Title –

THE HUMAN COMPUTER SCIENCE OF 13,800,000,000 B.C.

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Abstract – This article is another version of my entry in FQXi's 2014 contest – http://fqxi.org/community/forum/topic/1977. I was inspired to write this new version after reading "The Missing Universe" by Bob Berman (Astronomy magazine - April 2014) which says, "... MOND (MOdified Newtonian Dynamics) works well in predicting how galaxies rotate, but it doesn't work as well in predicting motions at much larger scales, such as those between galaxy groups (clusters and superclusters - DM, dark matter, seems compelling at the largest scales)."

This sounds like a message from the universe that we don't have to choose between dark matter and modified gravity. The following article shows that they can be integrated. And if a Theory of Everything really does describe the universe, the strong force and electromagnetic force (p.28 of Bob Berman's article) must also be capable of integration with DM/MOND.

To do this, I'll "Einsteinize" my article by reminding readers of a 1919 paper he wrote. Further Einsteinization will return us to the Theory of Everything by speaking of his Unified Field Theory. Then I'll finish with "What is Gravity?" (thanks to Einstein's General Relativity explaining that gravity is the warping of space-time, this could also be called "What is Space-time?") and a new interpretation of infinity.

Content –

If space-time (whose warping is gravity) forms mass, there could be "currents" of space-time 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). Along their course, the refracted gravitational waves are concentrated 10^24 times # in the intense warping we call matter.

 # WHY IS GRAVITY WEAK? (C^2 AND THE ATOM)

When gravity waves concentrate to form matter, gravity travels from external to matter: it pushes against matter (repels). Repulsive gravity is dark energy*. Successive waves are re-radiated at unconcentrated strength from matter to external (opposite action to repelling wave) and attract – it must be remembered that attraction is merely a matter of perspective, since Einstein showed that attraction of two bodies of matter actually results from space-time's curvature pushing bodies. The space-time we live in is described by ordinary [or "real"] numbers which, when multiplied by themselves, result in positive numbers e.g. 2x2=4, and -

2x-2 also equals 4. Inverted positive space-time becomes negative hyperspace which is described by so-called imaginary numbers that give negative results when multiplied by themselves e.g. i multiplied by itself gives -1. Calculating time using imaginary numbers makes distinctions between time and space disappear. A hypothetical negative 5th-dimension is described by imaginary numbers and motions of its negative particles (dark matter) are time, since time can be calculated using imaginary numbers. So imaginary numbers eliminate distinctions between space-time and the 5th dimension, permitting dark matter to exist as "ordinary" matter's scaffold.

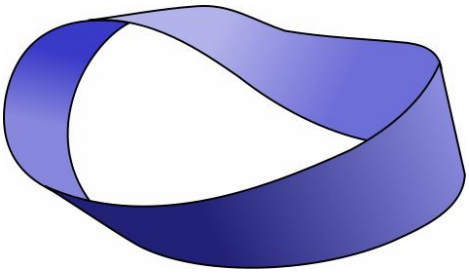
* Feeble gravity might push galaxy clusters apart in the same way that feeble sunlight propels a solar sail. In the 1970s, Robert Forward proposed two beam-powered propulsion schemes using either lasers or masers to push giant sails to a significant fraction of the speed of light. These vastly magnify the power of sunlight via Light (or Microwave) Amplfication by Stimulated Emission of Radiation. How is gravity's power boosted? 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 (300,000 km/s x 300,000 km/s) which approx. equals 10^11. After gravity forms matter, successive gravity waves are, via gravitational lensing, concentrated 10^24 times within the matter (to 10^25, weak nuclear force's strength). Then they're further 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. Successive gravity waves are absorbed by the matter and radiated as longer-wavelength waves (both as electromagnetic waves - possibly gamma rays, or a microwave background – and as gravitational waves which have lost 10^24 of their energy or strength (and are labelled "10^1".)

