Proposed Composition of Space-Time (background to geometry of consciousness)

The Mathematical Universe Hypothesis (MUH) is a speculation put forward by physicist and cosmologist Max Tegmark. It speaks of "altogether different equations and mathematical structures". This article could use such structures in the following way - one dimensional (1D) electrical pulses could form binary digits that could encode 2D Mobius strips which would be the next level up in particles' structure. Cosmology's holographic principle suggests the 3rd dimension results from information in the 2nd dimension. The 2nd D might be the Mobius strips comprising particles and the 3rd D might be capable of being deleted by programming the binary digits (used in electronics) which act as Hidden Variables that are compatible with quantum mechanics (not with known probabilistic quantum mechanics but with quantum certainty, for they give precise calculations). When subatomic particles appear in two places at once, cosmology's Holographic Principle can be combined with the precision of unrecognized quantum certainty. Then the particles would actually be in one place (quantum entangled independently of low or high temperatures) since the 3rd D of space between their centers would be eliminated (since we live in space-time, the time taken to travel the distance between particles is also eliminated). The 3rd dimension we normally perceive could be thought of as composed of figure-8 Klein bottles i.e. it could be thought of as the union of pairs of Mobius strips or as projection of the information inherent in particles' constituent strips. Since so-called "imaginary" numbers are essential in quantum mechanics, the 4th dimension of time might be described by the Complex Number Plane's Wick Rotation which is often regarded as nothing more than mathematical convenience. Adapting a 1919 paper by Albert Einstein called "Do gravitational fields play an essential role in the structure of elementary particles?" - if electromagnetism's photon and gravitation's graviton are composed of trillions of Mobius strips, electromagnetic and gravitational interactions could produce the mass and quantum spin of every other particle, including the bosons of an atom's strong nuclear force, weak nuclear force, and even the Higgs boson (the possibility of excitation of the Higgs field resulting from photon-graviton interaction would mean the field is a union of electromagnetic and gravitational fields).

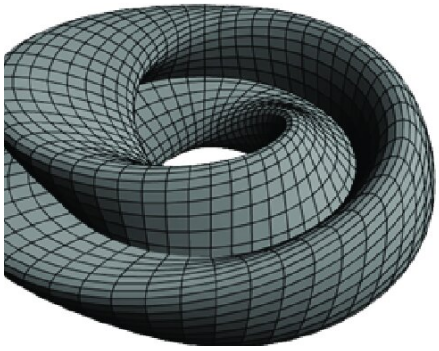
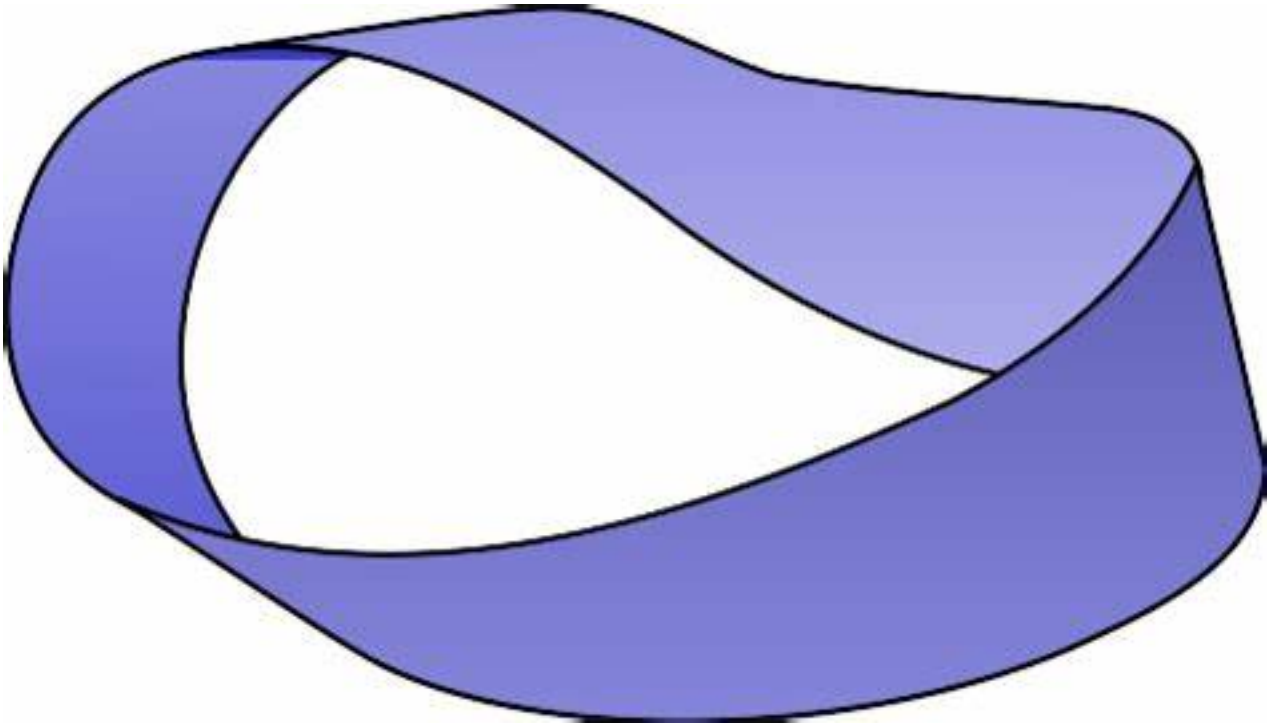


