

# Using the discovery of fundamental variables by artificial intelligence to unite general relativity and quantum mechanics

## Abstract

Article includes

- “Linking radioactive dating to origin of the universe” or “How dinosaurs committed scientific heresy & exterminated the Big Bang”
- Vector-tensor-scalar geometry’s important insights into 1) Cancer, 2) The origin of the moon

In a newsletter discussing “Automated discovery of fundamental variables hidden in experimental data” (Chen, B., Huang, K., Raghupathi, S. et al. Automated discovery of fundamental variables hidden in experimental data. *Nat Comput Sci* 2, 433–442 (2022). *Cosmos Magazine* attributed the following statement to co-author Qiang Du, “What other laws are we missing simply because we don’t have the variables?” According to *Cosmos*, another co-author (Hod Lipson) argues that scientists may be misinterpreting or failing to understand many phenomena simply because they don’t have a good set of variables. All of this reminds me of the Hidden Variables associated with Albert Einstein’s doubts about quantum mechanics. I’ve been thinking about hidden variables for perhaps twenty or more years and it seems that their combination with the Mobius strip, figure-8 Klein bottle, base 2 mathematics, vector-tensor-scalar geometry, and Wick rotation might unite quantum mechanics and relativity. The union would result in explanation of particles existing in two or more places at once being due to our frame of reference. It would also explain wave-particle duality and, on a universal scale, why there was no Big Bang. The section on vector-tensor-scalar geometry is very important since it provides insights into 1) cancer, and 2) the origin of the moon.

The yet-to-be-discovered underlying physics of the wave function proposed in this comment predicts exactness in outcomes, not probability or randomness. Quantum mechanics says particles can, according to our frame of reference, be in two or more places at once. This frame of reference is necessarily restricted to our present understanding of quantum mechanics which Albert Einstein and his colleagues claimed to be incomplete. 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.

Despite Bell’s theorem and the more recent Pusey–Barrett–Rudolph theorem, hidden variables can be a valid theory since the following boxed explanation of unification of all time periods allows the existence of both “retarded” waves going forwards in time and the disfavoured “advanced” waves travelling back in time and this permits quantum entanglement of every form of mass if, as shown, gravitational waves interacting with electromagnetic waves is responsible for production of mass. The misperception that the universe is expanding is accounted for by retarded/advanced shift.

**Keywords:** hidden variables, unipositional quantum mechanics, relativity’s time dilation, production of the higgs and all mass, unification of all mass and all time, dark matter and dark energy, retarded/advanced shift explains misperception of expanding universe, static universe, cancer, origin of the moon

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## Introduction

There’s an App for that! (Applying Quantum Certainty to the Prevention of Red Giants) 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. Wikipedia explains "The double-slit experiment is a demonstration that light and matter can display characteristics of both classically defined waves and particles. This type of experiment was first performed, using light, by Thomas Young in 1802, as a demonstration of the wave behaviour of light. At that time it was thought that light consisted of either waves or particles. With the beginning of modern physics, about a hundred years later, it was realized that light could in fact show behaviour characteristic of both waves and particles."

Thinking about the double-slit experiment can develop into a new interpretation of quantum mechanics that explains how particles can seem to be in two places at once. Since the explanation says the universe functionally only consists of one particle, it removes the differences between bosons and fermions deleting wave-particle duality.

### Start of boxed explanation

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 *unus* meaning one. This unipositioned particle interferes with itself since it's composed of self-intersecting Mobius strips. Self-intersecting Mobius strips also explain how the particle interfering with itself causes 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)
- 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).

