

From Quantum Entanglement To Quantum Biology To Quantum Universe

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Abstract –

Yes, can I take your order, Ma'am?

The reality? Wow, that's a big order - but I'll put it in the smallest package I can.

Do you want fries with that - or would you prefer a doughnut?

(a moment passes while Penny, the waitress, goes to the kitchen and returns)

Here's your reality - and your doughnut. Enjoy your meal!

This article was posted on the FQXi Community's "Ultimate Reality" page - <http://fqxi.org/community/forum/topic/1928> - which says, "If you have an unconventional, alternative model of reality, then this is the place to discuss it. (This is for contributors who have preliminary ideas and would like feedback, but do not have an academic paper or arXiv preprint and have not given a conference talk based on their ideas.)" My article refers to the article "Quantum Life" by Zeeya Merali - Discover Magazine, December 2014.

Zeeya's article about quantum biology fascinated me! Then it got me thinking of sentences I'd written on subjects like quantum entanglement, artificial intelligence, and macro-entanglement of matter on larger-than-subatomic (even cosmic) scales. I started writing just to see where my ideas went. In next to no time, paragraphs about cosmic things and topics like time travel were filling up the computer screen. My article almost got deleted then because I thought I couldn't stop straying from the topic at hand. At the last moment, the idea that everything was being unified occurred to me. And I decided to go ahead and explore the connections "From Quantum Entanglement To Quantum Biology To Quantum Universe".

Content –

What is this thing called quantum superposition? It's energy travelling along all molecular pathways at the same time ... the smearing out of electrons across all the molecules at once. How is this done? A possible solution is that quantum entanglement - the ability of all things to affect all other things irrespective of distance - exists between the energy, electrons and molecules because everything has the same origin of binary digits (they therefore affect each other like the 1's and 0's forming a computer image). It's possible that the gravitons of gravitational waves and photons of electromagnetic waves could be ultimately composed of the binary digits of 1 and 0 encoding π , e , $\sqrt{2}$ etc (because the

cosmos seems to be fundamentally mathematical). Matter particles (and even bosons like the Higgs, W and Z particles) could receive their mass by gravitons/photons interacting in “wave packets” (explaining wave-particle duality). The above explanation of superposition could even help unravel cosmology’s Big Bang theory: the universe would not be unified to near-uniform temperature and curvature by the whole cosmos having once been small enough for everything to be in contact, then undergoing extremely rapid expansion from a big bang during a period called inflation. It would be quantum entangled (unified) by everything having the same origin of binary digits.

I think $E=mc^2$ supports this idea –

Representing the masslessness of photons by 0 (zero) and replacing the m (mass in Einstein's famous equation relating energy, mass and the speed of light) with the masslessness results in $E=0*c^2$ i.e. $E=0$. Having reduced the equation to E , $m=0$ and $c^2=0$ which means $m=c^2$. At first glance, $m=c^2$ seems to be saying mass exists at light speed. But the absence of E refers to there being no interaction of light energy and gravitational energy, and therefore no mass. If mass cannot be produced, there must be no space-time/gravity and $space=0$, $time=0$ and $gravity=0$. The zero-ness of space-time/gravity does not mean they don't exist. It means we can appear to re-locate matter and information superluminally, or travel into the past and future, because distance is eliminated in both space and time.

Deleting distance in a mathematical sense is good but a mechanism that deletes it in a physical sense is vital - A 2009 electrical-engineering experiment at America's Yale University, together with the ideas of Albert Einstein, tells us how we could travel to other stars and galaxies in literally no time. Electrical engineer Hong Tang and his team at Yale demonstrated that, on silicon-chip and transistor scales, light can attract and repel itself like electric charges or magnets. This is the “optical force”. For 30 years until his death in 1955, Einstein worked on his Unified Field Theory with the aim of uniting electromagnetism (light is one form of this) and gravitation. Achievement of this – see “Digital String Theory and Dark Energy” plus “ c^2 and the Atom” in **Explaining The Mysterious Connection Between Physics and Mathematics By Reconciling the Unified Field and Anthropic Principle** (my entry in FQXi's 2015 essay contest) for a proposed method - means the microscopic components (gravitons) of warps of space (gravity, according to General Relativity) between spaceships and stars could mimic the Optical Effect and be attracted together, thereby totally eliminating distance (this is similar to traversing a wormhole, or shortcut, between two folds in space-time). Distance is not only deleted in space. There would no longer be any “distance” in time. Just as we can journey to particular stars, we could take trips to particular years in the past (using, as will be seen later, hyperspace) or future (using space-time).