"DIGITAL" STRING THEORY AND BIOLOGICAL EVOLUTION

Let's borrow a few ideas from string theory's ideas of everything being ultimately composed of tiny, one-dimensional strings that vibrate as clockwise, standing, and counterclockwise currents in a four-dimensional looped superstring - "Workings of the Universe" by Time-Life Books (1991, p.84). We can visualize tiny, one dimensional binary digits of 1 and 0 (base 2 mathematics) forming 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. Combination of the 2 loops' currents requires connection of the two as a four-dimensional Klein bottle. This connection can be made with the infinitely-long irrational and transcendental numbers. Such an infinite connection translates - via bosons being ultimately composed of the binary digits of 1 and 0 depicting pi, e, √2 etc.; and fermions being given mass by bosons interacting in matter particles' "wave packets" – into an infinite number of Figure-8 Klein bottles which are, in fact, "subuniverses" (see next subheading) (binary digits fill in gaps and adjust edges to fit surrounding subuniverses [similar to manipulation of images by computers]). Slight "imperfections" in the way the Mobius loops fit together determine the precise nature of the binary-digit currents (the producers of space-time-hyperspace, gravitational waves, electromagnetic waves, the nuclear strong force and the nuclear weak force) and thus of exact mass, charge, quantum spin. Binary digits are also the ultimate producers of everything material (see "Einsteinization"). This includes all inorganic and organic matter – so the human computer

science generating those digits and transported to the remote past (these points are addressed at various places throughout the present article) offer a new Origin of Species. The species do, of course, undergo mutations and natural selection through the course of time**;** ceaselessly adapting to their environment in accordance with evolution's principles.

Mobius Loop



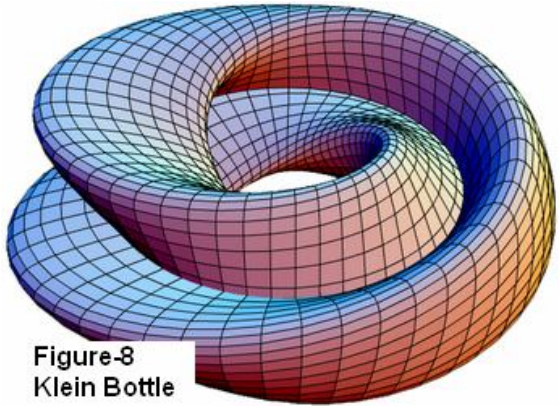


Figure-8
Klein Bottle

STEADY STATE UNIVERSE, BIG BANG SUBUNIVERSES AND DNA'S DOUBLE HELIX

Each "subuniverse" (bubble or pocket universe) is one of a series (extending infinitely in every direction) composing the physically infinite and eternal space-time of the universe. The infinite numbers make the cosmos 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 and has no room for expansion. Our own subuniverse has a limited size (and age of 13.8 billion years), is expanding from a big bang, and has warped space-time because it's modelled on the Mobius loop, which can be fashioned by giving a strip of paper a 180-degree twist before joining the ends. (It may have DOUBLE STRANDED, spiralling DNA because the universe is modelled on TWO twisted Mobius loops. Berman's article "Infinite Universe" says, "The evidence keeps flooding in. It now truly appears that the universe is infinite" and "Many separate areas of investigation – like baryon acoustic oscillations (sound waves propagating through the denser early universe), the way type 1a supernovae compare with redshift, the Hubble constant, studies of cosmic large-scale structure, and the flat topology of space – all point the same way." Support for the article – a) 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." and b) according to "The Early Universe and the Cosmic Microwave Background: Theory and Observations", the shape of the Universe found to best fit observational data is the infinite flat model).

NEWTONIAN AND RELATIVISTIC GRAVITATION

There's a stronger gravitational force on the surface of the Earth because gravity is concentrated in the matter there. So, like in a black hole, time is slowed down (by much less and at lower altitudes, in the case of Earth). The high velocities experienced by orbiting astronauts also slows time at their extreme altitudes. The article "Gravitation" by Robert F.

Paton - The World Book Encyclopedia (Field Enterprises Educational Corporation, 1967) – states, "… when one object is inside another, gravitation decreases the closer their centers are to each other" and Isaac Newton's 1687 Law of Gravitation explains why an object at the center of the earth would weigh nothing (it isn't affected by the concentrated gravity, which we call mass, above it). Objects in space or an orbiting spaceship are similarly free from the earth's (or any planet's or star's) concentrated gravity/mass which is below, instead of above, them and makes them relatively weightless. Gravity's pan-directional repulsive force * is UNconcentrated and, as Penguin Encyclopedia tells us, only about a millionth of Earth gravity. The concentrated gravity forming the spaceship is insignificant compared to the gravity forming a planet or star, and causes no reduction of weightlessness.

