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## **BLACK HOLES - ASTRONOMY VERSUS COSMOS**

Author – Rodney Bartlett

Abstract –

About "Black hole realities" by David J. Eicher (Astronomy magazine - August 2014) -

We just need to look at black holes in an original way to see that the reservations expressed by Astronomy's Editor concerning the "Cosmos" TV series' episode about black holes can be answered in a scientific way. There's no need to refer to science fiction at all - but only to Stephen Hawking, Albert Einstein and quantum mechanics.

Content –

First, we must remove the singularity from the sentences in "Black hole realities" that say you would survive the event horizon (from pulling you into a proton string) of a supermassive black hole but you'd be crushed by gravity as you approached the singularity. As Stephen Hawking writes ("A Brief History of Time", p.139), "Which is real, 'real' or 'imaginary' time? It is simply a matter of which is the more useful description." Earlier in that paragraph, he says, "In real time, the universe has a beginning and an end at singularities that form a boundary to space-time and at which the laws of science break down. But in imaginary time, there are no singularities or boundaries. So maybe what we call imaginary time is really more basic ..."

Maybe time travel into the future can be achieved by warping positive space-time. And maybe time travel into the past can be achieved by warping a 5D hyperspace that is translated 180 degrees to space-time, and is labelled as negative or inverted. This means it would have negative energy, negative mass, negative distances and negative time – these things are impossible and meaningless in the universe we're familiar with, but are definitely possible and full of meaning in a universe based on mathematics. (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  $-2 \times -2$  also equals 4. Inverted "positive" space-time becomes negative hyperspace which is described by so-called imaginary numbers that give negative results when multiplied by themselves e.g.  $i$  multiplied by itself gives  $-1$ .)

To briefly digress, imaginary time can be equated with dark matter in this way - calculating time using imaginary numbers makes distinctions between time and space disappear. A negative 5<sup>th</sup>-dimension is described by imaginary numbers

and motions of its negative particles (dark matter) are time, since time can be calculated using imaginary numbers. Time cannot be considered in isolation. Physics thinks of it as in a union with space. So imaginary numbers eliminate distinctions between space-time and the 5<sup>th</sup> dimension, permitting dark matter to exist as “ordinary” matter’s scaffold.

Thus, black holes – by means of removal of singularities - are a possible method of forming wormholes or “physical travel mechanisms to go elsewhere”. This letter has only dealt with time travel (going elsewhere), so how do we go elsewhere i.e. use space travel which can be utilized as time travel? In discussing ion propulsion in which thrust is generated by escaping plasma, "rocketman" (Discover magazine - May 2014) emphasized the relation of energy and mass. Another way of producing thrust is to emphasize the relation of gravity (G) and electromagnetism (EM). The concept of thrust from G-EM results from my entry, which suggests original ideas in physics and mathematics, in the Foundational Questions Institute’s 2014 contest (“New Physics Suggests Darwin’s Origin of Species Is Incomplete, and That Godlike Humanity Will Emerge”).

A 2009 electrical-engineering experiment at America's Yale University by electrical engineer Hong Tang and his team 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, Albert Einstein worked on his Unified Field Theory with the aim of uniting electromagnetism (light is one form of this) and gravitation.

Gravity is the warping of space-time, and it's composed of gravitons at the quantum level. Uniting G and EM to achieve GEM (see “**Why Is Gravity Weak? [c<sup>2</sup> and the atom]**” as well as “**Digital String Theory**” below) means the microscopic components of space-time warps called gravitons could mimic the Optical Effect and be attracted together, thereby eliminating distance between spaceships and stars/galaxies (this is similar to traversing a wormhole between two folds in space).

### **WHY IS GRAVITY WEAK? (C<sup>2</sup> AND THE ATOM)**

When gravity waves concentrate to form matter#, gravity travels from external to matter: pushes against matter (repels). Repulsive gravity is dark energy\*. Successive waves are re-radiated at unconcentrated strength from matter to external (opposite action to repelling wave) and attract – it must be remembered that attraction is merely a matter of perspective, since Einstein showed that attraction of two bodies of matter actually results from space-time’s curvature pushing bodies.

# If space-time (whose warping is gravity) forms mass, there could be "currents" of space-time flowing in the "oceans" between the galaxies. Space-time would form the matter in the galaxies, and it would form the Earth/objects on this planet.

How? By some of the currents of space-time or gravity which pass the solar system's outer boundary being diverted towards the massive Sun's centre (just as some of the waves passing an island are refracted toward the shore by the island's mass). Along their course, the refracted gravitational waves are concentrated  $10^{24}$  times in the intense warping we call matter.

