Title -

GRAVITY AND UNKNOWN SPECTRAL LINES EXPLAIN DARK UNIVERSE AND HIGGS BOSON MASS

Author –
Rodney Bartlett

Abstract -
The start of this article lies a few years in the past, when I wrote about the Little Ice Age experienced in Europe some 300-360 years ago. I then read an article in "Astronomy" magazine which prompted me to extend those ideas to explanation of heating the Sun's corona. On the same page of Astronomy, I was inspired by a story on unidentified spectral lines in the Sun. I thought about this, and decided it could be extended to all matter, supporting Einstein's conviction that mass is generated by gravitational-electromagnetic interactions (maybe the Higgs field is actually these interactions, for they fill the universe and are certainly capable of producing the Higgs boson, as will be explained here). In writing this, I felt the need to go into more detail frequently – about string theory, the mathematical universe, the infinite universe, the strong and weak nuclear forces, etc. (some of this is covered in previous articles I posted at www.vixra.org, www.fqxi.org and www.researchgate.net; some is new).

All of this seems to fit together perfectly in my mind. However, I don't feel as though I've done much of the work myself. It feels like figuring out the nature of the universe is a giant jigsaw puzzle, and I've been handed the solution (if indeed I have it) piece by piece over the years and decades. This fitting together of a giant jigsaw made me think the universe isn't really such a complicated place, and reminded me of Professor John Wheeler saying - Can we ever expect to understand existence? Clues we have, and work to do, to make headway on that issue. Surely someday, we can believe, we will grasp the central idea of it all as so simple, so beautiful, so compelling that we will all say to each other, "Oh, how could it have been otherwise! How could we all have been so blind so long! "

The scientist and philosopher in me inspire each other. They combined logic with measurement and willingness to speculate so they could produce these subheadings - Unidentified Spectral Lines; Graviton-Photon Oscillation; Relativistic Mass Increase and Time Dilation; Higgs Boson and (e∞); Quantum Entanglement and Retrocausality; Mathematical Unification; Coronal Heating (Part 1 – Little Ice Age); String Theory, the Mobius Loop and the Klein Bottle; Coronal Heating (Part 2 – Gravity and EM Interact); Nuclear Forces as Modified Gravity; Electromagnetism as Modified Gravity; Nonlinear Gravity and EM; Infinite Universe (Physically and Electronically); Brian Greene's Cosmic Movie; Something from Nothing, Something from Something; Universal Intelligence; Hidden Variables and Virtual Particles; Biogenesis; Bell's Theorem; Immortal Life; Space-time, Hyperspace and the Big Bang; Physicist John Wheeler; Equation Describing the Universe; and CHALLENGE – Explain To The Layman

How Gravity Accounts For Dark Matter and Dark Energy Without Using Any Mathematics (this could have been given subheadings of its own – about Kepler's laws of planetary motion, tides, orbits, but my abstract's long enough).

Content –

Introducing **Unidentified Spectral Lines** (ends at Coronal Heating)

Suppose Albert Einstein was correct when he said gravitation plays a role in the constitution of elementary particles (in "Do Gravitational Fields Play An Essential Part In The Structure Of The Elementary Particles Of Matter?", a 1919 submission to the Prussian Academy of Sciences). Einstein also said gravity and electromagnetism may be related – in his paper to the Prussian Academy, he said "Therefore, by equation (1) $G_{\mu\nu} - \frac{1}{2}g_{\mu\nu}G = -\kappa T_{\mu\nu}$, we cannot arrive at a theory of the electron by restricting ourselves to the electromagnetic components of the Maxwell-Lorentz theory …" A wave packet consisting of gravitation and EM (modified gravitation[0]) would possess what we call mass because of that force's effect on other particles. Where does this leave the Standard Model Higgs field and boson?

In the spectrum of the Sun, at least a few thousand spectral lines remain unknown today[1] (many of the unidentified ones lie at ultraviolet wavelengths). Ian Roederer of Carnegie Observatories in Pasadena, California, USA says "Each spectral line corresponds to a specific energy transition related to a particular atom – and thus, element." (Astronomy magazine – April 2013, p.50) If both gravitational and electromagnetic waves play a role in the constitution of elementary particles, association of particles with the EM spectrum could lead to this conclusion – "electromagnetic waves …exhibit particle-like properties, more noticeable for higher frequencies, consistent with quantum theory" (quote from the entry "electromagnetic radiation" in Penguin Encyclopedia 2006). This is why illustrations can be seen that include cosmic rays – which are actually subatomic particles – in the electromagnetic spectrum beyond the highest frequency energy of gamma rays. Another conclusion is - (unidentified) spectral lines corresponding to the gravitational input would be expected to be present in the electromagnetic spectrum.

[1] This also applies to the stars - "The analysis of the high-resolution UVES spectra of the chemically peculiar stars HR 6000 and 46 Aql has revealed the presence of an impressive number of unidentified lines, mostly concentrated in the regions 4404-4411 angstroms (violet) and 5100-5300 angstroms (green)." – "Unidentified lines in the spectra of two iron overabundant CP stars: Are they Fe II lines?" by F Castelli, S Johansson and S Hubrig (Journal of Physics: Conference Series 130 [2008] 012003)

Graviton-Photon Oscillation

Gravity and electromagnetism are both necessary in the production of all particles, not just the fermions. Bosons such as gravitons, for example, contain gravity in themselves since that's what they transmit. Their electromagnetic input is in the form of 1's and 0's generated by the electricity in computers (perhaps by magnetism or visible or invisible light in years to come). The bosons called photons are worthy of special consideration. It could be briefly stated that they contain electromagnetism in themselves and their gravitational input comes from the gravitons they encounter everywhere. But exactly how does a graviton transfer its energy to a photon? Is it possible for a graviton to transform into a photon? And can photons transform into gravitons? (the latter would be an additional source of gravitons' electromagnetic input)

This isn't unprecedented since neutrinos, having mass, can change (oscillate) between the type produced by nuclear fusion in the sun's core and two types that weren't caught by detectors on Earth after radiation from the sun (this meant only a third to a half of the sun's predicted neutrino output was detected prior to 2002 when the new understanding of neutrino physics was introduced). The particles called neutral B mesons can also spontaneously oscillate between their matter and antimatter states since they have mass. Particle types are fixed if the particles are massless, so gravitons and photons shouldn't oscillate from one to the other. Gravitons and photons must have mass after all. I'll just talk about photons now – experiments conducted by the Particle Data Group ("Review of Particle Physics" - Physics Letters B (Volume 667, Issues 1–5, 11 September 2008, Pages 1–6) say the mass of a single photon is no more than 10^-18 eV/c^2 (a billionth of a billionth of an electronvolt - a 100 watt lightbulb burning for 1 hour equals 2.2 trillion trillion electronvolts). Photons must have mass because Einstein proposed, and experiments confirm, that photons have momentum (the quantity of motion of a moving body). And momentum (possessed by gravitons, too) is defined in physics as the product of the mass and velocity of an object (p=mv). More needs to be stated, though - at speeds that are a significant percent of the velocity of light (the speed of light is symbolized by c for celeritas, a Latin word translated as swiftness or speed), the approximation that momentum is a product of rest mass and velocity is not accurate. At the high speeds dealt with by Special Relativity, that mass increases up to the speed of light then the photons become massless. [2]

Relativistic Mass Increase and Time Dilation

[2] It's impossible to point to the 4th dimension of time, so this cannot be physical. Since the union of space-time is well established in modern science, we can assume the 4th dimension is actually measurement of the motions of the particles occurring in the 3 dimensions of length, width, and height. The basic standard of time in the universe is the measurement of the motions of photons - specifically, of the speed of light. This is comparable to the 1960's adoption on

Earth of the measurement of time as the vibration rate of cesium atoms. At lightspeed, time = 0 (it is stopped). Below 300,000 km/sec, acceleration or gravitation causes time dilation (slowing of time as the speed of light is approached). If time's 0, space is also 0 because space and time coexist as space-time whose warping (gravity) is necessarily 0 too. Spacetime/gravity form matter/mass, so the latter pair can't exist at lightspeed and photons are massless. Suppose Albert Einstein was correct when he said gravitation plays a role in the constitution of elementary particles (in "Do Gravitational Fields Play An Essential Part In The Structure of the Elementary Particles?" – a 1919 submission to the Prussian Academy of Sciences). And suppose he was also correct when he said gravitation is the warping of space-time. Then it is logical that 1) gravitation would play a role in constitution of elementary particles and also in the operation of the nuclear forces, and 2) the warping of space-time that produces gravity means space-time itself plays a role in the constitution of elementary particles and the nuclear forces. Gravity is responsible for the mass of attracting or repelling EM's photons and is responsible for the nuclear forces - it is therefore the ultimate physical source of all repelling and attracting. Mass increase at increasing accelerations is inevitable because the object is encountering more spacetime and gravity (the producers of mass; which also confer mass's equivalent [energy] on cosmic rays that travel far enough through space, turning them into ultra-high-energy cosmic rays). But mass increase cannot become infinitely large since space-time, gravity and mass don't exist at lightspeed. The object is converted into energy which means mass and energy must be equivalent and Energy must equal Mass related to the Speed of Light ($E=mc^2$, in the words of Albert Einstein). Since there is zero, or no, spacetime at light speed; infinity (see "electronic infinity" on p.13) exists in that state … all distances are totally eliminated and a photon experiences the whole universe – as well as all time – in its existence. "Physics of the Impossible" by Michio Kaku (Penguin Books 2008, p.227) says, ".. whenever we naively try to marry these two theories (general relativity and quantum theory), the resulting theory makes no sense: it yields a series of infinite answers that are meaningless." We see that infinite answers are supposed to be arrived at because light is important in Relativity and "infinity (in the sense of total elimination of distance) exists at light speed". Infinity and infinite answers are not barriers to uniting general relativity and quantum theory. When we realize that $c=\infty$ (infinity exists at light speed), those infinite answers can yield real meaning.

