THE CYBERPHYSICS OF TOMORROW'S WORLD - EVOLUTION UPDATED PLUS COMPUTERS USING IMAGINARY TIME AND HYPERSPACE

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ABSTRACT -

When contemplating the theory of evolution, many people assume evolution belongs exclusively to the biological sciences. It's maintained here that complete comprehension also requires physics. Since discovery of gravitational waves in Sep. 2015 is a recent milestone in physics, it's fitting that evolution should be reassessed by that milestone. Without a conviction that time doesn't exclusively operate in a straight line and that time travel to the past is possible, science would have to totally agree with the evolutionary concepts Charles Darwin proposed.

This article also attempts to combine Einstein's two Relativity theories and Unified Field Theory with quantum physics and tomorrow's hyper-computers. It also uses the concepts of "real", "imaginary" and "complex" time to try to bring cosmology's Big Bang theory, the Steady State's infinity and eternity, and the Inflationary theory into the 21st century.

Einstein believed stars, planets, even quantum particles were part of, and not distinct from, the rubber-sheet geometry (the topology) comprising space-time. To read an explanation in plain English of subuniverses or observable universes using topology, go to the intimately related - indispensably so - "Topological monoverse" at the end of this article. This says that, from a purely spatial aspect, there is no multiverse (universes existing alongside ours). But remember, it regards the 13.8 billion year old structure we live in as merely a subuniverse within an infinite universe. It's saying there are no other universes beyond our infinite universe. If each subuniverse is viewed as the entire universe, the multiverse does indeed exist. From the temporal aspect of the space-time union: everything in space-time is unified into one thing - a product of the gravitational field. All past and future universes are unified with the present cosmos (is this the real meaning of the word "multiverse"?)

In some circles, the multiverse is not regarded as science but as philosophy or even sci-fi. Referring to the latter, the following was stated on the program "Catalyst" on the ABC (Australian Broadcasting Corporation) and its edition of Tuesday, 1 March 2016 entitled "SCIENCE OF SCI FI FILMS – FACT OR FICTION?" (http://www.abc.net.au/catalyst/stories/4415534.htm) - "science-fiction can give a false sense of how science progresses." To this, Professor Lawrence Krauss added, "One of the things that always amazes me in Star Trek is having a problem and they get the engineers to gather around and they solve the problem within an hour. Whereas in the real world, as a scientist, it can take decades and baby steps to make any major progress."

What about science's own work on the Unified Field Theory and Theory of Everything? Accomplished completely, these must surely allow any problem to be solved immediately (if not sooner) by providing access to all knowledge in space-time.

I agree that my proposals are based on many things that are still theory only. My ideas have been developing for 30 or 40 years, and I've found them to be very "internally consistent" (that's the way string theory has been described). String theory may have limits that future experiments* will reveal, but is worth pursuing at the moment. I think my ideas are worth pursuing - time will reveal their value or nonvalue.

* According to Special Relativity, experiments are overrated by modern science since the truths revealed by experimentation are necessarily restricted to one frame of reference. Regarding the question of length contraction in Special Relativity - Einstein wrote in 1911 that "It doesn't 'really' exist, in so far as it doesn't exist for a co-moving observer; though it 'really' exists, i.e. in such a way that it could be demonstrated in principle by physical means by a non-comoving observer." [Einstein, Albert (1911). "Zum Ehrenfestschen Paradoxon. Eine Bemerkungzu V. Variĉaks Aufsatz". Physikalische Zeitschrift 12: 509–510]. Demonstration "in principle by physical means by a non-comoving observer" is the same meaning as "demonstration by experiments performed by scientists not moving at the speed of light".

Cosmic unification via the gravitational field is one of my deep beliefs. The example of radiating gravity waves causing draining of energy does not incorporate this gravitational unification. Taking matter as an example - mass, EM (electromagnetic) energy and nuclear forces are capable of greatly varying degrees of renewal (from the microscopic to regeneration of a liver/rib to eventual total renewal) if matter and its properties are part of the G (gravitational) field. That field always exists and only changes form, including between matter and energy - the law of conservation says things always exist and merely change form.

I have the most intense desire to understand how everything works (my main interest is cosmology). My feeling as I typed these thoughts has always been that they already exist (though, since physics' Unification appears to connect every point and time in the Cosmos, not on early 21st-century Earth in every case). And I'm just a student, learning about them. Albert Einstein is quoted as saying - "If you can't explain it to a six year old, you don't understand it yourself." Since part of me takes Einstein literally, I avoid equations and jargon as much as possible and prefer to write clearly in plain English.

“We need a very different view of basic physics. This is the time for radical, new ideas” (theoretical physicist Neil) Turok concluded in early October, 2015. He believes that this is a great time in human history for the revolution to occur.

CONTENT -

EINSTEIN'S APPARENT VIEWS

The gravitational waves science is so excited about are only "the tip of the iceberg" of the waves which Einstein was speaking about. When forced to summarize the general theory of relativity in one sentence, Einstein said: time and space and gravitation have no separate existence from matter^ (“Physics: Albert Einstein’s Theory of Relativity” at www.spaceandmotion.com). Also, see his “Spielen Gravitationfelder in Aufbau der Elementarteilchen eine Wesentliche Rolle?” (**Do**

gravitational fields play an essential role in the structure of elementary particles?), Sitzungsberichte der Preussischen Akademie der Wissenschaften, (Math. Phys.), 349-356 (1919) Berlin. Consider the popular analogy to Einstein's description of gravity: this analogy says space-time is a flexible rubber sheet in which the stars, planets, black holes etc are weights that produce depressions and curvatures in that sheet; like hills and valleys in space-time. In post-relativity days; Einstein believed these "weights" were part of, and not distinct from, the rubber-sheet geometry (the topology) comprising space-time. Add to this his conviction that gravitation and electromagnetism are related, and Einstein proposed unification of electromagnetism with gravitation and particles of matter* ie of everything in time and space. His Unified Field Theory came into being in the 1920's and he continued working on it until his death 30 years later. In later revisions of his unified field, after discovery of the nuclear forces, it's likely that a scientist of his abilities concluded the nuclear forces are no more than byproducts of gravitational-electromagnetic interaction and therefore not fundamental. In this section's closing, there's an explanation of how the suggestion of matter being composed of space-time (more specifically, of the warping of space-time known as gravitation) answers a 50-year-old objection to Einstein's Unified Field Theory which was put forth by Professors Newman and Penrose.

^ If the existence of matter is not separate from space (gravitation, or space's warping), the motion of particles would not be separate from time and would actually be what is called time. Looking at the next (asterisked) paragraph, the union of matter and electromagnetism means those particles can be bosons as well as fermions.

* Modern physics proposes a theory called supersymmetry in order to unite boson particles like electromagnetism's photons with fermions like particles of matter. Einstein's unification of gravitation with matter and electromagnetism makes supersymmetry unnecessary (at least in this respect). For more about union with electromagnetism (inspired by a 2009 electrical-engineering experiment), see **SINGULARITY #1: WHAT SPACE-TIME?** below.

Albert Einstein's equations say that in a universe possessing only gravitation and electromagnetism, the gravitational fields carry enough information about electromagnetism to allow the equations of 19th-century British physicist James Clerk Maxwell to be restated in terms of these gravitational fields. Thus he went beyond Maxwell's unification of electricity and magnetism into electromagnetism. Einstein proposed unification of electromagnetism with gravitation and particles of matter ie of everything in time and space.

The suggestion of matter being composed of space-time (more specifically, of the warping of space-time known as gravitation) answers a 50-year-old objection to Einstein's Unified Field Theory which was put forth by Professors Newman and Penrose [Newman, E. T., Penrose, R. J. - Mathematical Physics 3, 566 (1962)]. The objection by Newman and Penrose was 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 they reasoned that Einstein's unified theory fails.

Time (which is not separate from space, and may therefore be referred to as "motion of particles in

space") is unified with the gravitational (G) and electromagnetic (EM) fields which are the creators of particles in space. So, the gravitational fields are not known for only a limited time but do contain enough information. And Einstein succeeded, just as John Wheeler and Charles Misner claimed [“Classical physics as geometry” by Charles Misner and John Wheeler - the “Annals of Physics” - Volume 2, Issue 6, December 1957, Pages 525–603)].

Are you prepared to speculate that perhaps the greatest scientist who ever lived on this planet might possibly have been able to see further than early 21st-century science?

