***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***

# By Rodney Bartlett

# Member of ResearchGate and ORCID (**0000-0003-2240-3743)**, Certificates in Astrophysics from ANU (Australian National University), Certificates in Robotics from QUT (Queensland University of Technology, Australia)

**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)

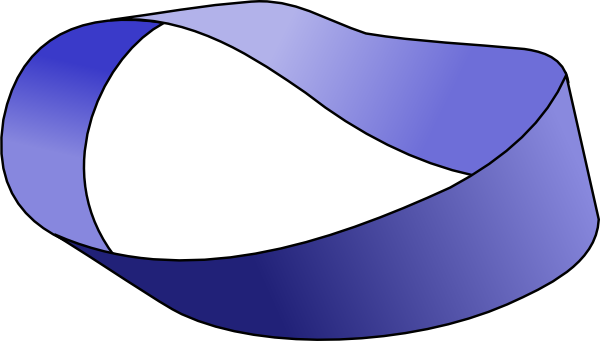
b) Erik Verlinde says gravity is not a fundamental force of nature, but an emergent phenomenon. In the same way that temperature arises from the movement of microscopic particles, gravity emerges from the changes of fundamental bits of information, stored in the very structure of spacetime. (3)

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).

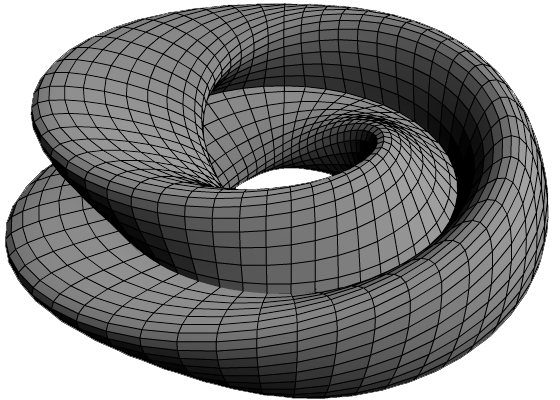
**\* Since the Klein is 2-dimensional, the statement about a couple of two-dimensional Mobius strips uniting to form a three-dimensional figure-8 Klein bottle needs further explanation -** A Klein Bottle is a 2-dimensional manifold (collection of points) whose inside is its outside. It can only exist 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).



**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).

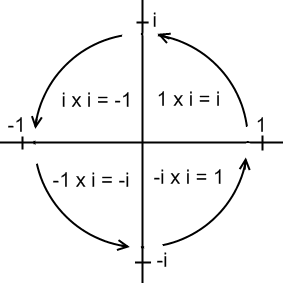
\* “Physicists now believe that entanglement between particles exists everywhere, all the time, and have recently found shocking evidence that it affects the wider, ‘macroscopic’ world that we inhabit.” (8) Though the effect is measured for distances in space, the inseparability of space and time means 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.



**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**



**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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