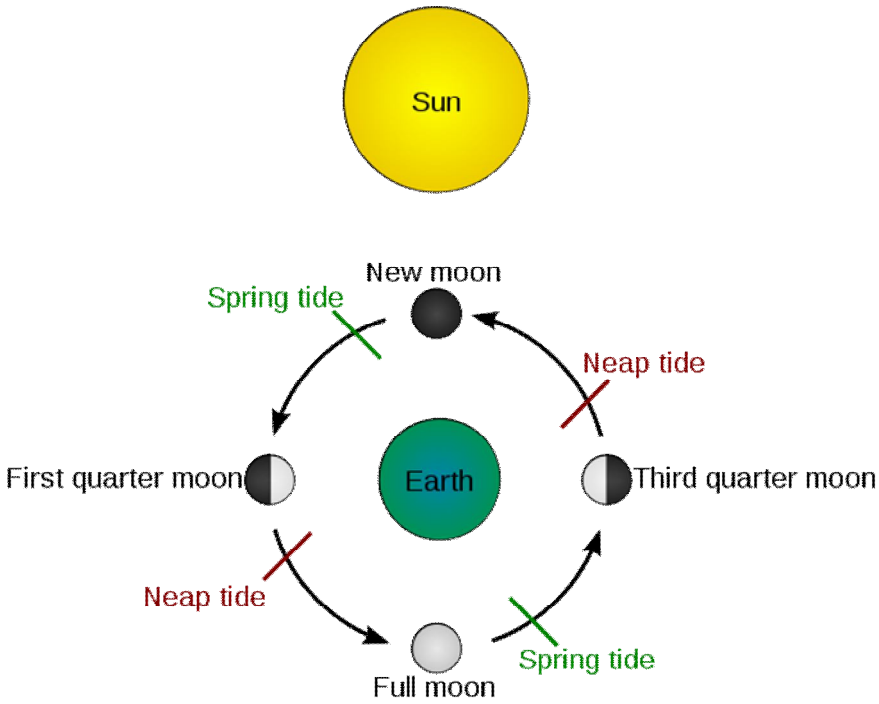
* Dr. Paton says, "Einstein says that bodies do not attract each other at a distance. Objects that fall to the earth, for example, are not 'pulled' by the earth. The objects are pushed toward the earth by (the curvature of space-time around the earth)."

The problem with the cosmos is that much of it appears to be "missing" to astronomers. I believe this will be solved by an integrated approach that both explains dark matter and slightly revises our concept of gravity. Let's continue with a couple of purely gravitational aspects of the riddle of the "missing" universe (these are extracted from my earlier article "Unified Field, Relativity and Quantum Mechanics Meet String Theory, Parallel Universes, the Mathematical Universe, and TOE" (http://vixra.org/abs/1303.0218). This early article attempted to see if I could explain alternative ideas about gravity (including Johannes Kepler's 3 laws of planetary motion) in plain English while keeping the mathematics to an absolute minimum.

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 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 the heavier tool does fall faster then the lighter feather as the ancient Greek philosopher Aristotle believed (it has a greater concentration of gravity within itself). But the difference is many billions of times beyond science's finest measuring instruments. It's appropriate to use the results of the experiments of Italian physicist Galileo, and say gravitation is absorbed into wave packets and the inertia of the gravitons carries

objects towards Earth's centre at 9.8 m/s 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 per second. But the seafloor prevents its descent. So there is a recoil, noticeable offshore (it is only where oceans and continents meet that tides are great enough to be noticed). This recoil is larger during the spring tides seen at full and new moon because sun, Earth and moon are aligned at these times. This alignment means more of the gravitational waves travelling from the outer solar system are captured by solar and lunar wave packets, and less of them are available on Earth to suppress oceanic recoil (there are still enough to maintain the falling-bodies rate of 32 ft/s). At the neap tides of 1st and 3rd quarter, more gravity waves are available to Earth and they significantly suppress oceanic recoil. If variables like wind/atmospheric pressure/storms are deleted, this causes neap tides which are much lower than spring tides.



