

Humans And Their Universes

Or

Science Out Of The Straitjacket: Rethinking General Relativity, $E=mc^2$... and String Theory

I saw a video ("Hidden Dimensions: Exploring Hyperspace" - <http://www.worldsciencefestival.com/hidden-dimensions>) in which it was stated that mathematicians are free to imagine anything while physicists work in a very different environment constrained by experiment, and that the American physicist Richard Feynman (1918-1988) said scientists work in a straitjacket. Well, Albert Einstein (1879-1955) said "Imagination is more important than knowledge" so let's see what happens when we throw away everyday tradition and conformity, let our imaginations fly (while trying to stay grounded in science and technology), and thus release science from its straitjacket!

This little book has its beginnings in cellular automata (in mathematics and computer science, collections of cells on a grid that evolve through a number of discrete time steps according to a set of rules based on the states of neighbouring cells) and grew into a belief that the universe (electromagnetism, gravitation, space-time and, as we'll see, 5th dimensional hyperspace) is not analog in nature but has a digital (electronic) foundation. This belief can be supported by 11 steps that begin with an experiment in electrical engineering at Yale University in the USA. These steps logically lead to assertions of instant intergalactic travel, time travel into the past as well as the future (neither of which can be altered), of unification of the large-scale universe with small-scale quantum particles, that the universe is a computer-generated hologram, that everyone who ever lived can have eternal life and health, that motion is an illusion caused by the rapid display of digitally generated "frames", that the entire universe is contained in (or unified with) every one of its particles, that the terms "computer-generated" and "computer" do not necessarily refer to an actual machine sending out binary digits or qubits, that we only possess a small degree of free will, that humanity could have created our universe and ourselves though unification physics says a being called God must nevertheless exist and likewise be Creator, and that Einstein's **$E=mc^2$** equation could be modified for the 21st century, reflecting the digital nature of reality. Though these things may be unbelievable in 2011, we should not ignore the possibilities of their being true or of their showing that reality is indeed digital because they are the logical product of already demonstrated electrical engineering and trips into space, science is investigating time travel and unification, the notion of motion has been suspect to some ever since the ancient Greek philosopher Zeno of Elea (490?-420? B.C.) argued that motion is absurd, and many religions worldwide speak of God and have some concept of survival of bodily death.

1) In July 2009, electrical engineer Hong Tang and his team at Yale University in the USA demonstrated that, on silicon chip- and transistor- scales, light can attract and repel itself like electric charges/magnets (Discover magazine's "Top 100 Stories of 2009 #83: Like Magnets, Light Can Attract and Repel Itself" by Stephen Ornes, from the January-February 2010 special issue; published online December 21, 2009). This is the "optical force", a

phenomenon that theorists first predicted in 2005 (this time delay is rather confusing since James Clerk Maxwell showed that light is an electromagnetic disturbance approx. 140 years ago). In the event of the universe having an underlying electronic foundation (hopefully, my summary will make it clear that this must be so – also ... an electronic universe is a necessary precursor to scientific fulfilment of Star Trek's "magic" which becomes clear as these steps are read), it would be composed of "silicon chip- and transistor- scales" and the Optical Force would not be restricted to microscopic scales but could operate universally. Tang proposes that the optical force could be exploited in telecommunications. For example, switches based on the optical force could be used to speed up the routing of light signals in fibre-optic cables, and optical oscillators could improve cell phone signal processing.

2) If all forms of EM (electromagnetic) radiation can attract/repel, radio waves will also cause communication revolution e.g. with the Internet and mobile (cell) phones. I anticipate that there may be no more overexposure to ultraviolet or X-rays.

3) In agreement with the wave-particle duality of quantum mechanics, EM waves have particle-like properties (more noticeable at high frequencies) so cosmic rays (actually particles) are sometimes listed on the EM spectrum beyond its highest frequency of gamma rays.

4) If cosmic rays are made to repel, astronauts going to Mars or another star or galaxy would be safe from potentially deadly radiation.

5) And if all particles in the body can be made to attract or repel as necessary, doctors will have new ways of restoring patients to health.

6) From 1929 til his death in 1955, Einstein worked on his Unified Field Theory with the aim of uniting electromagnetism and gravitation. Future achievement of this means warps of space (gravity, according to General Relativity) between spaceships/stars could be attracted together, thereby eliminating distance. And "warp drive" would not only come to life in future science/technology ... it would be improved tremendously, almost beyond imagination. This reminds me of the 1994 proposal by Mexican physicist Miguel Alcubierre of a method of stretching space in a wave which would in theory cause the fabric of space ahead of a spacecraft to contract and the space behind it to expand. Therefore, the ship would be carried along in a warp bubble like a person being transported on an escalator, reaching its destination faster than a light beam restricted to travelling outside the warp bubble. There are no practical known methods to warp space – however, this extension of the Yale demonstration in electrical engineering may provide one.

7) Since Relativity says space and time can never exist separately, warps in space are actually warps in space-time. Eliminating distances in space also means "distances" between both future and past times are eliminated - and time travel becomes reality. This is foreseen by the Enterprise time-travelling back to 20th-century Earth in the 1986 movie "Star Trek IV: The Voyage Home" and by Star Trek's "subspace communications". Doing away with distances in space and time also opens the door to Star Trek-like teleportation. Teleportation wouldn't involve reproducing the original and there would be no need to destroy the original body – we would "simply" be here one moment, and there the next

(wherever and whenever our destination is).

8) Another step might be to think of "... the grand design of the universe, a single theory that explains everything" (words used by Stephen Hawking on the American version of Amazon, when promoting his latest book "The Grand Design") in a different way than physicists who are presently working on science's holy grail of unification. Recalling the manmade Genesis Planet in the 1982 movie "Star Trek II: The Wrath of Khan", we might anticipate that the future will actually see a manmade planet (literally forming a planet is merely an advancement of terraforming, where a planet is engineered to be Earth-like and habitable). We might even free our minds from all restrictions and imagine science and technology creating every planet in the universe. The universe's underlying electronic foundation (which makes our cosmos into a partially-complete unification, similar to 2 objects which appear billions of years or billions of light-years apart on a huge computer screen actually being unified by the strings of ones and zeros making up the computer code which is all in one small place) would make our cosmos into physics' holy grail of a complete unification if it enabled not only elimination of all distances in space and time, but also elimination of distance between (and including) the different sides of objects and particles. This last point requires the universe to not merely be a vast collection of the countless photons, electrons and other quantum particles within it; but to be a unified whole that has "particles" and "waves" built into its union of digital 1's and 0's (or its union of qubits – quantum binary digits). If we use the example of CGH (computer generated holography, which is reminiscent of the holographic simulation called the Holodeck in "Star Trek: The Next Generation"), these "particles" and "waves" would either be elements in a Touchable Hologram - demonstrated by Japanese researchers in August 2009 (search for "Touchable Holography" in Google or You Tube) - or elements produced by the interaction of electromagnetic and presently undiscovered gravitational waves, producing what we know as mass (in September 2008, renowned British astrophysicist Professor Stephen Hawking bet US\$100 that the Large Hadron Collider would not find the Higgs boson, a theoretical particle supposed to explain how other particles acquire mass) and forming what we know as space-time. Einstein predicted the existence of gravitational waves, and measurements on the Hulse-Taylor binary-star system resulted in Russell Hulse and Joe Taylor being awarded the Nobel Prize in Physics in 1993 for their work, which was the first indirect evidence for gravitational waves. The feedback of the past and future universes into the unified cosmos's electronic foundation would ensure that both past and future could not be altered. (I'm disagreeing with Einstein's view of weights [mass] causing indentations in a malleable "rubber sheet" called space-time, but the system I'm proposing can yield exactly the same measurements as his and I think Einstein would welcome the chance to consider a different interpretation.) (Our brains and minds are part of this unification too, which must mean extrasensory perception and telekinetic independence from technology are possible.)

9) Elimination of diseased matter and/or eliminating the distance in time between a patient and recovery from any adverse medical condition – even death – would also be a valuable way of restoring health. With time travel in an electronic universe, people who have long since died could have their minds downloaded into clones of their bodies - a modification of ideas published by robotics/artificial intelligence pioneer Hans Moravec, inventor/futurist Ray Kurzweil and others - allowing them to "recover" from death (establishing colonies

throughout space and time would prevent overpopulation). Or if the distance between recovery and a patient is reduced to zero before illness or accident occurs (we might call this “eVaccination” – electronic vaccination); prevention of any adverse medical condition, including that of a second death for those resurrected, can occur. Science's real-life conquering of all disease, and even death, would certainly make the technology employed by Leonard "Bones" McCoy, the Enterprise's doctor, appear non-futuristic and “resurrection to eternal life” reminds us of Jesus Christ.

If we think of the existence of the universe as frames in a movie, displaying the successive frames in an incredibly tiny and undetectable fraction of a second would produce what we call motion. This display requires computer power undreamt of today. Unification of the universe with each of the subatomic particles composing it (via its hyperspatial computer being united with every particle's hyperspace computer) allows not just a single program resulting in our visible universe's large-scale structures (galaxies, superclusters) but many programs that manifest as the many smaller-scale things made of quantum particles e.g. stars, planets, roses, people, atoms as well as temporally differentiated structures like other universes.

Another way of stating the previous sentence is: just as $E=mc^2$ means energy must contain particles e.g. electromagnetic energy is composed of photons, $E=m^1+0$ (see #12) means a computer in the universe's hyperspace which is projected onto space-time must also be contained in each particle's hyperspace and projected onto the immaterial particle's space-time i.e. the entire universe is contained in (or unified with) every one of its particles (and if strings exist, cosmic strings might too).

This reminds me of something - American astronomer Carl Sagan (1934-1996) wrote these lines for his award-winning television series and accompanying book, “Cosmos”:
“There is an idea – strange, haunting, evocative – one of the most exquisite conjectures in science or religion. It is entirely undemonstrated; it may never be proved. But it stirs the blood. There is, we are told, an infinite hierarchy of universes, so that an elementary particle, such as an electron, in our universe would, if penetrated, reveal itself to be an entire closed universe.” Well, this article doesn't support the idea of a hierarchy of universes. I believe there is one static megauniverse (one Cosmos) existing forever and made up of an infinite number of expanding subuniverses (more about this below). But I do believe – it stirs my blood! – in the “exquisite conjectures” of the universe (and the infinite Cosmos) behaving like an elementary particle, and of these two combining to form one unified field.

$E=m^1+0$ also means, since energy equals mass, that the terms “computer-generated” and “computer” do not necessarily refer to an actual machine sending out the binary digits of 1 and 0 but could refer to binary digits that are sent forth by “telekinetic independence from technology” (see #8). Such telekinetic independence from technology wouldn't even require conscious knowledge of any programming language because all languages are already contained in, or unified with, your brain. In fact, all technology (even from the distant future) would already be contained in, or unified with, your unconscious and might be manifested when the subconscious becomes uninhibited during sleep. So the universe might literally be a dream – be careful what you dream about when you go to sleep tonight

or you might create the universe and yourself! Regarding roses and people, inanimate living ones look exactly the same as dead ones (even microscopically). The difference between those conditions would, according to this book, be that displaying slightly different frames from one fraction of a second to the next is life. Totally blocking a major cardiac artery may be incompatible with a beating heart, transmission of nerve signals, etc. and may produce death (not displaying slightly different frames from one fraction of a second to the next ... at least until decomposition begins).

