Title
Explaining the “Pioneer anomaly” by refinement of gravitational physics, and related topics ranging from cosmic to human to quantum levels

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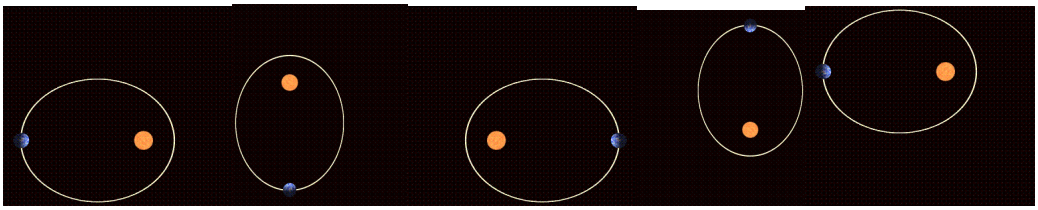
Abstract –
How the "Pioneer anomaly" refines Einstein's gravitation / space-time; and how equations he developed in 1919 show that the space warping in General Relativity extends to subatomic particles (with related topics: deflection of starlight, Optical Effect, electromagnetism, intergalactic and time travel, teleportation, the nuclear strong and weak forces, Theory of Everything or Unified Field Theory, quantum entanglement, retrocausality, dark matter, dark energy, Mobius strip, Klein bottle, Poincare conjecture, planet Mercury, precession, General Relativity, gravitation, dark flow, infinity, hidden variables, virtual particles, binary digits, wormholes, cosmic strings, quantum fluctuation, tides, origin of life, science-based eternal life, 5^{th}-dimensional hyperspace [I think this can be called “prespacetime” which is a non-temporal and non-spatial domain theorized to be the foundation of spacetime], the Law of Conservation of Energy, and how data from both the Big Bang and Steady State theories is essential).

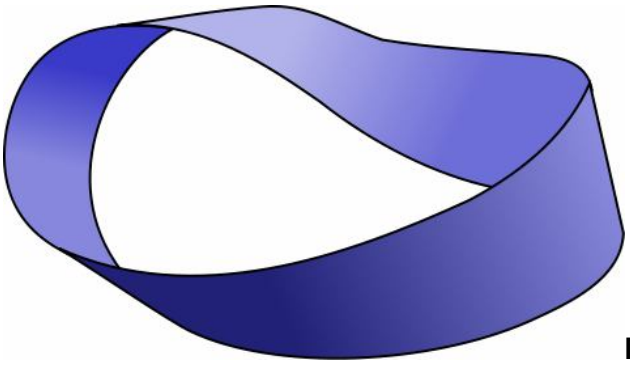
Content –
An experimental proof of the validity of the Theory of General Relativity is described by the following - According to Newton's theory, the planet Mercury moves in an ellipse about the Sun. According to Einstein's theory, the ellipse will turn about forty-three seconds of an arc per century more than Newton’s equations predict (all the planetary orbits precess, but the amount is greatest for Mercury). A complete rotation equals 360 degrees x 60 minutes x 60 seconds (1,296,000 seconds). 1 296 000 / 43 = 30,139.53488 (approx. 1 / 30,140 of a rotation).



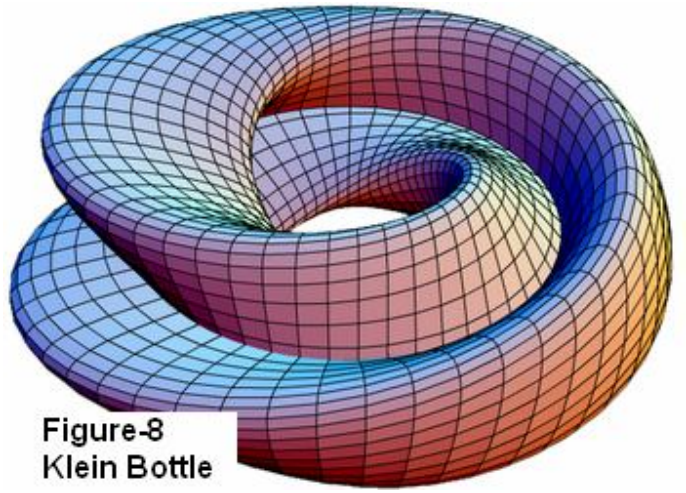
ORBITAL (PERIHELION OR APSIDAL) PRECESSION –
Imagine the orange star maintains the same position precisely halfway between top and bottom. Then the blue Earth’s orbit precesses (rotates gradually over about 112,000 years)

According to http://hypertextbook.com/facts/1997/PatricePean.shtml, the space probes Pioneer 10 and 11 are respectively travelling 2.39 and 2.22 Astronomical Units per year (1 astronomical unit is the average distance between the Earth and Sun - it equals 92,955,807.273 miles (from Wikipedia's "Astronomical unit").

Therefore, Pioneer 10 travels 2.39 x 92,955,807.273 (approx. 222 million) miles per year and Pioneer 11 2.22 x 92 955 807.273 (approx. 206 million). These approximations can be averaged to 214 million miles per year. However, the probes are travelling some 3,100 miles less than expected each year ("The Pioneer anomaly - solved?" by Liz Kruesi in "Astronomy" magazine - Nov. 2012, p. 20). This reduction in distance travelled amounts to 214,000,000 / 3,100 (approx. 1 / 69,000).