ENTANGLEMENT IN THE G-EM FIELD

'Physicists now believe that entanglement between particles exists everywhere, all the time, and have recently found shocking evidence that it affects the wider, "macroscopic" world that we inhabit.' - "The Weirdest Link" (New Scientist, vol. 181, issue 2440 - 27 March 2004, page 32 - online at http://www.biophysica.com/QUANTUM.HTM). The same article says that Caslav Brukner, working with Vlatko Vedral and two other Imperial College researchers, has uncovered a radical twist. They have shown that moments of time can become entangled too (www.arxiv.org/abs/quant-ph/0402127).

To phrase quantum entanglement in human terms - Independence from a physical body may be possible via an immaterial body designed in the far future. This necessarily involves much speculation and involves the development of an all-powerful, all-knowing, omnipresent human body composed of photons and gravitons, and quantum entangled with every point in space-time, for the purpose of overcoming the limits of biological bodies – or biological bodies incorporating computer and robotic systems.

In 1925, the Austrian physicist Wolfgang Pauli discovered the exclusion principle. [Hawking, S. W. – “A Brief History of Time” – Bantam Press, 1988, pp. 68-69] This says two similar particles cannot have both the same position and velocity. If two electrons could have identical positions and velocities, they could all collapse into a roughly uniform, dense “soup”. Protons and neutrons would do the same, and there would be no well-defined atoms. So we need the exclusion principle. Force-carrying particles like photons and gravitons do not obey the exclusion principle so we might assume the immaterial body wouldn’t be well-defined and would collapse into a ghostly soup. But perhaps a well-defined structure can be built if the photons are first stopped (or significantly slowed, since stopping them may destroy them)* before they’re collected and substituted for the body’s particles. The beginnings of this technology may be underway [Palus, S. - “Turning Light into Matter - Physicists have created a device that binds photons together to form “light molecules.” - Thursday, March 13, 2014 (http://discovermagazine.com/2014/april/6-how-to-make-light-matter)]. Referring to this reference, two photons end up sticking together and move forward just like a two-atom molecule.

* "Understanding the Universe: An Introduction to Astronomy, 2nd Edition" by Professor Alex Filippenko - video from The Great Courses, 2007 - says in Lecture 20 ("The Wave-Particle Duality of Light") that a photon is a massless particle when at rest, and would cease to exist if

stopped.
Rodney Bartlett says, The universe is the things in space and time and, since General Relativity says gravitation is the warping of space-time, the universe is a giant gravity field. Gravity does not need to travel – the gravitational field already exists everywhere. Nevertheless, any disturbance (from the waving of your hand to explosion of a supernova) will send ripples called gravitational waves through the universe. Since gravity makes electromagnetism, the universe is also a giant electromagnetic field. Electromagnetism is ubiquitous and doesn't need to travel, but any disturbance sends out electromagnetic waves. In this way, photons in the giant electromagnetic field which aren't travelling because of disturbances might be regarded as "already stopped".

GRAVITY AND THE QUANTUM

The Virtual Particles composing space-time are not actually particles but are fluctuations in an energy field and therefore are pulses of energy ("The Grand Design" by Stephen Hawking and Leonard Mlodinow - Bantam Press 2010, p.113). It will be seen that these fluctuations can occur exclusively in the gravitational field. Using Einstein's writings; it will be shown how gravity is responsible for mass and matter*, plus all forms of the nuclear forces and electromagnetism**. Thus, the great scientist's Unified Field manifests itself, uniting all space-time (the entire universe and all its particles' motions in the past, present and future). This makes time travel to the past possible. Comparing the universe to the "moving curtains of light" known as auroras, the cosmos might be called a rippling curtain of gravitation or gravitational waves.

* Albert Einstein's "Spielen Gravitationfelder in Aufbau der Elementarteilchen eine Wesentliche Rolle?" (Do gravitational fields play an essential role in the structure of elementary particles?), Sitzungsberichte der Preussischen Akademie der Wissenschaften, (Math. Phys.), 349-356 (1919) Berlin. The proposal of this article you're presently reading is that photons which can never be directly detected (virtual photons), and other virtual particles like gravitons, produce the binary digits of 1 and 0 which encode pi, e, √2 etc. Matter particles [and even bosons like the Higgs, W and Z particles] are given mass by photons/gravitons interacting in matter particles' "wave packets" (a term from quantum mechanics). This gives wave-particle duality to electrons, protons, and other bits of matter. Thanks to unification of matter with electromagnetism, even photons possess this duality and can cause the photoelectric effect where light strikes certain substances - particularly metals - with enough force to release electrons. The bestowing of mass by massless particles can solve the Yang–Mills mass-gap problem too. The Yang–Mills mass-gap problem may be phrased this way: the problem is that there is no rigorous mathematical theory which explains why the force-carriers of the strong and weak nuclear forces have mass - when photons, the carriers of the electromagnetic force, are massless. Some people desire nothing less than formal, rigorous maths. But it doesn't seem necessary to me - understanding the physics is the important thing personally.

** When Einstein penned E=mc^2, he used c (c^2) to convert between energy units and mass units. The conversion number is 90,000,000,000 (light's velocity of 300,000 km/s x 300,000 km/s) which approx. equals 10^11. Gravity waves with a strength of 10^1 are, via quantum gravitational lensing, concentrated 10^24 times after they're focused to form matter (to 10^25, weak nuclear force's strength - giving the illusion that a weak nuclear force^ that is not the product of gravitation exists). Waves are

magnified by the matter's density to achieve electromagnetism's strength (10^36 times gravity's strength) i.e. 10^25 is multiplied by Einstein's conversion factor [10^11] and gives 10^36 (this gives the illusion of the existence of electric and magnetic fields that are not a product of gravitation). (The gluons that bind mesons would likewise be either products of gravitation or, like quarks#, replaceable by the more fundamental 1's and 0's.) After absorption by atoms, the depleted remnant of the gravity waves is re-radiated from stars, interstellar gas and dust, etc. It's radiated as gravitational waves (a Gravity Wave Background, challenging the idea that Cosmic Inflation was necessary to generate gravitational waves) which have lost most of their energy or strength during formation of forces (returning to a strength of 10^1). Since gravity can produce electromagnetism, it's also radiated as electromagnetic waves – including an infrared background whose heat output exceeds that of the stars alone, in addition to a microwave background. The latter challenges the idea that existence of the cosmic microwave background proves the universe began with the traditional Big Bang (see the box below for a nontraditional perspective - the top and bottom are enclosed by ----------)

^ Remember, this is only one example: the so-called weak force's strength isn't constant and varies with distances [more info in "The Strengths of the Known Forces" by theoretical physicist Matt Strassler [May 31, 2013] - http://profmattstrassler.com/articles-and-posts/particle-physics-basics/the-known-forces-of-nature/the-strength-of-the-known-forces/

"It is certainly possible that some alien beings ... would make the same experimental observations that we do, but describe them without quarks." [Stephen Hawking, Leonard Mlodinow – "The Grand Design" – Bantam Press, 2010, p. 49]. So I'm going to turn into that book's alien being and describe observations without quarks, but with a more basic quantum process that says space and all particles are, ultimately, composed of virtual particles and bits and maths. (Interpretation of particle tracks in a detector might cause them to be misidentified as caused by actual particles called quarks, instead of as being the result of virtual particles producing digital patterns that imitate the properties of quarks.)

BASIC AND IMAGINARY

Imaginary time is a concept derived from special relativity and quantum mechanics. Physicists use a mathematical technique called Wick rotation - named after Italian theoretical physicist Gian Carlo Wick (1909-1992) – to transfer solutions from the 2 dimensional planes and 3 dimensional geometry of Euclidean space to the 4 dimensions (3 of space, 1 of time) of Minkowski space.

Geometrically, imaginary numbers are found on the vertical axis of the Complex Number Plane, allowing them to be presented perpendicular to the real axis. One way of viewing imaginary numbers is to consider a standard number line, positively increasing in magnitude to the right, and negatively increasing in magnitude to the left. At 0 on this x-axis (the so-called 'real' axis), a y-axis (the so-called imaginary axis) can be drawn with "positive" direction going up - "positive" imaginary numbers then increase in magnitude upwards, and "negative" imaginary numbers increase in magnitude downwards. ("Positive" numbers increasing upwards correspond to superspace and imaginary time, while "negative" numbers increasing downwards describe subspace and imaginary time.)

"This has an interesting effect on space-time: the distinction between time and space disappears completely." ("A Brief History of Time" by Stephen Hawking - Bantam Press, 1988, p.134). Stephen Hawking writes, "In real time, the universe has a beginning and an end at singularities that form a boundary to space-time and at which the laws of science break down. But in imaginary time, there are no singularities or boundaries. So maybe what we call imaginary time is really more basic …" ("A Brief History of Time" by Stephen Hawking - Bantam Press, 1988, p.139). But there's no need to choose between real and imaginary time (**THE REAL, IMAGINARY COMPLEX** below).