Gluons (the strong force's carriers) and the W+, W- and Z^0 particles (the weak force's carriers) have all been discovered – but that doesn't mean the strong and weak nuclear forces exist independently of gravity and electromagnetism. The nuclear forces might have no existence apart from G (gravitation) + EM (electromagnetism) but could simply be products of graviton-photon interaction: the strong nuclear force could be gravity "added to" electromagnetism (the electromagnetic force combined with 100 gravitons per electromagnetic photon) while the weak nuclear force could be gravity "subtracted from" electromagnetism (the product of the

electromagnetic force combined with 100 billion anti-gravitons). Similarly, both G + EM are needed to produce a Higgs boson.

Higgs Boson and (e∞)

It's appropriate that invisible gravity be represented in an invisible part of the spectrum while its result (the visible elements with their particles, atoms and matter) be represented in a visible part of the spectrum. Take a spectral line corresponding to a gravitational wave revealed at the ultraviolet wavelength of 10 nm (nanometres) – this corresponds to a photon energy of 123.98 eV (electronvolts). Combine this with a spectral line corresponding to an electromagnetic wave at the red wavelength of 620 nm (photon energy of 1.9997 eV). ("Energy of Photon" - http://pveducation.org/pvcdrom/properties-of-sunlight/energy-of-photon) This equals photon energy 125.9797 eV; multiplied by a billion, the result is 126 GeV when rounded to the nearest whole number (126 giga – or billion – electronvolts). To reach the same result using wavelengths of **440 nm** (violet with photon energy of 2.8177 eV) **and 520 nm** (green with photon energy of 2.3842 eV) – see [1], and note that I nm = 10 angstroms – we must combine those wavelengths with wavelengths corresponding to 125.9797-2.8177=123.1620 eV **(10.1 nm, ultraviolet)** and 125.9797-2.3842=123.5955 eV **(10 nm, the x-ray/ultraviolet borderline)**. Why multiply by a billion? This is a concession to the human way of measuring distance (a necessity if human mathematics and technology is used to build our subuniverse – see pp.8-9). "The International System of Units (abbreviated SI from French: Le Système international d'unités) is the modern form of the metric system (and) is the world's most widely used system of measurement, used in both everyday commerce and science." ("International System of Units" – Wikipedia, the free online encyclopedia) The official unit used by SI is the metre. Since this article uses the nanometre, multiplying by 10^9 (a billion) is required to convert to the metre.

Maybe this still seems totally arbitrary and done merely to achieve the desired result. But it is not unreasonable in fact. It's an important property of force-carrying particles e.g. photons that they do not obey Pauli's exclusion principle – discovered in 1925 by Austrian physicist Wolfgang Pauli, this says two similar particles cannot exist in the same state. This means there is no limit to the number that can be exchanged. So starting with any unit of measurement – such as the angstrom (10^-10, one ten-billionth of a metre) or the picometre (10^-12, one trillionth of a metre) or even the metre itself – has no effect on the number of photons. The same amount of space can be occupied by a billion, 10 billion, a trillion … or 1. Any number of photons (actually, all force-carrying particles) occupying the same space hints at unification. Unification could only happen if all fermions (particles of matter) also inhabited that quantum-sized space occupied by one photon. For a moment, forget that bodily senses and scientific instruments say this is ridiculous. Allow yourself to wonder about the mechanism that could make it happen and consider the following lines (from p.13) –

"The inverse-square law states that the force between two particles becomes infinite if the distance of separation between them goes to zero. Remembering that gravitation (associated with particles) partly depends on the distance between their centres, the distance of separation only goes to zero when those centres occupy the same space-time coordinates (not merely when the particles' or objects' sides are touching i.e. infinity equals the total elimination of distance). The infinite cosmos could possess this absence of distance in space and time, via the electronic mechanism of binary digits. To distinguish this definition from "the universe going on and on forever", we can call it "electronic infinity or e∞".

Quantum Entanglement and Retrocausality

Infinity does not equal nothing - total elimination of distance, or space, produces nothing in a physical sense and reverts to Lee Smolin's imagining of strings as "not made of anything at all" (p.35 of Dr. Odenwald's article). It also reverts the universe to the mathematical blueprint from which physical being is constructed (see below – this agrees with cosmologist Max Tegmark's hypothesis that mathematical formulas create reality, http://discovermagazine.com/2008/jul/16-is-the-universe-actually-made-of-math#.UZsHDalwebs and http://arxiv.org/abs/0704.0646). So, infinity = something, agreeing with Dr. Odenwald's statement on p.32 of his article that "The basic idea is that every particle of matter … and every particle that transmits a force … is actually a small one-dimensional loop of *something."* With all distances deleted and a photon experiencing the entire universe in its existence (including gravity and the nuclear forces – carried by the gravitons, gluons, W+, W- and Z^0 particles), the cosmos has become finite (even subatomic or quantum sized). The "pairing up" of particles by e-infinity i.e. by the electronic binary digits of 1 and 0, permits matter we know to defy the exclusion principle. Also, "pairing up" of particles by e-infinity means quantum effects become apparent on a large macroscopic scale. This permits a "distant" event to instantly affect another (exemplified by the quantum entanglement of particles separated by light years), or permits effects to influence seemingly separate causes (exemplified by the retrocausality or backward causality promoted by Yakir Aharonov and others). This means quantum processes wouldn't be confined to tiny subatomic scales but would also occur on the largest cosmic scales.

Mathematical Unification

Whatever number and operation (+, -, x, ÷) we use, it has no effect on the space occupied by photons or other particles and we return to the unification which describes our little corner of the universe, though our eyes and instruments misleadingly say that corner extends for many billions of light years. Is the physically infinite cosmos quantum-sized? E-infinity (removal of all space) implies that it's infinitely smaller and has no size at all in reality – every part of the universe must thus be identical to every other part. But as explained a minute ago, it (paradoxically) does not equal nothing (the whole cosmos is therefore a

mathematical unification). Being a math unity, the operation and number used to arrive at the Higgs boson's mass does not have to be either less than, other than or more than, multiplication by one billion. Divide 126 GeV by c^2 because an electron volt is actually a measurement of energy, and mass units equal energy units divided by c2, or m = E/c2 (which is E=mc^2 when both sides are multiplied by c^2), and the result is the mass of the Higgs boson. (According to "Observation of a new particle in the search for the Standard Model Higgs boson with the ATLAS detector at the LHC" by The ATLAS Collaboration (Physics Letters B - Volume 716, Issue 1, 17 September 2012, Pages 1–29 and http://arxiv.org/abs/1207.7214), its mass is 126.0 ± 0.4 GeV/c2.

Coronal Heating (Part 1 – Little Ice Age)

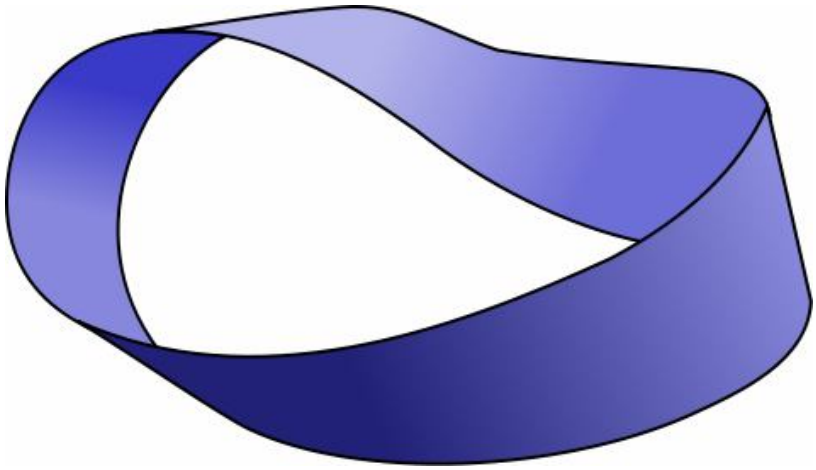
Sunspots form because the sun's equator rotates more quickly than its poles (25 days at the equator, 34 days at the poles). Being "frozen" into its gases, the magnetic field lines of the sun stretch, twist, are drawn out into loops and erupt through the sun's surface, forming sunspots. The intense magnetism of the spots prevents heat from rising to the surface and radiating into space because magnetic fields restrict the motion of charged particles - and infrared photons form charged electrons and protons when they interact with gravity in wave packets (at the most basic level, this process is mathematical and relies on quantum Mobius loops along with their translation into fractally quantum-sized figure-8 Klein bottles[3]). The Maunder Minimum of observations of extremely low sunspot activity from 1645 to 1715 (named after the solar astronomer Edward W. Maunder [1851-1928]) could actually be attributed to a period of intense sunspot activity. Why? Because a great number of decoupled sunspot vortices (rotating magnetic field lines that remain within the sun) would stop the Earth receiving as much warmth from the Sun. The Maunder Minimum coincided with the middle – and coldest part – of the Little Ice Age during which Europe and North America and perhaps much of the rest of the world saw glaciers advance and rivers freeze; even the Baltic Sea froze over, allowing sledge rides from Poland to Sweden with inns built along the way. The Maunder Minimum would be termed a period of minimum activity coz the sunspots (technically, their increased number of vortices) would not have been visible. The distorted magnetic loops don't have to break through the sun's surface or photosphere but can remain within, forming a rotating vortex that concentrates field lines and can create intense, heat trapping magnetism.