Mobius loop



(2 Mobius loops – each one is 2 dimensional - joined along their edges can form a 4 dimensional Klein Bottle)

General Relativity describes gravity and space-time partly by referring to Mercury's motion. If Einstein's space-time warping accurately described the motion of the Pioneer probes, we might expect it to conclude that the Pioneers' reduction in expected distance travelled would be approx. 1 / 30,140 * instead of the actual figure of 1 / 69,032. Rounded to the nearest thousand and inverted, this means the actual warping of space-time has a value of 69 whereas General Relativity gives it a value of 30 (less than half as much – Relativity's figure is only about 43% of the actual figure, in fact^). This can be explained by warping being based on the Mobius loop. Since one has to travel twice around a Mobius loop to arrive at the same point, the degree of warping is twice as much as it would be in Relativity. This takes us to 86% of the actual value. The foundation of 2-dimensional **Mobius loops** is then converted into 4-dimensional **Figure-8 Klein**

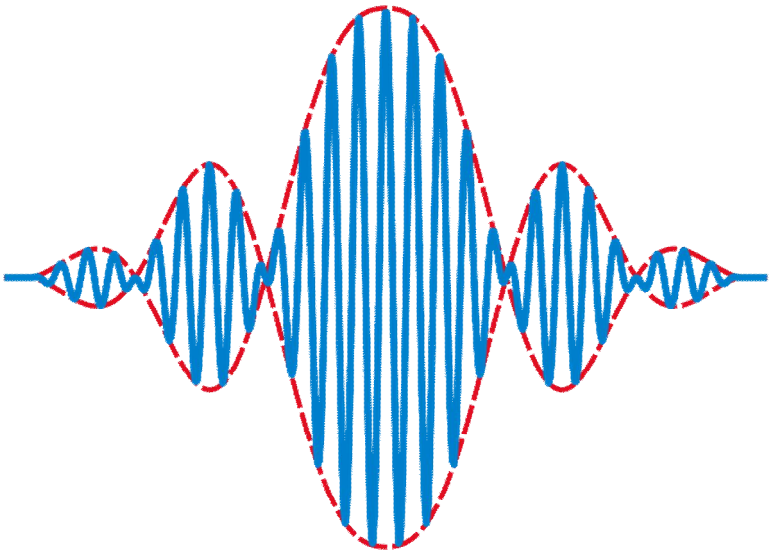
bottles (see **"Mobius loops and Klein Bottles"** later in article**)**. Bottles consist of 2 Mobius loops joined on their sides and bottles in motion make up the 3 space dimensions + 1 time dimension of each subuniverse's space-time. Conversion from Mobius loops into Figure-8 Klein bottles takes energy and could well account for space-time's warping rising from 86% of its actual value to 100%.

* (because Mercury's orbital precession is greater than other planets in our solar system, it indicates warping more easily)

^ Let me start this section by saying that rounding to the nearest thousand and inverting - as well as arriving at the fractions 1 / 69,032 and 1 / 30,140 - is not done merely to arrive at two small integers (instead of using large fractions), which simplifies calculations. It is also done for the purpose of conserving the number 43. The number has been firmly established in both theoretical and experimental science, being the well-confirmed amount by which Einstein's theory says Mercury's ellipse will turn in excess of Newton's prediction. Conserving 43 obeys physics' Law of Conservation of Energy (thinking of 43 requires the brain to expend energy) which means the number can never be destroyed and becomes Einsteinian Relativity's figure of 43% for the warping of space-time. "3,100 miles" is conserved too – this is Mercury's approximate diameter as well as the approximate decrease in the distance NASA expected Pioneer to travel each year. A couple of days after first reading about Pioneer's slowdown in "Astronomy" magazine, I glanced at Mercury's diameter in a 1967 version of World Book Encyclopedia (the article "Mercury" by E. C. Slipher) and was intuitively inspired to investigate the possible link between Mercury and the Pioneer spacecraft – this became an actual link when I started reading about the planet's precession. As stated above, "the actual warping of space-time has a value of 69 whereas General Relativity gives it a value of 30 (less than half as much – Relativity's figure is only about 43% of the actual figure, in fact)".

Then why has the deflection of starlight by the sun been experimentally proven to agree with General Relativity's prediction of 1.75 seconds of arc? In a paper published on June 12 in Physical Review Letters ["Support for the Thermal Origin of the Pioneer Anomaly" - Phys. Rev. Lett. 108, 241101 (2012) [5 pages]; Slava G. Turyshev, Viktor T. Toth, Gary Kinsella, Siu-Chun Lee, Shing M. Lok, and Jordan Ellis write: "We investigate the possibility that the anomalous acceleration of the Pioneer 10 and 11 spacecraft is due to the recoil force associated with an anisotropic emission of thermal radiation off the vehicles" and "We therefore conclude that at the present level of our knowledge of the Pioneer 10 spacecraft and its trajectory, no statistically significant acceleration anomaly exists." I don't think we have enough knowledge of the spacecraft and its trajectory (as they exist in 2012). Therefore, I personally favour the idea that gravitational physics needs a slight revision (Sergei Kopeikin of the University of Missouri and retired JPL scientist John Anderson seem to agree, and Dr. Kopeikin definitely believes

that a part of the Pioneer effect is due to the thermal emission, but that part is small, not more than 15-20% of the overall effect.



Wave packet (a concept in quantum mechanics - introduced in 1926 by Erwin Schrodinger and interpreted later that year as a **probability wave** by Max Born, grandfather of the singer Olivia Newton-John)

General Relativity's prediction of 1.75 seconds of arc is accurate if we consider the warping of space to only affect the deflection of starlight around our star. However, this is only 43% of the warping. Suppose Einstein was correct when he said gravitation plays a role in the constitution of elementary particles –

DO GRAVITATIONAL FIELDS PLAY AN ESSENTIAL PART IN THE STRUCTURE OF THE ELEMENTARY PARTICLES OF MATTER?