You and I would not merely possess a rigidly preprogrammed life in the universal hologram, but would be capable of a degree of free will because the universe possesses a "randomness factor" – also called a "mutation factor". (In computer art, randomness is introduced into the chain of repetitive calculations producing a mountain range so a convincingly rugged image will result.) I'd like to suggest that Charles Darwin's evolution has far greater consequences than either he or any scientist has realized. I believe the theory is not limited to biology, but is absolutely fundamental to the very existence of our universe and everything in it i.e. to cosmology, space-time, physics, mathematics, etc. In a vital way, Darwin's ideas even go beyond Albert Einstein's ideas since these paragraphs conclude that a "mutation factor" (a "randomness factor") is fundamental to the universe.

10) These paragraphs imply the possibility of humans time-travelling to the distant past and using electronics to create this particular subuniverse's computer-generated Big Bang (but there's still room for God because God would be a pantheistic union of the megauniverse's material **and mental** parts, forming a union with humans in a cosmic unification). We've seen several examples of how science fact could equal, or surpass, science fiction. A final example of surpassing is that, in Star Trek, there are many military conflicts with Klingons, Romulans, the Borg, etc. In a real-life cosmic unification, there are no wars between the stars but peace is normal - even on Earth - since nobody can attack anyone in any way without knowing they're attacking themselves. The realisation that every person is contained in, or unified with, every other person would not only usher in worldwide peace but also paradise on Earth (via the global financial "crisis"). The worldwide economic crisis has the potential for many political benefits, since cooperation will be the only way to maintain and improve our living standard if monetary systems fail. The crisis would encourage domestic and international peace and sharing - perhaps even paradise on earth ...

The present global financial crisis may indicate that the world we live in today has lost stability and is on the brink of changing. Therefore, this "crisis" might be necessary to awaken us to the potential of tomorrow. Just because money has been making the world go round for thousands of years doesn't mean money will be the way of the world forever. We should start looking for an alternative system to preserve, and increase, standards of living now in case we need it tomorrow (I imagine politicians are the ones with the resources and organizational ability needed to implement such a system). This scheme should not use any form of monetary organisation nor be based on gold, silver etc. It should, idealistic and naive as it appears at first, be based on mutual cooperation and the goal of ushering in a paradise on earth. We can say there can never be paradise on earth; but the human instinct to survive is much stronger than our tendency for other types of self-interest, and greed, and to not cooperate with each other. If money ceases to be an

option; most people will gladly cooperate with those we would have previously regarded as competition, or even as an enemy, if it's the only way to maintain and improve our living standard.

11) $E=m^{1+0}$ IS $E=mc^2$ FOR THE 21ST CENTURY

Does the simple modification of $E=mc^2$ ($E=mc^2$) to $E=m^{1+0}$ ($E=m^{1+0}$) extend Albert Einstein's genius, which he claimed was not genius but intense curiosity and imagination, infinitely beyond the 20th century?

Removing $E=mc^2$ from both equations means c^2 (to be precise, $c^2 = m^{1+0}$)

Multiplying each side by base n (any number) gives us

$$nc^2 = n^{1+0} \text{ i.e. } nc^2 = n$$

Dividing both sides by n gives $c^2 = 1$, therefore c also equals 1

Tradition says c is the speed of light. If c has the same value as c^2 then the velocity of light in a vacuum must be a universal constant and since it cannot change, space-time has to warp: producing things like gravity, gravitational lenses, black holes and time travel.

Solving $E=mc^2$ for mass (m) results in $m=E/c^2$

Since $c^2 = m^{1+0}$

$$m = E/m^{1+0}$$

Multiplying each part of each element by base n : $nm = nE/n^{1+0}$

$$nm = nE/n$$

$$m = E/1 = E$$

Therefore, the mass of the expanding universe can be thought of as pure energy.

If we interpret $m=E$ ($1m=1E$) as meaning all the mass and energy in the universe forms a unit, we won't be able to think of any of the masses and energies composing the universe as separate. Every planet, star, magnet, beam of light, etc. would be part of a unification comparable to a hologram (but a very special hologram, including all forms of electromagnetism as well as gravitational waves which give objects mass. In September 2008, renowned British astrophysicist Professor Stephen Hawking bet US\$100 that the Large Hadron Collider would not find the Higgs boson, a theoretical particle supposed to explain how other particles acquire mass. Einstein predicted the existence of gravitational waves, and measurements on the Hulse-Taylor binary-star system resulted in Russell Hulse and Joe Taylor being awarded the Nobel Prize in Physics in 1993 for their work, which was the first indirect evidence for gravitational waves).

The seeming fact that particles can communicate instantly over billions of light years (are entangled - a process that appears to have operated in the entire universe forever) also seems to support the holographic principle and makes these lines relevant - another effect of the universe being a unification having zero separation is that experiments in quantum mechanics would show that subatomic particles instantly share information even if physically separated by many light years (experiments conducted since the 1980s repeatedly confirm this strange finding). This is explicable as 2 objects or particles only

appearing to be 2 things in an objective, “out there” universe (Austrian physicist Wolfgang Pauli’s exclusion principle – which was discovered in 1925 and says 2 matter particles cannot have both the same position and the same velocity – only applies in an objective universe and therefore allows past and future versions of the universe to exist simultaneously with the present one ... though programming in the “cosmic computer” does include it as applicable to the reality we perceive since that appears objective). They’d actually be 1 thing in a unified, “everything is everywhere and everywhen” universe. If the universe is a hologram with each part containing information about the whole, the instant sharing of information over many light-years loses its mystery.

On p. 179 of “The Grand Design” by Stephen Hawking and Leonard Mlodinow (Bantam Press, 2010) it’s stated

“One requirement any law of nature must satisfy is that it dictates that the energy of an isolated body surrounded by empty space is positive ...”
and “... if the energy of an isolated body were negative ... there would be no reason that bodies could not appear anywhere and everywhere.”

The only problem with those sentences, in an “everything is everywhere and everywhen” universe, is the word isolated. There can be no such thing as isolated in our cosmic-quantum unification. Does this mean you and I (plus all things in time and space) are a union of both positive and negative energy, able to display both separateness/solidity (isolation) as well as the potential to appear anywhere and everywhere?

Page 179 also says “(the positive energy of a body) means that one has to do work to assemble the body.” Does this mean the positive component of the Cosmic-Quantum Union refers to an actual computer performing work by sending out the binary digits of 1 and 0 (in hyperspace) while its negative component refers to the universe being like a dream, and to binary digits that are transmitted by “telekinetic independence from technology” (see the end of #9). In 1928 English physicist Paul Dirac (1902-84) proposed that all negative energy states are already occupied by (then) hypothetical antiparticles (particles of antimatter) – “Workings of the Universe”, a book in the series “Voyage Through The Universe”, by Time-Life Books 1992. This has ramifications for the subatomic particles called mesons which bind protons and neutrons together to form the atomic nucleus, in much the same way that gluons are said to bind together quarks which are said to be the constituents of protons and neutrons. Mesons are always composed of a quark-antiquark pair i.e. of a positive energy-negative energy pair. So when we’re dreaming and our brains are using negative energy, they’re not merely using a much lower degree of positive energy to do work but the antiparticles in them are receiving greater expression, allowing us to do work literally effortlessly and to accomplish feats, like appearing “anywhere and everywhere”, that would be thought of as miracles while we’re awake.

Perhaps it also solves the “computer paradox” at the finish of my article by telling us how there could be more than one hyperspatial computer – there would only be one since it’s a union of those in each instant of the universe’s time periods (possibly, at a minimum, 10^{500}) with those in the hyperspace of each of the universe’s subatomic particles. Different hyperspace computers could be formed in each subuniverse by dreamlike independence from technology.

Page 180 of "The Grand Design" says "Because gravity is attractive, gravitational energy is negative." Since there was no gravitation in our universe prior to the Big Bang (we didn't even have a universe), this sentence can be combined with the "backward causality" (effects influencing causes) promoted by Yakir Aharonov, John Cramer and others to explain that gravity's negative energy gives us no reason to think that bodies could not appear anywhere and everywhere – as Professors Hawking and Mlodinow put it "Bodies such as stars or black holes* cannot just appear out of nothing. But a whole universe can." Maybe it's only playing with words, but I'd regard gravity as repulsive instead of attractive (its energy would then be positive like matter's and the universe could be more than a vast collection of the countless photons, electrons and other quantum particles within it; it could, as #8 proposes, be a unified whole that has particles and waves built into its union of digital 1's and 0's (or its union of qubits – quantum binary digits). And the article "Gravitation" by Robert F. Paton in World Book Encyclopedia 1967 agrees that gravity is repulsive – "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 curvature of space time around the earth forces the objects to take the direction on toward the earth. The objects are pushed toward the earth by the gravitational field rather than pulled by the earth." Repelling gravity would cause the universe to expand – as astronomer Edwin Hubble (1889-1953) confirmed in 1929 – and adding repelling gravity by continual "creation" (actually, recycling) of matter via the small amount from a preceding universe which is used to initiate expansion of its successor (or by dreaming and our brains using negative energy and antiparticles in them to do work effortlessly and to accomplish feats that would be thought of as miracles while we're awake) would cause it to expand at an accelerated rate – this acceleration was discovered in 1998 by observations carried out by the High-z Supernova Search Team and the Supernova Cosmology Project, has been confirmed several times and is claimed to be caused by mysterious "dark energy".

* On the subject of black holes, I'd like to write a couple of paragraphs showing how zero separation can physically link sunspots and black holes (regions of space that can be formed by collapse of massive stars and have such a powerful gravitational field that nothing inside the event horizon or boundary, including light and other radiation, can escape), making comparison of the two by no means a superficial one. Why do young stars form around a black hole when they should be torn apart? Compare the black hole to a sunspot. Sunspots form because the sun's equator rotates more quickly than its poles (25 days at the equator, 34 days at the poles). Being "frozen" into its gases, the magnetic field lines of the sun stretch, twist, are drawn out into loops and erupt through the sun's surface, forming sunspots. Since the intense magnetism of the spots prevents heat from rising to the surface and radiating into space, the Maunder Minimum of observations of extremely low sunspot activity from 1645 to 1715 (named after the solar astronomer Edward W. Maunder [1851-1928]) could actually be attributed to a period of intense sunspot activity. Why? Because a great number of sunspots would stop the

Earth receiving as much warmth from the Sun, and the Maunder Minimum coincided with the middle – and coldest part – of the Little Ice Age during which Europe and North America and perhaps much of the rest of the world saw glaciers advance and rivers freeze – even the Baltic Sea froze over, allowing sledge rides from Poland to Sweden with inns built along the way. It would be termed a period of minimum activity coz the sunspots would not have been visible. The distorted magnetic loops don't have to break through the sun's surface or photosphere but can remain within, forming a rotating vortex that concentrates field lines and can create intense, heat trapping magnetism (from recent observations by the satellite SOHO, the Solar and Heliospheric Observatory.)