When we solve (19th-century Scottish physicist James Clerk) Maxwell's equations for light,<sup>1</sup> 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.<sup>2</sup> 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.<sup>3</sup> Therefore, gravitational waves also have advanced components going back in time.) "Engineers have simply dismissed the advanced wave as a mathematical curiosity since the retarded waves so accurately predicted the behaviour of radio, microwaves, TV, radar, and X-rays. But for physicists, the advanced wave has been a nagging problem for the past century.<sup>2</sup> Assuming everything should always be open to being questioned, let's take a fresh look at advanced waves. All mass is composed of gravitational and electromagnetic waves, according to

vector-tensor-scalar (VTS) geometry inspired by the title of Einstein's 1919 paper "Do gravitational fields play an essential role in the structure of elementary particles?"<sup>4</sup> and described below. 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 (please see next paragraph). Therefore, all time (the entire past and present and future) is united into one thing just as all space and all mass are united into one thing. (If time only passed rectilinearly - from past to present to future - the idea of waves travelling back in time would make no sense at all. But if time is curvilinear - with past, present, and future interconnected - time must be able to move from future to present to past.)

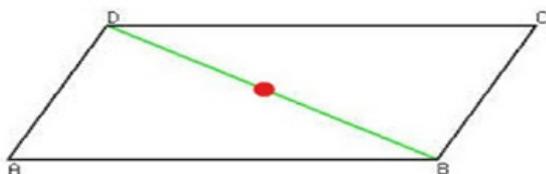
To answer the question of how the momentum of photons and gravitons produces mass, please recall that trillions of Mobius strips or figure-8 Klein bottles can form, respectively, a photon and a (presently hypothetical) graviton. An understanding of those particles' composition – they form the interacting gravitational/electromagnetic waves, and graviton/photon momentum, of VTS Geometry - is helpful. It also gives plausible answers to a couple of questions Albert Einstein asked – "What is a photon?", and "How could gravitational-electromagnetic unity be possible?" (the photon and graviton would both form from the topological Mobius and Klein [as well as binary digits], thus producing gravitational-electromagnetic unity). Let's swing to the opinion of Max Tegmark, MIT professor of cosmology, that the universe is literally composed of mathematics.<sup>5</sup> Building on his belief, let's say electronics' binary digits (BITS) of 1 and 0 - aka base 2 maths - are the ultimate composition of, and are used to "draw", Mobius strips. Then two Mobius strips can unite to form a figure-8 Klein bottle.<sup>6</sup> Trillions of Mobius strips can form a photon, and trillions of more complex figure-8 Klein bottles can form the more complex graviton. (The Klein is immersed, not embedded, in the 3rd dimension - a photograph of a stapler is a 2-dimensional immersion of a 3-dimensional stapler, and an immersion may have self-intersections; embeddings have no self-intersections.) If the whole universe is projected from 2D (as proposed by the holographic-universe theory), then both gravitational and electromagnetic waves must be projections from 2D, too i.e. from the Mobius strip which is made up of binary digits. Therefore, the range of frequencies (aka bandwidth) called gravitational and electromagnetic waves is composed of BITS. The universe is a mass of this gravitational-electromagnetic unification (and there is nothing except sufficient bandwidth).

### 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 a chaotic and random way assembling the planets.<sup>7</sup> 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.<sup>8</sup>

Explanation of geometric display of mathematics' vectors, scalars, and tensor calculus adapted from (Figure 1).<sup>9</sup> 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).



**Figure 1** VTS (vector-tensor-scalar) geometry - Interaction of gravitation and electromagnetism produces a momentum in gravitons and photons (and a pressure which is known as mass).

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  $\frac{1}{2}$  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.<sup>10</sup> 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  $125 \text{ GeV}/c^2$ , its union with spin 0 produces the Higgs boson.  $125 \text{ GeV}/c^2$  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).

$\text{GeV}/c^2$  originates with  $E=mc^2$  solved for  $m$  ( $m=E/c^2$ , 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.

### 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 ( $1-\frac{1}{2}+\frac{1}{2} =$  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,<sup>11</sup> - "What the spin of a particle really tells us is what the particle looks like from different directions."

- i. 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.
- ii. 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.
- iii. Spin 0 is like a ball of arrows having no spaces. A Higgs boson looks like a dot: the same from every direction.
- iv. Spin  $\frac{1}{2}$  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.

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 - retarded/advanced 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  $2 \div 1$ . The mass produced has the spin inherent in each of the gravitons composing space-time and could be an alternative, or complementary, method to supernovas for producing the gravitational waves making up black holes.