REAL AND IMAGINARY

The space we live in is described by ordinary [or "real"] numbers which, when multiplied by themselves, result in positive numbers e.g. 2 x 2 = 4, and -2 x -2 also equals 4. The gravitational waves of positive space can be inverted (in the sense of being turned inwards) at an angle of 90° to the 3 spatial dimensions, and are then described by so-called imaginary numbers that give negative results when multiplied by themselves e.g. the imaginary number i multiplied by itself gives -1. Space exists in an indissoluble union with time known as space-time. So imaginary numbers were naturally also applied to time, creating an entity called imaginary time which unites with imaginary space.

According to the book "A Brief History of Time" by Stephen Hawking (Bantam Press 1988, p.134), "Imaginary time may sound like science fiction but it is in fact a well-defined mathematical concept." Science has a history of finding applications in the real world for what was once regarded as purely mathematical. This article is searching for practical applications of the so-called imaginary.

COMPLEX HYPERSPACE

When (in the sense of being reversed) the gravitational waves of positive space are inverted 180° to the 3 spatial dimensions (length, width and height), they become hyperspace* which is again positive like real space but the waves proceed in the "opposite" direction. Opposite isn't exactly the right word since the waves are travelling outside the known dimensions. Hyperspace is coupled with hypertime, and this may be the location of what is called Dark Matter.

* Since the time associated with the 3 dimensions of up-down, back-front and side-to-side is often called the 4th dimension, should negative time in a 5th dimensional hyperspace be called the 6th dimension of hypertime? (It seems that only space and time on the positive axis of the Complex Number Plane can properly be said to possess dimensions. Borrowing a term from science fiction, imaginary space on the 90°-inverted imaginary axis might be referred to as subspace.)

Imagine a spaceship, its occupants and its computers are made of space. Or if you prefer, of the gravity (curvature of space) first spoken of in Einstein's 1919 paper "Do gravitational fields play an essential role in the structure of elementary particles?" Then the space, and time, could be gravitationally warped 90° and the ship etc would be inverted, and would enter subspace and imaginary time. But warping needn't stop there. Since the universe is modelled on the Möbius strip* (see the "Topological Monoverse" article below), warping can continue to the extreme curvature of hyper-spacetime's 180° -

where it includes imaginary time but the gravitational ripples have "flipped backwards" from the horizontal axis of real time, through the vertical axis of imaginary time, and proceed in the "reverse" direction along the horizontal axis (in complex time). This causes travel along the same axis as the so-called real time we're familiar with (real time, like imaginary time, is only part of the true nature of the 3-part gravitational rippling constituting the motion of particles ie of complex time). As will be proposed, the universe does possess on this real-time/complex-time axis a singularity from which it arose. This axis-sharing naturally leads to the singularity being associated with the Big Bang theory dominant in our present world. But the reversal of gravitational waves@ means the present understanding of that singularity the universe came from must be radically revised.

* Imagine a Möbius strip (this shape can be represented by a strip of paper that is twisted 180° before its ends are joined). Now visualize the Möbius being equivalent to a square (its sides are, starting from the right, marked in anticlockwise order as a, b, d and e). This square has a 5th side (marked c) protruding from the vertex or corner between b and d. A drawing of this visualization can be found on p.10 of "Explaining The Mysterious Connection Between Physics and Mathematics By Reconciling the Unified Field and Anthropic Principle" (http://vixra.org/abs/1501.0003). Width a is perpendicular to the length (b or e) which is perpendicular to height c. How can a line be drawn perpendicular to c without retracing b's path? By positioning it at d, which is then parallel to (or, it could be said, at 180 degrees to) a. d (the spaceship) is already at 90 degrees to length b and height c. To be at right angles to length, width and height simultaneously; it has to also be perpendicular to (not parallel to) a. This is accomplished by a twist (like on the Mobius loop) existing in a. Then part of a is indeed at 180 degrees to d, but part of a is at 90 degrees to d. This situation requires a little flexibility or "fuzziness". The fuzziness is represented in nature by past, present, future, space-time, and hyper-spacetime existing everywhere rather than being confined to particular locations (see IMAGINARY TIME MEETS E=mc^2, OR HAWKING MEETS EINSTEIN). Thus, 90+90 (the degrees between b & c added to the degrees between c & d) can equal 180, making a & d parallel. But 90+90 can also equal 90, making a & d perpendicular. (Saying 90+90=90 sounds ridiculous but it has similarities to the Matrix [of mathematics, not the action-science fiction movie] which is an array of numbers placed in rows and columns. It was worked out in the mid-nineteenth century by British mathematician Arthur Cayley, matrix mechanics is a version of quantum mechanics discovered by Werner Heisenberg in 1925, and matrices say X multiplied by Y does not always equal Y times X. In this paragraph, the first 90 plus the second 90 does not always equal the second 90 plus the first 90 because 90+90 can equal either 180 or 90.) Suppose the infinite universe is composed of subuniverses (our subuniverse is 13.8 billion years old) which are shaped like figure-8 Klein bottles. 2 Mobius loops are joined on their sides to form a Bottle, with binary digits filling in the central hole and perfectly adjusting the outer edges to fit surrounding subuniverses [simplified, this is similar to manipulation of an image on a computer screen]). The 2nd paragraph of "Topological Monoverse" states that construction of a subuniverse requires binary digits to be processed in 2 programs taking the shape of Mobius strips, clockwise currents in one loop combining with counterclockwise currents in the other to form a standing current. Therefore, the four-dimensional space-time of each subuniverse contains the equivalent of 2 cosmic squares, each having a protruding 5th side. Each 2-D square can be extruded (extended) to form a 3-D cube corresponding to the three dimensions of space (length, width and depth), and a 2-D Möbius

unites with another Möbius to form a Klein bottle. The 5th side extending at a right angle from one corner can be extruded (enlarged) to form the fourth dimension of time. Infinitely extruded, space-time is united with the tesseract (analog of the cube in 4 space dimensions) to form superspace, subspace and the partner they're indissolubly joined to, imaginary time. Then space-time and imaginary-spacetime are united with the hypercube, the n-dimensional analog of a square (n=2) and a cube (n=3) that describes hyperspace and hypertime. Infinite extrusion of cube(s), tesseract(s) and hypercube(s) means the square and cubic shapes (all types of space and time) expand to infinite and eternal proportions from the revised singularity (qubit) discussed in this article and associated with Complex Time - maybe this expansion could be called "Big Bang 2.0" (see IMAGINARY TIME MEETS E=mc^2, OR HAWKING MEETS EINSTEIN). Referring to Topological Monoverse, figure-8 Klein bottles are programmed to assume doughnut shapes whose holes are filled in and borders adjusted to smoothly transition to neighbouring subuniverses. So if expansion occurs in the manner of more and more air being pumped into a balloon, the square and cubic shapes are not conserved (retained) but transform into doughnut shapes. Subuniverses grow out of singularities, however. And 2 Mobius strips - the equivalent of 2 "cosmic squares" - are needed to make a subuniverse. LCD pixels - the smallest picture elements in a liquid crystal display - are often represented using dots or squares. So, the objects being called Cosmic Squares could be pixels composing figure-8 Klein bottle. If the singularity is the size of the Planck length science has worked out - 1.616 x 10^-35 m, or 100 billion billion times smaller than the diameter of a proton, one of its pixels would be (1.616 x 10^-35) ÷ 2 of a metre in diameter. It must be conserved - otherwise, no figure-8 Klein bottles could be displayed (to every one of the bodily senses), and no universe would exist. No screen is necessary to display the universe. As previously seen; light, electromagnetism and matter are universal thanks to the gravitational field. And their placement is controlled by cosmic programming.

@ Remember, this gravitational reversal occurs in time. This supports time travel into the past being possible. And since Special Relativity says time going backward would be achieved by travelling faster than the speed of light, a link is established between gravity and electromagnetism. That link is: 1) space can be thought of as an infinite gravitational field, 2) if gravitation produces mass and matter as well as the other fundamental forces, the universe itself can be thought of as an infinite gravitational field, 3) production of the other fundamental forces also makes space and the universe an infinite electromagnetic field, 4) time has joined space as space-time for more than a century, so time - which can be considered as the motions of particles in the past, present and future - is also an infinite gravitational / electromagnetic field, and 5) not only would gravitational and electromagnetic waves travel at identical velocity in a vacuum, perhaps this infinite field (which surrounds all observers to an equal - infinite - distance in every direction) accounts for gravitational and electromagnetic waves always having the same speed (in a vacuum) irrespective of the frame of reference.

