

Title –

**SOLVING DARK MATTER / THE PIONEER ANOMALY BY, AND RECONCILING QUANTUM MECHANICS WITH, PARTIAL REVISION OF GRAVITATION AND RELATIVITY - IN A UNIVERSE BASED ON MATHEMATICS (WMAP SEEMS TO SUPPORT A MATH COSMOS)**

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Abstract –

A paragraph explaining the way this article is written – the great French mathematician Jules Henri Poincare strongly favoured the use of intuition. Albert Einstein also said the most important things in science are intuition, imagination and curiosity. He said that things like logic and mathematical equations are necessary and valuable companions to scientific endeavour. But he was so sorry to see these companions taking the place of intuition and imagination. He thought science would suffer, and lose its way, as a result. Today, his fears seem to have reached their apex. Modern science believes logic and maths are much more than valuable and necessary – it tends to treat them as the **only** path to knowledge. At the same time it tends to ridicule intuition and imagination.

Sergei Kopeikin, professor of physics and astronomy at the University of Missouri, thinks the previous explanation for the so-called Pioneer Anomaly<sup>1</sup> was only able to account for 15 to 20% of the observed deceleration. He devised a new set of calculations that included the universe's expansion, and the way expansion affects the speed of photons which compose the light and radio waves.

<sup>1</sup> 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 ... conclude that, once the thermal recoil force is properly accounted for, no anomalous acceleration remains.”

Both the “thermal recoil” and “universal expansion” theories regarding Pioneer are extremely interesting. However, I suspect the emission of thermal radiation doesn't have a large enough effect, just as Sergei Kopeikin states. I also suspect the speed of photons in the vacuum of space is, as Relativity states, constant and always appears constant - and that universal expansion therefore doesn't have enough effect either. I'd therefore like to propose a refinement of gravitational physics. I redefine warping as 2.3 times General Relativity's value - deflection of starlight by the sun is still at 1.75 arcseconds since 57% of the light is diverted into solar wave packets (my ideas

owe part of their inspiration to the MUH or Mathematical Universe Hypothesis formulated by MIT's Professor Max Tegmark).

I didn't originally intend to write about tides, falling bodies, Earth's orbit, and Greek philosophers. But if someone is attempting to explain the Pioneer slowdown etc. by a new interpretation of space-time warping (and this warping is what gravitation is), it's a good idea – even an essential one – to not solely write about General Relativity and the spacecraft launched 40 years ago. Ideas from centuries ago, before General Relativity and Pioneer, must also be analysed – including those of Newton, Kepler, Galileo, Aristotle, Parmenides, Zeno. So must interpretations of the Mobius loop and figure-8 Klein bottle.

The article ends by mentioning the two ways to view both infinity and reality, time travel into the past as well as the future, and the elimination of distances in space (enabling overtaking of the Pioneer and Voyager spacecraft – and leaving them in a galaxy far, far away).

PS The Law of Conservation of Matter-Energy is not overlooked. Using the word “create” or “produce” is simply a matter of convenience, like speaking of “sunrise” and “sunset” when we know the world rotates.

### **Content –**

Sergei Kopeikin, professor of physics and astronomy at the University of Missouri, thinks the previous explanation for the so-called Pioneer Anomaly<sup>1</sup> was only able to account for 15 to 20% of the observed deceleration. He devised a new set of calculations that included the universe's expansion, and the way expansion affects the speed of photons which compose the light and radio waves.

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General Relativity's value - deflection of starlight by the sun is still at 1.75 arcseconds since 57% of the light is diverted into solar wave packets (my ideas owe part of their inspiration to the MUH or Mathematical Universe Hypothesis formulated by MIT's Professor Max Tegmark).