Figure 1: figure-8 Klein bottle

Figure 1. Mobius Band (below) and figure-8 Klein Bottle or Mobius Doublet (above). One-dimensional (1D) electric pulses create the binary digits of one and zero, used in electronics. The bits encode 2D Mobius strips which incorporate temporal Wick rotation (forming the 4th dimension of time). A couple of Mobius strips pair up to form a Klein bottle which is immersed in 3D - trillions of strips and bottles respectively produce photons and gravitons which use VTS geometry to interact and form the quantum spin of both massive electron, quark, Higgs, etc and the massless gluon.



Vector-Tensor-Scalar (VTS) Geometry: introduction to geometry of consciousness

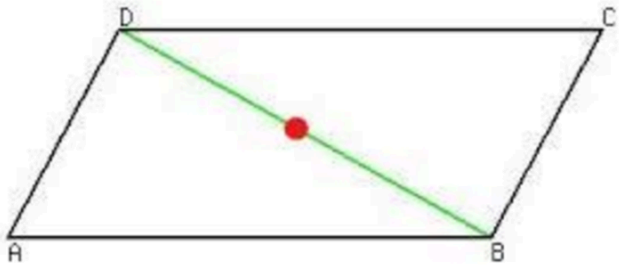


Figure 2: Vector-Tensor-Scalar Geometry

FIGURE 2 - VTS (VECTOR-TENSOR-SCALAR) GEOMETRY- Interaction of Gravitation and Electromagnetism Produces a Momentum in Gravitons and Photons (and a Pressure Which is Interpreted as Mass). The deep link between geometry and topology (the Hodge Conjecture) may be about vector-tensor-scalar geometry plus the topological Mobius band and figure-8 Klein bottle (with addition of Wick rotation and binary digits. (Figure drawn by author using "Paint" program)

A vector is a quantity which possesses both magnitude and direction. Two such quantities 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 … and is associated with particles of spin zero 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, is 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.