THE REAL, IMAGINARY COMPLEX

It was shown early in this article that space-time is unified into "a rippling curtain of gravitation or gravitational waves". Therefore, just as real and imaginary numbers form a union called complex numbers, real and imaginary time would be unified into complex time. Complex time has the properties of imaginary time (there are no singularities or boundaries), making the universe eternal and

infinite. It also has the properties of real time - there are singularities that form a boundary to space-time and at which the laws of science break down eg quantum physics and general relativity are irreconcilable. This is how complex time can create a singularity (also referred to as the qubit) in an infinite and eternal universe, thus overcoming the singularity/no singularity contradiction and allowing quantum physics to merge with general relativity.

SINGULARITY #1: WHAT SPACE-TIME?

First - I've heard that if all the space was removed between atoms making up our bodies, the entire human race would be compressed to the size of a sugar cube. And this is before the proposal that distance is deleted between the virtual particles called gravitons (and thus between binary digits) composing those atoms.^ How tiny would the observable universe become if there was no space between its gravitons? It would occupy the infinitesimal volume of the singularity the Big Bang is alleged to have started from.

^ When future electronics allows their displays to change from one still (as in photographic print) to another trillions of trillions of times per second, they are undergoing what we call motion or time. Were ancient Greek philosophers Zeno of Elea and Parmenides 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. There wouldn't even be any motion (neither switching nor randomness) if distance is eliminated between gravitons and the 1's and 0's which they generate exist as quantum-superposed qubits (the basic elements of information in quantum computing - just as "bit" is an abbreviation for "binary digit" in ordinary computers, "qubit" stands for "quantum bit" in quantum computers). How can distance be deleted?

A 2009 electrical-engineering experiment at America's Yale University, together with the ideas of Albert Einstein, tells us how we could travel to other stars and galaxies in literally no time. Electrical engineer Hong Tang and his team at Yale demonstrated that, on silicon-chip and transistor scales, light can attract and repel itself like electric charges or magnets ["Tunable bipolar optical interactions between guided lightwaves" by Mo Li, W. H. P. Pernice & H. X. Tang - Nature Photonics 3, 464 - 468 (2009)]. This is the "optical force". For 30 years until his death in 1955, Einstein worked on his Unified Field Theory with the aim of uniting electromagnetism (light is one form of this) and gravitation.

Achievement of this^^ means the microscopic components (gravitons) of warps of space (gravity, according to General Relativity) between spaceships and stars could mimic the Optical Effect and be attracted together, thereby totally eliminating distance (this is similar to traversing a wormhole, or shortcut, between two folds in space-time). If the existence of matter requires constant refreshing by gravitational input [see Einstein's 1919 paper], collisions are avoided because gravity between the spaceship and its destination would, during the timeless period of the ship's passage, be unable to function normally and refresh matter.

^^ Deleting external and internal distance between photons and gravitons allows them to exist simultaneously i.e. in "quantum superposition". This unites electromagnetism with gravitation.

Distance is not only deleted in space. There would no longer be any “distance” in time. Just as we can journey to particular stars, we could take trips to particular years in the past or future. Instantly traversing 700 light years in space enables a spaceship to arrive at a spot which a light beam could only reach by travelling for 7 centuries, putting the ship 7 centuries in the future. Entering subspace or superspace with its negatives (energy, matter, distance, time) permits travel to the past since it would be impossible to travel 700 lightyears there, and only possible to travel minus 700 lightyears. Doing so instantly would enable a spaceship to arrive at a spot in the past which a light beam could only reach by traversing negative distance for 7 centuries. Though negative distance or time is totally alien to us, it must exist as surely as positive distance or time if the universe is mathematical.

DISTANCE = 0, SPACE-TIME UNIFICATION AND TRAVEL INTO PAST CONTAINED WITHIN E=MC^2

I think E=mc^2 supports this idea of deleting distance. The formula is, of course, Albert Einstein’s famous equation relating energy, mass and the speed of light [Einstein, A. (1905) - “Ist die Trägheit eines Körpers von seinem Energieinhalt abhängig?” (“Does the inertia of an object depend upon its energy content?” - Annalen der Physik 18 (13): 639-643]:

Let's represent the masslessness of photons by 0 (zero), and also the masslessness of the theoretical gravitons by zero. Should theories developed from Einstein's 1919 paper regarding mass be proven correct one day ie that mass results from photon-graviton interaction, we can replace the m with zero. This results in E=0*c^2 ie outside familiar circumstances, it is possible for E to equal 0. Having reduced the equation to nothing but E, m=0 and c^2=0 which means m=c^2. At first glance, m=c^2 seems to be saying mass exists at light speed. But the absence of E (energy) refers to there being no interaction of light energy and gravitational energy, and therefore no mass. If mass cannot be produced, mass-producing space-time/gravity must be described by zero. The zeroness of space-time/gravity does not mean they don’t exist. It means we can appear to relocate matter and information superluminally, or travel into the past and future, because distance equals zero and can be eliminated from both space and time.

In the preceding paragraph, it's shown that m=c^2 when E=0 ie when no interaction of light energy and gravitational energy exists. Describing space-time by zero gives the impression that it doesn't exist. It obviously does, so the conclusion that zero means distance can be eliminated is accurate. Distance obviously exists, too. It is merely suggested that it's possible to delete it.

When distance is eliminated, more than the space between objects is deleted (this allows intergalactic travel). Space within objects can be deleted, too (permitting a singularity to have zero size). Therefore, removing distance easily unifies everything in space-time into one thing - a product of the gravitational field. All past and future universes are unified with the present cosmos (is this the real meaning of the word "multiverse"?)

E=mc^2 may have led Einstein to his General Relativity and Unified Field theories, to give physical meaning (in the form of gravitation) to the mathematics. As far as I know, he never specifically mentioned such a connection. Was Einstein as ignorant of the depth of his

accomplishment as the rest of us?

"Physics of the Impossible" by Michio Kaku (Penguin Books, 2009) states on pp. 276-277, "When we solve (19th-century Scottish physicist James Clerk) Maxwell's equations for light, we find not one but two solutions: a 'retarded' wave, which represents the standard motion of light from one point to another; but also an 'advanced' wave, where the light beam goes backward in time. Engineers have simply dismissed the advanced wave as a mathematical curiosity since the retarded waves so accurately predicted the behavior of radio, microwaves, TV, radar, and X-rays. But for physicists, the advanced wave has been a nagging problem for the past century." Suppose Einstein was correct about the gravitational fields carrying enough information about electromagnetism to allow Maxwell's equations to be restated in terms of these gravitational fields. Then gravitational waves would also have an "advanced" solution.

E=mc^2, when viewed as E=0 and m=c^2, also supports this article's earlier statement that "gravitational ripples ... proceed in the "reverse" direction along the horizontal axis (not in so-called 'real' time, but in 'complex' time)." This is because m=c^2 and they can only create 0 if, purely for example, m represents the retarded wave of light travelling forward in time - and, again purely for example, c^2 represents the advanced wave of gravitation travelling backward in time. If mass and matter are products of gravitational-electromagnetic interaction, matter can also travel into the past.

IMAGINARY TIME MEETS E=mc^2, or HAWKING MEETS EINSTEIN

Now, recall "Complex Hyperspace" and the statements about 1) the fuzziness of 180 degrees and 90 degrees, in relation to the Möbius strip and Cosmic Squares, meaning that all spaces and times share one location, and 2) "Big Bang 2.0", where squares are extruded to cubes and those to tesseracts and those to hypercubes; plus the 5th sides of the cosmic squares being expanded to form infinite (eternal) time. All this may seem to be too much for physicists and mathematicians. They'd say there's no Big Bang 2.0, and that 90 degrees or 180 degrees are exact measurements. **These objections are simply cases of not thinking far enough, because the "Complex Hyperspace" section is just another way of describing something physicists and mathematicians are already familiar with - imaginary time, which has "an interesting effect on space-time: the distinction between time and space disappears completely." ("A Brief History of Time" by Stephen Hawking - Bantam Press, 1988, p.134).** Stephen Hawking also writes, "In real time, the universe has a beginning and an end at singularities that form a boundary to space-time and at which the laws of science break down. But in imaginary time, there are no singularities or boundaries. So maybe what we call imaginary time is really more basic …" ("A Brief History of Time" by Stephen Hawking - Bantam Press, 1988, p.139).