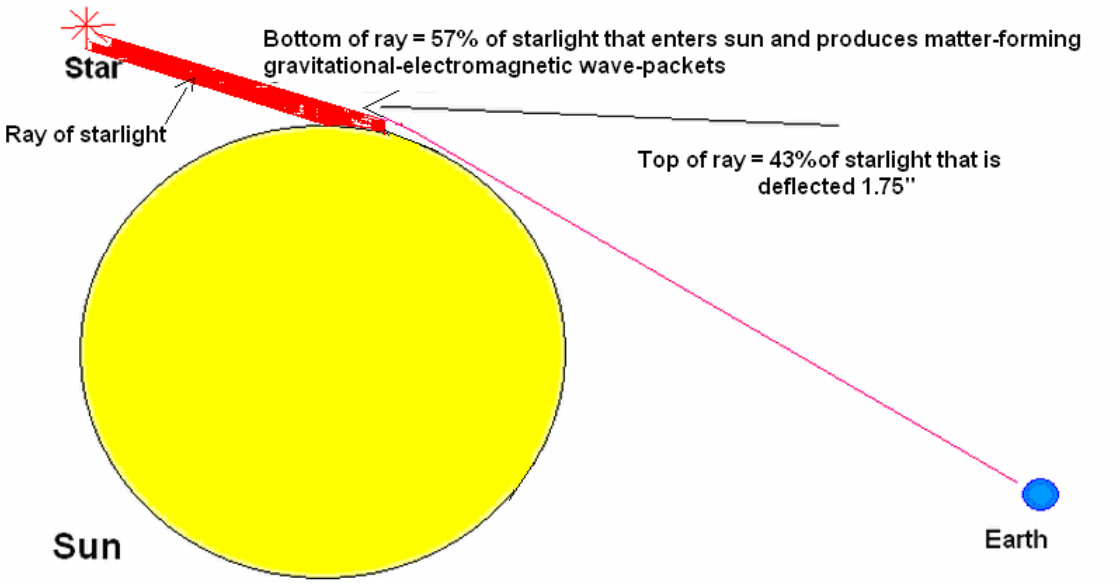
BY

A. EINSTEIN

Translated from "Spielen Gravitationsfelder im Aufber der materiellen Elementarteilchen eine wesentliche Rolle?" Sitzungsberichte der Preussischen Akad. d. Wissenschaften, 1919.

(a 1919 submission to the Prussian Academy of Sciences in which his equations say we cannot restrict ourselves to electromagnetic components). If "wave packets" of gravitation + electromagnetism compose matter, there would be no place for a Higgs field or boson in the generation of mass (G and EM could

account for particles' properties). Then the other 57% consists of warps which result in matter-forming gravitational-electromagnetic wave packets. Suppose Einstein was also correct in believing gravitation and electromagnetism are related. Then we might be able to say electromagnetism is merely modified gravitation (see "Electromagnetism as Modified Gravitation" below). Gravity might also play a role in constituting the nuclear strong and weak forces that allows us to say the nuclear forces are modified gravitation, too (see "Nuclear Forces as Modified Gravitation" below). Then there would not be 4 fundamental forces, or even the 2 of gravitation and electromagnetism, but only the 1 called gravitation. Would this 1 force introduce a Unified Field Theory and a Theory of Everything? When the starlight dives into the sun, it's diverted into the gravitational-electromagnetic "wave packets" which form our star's matter (because $E=mc^2$)**. Apparently, this diversion requires 57% of the starlight – the remaining 43% is free to bend around the sun and reach earth (at the low angle of 1.75 arc seconds, which is too low to enable it to become a constituent of the solar mass). Of course, more wave packets that form part of our planet are created when the electromagnetic (modified gravitational) light arrives at Earth. Einstein understandably, but incorrectly, assumed 100% of the starlight which grazes the sun is deflected at 1.75".



I think this shows that Albert Einstein and Isaac Newton didn't get their theories of gravity and space-time quite right. I also believe it shows that "Intergalactic Plus Time Travel; Hyperspace and Space-Time's Nature" (a slightly earlier viXra submission) is accurate. In the sense of celestial mechanics, I think it accurately portrays Earth's orbit and tides – as well as dark energy and gravitational diversion – despite that submission being nonmathematical. Imagine a few cosmic possibilities that could ensue from this article – the sun (and all things)

could be self-renewing to some degree, and might survive much longer than their predicted lifetime; the whole universe might survive much longer than scientists anticipate (other parts of the submission suggest it's eternal); stars could be brighter and closer than they appear – when their light isn't interacting with the sun; some of it is being absorbed by other stars, galaxies, etc. – this particular subuniverse that we live in could be younger than we think.

** (very approximate calculations only are used here, because mathematical precision is impossible considering how limited our knowledge of the cosmos is)

Earth receives 3.8x10^26 joules per second (watts) of energy from the sun;
1eV (electron volt) = 1.602x10^-19 joules;
10^19 (10 billion billion) eV's = 1.6 joules;
Earth gets 10^45 eV from the sun each second;
Proton = 938 MeV (mega, or million, electron volts);
Earth's area gets 10^42 protons per second;
Earth's area = ~200,000,000 square miles;
Receives 10^34 protons/sq mi/sec;
Earth's volume = 260,000,000,000 cubic miles;
Earth's volume = area x height = 200,000,000 x 1,000 (200x10^9~260x10^9);

Earth gets 10^35 protons/cu mi/sec (not only from solar EM rays; mostly from infrared rays associated with internal heat – result of changing E=mc^2 to m=E/c^2);

Mass of Proton = $1.6726231*10^{-27}$ kg;
Earth's mass increase = 10^-27 x 10^35 = 100 million kg = 100,000 tons/cu mi/sec;
This amounts to 260x10^9 times 1x10^5 tons (260x10^14) tons/cu mi/sec for the planet, which weighs over 6x10^21 tons;

Cosmos may be infinite but observable universe may contain 10^24 stars;
Volume of observable (not infinite) cosmos = (4/3)(pi [3.14])(r^3) where r (radius) = 50,000,000,000 light years = ~5x10^32 cubic light years;
Cosmic volume=2.03141×10^{38} times Earth's volume=10^38 x 10^9=10^47 cu mi;
Protons/cu mi/sec in cosmos = 10^47 x 10^34 = 10^81;
Earth has ~10^29 times as many atoms as the average density of outer space so 10^81 must be divided by 10^29 (protons/cu mi/sec in cosmos =10^52);
Quarts in cubic mile = 4x10^12;
Protons created in each quart every sec = 10^52/10^12 = 10^40;
Seconds in half a billion years = 3x10^7 x 500x10^6 = ~10^13;
Protons/quart/half billion years = 10^40/10^13 = 10^27;

We assumed the volume of the observable cosmos depended on the number of observable stars (without light from these stars, there could not be an observable cosmos), but let's reconsider – even if there are 5x10^11 galaxies in the 5x10^32

cubic light years of our observable universe, stars would have no place in ~10^21 of the cosmic volume. And our matter-forming wave packets would now occupy 10^32/10^21 = 10^11 cubic light years. Skipping to the last line above, the number of protons formed in each quart of space each half billion years decreases from 10^27 to 10^6 (1,000,000).