When a black hole is rotating; it might also stretch, twist and loop its magnetic field lines. The lines may penetrate into the hole and be lost, but in the case of star formation they'd be drawn out beyond the hole's event horizon (boundary) and compress clouds of dust and gas into new suns (a supermassive black hole's magnetic field is so strong that it can focus particles into jets ejected far out into space so, provided the star is a safe distance from the black hole, it should be able to stop the hole's gravity from shredding a star and making its gases spiral inwards). To condense the paragraphs on zero separation into a few words, the 2 objects which appear distant from each other could be a sunspot and a black hole. On the subject of sunspots and the sun, the famous 17th-century scientist Sir Isaac Newton once said the entire universe would instantly feel the loss of the sun's gravity if our star disappeared suddenly – I think modern science doubts this but zero separation forces me to agree with him. And on the subject of black holes, a massive star truly can collapse and explode as a supernova while a gravitational singularity (the place all matter falling into the black hole gathers) would be produced from the collapsing core. What if that singularity is disintegrated by the fantastic pressure? It would become "BITS of space-time" (this book's proposed building blocks of all matter and spacetime that are the Binary digiTS – strings of ones and zeros – from which space and time emerge). In this way, nature would protect us from black holes (as Einstein believed it would) and eliminate their assumed and perplexing properties of infinite density, infinite gravity and infinite spacetime curvature.

(Demonstrating zero separation to be relevant to the universe astronomers study requires a bit of research to get the astronomical facts right, so thanks go to the May 2009 interview in "Discover" science magazine with professor of astronomy and physics Andrea Ghez; the 2006? TV documentary "The Sun"; Wikipedia, the free Internet encyclopedia; "The Sun", a 1989 volume in Time-Life's series "Voyage Through The Universe", Stephen Hawking's 1988 book "A Brief History of Time" and Patrick Moore's 1986 book "A-Z of Astronomy")

Light can attract and repel itself like electric charges and magnets (according to Discover magazine's "Top 100 Stories of 2009 #83: Like Magnets, Light Can Attract and Repel Itself" by Stephen Ornes, from the January-February 2010 special issue; published online December 21, 2009 - in July 2009, electrical engineer Hong Tang and his team at Yale University in the USA demonstrated that, on silicon chip- and transistor- scales, light can attract and repel itself like electric charges/magnets). Therefore, it must be true to say electrically charged particles and magnets can attract and repel like light (electric/magnetic attraction/repulsion would, similarly to light, occur only on microscopic scales if the universe did not have an electronic foundation in which it was composed of silicon chip- and transistor- scales: more will be said about this later). We have known for ages they attract/repel – but now we know they do it “like light”, can we extend this phenomenon from quantum mechanics’ wave-particle duality (in the case of electric charges and light) to universe-wide wave-particle duality (in the case of magnets and light)? If the magnets we can see and touch behave like light, is it not possible that every object in the universe (from a small magnet to an enormous planet or star) behaves like light – making the universe a hologram.

Since $m=E$, we can think of c as not merely representing the speed of light (energy) but as symbolic of mass and the speed of universal expansion (c =Hubble Constant or 299,792.458 kilometres per second = approx. 70 km/sec/megaparsec). What can it mean if c and c^2 both equal 1 in the context of cosmic holographic expansion? Answering this is impossible unless we look back at the work of Albert Einstein. That work leads to the conclusion - if c has the same value as c^2 then the velocity of light in a vacuum must be a universal constant and since it cannot change, space-time has to warp: producing things like gravity, gravitational lenses, black holes and time travel. Applied to cosmic holographic expansion, the conclusion is – if c has the same value as c^2 then expansion (whether positive, zero or negative) obviously always exists and space-time’s warping produces the weird phenomena modern science proposes, like higher dimensions and hyperspace and time travel and parallel universes. Let’s see where things lead if we assume c and c^2 both equalling 1 means that the future universe, whose rate of expansion is the square of today’s, is existing at the same time as today’s – and if we think of present expansion as c^2 , that the present universe whose rate of expansion is the square of one in the past is unified with the past one. For a start, such an assumption would be consistent with "dark energy" causing expansion to accelerate.

We can, of course, write that c^2 equals a number, any number ($c^2 = n$)

Then $c = \text{square root } n$ ($n^{1/2}$)

But $c = 1$

Therefore $n^{1/2} = 1$

$n = 1^2$

$n = 1$

$n = c$

and $1 = c^2$

$n = c^2$

Since c and c^2 both equal n , any past or future universe (whatever the rate of expansion, even if zero or negative) exists at the same time as ours. So a simple modification of Einstein's $E = mc^2$ to $E = m^{1+0}$ implies that our holographic universe is generated and supported by binary digits (1's and 0's). What line of thinking could justify such an apparent leap? The universe's underlying electronic foundation (which makes our cosmos into a partially-complete unification, similar to 2 objects which appear billions of years or billions of light-years apart on a huge computer screen actually being unified by the strings of ones and zeros making up the computer code which is all in one small place) would make our cosmos into physics' holy grail of a complete unification if it enabled not only elimination of all distances in space and time, but also elimination of distance between (and including) the different sides of objects and particles. This last point requires the universe to not merely be a vast collection of the countless photons, electrons and other quantum particles within it; but to be a unified whole that has "particles" and "waves" built into its union of digital 1's and 0's (or its union of qubits – quantum binary digits). The feedback of the past and future universes into the unified cosmos's electronic foundation would ensure that both past and future could not be altered.

Carl Sagan (who was an American astronomer, astrophysicist, cosmologist and author) said there is "... *no* centre to the expansion, no point of origin of the Big Bang, at least not in ordinary three-dimensional space." (p. 27 of "Pale Blue Dot" - Headline Book Publishing, 1995). Does this mean the Big Bang (or for our purposes, the binary 1's and 0's) would exist outside space-time in what we might call 5th dimensional hyperspace? The revised equation also says this universe is a unification, permitting time travel into both past and future (because any past or future universe exists at the same time as ours – a twist on the concept of parallel universes). Repeated experimental verification of Einstein's Relativity theory confirms its statement that space and time can never exist separately but form what is known as space-time. So space, like time, must also be a unification whose separation can be reduced to zero. This suggests that intergalactic travel might oneday be completed extremely rapidly.

From 1929 til his death in 1955, Einstein worked on his Unified Field Theory with the aim of uniting electromagnetism and gravitation. Future achievement of this means warps of space (gravity, according to General Relativity) between spaceships/stars could be attracted together, thereby eliminating distance. And "warp drive" would not only come to life in future science/technology ... it would be improved tremendously, almost beyond imagination. This reminds me of the 1994 proposal by Mexican physicist Miguel Alcubierre of a method of stretching space in a wave which would in theory cause the fabric of space ahead of a spacecraft to contract and the space behind it to expand. Therefore, the ship would be carried along in a warp bubble like a person being transported on an escalator, reaching its destination faster than a light beam restricted to travelling outside the warp bubble. There are no practical known methods to warp space – however, this extension of the Yale demonstration in electrical engineering may provide one.

Let's return to Relativity's statement that space and time can never exist separately,

therefore warps in space are actually warps in space-time: Eliminating distances in space also means “distances” between both future and past times are eliminated - and time travel becomes reality. Can anything more specific about the mechanics of time travel be stated here? If we get into a spaceship and eliminate the distance between us and a planet 700 light-years away, it'll not only be possible to arrive at the planet instantly but we'll instantly be transported 700 years into the future. On page 247 of "Physics of the Impossible" by physicist Michio Kaku (Penguin Books - 2009), it's stated "astronomers today believe that the total spin of the universe is zero". This is bad news for mathematician Kurt Godel, who in 1949 found from Einstein's equations that a spinning universe would be a time machine (p. 223 of "Physics of the Impossible"). Professor Hawking informs us that “all particles in the universe have a property called spin which is related to, but not identical with, the everyday concept of spin” (science is mystified by quantum spin which has mathematical similarities to familiar spin but it does not mean that particles actually rotate like little tops). Everyday spin might be identical to Godel's hoped-for spinning universe. If the universe is a Mobius loop (a Mobius loop can be visualised as a strip of paper which is given a half-twist of 180 degrees before its ends are joined), the twisted nature of a Mobius strip or loop plus the fact that you have to travel around it twice to arrive at your starting point might substitute for the lack of overall spin. Then the cosmos could still function as a time machine. We've seen how it permits travel into the future. We can journey further and further into the future by going farther and farther around the Mobius Universe. We might travel many billions of years ahead - but when we've travelled around M.U. exactly twice, we'll find ourselves back at our start i.e. we were billions of years in the future ... relative to that, we're now billions of years in the past.

And according to Michio Kaku on p. 316 of "Physics of the Impossible" - Penguin Books, 2009 - "... the inverse-square law (of famous English scientist Isaac Newton [1642-1727]) says that the force between two particles is infinite if the distance of separation goes to zero". Space-time's being a unification whose separation can be reduced to zero also suggests the existence of an infinitely powerful, and infinitely intelligent (since those particles could be brain particles), God. Since the distance of separation is zero, the universe must be unified with each of its constituent subatomic particles and those particles must follow the rules of fractal geometry being similarly composed of space and time and hyperspace. Unification of the cosmos with its particles is an insurmountable challenge to our bodily senses and their extensions, scientific instruments – as is existence of zero separation between us and a star's gravity, heat etc. If we could see the universe exclusively with our minds, we'd see that these insurmountable challenges are indeed possible if we live in a non-materialistic holographic universe (combining gravitational with electromagnetic waves) controlled by the magic of computers.

Some people will criticise my mathematical approach. They'll say my article is invalidated by my selective use of the equations which, they'll contend, are too simple to convey anything of importance. But if you want to say something like “The sky is blue”, you need enough intelligence to mentally sort through an entire dictionary in a tiny fraction of a second and select the 4 little words that express what you know. This article is not wild speculation – it is a jigsaw ... combining a recent demonstration in electrical engineering at Yale University, Professor Ed Fredkin's belief that the universe is a computer, Professor

David Bohm's belief that the universe is a hologram, Professor Stephen Hawking's lack of belief in the existence of the Higgs boson, the Large Hadron Collider, the work of Nobel Laureates Russell Hulse and Joe Taylor for their discovery of the first indirect evidence for gravitational waves, the work of Yakir Aharonov and John Cramer and John Dobson and Neil Turok and Paul Steinhardt, the discovery of dark energy, Carl Sagan's statement that there is no point of origin of the Big Bang, Miguel Alcubierre's "warp drive", modern science's popularising science in books for the public as well as its openness to higher dimensions and hyperspace and time travel and parallel universes, Isaac Newton's religious belief, Benoit Mandelbrot's fractal geometry, Edwin Hubble's discovery of universal expansion, mathematician Kurt Godel who tried to use Einstein's equations to turn the universe into a time machine, and Albert Einstein's Theories of Special and General Relativity.

Perhaps the atheists among my readers are thinking it can't be denied that these paragraphs imply the possibility of humans from the distant future time-travelling to the distant past and using electronics to create this particular subuniverse's computer-generated Big Bang. Maybe any limits on trips to the future or past (e.g. travelling backwards beyond our starting point and into the past) are overcome by travelling to other universes and linking their "eliminated distances" to those in this universe. This linkage requires all laws of physics etc. to be identical everywhere. In a so-called multiverse consisting of parallel universes where things have the potential to be slightly different in each universe, the link could be broken because we might find ourselves trying to force a square peg into a round hole.

An accomplishment such as this (humans creating the universe) would be the supreme example of "backward causality" (effects influencing causes) promoted by Yakir Aharonov, John Cramer and others. However, recalling Isaac Newton's inverse-square law and what it says about the force between two particles being infinite if the distance of separation goes to zero means there's still room for God because God would be a pantheistic union of the megauniverse's material **and mental** parts, forming a union with humans in a cosmic unification. Subuniverse? Megauniverse? What am I talking about?