If the distinction between time and space disappears completely, unification exists in the sense that there is no distinction between the retarded and advanced waves spoken of in the last paragraphs of the preceding section. In every unit of "real" space-time, waves of gravity and light etc are both travelling forwards and backwards. However, that sentence can imply distinction since we can imagine a number of waves - some going forward in time while others go backward. There is no distinction and no distance between waves. Moving along the vertical axis of imaginary time* explains this since the

horizontal axis of "real" time sees absolutely no change, and there is therefore a total lack of time (in the normal sense) between retarded and advanced waves. Indeed, the complete lack of distinction between time and space means there can be no distance between mass-production or gravitational or electromagnetic waves - again unifying things, and Einstein is correct to believe a) the waves are related, and b) gravitation plays a role in formation of the elementary particles. I think he was referring to particles of matter when he wrote his paper^ but the complete lack of distance in space-time causes gravitation to play a role in formation of bosons like the Higgs particle and photons, too.

* plus the possible axis of sideways time, which is perpendicular to both imaginary time and the horizontal axis of real time (see **BASIC AND IMAGINARY** above, and **ASTERISKS LEADING TO COSMIC UNIFICATION AND EXO-SPACETIME COMPUTERS** BELOW)

^ “Spielen Gravitationfelder in Aufbau der Elementarteilchen eine Wesentliche Rolle?” (**Do gravitational fields play an essential role in the structure of elementary particles?**), Sitzungsberichte der Preussischen Akademie der Wissenschaften, (Math. Phys.), 349-356 (1919) Berlin

PLANETARY FIELDS

The deletion of distance between gravitons and binary digits in space-time is one method of producing the gravitational warping that accounts for space-time having the triple nature of real, imaginary and complex. I use the word "space-time" and the sentence "time is not separate from space, so time can be considered to be the motions of particles in space". Still, a lingering feeling persists in me that time and space really are somehow separate. Maybe the next couple of paragraphs will help dispel my irrational feeling.

There are 2 forms of spin - classical (e.g. a rotating top) and quantum. The latter can't be explained classically but may possibly be explained by particles and space mutually affecting each other. According to General Relativity, matter causes a gravity field by its mass creating depressions in space that can be pictured as a flexible rubber sheet. Space could affect particles through its curvature (gravity) infiltrating particles, thus giving them quantum spin. Curvature implies this quantum spin could be continuous. Since it's known this type of spin can only have discrete values, these values (and space's curves) must be determined by discrete pulses of energy that also transmit information (the binary digits of 1 and 0 possess this property). Space's curves influencing particles is consistent with Einstein's previously mentioned paper "Do gravitational fields play an essential role in the structure of elementary particles?" Space has gravitational qualities, while particles have electric and magnetic properties. Just as interference between light waves makes a hologram, interference between electromagnetic and gravitational waves might make mass and Einstein's version of modern science's holographic universe (he believed electromagnetism and gravitation were related).

- Now visualize the following in your mind - a planet precessing, so that it always returns to the same point on one side of its star, while the planet is several degrees higher each time its orbit takes it to the star's opposite side. The knowledge that two kinds of spin exist (classical and quantum) allows us to look at this illustration in two ways. It’s accurate to interpret it

classically, as representing one planet with several examples of its precessed orbit. However, believing in interaction of particles and their forces with space-time / gravity allows a quantum interpretation of this astronomical event. Space-time / gravity may not only make subatomic particles but also planets. So we can view the illustration as one “planetary field” incorporating the matter of the planet, forces and several pathways of space-time curvature (hypothetically achievable by modelling the distribution of the universe’s fundamental energy pulses on the twisting Mobius strip). This means precession is not only classical (with a planet’s orbit being affected by other planets), but is also quantum. A planet’s affecting, and being affected by, other planets quantumly can be viewed as quantum entanglement on astronomical rather than subatomic scales. Such “astro-entanglement” must extend infinitely – the planet and its precession are affected by other planets and the Sun, these gravitationally interact with still more distant bodies, those with still others, and on and on forever. Ultimately, the entire infinite universe is quantum/astro- entangled into a unified field. Since time may merely be the motions of particles, the entire past and present and future would inevitably be parts of this cosmic entanglement - the entire past, the present, and the whole future all exist right now as an "eternal present". Forward and backward time travel are both possible, with our limited perspective at any point being analogous to the limited sights and sounds on any one point of a DVD.

MAIN SEQUENCE FOREVER

Remembering that gravity makes matter, here's a related form of gravitational warping affecting stars instead of space-time (again, they appear vastly different but are actually united by the gravitational field).

A supernova blows off gaseous material before exploding - forming a slower moving, cooler shell^. Travelling at light speed, gravitational and electromagnetic radiation from the blast slams into that material. The lower temperature allows the gravitons’ energy to interact with the photons’, producing mass in the form of dust i.e. dust particles condense in the shell. Waves from deep space produce graviton-photon interaction, forming collapsing clouds from which stars form. If there’s no interaction as a result of higher temperatures, no matter is created and there is no cloud of gas and dust. A black hole – formed of gravitational waves and electromagnetic waves - could result.

^ Gall, C.; Hjorth, J.; Watson, D.; Dwek, E.; Maund, J. R.; Fox, O.; Leloudas, G.; Malesani D.; Day-Jones, A. C. *“Rapid formation of large dust grains in the luminous supernova 2010jl”. - Nature,* Volume **511,** Issue 7509, pp. 326-329 (17 July 2014). It was published online on July 9, 2014 (http://www.nature.com/nature/journal/vaop/ncurrent/full/nature13558.html)

Gravitational waves radiating from a supernova to its shell would push against the shell and be repulsive. Similarly, waves originating from warps far out in space and condensing into star-forming clouds would be repelling waves that conceivably account for expansion within portions of the infinite universe (the 1’s and 0’s forming the waves would be candidates for explaining dark energy).

There must be forms of time travel that are astronomical in scale. One of these might involve a star's progression to a red giant and, referring to binary digits, possible programming back to the Main Sequence where it would resume fusing hydrogen into helium. It'd be necessary to "fast backward" the star in a particular region of the Cosmic DVD - cosmic 1's and 0's would correspond to the lands and pits of earthly DVD's - before it reaches the red giant stage, and maintain it at this earlier stage (such regular maintenance would make stellar engineering not obvious to present-day astronomers on, say, Earth). The Sun will become a red giant in 5 billion years if left to its own devices, but the heat from its present expansion will make Earth uninhabitable in no more than 1 billion years. This fast-backwarding could conceivably be achieved by what Russian astrophysicist Nikolai Kardashev has conjectured to be a Type II civilization, capable of utilizing the entire power of their sun ("Physics of the Impossible" by Michio Kaku – Penguin Books, 2008, pp.145-147). A Type III civilization – 10 billion times more powerful – could utilize the power of an entire galaxy, and might be able to engage in creation of subuniverses. This could certainly be done by what I consider a plausible addition – a Type IV civilization, who could manipulate infinity and eternity (the universe as a whole). A Type I civilization, that can use all the power of their home planet, is 10 billion times LESS powerful than the Type II civilization that controls their sun. As for us, Earth only qualifies as Type 0 and Prof. Kaku rightly says we'd be as interesting as an ant hill (I think Earth would be fascinating for entomologists, who love ant hills). Establishing colonies throughout space and time would prevent overpopulation – instant intergalactic and time travel are explained above. With all our future instant intergalactic and time travel, these colonies – which will develop into civilization Types I, II, III and IV - throughout space and time would be composed of what we'd call aliens or extraterrestrials. They might look and think differently, due to adaptations - possibly including genetic engineering - to alien environments.

DARK, ANTI, NEGATIVE MATTER AND DARK ENERGY

Leaving subspace and superspace with their access to the future as well as the past - the (positive) matter in hyperspace might be what's called Dark Matter. This could be produced by gravitational waves travelling in "reverse" (into the past) and forming particles in agreement with Einstein's paper to the Prussian Academy of Sciences, "Do gravitational fields play an essential role in the structure of elementary particles?" (Math. Phys.), 349-356 (1919). Physics has established that these particles are invisible and only ever interact gravitationally. Being in the past, experience tells us they'd naturally be invisible. However, they must create gravitational effects if the cosmos is a unification of the gravitational field.

"Physics of the Impossible" by Michio Kaku (Penguin Books, 2009) states on p.205, "Antimatter and negative matter are two entirely different things. The first exists and has positive energy, but a reversed charge. (Scientists have looked for negative matter in nature, but it) hasn't yet been proven to exist." This supports the idea of negative matter existing in negative imaginary-time while antimatter exists in positive complex-time, along with dark matter.

