

Title – **The Cosmos According To FQXi From A Parallel Universe**

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Abstract –

This was adapted by me from my entry in the Foundational Questions Institute's (FQXi's) 2015 contest, "Trick or Truth: the Mysterious Connection Between Physics and Mathematics". My entry is "Explaining The Mysterious Connection Between Physics and Mathematics By Reconciling the Unified Field and Anthropic Principle" (<http://fqxi.org/community/forum/topic/2312>). I've tried to make the article below understandable without referring to the FQXi entry, though it may well be recommended to view FQXi at times for more information. The article below touches on the following -

1) 3 POSITIVES OF SPACE-TIME, BLACK HOLES AND GRAVITY BALANCED BY A NEGATIVE HIGHER DIMENSION,

2) PARTLY REVISED GRAVITY REQUIRES THE IDEA OF NEWTON AND KEPLER THAT THE MOON CAUSES THE TIDES, TO BE JOINED WITH GALILEO'S PARTLY CORRECT IDEA THAT THE EARTH'S MOVEMENTS SLOSH ITS WATER

3) MICROWAVE BACKGROUND WITHOUT A BIG BANG, AND ALTERNATIVE TO INFLATION,

4) SUPERPOSED ELECTROMAGNETISM AND GRAVITY, QUANTUM SUPERPOSED PHOTON AND GRAVITON,

5) COSMIC EXPANSION VIA BARYON ACOUSTIC OSCILLATIONS,

6) RELATING MASS GENERATION BY PHOTON-GRAVITON INTERACTION TO BLACK HOLES, THE SOLAR NEBULA AND THE HIGGS BOSON,

7) HOLOGRAPHIC UNIVERSE, 5TH-DIMENSIONAL HYPERSPACE, AND DARK ENERGY

Content –

3 POSITIVES OF SPACE-TIME, BLACK HOLES AND GRAVITY BALANCED BY A NEGATIVE HIGHER DIMENSION

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 (modelled on the Mobius loop – see my essay) positive space-time becomes negative hyperspace which is described by so-called imaginary numbers that give negative results when multiplied by themselves e.g. i multiplied by itself gives -1 . Many scientists say gravity is negative and balances space-time which is labelled positive [“The Grand Design” by Stephen Hawking and Leonard Mlodinow – Bantam Press, 2010, p.180]. This article says space-time's warps (which General Relativity says are gravity) would also be positive. It agrees with Professors Hawking and Mlodinow that black holes are positive, and claims the negative balance to space-time is an equal quantity of mass in a higher dimension. They say gravity is negative because it's attractive. This article aims to show that gravity repels and is indeed positive (the section in my essay about the Sun and Moon affecting Earth's tides is perhaps the best explanation of gravity's apparent attraction – see next section).

The universe is the things in space and time and, since General Relativity says gravitation is the warping of space-time, the universe is a giant gravity field (remember the statement in my Feb. 5 reply on FQXi about it forming all reality, including matter and electromagnetism). Gravity does not need to travel – the gravitational field already exists everywhere. Nevertheless, any disturbance (from the waving of your hand to explosion of a supernova) will send ripples called gravitational waves through the universe. Since gravity makes electromagnetism, the universe is also a giant electromagnetic field. Electromagnetism is ubiquitous and doesn't need to travel, but any disturbance sends out electromagnetic waves.

PARTLY REVISED GRAVITY REQUIRES THE IDEA OF NEWTON AND KEPLER THAT THE MOON CAUSES THE TIDES, TO BE JOINED WITH GALILEO'S PARTLY CORRECT IDEA THAT THE EARTH'S MOVEMENTS SLOSH ITS WATER [Galileo info from “Galileo's Big Mistake” By Peter Tyson - Posted 10.29.02 (<http://www.pbs.org/wgbh/nova/earth/galileo-big-mistake.html>)].

