Title – **Echoes of the Big Bang**

Author – Rodney Bartlett

Abstract –

What do you think of today's attention to so-called echoes of the big bang (imprints of gravitational waves from the time of the big bang that have left their trace in the cosmic microwave background)? It's obviously an amazing discovery but my fear is that it's going to be used more for alleged confirmation of present theories than for investigation of the questions it raises (especially in the short term). A starting point for these questions is, "If the universe expanded to about the size of a football in 10^-36 second, what was outside the football?" Many people will say this is an invalid question because no space or time existed outside the football. But I think that's mere evasion of the question (understandable if there are no other ideas to fall back on).

There's a simple alternative which says there was space and time outside the football, and this alternative is supported by the modern idea of a multiverse. I'll take a lazy approach to the last sentence and copy/paste relevant sections from a couple of my recent vixra articles - "Defining Division by Zero (Making it not Just Possible, But Essential) and Relating Zero to Infinity" (http://vixra.org/abs/1402.0087) and "Connecting Bioscience, Atoms, Gravitation, Black Holes, and Strings" (http://vixra.org/abs/1403.0149). I heard a short talk with Dr. Lawrence Krauss, a theoretical physicist at Arizona State University in the US (http://www.abc.net.au/newsradio/content/s3965819.htm), whose comments about gravity being a quantum theory and the universe originating from "absolutely nothing" are addressed by my articles. If the binary digits of 1 and 0 are the basis for manufacturing space-time (whose curves and warps are gravity), this is in firm agreement with gravity being a quantum theory. And electronic bits could easily avoid Dr. Krauss's "supernatural shenanigans" by being a product of human technology – we know this much to be true – that is recycled to 13.8 billion years ago by our future discovery of how to time travel into the past (a hypothesis explaining this is presented).

It seems unfortunate that no science journal is interested in my ideas (maybe it's the way I write?) because I'm certain I'm correct, even if my ideas sound too strange to be true. I don't think I'll bother sending these thoughts to Dr. Krauss (professional scientists don't answer my emails) – but I just might, if I get impulsive.

Content -

Part A –

From "Defining Division by Zero (Making it not Just Possible, But Essential) and Relating Zero to Infinity"

I think the Roman philosopher Lucretius was correct 2,000 years ago when he said, "nothing can be created from nothing". The idea of quantum fluctuations - which are proposed by modern science in order to create the universe from nothing - is valid in a sense (quantum fluctuations actually happen because they're temporary changes in the amount of energy at points in space). But this doesn't mean the universe can be created from nothing (from, using traditional knowledge, zero alone). I think the universe, and life, began because brains acquire knowledge from the 4 dimensions of space-time. Then brains interact with a 5th-dimensional hyperspace to purposely switch the binary digits composing the universe from 1 to 0 or vice versa (this switching would be quantum fluctuations).

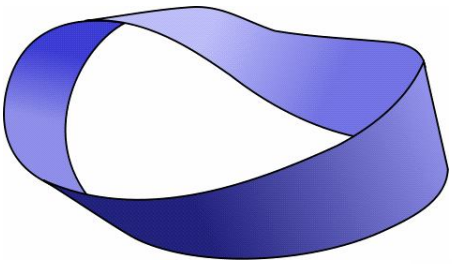
"DIGITAL" STRING THEORY AND RENORMALIZATION

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, $\sqrt{2}$ etc.; and fermions being given mass by bosons interacting in matter particles' "wave packets" – into an infinite number of Figure-8 Klein bottles which are, in fact, "subuniverses" (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.

* If the material and immaterial universe consists of an infinite connection of transcendentals and irrationals, renormalization might be unnecessary in certain circumstances. This mathematical procedure is regarded as prerequisite for a useful theory and is used in attempts to unite general relativity with quantum mechanics to produce Quantum Gravity and the Theory of Everything.

Renormalization seeks to cancel infinities – but in a literally infinite universe, retaining the infinite values might point the way to deeper understanding of the cosmos.