Beginning on p.276, Professor Kaku writes -

"When we solve (19th-century Scottish physicist James Clerk) Maxwell's equations for light, we

find not one but two solutions: a 'retarded' wave, which represents the standard motion of light from one point to another; but also an 'advanced' wave, where the light beam goes backward in time. Engineers have simply dismissed the advanced wave as a mathematical curiosity since the retarded waves so accurately predicted the behavior of radio, microwaves, TV, radar, and X- rays. But for physicists, the advanced wave has been a nagging problem for the past century."

Albert Einstein's equations say that in a universe possessing only gravitation and electromagnetism##, the gravitational fields carry enough information about electromagnetism to allow the equations of 19th-century British physicist James Clerk Maxwell to be restated in terms of these gravitational fields. Thus he went beyond Maxwell's unification of electricity and magnetism into electromagnetism. Einstein proposed unification of electromagnetism with gravitation ie of everything in time and space. His Unified Field Theory came into being in the 1920's and he continued working on it until his death 30 years later.

Modern science adds the nuclear weak and strong interactions, for a total of 4 fundamental forces. It's claimed that Einstein never paid enough attention to the nuclear forces while developing the unified field theory. But commonsense says a scientist of his proven abilities must have considered them carefully. It's far more likely that Einstein concluded the nuclear forces are no more than byproducts of gravitational-electromagnetic interaction, and therefore not fundamental.

Suppose Einstein was correct about the gravitational fields carrying enough information about electromagnetism to allow Maxwell's equations to be restated in terms of these gravitational fields. Then gravitational waves would also have an "advanced" solution. Not only does the light beam go backward in time, a gravity wave would too - just as was stated above regarding waves in real space-time being flipped backwards through the negative imaginary-axis to the positive, 180° inversion of the complex-axis.

"Physics of the Impossible" continues on pp. 277-278:
"These advanced waves were a mystery until they were studied by (20th-century American) physicist Richard Feynman, who revealed the true secret of antimatter: it's just ordinary matter going backward in time." He arrived at this conclusion by analyzing the work of Paul Dirac on the electron a few decades before, and finding something very strange. Kaku explains, "If he simply reversed the direction of time in Dirac's equation, the equation remained the same if he also reversed the electron charge. In other words, an electron going backward in time was the same as an antielectron going forward in time!"

This article has spoken of gravity waves going back in time, and of all matter resulting from gravity. This produces "ordinary matter going backward in time." Particles with gravitational warping that's equal to hyperspace's dark particles might, since gravity makes both matter and the electric charges of electromagnetism, be known as the oppositely-charged antiparticles.

If the warps creating dark matter are equivalent to the warps creating antimatter, is it possible that dark matter is antimatter or at least related to it? If they're equivalent, dark matter would not only equal antimatter going forward in time but would also be ordinary matter - like the electron mentioned above

- travelling back in time. If the particles come from our future, they're called antimatter while in our present. When they travel to our past - either immediately or after a delay of varying length - they become dark matter.

It's already known that calculating time using imaginary numbers makes distinctions between time and space disappear^. In a cosmic unification, the 3 aspects of time (real, imaginary and complex) aren't separated - they intimately influence each other, and share properties. This sharing means not only the negative imaginary axis, but also the positive complex axis, are described by imaginary numbers to, respectively, greater and lesser degrees. So imaginary numbers eliminate distinctions between real space-time and the complex hyper-spacetime of the 5th dimension, permitting hyperspace to exist in the same place as space-time (on the real-complex axis) and also permitting dark matter to co-exist with "ordinary" matter. "... 'dark matter' might be just ordinary matter", Nima Arkani-Hamed suggests in an interview about his paper ["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].

^ "This (measuring time using imaginary numbers) has an interesting effect on space-time: the distinction between time and space disappears completely." ["A Brief History of Time" by Stephen Hawking (Bantam Press, 1988, p. 134)]

And electronically-generated virtual particles that produce the binary digits that produce mathematics might be called Dark Energy - and would fill the space-time of our infinite cosmos, as well as every human brain, with AI (artificial intelligence).

THE UNIFIED FIELD IS THE UNIFIED QUBIT

The subject of imaginary time is being discussed. So in preference to saying warps of space are attracted together to eliminate distance, the focus can be placed on the temporal aspect - and we travel at 90 degrees to time as it's known. Movement forwards through imaginary time is always in the "up" direction and, whether the trip is a relatively short one to Mars or one of countless billions of light years, absolutely no motion occurs in ordinary time's horizontal direction (Relativity's time dilation implies time might be stopped, making travel instant). And the journey is thus instant. Another way of viewing this phenomenon would be to say the object (though macroscopic) is in 2 widely-separated places at once (the start and end of its trip). So we can produce the effect of faster-than-light travel for both matter and information, without engaging in actual faster-than-light travel (that is impossible).

The above shows that deletion of distance is possible. Gravitons are the virtual particles filling space and producing bits (binary digits) that encode transcendental and irrational numbers like pi (the infinite cosmos arises from infinitely long numbers such as pi). Deleting distances between gravitons also deletes distances between 1's and 0's. Eliminating digital distance superposes all the 1's and 0's, forming a cosmos that is one qubit (the "quantum bit" used by quantum computers). 20th-century physicist Richard Feynman once wondered if the universe contained just one electron (I think it's the unifying entity of one qubit, which is also referred to as the singularity). If the universe is a projection from an infinitesimal qubit, it redefines cosmic inflation theory because it says everything used to be in

contact and is now quantum entangled (wherever and whenever it is).

Creation of the infinite universe doesn't require even the tiniest increase in the qubit's volume because the qubit producing our observable cosmos already contains infinite numbers like pi, which generate the never-ending and eternal cosmos as a whole. Specifically, they generate the infinite number of subuniverses comprising the cosmos as a whole.* While each subuniverse has a beginning and eventual end, the literally infinite number of starts and finishes means the universe as a whole does not have a beginning or end.

* To read an explanation in plain English of subuniverses using topology (rubber-sheet geometry), go to "Topological monoverse" at the end of this article. This says there is no multiverse (universes existing alongside ours). But remember, it regards the 13.8 billion year old structure we live in as merely a subuniverse within an infinite universe. It's saying there are no other universes beyond our infinite universe. Each subuniverse or observable universe could be viewed as the entire universe, in which case the multiverse does exist.

Speaking of the universe and its creation - on page 180 of "The Grand Design" (Bantam Press, 2010), Stephen Hawking and Leonard Mlodinow write, "Because gravity is attractive, gravitational energy is negative". I think they're mistaken. Gravitational energy on the imaginary axis certainly is negative. But that's only half the story: that energy also exists on the real-complex axis which is positive. The positive and negative may balance to provide the stability of empty space and the universe which "The Grand Design" mentions. The idea that "gravity is attractive" is open to challenge though (see the small box below within the large box making up most of this article).

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REPELLING GRAVITY, OCEAN TIDES AND THE GROWING AU

I believe an idea of partly revised gravity requires the idea of 17th-century scientists Isaac Newton and Johannes Kepler that the moon causes the tides, to be joined with Galileo's partly correct idea that the Earth's movements slosh its water. According to "Galileo's Big Mistake" by Peter Tyson - Posted 10.29.02 (http://www.pbs.org/wgbh/nova/earth/galileo-big-mistake.html) - "If a barge (carrying a cargo of freshwater) suddenly ground to a halt on a sandbar, for instance, the water pushed up towards the bow then bounced back toward the stern, doing this several times with ever decreasing agitation until it returned to a level state. Galileo realized that the Earth's dual motion —its daily one around its axis and its annual one around the sun—might have the same effect on oceans and other great bodies of water as the barge had on its freshwater cargo."

Gravity's apparent attraction can be summarized by the following - gravitation is absorbed into wave packets and the inertia of the gravitons (united with far more energetic photons) carries objects towards Earth's centre at 9.8 m/s or 32 ft/s. 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, 10th edition 2008]. All this water is being pushed towards Earth's centre at 32 feet per second every second. But the seafloor prevents its descent. So there is a recoil, noticeable
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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.

The previous paragraph's alignment of Sun, Earth and moon therefore refers to their being lined up where the gravitational current is greatest* (in the plane where planets and moons are created) and more of the gravitational waves travelling from the outer solar system being captured by solar and lunar wave packets, and less of them being 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 1st and 3rd quarter; the sun, earth and moon aren't lined up but form a right angle and our planet has access to more gravity waves, which suppress oceanic recoil to a greater degree. We can imagine the sun and moon pulling earth's water in different directions at neap tide. If variables like wind / atmospheric pressure / storms are deleted, this causes neap tides which are much lower than spring tides.