Prior to specifically addressing resolution of the Pioneer anomaly through refinement of gravitational physics, it's necessary to mention a few other topics as a result of the need to write at some length regarding the mathematical and unified nature of the cosmos. This nature includes the unavoidable introduction of a couple of unfamiliar concepts - 1) binary digits generating space-time from a 5th dimension<sup>2</sup> via matter-forming wave packets produced from the interaction of gravitation and electromagnetism (both ultimately made of 1's and 0's)<sup>3</sup>; and 2) the Mobius loop being changed into the physical form of Einstein's warping of space and time (since this universe is described by fractal geometry<sup>4</sup>, quantum loops describe wave packets). There is already support for the idea of the electronic mechanism of binary digits - in 1) the Kabbalah (an interpretation of the Scriptures used by some Jews and Christians that seeks to discover mysteries by using special methods of interpretation), and 2) the data obtained by the WMAP space probe (Wilkinson Microwave Anisotropy Probe) (see halfway through this article). According to an email I received from a priest in the USA, "What you have presented is a confirmation of what the kabbalah has within its texts. That there is only nothing (represented by 0) and 1." 0 and 1 are pulses of energy being off or on. It can be phrased this way "... orientation of Mobius loops and the flow of the loops' binary digits accounting for the interference between gravitation and electromagnetism". That is: the flow of 0's and 1's (in the 5th dimension) causes gravitational and electromagnetic waves (in the wave packets of the 4 familiar dimensions) to either cancel and produce nothing or 0 (or add up to an electrically neutral particle). Alternatively, the waves can reinforce and produce an "on" pulse or 1 (add up to a positively charged particle). Naturally, gravitational and electromagnetic waves can only cancel and reinforce if they're similar and approximately equivalent. In agreement with the idea that gravitation (the warping of space-time) is the foundation of the universe<sup>5</sup>; electromagnetism is referred to as modified gravity and subatomic phenomena like electric charge/magnetic polarity, the nuclear strong and weak forces, and quantum spin, are the product of gravitational and electromagnetic waves interacting in wave packets (it's possible that what we call quarks could be redefined as mathematical constructs and still agree with observational data). Since the flow of binary digits – base 2 mathematics - is a purely mathematical concept, the G and EM waves – being ultimately composed of 1's and 0's – don't have to result in a positively charged particle. Their maths can result in a negative charge.

<sup>2</sup> I don't believe the supersymmetry theories can provide a unified account of the 4 fundamental forces but supersymmetry attracts me because it's the child of hyperdimensionality (which is vital to my idea of binary digits originating in 5<sup>th</sup>-dimensional hyperspace and "creating" space-time). In 1919, German scientist

Theodor Kaluza "... wrote to Einstein, proposing that Einstein's dream of finding a unified theory of gravitation and electromagnetism might be realized if he worked his equations in five-dimensional space-time. A few years after that, the Swedish physicist Oskar Klein published a quantum version of Kaluza's work. The resulting Kaluza-Klein theory ... turned out to be salutary in working on supersymmetry (in the 1970s)." (p.332 of "Coming of Age in the Milky Way" by Professor Timothy Ferris – published by The Bodley Head, 1988) (Supersymmetry is part of present-day string theory too.)

<sup>3</sup> 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) 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? Also - Steven Weinberg, Abdus Salam and Sheldon Glashow shared the 1979 Nobel prize in physics for electroweak unification (of the weak force and electromagnetism). I suggest it's possible to alter the physics and mathematics of their electroweak theory to agree with the insights of a man called Einstein (especially when, as later parts of this article show, his insights lead to resolution of the dark matter problem and a revision of gravitational theory that explains all 3 of Kepler's laws of planetary motion). And I suggest theories of the scientists who proposed quarks as elementary constituents of matter, George Zweig and Murray Gell-Mann, could also be adapted to fit Einstein's insights. After all, Stephen Hawking and Leonard Mlodinow wrote on p.49 of their book "The Grand Design" (Bantam Press, 2010), "It is certainly possible that some alien beings ... would make the same experimental observations that we do, but describe them without quarks."

Speaking of the electroweak force, here's a little bit about "the nuclear forces as modified gravity" - 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.