Mobius Loop



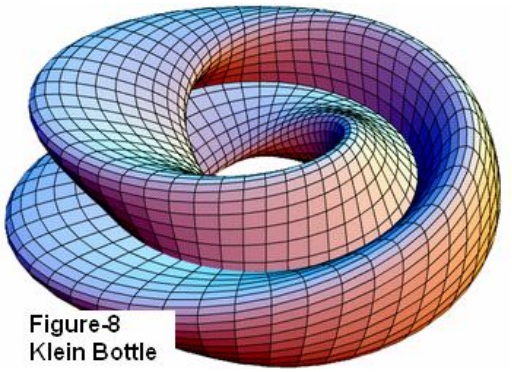


Figure-8
Klein Bottle

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 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 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.

STEADY STATE UNIVERSE, BIG BANG SUBUNIVERSES AND BLACK HOLES

As for the new perspective on the Big Bang, don’t think of space’s expansion as the universe starting with a big bang and the galaxies forever flying apart. Think of it as the production of “new” space by binary digits which is added to existing space and pushes that existing space farther and farther away. The Law of Conservation says new space isn’t created from nothing but is converted from something else. It may be speculated that new space is converted from the BITS (BInary digiTS) of 1 and 0. (Does ultra-advanced human computer technology of the far future have a role in the universe’s origin and destiny?)

Also, recall that each “subuniverse” (bubble or pocket universe) is one of a series of figure-8 Klein bottles (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.)

And the new perspective on black holes would be – in the case of the sun, our star would become a black hole if it was compressed to 2.95 kms (“From the

Big Bang to Dark Energy" – a lecture on coursera.org by Hitoshi Murayama from the University of Tokyo), in which case the pressure increase "shreds" the sun into its binary digits. In other words, its mass is relativistically converted into the energy of binary digits i.e. the bosons stop interacting in wave packets to produce the forces we identify as mass, and the bosons – which are ultimately composed of the binary digits depicting pi, e, √2 etc. (see "Digital String Theory") – register as 1's and 0's.

Part B –

From "Connecting Bioscience, Atoms, Gravitation, Black Holes, and Strings"

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".)** If space comes from bits (the BInary digiTS of 1 and 0 - specifically, the energy responsible for the bits is converted into space), then so does gravity (warping of space). So as more and more energy is invested in bit production, more and more space and repelling gravity result. This causes accelerating expansion within the universe; as discovered in 1998 by Saul Perlmutter, Brian Schmidt, and Adam Riess.

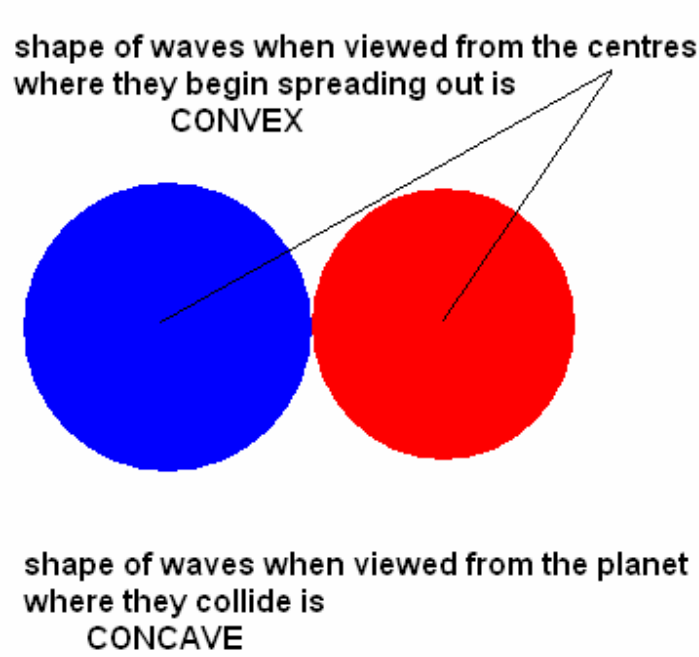
** During absorption, something occurs with gravitational waves besides interactions producing electromagnetic and nuclear forces. Does this picture of the atom conflict with the theories of electroweak interaction (electromagnetism combined with the weak nuclear force) which won the 1979 Nobel Prize in Physics for Steven Weinberg, Sheldon Glashow and Abdus Salam? The warping of space-time in General Relativity is not separate from matter but gives an electron a mass of 0.511 MeV (mega electron volts) – technically, physicists say "0.511 Mev/c^2" because an electron volt is actually a measurement of energy, and mass units equal energy units divided by c^2, or m = E/c^2 (which is E=mc^2 when both sides are multiplied by c^2). (E=mc^2 means a tiny amount of mass can be converted into a very large amount of energy. Similarly, m=E/c^2 means a very large amount of energy is converted into a tiny amount of mass.) E (energy) is measured in joules (J), m is the mass in kilograms (kg; 1 kg = approx. 2.2 pounds), and c is the speed of light (about 186,282 miles/299,792.458 kilometres per second) measured in metres per second (m/s or ms^-1).