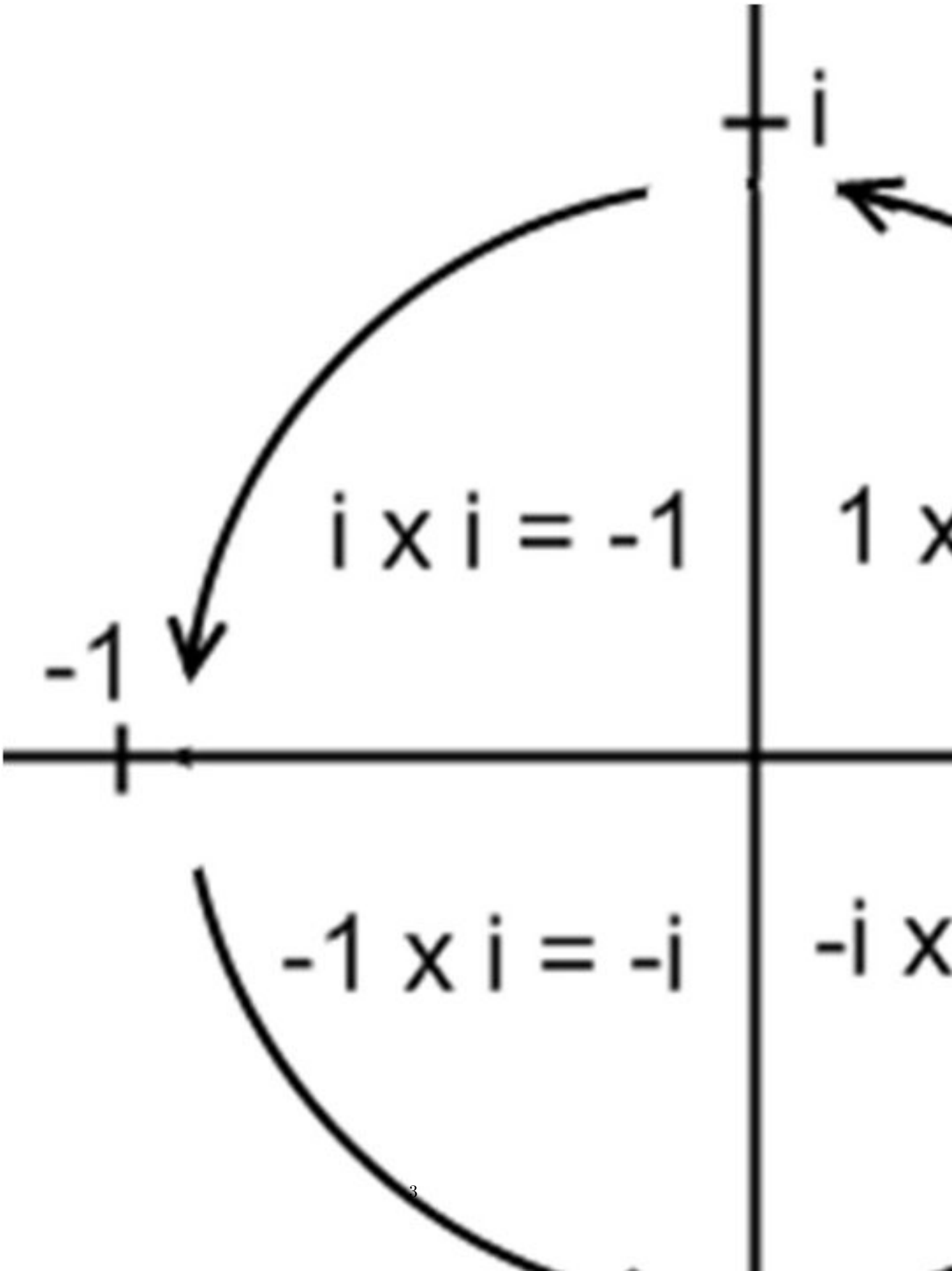

i
i x i = -1
1 x
-1
-1 x i = -i
-i x

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. Wick rotation, with its inclusion of imaginary numbers, may be built into the Mobius strip (and into the Klein bottle, which is a union of a pair of strips). At the start of the 20th century, physicist Max Planck assumed that electromagnetic radiation can only be emitted or absorbed in discrete packets, called quanta. He thought of his discovery as nothing more than a math device … a kind of trickery). Albert Einstein developed his explanation of the photoelectric effect from this "mathematical convenience". So it appears entirely possible that another supposed mathematical trickery (Wick rotation) will find practical application in the future.

