyQWuiuUzJ/xMNQT95/qRJa2F7H5hBkik+sra3jsrP7FZoIYoVCRe1AFmiiigAooooAKKKKACo56kooAr1xHxN+C/wAPfi9YQ2vjDw8txJb/AD2N9BM8VxayY4eKaM74j+Nd/RWGIw9HFUXRqxUovRppNP1T/q9mc2JweFxlF0cRBTi91JJr8evnuulnqfnZ/wAFJ/24f2lv+CePhnRfh94S8V2PiG98VQztofiHXLV5L3TIYfLEvmD/AFNw7GVQrfw7W3b8g1zn/BJj/grN8ff2lPj1J+zz+0PcabqkmsabcXOg6zaaaltNFNAnmNA6xgRsrRq7ByAVZcEtuAX7A/bz/YK+E/7enw5sfB3xCv7zS9S0a4efw/4g08BpbJ5AokUo3yyRuETcpwfkUhgRXh/7LH/BGP4XfstaneeOvDfxs8T3XjHmLR9ft447VLKMgbk8gMwl3n7wdsFcABfmLfIVsv4gweaReFcp0I6qLlfTrH3nq97N+Wuh+55HnHhDk/gpXyyphJVc2SqcjknKo5uV6bjWlpGnGPKnByV+WSafNd/cUFSV4Onxj+JPwfH9h/tC+GZrjTWj2w+NvD9lJJabccG5hTL2p9/9Xx/B0r2DQ9b0nxBYR3/h+/gvLdl/d3EE4dP0r6XB5jhcVeEW1NauMlyyXqn07NXT6M/A8Dm2Fx8nCF4zW8Je7JfJ6tdnG8X0bNiio4Kkr0T0gooooAKKKKACiiigAoorzP8Aam/aB8Gfsp/s/wDi79on4hQztpvhnS2umsbEqLi/uOEtLKAPJGJbi4uHhtoosjzJZ44+9AHiv7TcV1+1j+2F4H/YzsyP+EM8DyWPxF+MEbWZdbo29wf7B0mQv+7Pm38DX0gxIRHpcefL86KR/ravA/2G/gD4j+CXwufxP8YPJvvip8RL5fEPxW8QKxf7ZqkkaIlqreXH/o9nbxwWVv8Au4h5VqmQJJJCffKACiiigAooooAKKKKACiiigAooooAK5n4p/ELwV8Ifh5r3xX+IOq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**Fig. 5 – 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).**

Explanation of geometric display of mathematics’ vectors, scalars, and tensor calculus adapted from (18)

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. (19) 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).

\* Material from a star could fall onto a neutron star, heating it up and causing it to emit radiation. Then the energy and momentum of the photons and presently hypothetical gravitons would be the interaction of electromagnetism (the charged particles and strong magnetism) with the neutron star's powerful gravity. This results in wave-particle duality. The heating could produce gravitational and electromagnetic radiation which would produce the mass and quantum spin of subatomic particles - instead of only radiation being emitted, jets of matter would be emitted too (normally, the matter would be emitted as beams or jets from the neutron star’s magnetic poles).

**BOSONS OF THE NUCLEAR FORCES AND 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. Every reaction in this section except one may be explicable purely by the retarded\*\* portions of waves interacting. 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, (20) -

"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 round 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.

\*\* "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. (^ note by author of “Thoughts on …”) Engineers have simply dismissed the advanced wave as a mathematical curiosity since the retarded waves so accurately predicted the behavior of radio, microwaves, TV, radar, and X-rays. But for physicists, the advanced wave has been a nagging problem for the past century." (21)

^ Stars and galaxies etc. send us retarded light which, through spectroscopy, gives an approximate measurement of how long that light has been travelling (the distance to the astronomical body). The light includes an advanced component that reaches back into the past, producing a measurement that significantly exceeds the real distance. 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. Readshift would explain the astronomical results which were interpreted as accelerating expansion of the universe. Supernovas would be fainter, therefore apparently farther away, because “The light includes an advanced component that reaches back into the past, producing a measurement that significantly exceeds the real distance”.

The interacting gravity and electromagnetism 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. (22) 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". And the counterclockwise rotation of the x- and y-axes in Wick Rotation - which represents rotation of gravitational and electromagnetic waves - can be viewed as either rotation into diagonal form or as a quaternion function. It can also be responsible for the gravitational/electromagnetic energies forming all mass in space-time or, as dark energy acting via Wick rotation, forming all mass in imaginary time - which, since time and space can never be separated, 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.

