

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

I saw a video today ("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 essay 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" – 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, which is reminiscent of the holographic simulation called the Holodeck in "Star Trek: The Next Generation"), 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.)

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).

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 #11) 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.

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."

$E=m^1+0$ 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!

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

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

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

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

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

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

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

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.

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). 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 one day be completed extremely rapidly.

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.

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 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 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.

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

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p3 'words used by Stephen Hawking on the American version of Amazon' - 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

p4 -- "Carl Sagan (1934-1996) wrote these lines...accompanying book, "Cosmos": -- published by Macdonald & Co. 1981, Futura 1983

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

p.10 – "Raymond Kurzweil" Wikipedia contributors. Raymond Kurzweil. Wikipedia, The Free Encyclopedia. April 25, 2010, 18:43 UTC. Available at:http://en.wikipedia.org/w/index.php?title=Raymond_Kurzweil&oldid=358250213. Accessed January 13, 2011,

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

Regarding the holographic principle, read about Craig Hogan (Professor of Astronomy and Physics at the University of Chicago and director of the Fermilab Center for Particle Astrophysics) and the GEO600 gravitational-wave detector in "New Evidence of a Holographic Universe?" at <http://www.khouse.org/articles/2009/839/> (excerpted from *New Scientist*, January 15, 2009)

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>)

The cosmology of **John Dobson**, put forth in his 2008 book “The Moon Is New – Time Comes In With A Minus Sign” (Berbeo Publishing).

The books/ebooks of **Rodney Bartlett**

“Rod’s Room: A New Earth And A New Universe” – Xlibris, 2006

“A New Earth And A New Universe” – PublishAmerica, 2009

“Humans and their Universes” – CreateSpace, 2010

Some titles available at Amazon.com, Google.com, Free-ebooks.net