<sup>4</sup> "Monthly Notices of the Royal Astronomical Society" 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.

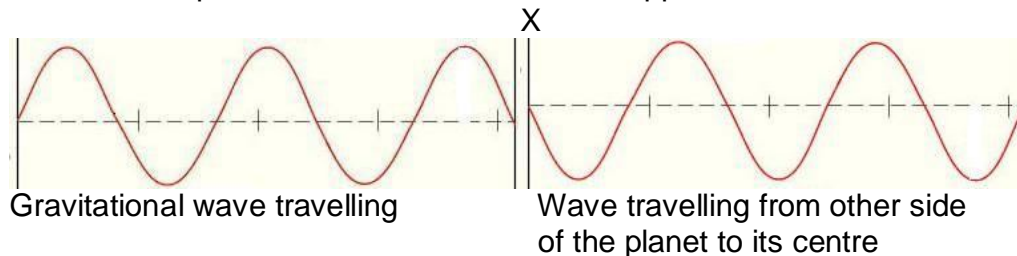
(after examining recent measurements by the Wilkinson Microwave Anisotropy Probe, NASA declared "We now know that the universe is flat with only a 0.4% margin of error." - [http://map.gsfc.nasa.gov/universe/uni\\_shape.html](http://map.gsfc.nasa.gov/universe/uni_shape.html); and according to "The Early Universe and the Cosmic Microwave Background: Theory and Observations" by Norma G. Sánchez, 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).

<sup>5</sup> Actually, gravity is only the apparent foundation of the universe – the cause we can detect, and see the effects of. It'd be more accurate to call gravity the universe's middleman. It's the cause of things like electromagnetism, the nuclear strong and weak forces, wave packets, repulsion, and attraction. (If electromagnetism truly is nothing but modified gravitation, the same could be true of the strong and weak nuclear forces. 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?) But gravity is also an effect – of mathematics generated in a 5<sup>th</sup> dimension. The true foundation of the universe is maths.

In relation to wave packets (referring to Einstein's paper "Do Gravitational Fields Play An Essential Part In The Structure Of The Elementary Particles Of Matter?") - If gravity is actually a repulsive force, it would eliminate the need for dark energy<sup>6</sup> (see the paragraphs below, enclosed in borders) 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 next paragraph). 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