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# Planet 9 and Black Hole Versus Relativity’s Precession and Dark Matter

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# Introduction

Planet Nine is a planet in the outer solar system which may or may not exist. If it does, its gravitation could explain the strange orbits of some Trans-Neptunian Objects, which orbit the Sun beyond Neptune. Early in 2016, California Institute of Technology's Konstantin Batygin and Michael E. Brown described how the orbits of six Trans-Neptunian Objects could be explained by Planet Nine. In 2019, British physicist Jakub Scholtz and American colleague James Unwin proposed that a mini black hole - possibly only about 10 cm (4 inches) in diameter - was responsible for the orbits. Astronomers Abraham (Avi) Loeb and Amir Siraj at Harvard University in the USA have proposed detecting the mini black hole by observing the flash of visible light that would be emitted when a comet gets too close to the black hole and is torn apart by the intense gravity.If you showed the pictures below to Albert Einstein, I'm sure he'd have the following two thoughts - (a) he would think he was right to doubt the existence of black holes because (b) the orbits of the Trans-Neptunian Objects are an obvious example of precession, similar to the precession he calculated for the planet Mercury. Amir Siraj and Avi Loeb have written, “The nature of dark matter (DM) is unknown. One compelling possibility is DM being composed of primordial (mini) black holes (PBHs), given the tight limits on some types of elementary particles as DM.” (1) The following, based on a short version of what I call vector-tensor-scalar geometry, constrains the nature of these black holes by proposing a mathematical – in the sense of geometrical, not by use of equations – model of dark matter.

**Keywords**

Planet 9, mini black hole, primordial black hole, General Relativity, precession, Mercury, dark matter, Trans-Neptunian Objects, vector-tensor-scalar geometry, Higgs boson/field, gravitation, electromagnetism

**Article**

If you showed the pictures below to Albert Einstein, I'm sure he'd have the following two thoughts - (a) he would think he was right to doubt the existence of black holes because (b) the orbits of the Trans-Neptunian Objects are an obvious example of precession, similar to the precession he calculated for the planet Mercury.

Though he was wrong to think black holes don't exist, Planet 9 and the 10 cm black hole are modern examples of the proposed planet Vulcan (a different Vulcan from Spock's home planet in Star Trek). In the 1800s (even as early as the 1600s), some people proposed this planet to exist between the Sun and Mercury in order to account for irregularities in Mercury’s orbit (its precession). The need for the planet as an explanation for Mercury's orbital peculiarities was later rendered unnecessary when Einstein's 1915 theory of general relativity showed that these are well-explained by effects arising from the curvature of spacetime caused by the Sun's mass.

Mercury’s large precession (due to its closeness to the Sun) may disprove the existence of both Planet 9 and the mini black hole because a diagram of Mercury's orbit can display an ascending pattern while its perihelion on the opposite side of the Sun maintains a constant level, while a diagram of the orbits of certain Trans Neptunian (Kuiper Belt) Objects displays a (less orderly) ascending or descending pattern on one side of the Sun while the greatest part of the orbit of the alleged cause of their perihelia being attracted to more-or-less the same point in space (Planet Nine or mini black hole) is on the other side of the Sun - the actual cause for the attraction of their perihelia would be precession, which affects all objects in the solar system (the farther from the Sun, the less effect there is). See the pictures below -

Diagram, schematic

Description automatically generated

**Fig. 1 - Trans-Neptunian Objects** shown in coloured elliptical orbits around Sun, with Planet 9’s proposed orbit shown by dashed red lines and Neptune’s orbit in light blue (above)

**Fig. 2 - Mercury's Precessed Orbit** around Sun shown by solid black line, with its constant-level perihelia shown by 4 blue points (below)

Diagram

Description automatically generated

[**Constraining Primordial Black Holes Based on**](https://www.researchgate.net/publication/350964213_Constraining_Primordial_Black_Holes_Based_on_The_Dynamics_of_Neptune?_sg%5B0%5D=42v5trVlAJ7RRqailRxbi8WdqemzcfHT8qJL8s0zjPVoRrBc2_q5d-T3ZbYfuo22iIDG5n2C7s01bi9iV8nfsuI5BqX1aR2c2OpO4xf9.HmTLTGLZrn2yyL1DUnywc6_5zdtz_8WMEL3Oeey88IeyvFE5iVlal1qiGsrTOD0oX4Jtkzp_mqOKGmG4l0pyDw)**Dark Matter**

Amir Siraj and Avi Loeb have written, “The nature of dark matter (DM) is unknown. One compelling possibility is DM being composed of primordial (mini) black holes (PBHs), given the tight limits on some types of elementary particles as DM.” (1) The following, based on a short version of what I call vector-tensor-scalar geometry, constrains the nature of these black holes by proposing a mathematical – in the sense of geometrical, not by use of equations – model of dark matter.