A megauniverse is hinted at by Einstein's equations as well as cosmology's Steady-State theory, which say the universe has always existed and will continue forever. Einstein spoke of a "static" universe (which accurately describes a megauniverse that has no limits in space and has always existed/will continue forever), but he thought of this local branch as static, and rightly called it his greatest mistake since the local universe (our subuniverse) is now known to have had a beginning and to be expanding. Each subuniverse and its region of space-time is created from a big bang, but the megauniverse they belong to has no beginning and no end. And it maintains its average density through continuous "creation" (actually, recycling) of matter via the small amount from a preceding universe which is used to initiate expansion of its successor. This steady-state, or static, megauniverse would have its tendency to collapse (from, according to the viewpoint that only one time exists at any instant, ever-increasing gravitational attraction) always exactly balanced by, again from the viewpoint that all times cannot exist at once, the ever-increasing expansion of the universes it contains. The notion that contained universes that

are forever expanding would somehow "burst" a static, steady-state megauniverse mistakenly assumes the megauniverse possesses a finite size; and it also reverts to our everyday experience that only one time exists at any instant (forgetting that all times exist and the megauniverse therefore accommodates not just some, but all, extents of expansion). Expanding subuniverses reminds me of the claim by cosmologists Paul J. Steinhardt and Neil Turok that the Big Bang which created our universe was triggered by a collision between our cosmic brane (or membrane) and a neighbouring one. The only essential difference between our hypotheses is that I believe collisions between neighbouring universes are the result, not the cause, of big bangs. We can regard the cosmic hologram and the megauniverse as examples of invariance (the quality of not changing) and the hologram's relativistic property of appearing different from differing vantage points as represented by the expanding universes with their big bangs.

Essay - "From the View of Physics, What Could a Gene Possibly Be?"

Part 1 - To understand what genes are truly capable of, we'll first have to fulfill Einstein's dream and describe the universe as a Unified Field.

Like Dr. Michio Kaku in the book "Physics of the Impossible", I believe that time travel is possible but unlike him, I don't believe in parallel universes. I hope to show that the combination of belief in time travel/disbelief in parallel universes validates string theory's faith in unification. And unlike the Doctor, who says on page 283 that "It would set off a major shake-up in the very foundations of modern physics if precognition was ever proved in reproducible experiments", I believe the unification born from time travel/no parallel universes will one day be seen to be not merely mathematical but a literal unification of the mind with all space-time**, making the non-existence of precognition impossible.

** The line "I believe the unification born from time travel/no parallel universes will one day be seen to be not merely mathematical but a literal unification of the mind with all space-time" has no intention of denying the value of mathematics in this world. Mathematics is central to my theory (which is certainly very different but that doesn't make it crazy - as Albert Einstein said, a theory that doesn't sound absurd at first doesn't stand a chance). The intent is to suggest that the underlying foundation of this universe (and the maths used to describe and manipulate it) is in the form of the binary mathematics of 1's and 0's.

These comments are based on scientific facts and theories which, woven into a consistent philosophy using Albert Einstein's famous quote that "Imagination is more important than knowledge", show how every aspect of the world can be radically transformed forever. It starts with a proposed new view of ultimate reality which grew from 30 years of study into physics' belief in universal unification as well as experiments in quantum mechanics which show that subatomic particles instantly share information even if physically separated by billions of light years. The conclusion is that there is absolutely no solidity or separation, as

commonly understood, between any physical or nonphysical entities on Earth, in space or in time. This interesting, but not very relevant to daily routine in 2010, conclusion led to the realization that the world might be on the brink of revolutionary breakthrough in all areas of life: any and all objects which appear distant from each other are not actually separated at all. This is similar to 2 objects which appear distant from each other on a huge computer screen actually being unified by the strings of ones and zeros making up the computer code which is all in one small place (this appears, based on Einstein's equations, to be a 5th dimension - hopefully, Europe's Large Hadron Collider will verify the 5th dimension's existence). In a universal zero-separation unification; the feedback of matter, energy and force into matter, energy and force is also likely to produce distortions and corrections. Instead of microphones' high-pitched screeches or control of missiles' trajectories, we could see blurring/smearing/indeterminacy in positions and velocities on all scales (subatomic, human, galactic) because, in a unification, effects cannot avoid influencing causes and because the universe consists of fractals (phenomena repeated at all magnifications, from the tiniest to the grandest). The 2 objects which appear distant from each other could be a star (along with its gravity and heat) and this world – or the genes in any two cells; or 2 atoms of thymine, cytosine or any other base in different millennia; or the opposite sides of a subatomic particle within an atom of a base.

All this sounds totally strange because separation between things seems obvious and, according to science, the quantum scale of atoms obeys different rules from the classical scale of humans and galaxies (if science is correct about this, the quantum and classical can never be unified in a literal sense). But remember that this article is based on grand ideas of Unification that began with Einstein and are best known today from Superstring Theory, as well as being based on experiments in quantum mechanics which have been confirmed time and time again. If the hypotheses in this article, though necessarily extremely incomplete, offer even the briefest glimpse of the true nature of unification and quantum mechanics; then it follows that the article is correct when it says everything will change and nothing can ever be the same. Science will be different, medicine and surgery will be different, religion will be different ... and genes will not only help our bodies to function but will be revealers of the universe and all time!

Essential to such a future is the idea of the great English writer William Shakespeare not merely being poetic or entertaining when he said in his play "Hamlet",
"There are more things in heaven and earth, Horatio,
Than are dreamt of in your philosophy."

A good illustration of the journey into these limitless miracles and magical experiences of the science that will create a new earth and a new universe is this line from the 1968 song "Master Jack" (by the South African band 4 Jacks and a Jill),
"It's a strange, strange world we live in".

Now for a section about time travel -

Particles and the universe can be regarded as closed loops of electromagnetic energy. These could be called strings or superstrings or Mobius loops * (a Mobius loop can be visualised as a strip of paper which is given a half-twist of 180 degrees before its ends are joined). Remember that the top, side and bottom of each loop each consist of a miniaturised, fractal version of electromagnetic pulses forming length, width and depth (a fractal is a geometric structure having an irregular or fragmented appearance which is of a similar character at all magnifications - the word "fractal" was coined in 1975 by French mathematician Benoit Mandelbrot). The 3 familiar dimensions of length, width and height along, for example, the top of a loop would have a 4th dimension (time) perpendicular to them (on the side of the twisted paper ... or electromagnetic loop). And there would also exist a 5th dimension called hyperspace, at right angles to the 4th and 180 degrees from the length/width/height along the loop's top. The previous parts of this paragraph can be likened to astronomy's picture of the 3+1 dimensions of space-time existing on the surface of a balloon which is expanding from an inner hyperspatial point (not in space-time) where the Big Bang occurred. These loops unite space and time into Einstein's space-time; and the famous scientist Stephen Hawking says time can be thought of as another dimension, so literal time travel is a possibility. With literal time travel, people who have long since died could have their minds downloaded into reproductions of their bodies (establishing colonies throughout space and time would prevent overpopulation). Remember that a paper Mobius, like particles and the universe, is flexible - it can resemble a triangular, circular or square shape at various times; and its side and bottom may or may not be precisely 90 and 180 degrees from its top. Thus the electronic computations necessary in a time machine may not involve precise digital calculations but those of "fuzzy" neural networks.

* Why can particles and the universe be considered as Mobius loops? The 1st reason this seems possible is - all particles in the universe have a property called spin which is related to, but not identical with, the everyday concept of spin. In the case of particles of matter, according to the book "A Brief History of Time" by mathematician and physicist Stephen Hawking, this spin is said to have a fractional value of $1/2$ which means they "do not look the same if one turns them through just one (complete) revolution: you have to turn them through two complete revolutions!" Similarly, you have to travel around a Mobius strip or loop twice to arrive at your starting point. The 2nd reason it seems possible is - the concept of "dark matter" would be used today to explain the increased gravitational effects caused by undetectable matter. But that undetectable matter would not be a new, unknown form of matter - it would be known particles travelling through the 4th and 5th dimensions (and therefore nonexistent in the 3 dimensions of ordinary space). While in these other dimensions, the particles known as dark matter are invisible ... but would of course still exert gravitational influence. (Physics' string theory states this by saying "Gravity may not be confined to 3 dimensions.")

Since the universe is a unification possessing zero separation; every bit of its matter, energy and force would feed back into the computer network that is the underlying foundation of our universe and, even as the computer directs the matter/energy/forces in the universe, be simultaneously directing it, ensuring that history and the future could never be changed. Another effect of the universe being a unification having zero

separation is that experiments in quantum mechanics would show that subatomic particles instantly share information even if physically separated by many light years (experiments conducted since the 1980s repeatedly confirm this strange finding). This is explicable as 2 objects or particles only appearing to be 2 things in an objective, "out there" universe. They'd actually be 1 thing in a unified, "everything is everywhere and everywhen" universe. If the universe is a hologram with each part containing information about the whole, the instant sharing of information over many light-years loses its mystery. And we'll see that time travellers from our future could return to the time of our Big Bang and make this a computer-generated hologram in which things appear distant from each other on a huge "screen" but are also unified by the strings of ones and zeros making up the computer code which is all in one small place. And objects in the universal hologram would not only include the screens of our computers, TVs and mobile phones but every physical and nonphysical part of the universal hologram would be a receptor for the downloading of data from the Quantum Supercomputer (in other words, a "screen" for invisibly displaying data).

In July 2009, electrical engineer Hong Tang and his team at Yale University in the USA demonstrated that, on silicon chip- and transistor- scales, light can attract and repel itself like electric charges/magnets (this is the "optical force", a phenomenon that theorists first predicted in 2005 {I find this "time delay" rather confusing since James Clerk Maxwell showed that light is an electromagnetic disturbance approx. 140 years ago}). In the event of the universe having an underlying electronic foundation, it would include "silicon chip- and transistor- scales" and the Optical Force would not be restricted to microscopic scales but could operate on a universal scale.

If all forms of electromagnetic radiation can attract/repel, radio waves will cause communication revolution e.g. with the Internet and mobile (cell) phones. I anticipate that there may be no more overexposure to X-rays or ultraviolet rays: we could call this the EM (ElectroMagnetic) or electronic approach to photo-protection ... or the first step towards development of eSunscreen and eSunglasses.

In agreement with the wave-particle duality of quantum mechanics, EM waves have particle-like properties (more noticeable at high frequencies) so cosmic rays (actually particles) are sometimes listed on the EM spectrum beyond its highest frequency of gamma rays.

If cosmic rays are made to repel, astronauts going to Mars or another star or galaxy would be safe from potentially deadly radiation.

And if all particles in the body can be made to attract or repel as necessary, doctors will have new ways of restoring patients to health.

From 1929 til his death in 1955, Einstein worked on his Unified Field Theory with the aim of uniting electromagnetism and gravitation. Future achievement of this means warps of space (gravity, according to General Relativity) between spaceships/stars could be attracted together, thereby eliminating distance.