From "The Universe in Another Nutshell" (http://vixra.org/abs/1312.0195)

So hyperspace can exist**.** But is there a plausible means of entering it?

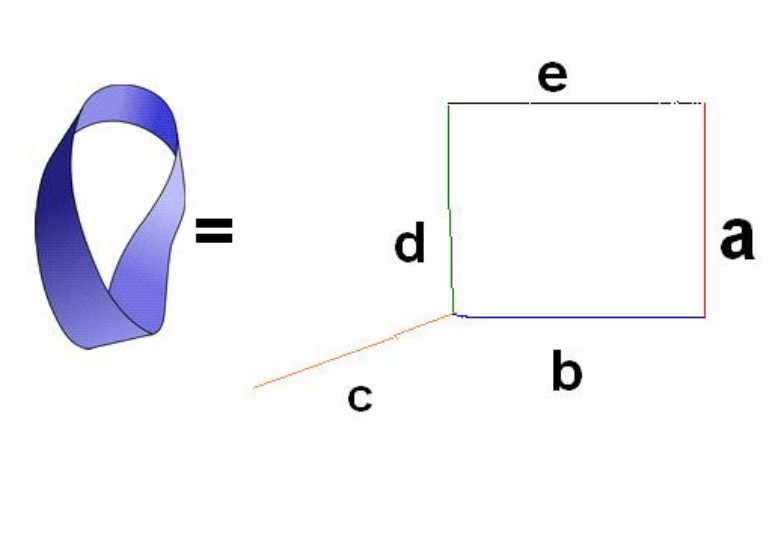
LOCALIZED UNIFIED FIELD

Instantly travelling to a planet 700 light years away and instantaneously arriving at a spot in the future which a light beam could only reach by travelling for 7 centuries can be likened to a wave which spreads out from the point of departure. This is because of quantum mechanics' wave-particle duality which can view the spaceship not as a collection of particles but as a wave, or collection of waves.



At the destination, the convex shape of the spreading wave arrives instantly (meaning the ship and planet are quantum entangled). This situation is equivalent to space being translated (shifted) by 90 degrees so that the ship is perpendicular to length, width and height simultaneously. What if the spaceship is simultaneously quantum entangled with another wave arriving at the planet from the other side of the universe? Since the waves are entangled and unified, their motions are instant and this situation is equivalent to space being translated by 180 degrees. It's inverted and becomes 5th-dimensional hyperspace.