### Vector-tensor-scalar geometry's important insights

**Cancer:** 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?" 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 DNA repair and cancer arise from interaction between the two forces known when Einstein wrote (gravitation and electromagnetism).

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 tumor 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.

**Origin of the moon:** Astronomy's nice model from earlier this century speculates that Jupiter migrated in the early solar system, moving closer to the Sun than its present position then retreating farther away. Similarly, this article hypothesizes that Mercury formed beyond the orbit of Mars because its high potassium/thorium ratio indicates that it formed farther from the Sun, and migrated inwards. The Moon's potassium level is approximately ten times lower than that of Venus or Earth. Therefore, it would have been closer to the Sun than Mercury is today and much of its potassium would have evaporated into space. The Clementine data from the US spacecraft launched to explore the moon in 1994 best fits the capture hypothesis - the potassium model placing the Moon's origin close to the Sun. A damaging blow was delivered to the capture hypothesis by the discovery that the Moon rocks were, in other respects (apart from volatiles and iron), hauntingly similar to those on Earth. The Earth-Moon system has unique chemical and isotopic signatures compared with other planetary bodies; any successful model for the origin of this system therefore has to satisfy these chemical and isotopic constraints.

Current theories about the Moon's origin involve a) CO-ACCRETION, proposed by Edouard Roche in 1873 (the Moon condensed nearby from a disk of gas and dust encircling the proto-Earth), b) CAPTURE, suggested in 1909 by Thomas Jefferson Jackson See (the Moon formed out past the orbit of Uranus, eventually coming close and being bound to Earth's gravity). The other theories regarding lunar origins can be divided into c) Darwinian fission and d) Theian fission. First, Darwinian fission - the first detailed attempt at investigating where the Moon came from was put forward in 1879 by George Darwin, son of the famous evolutionary naturalist Charles. This says Earth was spinning so rapidly 50 million years ago that centrifugal force caused it to bulge markedly at the equator. The Sun's gravity then tore away a large blob of the protruding material, and this solidified into the Moon. The much more recent Theian fission, or giant-impact hypothesis, says an ancient Mars-sized planet called Theia collided with the early Earth some 4.5 billion years ago, with the Moon developing from the blob of vapour, melted rock, and debris that resulted. Recent research spells trouble for the co-accretion theory which assumes a basic chemical kinship between Earth and its satellite. The Moon's relative scarcity of volatiles and iron hardly suggests chemical kinship of Earth and Moon.

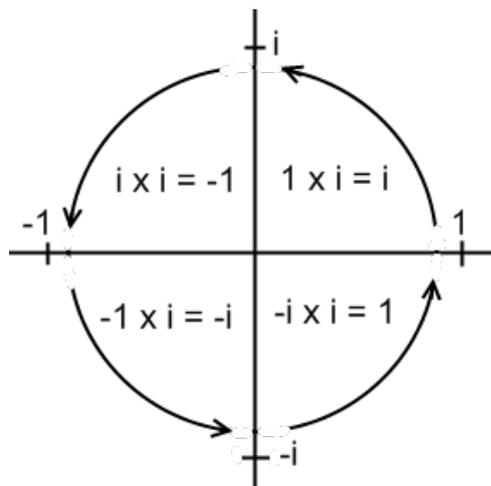
The similarity of chemical and isotopic signatures within the capture hypothesis can be explained using the section titled Vector-Tensor-Scalar (VTS) Geometry. This says "... the particles of matter in the protoplanetary disk could imprint themselves on the waves' interaction and, like the repeating action of refreshing or reloading a computer screen, repeat the action of building up a planet layer by layer in order for two similar planets (the Earth-Moon system) to come into being. The differences in the quantities/distribution of iron, oxygen, water, mass, etc simply means that the building up of two similar planets may be compared to a gravitational/electromagnetic scanner incorporating a subroutine utilizing "fuzzy logic". VTS Geometry also provides insights into the production of mass - including the Higgs boson, stellar jets, and black holes, the bosons of the strong and weak nuclear forces. There are even insights into dark matter, dark energy, the alleged Big Bang's readshift, the static universe, and quaternions.