\* Feeble gravity might push galaxy clusters apart in the same way that feeble sunlight propels a solar sail. In the 1970s, Robert Forward proposed two beam-powered propulsion schemes using either lasers or masers to push giant sails to a significant fraction of the speed of light. These vastly magnify the power of sunlight via Light (or Microwave) Amplification by Stimulated Emission of Radiation. How is gravity's power boosted? When Einstein penned  $E=mc^2$ , he used  $c$  ( $c^2$ ) to convert between energy units and mass units. The conversion number is 90,000,000,000 (300,000 km/s x 300,000 km/s) which approx. equals  $10^{11}$ . After gravity forms matter, successive gravity waves are, via gravitational lensing, concentrated  $10^{24}$  times (to  $10^{25}$ , weak nuclear force's strength). Then they're further magnified by the matter's density to achieve electromagnetism's strength ( $10^{36}$  times gravity's strength) i.e.  $10^{25}$  is multiplied by Einstein's conversion factor [ $10^{11}$ ] and gives  $10^{36}$ . Successive gravity waves are absorbed by the matter and radiated as longer-wavelength waves (both as electromagnetic waves - possibly gamma rays, or a microwave background – and as gravitational waves which have lost  $10^{24}$  of their energy or strength (and are labelled “ $10^1$ ”).)\*\* “If space comes from bits” (see **Universe Within A Black Hole** - specifically, the energy responsible for the bits is converted into space), then so does gravity (warping of space). So as more and more energy is invested in bit production, more and more space and repelling gravity result. This causes accelerating expansion within the universe, as discovered in 1998 by Saul Perlmutter, Brian Schmidt, and Adam Riess.

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

According to (28), “So from 1kg of matter, *any* matter, we get  $9 \times 10^{16}$  joules of energy. Writing that out fully we get: 90,000,000,000,000,000 joules (enough to

power a 100 watt lightbulb for 28,519,279 years). From gravitational energy equivalent to a 100 watt lightbulb burning for 28,519,279 years, only a kilogram of matter is formed.

Suppose the unit ascribed to concentrated gravity's strength of  $10^{25}$  is the hertz (Hz), a frequency of one cycle per second. If a gamma ray is emitted from an atom, that typically accounts for more than  $10^{19}$  Hz of the  $10^{25}$  Hz. The remainder's accounted for by radiation of gravitational and other electromagnetic frequencies.

We must not violate any conservation laws in creation of the universe i.e. neither matter nor energy can ever be created or destroyed, and changes must add up to zero. So the universe has a component possessing negative energy This does not have to be gravity as many scientists claim today. Gravity would be positive like matter if it forms matter, as described above. The negative portion can be the previously described hyperspace of the 5<sup>th</sup> dimension# (when this is added to the positive energy of gravitation/matter, the result is zero.)

### # Overcoming Instability in Extra Dimensions

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

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

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

\* Picture spacetime existing on the surface of the figure-8 Klein bottles (described in the next paragraph as subuniverses, and analogous to doughnuts). The Poincare conjecture has implications for the universe's shape and says you cannot transform a doughnut shape into a sphere without ripping it. One interpretation follows: This can be viewed as subuniverses shaped like Figure-8 Klein Bottles gaining rips called wormholes when extended into the spherical spacetime that goes on forever (forming one spatially infinite, temporally eternal

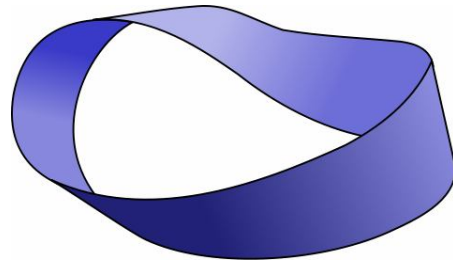
universe which is often called the multiverse when subuniverses - which share the same set of physics' laws - are incorrectly called parallel universes which are wrongly claimed to each possess different laws). These rips (cosmic wormholes) provide shortcuts between points in space and time – and belong in a 5<sup>th</sup>-dimensional hyperspace. The boundary where subuniverses meet might be a Cosmic String (they'd be analogous to cracks that form when water freezes into ice i.e. cosmic strings would form as subuniverses cool from their respective Big Bangs and would move as subuniverses expand).