THE MATRIX AND THE FIGURE-8 KLEIN BOTTLE



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 right side of the Mobius loop pictured above, 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" which allows the numbers to deviate slightly from their precise values of 90 and 180. The fuzziness is represented in nature by past, present, future, space, time, and hyperspace existing everywhere rather than being confined to particular locations. 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.) If the infinite universe is composed of subuniverses shaped like figure-8 Klein bottles (diagram at end of paragraph - 2 Mobius loops are joined on their sides to form 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]), in each subuniverse there would be 2 perpendicularities to the twist (one lot of 90+90, then another 90+90). 180+180 could equal

360 – represented in physics as a subuniverse, a galaxy, or one of the spherical waves above producing quantum entanglement and translating space by 90 degrees. 180+180 could also equal 180 – represented in physics by both of the above spherical waves interacting to produce inversion (translation by 180 degrees) of space which permits the spaceship to enter hyperspace. Since a fuzzily spherical figure-8 Klein bottle is necessary to form (90+90) + (90+90), any spherical or fuzzily spherical thing in this fractal universe (subuniverse, galaxy, black hole, asteroid, subatomic particle, or anything made of either fermions or bosons) would be an example of altered or warped space-time and must include hyperspace in its composition.

From "New Physics Suggests Darwin'S Origin of Species is Incomplete, and that Godlike Humanity Will Emerge"(http://vixra.org/abs/1310.0170)

Amplituhedron

Nima Arkani-Hamed's amplituhedron is a multidimensional, geometric shape that dramatically simplifies calculations of particle interactions and challenges the notion that space and time are fundamental components of reality. The multidimensional amplituhedron is outside space-time, providing a possible way to imagine a non-spacetime world as fundamental to reality, and from which the space-time we know could emerge. The geometric shape can be thus be equated with a 5^{th}-dimensional hyperspace. And it can be equated with dark matter in this way - calculating time using imaginary numbers makes distinctions between time and space disappear. A negative 5^{th}-dimension is described by imaginary numbers and motions of its negative particles (dark matter) are time, since time can be calculated using imaginary numbers. Time cannot be considered in isolation. Physics thinks of it as in a union with space. So imaginary numbers eliminate distinctions between space-time and the 5^{th} dimension, permitting dark matter to exist as "ordinary" matter's scaffold.

The amplituhedron assumption that space-time leads to mathematical inconsistencies could be revised through the picture of space-time which embraces "digital string theory". Digital strings say the physical universe is founded on an infinite connection of transcendentals and irrationals, making space infinite (and its partner in the space-time union is automatically eternal). In a literally infinite universe, retaining the infinite values renormalization seeks to cancel might point the way to deeper understanding of the cosmos.

Causal Sets

For the info below on Causal Sets and Holography, I thank Zeeya Merali and her article "Theoretical physics**:** The origins of space and time" ("Nature" 500, 516–519 - 28 August 2013).

"Pioneered by Rafael Sorkin, a physicist at the Perimeter Institute in Waterloo,

Canada, the theory (causal sets) postulates that the building blocks of space-time are simple mathematical points that are connected by links, with each link pointing from past to future." This entry in fqxi's contest agrees that space-time's building blocks are mathematical (base-2 maths' binary digits of 1 and 0). Though the digits are programmed into Mobius loops in hyperspace, they form the physical universe and also, the distinction between space-time and the 5th dimension is meaningless. As Stephen Hawking writes ("A Brief History of Time", p.139), "Which is real, 'real' or 'imaginary' time? It is simply a matter of which is the more useful description." Earlier in that paragraph, he says, "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 …"

Back to Zeeya's "origins of space and time" – "In the late 1980s, Sorkin used this framework to estimate the number of points that the observable Universe should contain, and reasoned that they should give rise to a small intrinsic energy that causes the Universe to accelerate its expansion. A few years later, the discovery of dark energy confirmed his guess." This impresses me, but the part about "each link pointing from past to future" doesn't agree with my conviction that the future can influence the past, and that humanity was born from time travel to the past coupled with biotechnology existing centuries from 2014 ("Retrocausal" Sets exist too).

Holography

"Imagine waking up one day and realizing that you actually live inside a computer game," says Mark Van Raamsdonk, a physicist at the University of British Columbia in Vancouver, Canada. If it is true, he says, "everything around us — the whole three-dimensional physical world — is an illusion born from information encoded elsewhere, on a two-dimensional chip". That would make our Universe, with its three spatial dimensions, a kind of hologram, projected from a substrate that exists only in lower dimensions."