("Recent observations from the Solar and Heliospheric Observatory [SOHO] using sound waves traveling below the Sun's photosphere [local helioseismology] have been used to develop a three-dimensional image of the internal structure below sunspots; these observations show that there is a powerful downdraft underneath each sunspot, forming a rotating vortex that concentrates the magnetic field." - Wikipedia's "Physics" of "Sunspot" and "Helioseismic Observation of the Structure and Dynamics of a Rotating Sunspot Beneath the Solar Surface" by Junwei Zhao and Alexander G. Kosovichev: "The Astrophysical

Journal" Volume 591 Number 1.) Therefore, SOHO's observations support the idea that gravitation and electromagnetism are "trapped" in matter/mass-forming wave packets (by analogy with the spacecraft's support for magnetism trapping infrared bosons).

String Theory, the Mobius Loop and the Klein Bottle

[3] Let's borrow a few ideas from string theory's ideas of everything being ultimately composed of tiny, one-dimensional strings that vibrate as clockwise, standing, and counterclockwise currents in a four-dimensional looped superstring. We can visualize tiny, one dimensional binary digits of 1 and 0 (base 2 mathematics) forming currents in a Mobius loop – or in 2 Mobius loops, clockwise currents in one loop combining with counterclockwise currents in the other to form a standing current. Combination of the 2 loops' currents requires connection of the two as a four-dimensional Klein bottle. This connection can be made with the infinitely-long irrational and transcendental numbers. Such an infinite connection translates - via bosons being ultimately composed of 1's and 0's depicting pi, e, $\sqrt{2}$ etc.; and fermions being given mass by bosons interacting in matter particles' "wave packets" – into an infinite number of Figure-8 Klein bottles.[0.1 and 4] Slight imperfections in the way the Mobius loops fit together determine the precise nature of the binary-digit currents (the producers of gravitational waves, electromagnetic waves, the nuclear strong force and the nuclear weak force) and thus of exact mass, charge, quantum spin, and adherence to Pauli's exclusion principle. Referring to a Bose-Einstein condensate, the slightest change in the binary-digit flow (Mobius loop orientation) would alter the way gravitation and electromagnetism interact, and the BEC could become a gas (experiments confirm that it does).



Mobius loop – This is how it might be used in building a universe:
We write down everything our species has learned (an "Encyclopedia Universalis"). Instead of using ink, we use the binary digits of 1 and 0. And we do not write on paper or in computers in a linear fashion (one line after the other … left to right, top of page to bottom). We "write" in the warps of space-time and

hyperspace, and do so in Mobius fashion (everything is written so that it's comparable to being on a piece of paper that's given a twist before the ends are joined). This causes curving and warping in space-time, confusion of "here" and "there" (quantum entanglement), and muddled causes and effects (retro- or backward causality). Because of this entanglement of all time and space; if the writing is done in the year 3,000 it could still include the knowledge of the year 3,000,000 or 3,000,000,000 and so on.

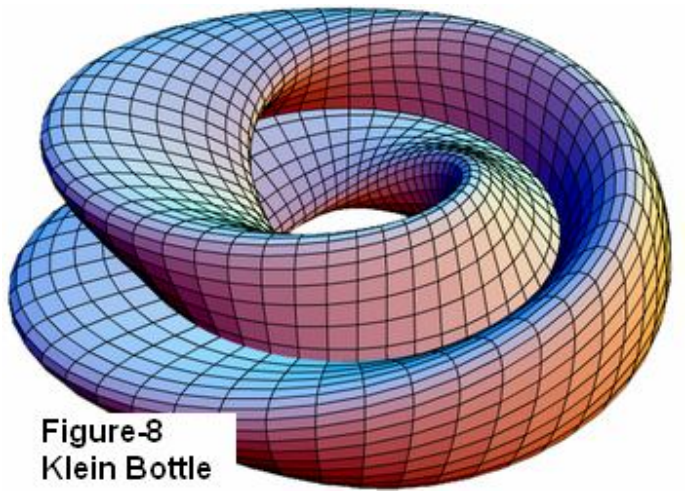
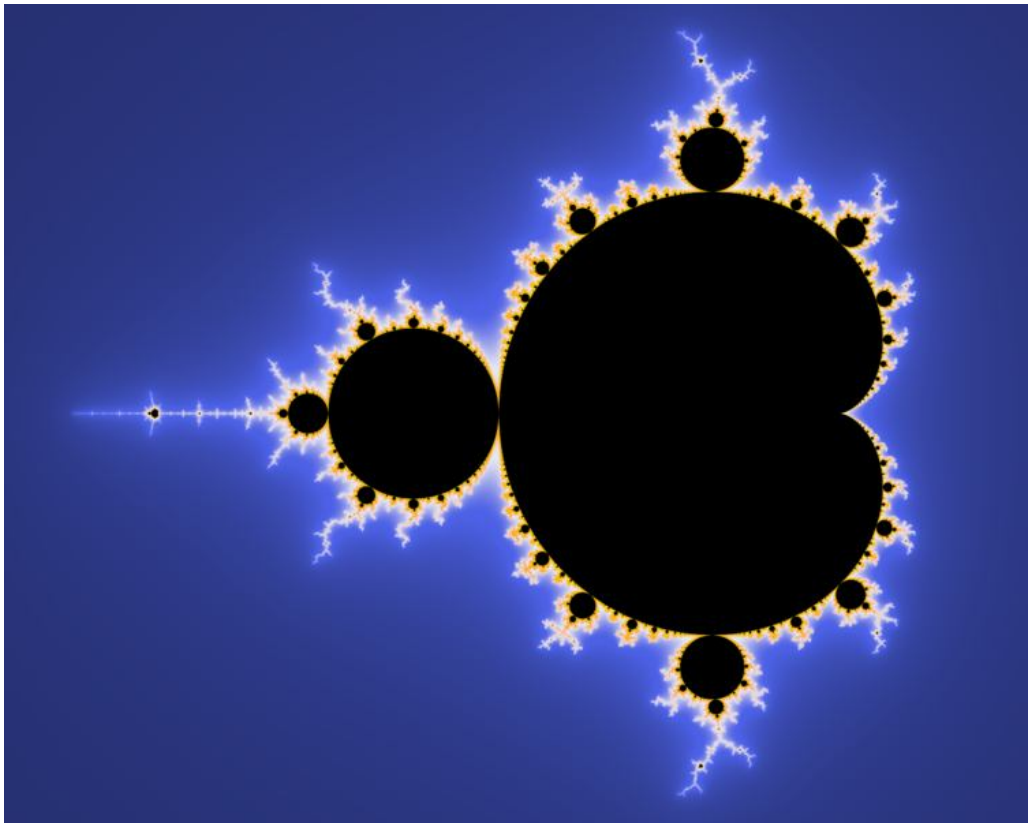


Figure-8
Klein Bottle

(2 Mobius loops – each one is 2 dimensional - joined along their edges can form a 4 dimensional figure-8 Klein Bottle) Remember that the flexibility afforded by 1's and 0's seamlessly welds this, a subuniverse, with surrounding subuniverses as well as deleting the hole from its centre.



MANDELBROT SET:
Mathematician Benoit Mandelbrot (1924-2010) developed this fractal geometry and coined the word fractal (a fractal is a shape 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 – fractals are used to describe coastlines, mountain ranges, etc). The diminishing size of spheres may be seen as representing cosmic, galactic, human, quantum scales.