At this point, we should remember Einstein's famous formula E=mc^2. But we're interested in solving for mass … so it becomes m=E/c^2. In this part of the article, we've been talking about light years and miles and seconds. So it seems appropriate to square the speed of light using the number of miles it travels in a second (186,282). It's inadvisable to pretend mathematical exactness can be used here (because our knowledge of the universe is so limited). So rounding light's speed to 200 000 miles/second, and obtaining the square of 40 billion, is reasonable. If E (the number of energy-radiating galaxies we can observe) is estimated at 200 billion, and they're divided by 40 billion (c^2), the number 5 results (5 protons form in each quart of space every half-billion years)

This figure is very close to the number worked out by pioneers of the Steady State theory, a former rival of the Big Bang – people like Fred Hoyle, Hermann Bondi and Thomas Gold. They calculated that, to keep the universe in a "steady state", new matter or energy has to be continually created at a rate equal to the mass of one hydrogen atom in each quart of space every half-billion years. A hydrogen atom has 3 forms – protium, with no neutrons in its nucleus; deuterium (1 neutron); and tritium (2 neutrons). I find it intriguing that I arrived at the similar mass of 5 protons even though I used such crude estimates. This is also intriguing because I mention how this article supports the Big Bang – and the continual creation (a better word might be "recycling", to prevent conflict with the Law of Conservation which says matter and energy can be neither created nor destroyed) of matter and energy supports my idea of binary digits "creating" gravitation which plays a role in particles and their forces (that last part was Einstein's idea – I just agree with it).

I neglected to keep track of my references for the last couple of pages – but I'd like to thank all the websites that helped with calculations and research, particularly Wikipedia and a hardcover book published by Life Nature Library and called "The Universe". **The figures relating to Earth's mass increase troubled me; but these figures are only necessary to reach "5 protons" in the context of the finite, observable universe. If infinity is plugged into the size of space-time, Earth's mass increase obviously reduces enormously. Renewal of the entire planet via gravitational and electromagnetic waves obeying m=E/c^2 and interacting in wave packets could conceivably occur over billions of billions of years.**

Electromagnetism as Modified Gravitation

Gravity and light are 2 basic parts of the universe. Could Einstein's aim of uniting

electromagnetism (light is one form of this) and gravitation be related to electrical engineering's Optical Effect which says that, on silicon chip-and transistor-scales, light can attract and repel itself like electric charges/magnets. Achievement of Einstein's Gravitational-Electromagnetic Equivalence means gravity could, on quantum levels, also attract and repel itself. General Relativity says gravity is the warping of space-time, so space and time could be made to attract and repel at quantum levels (and quantum levels make up all time plus the entire universe - unconventional US cosmologist Max Tegmark says "You are made up of quantum particles, so if they can be in two places at once, so can you.") Distances between points billions of light years apart, might therefore be eliminated – this is similar to traversing a wormhole between two folds in space. Since Relativity says space and time can never exist separately, warps in space are actually warps in space-time. Eliminating distances in space also means "distances" between both future and past times are eliminated - and time travel becomes reality. If you travelled at the speed of light to a galaxy 10 billion light years away, you'd take a trip lasting 10 billion years. But if you traversed that distance literally instantly, space-time would be so warped that you'd find yourself 10 billion years in the future. Doing away with distances in space and time also opens the door to Star Trek-like teleportation. There would be no need to destroy the original body – we would "simply" be here one moment, and there the next (wherever and whenever our destination is).

Nuclear Forces as Modified Gravitation

The strong force binds protons and neutrons (nucleons) together to form the nucleus of an atom. It's also the force (carried by gluons) that holds quarks together to form protons, neutrons and other hadron particles. It's 10^38 (100 trillion trillion trillion) times the strength of gravity because it's the product of the electromagnetic force (10^36 times gravity's strength) combined with 10^2 (100) gravitons per electromagnetic photon (the graviton is a hypothetical elementary particle that mediates the force of gravitation). The weak force is responsible for the radioactive decay of subatomic particles and initiating hydrogen fusion in stars. The weak force is 10^25 (10 million billion billion) times gravity's strength because it's the product of the electromagnetic force combined with 100 billion anti-gravitons. That is, it's 10^36 times the strength of gravity divided by 10^11. Physicists argue that a unified "theory of everything" must now include not just gravity and electromagnetism, but also the weak and strong nuclear forces plus dark matter and dark energy. Although the nuclear forces weren't well understood in Einstein's day, I believe Einstein understood them better than any other scientist (both then, and in the nearly 60 years since his death) and was correct not to worry about including them in a unified theory. The title of one of his papers "Do Gravitational Fields play an Important Role in the Constitution of the Elementary Particles?" suggests that Einstein's understanding of the nuclear forces may have been that they have no existence independently of gravitation. Steven Weinberg, Abdus Salam and Sheldon Glashow shared the 1979 Nobel prize in physics for electroweak unification (of the weak

force and electromagnetism). I wonder if they think the nuclear forces, and electromagnetism, are dependent on gravitation?