From Einstein's formula, $c^2=E/m$ and (using $m=c^2$) $c^2=E/c^2$ which means $E=c^4$. If graviton/photon interaction produces mass (both particles are equally

vital), E (mass-energy of particle) = c^2 (light's photon) multiplied by c^2 (gravity's graviton) ($c^2 \cdot c^2 = c^4$). Since E also equals 0, $c^2 \cdot c^2$ is the masslessness of the photon times the masslessness of the graviton. Now, recall the statement from two paragraphs ago that "The zeroness of space-time/gravity does not mean they don't exist. It means ... distance is eliminated in both space and time ..." Since $0 = c^4$, the interactions between photons and gravitons would also be real and mean that distances in space-time are eliminated.

Feynman diagrams could be used to interpret this to mean there's only one particle in the universe - no distance between photons and gravitons, no distance (not even internally-existing distances*) involving a single photon and single graviton. With his thesis adviser John Wheeler, Richard Feynman speculated that perhaps the entire universe consisted of just one electron. An alternative interpretation is that everything in space-time (undoubtedly including the dark matter of a 5th dimension) comprises a unification e.g. electromagnetism, gravitation and matter are unified. There's no problem in the previous paragraph with 0 referring to masslessness and also referring to deletion of distance. If interaction of photons and gravitons produces mass, removing all internal as well as external photon-graviton distances means there cannot be interaction of those no-longer-separate particles and no mass exists.

* The inverse-square law states that the force between two particles becomes infinite if the distance of separation between them goes to zero. Remembering that gravitation (associated with particles) partly depends on the distance between their centres, the distance of separation only goes to zero when those particles' centres occupy the same space-time coordinates (not merely when the particles' or objects' sides are touching i.e. infinity equals the total elimination of distance, both in space and time).

The 1's and 0's eliminate probabilities and introduce the exactness called for by quantum mechanics' Hidden Variables* theory. This exactness could be called a form of Artificial Intelligence filling the universe at every level, and accounts for the sentence "once the quickest road is identified" in "Quantum Life" (that sentence refers to all the possible pathways in photosynthesis being taken at once initially, then "collapsed" into the shortest pathway). Since there is no separation or distance, the universe would be filled with human/humanoid intelligence, personality and consciousness. Erwin Schrodinger (1887-1961), the Austrian theoretical physicist who achieved fame for his contributions to quantum mechanics and received the Nobel prize in 1933, had a lifelong interest in the Vedanta philosophy of Hinduism and this influenced Schrodinger's speculations about the possibility of individual consciousness being only a manifestation of a unitary consciousness pervading the universe. (The implication is that human intelligence is nothing more than AI or artificial intelligence. It's only our egos that make us believe our minds are somehow more than an advanced form of photosynthesis, or fundamentally different from

the computers we use.)

* The most famous believer in Hidden Variables is Albert Einstein; who thought quantum mechanics was incomplete and that the hidden variables constitute underlying, extra information that completes quantum theory (1's and 0's might be this additional info).