EINSTEINIZATION

Albert Einstein said gravitation plays a role in the constitution of elementary particles, such as the electrons which help compose cosmic rays and matter (in "Do gravitational fields play an essential role in the structure of elementary particles?" - a 1919 submission to the Prussian Academy of Sciences). In the Epilogue to "How Einstein Discovered Dark Energy" (http://arxiv.org/abs/1211.6338) (*Submitted on 22 Nov 2012)*, Alex Harvey gives this interpretation of "Do gravitational fields play an essential role in the structure of elementary particles?" -

“Recall that in 1918 the only elementary particles known were the electron and the proton. Physicists were attempting to understand why these were stable despite their internal electromagnetic repulsion. Most attempts were based solely on electromagnetic theory. For a review of these efforts see Pauli [12]. Einstein’s effort was to construct a model in which stability was achieved through the use of gravitational forces. In particular, he used modified gravitational field equations which included the cosmological constant [13]. The attempt was not successful and this was the last time he mentioned the cosmological constant other than to denounce it”.

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). And suppose he was also correct when he said gravitation is the warping of space-time. Then it is reasonable to conclude that 1) gravitation would play a role not only in the structure and mass of elementary particles but also in the forces associated with those particles, and 2) the warping of space-time that produces gravity means space-time itself plays a role in the constitution and mass of elementary particles as well as of the nuclear and electromagnetic forces i.e. all the other forces may not be separate from gravitation but may be modifications of it.

Anatolij Prykarpatski says,

"The force exerted by any small mass object on the Earth is exactly THE SAME as the force exerted by the Earth on this body (The Newton's law...)"

Newton’s 3rd law of motion states that there's an equal and opposite reaction to every action, so the gravitational force exerted by the relatively huge mass of the Earth could only be equal to the force exerted by any small-mass object if gravitation does not depend on mass (making the force from Earth, and the small mass, both equal to zero). Instead, mass would depend on gravitation - this agrees with Einstein's paper.

In the 19th century, Scottish mathematician and physicist James Clerk Maxwell unified electricity and magnetism into electromagnetism. 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 Maxwell to be restated in terms of these gravitational fields. This was discovered by the mathematical physicist George Yuri Rainich (1886 -1968). England’s Professor Penrose has argued that the gravitational fields, if known everywhere but only for a limited time, do not contain enough information about their electromagnetism to allow the future to be determined, so Einstein's unified theory fails

We’ve seen that time is unified with the gravitational field, which produces electricity and magnetism (the electromagnetic field – see **WHY IS GRAVITY WEAK?**) If time is unified with the gravitational and electromagnetic fields, 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 in the “Annals of Physics in 1957.This overcomes the 50-year-old objection to Einstein’s Unified Field which was put forth by Penrose. Physicists also argue

that a unified theory must now address the strong and weak nuclear forces in the atom, as well as dark matter and dark energy. All of these subjects are dealt with here.

WHAT IS GRAVITY?

Page 28 of Bob Berman's article says, "Of the four fundamental forces in the universe, gravity is the most mysterious. No one knows why it is the way it is …" In my article's "Digital String Theory" section, it was suggested that binary-digit currents are the producers of space-time-hyperspace**:** and because of their warping, gravity. The following paragraphs about hidden variables/virtual particles called binary digits may further confirm this to some people -

Maybe binary digits are able to be called hidden variables - Einstein said hidden variables carry extra information about the world of quantum mechanics and complete it, eliminating probabilities and bringing about exact predictions. Energy from hyperspace (which is unified with space-time and forms its scaffold - see **WHY IS GRAVITY WEAK?**) creates the 1's and 0's in space-time's so-called vacuum that are usually labelled "virtual particles". And the intimate connection between everything which is a result of being produced by the digits – between matter, time, space, gravity, dark energy, etc. (see **"DIGITAL" STRING THEORY**) – is known as quantum entanglement. Maybe binary digits could also 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. This means it would have negative energy, negative mass, negative distances and negative time – these things are impossible and meaningless in the universe we know, but are definitely possible and full of meaning in a universe based on mathematics. (The space-time we live in is described by ordinary [or "real"] numbers which, when multiplied by themselves, result in positive numbers e.g. 2x2=4, and -2x-2 also equals 4. Inverted "positive" space-time becomes negative hyperspace which is described by so-called imaginary numbers that give negative results when multiplied by themselves e.g. i multiplied by itself gives -1.) Entering hyperspace 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 (see **INFINITY**) 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.