Mobius loops and Klein Bottles

Discovery.com (March 18, 2010) says: "The universe is not only expanding -- it's being swept along in the direction of constellations Centaurus and Hydra at a steady clip of one million miles per hour, pulled, perhaps, by the gravity of another universe." (this is called “the dark flow”) Could this be describing evidence of an idea suggested by mathematics’ "Poincare conjecture", which says you cannot transform a doughnut shape into a sphere without ripping it? Maybe the known cosmos is actually one of infinite^ subuniverses shaped like a Figure-8 Klein Bottle (whose shape reminds me of a doughnut) gaining rips called Cosmic Wormholes when extended into the infinite spherical spacetime that forms one universe (whose infinity prohibits other universes existing - discovery.com's "another universe" would be another subuniverse, and there would be no multiverse or parallel universes^^). Wormholes might exist in a 5th dimension, and the boundary where subuniverses meet could be called a Cosmic String (boundaries would be “cracks” in spacetime formed as subuniverses cool, analogous to cracks that form when water freezes into ice).

^ Bob Berman’s article "Infinite Universe" (“Astronomy” – Nov. 2012) wrote, “The evidence keeps flooding in. It now truly appears that the universe is infinite” and “Many separate areas of investigation – like baryon acoustic oscillations (sound waves propagating through the denser early universe), the way type 1a supernovae compare with redshift, the Hubble constant, studies of cosmic large-scale structure, and the flat topology of space – all point the same way.”

Infinity

He also wrote, "... no one can picture (an infinite universe)". Let's start to at least try to picture it by using mathematics’ "Poincare conjecture", which has implications for the universe’s shape and says you cannot transform a doughnut shape into a sphere without ripping it. This can be viewed as subuniverses shaped like Figure-8 Klein Bottles (vaguely similar to doughnuts) gaining rips called wormholes when extended into the spherical spacetime that, as the evidence indicates, goes on forever (forming one infinite universe). Picture spacetime existing on the surface of this doughnut which has rips in it. These rips provide shortcuts between points in space and time – and belong in a 5th-dimensional hyperspace (since “dark matter” is invisible but has gravitational influence, its existence could be achieved by ordinary matter travelling through time).

The continuing, accelerating expansion of space-time* which results, in the never-ending future**, in an infinite universe instantly ripples back in time (because of “retrocausality” - promoted by Yakir Aharonov, the Israeli physicist

specializing in quantum physics [and other scientists], this states that effects and causes are not necessarily separated and can instantly interact) and means the cosmos has always been infinite.

* This acceleration was discovered in 1998 by observations carried out by the High-z Supernova Search Team and the Supernova Cosmology Project, has been confirmed several times and is claimed to be caused by mysterious “dark energy”.

** Page 118 of Stephen Hawking’s/Leonard Mlodinow’s “The Grand Design” (published in 2010 by Bantam Press) says “M-theory (that theory which string theorists now consider fundamental) has solutions that allow for many different internal spaces (the curling up of extra dimensions into tiny, invisible spaces), perhaps as many as 10^500, which means it allows for 10^500 different universes, each with its own laws.” I suggest there is only one extra dimension and only one universe, with one set of physical laws. 10^500 would therefore refer to either the number of subuniverses existing in space at present or to time and the number of “frames” (corresponding to motion) existing in the cosmos at present. It could also refer to both subuniverses and frames, since space and time can never be independent of each other (meaning space that is infinite would be partnered with time that is eternal i.e. infinite space would produce an infinite number of frames, which results in eternal motion – see “Science-based eternal life” below). Could this unbelievably enormous number also be known as infinity? Infinity will increase in the future in the eventuality of transmissions^ from 5th-dimensional hyperspace producing more space and time via Big Bangs forming more subuniverses. Another way of stating this is – hyperspace can be called “prespacetime” which is a non-temporal and non-spatial domain theorized to be the foundation of spacetime. This concept of infinity is somewhat like the subset of all integers [1, 2, 3, etc.] extending to infinity yet that infinity being smaller than the infinite subset of all decimals. Nevertheless, there can never be anything outside the universe since true infinity of time-space uses backward causality (retrocausality) to instantly ripple back in time and make the cosmos eternally infinite.

^ "Hidden variables" is an interpretation of quantum mechanics which is based on belief that the theory is incomplete (Albert Einstein is the most famous proponent of hidden variables) and it says there is an underlying reality with additional information of the quantum world. I suggest this underlying reality is binary digits generated in 5D hyperspace. These allow time travel by making it possible to warp space^^, simultaneously adding precision and flexibility to the elimination of distances (wormholes being one example of doing this) and the “fitting together” of subuniverses to form a continuous superuniverse. (The boundary where subuniverses meet could be called Cosmic Strings - analogous to “cracks” in spacetime formed as subuniverses cool, similar to cracks that form as water freezes into ice, and first contemplated by the theoretical physicist Tom Kibble in the 1970s.)

^^ Maybe hidden variables called binary digits could permit time travel into the future by warping positive space-time. And maybe they'd allow time travel into the past by warping a 5D hyperspace that is translated 180 degrees to space-time, and could be labelled as negative or inverted.

"Empty" space (according to Einstein, gravitation is the warping of this) seems to be made up of what is sometimes referred to as **virtual particles** by physicists since the concept of virtual particles is closely related to the idea of quantum fluctuations (a quantum fluctuation^ is the temporary change in the amount of energy at a point in space). The production of space by BITS (BInary digiTS) necessarily means there is a change in the amount of energy at a certain point, and the word “temporary” refers to what we know as motion or time. Vacuum energy is the zero-point energy (lowest possible energy that a system may have) of all the fields (e.g. electromagnetic) in space, and is an underlying background energy that exists in space even when the space is devoid of matter. Binary digits might be substituted for the terms zero-point energy (since BITS are the ground state or lowest possible energy level) and vacuum energy (because BITS are the underlying background energy of empty space). Relativistically, space can’t be mentioned without also mentioning time, whose warping can therefore also be viewed as gravitation (since “dark matter” is invisible but has gravitational influence, its existence could be achieved by ordinary matter travelling through time).