Since Relativity says space and time can never exist separately, warps in space are actually warps in space-time. Eliminating distances in space also means "distances" between both future and past times are eliminated - and time travel becomes reality. So if we get into a spaceship and eliminate the distance between us and a planet 700 light-years away, it'll not only be possible to arrive at the planet instantly but we'll instantly be transported 700 years into the future. On page 247 of "Physics of the Impossible" by physicist Michio Kaku (Penguin Books - 2009), it's stated "astronomers today believe that the total spin of the universe is zero". This is bad news for mathematician Kurt Godel, who in 1949 found from Einstein's equations that a spinning universe would be a time machine (p. 223 of "Physics of the Impossible"). Professor Hawking informs us that "all particles in the universe have a property called spin which is related to, but not identical with, the everyday concept of spin" (science is mystified by quantum spin which has mathematical similarities to familiar spin but it does not mean that particles actually rotate like little tops). Everyday spin might be identical to Godel's hoped-for spinning universe. We've previously related the property of particles called spin to the Mobius loop and have seen how each part of the universe (each particle) contains information about the whole. If the universe is a Mobius loop, the twisted nature of a Mobius strip or loop plus the fact that you have to travel around it twice to arrive at your starting point might substitute for the lack of overall spin.

Then the cosmos could still function as a time machine. We've seen how it permits travel into the future. We can journey further and further into the future by going farther and farther around the Mobius Universe. We might travel many billions of years ahead - but when we've travelled around M.U. exactly twice, we'll find ourselves back at our start i.e. we were billions of years in the future ... relative to that, we're now billions of years in the past. Travelling through space in the MU (Mobius Universe) can not only be an instant affair but it can give instant access to any point in time or hyperspace because both the universe and the particles it consists of are, as suggested above, "fractal version(s) (... a geometric structure ... which is of a similar character at all magnifications ...) The 3 familiar dimensions of length, width and height along, for example, the top of a loop would have a 4th dimension (time) perpendicular to them (on the side of the twisted paper ... or electromagnetic loop). And there would also exist a 5th dimension called hyperspace, at right angles to the 4th and 180 degrees from the length/width/height along the loop's top." It seems appropriate now to address a question I've heard posed by Stephen Hawking, Michio Kaku and other scientists: Where are the tourists from our future who've journeyed into their past to check out our present? I can think of 3 possibilities - maybe they've used synthetic biology to develop ghostly, non-physical bodies ... if they're still physical, maybe they're "dark tourists" who resemble dark matter by remaining invisible yet are capable of exerting gravitational, or other, influence. Or an even more bizarre possibility ... it's possible that every person we see is ultimately from the future, though they'd be totally unaware of it. They'd be unconscious of their true place in this eternal universe since their job is to contribute, in whatever way they can, to development of the fantastic future awaiting everyone. They'd be less inclined to build the future if they had awareness of it already existing. Any limits on trips to the future or past might be overcome by travelling to other universes and linking their "eliminated distances" to those in this universe. This

linkage requires all laws of physics etc. to be identical everywhere. In a so-called multiverse consisting of parallel universes where things have the potential to be slightly different, the link could be broken because we might find ourselves trying to force a square peg into a round hole. Thus, my conviction in unlimited time travel compels me to use the term "megauniverse".

The universe's underlying electronic foundation would make our cosmos into a unification if it enabled not only elimination of all distances in space and time, but also elimination of distance between the different sides of objects and particles. This last point requires the universe to not merely be a vast collection of the countless photons, electrons and other quantum particles within it; but to be a unified whole that has particles and waves built into it, just as a computer-generated hologram (using gravity waves plus all forms of EM waves) would have seemingly separate points built into its union of digital zeros and ones (or its union of qubits – quantum binary digits). The feedback of the past and future universes into the unified cosmos's electronic foundation would ensure that both past and future could not be altered.

Our brains are part of this unification, too. So our minds have the potential to access information many billions of light years away, or billions of years in the past/in the future. They also possess the potential to manipulate things anywhere on Earth, in space or in time. Unbelievable as this sounds, it's only a natural outcome of the universe we live in and has nothing to do with science fiction.

Maxwell could never have imagined the possibilities outlined above. Even Einstein lived too long ago to get more than a glimpse of them. Will the rapid advances in today's world see these possibilities fulfilled in the lifetime of Hong Tang and his team (the engineers who demonstrated that beams of light can attract and repel each other)?

And now for a paragraph about parallel universes -

How could subatomic particles communicate instantaneously across the universe (phrased another way - how could they experience the whole universe in their existence)? The last two phenomena could be understood by stating that any particle has the same properties as the universe as a whole. Unconventional US cosmologist Max Tegmark says "You are made up of quantum particles, so if they can be in two places at once, so can you." We can say "The universe is made up of quantum particles, so if they can be in two places at once, so can the universe." There need not be any such thing as parallel universes, however (the parallel-universes, also called the many-universes or many-worlds, interpretation of quantum mechanics was developed by American physicist Hugh Everett III in 1957). The universe's being in two places simultaneously could mean it's in the same space-place as any or all of its particles. It could also be in the same time-place as any or all of its earlier or later selves because there can be no space without time. Jack Harris, an Applied Physicist at Yale University says quantum mechanics describes a crazy microscopic world where particles whiz around at blistering speeds and routinely violate

the classical laws of physics we take for granted. Jack Harris's goal is to take advantage of the "really strange, even mystical" laws of the microscopic and apply them to problems in our macroscopic world. "The ultimate eureka moment would be to suddenly realize that a [macroscopic] object is doing something that is absolutely forbidden by classical physics," he says. If we look closely at the universe by not restricting it to the classical physics which preceded the quantum principle, we can comprehend how the macroscopic universe could behave quantum mechanically and violate classical physics. It's easy to imagine all parts of the universe being in contact (and thus forming a unification) when that universe was the size of a subatomic particle, nearly 14 billion years ago. Since the universe still has the same properties as a particle (and particles obey quantum mechanics' wave-particle duality), it is still a unification (and a unified field). In 1980 or the late 1970s, American astronomer Carl Sagan (1934-1996) wrote these lines for his award-winning television series and accompanying book, "Cosmos": "There is an idea – strange, haunting, evocative – one of the most exquisite conjectures in science or religion. It is entirely undemonstrated; it may never be proved. But it stirs the blood. There is, we are told, an infinite hierarchy of universes, so that an elementary particle, such as an electron, in our universe would, if penetrated, reveal itself to be an entire closed universe." Well, this article doesn't support the idea of a hierarchy of universes. I believe there is one static megauniverse (one Cosmos) existing forever and made up of an infinite number of expanding subuniverses (more about this below). But I do believe – it stirs my blood! – in the "exquisite conjectures" of the universe (and the infinite Cosmos) behaving like an elementary particle, and of these two combining to form one unified field.

Part 2 - Now that you're convinced my article is not about genes at all, I'm going to introduce Charles Darwin, and I'll finally tell you what genes are truly capable of.

A megauniverse is hinted at by Einstein's equations as well as cosmology's Steady-State theory, which say the universe has always existed and will continue forever. Einstein spoke of a "static" universe (which accurately describes a megauniverse that has no limits in space and has always existed/will continue forever), but he thought of this local branch as static, and rightly called it his greatest mistake since the local universe is now known to have had a beginning and to be expanding. Each universe and its region of space-time is created from a big bang, but the megauniverse they belong to has no beginning and no end. And it maintains its average density through continuous "creation" (actually, recycling) of matter via the small amount from a preceding universe which is used to initiate expansion of its successor. This steady-state, or static, megauniverse would have its tendency to collapse (from, according to the viewpoint that only one time exists at any instant, ever-increasing gravitational attraction) always exactly balanced by, again from the viewpoint that all times cannot exist at once, the ever-increasing expansion of the universes it contains. The notion that contained universes that are forever expanding would somehow "burst" a static, steady-state megauniverse mistakenly assumes the megauniverse possesses a finite size; and it also reverts to our everyday experience that only one time exists at any instant (forgetting that all times exist and the megauniverse therefore accommodates not just some, but all, extents of expansion). Expanding subuniverses reminds me of the claim by Paul J. Steinhardt of Princeton University and Neil Turok of Cambridge University that the Big Bang which created our universe was

triggered by a collision between our cosmic brane (or membrane) and a neighboring one. The only essential difference between our hypotheses is that I believe collisions between neighbouring universes are the result, not the cause, of big bangs. We can regard the cosmic hologram (see ^ after next paragraph) and the megauniverse as examples of invariance (the quality of not changing) and the hologram's relativistic property of appearing different from differing vantage points as represented by the expanding universes with their big bangs.

Every bit of space/instant of time exists forever like an individual frame of a movie (when these are displayed in rapid succession, what we call motion comes into being) – therefore, things are happening when we visit any point in the past or future. Let's consider ordinary, visible light and that vacuum it travels through: space. Quantum particles like the photons which compose light are not separate from space itself. The universe would not merely be a vast collection of the countless photons, electrons and other quantum particles within it, but would be a unified whole that has particles and waves built into it, just as a computerised hologram^ would have seemingly separate points built into its union of digital zeros and ones. It's necessary to suggest how this unified whole could appear to us as an infinity of different and separate entities (not only in space but also in time). If light and space were unified in a digitised hologram, the apparent velocities of light and space's expansion would differ because light would be a subroutine embedded in the main space program (speaking of circulation, travel, expansion or velocity would simply be a convenience, like talking of the sun rising and setting).

^ The lasers generating this hologram would have to be combined with a "randomness factor" - which could also be referred to as a "mutation factor" - so you and I would not merely possess a rigidly preprogrammed life in the universal hologram, but would be capable of a degree of free will. (In computer art, randomness is introduced into the chain of repetitive calculations producing a mountain range so a convincingly rugged image will result.) I'd like to suggest that Charles Darwin's evolution has far greater consequences than either he or any scientist has realized. I believe the theory is not limited to biology, but is absolutely fundamental to the very existence of our universe and everything in it i.e. to cosmology, space-time, physics, mathematics, etc. In a vital way, Darwin's ideas even go beyond Albert Einstein's ideas since these paragraphs conclude that a "mutation factor" (a "randomness factor") is fundamental to the universe. Nothing was known of mutation in Darwin's day - he referred to "natural selection" when he published "On the Origin of Species" in 1859. But his ideas were expanded by later researchers such as Gregor Mendel - who discovered the laws of heredity and reported his experiments in 1866 - and Hugo de Vries, author of "The Mutation Theory" in 1900-1903. In other words, Einstein was wrong when he said "God does not play dice with the universe" (he believed there could be no randomness, or mutation, in the fabric of space-time).

When future civilisation acquires the technology to manipulate the unification and zero separation of all space-time (resulting in carriers of human genes producing unimaginable revolutions in travel within outer space and on Earth, as well as what science-fiction fans term time travel); everyone who has long since died could have the mind downloaded into a reproduction of the body and be resurrected into a world where that mind can use ESP

or directly influence seemingly separate genetic or nongenetic matter, and where world and domestic peace is normal since nobody can attack anyone in any way without knowing they're attacking themselves.

Part 3 - Return to the title and the question "what could a gene possibly be?"

What kind of technology could manipulate the unification and zero separation of all space-time? Morpho butterflies create colour by selectively adding and deleting certain wavelengths of light. Physicists have only recently devised comparable materials, called photonic band-gap crystals; and are now exploring their use in phone switches, solar cells and antennas. No surprise, then, that some engineers are looking to the living world for the next generation of optic inspirations. I believe advances in engineering and biology will enable humans, like the morpho butterfly, to selectively add and delete certain wavelengths of light. But the word "light" need not only refer to visible wavelengths. It can be extended and refer to any wavelength of the electromagnetic spectrum. Science accepts that radio, infrared, ultraviolet waves and X-rays as well as gamma radiation are all forms of light.