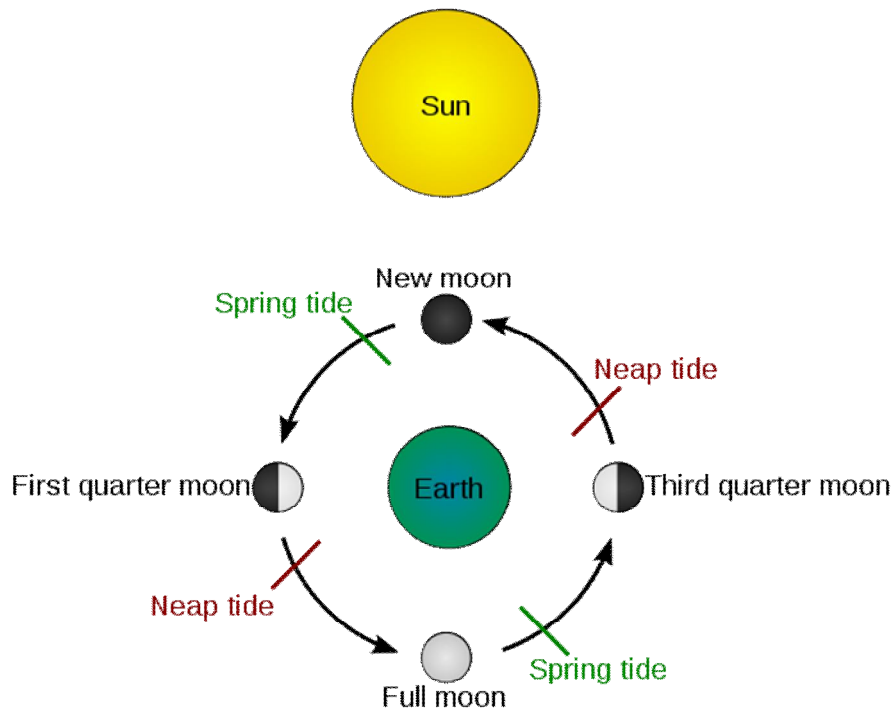
from one side of planet to centre

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 1<sup>st</sup> 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 than 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  $9.8 \text{ m/s}^2$  or  $32 \text{ ft/s}^2$ . 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<sup>th</sup> 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  $32 \text{ ft/s}^2$ ). At the neap tides of 1<sup>st</sup> and 3<sup>rd</sup> 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 2<sup>nd</sup> 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 I believe the equations used in mathematics, though accurate and precise, often confuse our 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

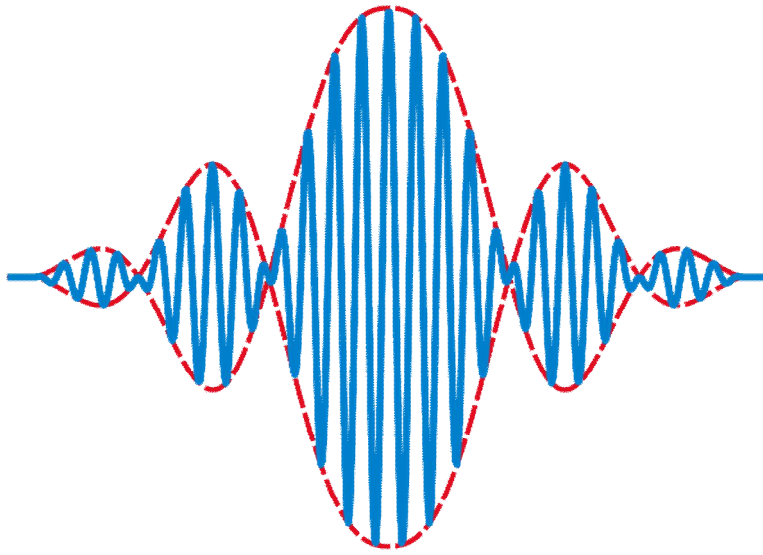


cause slight variations in its nearly circular orbit.) At lunar apogee, the strength of gravitational waves pushing the moon toward Earth is greater than those passing Earth (i.e. not tied up in this planet's wave packets) and heading to the moon. It returns to perigee where gravitational waves from 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 (see diagram above), 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 3<sup>rd</sup> law of planetary motion.

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

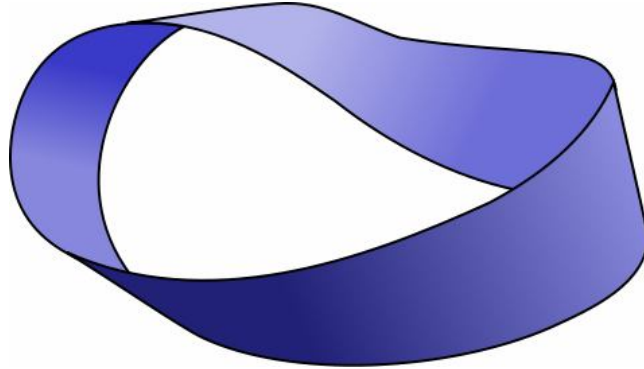
accelerate the stars in the central core or bulge beyond the orbiting speeds of the galaxy's outermost stars. In the 1970s, Vera Rubin concluded outer stars were being sped up by the gravitational attraction of unseen Dark Matter in a halo well beyond the galaxy.