## **“DIGITAL” STRING THEORY AND RENORMALIZATION**

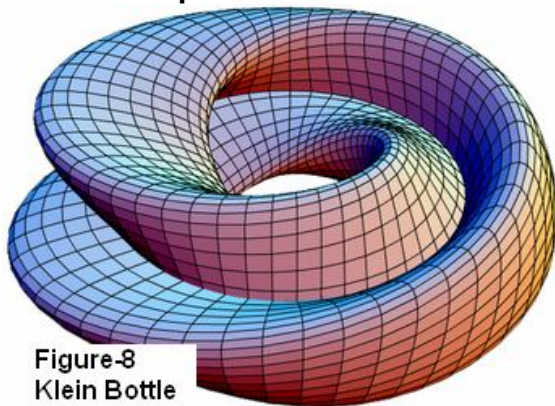
Let's borrow a few ideas from string theory's ideas of everything being ultimately composed of tiny, one-dimensional strings that vibrate as clockwise, standing, and counterclockwise currents in a four-dimensional looped superstring. We can visualize tiny, one dimensional binary digits of 1 and 0 (base 2 mathematics) forming currents in a two-dimensional program called a Mobius loop – or in 2 Mobius loops, clockwise currents in one loop combining with counterclockwise currents in the other to form a standing current. Combination of the 2 loops' currents requires connection of the two as a four-dimensional Klein bottle. This connection can be made with the infinitely-long irrational and transcendental numbers. Such an infinite connection\* translates - via bosons being ultimately composed of the binary digits of 1 and 0 depicting pi, e,  $\sqrt{2}$  etc.; and fermions being given mass by bosons interacting in matter particles' "wave packets" – into an infinite number of Figure-8 Klein bottles which are, in fact, "subuniverses" (binary digits fill in gaps and adjust edges to fit surrounding subuniverses [similar to manipulation of images by computers]). Slight "imperfections" in the way the Mobius loops fit together determine the precise nature of the binary-digit currents (the producers of space-time-hyperspace, gravitational waves, electromagnetic waves, the nuclear strong force and the nuclear weak force) and thus of exact mass, charge, quantum spin. They would also produce black holes - whose binary digits could, in the case of the sun, come from our star being compressed to 2.95 kms, in which case the pressure increase "shreds" the sun into its binary digits (its mass is relativistically converted into the energy of binary digits). In this way, the universe could be spared [as Einstein hypothesized] from the consequences of black holes' alleged infinite gravity, infinite curvature and infinite mass.) Referring to a Bose-Einstein condensate, the slightest change in the binary-digit flow (Mobius loop orientation) would alter the way gravitation and electromagnetism interact, and the BEC could become a gas (experiments confirm that it does).

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

retaining the infinite values might point the way to deeper understanding of the cosmos.



**Möbius Loop**



**Figure-8  
Klein Bottle**

### **Universe Within A Black Hole**

“Black hole realities” states, “An entire universe could exist within a black hole,” (Neil deGrasse) Tyson said (he’s an astrophysicist, director of the Hayden Planetarium in the USA and presenter of TV’s new “Cosmos” series). What happens if we look at this universe-black hole relationship not as the physical placing of the former within the latter (not possible if, as explained moments ago, black holes don’t possess infinite mass), but as both being composed of precisely identical structures at the most fundamental level? This structure is suggested to be the base-2 maths (binary digits, or bits, of 1 and 0) outlined in Digital String Theory.

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

“Pioneered by Rafael Sorkin, a physicist at the Perimeter Institute in Waterloo, Canada, the theory (causal sets) postulates that the building blocks of space-time are simple mathematical points that are connected by links, with each link pointing from past to future.”

“In the late 1980s, Sorkin used this framework to estimate the number of points

that the observable Universe should contain, and reasoned that they should give rise to a small intrinsic energy that causes the Universe to accelerate its expansion. A few years later, the discovery of dark energy confirmed his guess.”

This impresses me, but the part about “each link pointing from past to future” doesn’t agree with my conviction that the future can influence the past, and that humanity was born from time travel to the past coupled with biotechnology existing centuries from 2014 (“Retrocausal” Sets should exist too). Maybe binary digits are able to be called hidden variables - Einstein said hidden variables carry extra information about the world of quantum mechanics and complete it, eliminating probabilities and bringing about exact predictions. Energy from hyperspace (which is unified with space-time and forms its scaffold) creates the 1’s and 0’s in space-time’s so-called vacuum that are usually labelled “virtual particles”. And the intimate connection between everything which is a result of being produced by the digits – between matter, time, space, gravity, dark energy, etc. – might be known as “quantum entanglement”.

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