For decades scientists have theorised the existence of a particle, called the Higgs boson, that explains how other particles acquire mass. The Higgs boson is believed to produce a field that interacts with particles and gives them a property we interpret as mass, explains Dr Kevin Varvell, of the University of Sydney in Australia. Dr Aldo Saavedra, a particle physicist also at the University of Sydney, made this comment as colleagues at the European Organization for Nuclear Research (CERN), near Geneva, switched on the Large Hadron Collider - "It would be really nice if nature actually provided some very puzzling thing that theories haven't actually thought of." In September 2008, renowned British astrophysicist Professor Stephen Hawking bet US\$100 that the LHC experiment would not find the Higgs boson. "I think it will be much more exciting if we don't find the Higgs." Suppose matter (including genes) acquires all its properties (including mass) by the superimposing of electromagnetic and gravitational waves* (computer-generated in a 5th dimension and projected into the hologram of 3+1 dimensions which we call space-time). We can then further extend the above reasoning and regard matter as a form of light. So the day will come when we can add or delete wavelengths anywhere we choose! The concept of "dark matter" would be used today to explain the increased gravitational effects caused by, say, undetectable genes. But those undetectable genes might not be a new, unknown form of matter - they might be known genetic material being transported by its owners through the 4th and 5th dimensions (and therefore nonexistent in the 3 dimensions of ordinary space). While in these other dimensions, the particles known as "dark genes" are invisible ... but would of course still exert gravitational influence. (Physics' string theory states this by saying "Gravity may not be confined to 3 dimensions.")

* Einstein predicted the existence of gravitational waves but they haven't been discovered yet. The measurements on the Hulse-Taylor system (a pulsar & a star in orbit around a common centre of mass – in 300,000,000 years they will merge to form a black hole and cease to radiate gravitational waves) have been carried out over more than 30 years. The

orbit has decayed since the binary system was initially discovered, in precise agreement with the loss of energy due to gravity waves predicted by Einstein's General Theory of Relativity (there's a 0.2% disparity between the data and the predicted results which is due to poorly known galactic constants). In 1993, Russell Hulse and Joe Taylor were awarded the Nobel Prize in Physics for this work, which was the first indirect evidence for gravitational waves. A precursor to the superimposing of electromagnetic and gravitational waves is the Touchable Hologram method, demonstrated on 6 Aug 2009 by researchers from The University of Tokyo led by Hiroyuki Shinoda, of using an ultrasound phenomenon called acoustic radiation pressure to create a pressure sensation on a user's hands, which are tracked with two Nintendo Wiimotes.

I anticipate people will oneday have band-gap structures in their brains that are no bigger than a computer chip (these won't require surgical implantation, but simply downloading, because of the computer-generated hologram's creation of the pre-existing digital nature of all parts of the universe). Photonic band-gap crystals would, of course, only deal with light in its photonic forms (energy forms such as visible light or radio waves). The band-gap structures I have in mind would need to deal with forms like genes, so they could add or delete anything and everything we choose. They might accomplish this by acting similarly to a modem that acts on a scale trillions of times smaller than a modem manufactured by nanotechnology, and would be capable of manipulating digitised matter. Then they could emulate computers' copy/paste function to add things; as well as their delete function, to remove things (now that's what I call genetic engineering!). This ability must only come to fruition in a future, ideal society: it would only be wasted and abused in the present warring and selfish world!

Though humans have a very special potential which will, I believe, see us use our inbuilt creativity to oneday produce universes and ourselves and perform other so-called miracles; this is, in the end, just another article proclaiming that God created us and the universe. This apparent contradictory statement is resolved easily by noting that this article makes 4 points - a) it attempts to use science to demonstrate how people could create the universe and ourselves, b) it tries to show scientifically that there truly is a God – who is the total of everything in the universes, from consciousness and personality to a cluster of galaxies to a person ... to a grain of sand ... to an atom ... to a ray of light or a magnetic or gravitational field (with the One's consciousness capable of "downloading" into any component physical form, type of energy or force), c) finite humans are united with God via the universe's Unified Field (which embraces zero-separation). The inverse-square law (see next paragraph) of famous English scientist Isaac Newton (1642-1727) says the force between two particles is infinite if the distance of separation goes to zero which surely means the force between 2 zero-separated particles in the zero-separated universes is the infinity we term God, and if God is everything++, must be particles themselves (of brains, light, computers, gravity, etc.), and d) therefore, saying "we created the universe and ourselves" is another way of saying "God created the universe and us" – the religious writer and broadcaster Herbert W. Armstrong (1892-1986) would have phrased this apparent contradiction as "God is reproducing himself through mankind" since he taught that the true message Jesus brought to the world was that mankind's destiny is to become God. And, on another religious/philosophical viewpoint, Hindu Tantrism would correctly state that unity of the worshipper with the worshipped is ultimately achieved.

The inverse-square law says that if stars A and B emit light of equal intensity but star B is twice as distant, it will appear one quarter as bright as star A ie not the square of 2 (4) but the inverse square of 2 (1/4 or one divided by four). Newton was just as dedicated to the quest for God as he was to the quest for scientific enlightenment. I don't know if he was familiar with the teachings of ancient Greek philosopher and politician Parmenides (c.515 BC - c.445 BC) Parmenides taught that the only true being is "the One" which is infinite, indivisible and the whole of it is present everywhere (if accepted, these beliefs would surely have assisted Newton's thoughts regarding zero-separation and an infinite God). This last point seems to anticipate invention of the hologram (each piece of a hologram stores information about the whole image). The philosopher and mathematician Pythagoras (580? - 500 BC) believed that numbers constitute the true nature of the universe. Combine Parmenides' belief in the One with the Pythagorean belief in number being the essence of the universe and you have the foundation of my conviction that the building blocks making up the universe are a combination of electromagnetic pulses (forming a cosmic computer which includes randomness and thus the potential to escape rigid preprogramming, and have a free will) as well as lasers' reference/object beams, masers, sasers, etc. (forming a cosmic hologram). Laser stands for Light Amplification by Stimulated Emission of Radiation, maser is Microwave Amplification by Stimulated Emission of Radiation, saser is Sound Amplification by Stimulated Emission of Radiation ...

++ Dutch philosopher Baruch (or Benedict) Spinoza (1632 to 1677) said everything that exists, including individual men and women, is a part of God and is a tiny part of an all-inclusive pantheism. Scientists today and of the recent past, including Albert Einstein, tend to believe in "Spinoza's God" and an impersonal pantheism. While Spinoza said there can be no such thing as personal immortality but only the impersonal sort that consists in becoming more and more one with God i.e. one with the material universe, he also said thought and mind were attributes of God. This sounds like agreement that "(God) is the total of everything in the universes, from consciousness and personality to a cluster of galaxies to a person ... to a grain of sand ... to an atom ...to a ray of light or a magnetic or gravitational field" (I think we need a time machine so we can go to the 17th century and ask him for his thoughts about this). In any case, I believe advances in technology will prove him wrong about there being no personal immortality because "people who have long since died could have their minds downloaded into reproductions of their bodies" (welcome back, Spinoza).

When we take Einstein's theory of gravity and renormalize it (subject it to the tedious process of adding quantum corrections), these corrections instead of being small are infinite. Instead of trying to eliminate these infinities, maybe physicists should accept that the above lines about zero separation and infinity indicate the renormalized infinities of Einstein's theory of gravity show it possesses a certain validity. His theory is lacking to some extent since he did not explain the cause of gravity, although he suggested electromagnetism and gravitation might be related – nearly a century later, this article makes it apparent that the antigravity force called dark energy (discovered as the result of 1998 observations of the redshift [shifting of an object's light towards the less-energetic

red end of the electromagnetic spectrum by the object's receding motion] of Type 1a Supernovas [a type of stellar explosion] carried out by the High-z Supernova Search Team and the Supernova Cosmology Project, and confirmed several times) is related to electromagnetism and gravity, and ultimately derives from the same source. Would the entire universe instantly feel the loss of the sun's gravity if our star disappeared suddenly? The answer to this is a matter of relativity. If we're viewing this occurrence from the 3+1 dimensions of spacetime, the answer must be "no" (and agree with Einstein's Relativity) because we'd be dealing with the finite speed of gravitational (and electromagnetic) waves - 299,792,458 metres per second (approximately 186,282 miles per second). If we're viewing from the 5th dimension (where this article theorises electromagnetic and gravitational waves are computer-generated and "projected" into the hologram of 3+1 dimensions which we call space-time), or from those 3+1 dimensions after spacetime and matter have been subjected to the "eliminated distances" mentioned in the middle of this article, the answer must be "yes" (and agree with Newtonian physics) because we'd be dealing with unification and zero separation.

I was seriously tempted to rethink everything in the above article when I read online that in "The Atlantic Monthly" for April 1988, journalist Robert Wright says U.S. computer scientist and physicist "Ed Fredkin thinks that the universe is a computer. According to his theory of digital physics, information is *more* fundamental than matter and energy. He believes that atoms, electrons, and quarks consist ultimately of bits—binary units of information, like those that are the currency of computation in a personal computer or a pocket calculator." After all, it's easier to contemplate the universe being a computer than thinking of the universe as the product of a quantum computer hiding in hyperspace. However, I find 3 faults with his theory of digital physics and I'll discuss these now –

First, the theory has no need for a 5th dimension. Albert Einstein saw the value of a 5th dimension after receiving a letter in 1919 written by Theodor Kaluza. He proposed that Einstein's dream of finding a unified theory of gravitation and electromagnetism might be realized if he worked his equations in five-dimensional space-time. Einstein scoffed at the idea at first but later reconsidered and helped Kaluza get his paper published. A few years after that, physicist Oskar Klein published a quantum version of Kaluza's work. In the 1970s, the resulting Kaluza-Klein theory turned out to be beneficial in working on supersymmetry (a postulated unifying relationship between elementary particles).

The existence of the 5th dimension is also proposed by these lines from the start of this article's section about time travel – "Particles and the universe can be regarded as closed loops of electromagnetic energy. These could be called strings or superstrings or Mobius loops (a Mobius loop can be visualised as a strip of paper which is given a half-twist of 180 degrees before its ends are joined). Remember that the top, side and bottom of each loop each consist of a miniaturised, fractal version of electromagnetic pulses forming length, width and depth (a fractal is a geometric structure having an irregular or fragmented appearance which is of a similar character at all magnifications - the word "fractal" was coined in 1975 by French mathematician Benoit Mandelbrot). The 3 familiar dimensions of length, width and height along, for example, the top of a loop would have a 4th dimension (time) perpendicular to them (on the side of the twisted paper ... or electromagnetic loop).

And there would also exist a 5th dimension called hyperspace, at right angles to the 4th and 180 degrees from the length/width/height along the loop's top."

Professor Fredkin's digital physics leaves no room for the universe to be considered a hologram.

The article "Holographic Principle" in the Internet's free encyclopedia Wikipedia states: "The holographic principle is a property of quantum gravity and string theories which states that the description of a volume of space can be thought of as encoded on a boundary to the region—preferably a light-like boundary like a gravitational horizon. First proposed by Gerardus 't Hooft, it was given a precise string-theory interpretation by Leonard Susskind. In a larger and more speculative sense, the theory suggests that the entire universe can be seen as a two-dimensional information structure "painted" on the cosmological horizon, such that the three dimensions we observe are only an effective description at macroscopic scales and at low energies. Cosmological holography has not been made mathematically precise, partly because the cosmological horizon has a finite area and grows with time."