Gravity's apparent attraction can be summarized by the following - gravitation is absorbed into wave packets and the inertia of the gravitons carries objects towards Earth's centre at 9.8 m/s or 32 ft/s. The mass of the oceans on Earth is estimated at nearly 1.5 billion cubic kilometres [“Ocean Volume and Depth” – Van Nostrand's Scientific Encyclopedia, 10th edition 2008]. All this water is being

pushed towards Earth's centre at 32 feet per second every second. But the seafloor prevents its descent. So there is a recoil, noticeable offshore (it is only where oceans and continents meet that tides are great enough to be noticed). This recoil is larger during the spring tides seen at full and new moon because sun, Earth and moon are aligned at these times.

The rotating Sun bulges at its equator and therefore has a larger equatorial than polar diameter, and more mass at its equator. This means more gravitation has been diverted to that region. Planets are also made from gravity and electromagnetism interacting, and must consequently lie in the path gravity waves took from the outer solar system to the solar equator (more gravitation was diverted here - so if planets are created by gravity and electromagnetism, it follows that they'd be created where the gravitational "current" is greatest). For simplicity, we say the Sun's gravitation is strongest at its equator and planets are compelled to orbit in the ecliptic plane. The previous paragraph's alignment of Sun, Earth and moon therefore refers to their being lined up "where the gravitational current is greatest" and more of the gravitational waves travelling from the outer solar system being captured by solar and lunar wave packets, and less of them being available on Earth to suppress oceanic recoil (there are still enough to maintain the falling-bodies rate of 32 ft/s^2). At the neap tides of 1st and 3rd quarter; the sun, earth and moon aren't lined up but form a right angle and our planet has access to more gravity waves, which suppress oceanic recoil to a greater degree. We can imagine the sun and moon pulling earth's water in different directions at neap tide. If variables like wind/atmospheric pressure/storms are deleted, this causes neap tides which are much lower than spring tides.

The above paragraph about tides exemplifies gravitation attracting despite its repelling nature, which means gravitational waves are focused into the increased warping that is matter (the greater the amount of matter and mass, the greater is the number of gravitational waves converging there - and the greater is the gravitation associated with the body, and the deeper the body depresses space-time that's pictured as a rubber sheet). A spaceship in orbit would have virtually no effect on the rubber sheet, rendering its astronauts or cosmonauts practically weightless – while black holes, being meeting-places for gravitational waves (gravity sinks), can be millions or billions of times more massive than the Sun (the black hole itself doesn't possess the graviton-photon interactions that produce matter).

MICROWAVE BACKGROUND WITHOUT A BIG BANG, AND ALTERNATIVE TO INFLATION

Electromagnetism's property of existing everywhere naturally means things like microwaves must be everywhere, and there would be a Cosmic Microwave Background whether the Big Bang and Inflation occurred or not. The electromagnetic field's superposition on the gravity field also means gravitational imprints would be found in the microwave background by experiments like BICEP2. However, such detection does not necessarily confirm either the Big Bang or inflation (or the multiverse belief that has grown from them). 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. The digits unite everything in time and space in the same way that 1's and 0's form an image. Even if that image contains many seemingly separate elements, it's actually a single image.

SUPERPOSED ELECTROMAGNETISM AND GRAVITY, QUANTUM SUPERPOSED PHOTON AND GRAVITON

The popular phrase "quantum superposition" can refer to photons and gravitons. Mathematician Benoit Mandelbrot coined the word fractal in 1975 (a fractal is a shape such that, if you look at a small piece of the shape, then it looks the same as the original, just on a smaller scale – it is used to describe coastlines, mountain ranges, etc). The fractal versions of superposed electromagnetism and gravitation are, respectively, the quantum superposed photon and graviton.