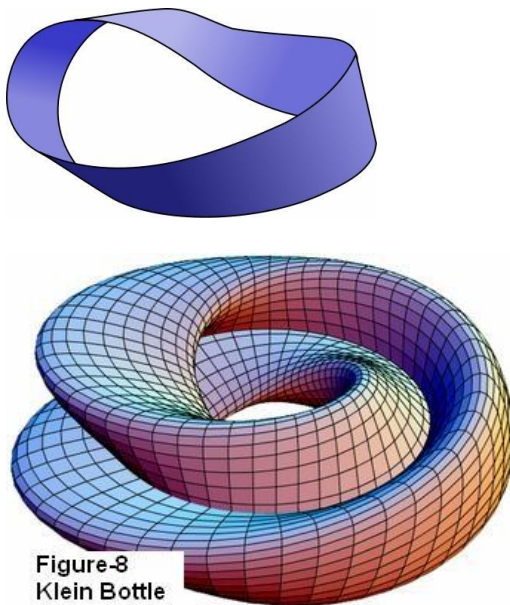
Speaking of computers and elimination of distance in time – not only is instant intergalactic and time travel possible; but Albert Einstein showed that space-time is curved and warped, so it's possible that our own computer science (and terraforming, and biotechnology from many centuries in the future) found its way into the remote past (this explanation of origins would leave the Theory of Evolution to explain adaptations and modification of pre-existing species). How might our computer science be taken into the remote past? The space-time we live in is described by ordinary [or "real"] numbers which, when multiplied by themselves, result in positive numbers e.g. $2 \times 2 = 4$, and -2×-2 also equals 4. Inverted* positive space-time becomes a negative hyperspace which is described by so-called imaginary numbers[^] that give negative results when multiplied by themselves e.g. i multiplied by itself gives -1 . Entering hyperspace with its negatives (energy, matter, distance, time) permits travel to the past since it would be impossible to travel 700 lightyears there, and only possible to travel minus 700 lightyears. Doing so instantly would enable a spaceship to arrive at a spot in the past which a light beam could only reach by traversing negative distance for 7 centuries. (Travelling 700 light years in space-time instantly enables you to arrive at a point in the future which a light ray would reach by traversing positive distance for 7 centuries.)

* What does "inverted" mean? "Inversion" refers to anatomy's "turning inwards of a part" and the twist on the top right of the Mobius loop illustrated below. String theory says everything's composed of tiny, one-dimensional strings that vibrate as clockwise, standing, and counterclockwise currents. We can visualize tiny, one dimensional binary digits of 1 and 0 (base 2 mathematics) forming currents in a two-dimensional program called a Mobius loop – or in 2 Mobius loops, clockwise currents in one loop combining with counterclockwise currents in the other to form a standing current. Combination of the 2 loops' currents requires connection of the two as a four-dimensional (figure-8) Klein bottle, one of which might represent our 13.8 billion-year-old observable universe. This connection of the loops' currents can be made with the infinitely-long irrational and transcendental numbers (such as pi – see 1st paragraph), which means an infinite number of connections (infinite number of figure-8 Klein bottles) would be made. And the flexibility imposed by the binary digits which ultimately compose the bottles or "sub"-universes means they can be stitched together as easily as numbers of images on a computer screen. If the universe outside our observable portion is infinite, the fact that space and time aren't separate but

form an entity called space-time means the cosmos beyond our observation is eternal.

^ As Stephen Hawking writes, "Which is real, 'real' or 'imaginary' time? It is simply a matter of which is the more useful description." Earlier in that paragraph, he says, "In real time, the universe has a beginning and an end at singularities that form a boundary to space-time and at which the laws of science break down. But in imaginary time, there are no singularities or boundaries. So maybe what we call imaginary time is really more basic ..."

Mobius Loop



OK, so we live in a Klein bottle. But why a figure-8 Klein bottle? Because its similarities to a doughnut's shape describes an idea suggested by mathematics' "Poincare conjecture". The conjecture has implications for the universe's shape and says you cannot transform a doughnut shape into a sphere without ripping it. One interpretation follows: This can be viewed as subuniverses shaped like Figure-8 Klein Bottles gaining rips called wormholes when extended into the spherical spacetime that goes on forever (forming one infinite superuniverse which is often called the multiverse when subuniverses - which share the same set of physics' laws - are incorrectly called parts of a multiverse, and are wrongly claimed to each possess different laws). Picture spacetime existing on the surface of this doughnut which has rips in it. British quantum physicist David Bohm (1917-1992) asserted

“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.”

In “The Hidden Reality” - Knopf [January 25, 2011], Brian Greene writes

“... reality ... may take place on a distant boundary surface, while everything we witness in the three common spatial dimensions is a projection of that faraway unfolding. Reality, that is, may be akin to a hologram. Or, really, a holographic movie.”

Brian Greene’s “...projection of that ... reality that is ... akin to a holographic movie” and David Bohm’s “...projections from another dimension ... that is beyond both space and time” could be interpreted as “projections of binary digits from a 5th-dimensional hyperspace which become matter, energy, force and space-time in the known 4 dimensions” (by the way, this makes binary digits candidates for explaining dark energy). These rips provide shortcuts between points in space and time (they’re a partial elimination of distance which permit travel directly from one side of the “doughnut” to the other, without having to go the long way and follow the doughnut’s loops) – and the rips belong in a 5th-dimensional hyperspace.