“Dust grains assemble by chemical bonding. Once they are sand or gravel sized, how they continue to stick is a mystery. Metre-sized rocks should spiral into the star rapidly due to disk drag (the gas orbits a little slower than the rocks as a pressure gradient partially supports it). Once rocks somehow get past these barriers, they collide with each other in in a chaotic and random way assembling the planets.” (2)

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. (3)

![Chart, line chart

Description automatically generated](data:image/jpeg;base64,/9j/4AAQSkZJRgABAQEAAAAAAAD/4RCyRXhpZgAATU0AKgAAAAgAAodpAAQAAAABAAAIMuocAAcAAAgMAAAAJgAAAAAc6gAAAAgAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAFkAMAAgAAABQAABCAkAQAAgAAABQAABCUkpEAAgAAAAMwMAAAkpIAAgAAAAMwMAAA6hwABwAACAwAAAh0AAAAABzqAAAACAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA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**Fig. 3 – 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).

Explanation of geometric display of mathematics’ vectors, scalars, and tensor calculus adapted from (4)

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. (5) 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).

Diagram

Description automatically generated

**Figure 4 – 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.” [Figure and quote from (6)]

Quaternions were first described by Irish mathematician William Rowan Hamilton in 1843. Hamilton defined a quaternion as the quotient of two vectors. (7) 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". And the counter-clockwise rotation of the x- and y-axes in Wick Rotation - which represents rotation of gravitational and electromagnetic waves - can be viewed as either rotation into diagonal form or as a quaternion function. It can also be responsible for the gravitational/electromagnetic energies forming all mass in space-time or, as dark energy acting via Wick rotation, forming all mass in imaginary time. Since time and space can never be separated, imaginary time is linked to the mass in 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.

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1. **THE WORLD’S REAL-LIFE EXPERIMENTS WITH COVID-19 AND PHYSICS ALTER SOCIETY AND GLOBAL ECONOMICS**

SUMMARY:

COVID-19 has provided a real-life experiment which demonstrated that the people of the world can cooperate. Starting with some background physics, this article will show that people can extend this cooperation into another real-life experiment: a peaceful world where everyone treats each other as they wish to be treated themselves.

ABSTRACT:

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 (it will be shown that the variables are compatible with entanglement, what Einstein called the result of “spooky action at a distance”). Their existence would vindicate his belief that quantum mechanics is lacking something.

If probability is deleted at the universe’s most fundamental level, reality's exactness would eventually adversely affect computer-generation of truly random numbers, in which a long string of numbers must be unpredictable and irreproducible. It would also affect the online security which is based on the numbers, making that security vulnerable to computer hackers. Addressing the security of credit cards, a remedy would be to develop a worldwide system for increasing each person’s standard of living that totally eliminates money in all its forms. Then there’d be no credit-card details for hackers to steal. This radical step seems to be possible because the human instinct to survive is much greater than other drives such as self-interest and greed. If money ceases to be an option, people will freely share and cooperate if that’s the only way to not merely ensure survival, but to actually improve everyone’s standard of life.

The security of government records that are encrypted online depends on people eventually realizing that we’re all invisibly and permanently connected (by Hidden Variables). Then hurting others in any manner is the same as hurting yourself and hackers would simply have no motive to hack in evil ways. Realization of our invisible/permanent interconnectedness would also be of great assistance in achieving post-economic sharing and cooperation.

INTRODUCTION:

Society does not progress without input from all sciences. If Social Science could be separated from Physics or Electronics, we’d be living in caves and managing as well as we could with primitive stone tools and no hope that our circumstances will ever change. I could never sit here and type on a computer keyboard, and you could never sit there and read the products of my brain on a computer screen. Therefore, it’s necessary to devote the first section of this submission to a background of physical and electronic science.