Life

^ The idea of quantum fluctuations is valid but forget quantum fluctuations that mysteriously happen for no reason. And forget spontaneous generation of life from nonliving matter. Origin of life, the universe and everything from something – brains (and bodies) engaging in feedback with hyperspace to purposely switch bits from 1 to 0 or vice versa - is important for 2 reasons:

1) Science’s own Law of Conservation says the total mass (or matter) and energy in the universe does not change, though the quantity of each varies (I interpret this Law as saying – to get matter and energy, you have to start with matter and energy), and

2) By actual experimentation the great 19th-century French scientist Louis Pasteur disproved the false theory of spontaneous generation of life, and proved biogenesis (that living things descend only from living things). In relation to biogenesis, consider the Miller-Urey Experiment of 1952. Here, amino acids (the building blocks of protein) were made from inorganic material and by natural* causes in a lab. Subtract Stanley Miller and Harold Urey from the experiment, and the experiment would obviously fail - amino acids can still form naturally in interstellar clouds, on asteroids, etc. (but all amino acids are relatively simple). Subtracting humans of the distant future;

with their ability to travel into the past and use incomprehensibly-advanced cosmogenesis, terraforming and biotechnology; from the origins of life makes it impossible for inorganic materials to be assembled into complex plants and animals.

* Even the so-called supernatural is, in fact, completely natural. In the 17th century, Isaac Newton formulated the inverse-square law (it says that if stars A and B emit light of equal intensity but star B is twice as distant, it will appear one quarter as bright as star A i.e. not the square of 2 (4) but the inverse square of 2 (1/4 or one divided by four). It also says the gravity between any 2 objects – see ***The more mass a body possesses, the more gravitation is diverted to play a part in that body's formation*** in the very last segment of text - is only one quarter as strong if the distance between the objects doubles. The inverse-square law further states that the force between two particles becomes infinite if the distance of separation between them goes to zero. Remembering that gravitation partly depends on the distance between the centres of objects, the distance of separation between objects only goes to zero when those centres occupy the same space-time coordinates (not merely when the objects' sides are touching). Zero separation is the case in **quantum-entangled** space-time and physicist Michio Kaku says in his book "Physics of the Impossible" that modern science thinks the whole universe has been quantum-entangled forever. This means there's still room for the infinity known as God. God would be a suprapantheistic union of the universe's spatial, temporal, hyperspatial, material and conscious parts; forming a union with humans in a cosmic unification.

I call hidden variables (or virtual particles) binary digits generated in a 5th-dimensional hyperspace which makes them - as explained in the next sentence - a non-local variety, in agreement with the limits imposed by Bell's theorem. (Bell's Theorem is a mathematical proof discovered by John Bell in 1964 that says any hidden variables theory whose predictions agree with quantum mechanics must be non-local i.e. it must allow an influence to pass between two systems or particles instantaneously, so that a cause at one place can produce an immediate effect at some distant location [not only in space, but also in time] – please see "Quantum" by Manjit Kumar, published by Icon Books 2008.) Comparing space-time to an infinite computer screen and the 5th dimension to its relatively small – in this case, so tiny as to be nonexistent in spacetime – Central Processing Unit, the calculations in the "small" CPU would create and influence everything in infinite space and infinite time, and thus permit a distant event to instantly affect another (exemplified by the quantum entanglement of particles separated by light years) or permit effects to influence causes (exemplified by the retrocausality or backward causality promoted by Yakir Aharonov and others). But what about the statement "The continuing and accelerating expansion of space-time which results in an infinite universe instantly ripples back in time and means the cosmos has always been infinite"? This means quantum processes, in

which effects and causes are not necessarily separated, wouldn't be confined to tiny subatomic scales but would also occur on the largest cosmic scales.

Science-based eternal life

Thinking about what's been written here leads to the conclusion that we all have eternal life. Let me explain – In a Unified Field Theory or Theory of Everything, humans are unified with the universe. Space and time may be infinite (this is indeed possible according to physics and mathematics).
[It seems logical to believe the universe is, by definition, everything that has or does or will exist and that there can be nothing outside the universe. For this reason, "multiverse" and "parallel universe" appear to be misleading terms that can be replaced with "the known cosmos is actually one of infinite subuniverses shaped like a Figure-8 Klein Bottle" and "discovery.com's 'another universe' would be another subuniverse." The hidden variables that are the electronic binary digits of centuries to come could exist in a 5^{th}-dimensional hyperspace. In a universe described by fractal geometry, the 5th dimension wouldn't exist only on a cosmic scale but also as a hyperspace in every fermion (matter particle) and boson (force-carrying particle). Binary digits would allow time travel by making it possible to warp space, simultaneously adding precision and flexibility to the elimination of distances and the "fitting together" of subuniverses to form a continuous universe.]

If humans are unified with an infinite universe, every one of us must possess infinite (immortal) life. Everyone knows that life is full of twists and turns, so we should not expect immortality to be a simplistic matter of having an eternal spirit or soul which lives on after death. What then? Think about this alternative –

When we die, we're dead. There's no life or consciousness at all. But sometime in the distant future, doctors and scientists discover how to resurrect us – possibly, they could use time travel to obtain a copy of our minds which could be downloaded into a clone bioengineered to be free of defects so it would be healthy and ethical. The resurrected self – perhaps in an immaterial body designed in the far future to overcome physical limitations - would be capable of returning to the point of death (even an eternity before that), and thus having immortal life.