My entry's emphasis on binary digits is consistent with this computer-game scenario. If we only accept that time goes in a straight line from past to future, believing this scenario leaves us and the universe at the whims of some god. But Einstein informs us that time is warped and curved - so besides the past affecting the future, the future can affect the past (and both times affect the present). If his Unified Field can be accepted, this god is not separate from humanity … and we are the designers of our own computer game. The universe, and other worlds, are therefore "user friendly" to us. The information encoding our universe can't be on a computer chip in my opinion – it originates in hyperspace (it also originates in space-time with the relatively primitive electronics of 20th and 21st century Earth). Nor can the information exist "only in lower dimensions" if hyperspace has 5 dimensions (4 of space, 1 of time).

Overcoming Instability in Extra Dimensions

Speaking of space dimensions and gravity, Stephen Hawking's and Leonard Mlodinow's book "The Grand Design" (Bantam Press 2010) says on pp. 160-161 - "In any but three dimensions even a small disturbance, such as that produced by the pull of the other planets, would send a planet off its circular orbit and cause it to spiral either into or away from the sun …"

This notion of instability is based on the assumption that gravity is purely attractive. However, the essay above (the "body") attempts to make it clear that gravity repels. Einstein showed that attraction of two bodies of matter actually results from space-time's curvature pushing bodies.

There is a powerful statement in mathematical topology known as the fixed-point theorem, which was proved before World War 1 by the Dutch mathematician Luitzen Egbertus van Brouwer. It states that when a surface* is subjected to certain forms of continuous distortion, at least one point of the surface will remain fixed, or stationary. Such a stationary point is consistent with gravity pushing equally on a planet from every direction, causing the entire planet to maintain its orbit and not spiral into, or away from, its star. A large force from one direction acting over a short timespan, or a tiny gravitational disruption over eons, is necessary to change the orbit.

* Picture spacetime existing on the surface of the figure-8 Klein bottles (described above as subuniverses, and as similar to doughnuts). The Poincare conjecture has implications for the universe's shape and says you cannot transform a doughnut shape into a sphere without ripping it. One interpretation follows: This can be viewed as subuniverses shaped like Figure-8 Klein Bottles gaining rips called wormholes when extended into the spherical spacetime that goes on forever (forming one infinite superuniverse which is often called the multiverse when subuniverses - which share the same set of physics' laws - are incorrectly called parallel universes which are wrongly claimed to each possess different laws). These rips (cosmic wormholes) provide shortcuts between points in space and time – and belong in a 5^{th}-dimensional hyperspace. The boundary where subuniverses meet might be a Cosmic String (they'd be analogous to cracks that form when water freezes into ice i.e. cosmic strings would form as subuniverses cool from their respective Big Bangs and would move as subuniverses expand).

Back to "Connecting Bioscience, Atoms, Gravitation, Black Holes, and Strings"

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)."

Recalling the "if space comes from bits" sentence from two paragraphs ago, black holes may be thought of as meeting-places and "sinks" for the gravitational currents flowing in and between galaxies. Though they aren't composed of matter, they do have mass because they are "gravity sinks" and gravity is capable of producing matter and mass. In black holes, the mass falling into them is relativistically converted into the energy of binary digits i.e. the bosons stop interacting in wave packets to produce the forces we identify as mass, and the bosons – which are ultimately composed of the binary digits depicting pi, e, $\sqrt{2}$ etc. (see "Digital String Theory") – register as 1's and 0's. They possess charge because the universe's mathematical foundation unites gravity/spacetime with electricity/magnetism (see the paragraph about Digital String Theory). Since it has mass, a black hole can naturally possess the 3rd property of holes viz. spin. Far from the hole becoming infinitely dense and infinitely massive, there is no singularity but the matter is "shred" into binary digits by the black hole's fantastic pressure.