And it is stated by <http://www.spaceandmotion.com/Physics-David-Bohm-Holographic-Universe.htm> (part of one of the top philosophy sites on the Internet) that the British quantum physicist David Bohm (1917-1992) asserted that the tangible reality of our everyday lives is really a kind of illusion, like a holographic image. Underlying it is a deeper order of existence, a vast and more primary level of reality that gives birth to all the objects and appearances of our physical world in much the same way that a piece of holographic film gives birth to a hologram. Bohm calls this deeper level of reality the implicate (which means enfolded or hidden) order, and he refers to our own level or existence as the explicate, or unfolded order. Bohm is not the only researcher who has found evidence that the universe is a hologram. Working independently in the field of brain research, Stanford neurophysiologist Karl Pribram has also become persuaded by the holographic nature of reality. He says that the human brain can be modeled as a hologram. Capitalizing on Pribram's findings, Bohm states that our brains are smaller pieces of the larger hologram. That our brains contain the whole knowledge of the universe. So, you can see how each mind has a limited perspective of the universal hologram. Our brains are our windows of perception. Each mind always contains the whole picture, but with a limited and unclear perspective. We each have different experience in our lives, but each perspective is valid. Our brains mathematically construct objective reality by interpreting frequencies that are ultimately projections from another dimension, a deeper order of existence that is beyond both space and time.

The fact that particles can communicate instantly over billions of light years (are entangled - a process that appears to have operated in the entire universe forever) also seems to support the holographic principle and makes these lines from this article relevant: "Another effect of the universe being a unification having zero separation is that experiments in quantum mechanics would show that subatomic particles instantly share information even if physically separated by many light years (experiments conducted since the 1980s

repeatedly confirm this strange finding). This is explicable as 2 objects or particles only appearing to be 2 things in an objective, “out there” universe. They’d actually be 1 thing in a unified, “everything is everywhere and everywhen” universe. If the universe is a hologram with each part containing information about the whole, the instant sharing of information over many light-years loses its mystery. And we’ll see that time travellers from our future could return to the time of our Big Bang and make this a computer-generated hologram* in which things appear distant from each other on a huge “screen” but are also unified by the strings of ones and zeros making up the computer code which is all in one small place. And objects in the universal hologram would not only include the screens of our computers, TVs and mobile phones but every physical and nonphysical part of the universal hologram would be a receptor for the downloading of data from the Quantum Supercomputer (in other words, a “screen” for invisibly displaying data).”

* According to Wikipedia, “Computer Generated Holography (CGH) is the method of digitally generating holographic interference patterns. A holographic image can be generated e.g. by digitally computing a holographic interference pattern and printing it onto a mask or film for subsequent illumination by suitable coherent light source. On the other hand, if holographic data of existing objects is generated optically, but digitally recorded and processed, and brought to display subsequently, this is termed CGH as well.”

Fredkin’s digital physics allows the zero-separation of “eliminated distances” which I spoke of earlier but I don’t see how it could unify the entire universe at once. Since processing in the hyperspatial quantum computer doesn’t happen at infinite speed but is always restricted to the speed of light, this unification must be only virtual or partial even if processing takes an infinitesimal 10^{-43} of a second (that’s a second divided into 10 million trillion trillion trillion parts). Things like ESP and telekinesis (psychokinesis) would be everyday phenomena if unification was total. But because our universe’s unification is the tiniest degree removed from total, they aren’t. Why are true telekinesis and ESP possible at all? It must be because the universe’s underlying electronic foundation enables our cosmos to be a total and complete unification by elimination of all distances in space and time and between the different sides of objects and particles, too. In other words, the brain can sometimes transcend the barriers of space, time and matter to connect with other brains, living structures or nonliving structures.

Now I feel compelled to return to “... the universe (being the) product of a quantum computer hiding in hyperspace.” The everyday, linear notion of time we’re familiar with says the 8,000 previous words in this article are convincing enough to make people believe in a quantum computer hiding in hyperspace. But here’s a paradoxical question – since we obviously don’t need to construct another computer (the whole of space-time is already functional ... and always has been ... and always will be), why should that other computer be built by our future technology without the previous one being switched off (and making the universe, along with the next quantum computer’s builders, disappear)? If they vanish, no hyperspatial quantum computer can ever get constructed. Some readers will say this disproves what I’ve written – but I think they’re taking the easy way out. Some will say it proves there’s a God who is separate from humans. But my article states “finite humans are united with God” so I believe they’re taking the easy way out too. There’s no

need for paradoxical questions if a new hyperspatial computer is built each time a new universe is brought into existence within this megauniverse (it would occupy not just that universe's hyperspace but also the hyperspace in each constituent subatomic particle because the universe is unified with each of its particles, thus sort of making the universe a computer). If there's only one hyperspatial computer controlling the whole megauniverse, we'd have to start asking paradoxical questions however. Maybe the grandfather paradox's solution is also the solution to this computer paradox.

Suppose a man travelled back in time and killed his biological grandfather before the latter met the traveller's grandmother. As a result, one of the traveller's parents (and by extension, the traveller himself) would never have been conceived. This would imply that he could not have travelled back in time after all, which in turn implies the grandfather would still be alive, and the traveller would have been conceived, allowing him to travel back in time and kill his grandfather. Thus each possibility seems to imply its own negation, a type of logical paradox.

(From the article "Grandfather paradox" - Wikipedia, the free Internet encyclopedia)

The solution to the grandfather paradox is - instantly directing matter, energy and forces anywhere in the universe at any point in the past, present or future; the hyperspatial quantum computer would be a spaceless and timeless basic reality from which space-time would emerge (since the universe is a unification possessing zero separation; every bit of the matter, energy and force directed by the hyperspace computer would feed back into the computer and be simultaneously directing IT, ensuring that history and the future could never be changed and the "grandfather paradox" is no problem after all). Maybe the solution to the "computer paradox" is that our megauniverse and the hyperspace computer are simultaneously directing each other, ensuring that history and the future can never be changed – the computer may well possess the ability to speak since the whole megauniverse is a product of it, and it might explain the computer paradox by saying "I Am That I Am". Unless my reader can suspend everyday, linear thinking and appreciate that "There are more things in heaven and earth ... Than are dreamt of in your philosophy", I doubt this will be enough to satisfy her or him that the "computer paradox" is no problem after all. Maybe the solution was explained way back in #11 under the reference to "The Grand Design".

REFERENCES - Many of these are within the text. I would also refer readers to –

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http://www.amazon.com/Grand-Design-Stephen-Hawking/dp/0553805371/ref=sr_1_1?s=books&ie=UTF8&qid=1294896491&sr=1-1

pp3, 6 -- "Einstein predicted the existence of gravitational waves" – "The Grand Design" by Stephen Hawking and Leonard Mlodinow, Bantam Press 2010, page 102

p3 -- "a modification of ideas published by robotics/artificial intelligence pioneer Hans Moravec, inventor/futurist Ray Kurzweil" – "Mind Children: The Future of Robot and Human Intelligence" by Hans Moravec, Harvard University Press 1990 and "The

Singularity Is Near: When Humans Transcend Biology” by Ray Kurzweil, Viking Adult, 2005

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p8 -- "Professor Hawking informs us..." – “A Brief History of Time: From The Big Bang To Black Holes” by Stephen Hawking, Bantam Press 1988, pp. 67, 187

p9 -- "Einstein spoke of a "static" universe..." - “The Grand Design” by Stephen Hawking and Leonard Mlodinow, Bantam Press 2010, page 126

p9 -- "claim by cosmologists Paul J. Steinhardt and Neil Turok" - "The Day Before Genesis" (Discover magazine, April 2008), p. 56

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p.12 Gerardus 't Hooft and Leonard Susskind (and Charles Thorn) Wikipedia contributors. Holographic principle. Wikipedia, The Free Encyclopedia. January 8, 2011, 15:49 UTC. Available at:
http://en.wikipedia.org/w/index.php?title=Holographic_principle&oldid=406691997. Accessed January 13, 2011

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ENDNOTES

The religious writer and broadcaster **Herbert W. Armstrong** (1892-1986) who would have phrased the union of humans with God as “God is reproducing himself through mankind” since he taught that the true message Jesus brought to

the world was that mankind's destiny is to become God.

Ancient Greek philosopher and politician **Parmenides** (c.515 BC-c.445 BC). Parmenides taught that the only true being is "the One" which is infinite, indivisible and the whole of it is present everywhere. He seems to have anticipated invention of the hologram (each piece of a hologram "is present everywhere" i.e. it stores information about the whole image).

The Greek philosopher and mathematician **Pythagoras** (580?-500 BC) who believed that numbers constitute the true nature of the universe. Combine Parmenides' belief in the One with the Pythagorean belief in number being the essence of the universe and you have the foundation of my conviction that the building blocks of the universe are a) digital (forming a cosmic computer) as well as b) computer-generated holograms.

Dutch philosopher **Baruch (or Benedict) Spinoza** (1632-1677) who said everything that exists, including individual men and women, is a part of God and is a tiny part of an all-inclusive pantheism. He also said thought and mind were attributes of God.

U.S. computer scientist and physicist **Ed Fredkin** who thinks that the universe is a computer.

Theodor Kaluza (1885-1954), the German mathematician and physicist who proposed that Einstein's dream of finding a unified theory of gravitation and electromagnetism might be realized if he worked his equations in five-dimensional space-time.

Oskar Klein (1894-1977), the Swedish theoretical physicist who published a quantum version of Kaluza's work.

Gerardus 't Hooft and **Leonard Susskind**, whose holographic principle (a property of quantum gravity and string theories which states that the description of a volume of space can be thought of as encoded on a boundary to the region) has led to the speculation "... that the entire universe can be seen as a two-dimensional information structure 'painted' on the cosmological horizon, such that the three dimensions we observe are only an effective description at macroscopic scales and at low energies. Cosmological holography has not been made mathematically precise, partly because the cosmological horizon has a finite area and grows with time." (quoted section from Wikipedia)

British quantum physicist **David Bohm** (1917-1992) who asserted that the tangible reality of our everyday lives is really a kind of illusion, like a holographic image. Underlying it is a deeper order of existence, a vast and more primary level of reality that gives birth to all the objects and appearances of our physical world in much the same way that a piece of holographic film gives birth to a hologram.

Stanford neurophysiologist **Karl Pribram** has also become persuaded by the holographic nature of reality. Bohm says our brains mathematically construct objective reality by interpreting frequencies that are ultimately projections from another dimension, a deeper order of existence that is beyond both space and time. (<http://www.spaceandmotion.com/Physics-David-Bohm-Holographic-Universe.htm>)

PS

I fully realise that my essay doesn't sound like science at all. I can appreciate that many readers think it belongs to science fiction and fantasy. It does have saving graces though. I'm amazed at how well it fits in with the discoveries of the Microwave Anisotropy Probe and with string theory, culminating in the LHC's experimentally verified strings and my prediction of negative-energy antistrings. Having said that, I must say this – it's very strange that the scientific world is so obsessed with mathematics (admittedly, my essay did dabble with it when offering a version of $E=mc^2$ to suit the digital world - but I kept it very simple ... so simple it might be regarded as wrong). Math seems to be regarded as infallible, even though it leads to mistakes. The (partial) mistake I have in mind is string theory. I don't deny that there certainly is value in the theory, and in maths, but logic reveals shortcomings. Let me explain, after first writing a short section describing an unconventional approach to unveiling unification and offering an alternative to the Higgs boson that relies on gravitational waves.