[4] Each one is a “subuniverse” composing the physically infinite and eternal space-time of the universe (our own subuniverse is 13.7 billion years old). We don’t have to worry about accelerating cosmic expansion – the result of more space being continually produced by binary digits - leaving our galaxy alone in space. As “dark energy” causes known galaxies to depart from view, more energy and matter – also the product of binary digits - can replace them (since the universe obeys fractal geometry, gravity is the source of repelling and attracting not only on a quantum scale but on a cosmic scale, too i.e. it accounts for dark energy – it accounts for dark matter and Kepler’s laws of planetary motion, too [but that’s a long explanation best left in my article “Unified Field, Relativity and Quantum Mechanics Meet String Theory, Parallel Universes, the Mathematical Universe, and TOE” - http://vixra.org/abs/1303.0218]). The Law of Conservation says neither matter nor energy can be created or destroyed (though the quantity of each can change), so a better phrase might be “binary digits recycle spacetime” (when matter changes into energy or energy becomes

matter, we commonly say matter or energy has been created). As well, other expanding subuniverses can collide with ours and their galaxies enter our space to keep our galaxy company. (see “Cosmic evolution in a cyclic universe” by Paul Steinhardt and Neil Turok - Phys. Rev. D 65, 126003 (2002) [20 pages] – also see “Will Our Universe Collide With a Neighboring One?” by Zeeya Merali: http://discovermagazine.com/2009/oct/04-will-our-universe-collide-with-neighboring-one#.UY3YTKL-Gbs (from the October 2009 issue of Discover) that speaks of the “axis of evil”, an unexpected alignment of cold and hot [denser and less dense] spots in the cosmic microwave background; one of the possible explanations of this being collision with another universe [other proposals are that the universe’s inflation wasn’t perfectly symmetrical, and that the entire universe is rotating])

Coronal Heating (Part 2 – Gravity and EM Interact)

As the sun's magnetic field extends to its corona (outer atmosphere), the infrared photons trapped within it heat the corona to temperatures of one to three million kelvin. Recall that “magnetic fields restrict the motion of charged particles - and infrared photons form charged electrons and protons when they interact with gravity in wave packets”. This means heating of the corona is not solely dependent on magnetic fields but also on “… rapid heating events like fast jets of hot material …” (Astronomy magazine - April 2013, p.50). In the Astronomy article; Scott McIntosh from the National Center for Atmospheric Research in Boulder, Colorado, USA writes, "The Alfven (magnetic) waves likely dump their energy in the corona, too, but the means by which that happens is a topic of great debate. So, we still don't know exactly why the Sun's corona is hot ..." This article proposes that magnetic waves "dump" energy in the corona by interacting with gravity waves refracted towards the sun’s centre from the outer solar system, thus producing mass in the corona and giving the illusion that gravitational attraction emanates from the sun’s centre. (Recall that Relativistic space – whose warps ARE gravity - is curved and pushes bodies … for a nonmathematical explanation of how gravitation accounts for dark matter and Kepler’s laws of planetary motion, see “Unified Field, Relativity and Quantum Mechanics Meet String Theory, Parallel Universes, the Mathematical Universe, and TOE” by the author - http://vixra.org/abs/1303.0218, or see the end of this article). The corona’s mass does not perpetually increase because of the massive burst of solar wind and magnetic fields ejected in coronal mass ejections (CMEs) - about one to fifteen every five days, each averaging 1.6 x 10^12, or 1.6 trillion, kg. And particles are also released in the solar wind – between 4 and 6 billion tonnes per hour (equal to losing Earth’s mass every 150 million years).

Nuclear Forces as Modified Gravity

[0] To introduce electromagnetism as modified gravitation, here’s a little bit about “the nuclear forces as modified gravity” - in the Standard Model (physicists’ accepted exolanation of how particles and forces interact), the strong force binds

nucleons (protons and neutrons) 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. In this article's non-Standard-Model explanation, 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. 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, which equals 10^25. Although the nuclear forces weren't well understood in Einstein's day, I believe Einstein understood them better than any other scientist 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. In the case of nuclear fusion within the sun - the electric repulsion between two positively charged proton nuclei is strong but when the separation is small enough, the attractive nuclear force is stronger. It's essential to remember that this article is not saying electromagnetism and the nuclear forces do not exist. It's saying they don't exist independently of gravitation, which is the underlying cause of all repelling and attracting (on both cosmic and quantum levels, since the universe obeys fractal geometry - "The WiggleZ Dark Energy Survey: the transition to large-scale cosmic homogeneity" (29 authors) - Monthly Notices of the Royal Astronomical Society; Volume 425, Issue 1, pages 116–134, 1 September 2012 reports that the WiggleZ galaxy survey confirms that matter is distributed evenly at the largest scales. But if we disregard the largest scale of infinite flatness; smaller scales reflect the idea of fractals e.g. from roughly spherical galaxy clusters, down to stars, down to atoms.)

Electromagnetism as Modified Gravity

[0.1] If the nuclear forces may be different facets of gravitation, is it possible that electromagnetism also has no existence independently of it? This is possible if all forces have a mathematical[5] origin, in which case a few ideas can be borrowed from string theory's ideas of everything being ultimately composed of tiny, onedimensional strings that vibrate as clockwise, standing, and counterclockwise currents in a four-dimensional looped superstring. We can visualize tiny, one dimensional binary digits of 1 and 0 (base 2 mathematics) forming currents in a program called a Mobius loop – or in 2 Mobius loops, clockwise currents in one loop combining with counterclockwise currents in the other to form a standing current. Combination of the 2 loops' currents requires connection of the two as a four-dimensional Klein bottle whose construction from binary digits would make it malleable and flexible, deleting any gap and molding its border to perfectly fit

surrounding subuniverses. This Klein bottle could possibly be a figure-8 Klein bottle because its similarities to a doughnut's shape describes an idea suggested by mathematics' "Poincare conjecture". The conjecture has implications for the universe's shape and says you cannot transform a doughnut shape into a sphere without ripping it. One interpretation follows: This can be viewed as subuniverses shaped like Figure-8 Klein Bottles gaining rips called wormholes when extended into the spherical spacetime that goes on forever (forming one infinite[6] superuniverse which is often called the multiverse when subuniverses - which share the same set of physics' laws - are incorrectly called parallel universes which are wrongly claimed to each possess different laws). Picture spacetime existing on the surface[7] 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 - If binary digits are strings, and if digits create rips in the space of a universe that obeys fractal geometry, Steven Weinberg would be correct to imagine strings as rips in space ("What String Theory Tells Us About the Universe" by Dr. Sten Odenwald (Astronomy – April 2013, p.35). The boundaries where subuniverses meet could be called Cosmic Strings (they'd be analogous to cracks that form when water freezes into ice i.e. cosmic strings would form as subuniverses cool from their respective Big Bangs).

Nonlinear Gravity and EM

[5] In a universe based on mathematics; not only string theory would have a place, so would fractals and nonlinear dynamics. Travelling full circle in our exploration of nonlinear dynamics; we would expect that electromagnetism, though a modification of gravitation, is the source of gravitation too (accounting for electromagnetic BITS – Binary digiTS – creating gravitation). It seems that gravitation can be viewed as the effect of the cause known as binary digits. What if Israeli scientist Yakir Aharonov, and others, are correct about the theory of retrocausality? (effects influence causes – therefore, causes and effects operate nonlinearly and are not necessarily separate: see "Five Decades of Physics" by John G. Cramer, Professor of Physics, University of Washington - http://www.physics.ohio-state.edu/~lisa/CramerSymposium/talks/Cramer.pdf). Then electromagnetism (in this context, limited to the electricity and magnetic fields in present-day computers and taking the form of binary digits) is the effect of the cause known as gravitation. The Law of Conservation says neither matter nor energy can be created or destroyed (though the quantity of each can change), so it would be more accurate to say binary digits recycle the products of gravitation. These products are the force-carrying particles or bosons of **ENERGY** that are ultimately composed of 1's and 0's depicting the infinite transcendental and irrational numbers pi, e, √2 etc. which combine the two-dimensional Mobius-loop programs into an infinite number of four-dimensional Klein bottles (subuniverses); and the **MATTER** particles or fermions that are given mass by bosons interacting in matter particles' "wave packets" (when matter changes into energy or energy becomes matter, we commonly say matter or energy has been created).

Infinite Universe (Physically and Electronically)

[6] Support for a physically infinite universe - 1) 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."
2) after examining recent measurements by the Wilkinson Microwave Anisotropy Probe, NASA declared "We now know that the universe is flat with only a 0.4% margin of error." - http://map.gsfc.nasa.gov/universe/uni_shape.html;
and 3) according to "The Early Universe and the Cosmic Microwave Background: Theory and Observations" by Norma G. Sànchez, Yuri N. Parijskij (published by Springer, 31/12/2003), the shape of the Universe found to best fit observational data is the infinite flat model).
Thinking about a finite cosmos makes my head hurt (if the cosmos is finite, what exists outside it? If there's something, that something must be part of the universe. If there's absolutely nothing, how can that be? Nothing doesn't exist.) But I can't really picture an infinite cosmos that never ends. A new definition of infinity is needed. The inverse-square law states that the force between two particles becomes infinite if the distance of separation between them goes to zero. Remembering that gravitation (associated with particles) partly depends on the distance between their centres, the distance of separation only goes to zero when those centres occupy the same space-time coordinates (not merely when the particles' or objects' sides are touching i.e. infinity equals the total elimination of distance). The infinite cosmos could possess this absence of distance in space and time, via the electronic mechanism of binary digits. To distinguish this definition from "the universe going on and on forever", we can call it "electronic infinity or e∞". Infinity does not equal nothing - total elimination of distance, or space, produces nothing in a physical sense and reverts to Lee Smolin's imagining of strings as "not made of anything at all" (p.35 of Dr. Odenwald's article). It also reverts the universe to the mathematical blueprint from which physical being is constructed (see below – this agrees with cosmologist Max Tegmark's hypothesis that mathematical formulas create reality, http://discovermagazine.com/2008/jul/16-is-the-universe-actually-made-of-math#.UZsHDaIwebs and http://arxiv.org/abs/0704.0646). So, infinity = something, agreeing with Dr. Odenwald's statement on p.32 of his article that "The basic idea is that every particle of matter … and every particle that transmits a force … is actually a small one-dimensional loop of *something*.