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 5<sup>th</sup> 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, 5<sup>th</sup> 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, for example, one of the two-dimensional loops that are integrated by transcendental numbers like pi, and likewise-infinite irrationals, into a subuniverse's figure-8 Klein bottle (see reference <sup>8</sup>). 1's and 0's portraying those physical dimensions would comprise photons and gravitons that interact in wave packets to create mass. The 2<sup>nd</sup> loop could correspond to the electronic clock mentioned in the next paragraph, and measure/record the motions of matter. It would be what we call the 4<sup>th</sup> dimension (time). 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 (the twisted part at the top in the picture below – the entire strip is curved; so it translates into the warps common to space, time and hyperspace). And there would also exist an integrating (without it, there would be no space-time) 5<sup>th</sup> dimension called hyperspace, at right angles to the 4<sup>th</sup> 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 (the other being 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 – 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 "hyperspace recycles spacetime" (when matter changes into energy or energy becomes matter, we say matter or energy has been created).

If spacetime is recycled, recycling must also occur to people since humanity is a fractal version of space-time. 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 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. (p.2 of "Is the Universe Actually Made of Math?" By [Adam Frank](http://discovermagazine.com/2008/jul/16-is-the-universe-actually-made-of-math#.UQNDUR2-pFk), Monday, June 16, 2008 - <http://discovermagazine.com/2008/jul/16-is-the-universe-actually-made-of-math#.UQNDUR2-pFk>)



Möbius Strip

Production of wave packets is ultimately mathematical (the mathematical foundations could perform “packet switching” - transforming from the abstract world of maths to the physical world of matter’s wave packets). I believe the maths involved belongs to base 2 i.e. the binary digits of 1 and 0 are the cause of matter, gravity, EM, the nuclear forces, black holes, space (whose warps are gravity), and time. (Time is also warped, and 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.)

I didn’t originally intend to write about tides, falling bodies, Earth’s orbit, and Greek philosophers. But if someone is attempting to explain the Pioneer slowdown etc. by a new interpretation of space-time warping (and this warping is what gravitation is), it’s a good idea – even an essential one – to not solely write about General Relativity and the spacecraft launched 40 years ago. Ideas from centuries ago – including those of Newton, Kepler, Galileo, Aristotle, Parmenides, Zeno – must also be analysed. So must interpretations of the Möbius loop and figure-8 Klein bottle.

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<sup>6</sup> An alternative interpretation of dark energy would be to consider it as radiation of binary digits from hyperspace. It seems to me 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 (that effects influence causes – therefore, causes and effects are not necessarily separate?) Gravitation would then be dark energy too, and I think it would change the astronomy world if scientists would study this possibility.

"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<sup>7</sup> (wormholes being one example of doing this) simultaneously adding precision and flexibility to the elimination of distances; and the "fitting together" of subuniverses (see p.19) to form a continuous superuniverse. (The boundary where subuniverses meet might be called Cosmic Strings - analogous to "cracks" in spacetime formed as subuniverses cool and similar to cracks that form as water freezes into ice - and first contemplated by the theoretical physicist Tom Kibble in the 1970s.)

<sup>7</sup> 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.  $2 \times 2 = 4$ , and  $-2 \times -2$  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  $-1$ . [Supporting info from Stephen Hawking's "A Brief History of Time" – Bantam Press 1988, p.134]) 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. Our free will can be used to a small extent to change the course of our personal lives ... but it's powerless to stop Hitler doing what he did, or to prevent humans learning to time travel oneday.

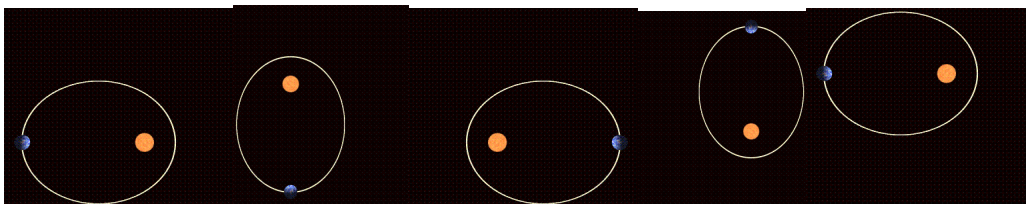
"Empty" space (according to Einstein, gravitation is the warping of this) seems to be made up of what is sometimes referred to as **virtual particles** by physicists since the concept of virtual particles is closely related to the idea of quantum fluctuations (a quantum fluctuation is the temporary change in the amount of energy at a point in space). The production of space by BITS (BInary digiT) 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).