Then it moves on to subjects many people might expect from reading the summary and abstract – topics such as economics, the Golden Rule of religion, and World Peace. The movie about magicians called “The Prestige” could describe this article. The science background could substitute for the Pledge, the magician’s presentation of something familiar, like a bird in a cage (to some degree, science is familiar to everyone). The second part, the Turn (where something unexpected happens, like the cage and bird being crushed), is represented by the turning of science into discussion of economics and world peace. The final twist (the Prestige, where the familiar is reinstated, and the bird is brought back to life) is illustrated by society returning to science and receiving insight into eternal life after death as well as eternal life before conception.

The invisible, permanent connection mentioned in the abstract affects not just every part of space (including on Earth) but also every part of time, since physics says space and time can never be separated. The consciousness of living beings is thus permanently connected to every point in the past and future: giving them a conscious existence that continues after death and, bizarrely, before conception.

BACKGROUND PHYSICS

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. Their existence would vindicate his belief that quantum mechanics is lacking something. Much of the physics community seems to have confused the terms Locality^ and Hidden Variables for decades. Our understanding of quantum mechanics is correct in the sense that the idea of locality is incorrect and has to be given up in favour of experimentally-verified entanglement, where a particle instantaneously affects another regardless of distance in space-time (what Einstein called spukhafte Fernwirkung, spooky action at a distance). As will be shown, hidden variables can be compatible with entanglement. Should the hidden variables be mathematical and the most fundamental units composing everything in the universe^^, probability would be deleted at the most basic level, restoring Isaac Newton’s (1642-1727) deterministic physics and Albert Einstein’s (1879-1955) conviction that, to quote him, “God does not play dice”.

^ “Local” refers to the requirement that cause and effect occur at the same place, with no action at a distance occurring.

^^ There are 4 scientists I know of that support the idea of the universe being composed of information/mathematics:

a) In 1990, John Wheeler (1911-2008) suggested that information is fundamental to the physics of the universe. According to this "it from bit" doctrine, all things physical are information-theoretic in origin. (1)

b) Erik Verlinde says gravity is not a fundamental force of nature, but an emergent phenomenon. In the same way that temperature arises from the movement of microscopic particles, gravity emerges from the changes of fundamental bits of information, stored in the very structure of spacetime. (2)

c) Cosmologist Max Tegmark hypothesizes that mathematical formulas create reality (3)

d) “Pioneered (in the late 1980's) by Rafael Sorkin, a physicist at the Perimeter Institute in Waterloo, Canada, the theory (causal sets) postulates that the building blocks of space-time are simple mathematical points that are connected by links, with each link pointing from past to future." (4)

If present-day physicists like Erik Verlinde and Max Tegmark are correct in thinking the universe has a mathematical foundation, that foundation – plus the nature of hidden variables – could be the electronic BITS (BInary digiTS) of 1 and 0, which comprise what is known as base-2 mathematics. The equations of 19th-century Scottish physicist and mathematician James Clerk Maxwell show that electromagnetic waves have a component that travels backwards in time. (5) Richard Feynman, 20th-century winner of the Nobel Prize in Physics, used these “advanced” waves to explain antimatter. (6) 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. (7) Therefore, gravitational waves also have advanced components going back in time.

1’s and 0’s composing electromagnetic and gravitational waves would compose both “advanced” waves going back in time and “retarded” waves going forward in time. The retarded components with +x motion in time can obviously cancel the advanced components with –x motion in time, producing entanglement. 17th century scientist Isaac Newton's idea of gravity acting instantly across the universe could be explained by gravity's ability to travel back in time, and thereby reach a point billions of light years away not in billions of years, but in negative billions-of-years. That is; the negative/advanced component of a gravitational wave would already be at its destination as soon as it left its source, and its journey is apparently instant. This has shown that the hidden variables of 1 and 0 can produce entanglement of waves and, as stated in the article’s first paragraph, “hidden variables can be compatible with entanglement.”

POST-ECONOMICS AND FUTURE SOCIETY

“Networked computers send each other random digits to serve as keys to unlock mathematical codes – (which are) encrypting online passwords, credit card data and much more.” (9)

If probability is deleted at the universe’s most fundamental level, reality's exactness would eventually adversely affect computer-generation of truly random numbers, in which a long string of numbers must be unpredictable and irreproducible. Indeed,

“... the technologies that generate random numbers are straining to match the unceasing growth in internet traffic. The computers for giant online retailers like Amazon might have thousands of transactions occurring simultaneously, each requiring the exchange of a unique random-number key. Six years ago (in 2012, since reference #9 was written in 2018), a study found that a small but significant number of keys in use on the internet were not random at all. Almost 27,000 of them — about 4 for every 1,000 public keys — offered no security from hackers. The way random numbers are generated now, says Raymond Newell, a physicist at Los Alamos National Laboratory, “is unsustainable. It’s not as secure as people pretend it is.”