Brian Greene's Cosmic Movie

[7] Picture spacetime existing on the surface of this doughnut which has rips in it. British quantum physicist David Bohm (1917-1992) asserted "Our

brains mathematically construct objective reality by interpreting frequencies that are ultimately projections from another dimension, a deeper order of existence that is beyond both space and time." (In "The Hidden Reality" - Knopf [January 25, 2011], Brian Greene writes "… reality … may take place on a distant boundary surface, while everything we witness in the three common spatial dimensions is a projection of that faraway unfolding. Reality, that is, may be akin to a hologram. Or, really, a holographic movie."[8] Brian Greene's "…projection of that … reality that is … akin to a holographic movie" and David Bohm's "…projections from another dimension … that is beyond both space and time" could be interpreted as "projections of binary digits from a 5^{th}-dimensional hyperspace[9] which become matter, energy, force and space-time in the known 4 dimensions". This interpretation seems all the more relevant when we recall Carl Sagan's saying – "There is, in fact, *no* center to the (universe's) expansion … at least not in ordinary three-dimensional space.") These rips provide shortcuts between points in space and time – and belong in a 5th-dimensional hyperspace.)

[8] Time is possibly an electronic "clock" measuring the motions of matter i.e. producing frames as in a movie. If the universe is made of frames, the word "travel" would refer to one state or position (such as in a planet's or moon's orbit) being electronically represented in a "cosmic movie frame", with possibly a billion times a billion frames displayed every second [or a billion times that] so that its "movement" would appear continuous. Time travel into the past or future would be like going to different points in the cosmic movie instantly. Were ancient Greek philosophers Parmenides and Zeno of Elea at least partly correct to speak of the absurdity of reality being made up of many changing things? Zeno also said motion is absurd. Motion and change would, in the end, merely be the switching of 1's to 0's and vice versa.

Something from Nothing, Something from Something

[8.1] If, as has been suggested, frames are created in the 5^{th} dimension by bits and their very rapid display results in the macroscopic motion we see; what causes the microscopic motion of bits switching on and off in order to display frames? Maybe the switching on and off of bits, and thus building of the universe, is not accomplished entirely by application of the positive energy familiar to our lives in space-time. Maybe it relies on the brain's using positive energy that interacts with the negative energy in 5^{th}-dimensional hyperspace. "Physics of the Impossible" by Michio Kaku (Penguin Books, 2008) says on p.205, "Traditionally, physicists have dismissed negative energy and negative mass as science fiction. But we now see that they are indispensable for faster-than-light travel, and they might actually exist". On p.179 of "The Grand Design" by Stephen Hawking and Leonard Mlodinow (Bantam Press, 2010) it's stated "One requirement any law of nature must satisfy is that it dictates that the energy of an isolated[8.2] body

surrounded by empty space is positive, which means that one has to do work to assemble the body." Page 179 also says "… if the energy of an isolated body were negative … there would be no reason that bodies could not appear anywhere and everywhere." Could the sleeping, and consequently less distracted by events in our daily space-time, brain engage in feedback with negative hyperspace and easily create the universe without doing very much traditional work? Fractal geometry states that every particle in space-time contains hyperspace (about 70% of space consists of dark energy, according to the WMAP and Planck space probes) – so more than two-thirds of the universe requires no assembly at all. It seemingly appears from nothing, but actually uses the brain's positive energy which interacts with the negative energy in 5^{th}-dimensional hyperspace (negative energy requires no work at all, according to "The Grand Design"). (A universal intelligence[8.3] would necessarily combine positive and negative energy in itself – or, since consciousness and personality are parts of the cosmos, should we say herself or himself - i.e. space-time combines with hyperspace.) The remaining third is entangled with the no-work two-thirds and similarly only needs personal interaction with hyperspace (since every particle and atom contains hyperspace, interactions can be physical e.g. using computers, manufacturing and engineering). Thus, the whole universe appears to be created from nothing.

[8.2] Nothing can be truly isolated when we consider the universe as a unification caused by 1's and 0's, but our physical senses and scientific instruments don't detect binary digits and our senses/instruments thus reinforce the illusion of isolation.

Universal Intelligence

[8.3] God's existence cannot possibly be scientifically comprehended in the current non-unified understanding of the cosmos. Thus, many scientists need to invoke the existence of an unlimited number of parallel universes having limitless combinations of the laws of physics (so one of those universes would produce all the correct laws that enable beings such as ourselves to exist). A non-supernatural God is proposed via the inverse-square law's infinite aspect coupled with eternal quantum entanglement, but Einstein taught us that time is warped. Warped time is nonlinear, making it at least possible that the BITS composing space-time and all particles originate from the computer science of humans - BInary digiTS only suggest existence of the divine if time is linear. The inverse-square law 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 i.e. infinity equals the total elimination of distance – the infinite cosmos could possess this absence of distance in space and time, via the electronic mechanism of binary digits). 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, and forming a universal intelligence. 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; which means that time must be warped). So what happens if we subtract humans of the distant future - with their ability to travel into the past and use incomprehensibly-advanced cosmogenesis, terraforming and biotechnology (cosmos, Earth-like planet, and life-generating abilities) from the origins of life? It becomes impossible for inorganic materials – and referring to the creation of amino acids in the laboratory by Harold Urey and Stanley Miller in 1952, relatively simple amino acids - to be assembled into complex plants and animals, whose adaptations are often called evolution.

Hidden Variables and Virtual Particles

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. Their identification would lead to problems having exact, instead of merely probabilistic, outcomes – and could also restore a reality that exists independently of observation ("Quantum" by Manjit Kumar – Icon Books 2008, p.379) I suggest this underlying reality is the 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 and the "fitting together" of subuniverses to form a continuous superuniverse.

[8.4] 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. (The space-time we live in is described by ordinary [or "real"] numbers which, when multiplied by themselves, result in positive numbers e.g. 2x2=4, and -2x-2 also equals 4. Inverted positive space-time becomes negative hyperspace which is described by so-called imaginary numbers that give negative results when multiplied by themselves e.g. i multiplied by itself gives -1.) The past can never be changed from what occurred, and the future can never be altered from what it will be. Both are programmed by the 1's and 0's.

"Empty" space (according to Einstein, gravitation is the warping of this – it is not

empty but is filled with the energy of binary digits) 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 – see next paragraph). 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 – the measurement of particles' properties - which 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).

Biogenesis

^ 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) – see "The Microbial World – A Look At All Things Small" http://www.microbiologytext.com/index.php?module=Book&func=displayarticle&art_id=27 and " Biogenesis and Abiogenesis: Critiques and Addresses" http://aleph0.clarku.edu/huxley/CE8/B-Ab.html. 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. Similarly, subtracting humans of the distant future from the origins of life makes it impossible for inorganic materials to be bioengineered to form amino acids.

Bell's Theorem

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 (at least to present-day observation/experiment) – 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).

Immortal Life

Remember how the Law of Conservation says the total mass (or matter) and energy in the universe does not change, though the quantity of each varies? In what form did the matter and energy making up you and me exist before birth, and in what form will it exist after death? 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 (after all, it began with a Mobius loop), so we should not expect immortality to be a simple matter of having an eternal spirit or soul which lives on after death. What then? Think about this alternative –

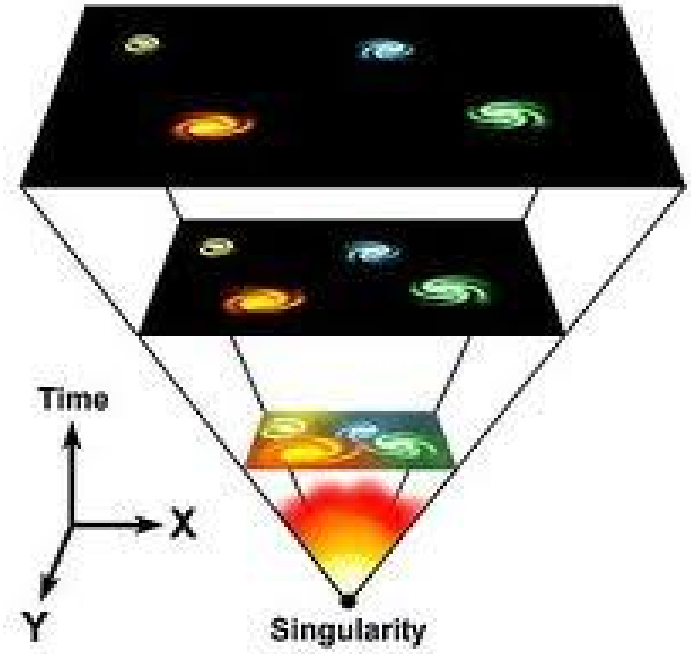
When we die, we're dead. There's no life or consciousness at all. But sometime in the future, doctors and scientists discover how to resurrect us – possibly, they could use time travel to obtain a copy of our minds which could be downloaded into a clone bioengineered to be free of defects so it would 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. Then, because retrocausality exists, the future self will influence the present and past self in a good way.