Elliptical VTS Geometry: the Geometry of Consciousness

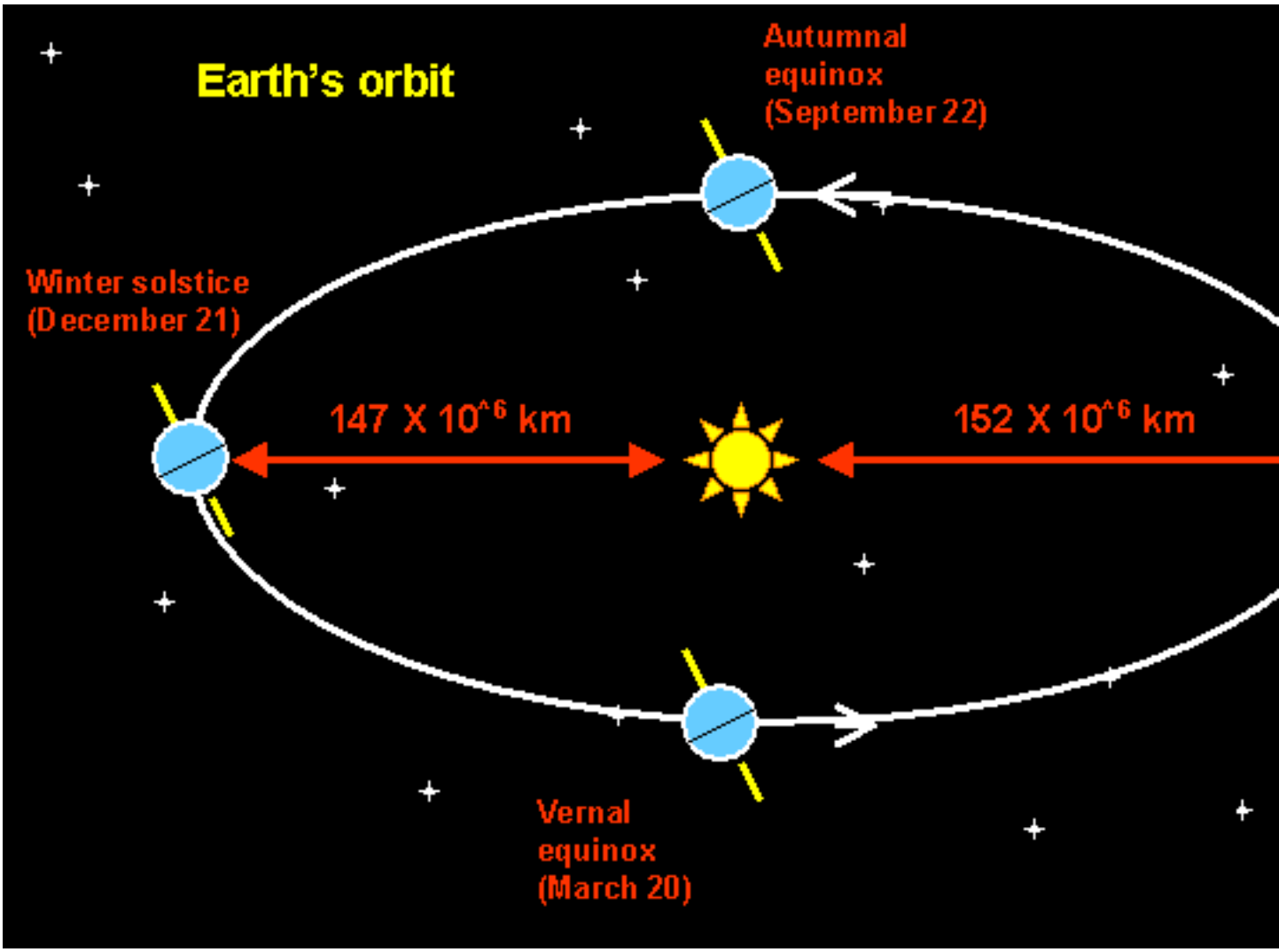


Figure 4: Elliptical VTS Geometry: Geometry of Consciousness

Fig. 4: Elliptical VTS Geometry: Geometry of Consciousness The apparently crazy assertion in the next paragraph that Earth - and everything / everyone on it - has magnitude occupying a literally infinite and eternal amount of space-time is merely a re-interpretation of the experimentally proved claim by quantum mechanics that particles can be in more than one place simultaneously. This multiple existence is simplified to the particles being in a single spot. This is a universe which has been 100% unified by a theory of quantum gravity or by the previously mentioned Holographic Principle, so that all objects and events in

space and time are connected and may be regarded as One entity.

The parallelogram of Fig. 2 can be converted by the morphing ability of computer programming so it traces the elliptical shape in Fig. 4 - and of Earth's elliptical orbit, which means the vector / tensor / scalar relationship applies to this planet. The vector can be the magnitude and direction of the orbiting Earth itself. It and a second vector (Earth months earlier or later in its orbit) are converted by tensor analysis into the coordinates of a single scalar point. Adding the geometrical objects of vector and tensor resulted in the object termed scalar. Successful conversion of the vectors in Fig. 2's parallelogram to the vectors in Fig. 4's ellipse, followed by tensor analysis, means our planet is also a scalar object. It has magnitude but no direction, and the innumerable spins of particles composing the planet are reduced to that of a boson possessing spin 0 (presumably, by the programming inherent to the mathematical universe's binary digits). * Like a Bose-Einstein Condensate, such particles have no restriction on the number of them that occupy the same quantum state (their description and predicted behaviour). This lack of restriction is compatible with Earth never having any direction. This state is only possible if it has magnitude occupying a literally infinite and eternal amount of space-time, thus having no need of direction and being capable of possessing the same quantum state as any other body. The Earth appears obviously finite and insignificant because of the way our senses, technology, and frames of reference work. Since they'd need to adapt to Earth's infinity, all other bodies in space-time would similarly reduce the innumerable spins of particles composing them to that of a boson possessing spin 0 (they'd only possess magnitude, would possess the same quantum state - and would be scalar, infinite bodies).