If a star only received the input of gravitational waves from deep space entering it, there would be no limit to its potential growth. Since it also radiates mass-forming gravitational waves, there is a limit to the growth. 99% of the solar system's mass / gravity / gravitational waves are associated with our star, so the gravitational push on Earth from its sphere may be slightly greater than the push from the waves originating in deep space. In the end, our planet's orbit would be growing slowly larger. According to "Secular Increase of Astronomical Unit from Analysis of the Major Planet Motions, and Its Interpretation" in "Celestial Mechanics & Dynamical Astronomy", Volume 90, Issue 3-4, 2004, pp. 267-288 by Krasinsky, G.A. and Brumberg, V.A.; the distance between Sun and Earth is growing by approx. 15 centimetres per century. The two authors attribute this increase of the Astronomical Unit (AU) to dark energy.

ASTERISKS LEADING TO COSMIC UNIFICATION AND EXO-SPACETIME COMPUTERS

* If space-time (whose warping is gravity) forms mass, there could be "currents" of space-time, ie gravitational waves, flowing in the "oceans" between the galaxies.** Space-time would form the matter in the galaxies, and it would form the Earth/objects on this planet. How? By some of the currents of space-time or gravity which pass the solar system's outer boundary being diverted towards the massive Sun's centre (just as some of the waves passing an island are refracted toward the shore by the island's mass).

** Ocean waves carry little water to an island since the water's motion is that of simply rising and falling. Gravitational and electromagnetic waves don't require a medium such as water - only the medium of the universal gravitational field.*** The motion of these waves is therefore different and they can carry gravity and light and mass-formation throughout the solar system.

*** Einstein sometimes used the word "aether" (also spelled "ether") for the gravitational field, within general relativity. The gravitational field can create electromagnetism, and their interaction produces matter (along with its short-range strong and weak nuclear forces). Step 1 can be described this way - gravitational waves may be called quadrupole because they vibrate in 4

directions: up-down, side-to-side, forwards-backwards, and in time (the progress of the first 3 motions). Then the wave is split into a dipole electromagnetic wave which, if viewed in a snapshot of space (as stationary), only vibrates in two directions: the up-down of one component, and the side-to-side of its other component (the components are electrical and magnetic). The smallest excitations of electromagnetic and gravitational waves - the photon and the theoretical graviton - could then interact in Erwin Schrödinger's "wave packets"** ** to give matter Wave-particle Duality.

** ** There are two problems with wave-packet theory, according to "Quantum" by Manjit Kumar (Icon Books, 2008, pp.215-217). The solution to both appears to reside in the unification of space-time and its contents by gravitation. That is - by the gravitational field creating electromagnetism, their interaction producing matter and the 2 nuclear forces, and the motions of particles being what we call time. First, waves would spread out to such a degree that they'd have to travel faster than light in order for experiments to connect them with detection of a particle-like electron. Possible solution - this is only a problem if things are actually separate. Modern understanding of quantum entanglement suggests that distance and travel faster than light are inconsequential in a universe where gravitation unites electromagnetism, matter and time into one thing. Second, applying Schrödinger's wave equation to helium and other atoms led to an abstract multidimensional space that was impossible to visualize. Possible solution - "Physics of the Impossible" by Michio Kaku (Penguin Books, 2009) states on p.276, "When we solve (19th-century Scottish physicist James Clerk) Maxwell's equations for light, we find not one but two solutions: a 'retarded' wave, which represents the standard motion of light from one point to another; but also an 'advanced' wave, where the light beam goes backward in time. Engineers have simply dismissed the advanced wave as a mathematical curiosity since the retarded waves so accurately predicted the behavior of radio, microwaves, TV, radar, and X-rays. But for physicists, the advanced wave has been a nagging problem for the past century." Albert Einstein's equations say gravitational fields carry enough information about electromagnetism to allow Maxwell's equations to be restated in terms of these gravitational fields. Therefore, gravitational waves also have a "retarded" wave and an "advanced" wave. They can travel forward or backward not only in space, but in time too. Believing matter results from gravitational-electromagnetic interaction means matter can also go back and forth in time. In 3 dimensions; an object has length, width and height at right angles to each other. To enter the 4th dimension and go back or forward in time; we must travel perpendicular to length, width and height - all at once. Going forward in time has always been a reality - by simply living, we go forward one day every day. So reality and the universe are multidimensional, even though only 3 dimensions can be visualized.

Extra questions - 1) How could a wave packet possess electric charge? By quadrupole gravitational waves that vibrate in 4 directions being split into dipole electromagnetic waves that vibrate in 2 directions, and one component of the latter wave being electrical.
2) Could wave mechanics incorporate quantum spin? There are 2 forms of spin - classical (e.g. a rotating top) and quantum. The latter can't be explained classically but may possibly be explained by particles and space mutually affecting each other. According to General Relativity, matter causes a gravity field by its mass creating depressions in space that can be pictured as a flexible rubber sheet. Space could affect particles through its curvature (gravity) infiltrating particles, thus

giving them quantum spin.
3) If the wave function doesn't represent real waves in 3-dimensional space, what does it represent? Not the probability of a particle being in a certain position, but complex waves in 5-dimensional space. Visualize space-time as a sphere defined by a horizontal diameter, a vertical diameter, and a third diameter that's perpendicular to both of these. These represent the cardinal directions gravitational waves can travel. One direction along the horizontal axis corresponds to going forwards in time but any direction in space, and is called "real". The reverse direction along the horizontal axis corresponds to going backwards in time but any direction in space, and is called "complex". The vertical axis represents the "imaginary time" described by the imaginary numbers of physics. The terms real, imaginary and complex come from the corresponding numbers in maths. And the 3rd diameter may allow sideways movement in time - to complement forward motion in time, backward motion, and up-down movement in imaginary time. Even if a computer operated continuously for billions of years in either imaginary or sideways time, its calculations would be retrieved instantly because no period at all could elapse in our "real" time - a computer working in complex time delivers results at any desired point in the past. Since space-time includes infinitely-long numbers like Π (pi), the sphere of space-time must be extended infinitely - meaning the universe would literally go on and on forever (not merely in terms of space but into the past and the future).

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FRACTALS, ENTANGLEMENT

Mathematician Benoit Mandelbrot coined the word fractal in 1975 (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 in computer paintings to depict coastlines, mountain ranges, etc). The qubit is space and, obeying the rules of fractal geometry, its curvature (gravity) manifests as innumerable things - mass; electromagnetism and other forces; matter in the form of seemingly separate computers, people, animals, plants, objects and particles.

'Physicists now believe that entanglement between particles exists everywhere, all the time, and have recently found shocking evidence that it affects the wider, "macroscopic" world that we inhabit.' - "The Weirdest Link" (New Scientist, vol. 181, issue 2440 - 27 March 2004, page 32 - online at http://www.biophysica.com/QUANTUM.HTM). The same article says that Caslav Brukner, working with Vlatko Vedral and two other Imperial College researchers, has uncovered a radical twist. They have shown that moments of time can become entangled too (www.arxiv.org/abs/quant-ph/0402127).

SINGULARITY #2: SOMETHING FROM SOMETHING

Second - the universe (which I believe to be infinite) is commonly portrayed as coming into existence from nothing. If the singularity began in a part of the infinite universe outside our observable portion, that would be "creation" from something. We can rule that out if we believe scientists must be displaying intelligent insight when they claim the cosmos came from nothing. The only way it could come from nothing without violating the Law of Conservation of Matter and Energy* is to originate in
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hyperspace and hypertime (somethings which have absolutely no existence in the practicalities of our current perspective).

* Neither matter nor energy can be created or destroyed, but only change form (including into each other).

The singularity in hyperspace is the perfect model of the universe that humanity will develop by deletion of distance between gravitons (and between binary digits) in, say, a thousand years. Of course, it can't result from knowledge about - or provide comprehensive data about - every specific part of the cosmos in a universe that's literally infinite and eternal. It would be like the zygote resulting from the joining of a sperm cell with an egg cell. The zygote contains information about the whole body it will develop into though it doesn't contain detailed info exclusive to each type of tissue. Similarly, the singularity-model contains information about the nature of the infinite universe extrapolated from study and exploration of our subuniverse or observable universe. However, it doesn't contain detailed info exclusive to the other subuniverses. From the singularity, binary digits would follow the programming we give them in the far future and project, or teleport, to form the universe we see and touch. This is reminiscent of the holographic principle, which says our four-dimensional world may be encoded on (projected or teleported from) a five-dimensional space-time called hyperspace/hypertime. Since all time is linked in the qubit, its input could originate a thousand years in the future while its output (the projection that forms our subuniverse) could be 13.8 billion years in the past.