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 rejected the rejection and said, “Extremely speculative? Bah!” Then he reminded Tegmark that some of the original papers on quantum mechanics were also considered extremely speculative. (p.2 of “Is the Universe Actually Made of Math?” By Adam Frank, Monday, June 16, 2008 - http://discovermagazine.com/2008/jul/16-is-the-universe-actually-made-of-math#.UQNDUR2-pFk

Space-time, Hyperspace and the Big Bang

[9] This 5th-dimensional hyperspace would be tinier than a subatomic particle, like the dimensions invoked by string theory (about 70% of space consists of dark energy, according to the WMAP and Planck space probes – which is interpreted in this article as 70% of a particle also consisting of dark energy since “space-time itself plays a role in the constitution of elementary particles and the nuclear forces” (see paragraph above about Einstein’s 1919 submission to the Prussian Academy of Sciences). Space (spacetime, to be precise), and therefore time, is unified with gravitation; overcoming this objection - England’s Professor Penrose has argued that the gravitational fields, if known everywhere but only for a limited time, do not contain enough information about their electromagnetism to allow the future to be determined, so Einstein's unified field theory fails (information from an email received in early 2012 from American physicist Charles Misner). This dark energy can be associated with hyperspace and its spacetime-forming binary digits, so a) 70% of a particle is composed of hyperspace, and b) the extra dimension also exists everywhere in empty space. With a single extra dimension of astronomical size, gravity is expected to cause the solar system to collapse (“The hierarchy problem and new dimensions at a millimetre” by N. Arkani-Hamed, S. Dimopoulos, G. Dvali - Physics Letters B - Volume 429, Issues 3–4, 18 June 1998, Pages 263–272, and “Gravity in large extra dimensions” by U.S. Department of Energy - http://www.eurekalert.org/features/doe/2001-10/dbnl-gil053102.php However, collapse never occurs if gravity accounts for repulsion as well as attraction. It does this not only on astronomical scales but on the subatomic, too (accounts for dark energy and familiar concepts of gravity, as well as repelling aspects of the electroweak force such as placing two like magnetic poles together and attracting electroweak/strong force aspects).



The universe and big bang are not only physical – they're also mathematical and electronic

Physicist John Wheeler

The American theoretical physicist John Archibald Wheeler (1911-2008) said in "Proceedings of the Third International Symposium on the Foundations of Quantum Mechanics", Tokyo, pp.354-368 (1989). (Copy located at http://jawarchive.files.wordpress.com/2012/03/informationquantumphysics.pdf) –

A single question animates this report: Can we ever expect to understand existence? Clues we have, and work to do, to make headway on that issue. Surely someday, we can believe, we will grasp the central idea of it all as so simple, so beautiful, so compelling that we will all say to each other, "Oh, how could it have been otherwise! How could we all have been so blind so long "

I've tried to remove our blindfolds and our blindness in my articles. I've tried to assemble the central idea in the latter part of this article, although readers may find additional data in my other writings at www./vixra.org, www.fqxi.org and www.researchgate.net. Sure I've made mistakes – but mistakes are good. That's one of the ways we learn. Another is by appreciating the work of everyone else. I'm happy with the things I've learned. I see the world and universe around me, and am confident that this means I'm on the right track. Wherever John Wheeler is now, I'm confident that he's happy with the way things are happening, too

(because a reasonable theory of everything is being constructed here).

Equation Describing the Universe

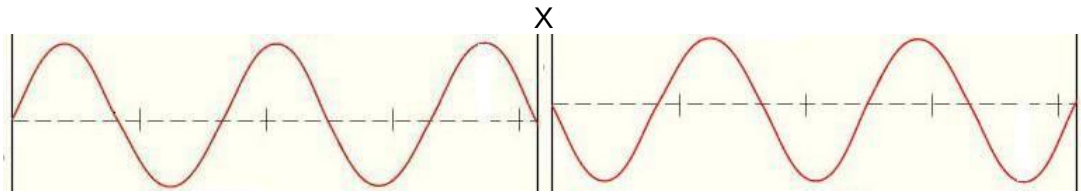
This theory of everything can be described by an equation explaining the universe on both cosmic and quantum levels - $\mathbf{H_u = (BEc)^{(e\infty)}}$**, or** $\mathbf{1 = 1^{\infty}}$. H is for the Hamiltonian, representing the total energy of a quantum mechanical system. The subscript u stands for "universe" and H_u means the universe operates quantum mechanically (quantum effects operate macroscopically as well as microscopically, and this unification is symbolized by the first 1). BEc is for Bose-Einstein condensate, a state of matter composed of bosons cooled close to absolute zero (0 K, − 273.15 °C, or − 459.67 °F) which is the first known example of quantum effects becoming apparent on a macroscopic scale (represented by the second 1). The inverse-square law states that the force between two particles becomes infinite if the distance of separation between them goes to zero. Remembering that gravitation (associated with particles) 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 i.e. infinity equals the total elimination of distance*– the infinite cosmos could possess this absence of distance in space and time, via the electronic mechanism of binary digits). To distinguish this definition from "the universe going on and on forever", we can call it "electronic infinity or $e\infty$" (not E_8). When the macroscopic quantum effects of the BEc are magnified by $^{e\infty}$**,** those effects are instantly translated into all space-time operating quantum mechanically. In other words, you can multiply a BEc (the second 1) an infinite number of times – but no matter how many (or how few) times you do it (using a positive integer), you'll always end up with 1 (the macroscopic universe's time and space operating quantum mechanically). Consequent to this operation is the inevitable quantum entanglement of everything (matter, energy, forces); making all space and all time a unification.

CHALLENGE – Explain To The Layman How Gravity Accounts For Dark Matter and Dark Energy Without Using Any Mathematics

Gravity causes both attraction and repulsion if electromagnetism and the nuclear forces are not independent of it. Considering the repulsive aspect of gravity, it would eliminate the need for dark energy to exist and cause universal expansion. But the sun and moon cause varying tide levels as a result of the constantly varying position, relative to Earth, of the gravitation-absorbing wave packets which compose them i.e. the gravity associated with the sun and moon causes attraction (more about tides in coming paragraphs). The apple that was supposed to have hit Isaac Newton on the head wouldn't have been pulled there by our planet's centre – it would have been pushed there by gravity coming from the outer solar system (and ultimately by warps of space outside our galaxy). Not all of

the gravity encountering the sun or moon is blocked by being diverted into solar and lunar wave packets. Much reaches Earth and is diverted into the wave packets of all things from the top of the atmosphere, to the surface, to the centre of the inner core. Gravity pushes planets toward the sun (planets' orbital speeds prevent them falling into the sun). Some gravitational waves from outside the solar system pass by and some are diverted towards the sun (just as some of the ocean waves passing an island are diverted to the shore by being refracted by the island's mass). As the waves pass the outer planets, more of the waves are refracted by the planetary masses and **appear** to cancel each other at the planet's centres. No interactions in wave packets occur there, meaning there is no mass and, agreeing with conclusions from Isaac Newton's theories, (hypothetical) objects weigh nothing.