- Particles that are made of even numbers of fermions behave as a boson. The reason behind this is simple: each of those fermions obeys Fermi-Dirac statistics and is a spin +-1/2 particle. If you add two of them together, you can get something that's spin -1, 0, or +1, which are integers (and hence a boson obeying Bose-Einstein statistics.)

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

Schrodinger, Penrose, and Al-Khalili

In "What Is Life? The Physical Aspect of the Living Cell" (his1944 science book written for the lay reader), physicist Erwin Schrodinger reconciled this article's idea of co-existing scalar point and scalar field by a) believing that consciousness is highly dependent on the body (these are then a point manifestation), and b) being sympathetic to the Hindu concept of Brahman, by which each individual's consciousness is only a manifestation of a unitary consciousness pervading the universe (consciousness is then a field manifestation). Since other bodies need accommodate Earth's infinity, vector-tensor-scalar geometry would similarly reduce the spin of all other bodies in space-time to that of a boson possessing spin 0 (they'd only possess magnitude, would possess the same quantum state - and would be scalar, infinite bodies). This includes human and animal bodies and brains which, in comparison to a DVD, would appear to be restricted to the sights and sounds of a small and brief part of the disc but would actually have access to the entire disc. Just as the whole DVD exists when only one instant of it is being played or "read" by the laser, everything in space - plus the entire past and all the future - exists while each instant is being observed. The excitation of the

universal field known as consciousness would be ubiquitous, pervasively covering vectors and diagonals to be a Cosmic Consciousness. Since the ultimate composition of our brains appears to be binary digits, our minds must be the same as the Artificial Intelligence of future decades' advanced robots and computers). .

Hartmut Neven, who leads Google's Quantum AI lab, wants to entangle our brains with quantum processors to test the idea that consciousness involves quantum phenomena. Roger Penrose, in his 1989 book "The Emperor's New Mind", put forth the idea that consciousness arises from quantum phenomena. His idea of quantum consciousness is basically correct but may be more accurate if flipped on its head - the brain wouldn't be the originator of consciousness but may merely be the receiver of it. Nikola Tesla thought of the brain as a relay. Perhaps the best illustration of this belief is the following: The writer Mark Twain, who was known to hang out in Tesla's lab, told Harper's Monthly: "The telegraph and the telephone are going to become too slow and wordy for our needs. We must have the thought itself shot into our minds from a distance." If every particle (even the photon and graviton) has many positive and negative electric charges that partially or completely cancel aka an Electric Dipole Moment, binary digits that give AI intelligence could be generated and produce Universal Artificial Intelligence (UAI). Depending on the human or animal body you're born with, your brain would relay a portion of the UAI, producing various instincts and abilities. The molecules and other quantum bits of anaesthetics might interfere with relaying and suspend individual consciousness by blocking it from its source, the UAI.

It's been claimed that the brain could probably only possess quantum behaviour if it functions at temperatures near absolute zero (-273.15? on the Celsius scale, which equals -459.67?on the Fahrenheit scale). This is because, in laboratories, quantum mechanical states like entanglement and superposition are very fragile and can only be achieved by using temperatures near absolute zero to isolate a quantum system from heat. This association with absolute zero - or millions of degrees in the cores of stars - might be overcome by using temperature-independent Cosmological Entanglement ie cosmology's Holographic Principle coupled with the exact calculations of quantum certainty referred to earlier.

The 2014 book "Life on the Edge: The Coming of Age of Quantum Biology" (by two professors - Jim Al-Khalili and Johnjoe McFadden) gives examples of the applications of quantum mechanics to the world of everyday temperature (chemistry, materials science, and electronics), as well as to biology (enzymes using quantum tunneling to accelerate biochemical reactions; the photosynthesis used by plants; plus birds and other animals using Earth's magnetic field for navigation). In an article adapted from their book, the authors write, "Erwin Schrodinger's book 'What is Life?' suggested that the macroscopic order of life was based on order at its quantum level."