COSMIC EXPANSION VIA BARYON ACOUSTIC OSCILLATIONS (also see final heading)

Gravity makes matter and mass, too – so there's no need to call on big bangs or inflation to explain the universe. According to my essay, human computer science's binary digits of 1 and 0 can be "recycled" from their advanced development in centuries to come back to 13.8 billion years ago. There; they could bring into being this observable portion of what seems to be an infinite, eternal cosmos. The beginnings of the infinite number of observable-size universes would, of course, be literally infinite. There was no beginning to the universe as a whole but it had (and will continue to have) an infinite number of creations* of its "sub"universes. Creation of the universe as a whole is therefore

forever lost in infinity and it's accurate to say it had no beginning. But back to OUR observable part of the universe – a gravitational wave could be transmitted to the centre of a BAO (baryon acoustic oscillation; which refers to a regular, periodic fluctuation in the density of the visible matter of the Universe). Matter would be created at the BAO's centre if the temperature allows the gravity wave to interact with photons.

* The Law of Conservation of Mass-Energy says neither matter nor energy can ever be created or destroyed. “New” space-time isn't really formed but is simply the arrangement of binary digits into what we call the universe. This conservation can also be viewed as equal quantities of positive and negative space-time existing within the universe, with changes adding up to zero.

RELATING MASS GENERATION BY PHOTON-GRAVITON INTERACTION TO BLACK HOLES, THE SOLAR NEBULA AND THE HIGGS BOSON

A supernova blows off some material before exploding and this forms a slower moving, cooler shell - “Rapid formation of large dust grains in the luminous supernova 2010j” by Christa Gall, Jens Hjorth, Darach Watson, Eli Dwek, Justyn R. Maund, Ori Fox, Giorgos Leloudas, Daniele Malesani & Avril C. Day-Jones. It was published online on July 9, 2014

(<http://www.nature.com/nature/journal/vaop/ncurrent/full/nature13558.html>).

Travelling at light speed, gravitational and electromagnetic radiation (consisting of binary digits) from the blast slams into that material – see “ c^2 and the Atom” plus “Gravitational Radiation” plus “Black Holes and More Dark Energy” near the start of my essay. The lower temperature allows the energy of the gravitons to interact with that of the photons, producing mass in the form of dust i.e. dust particles condense in the shell. In the same way, waves from deep space can produce graviton-photon interaction, forming collapsing clouds of dust and gas from which stars form. If there's no interaction as a result of higher temperatures, no matter is created and there is no cloud of gas and dust. A black hole – formed of gravitational waves and their precursors, binary digits – could result. (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).

HOLOGRAPHIC UNIVERSE, 5TH-DIMENSIONAL HYPERSPACE, AND DARK ENERGY

As succeeding gravity waves condense into matter at a BAO's centre, matter already present in the centre would be pushed out of the way and the universe expands. Physicist Brian Greene's "...projection of that ... reality that is ... akin to a holographic movie" [The Hidden Reality" by Brian Greene - Knopf [January 25, 2011] and quantum physicist David Bohm's "...projections from another dimension ... that is beyond both space and time" ["David Bohm's Holographic Universe" - <http://www.spaceandmotion.com/Physics-David-Bohm-Holographic-Universe.htm>] 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 a candidate for explaining accelerating universal expansion, and a candidate for explaining dark energy).

According to Wikipedia, GEO600 is a gravitational wave detector located near Sarstedt in the South of Hanover, Germany. On January 15, 2009, it was reported in New Scientist ("Our world may be a giant hologram") that some yet unidentified noise that was present in the GEO600 detector measurements might be because the instrument is sensitive to extremely small quantum fluctuations of space-time affecting the positions of parts of the detector. This claim was made by Craig Hogan, a scientist from Fermilab. Should the noise be definitely linked to extremely small quantum fluctuations (researchers expect results by 2015[^]), it could be seen as support for my idea of binary digits forming space-time.

[^] April 08, 2014

"SEARCHING FOR THE HOLOGRAPHIC UNIVERSE - Physicist Aaron Chou keeps the Holometer experiment—which looks for a phenomenon whose implications border on the unreal—grounded in the realities of day-to-day operations." By Leah Hesla (<http://www.symmetrymagazine.org/article/april-2014/searching-for-the-holographic-universe>)