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].) 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. This permits 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 (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>). This means quantum processes, in which effects and causes/distant events are not separated, wouldn't be confined to tiny subatomic scales but would also occur on the largest cosmic scales.

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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).

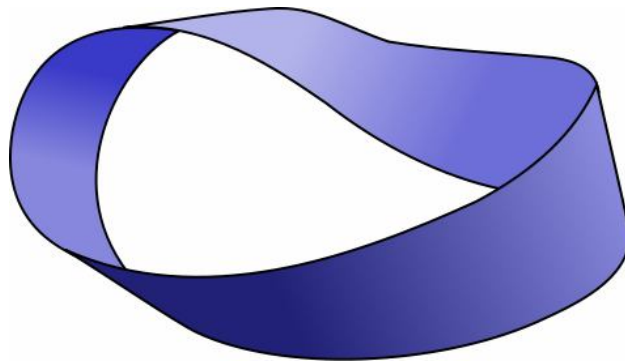


ORBITAL (PERIHELION OR APSIDAL) PRECESSION –

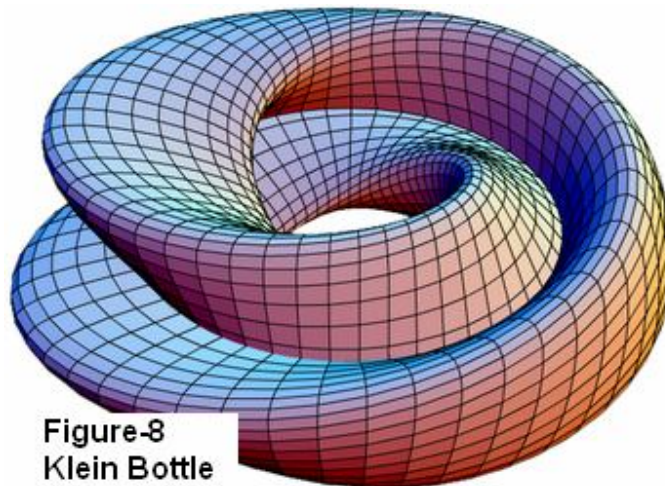
Imagine the orange star maintains the same position precisely halfway between

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  $2.39 \times 92,955,807.273$  (approx. 222 million) miles per year and Pioneer 11  $2.22 \times 92,955,807.273$  (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.  $1 / 69,000$ ).