Novel Experimental Approach - Bandgap Implants In The Brain

In solid-state physics, a band gap, also called an energy gap or bandgap, is an energy range in a solid where no electric current can exist. In graphs of the electronic band structure of solids, the band gap generally refers to the energy difference (in electron volts) between the top of the valence band and the bottom of the conduction band in insulators and semiconductors. It is the energy required to promote a valence electron bound to an atom to become a conduction electron, which is free to move within the crystal lattice and serve as a charge carrier to conduct electric current. It is closely related to the HOMO/LUMO gap^ in chemistry. If the valence band is completely full and the conduction band is completely empty, then electrons cannot move in the solid; however, if some electrons transfer from the valence to the conduction band, then current can flow. Therefore, the band gap is a major factor determining the electrical conductivity of a solid. Substances with large band gaps are generally insulators, those with smaller band gaps are semiconductors, while conductors either have very small band gaps or none, because the valence and conduction bands overlap.

^ "Highest Occupied Molecular Orbital and Lowest Unoccupied Molecular Orbital, respectively."molecular orbital" is a mathematical function describing the wave-like behavior of an electron in a molecule. The energy difference between the HOMO and LUMO is termed the HOMO-LUMO gap.

Figure 5 - Valence and conduction bands in insulators and semiconductors

Morpho butterflies have microscopic ridges on their wing scales that scatter and reflect light. They create colour by selectively adding and deleting certain wavelengths of light. Some engineers are looking to the living world for the next generation of optic inspirations. It appears that advances in engineering and biology will