X = centre of planet, where waves meet and appear to cancel each other



Gravitational wave travelling from one side of planet to centre

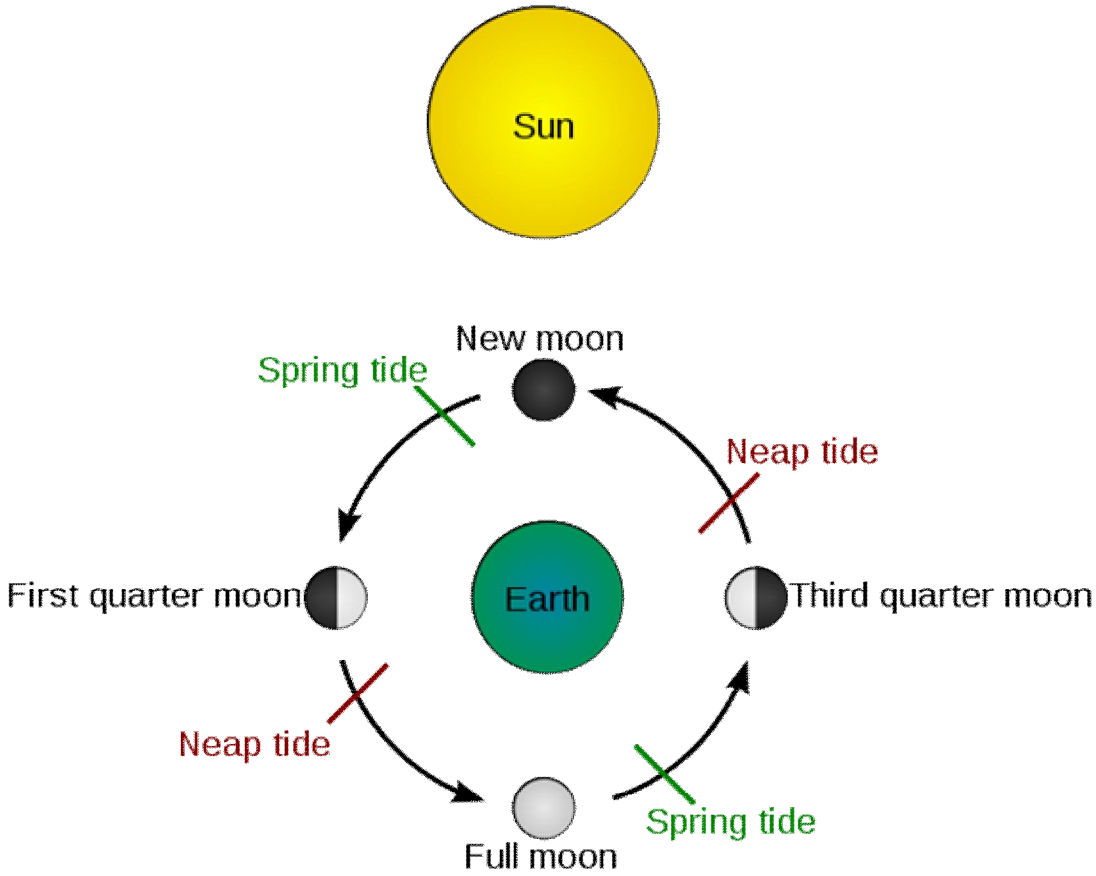
Wave travelling from other side of the planet to its centre

If an equal amount of gravitational waves from every direction in the outer solar system converged on a planet whose composition was separate from the gravitation; the orbit of our planet would be equally pushed towards and pushed away from the sun at every point in its orbit and would be a perfect circle. But the gravitational balance is upset because the gravitation composes the planet's matter-forming wave packets. We might expect waves from every direction to contribute equally to the formation of wave packets. This would be so if local space-time was uniform in composition or character everywhere (flat and homogeneous). However, General Relativity attests that space-time is curved and warped and the Mobius loop attests the same when it's transformed from the abstract world of maths to the world and cosmos we know via gravity being ultimately composed of binary digits. These digits make space-time (and its warps which are called gravity) appear to be nothing when they're actually something, and they make mass when they're combined in wave packets with the modified gravity known as electromagnetism. Upsetting of gravitational balance by planets means their orbits cannot be circular but must be elliptical (Johannes Kepler's 1st law of planetary motion says orbits are oval or elliptical). Fractal scaling of the Mobius could cause individual planets to each possess their own balance and have tiny variations in warping of the surrounding space (a variation resulting in the Pioneer anomaly, and also variously – sometimes imperceptibly - influencing the "flyby anomalies" of spacecraft receiving gravitational slingshots/gravity assists to alter their trajectory or speed). There is no independence of time and space; so if flyby anomalies occur at different

points in space, they must also occur at different times at the same point in space (space-time warps are very dynamic).

Why will two bodies dropped from the same height in a vacuum reach the ground simultaneously (this was verified by the Apollo astronauts on the Moon using a feather and a wrench or hammer)? They actually don't. There's an incredibly tiny, immeasurable, difference explained this way - the more mass a body possesses, the more gravitation is diverted to play a part in that body's formation (and the more inertia is imparted by the gravitons); 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.

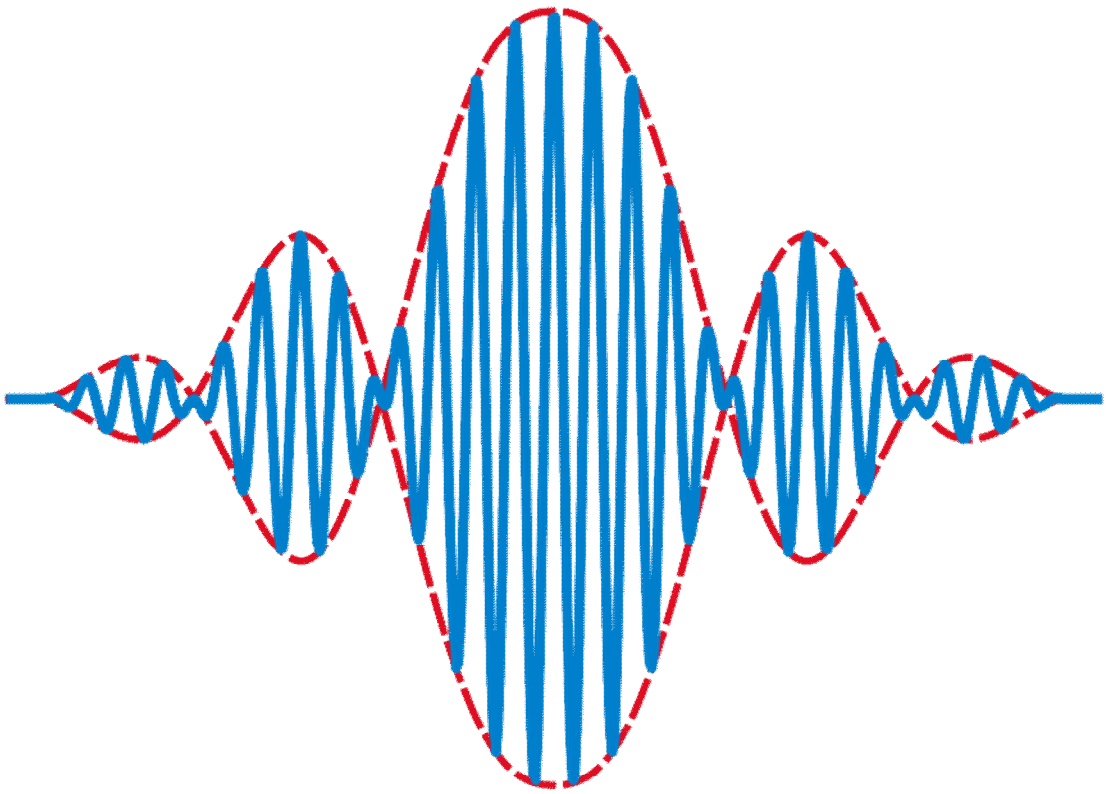
In further relation to wave packets and the tides - The difference in mass between a space station and a black hole is enormous; but the difference between a feather and tool is, in comparison, nothing. So while the heavier tool does fall faster then the lighter feather as the ancient Greek philosopher Aristotle believed, the difference is many billions of times beyond science's finest measuring instruments. It's appropriate to use the results of the experiments of Italian physicist Galileo, and say gravitation is absorbed into wave packets and the inertia of the gravitons carries objects towards Earth's centre at 9.8 m/s^2 or 32 ft/s^2. The mass of the oceans on Earth is estimated at nearly 1.5 billion cubic kilometres ("Ocean Volume and Depth" – Van Nostrand's Scientific Encyclopedia, 10^{th} edition 2008). All this water is being pushed towards Earth's centre at 32 feet per second per second. But the seafloor prevents its descent. So there is a recoil, noticeable offshore (it is only where oceans and continents meet that tides are great enough to be noticed). This recoil is larger during the spring tides seen at full and new moon because sun, Earth and moon are aligned at these times. This alignment means more of the gravitational waves travelling from the outer solar system are captured by solar and lunar wave packets, and less of them are available on Earth to suppress oceanic recoil (there are still enough to maintain the falling-bodies rate of 32 ft/s^2). At the neap tides of 1^{st} and 3^{rd} quarter, only the moon is significantly suppressing oceanic recoil. If variables like wind/atmospheric pressure/storms are deleted, this causes neap tides which are much lower than spring tides.