**Möbius loop**



**Figure-8  
Klein Bottle**

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

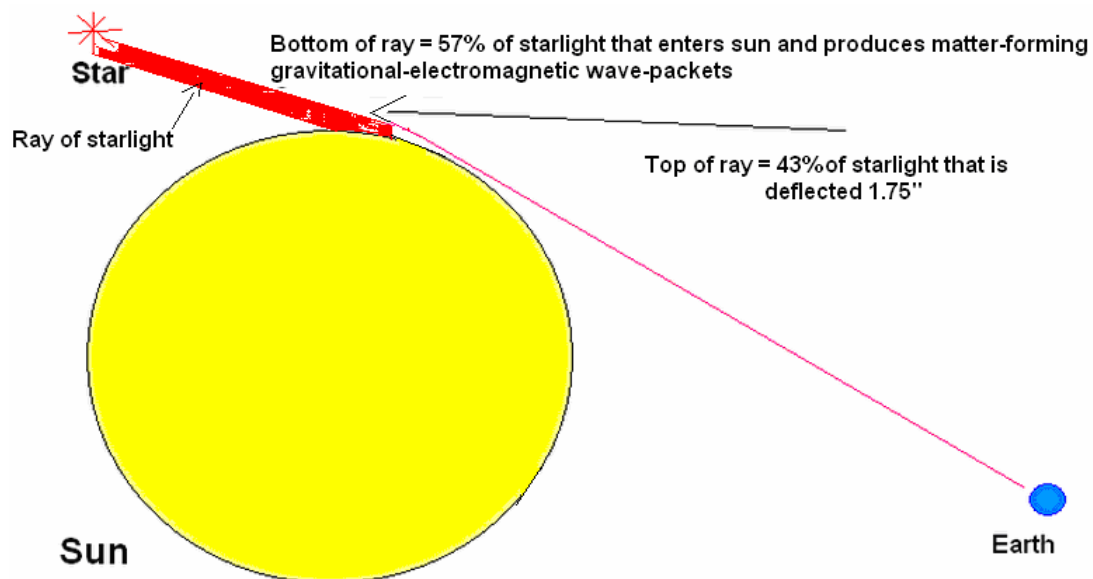
General Relativity describes gravity and space-time partly by referring to Mercury's motion. If Einstein's space-time warping accurately described the motion of the Pioneer probes, we might expect it to conclude that the Pioneers' reduction in expected distance travelled would be approx.  $1 / 30,140$  \* 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<sup>^</sup>). 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**. 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)

<sup>^</sup> 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?  
 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. 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. Imagine a few cosmic possibilities that could ensue from this article – 1) the sun (and all things) could be self-renewing to some degree, and might survive much longer than their predicted lifetime; 2) the whole universe might survive much longer than scientists anticipate (other parts of the submission suggest it's eternal); 3) 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. (scientists know that when light is absorbed by dust in space, it can be reradiated as the infrared rays associated with heat – but this energy can, as Special Relativity and  $E=mc^2$  inform us, be converted to mass i.e. light absorption can produce mass, as suggested by  $m=E/c^2$ ); and 4) this particular subuniverse that we live in could be younger than we think if stars are brighter and closer than they appear.

On September 9th 2012, Pioneer 10 was 9.918 billion miles from Earth. It was launched on March 2, 1972 so it had been travelling for 14,799 days. Its trajectory has not always been a straight line but let's assume another 820 million miles have been involved in its encounters with planets (including Earth) and moons, plus in its course corrections. Then we can make its path a straight line i.e. 180 degrees which is 10 billion miles long. If we also assume exactly 15,000 days of travel (that takes us to late April-early May 2013), the spacecraft travels an average of  $10,000,000,000/15,000$  or 666,666 miles per day i.e. 243,333,090 miles each year. Since everything in a unified field theory or Theory of Everything is united <sup>8</sup> (including spacecraft, miles, and angles), it travels (in a year) 243,000,000 miles in 180 degrees (648,000 arcseconds). Above the previous illustration, I suggested the curvature of space proposed by Relativity is only 43% of the actual figure. In that article, it's said starlight does indeed get deflected 1.75 arcseconds by the sun (as Einstein stated), but that 57% of the light is diverted into the sun's matter-forming wave packets (as  $E=mc^2$  implies when it's converted to  $m=E/c^2$ ). But in the present article, the relevant figures (100%, 43%, 1.75 in fractional form) become  $(100/43 \times 7/4)$  and equal 4.069. The true curvature would be 4 arcseconds or 2.3 times the accepted 1.75. In one arcsecond, Pioneer travels  $243,000,000/648,000 = 375$  miles. Remembering that my contributions to viXra often describe space-time warps as Mobius warps (you need to travel around a Mobius loop twice to reach your starting point); we must multiply the 375 miles by 2. In one arcsecond, Pioneer travels 750 miles. In 4 arcseconds, three thousand miles. The total shortfall in travel distance (see next sentence) is 3,000 miles per year if Pioneer is traversing space-time that is curved and warped 2.3 times General Relativity's prediction.