IMAGINARY & HYPER COMPUTERS

So an imaginary computer can perform calculations at the familiar rate of time's passing while the horizontal axis of "real" time sees absolutely no change (no time passes in the normal sense). A hyper-computer using the reversed horizontal axis of complex time would have the same calculations done yesterday ... or 13.8 billion years ago ... or an eternity before then.

HYPOTHESIS FOR ORIGIN OF LIFE DEVELOPED FROM WORKS OF EINSTEIN AND PASTEUR

Even though Einstein told us space and time are curved and warped, we insist on limiting ourselves to a purely straight-line concept of time. Such a concept means Darwinian evolution is the only possible explanation for the origin of species (unless you believe in God). But to stick to science - Einstein's nonlinear time allows evolution to be restricted to adaptations and relatively minor modifications within species. Their origin is plausibly explained by human biotechnology from centuries in the future finding its way into the distant past when no humans existed.

The famous French scientist Louis Pasteur (1822-1895) did more than invent pasteurization, the use of heat to preserve food by killing germs in it. He disproved spontaneous generation (a theory that life could come from nonliving things like dirt) and showed that living things come only from living things. Amino acids and other molecules are obviously much more advanced than dirt, but dirt can't develop

into amino acids. Any large lifeform is far more advanced than any amino acid. Logically, it must be impossible for a collection of amino acids and other molecules to spontaneously - entirely by themselves, with no external influence - develop into a large lifeform. So ultimately, life (whether Earthly or extraterrestrial) had to originate with supremely advanced biotechnology forming a less advanced lifeform which gradually became more civilized. In a biological sense, the Theory of Evolution certainly explains adaptations and modifications. But believing it also explains origins is unwarranted extrapolation. That takes an idea which accounts for some parts of life and, since it's the only scientific explanation we currently have, assumes it accounts for all parts of life.

The knowledge we gain throughout history, and into future centuries, gradually builds into godlike abilities which transcend the barrier of time apparently only moving forwards. In the TV program "Custom Universe – Finetuned For Us?" (Australian Broadcasting Corporation's "Catalyst", August 29 2013), Dr. Graham Phillips reported that "the physicist and writer Paul Davies thinks the universe is indeed fine-tuned for minds like ours. And who fine-tuned it? Not God but minds from the future, perhaps even our distant descendants, that have reached back through time … and selected the very laws of physics" (as well as, this author thinks, the electronic energy pulses known as virtual particles) "that allow for the existence of minds in the first place. Sounds bizarre, but quantum physics actually allows that kind of thing."

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Topological Monoverse

Abstract -
This rebuttal of the multiverse hypothesis, the idea that other universes exist alongside ours, draws on mathematics' topology, or rubber-sheet geometry. The topology takes the form of electronics' binary digits (1's and 0's) composing 2 Möbius strips which are united into a figure-8 Klein bottle constituting a "sub"universe. The encoding of infinitely-long irrational and transcendental numbers like pi, e, √2 by the digits produces an infinite series of sub-universes (an infinite universe).* And other subs can naturally affect our own 13.8 billion-year-old subcosmos. ("Our Mathematical Universe" by cosmologist Max Tegmark – Random House/Knopf, January 2014 believes the universe has a mathematical foundation).

* For what I see as potential support for this maths, l thank "The origins of space and time" by Zeeya Merali ("Nature" 500, 516–519: 28 August 2013) which supplied the info that Rafael Sorkin, a physicist at the Perimeter Institute in Waterloo, Canada postulates that the building blocks of space-time are simple mathematical points that are connected by links. He calls his theory Causal Sets.

Article -
Binary digits are proposed to be the Hidden Variables which "are an interpretation of quantum mechanics based on the belief that the theory is incomplete and that there is an underlying layer of reality that contains additional information about the quantum world. This extra information is in the form of the hidden variables, unseen but real quantities. The identification of these hidden variables would lead to exact predictions for the outcomes of measurements and not just probabilities of

obtaining certain results." ("Quantum" by Manjit Kumar - Icon Books, 2008 - p. 379)

String theory says everything's composed of tiny, one-dimensional strings that vibrate as clockwise, standing, and counterclockwise currents. We can visualize so-called virtual particles generating tiny, one dimensional binary digits of 1 and 0 (base 2 mathematics) that form currents in a two-dimensional 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. (The curving of what we call space-time sounds very strange, but I think it can actually be explained by modelling space-time's construction on the Mobius strip that can be represented by giving a strip of paper a half-twist of 180 degrees before joining its ends.)

Mobius Loop (source: http://www.polyvore.com/mobius_strip_public_domain_clip/thing?id=72360021)

Joining two Mobius strips (or Mobius bands) forms a four-dimensional Klein bottle (http://plus.maths.org/content/os/issue26/features/mathart/index)

Figure-8 Klein Bottle (source: http://commons.wikimedia.org/wiki/File:KleinBottle-Figure8-01.png)

And each Klein bottle can become an observable (or "sub") universe (figure-8 Klein bottles resemble spiral galaxies, and appear to have the most suitable shape to form subuniverses). This connection of the 2 Mobius strips can be made with the infinitely-long irrational and transcendental numbers. Such an infinite connection translates into an infinite number of TANGIBLE figure-8 Klein bottles which are, in fact, subuniverses (they're tangible because the numbers result from virtual particles called gravitons that also make matter). The infinite numbers make the cosmos as a whole* physically infinite, the union of space and time makes it eternal, and it's in a static or steady state because it's already infinite.

* That is: the cosmos beyond our 13.8-billion-year-old subuniverse, which is apparently expanding from the energy of virtual particles becoming space-time or matter, and displacing parts of the universe beyond (in about the middle of last century; Fred Hoyle, Hermann Bondi and Thomas Gold calculated that maintaining a "steady state" where the universe is constantly roughly the same on the largest scales only requires the mass of one hydrogen atom to be added [from electronically-generated virtual particles, it turns out] in each quart of space every half-billion years ("The Universe" by Life Nature Library - Time Inc. 1964, p.175). In space, the energy of weak gravitational waves combines with the 10^36-times-stronger energy of electromagnetic waves to make mass.^ Translation into matter could be via photons of electromagnetic waves and gravitons of gravitational waves being disturbances in electromagnetic and gravitational fields. These disturbances are known as virtual particles and are equivalent to energy pulses that produce the binary digits of 1 and 0 encoding pi, e, √2 etc. Matter particles [and even bosons like the Higgs, W and Z particles] are given mass by the energy of photons and gravitons interacting in "wave packets" (interaction within this term from quantum mechanics results in wave-particle duality).

^ Albert Einstein's "Spielen Gravitationfelder in Aufbau der Elementarteilchen eine Wesentliche Rolle?" (**Do gravitational fields play an essential role in the structure of elementary particles?**),

Sitzungsberichte der Preussischen Akademie der Wissenschaften, (Math. Phys.), 349-356 (1919) Berlin.

For the note below on the figure-8 Klein bottle, I refer to –

a) Bourbaki, Nicolas (2005). Lie Groups and Lie Algebras. Springer
b) Conway, John (1986). Functions of One Complex Variable I. Springer
c) Gamelin, Theodore (January 2001). Complex Analysis. Springer
d) Joshi, Kapli (August 1983). Introduction to General Topology. New Age Publishers
e) Spanier, Edwin (December 1994). Algebraic Topology. Springer

Informally - if an object in space consists of one piece and does not have any "holes" that pass all the way through it, it is called simply-connected. A doughnut (and the figure-8 Klein bottle it resembles) is “holey” and not simply connected (it’s multiply connected). The universe appears to be infinite (more info in "Infinite Universe" by Bob Berman - "Astronomy”, Nov. 2012), being flat on the largest scales and curved on local scales (from far away, a scene on Earth can appear flat, yet the curves of hills become apparent up close). A flat universe that is also simply connected implies an infinite universe [Luminet, Jean-Pierre; Lachi`eze-Rey, Marc - "Cosmic Topology" - Physics Reports 254 (3): 135–214 (1995) arXiv:gr-qc/9605010]. So it seems the infinite universe cannot be composed of subunits called figure-8 Klein bottles (flat universes that are finite in extent include the torus and Klein bottle).

But gaps in, or irregularities between, subuniverses shaped like figure-8 Klein bottles are "filled in" by binary digits in the same way that computer drawings can extrapolate a small patch of blue sky to make a sky that's blue from horizon to horizon. This makes space-time relatively smooth and continuous - and gets rid of holes, making these types of Klein subunits feasible. The Klein bottle is a closed surface with no distinction between inside and outside. There cannot be other universes outside ours – there’s only one universe.

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