ALTERNATIVE TO HIGGS BOSON

An important step might be to think of "... the grand design of the universe, a single theory that explains everything" (words used by Stephen Hawking on the American version of Amazon, when promoting his latest book "The Grand Design" – coauthored with Leonard Mlodinow, Bantam Books, 2010) in a different way than physicists who are presently working on science's holy grail of unification. The universe's underlying electronic foundation* (which makes our cosmos into a partially-complete unification, similar to 2 objects which appear billions of years or billions of light-years apart on a huge computer screen actually being unified by the strings of ones and zeros making up the computer code which is all in one small place) would make our cosmos into physics' holy grail of a complete unification if it enabled not only elimination of all distances in space and time, but also elimination of distance between (and including) the different sides of objects and particles. This last point requires the universe to not merely be a vast collection of the countless photons, electrons and other quantum particles within it; but to be a unified whole that has "particles" and "waves" built into its union of digital 1's and 0's (or its union of qubits – quantum binary digits). If we use the example of CGH (computer generated holography, these

"particles" and "waves" could be elements produced by the interaction of electromagnetic and presently undiscovered gravitational waves, producing what we know as mass and forming what we know as space-time. Einstein predicted the existence of gravitational waves, and measurements on the Hulse-Taylor binary-star system resulted in Russell Hulse and Joe Taylor being awarded the Nobel Prize in Physics in 1993 for their work, which was the first indirect evidence for gravitational waves. The feedback of the past and future universes into the unified cosmos's electronic foundation would ensure that both past and future could not be altered. Our brains and minds are part of this unification too - which must mean extrasensory perception and telekinetic independence from technology are possible, despite modern science's objections to these phenomena which appear to be based on non-unification.

* For more information on the universe's proposed electronic foundation, please see my article and postings at

<http://fqxi.org/community/forum/topic/814>

STRINGS ARE ONLY PART OF MATTER'S BASIS

Space and time only exist in our experience. They are emergent properties, like wetness and mind. We experience wetness because it emerges from the building blocks of the hydrogen and oxygen atoms which make up water. We experience mind because it emerges from the building blocks of neurons composing the brain. And we experience space-time since it emerges from the building blocks making up the universe. These units are a combination of electromagnetic pulses (forming a cosmic computer which includes randomness and thus the potential to escape rigid preprogramming, and have a small degree of free will) as well as a cosmic hologram (this is produced by the interaction of electromagnetic plus gravitational waves and combination of the holographic aspect with the electronic aspect unifies general relativity with quantum physics). Every physical and nonphysical part of the universal hologram would be a receptor for the downloading of data from the cosmic computer which not only exists in the hyperspace of the large-scale universe but also in the hyperspace of each subatomic particle. (In other words, the holographic universe or spacetime we know is a screen for displaying data from the 5th-dimensional computer.)

It might be helpful to visualise time as the playing of a CD or video tape. The entire disc or tape obviously exists all the time. But our physical senses can only perceive a tiny part of the sound and the sights at any fraction of a second. I believe space and time are infinite, so it might be more accurate to visualise time as that HUGE number - in this case, of CDs or tapes - which some versions of string theory propose (10^{500}). My essay

tells you exactly how to travel to the future, how to return home, and how to travel into our past. Neither future nor past can be altered (a blow to our belief that we have the free will to shape the future) and my explanation of travel to the past requires re-interpretation of the concepts of "multiverse" and "parallel universes". It also requires the ability to travel billions of light years INSTANTLY - no doubt many readers will instantly dismiss the essay because their preconceptions "know" this simply isn't possible. It indeed sounds like pure fantasy, but I outline an approach based on electrical engineering, General Relativity, and Miguel Alcubierre's 1994 proposal of "warp drive" that makes it logically possible.

My essay explains why the universe is a Mobius loop and how it is contained in, or unified with, each of its particles (relying on physical senses or 21st-century scientific instruments would make this statement ridiculous). Then each fermion and boson would also be composed of the 3 spatial dimensions, the 4th dimension of time, and the 5th dimension of hyperspace. Detectors like the Large Hadron Collider would be unable to "see" the time and hyperspace components of particles but could only see the small (maybe 5% of the whole) 3 spatial dimensions (the time component would be what we call dark matter), erroneously assuming particles are those small fractions of a Mobius loop that physics calls strings. "Dark matter" would exert a gravitational influence because time, being part of a curved Mobius loop (whether of quantum or cosmic scale), would push objects together in the same way Einstein's curved space-time pushes objects together. We can speak of the HST now - no, not the Hubble Space Telescope but Hyperspatial SpaceTime. We can visualise the Mobius loop as composed of a hyperspace computer which generates information on how things change from one presently undetectably tiny fraction of a second to the next (we call this time, and it's comparable to the frames in a movie) and transmits the data (transmits dark energy) to the insignificant portion of length, width and depth that makes up subatomic particles ... and the universe.

Preceding the Big Bang (which created this local section of the infinite, eternal universe ... or if you prefer, this subuniverse of the megauniverse) there would have been no space, matter or time in this subuniverse. No transmissions of dark energy (creating time and space/matter) would have occurred - therefore the dark-energy content of the universe would have been zero, increasing to the present 72% as more and more matter was created. How is matter created? Perhaps as cosmologist Alan Guth once suggested -

"You might even be able to start a new universe using energy equivalent to just a few pounds of matter. Provided you could find some way to compress it to a density of about 10^{75} (10 exponent 75) grams per cubic centimeter, and provided you could trigger the thing ..."

At the time the Cosmic Microwave Background was emitted (less than a million years after the big bang), results from the Wilkinson Microwave Anisotropy Probe say the dark-energy content of the universe was negligible. Space/matter has been increasing since the big bang so transmissions from hyperspace computer (dark energy) which create them are increasing while the volume of the Mobius loop occupied by time/hyperspace (dark matter) has been shrinking as a result - according to the WMAP satellite, from 63% when the CMB was emitted to 23% today. Why isn't dark energy increasing at the same rate dark matter is decreasing? It must be because, as stated earlier, both time and hyperspace exert a gravitational influence, thereby mimicking space and matter to a degree. This mimicry causes the dark matter between the start of the CMB and the present to decrease by only about 40% while dark energy increases in the same period by about 70%. If we were dealing with a simple and ordinary loop, this similarity would cause dark matter and dark energy to be more or less equal and if there was any difference in their amount of decrease/increase, it would be in the same direction. But we're talking about Mobius loops which are like strips of paper that have been twisted 180 degrees before the ends are joined. This causes their variation to go in different directions (one increases, the other decreases) and the amount of variation is quite significant (+72%, -40%). My guess is that the real-life twist occurs in the temporal segment of the loop, enabling a traveller in time to go in different directions i.e. into the future or into the past. To replenish dark matter in billions of years, we merely have to extend Guth's proposal by using the knowledge of that time to create more matter (or by creating more hyperspace which creates more space and more time).

A real-life Mobius is by no means a featureless loop, however. If, contrary to our impressions, the universe is unified with each particle it's composed of; the WMAP satellite's findings must apply to the quantum world. The figures 72%, 23% and 5% would not only describe the present universe's content of dark energy, dark matter and ordinary matter but also any particle's content of **space or ordinary matter** (5%), **time or dark matter** (23% - time is considered to be dark matter here because dark matter is regarded as ordinary matter invisible to us since it's present in another region of the dimension we call time, just as most of a sphere is in another dimension and consequently appears as a dot when first entering Edwin Abbott's 1884 exploration of other dimensions called "Flatland"), **and hyperspace** (72%: the transmissions from the hyperspace computer create space and matter, cause expansion of space on cosmic scales where there are no forces to overcome the expansion as there is in matter, and are known as dark energy - creating more matter causes that matter's repelling gravity to bring about accelerating expansion).

Look at a picture of a Mobius (thanks to the repeating scales of fractal geometry, the apparently empty interior and exterior of the Mobius universe would actually be the same as the visible loop). Imagine the space/ordinary matter to be situated immediately counterclockwise (perhaps on the bottom of the loop) to the hyperspace segment and the time/dark matter portion to be immediately counterclockwise to the space/ordinary matter (time/dark matter would, moving clockwise, be next to the hyperspace segment).

The hyperspace transmissions flow directly into space/matter (all motion - "flow" and "transmissions" – are actually comparable to individual frames in a movie but are spoken of in everyday terms of motion for convenience, like saying the sun rises and sets) and are responsible for the large and unimpeded 72% increase, since the CMB was emitted, of dark energy. This flow rate of 72% also enters the time/dark matter section adjacent to hyperspace ... but the loop's twist seems to be in the time section. If we were to cut the loop lengthwise with scissors, previously varying the number of half-twists results in things such as two rings linked together or a knotted ring. So we get barriers to motion and blockages. Returning to the normal loop and twist, matters are less drastic and motion is merely slowed, resulting in a 23% flow rate into the space/ordinary matter section.

If we lived in a non-unified universe of materialism, this is how things would remain (dark matter would have increased so today's content would be a low 23%). On p. 179 of "The Grand Design" by Stephen Hawking and Leonard Mlodinow (Bantam Press, 2010) it's stated

"One requirement any law of nature must satisfy is that it dictates that the energy of an isolated body surrounded by empty space is positive ..."

The only problem with that sentence, in an "everything is everywhere and everywhen" universe, is the word isolated. There can be no such thing as isolated in our cosmic-quantum unification. Page 179 also says "... if the energy of an isolated body were negative ... there would be no reason that bodies could not appear anywhere and everywhere." Does this mean you and I (plus all things in time and space) are a union of both positive and negative energy, able to display both separateness/solidity (isolation) as well as the potential to appear anywhere and everywhere? Dark matter, not being entirely positive, would be anywhere and everywhere as well as having decreased so today's content would be a low 23% (which is what WMAP says is the case).

If everything is a union of positive and negative energy, every matter particle and force-carrying particle would be too. And the strings the Large Hadron Collider might detect (being the parts of particles' Mobius loops it could see since those parts would be space/ordinary matter) might come in both positive and negative varieties. In 1928 English physicist Paul Dirac (1902-84) proposed that all negative energy states are already occupied by (then hypothetical) antiparticles (particles of antimatter). Building on this results in proposal of strings and antistrings – mathematics has positive and negative quantities, and computers (whether in hyperspace or not) generate maths, causing reality to be both positive and negative; and unconventional cosmologist Max Tegmark is correct

when he says mathematical formulas create reality.

My essay tells you how to travel into the future, how to return home, and how to take a trip into our past. Regarding travel beyond our start and into the past ... it can't be denied that these paragraphs imply the possibility of humans from the distant future time-travelling to the distant past and using electronics to create this particular subuniverse's computer-generated Big Bang. An accomplishment such as this would be the supreme example of "backward causality" (effects influencing causes) promoted by Yakir Aharonov, John Cramer and others. However, realising that we live in a cosmic-quantum unification with zero-separation and recalling Isaac Newton's inverse-square law and what it says about the force between two particles being infinite (does infinite mean 10^{500} , the HUGE number of universes proposed by some versions of string theory?) if the distance of separation goes to zero means there's still room for God (another bit of scientifically objectionable science fiction?) because God would be a pantheistic union of the megauniverse's material and mental parts, forming a union with humans in a cosmic unification.