If it was possible to do, flattening the very small arc formed by introducing 4 arcseconds each year would extend the endpoint of the space probe's travelled distance by 3,000 miles. The probes are travelling some 3,100 miles less than expected each year according to "The Pioneer anomaly - solved?" by Liz Kruesi in "Astronomy" magazine - Nov. 2012, p.20. Did my fondness for approximating,

both here and in <http://vixra.org/pdf/1212.0096v2.pdf>, remove some 100 miles (about 3%)? The Planetary Society comes to my rescue and says, "Each year, they (the Pioneer space probes) fell behind in their projected travel by about 5,000 kilometers (3,000 miles).

<sup>8</sup> See the earlier paragraph where gravitation is called the universe's apparent foundation and mathematics is called its true foundation. As well, see <http://vixra.org/pdf/1301.0040v1.pdf> which speaks of using transcendental and irrational numbers generated in a 5<sup>th</sup>-dimension to connect two programs (2-dimensional Mobius loops) into an infinite number of 4-dimensional [3 dimensions of space, 1 of time] figure-8 Klein bottles (each is the basic unit – a subuniverse completed with two loops of its own – comprising the universe). Could this be describing evidence of an idea suggested by 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 one of the infinite number of subuniverses, each shaped like a Figure-8 Klein Bottle, gaining rips called wormholes when extended into the spherical spacetime that goes on forever (forming one infinite superuniverse). Picture spacetime existing on the surface which has rips in it. These rips provide shortcuts between points in space and time – and belong in a 5<sup>th</sup>-dimensional hyperspace. I could branch into a discussion of these subuniverses, but that doesn't seem appropriate at this point. I'm here to talk about Pioneer. The only thing connecting Pioneer and a subuniverse is the Mobius. A subuniverse has two loops, but Pioneer is travelling through the warped space-time created by only one. Why is this? Could it be related to the unified field/TOE and be the result of the 2 Mobiuses being integrated into 1 figure-8 Klein bottle?

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 i.e. infinity equals the total elimination of distance – the infinite cosmos could possess this absence of distance in space and time<sup>9</sup>, 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 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 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 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.

<sup>9</sup>Elaborating on the infinite cosmos being one in which distance is totally absent from space and time – We need to remain extremely flexible in our thinking, and to be able to regard objects and events in two ways: both like parts of a webpage on the Internet (i.e. as what they appear to be) and as products of a programming language/the electronic mechanism of the binary digits 1 and 0 (ultimately, that's what the webpage is). This might be called "the particle-wave duality of logic". This type of logic could see infinity as both "the state of never ending space-time" and "the state of eliminated distance in space-time". 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 (On-chip push-pull effect - Nature Photonics 3, 484 [2009]) . 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." There's no need for Star Trek-like teleportation if you're in 2, or even infinite, places; or 2, or infinite, times at once (see the mention about everyone and everything merging on p.11, as well as the one about the whole universe being quantum entangled forever on p.19). Distances between points billions of light years apart, or between the past and future, might therefore be eliminated - both by gravitational-electromagnetic equivalence, and the act of being in more than one place or time at once. The latter sounds like science fiction or only possible by quantum effects on subatomic scales. So consider the following –

Existence of quantum effects at human or cosmic scales 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. In a universe obeying fractal geometry, quantum effects at human or cosmic scales and human or cosmic effects at quantum scales naturally occur. 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 – it is used

to describe coastlines, mountain ranges, etc). Jack Harris, an Applied Physicist then 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. "20 Best Brains Under 40" By Sarah Webb, Andrew Grant, Elizabeth Svoboda, Yudhijit Bhattacharjee, Emily Anthes, Jullianne Pepitone - Thursday, November 20, 2008 -

<http://discovermagazine.com/2008/dec/20-best-brains-under-40#.UQjTcB2-pFk>

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." ("Cosmos" by Carl Sagan – Futura, 1983, p.294) 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).



Fractal (flowerlike)

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