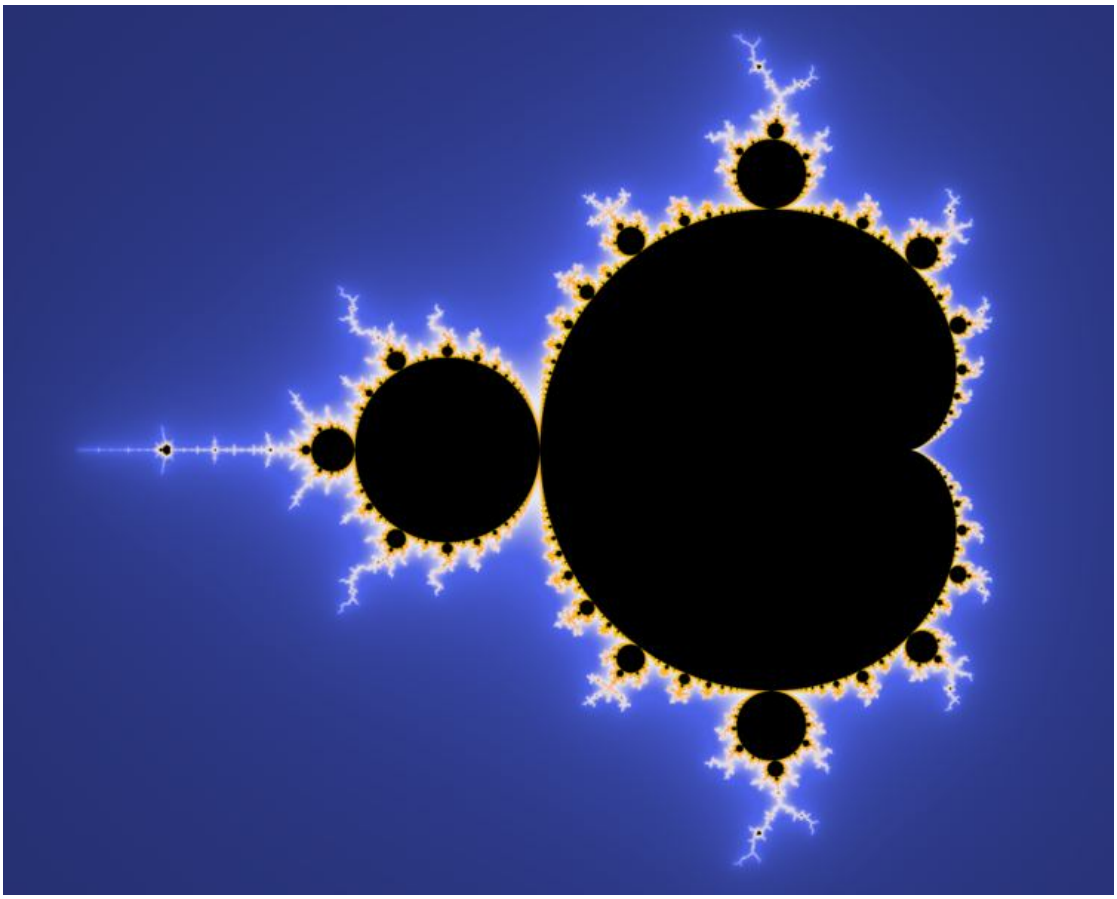
But if people are unified with an infinite universe, the relationship could not be just with time – it necessarily extends to space because Albert Einstein showed that space and time cannot exist independently of each other (they form space-time). Everyone (along with everything) merges, and there are no gods - only what is called God. The complementary, negative aspect of God's positiveness would be called illness, accident, death … or in a suprapantheistic context (where the negativity, like the positiveness, embraces all matter and consciousness in electronics-based space-time-hyperspace and is capable of downloading into living or nonliving components), Satan the Devil. Remember,

both the positive and negative sides of this cosmic coin are essential for the tiniest, and grandest, functions of the universe as we know it. But it may not always be so – the time will come when there is no illness, accident or death.

Maybe this seems too speculative. When his paper regarding mathematical formulas creating reality was submitted to a scientific journal and rejected as being too speculative, U.S. cosmologist Max Tegmark showed the rejection letter to his friend John Wheeler (1911-2008), a Princeton theoretical physicist. Wheeler said, “Extremely speculative? Bah!” Then he reminded Tegmark that some of the original papers on quantum mechanics were also considered extremely speculative.

Fractals

Such existence of quantum effects at cosmic scales (quantum processes, in which effects and causes are not necessarily separated, occurring on a cosmic scale and turning universal expansion into the making of an ETERNALLY infinite universe) is not wishful thinking. It’s the other side of the coin that says cosmic effects exist at quantum scales – which is supported by the equations Einstein developed in 1919 showing that the space warping in General Relativity extends to subatomic particles. If particles consist of space-time, it seems likely that they also partly consist of 5^{th}-dimensional hyperspace, meaning this universe obeys fractal geometry (the large realm of the cosmos consists of space-time-hyperspace, and the tiny subatomic realm also consists of prespacetime plus spacetime). Mathematician Benoit Mandelbrot (1924-2010) developed this geometry and coined the word fractal (a fractal is a shape – like the Mandelbrot set at the end of the paragraph - such that, if you look at a small piece of the shape, then it looks the same as the original, just on a smaller scale). Jack Harris, an Applied Physicist at Yale University says quantum mechanics describes a crazy microscopic world where particles whiz around at blistering speeds and routinely violate the classical laws of physics we take for granted. Jack Harris’s goal is to take advantage of the “really strange, even mystical” laws of the microscopic and apply them to problems in our macroscopic world. “The ultimate eureka moment would be to suddenly realize that a [macroscopic] object is doing something that is absolutely forbidden by classical physics,” he says. In 1980 or the late 1970s, American astronomer Carl Sagan (1934-1996) wrote these lines for his award-winning television series and accompanying book, “Cosmos”: “There is an idea – strange, haunting, evocative – one of the most exquisite conjectures in science or religion. It is entirely undemonstrated; it may never be proved. But it stirs the blood. There is, we are told, an infinite hierarchy of universes, so that an elementary particle, such as an electron, in our universe would, if penetrated, reveal itself to be an entire closed universe.” Dr. Harris and Dr. Sagan remind us, respectively, of quantum effects at cosmic scales and cosmic effects at quantum scales (they both remind us that the space warping in General Relativity extends to subatomic particles).