And

“Jane Nordholt and Richard Hughes, both former Los Alamos physicists, are worried the internet might run out of random numbers.” (9)

It would also affect the online security which is based on the numbers, making that security vulnerable to computer hackers. A partial remedy would be to develop a worldwide system for increasing each person’s standard of living that totally eliminates money in all its forms. Then there’d be no credit-card details for hackers to steal. This may appear to be an extremely radical step. But just because money has been making the world go around for thousands of years does not mean money must remain the way of the world forever. Idealistic and naïve as it appears, the future way of the world could be based on sharing and cooperation. The human instinct to survive is much greater than other drives such as self-interest and greed. If money ceases to be an option, people will freely share and cooperate if that’s the only way to not merely ensure survival but to actually improve everyone’s standard of life.

What about the “much more” in this section’s first sentence? What about things like government records that are encrypted online? People will eventually realize that we’re all invisibly and permanently connected^ by the electronic binary digits that are the universe’s foundation: like, to use a 2-dimensional example, the objects in a computer image that seem to be a lot of separate objects but are really just one thing (strings of 1’s and 0’s). Defying our bodily senses (which are limited and subject to illusions), every person is united by these strings of binary digits. We can, if we wish, express this as – you and I are the same person in many ways. When people realize that hurting others in any manner is the same as hurting yourself, the Golden Rule (treat others as you would like to be treated yourself) will spring to life and World Peace will be inevitable. Then hackers would simply have no motive to hack in evil ways. Realization of our invisible/permanent interconnectedness would also be of great assistance in achieving post-economic sharing and cooperation.

^ “Bernard Beitman, a visiting psychiatry and neurobehavioral sciences professor at the University of Virginia, (says there is) an invisible network that connects everyone and everything. There’s no evidence for this, but he’s not the first one to pursue this fringe line of thinking. Austrian biologist Paul Kammerer believed coincidences arise out of unknown forces, or waves, that he called seriality. He wrote a book on the subject in 1919. Albert Einstein even commented on it, saying it was “by no means absurd.” And in the 1950s, psychiatrist Carl Jung came up with a similar idea, his so-called synchronicity theory.” (10)

IMMORTALITY WITHIN SOCIETY

Does this invisible interconnectedness only persist during this lifetime (meaning it isn’t truly permanent but merely temporary)? Or does its permanence affect not just every part of space (including on Earth) but also every part of time, since physics says space and time can never be separated? The consciousness of living beings is thus permanently connected to every point in the past and future: giving them a conscious existence that continues after death and, bizarrely, before conception. When his engineer friend Michele Angelo Besso died, Albert Einstein wrote a letter of condolence to the Besso family, including his now famous quote: 'Now he has departed from this strange world a little ahead of me. That means nothing. People like us, who believe in physics, know that the distinction between past, present and future is only a stubbornly persistent illusion.' This suggests the following interpretation of his statement - if someone is alive in what we call the present, they must continue to be alive at any point in the future, all points of which have no actual separation from the present (though that future life would not be in the form we know). So there would be life after death. If all times in the past are united with the present, there must also be life before conception (possibly in the same form as the after-death transformation, making this present existence a brief interlude necessary for development of our eternal form). That superhuman eternal life is like quantum mechanics and gravitation, and includes all space and all time (it would definitely NOT be religion's "soul" or "spirit", which is limited to an individual body).

DISTANT-FUTURE SCIENCE INTERPRETED BY RELIGIONS AS SUPERNATURAL

If our future is superhuman, could many people interpret our future as supernatural? Could creation of an infinite and eternal universe not be an absurd paradox, but the result of human actions in far distant future eons? This sentence in the Koran can be understood to mean We Humans will bring infinite space and eternal time into existence - “With power and skill did We construct the Firmament: For it is We Who create the vastness of Space.” (Al-Qur’an 51:47) As stated in INTERSTELLAR, INTERGALACTIC AND TIME TRAVEL PLUS SIMPLY-CONNECTED AND NONORIENTABLE TOPOLOGY, evolution would not explain the origins of life. So extraterrestrial humanoids would need to be human descendants capable of journeying to planets throughout space and time; and using technologies such as terraforming or genetic engineering to adapt to, and colonize, those planets. Earth itself would be colonized via far-future technology traversing space-time wormholes which might originate either in our planet’s distant future or on the planet of descendants who are much more advanced than us. 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”.