The explanation for Johannes Kepler's 2nd Law of planetary motion (the three laws were announced between 1609 and 1618, and the second states that a planet or moon moves fastest when at its closest to the star or planet it orbits) can be phrased in terms of recoil. Referring to Earth's moon (I'll explain this physically because the equations used in mathematics, though accurate and precise, often confuse my comprehension of what is actually happening) – when the moon is near Earth, gravitational waves from one direction of the outer solar system are captured in lunar wave packets before reaching Earth, and the momentum of this capture both pushes the moon towards Earth and causes it to move faster when it's near. It suppresses recoil. In this case, the moon's orbit corresponds to the seafloor in the above paragraph – but recoil from the seafloor is not suppressed as is the case with neap tides. The moon's capture of gravitational waves means more gravity waves repress "orbital recoil", the moon's tendency for inertia to move it away from Earth (either by flying off into space, or by increasing the radius of its orbit) i.e. recoil from the moon's orbit is diminished and our satellite remains near to Earth for a time. Eventually the moon's inertia transports it to the farthest point in its orbit where it is orbiting at its slowest speed because our satellite's increasing distance has been allowing more and more gravitational waves to reach Earth (more of them are interacting

in wave packets here - and less are available in the space of the Earth-moon system to repress the moon's orbit or to add speed to that orbit). So it can move from perigee to apogee where an imaginary line called the radius vector which joins Earth's centre to the moon's centre sweeps out an equal area in an equal time. (The very slight difference in gravity waves available to Earth is not enough to make the moon crash into Earth or fly off into space - but only enough to cause slight variations in its nearly circular orbit.) At lunar apogee, the strength of gravitational waves pushing the moon toward Earth is greater than those passing Earth (i.e. not tied up in this planet's wave packets) and heading to the moon. It returns to perigee where gravitational waves from one direction of the outer solar system are captured in lunar wave packets before reaching Earth, and this capture pushes the moon towards Earth and accelerates its orbit. Then to apogee again because its inertia and increasing distance have been allowing more and more gravitational waves to reach Earth (more of them are interacting in wave packets here - and less are available in space to repress the moon's orbit or to keep it orbiting as quickly). Since astronomical bodies receive virtually identical amounts of gravitational waves from all directions, the waves' effect on rotation is normally insignificant, only having appreciable effect over the much larger distances (and much greater exposure periods) of their orbits.
So every aspect of the moon's orbit, and all orbits, is dependent on the 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).

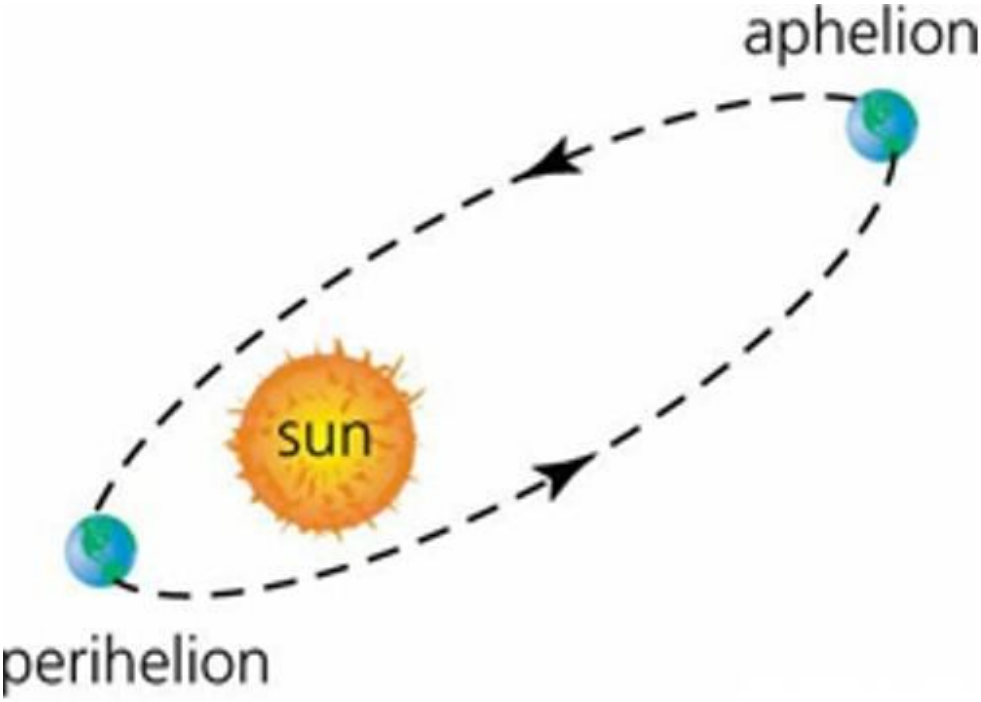
"Einstein says that bodies do not attract each other at a distance. They merely follow the line of least resistance through the hills and valleys of the curved space that surrounds other bodies. Objects that fall to the earth, for example, are not 'pulled' by the earth. The curvature of space time around the earth forces the objects to take the direction on toward the earth. The objects are pushed toward the earth by the gravitational field rather than pulled by the earth." ("Gravitation" - Robert F. Paton, M.Sc., Ph.D.)
Wave packets are the product of a type of "micro gravitational lensing" (lensing is not achieved directly by matter's mass, but by base-2 mathematics comprising gravitons – and their close relative, photons – then forming mass by interaction in wave packets). Gravitational microlensing on a quantum scale magnifies gravitation by concentrating it inside matter's wave packets. This magnified momentum of gravitons composing the gravitation also explains why the moon is pushed to perigee, and why orbits are fastest when a planet or moon is closest to the body it orbits (the paragraph above phrased this as "the momentum of this capture both pushes the moon towards Earth and causes it to move faster when it's near" - and, at apogee, "less (gravitational waves) are available in the space of the Earth-moon system (because there's a tiny increase in the number of them interacting in Earth's wave packets) to repress the moon's orbit or to keep it orbiting as quickly".



Wave packet

Planets nearer the Sun orbit faster than those farther out because an outer planet concentrates gravity waves in itself – the increasing density with depth corresponds to increasing concentration and magnification of wave packets and gravitational waves. When gravity waves meet in the planetary centre, they appear to cancel and have their progress terminated. However, the waves continue – following the oscillations of the wave that entered the planet's opposite side. They eventually emerge from that opposite side, in a magnified condition which they are able to transfer to an inner planet as they journey to the sun (inevitably, the vast majority of magnified waves do not encounter any planet but dissipate into space). This magnification accounts for planets nearer the sun orbiting faster than those farther out i.e. for Kepler's 3rd law of planetary motion.

Speaking of planets orbiting the sun, here's a nonmathematical paragraph about how dark energy/gravitation causes attraction in the solar system –



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 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.

The warping of space-time in General Relativity is not separate from matter but gives an electron a mass of 0.511 MeV (mega electron volts) – technically, physicists say "0.511 Mev/c^2" because an electron volt is actually a

measurement of energy, and mass units equal energy units divided by c_2, or m = E/c_2 (which is E=mc^2 when both sides are multiplied by c^2). (E=mc^2 means a tiny amount of mass can be converted into a very large amount of energy. Similarly, m=E/c^2 means a very large amount of energy is converted into a tiny amount of mass.)

Back to Kepler's 3rd Law - the average density of the Milky Way is much less than the solar system. Picture the galaxy, except for the central dense bulge that may be roughly 10,000 light years in diameter, made up of solar systems like ours and separated by 4 or 5 light years (the closest star to the Sun is Proxima Centauri, 4.2 light years away). Within those systems, there is a lot of mass and density in the form of stars, planets, moons, asteroids, comets, gas, and dust. But the vast reaches of near vacuum between systems lowers average density enormously – the MacMillan Encyclopedia of Physics says the average density of matter between the stars of the Milky Way is 0.1 neutral hydrogen atoms per cubic centimetre. Since density corresponds to concentration of wave packets and magnification of gravitational waves, there would be extremely little magnifying of gravity waves in interstellar space. I suspect that if it is (very approximately) 10^15 times or a million billion times less, there would be insufficient gravitational magnification to accelerate the stars in the central core or bulge beyond the orbiting speeds of the galaxy's outermost stars.

In the 1970s, Vera Rubin concluded outer stars were being sped up by the gravitational attraction of unseen Dark Matter in a halo well beyond the galaxy. This partial revision of gravity states there would be no such thing as dark matter of this nature. However, the term "dark matter" could be used to describe particles in the 5th dimension, or travelling through time, that would be invisible but still exert gravitational influence (in a universe structured according to the rules of fractal geometry, 5th dimensional hyperspace would occupy every fermion and boson, alongside space-time which is ultimately composed of 1's and 0's like particles). The 3 familiar dimensions of length, width and height could be said to correspond to the integrated clockwise and anticlockwise currents in the two-dimensional loops that are integrated by transcendental numbers like pi, and likewise-infinite irrationals, into an infinite number of subuniversal figure-8 Klein bottles. 1's and 0's portraying those physical dimensions would comprise photons and gravitons that interact in wave packets to create mass. After the 2 loops are integrated, they could be thought of as one loop. The 3 physical dimensions represent the left side of the loop and the time dimension is perpendicular to them. And there would also exist an integrating (without it, there would be no space-time) 5th dimension called hyperspace, at right angles to the 4th and (it could be said) 180 degrees from the length/width/height i.e. on the right. H-space is extended from the side along the loop's bottom because the WMAP space probe (Wilkinson Microwave Anisotropy Probe) has determined that a very large 72% of the universe is dark energy, and transmissions of binary digits from hyperspace are an interpretation of dark energy – since binary digits are mathematical, this means the WMAP SPACECRAFT HAS DETECTED EVIDENCE THAT THE UNIVERSE HAS MATHEMATICAL FOUNDATION. The other interpretation of dark energy is gravitation in its repelling role – just as there

is quantum entanglement in space, there is retrocausality or backward causality in space-time's other half which means the effect of gravitation has no separation in time from the cause of binary digits. To reach the total of 72%, h-space must also invade parts of the loop assigned to time and normal space. That's not surprising since hyperspace "creates" spacetime.

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