Gravitation

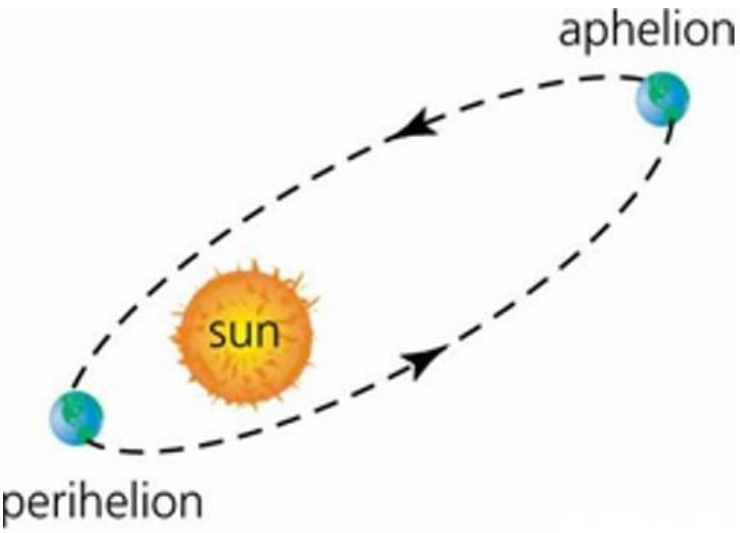
I realize scientists might dismiss the talk here about Earth's orbit and tides because they're understandably horrified at the total lack of mathematics in the following. But this is the age of the Internet, and we should adapt our methods so explanations can be understood by anyone with a computer – not only by those with mathematical training. If you're still not happy though, I refer you to the gravitational maths of Isaac Newton and Albert Einstein. The words below don't refute their ideas … they simply approach gravitation from a different perspective (Einstein did the same with Newton's original theories). I sincerely believe any scientist can adapt the maths already published by Newton and Einstein to verify the English below.

We have previously considered dark energy as radiation of hidden variables in the form of binary digits from hyperspace. It seems to me that another interpretation involves gravitation, since this can be viewed as the effect of the cause known as binary digits – and this article previously said causes and effects are not necessarily separate. Dark energy and gravitation would then be different facets of the same thing, and I think it would change the astronomy world if scientists would study the possibility.

If gravity is actually repulsive, it would cause universal expansion (accelerating expansion if more space-time is continually produced by, say, quantum mechanical Hidden Variables that are actually binary digits in hyperspace). Since quantum processes occur on scales up to, and including, the cosmic; biological egg cell and adult would, defying our senses and experiments, instantly affect each other and thus actually coexist – in different times - in this cosmos unified by binary digits' production of gravity, the universe's foundation. The feedback between bits would keep the past from changing from what history has recorded and stop the future from changing from its glorious destiny; like a digital thermostat regulating a hot water system and keeping the temperature constant.

Gravity might actually repel but simultaneously, dark energy/gravitation causes attraction in the solar system by

a) pushing planets toward the sun (planets' orbital speeds prevent them falling into the sun),



As gravitational waves travel from the outer solar system towards the sun (as a starting point, let's say they're coming from the lower left in this picture), they'd push the orbiting Earth to aphelion, its farthest distance from the sun – 152 million km. But gravity waves are also coming towards the sun from the aphelion direction. So Earth's progress to the upper right is stopped and it follows the line of least resistance to waves pushing it from both the lower and upper directions – this corresponds to the path indicated by the arrow pointing left. When it reaches perihelion (its closest approach to the sun – 147 million km), the waves from the

right are pushing it back while waves from the left are pushing it forward. Our planet follows the boundary between waves assaulting it from opposite directions and its inertia compels it to follow the arrow pointing right. Upon reaching aphelion again, the tug-of-war (oops, I mean push-of-war) continues and Earth's momentum causes it to go left. We mustn't forget the waves that push Earth towards and away from the sun at both its perihelion and aphelion points. The balance between these forces reinforces the planet's tendency to stay in the illustrated orbit. The sun's position in the illustration is exaggerated – it should be closer to the centre of the ellipse since the difference between perihelion and aphelion is only about 3%. The existence of this difference would rely on the planet manifesting as a multitude of matter-forming wave-packets which divert some gravity waves to every point from the top of the atmosphere to the centre of the inner core – thus slightly upsetting the balance of gravity waves from opposing directions.

b) pushing objects toward the centre of Earth (where I suggest gravitational waves cancel and, agreeing with conclusions from Isaac Newton's theories, objects weigh nothing) and

c) being diverted to the sun's and/or moon's centre by the formation of wave packets (subatomic unions of gravitational and electromagnetic waves which account for mass). At first and third quarter, diversion by the moon lowers the push of gravitational waves travelling from the outer solar system to reach Earth via the moon. This push keeps ocean tides low – and permits neap tides (which aren't as high as spring tides). At full and new moon, some of those gravity waves from the solar system's edge are diverted both by the moon and the sun. This causes a more noticeable decrease in gravity's push against the earth and permits a spring tide. If the sun and moon were the same distance from earth, the sun would exert about 27 million times as much tide-producing force as the moon. But the sun is about 390 times as far away as the moon. If the distance of a body from the earth could be doubled, it would only exert one-eighth as much tide-producing force on earth. As a result, the tides caused by the sun are only 46% as high as those caused by the moon. (the previous 4 sentences are from "World Book Encyclopedia": the article "Tide" by professor of oceanography Robert O. Reid – we keep it simple by speaking of sunrise and sunset instead of lecturing, in everyday speech, about earth's rotation on its axis; so let's continue to keep it simple by speaking of the sun [and moon] producing tides instead of lecturing, in everyday speech, about gravitational diversion). **The more mass a body possesses, the more gravitation is diverted to play a part in that body's formation; though the International Space Station weighs around 400 tons, it has tiny mass compared to any planet and produces so-called weightlessness while black holes – ranging from about 3 solar masses for the smallest stellar variety to billions of solar masses for supermassive black holes in galaxy centres – have so much mass and diverted gravity that light pushed into them is unable to escape (differentiating them from ordinary**

matter, black holes appear to have no electromagnetism of their own – their electric and magnetic properties come from the matter and radiation they swallow).