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. These 1's and 0's correspond to the 1's and 0's of the pits and land (or pits and bumps) of a DVD or CD. Science's Law of Conservation has known since the 19th century that neither matter nor energy can ever be destroyed or created - they only change form. If nothing in any time can be destroyed (it only changes form at a different point on the DVD), all time might be like a DVD. All of the "cosmic" DVD always exists even though a very limited set of sights and sounds can be perceived at any point during its playing. In different parts of the cosmic DVD; people are forever being born, forever taking their first step (are they in perpetual motion in an eternal present?), forever resting in peace. I believe English physicist Julian Barbour has the same understanding of time which this sentence speaks of. And I think medical science will someday advance so much (and in such unexpected ways) that we'll be able to say they're

forever being resurrected. How could the time travel loved by theoretical physicists come to pass without this "cosmic DVD"?

* Michio Kaku writes in “Physics of the Impossible”, “Traditionally, physicists have dismissed negative energy and negative mass as science fiction. But we now see that they are indispensable for faster-than-light travel, and they might actually exist.” In 1957, cosmologist Hermann Bondi suggested that mass might be negative as well as positive.

INFINITY

The inverse-square law states that the force between two particles becomes infinite if the distance of separation between them goes to zero. Remembering that gravitation partly depends on the distance between the centres of objects, the distance of separation between objects only goes to zero when those centres occupy the same space-time coordinates (not merely when the objects’ sides are touching). That is, infinity equals the total elimination of distance* – the infinite cosmos could possess this absence of distance in space and time via the electronic mechanism of binary digits, which would make the universe as malleable and flexible as any image on a computer screen**.** If infinity is the total elimination of distance in space-time, there would be nothing to prevent instant intergalactic travel or time travel to the past and future. Infinity does not equal nothing - total elimination of distance, or space-time, produces nothing in a physical sense and reverts to theoretical physicist Lee Smolin’s imagining of strings as “not made of anything at all” - “What String Theory Tells Us About the Universe” by Dr. Odenwald**:** Astronomy – April 2013, p.35. It also reverts the universe to the mathematical blueprint from which physical being is constructed (this agrees with cosmologist Max Tegmark’s hypothesis that mathematical formulas create reality – “Is the universe actually made of math?” by Adam Frank - http://discovermagazine.com/2008/jul/16-is-the-universe-actually-made-of-math#.UZsHDaIwebs, and “The Mathematical Universe” by Max Tegmark - http://arxiv.org/abs/0704.0646. So, infinity = something (mathematics, just like zero).

Applying this practically, 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 next to 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. 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 – see “Digital String Theory” and “Why is Gravity Weak?” for a proposed method - 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 eliminating distance (this is similar to traversing a wormhole between two folds in space). Now we just need some clever engineers to design a spacecraft that works according to the Einstein-Yale principle.

* This means there's still room for the infinity known as God. God would be a suprapantheistic union of the universe's spatial, temporal, hyperspatial, material and conscious parts; forming a union with humans in a cosmic unification, and forming a universal intelligence that even pervades atoms and biological cells. When first reading that last

sentence, we're left with the idea that God and humanity are partners and somehow separate, despite use of the word "union". But the human body and brain might become immaterial and quantum entangled with all space and time^ (no doubt many people, even today, would call such invisible, endlessly powerful, entangled beings "supernatural"). This means eternal God and humanity of the far future are not separate in any sense but are the same thing. The "union with humans" refers to the ability of these beings to affect the past and thus have a relationship with people living in earlier times. A name used for God in the Old Testament is Elohim, which means the "plural majesty of the one god" i.e. the billions of earth's inhabitants entangled with, and dispersed throughout, the united infinity of the universe and eternity of time. Such entanglement suggests extrasensory perception and telekinetic independence from technology is possible, despite modern science's objections which appear to be based on non-unification.

^ The portion of that sentence referring to the body anticipates possible developments from the concept of an immortal, immaterial soul advocated by ancient Greek philosopher Plato and his followers; as well as from the belief of the Mormons that God has a glorified body of flesh and bone which I hypothesize would be quantum entangled with all space and time. The portion referring to quantum entanglement says entanglement exists not merely in the present but also reaches into the past … and the Unified Field extrapolates this entanglement to perception of the future (which could never be perceived unless it already exists – and that would permit time travel).

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