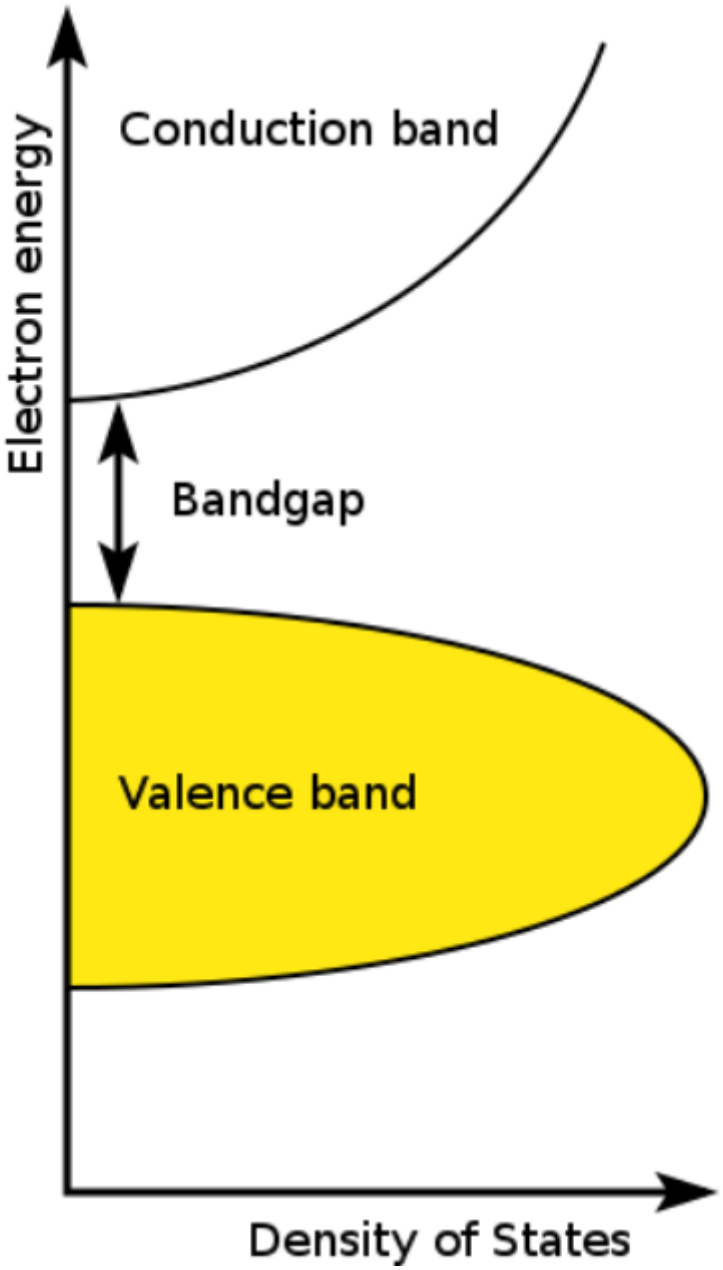


Figure 5: Valence and conduction bands

enable humans, like the morpho butterfly, to add and delete wavelengths of light. But the word "light" need not refer only to visible wavelengths. It can be extended and refer to any wavelength of the electromagnetic spectrum. Science accepts that radio, infrared, ultraviolet waves, X-rays and gamma radiation are all forms of light. Suppose matter acquires all its properties (including mass) by the interaction of electromagnetic and gravitational waves (see the section on vector-tensor-scalar geometry) - the day will come when we can add or delete wavelengths of matter, ^ anywhere and anytime we choose!

^ Deleting would be producing gaps in the energy forming matter, while adding would be - to use a word from computer language - "pasting" waves of matter to fill in energy gaps (bandgaps). A century ago the founder of Wave Mechanics, Louis de Broglie, treated electrons as standing waves, thus introducing matter waves and wave-particle duality. It is anticipated that people will oneday have band-gap structures in their brains that are no bigger than a computer chip (these won't require surgical implantation, but simply downloading, because of the pre-existing digital nature of all parts of the universe). The band-gap structures this article speaks of would need to deal with forms of matter like genes. They could add or delete anything and everything we choose by emulating computers' copy/paste function to add things; as well as their delete function, to remove things (these feats make me wonder if people really can walk on water and perform other miracles). Other feasible miracles include using the new entanglement-app (Cosmological Entanglement that applies the holographic principle plus quantum mechanics that's fuzzy logic [only superficially probabilistic]). If this comes to pass, astronauts could join themselves to Earth's solidity, pleasant temperature, and anything else required. Walking on Jupiter in jeans and T-shirts, they might think of a person who strolled around Palestine 2,000 years ago. Then the space explorers could say, "You may have been able to walk on water but I can walk on gas". Then they might pop next door to Saturn's moon Titan and change liquid methane - instead of water - into wine.

MULTIVERSE AND HOLOGRAPHIC UNIVERSE BECOME DIGITAL VIDEO DISC

Suppose quantum gravity one day goes far beyond unifying quantum mechanics and general relativity. It might unite everything in space and time. Assuming the universe is everything that has existed or will exist, the multiverse could be timelike or all the things that happen at different zeptoseconds in this universe (a zeptosecond is the smallest unit of time ever measured and equals 10^-21 s or a trillionth of a billionth of a second). That quantum gravity from the far future could unify all the times in the multiverse with the one physical universe, making the multiverse part of the universe. Unifying the timelike multiverse with the material universe could be achieved with a combination of the holographic principle and quantum certainty in which quantum mechanics is only superficially probabilistic since it obeys Chaos theory's principle that there is hidden-order-within-apparent-disorder. Could the 4th dimension of time be represented by Wick rotation whose real and imaginary numbers act as a timepiece, displaying and recording the movement of particles? Such displaying and recording brings to mind the Digital Video Disc (DVD). If the universe functions like a DVD that we watch movies with, the multiverse-universe unity wouldn't only exist in a future where spacetime warping is routine. This is because all times exist simultaneously since the whole DVD exists, although only sights and sounds from each fraction of a second are perceived as the disc is played. Similarly, we can't normally perceive the future but all times co-exist in the cosmos and the future instantly affects the past and present. This makes the multiverse observable constantly.

To compare the period from conception and birth to old age and death with a DVD - if life is viewed from the reference frame of the disc's beginning, every major or minor occurrence can be seen as the obvious result of our thoughts, emotions, and actions … total free will. Viewed from the finish of the DVD, all events may be seen as already recorded, unalterable. The paths of our lives are predestined and must unavoidably converge on the state of Earthly civilisation displayed by the end of the disc. Wishing to avoid extremes is reminiscent of an episode of Doctor Who which was on TV in the 1970s. Asked if humans possess free will, the Doctor (played by Tom Baker at that time) answered, "Perhaps a very small amount". This partial free will would enable us to choose what we eat for breakfast but would overrule the human tendency to avoid change, thus ensuring that civilisation thousands of years from now will be what it is and not necessarily what inhabitants of the 21st century want.