Quaternions were first described by Irish mathematician William Rowan Hamilton in 1843 (Figure 2). Hamilton defined a quaternion as the quotient of two vectors.<sup>12</sup> 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). (The quotient of two vectors is also  $2/1$ .) 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.

### Linking radioactive dating to the origin of the universe or how dinosaurs committed scientific heresy & exterminated the Big Bang

The following is a logical deduction from "Using the Discovery

of Fundamental Variables by Artificial Intelligence to Unite General Relativity and Quantum Mechanics” which states -



**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 centre of the plane.

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 - retarded advanced 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”.

When a dinosaur dies, the advanced gravitational and electromagnetic waves composing its particles would continue traveling back in time. By the time its bones or fossilized remains, or the surrounding rocks, were subjected to modern science’s dating methods; those advanced waves might have gone so far back in time that the dating method says the dinosaur died 100 million years ago or more. Radioactive dating is thus a form of (advanced) gravitational-wave detection, just as LIGO - the Laser Interferometer Gravitational-wave Observatory - picks up (retarded) gravitational waves. Technology based on the way noise-cancelling headphones work might provide a more accurate reading of when the dinosaur lived. The headphones increase the signal-to-noise ratio by incorporating a microphone that measures ambient sound (noise), generating a waveform that is the exact negative of the ambient sound, and mixing it with any audio signal the listener desires. Generating a waveform that’s the exact opposite of the advanced waves emitted by the deceased dinosaur should, at least partially, neutralize the advanced waves and restrict measurement to the retarded waves associated with the animal’s decay.

### Impact on health and lifespan

Advanced waves also cause living creatures to age faster than they would without those waves, by extending the creatures’ reach into the past (this is equivalent to having lived longer). Neutralising the

advanced waves should dramatically increase the health and lifespan of humans and all other species if it doesn’t adversely affect anatomy and physiology i.e. if the retarded waves which go forward in time are sufficient for normal structure and function.

### How did the universe originate after dinosaurs deleted the Big Bang?

In the section of the article regarding VTS Geometry, gravitational and electromagnetic waves form every massive 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. 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 (in a functional sense) - 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 *unus* meaning one).

Creating something which has always existed seems to be a paradox – whose definition is “a seemingly absurd or contradictory statement or proposition which when investigated may prove to be well founded or true”. On the subject of paradox, 20th-century physicist Niels Bohr said, “How wonderful that we have met with a paradox. Now we have some hope of making progress”. He also said, “Your theory is crazy, but it’s not crazy enough to be true”. Hopefully, the crazy ideas in this article are “crazy enough to be true”. So, how might it be done? A model of the cosmos might be built that uses the infinite number  $\pi$  and imaginary time, and resides in Virtual Reality (artificial, computer-generated simulation). The entanglement (quantum-mechanics style) in the simulated universe is unable to remain separate from the entanglement existing in our perceived reality because computers using so-called “imaginary time” (which is defined by numbers with the property  $i^2 = -1$ ) remove all boundaries between the two universes. This enables them to become one Augmented Reality (known now as technology that layers computer-generated enhancements onto an existing reality but seen here as the related layering of virtual reality onto other points in time and space). The poorly named imaginary time of physics and mathematics unites with  $\pi$  (both are necessary to generate a non-Big-Bang cosmos i.e. an infinite universe which, because space and time can never be separated, is eternal). This manipulation of time, space, and the universe with virtual and augmented reality might possibly be produced by the two-valued binary-digit system used in electronics traversing a wormhole, or shortcut between folds in space and time, designed by humans of the far future. The augmented reality which is layered on “other” points in space-time actually isn’t transmitted to other points - because of unipositional quantum mechanics, only one ever exists. Thus, transmissions to any (apparently other) places or times wouldn’t be restricted to the speed of light but are instantaneous.

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None.

## Conflicts of interest

The Authors declares that there is no Conflict of interest.

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