A model of the cosmos might be built that uses 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 i² = −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: alone, unbounded imaginary time is finite). This manipulation of time, space, and the universe with virtual and augmented reality might be done not by computers but by band-gap implants (see the earlier section about bandgaps).

This article suggests the entire universe could be composed, at the most fundamental level, of electronics’ binary digits. These enter a natural or artificial time-warp in the distant, far advanced future to produce the Mobius strips, figure-8 Klein bottles, adaptive Wick rotation, and “vector-tensor-scalar geometry” that make up the past and present cosmos. The basics of mammalian cloning have been understood since Dolly the sheep’s birth in 1996. To attain immortality in these physical bodies, a mind may be downloaded into a cloned brain. It’s proposed that individual cells and synapses in the original brain can be connected with their counterparts in the cloned brain via space-time warping. Since space-time and brains may be composed of binary digits, all the information in one organ could be successfully downloaded into the other – transferring each brain area’s memories, perceptual abilities, creativity, etc. Einstein's General Relativity says gravity is a push caused by the curvature of space-time (gravitation therefore is space-time). This means the space-time warping referred to a couple of sentences ago is gravity. To the relief of many, gravity – and the "surfing" of gravitational waves – will make the prospect of human cloning completely unnecessary. This is because the human mind generated by the brain has an essential role in creating the universe (see ^ below) and, therefore, in our interactions with physical reality – leading to the repairing of every minor (even microscopic) defect in the body and brain as it occurs.

Space-time (gravity) connections allowing downloading of minds will one day be extended to everyone who ever lived, resulting in resurrection of loved ones to eternal life and health. Perhaps bodies will be made for them using some form of biotechnology … or perhaps scientists and doctors will somehow reach back in time to obtain samples for cloning. After downloading minds, overpopulation could be avoided by colonizing of other planets in space or in time.

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^ In a science TV program [Australian Broadcasting Corporation, ‘Custom Universe – Finetuned For Us?”, https://www.abc.net.au/catalyst/stories/3836881.htm (2013)], Dr. Graham Phillips reported,

‘the physicist and writer Paul Davies thinks the universe is indeed finetuned for minds like ours. And who finetuned it? Not God but minds from the future, perhaps even our distant descendants, that have reached back through time ... and selected the very laws of physics that allow for the existence of minds in the first place. Sounds bizarre, but quantum physics actually allows that kind of thing.’

And Carl Sagan writes [Carl Sagan, ‘Pale Blue Dot – A Vision of the Human Future in Space’ (Headline Book Publishing, 1995) p. 382]

‘Many religions, from Hinduism to Gnostic Christianity to Mormon doctrine, teach that – as impious as it may sound – it is the goal of humans to become gods.’

Author comment: maybe the term God should be redefined to mean ‘our distant descendants, that have reached back through time …’ Their population of billions would know how to apply the laws of Quantum Gravity – the anticipated unification of Quantum Mechanics and Einstein’s theory of gravity, General Relativity - to become omnipresent in space-time as well as its other dimensions, and to become omnipotent and omniscient. They could then constitute the Elohim - a name used for God in the Old Testament which, according to World Book Encyclopedia, means the PLURAL MAJESTY OF THE ONE GOD.) [‘Elohim’, The World Book Encyclopedia (Field Enterprises Educational Corporation, 1967)

It seems possible that, after death and before conception, a human exists as a member of the Elohim: humans from the distant future who have learned how to affect all space and all time, including our past and present. Since anything and everything is possible for such a being, we could either exist eternally in that condition or choose to be born on Earth and have a human life. The latter would give us new perspective and experiences. It would also allow us to directly contribute to the eventual rise of Elohim civilization: perhaps by adding something to some field of knowledge or technology (this might oneday lead to the ability to choose eternal life as a human); perhaps by ensuring that the human race continues into new generations; perhaps by sharing with, and otherwise helping, whomever we can.

The Elohim use Quantum Gravity and the Theory of Everything to become entangled with all space-time. Therefore, their power has no limits and it must be possible for them to concentrate those abilities in, and to occupy, one individual body (a part of the space-time they're entangled with). That individual (and since the entire universe, the present, all the past, and all the future are united; every individual) has the potential to be omnipresent, omnipotent, and omniscient. One day, you and I will fulfil our potential to exist everywhere/everywhen (this could be termed immortality). We'll also someday be all-powerful and all-knowing.

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THE END (FOR NOW)