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Communication

Gravity, Topology, and Complex Mathematics in the Universal Optimized Simulation

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Abstract - An interesting sentence in an MSN article about Dr. Vopson's theories concerning a computational or simulated universe is: "Essentially, moving several objects close together via gravity reduces the amount of computational power to describe the whole system [1]."

Keywords - Computational universe; Gravity; Mobius strip; Binary digits; Imaginary numbers.

The centers of the gravitons, whether the gravitons are pictured as particles or waveforms, might be physically quantum entangled. Then all the universe's gravitational fields could be regarded as a single graviton. In this way, objects couldn't possibly be closer and computational power would be at its absolute minimum. How could this kind of entanglement be achieved? A form of entanglement - not limited to laboratories and temperatures near absolute zero (or in stars' cores) - might be achieved by adaptation of cosmology's holographic principle. [2] The principle says the 3^{rd} dimension results from information in a 2^{nd} dimension. By reprogramming that 2^{nd} dimension, the 3^{rd} dimension (and thus, distance) is feasibly totally removed between the centers of particles, physically quantum-entangling them.

Accepting the computational nature of the cosmos, imagine that the 2^{nd} dimension is the 2D Mobius strip being composed of electronics' binary digits. Trillions of strips could compose a photon, with a pair of Mobius strips joining into the 3^{rd} dimensional figure-8 Klein bottle (trillions of these Klein bottles make up a graviton). This is another way of saying the 3^{rd} dimension results from information in a 2^{nd} dimension. Interaction of photons and gravitons might cause a pressure defined as mass of, say, the nuclear-force particles. And the photon's quantum spin of 1 could be divided by the graviton's spin 2 to produce any fermion's spin 1/2. Such a scenario agrees with a paper of Einstein's which asks if the interaction of gravitation and electromagnetism plays a role in forming elementary particles [3].

The strong nuclear force's massless gluon could be formed by cancellation. Wick Rotation can exemplify cancellation of the Real and Imaginary components within the universe's Complex mathematics if Wick isn't restricted to being thought of as mere convenience or trickery. Wick is a circle containing two axes that intersect at its origin - a horizontal x-axis whose "real" ends are labeled 1 and -1, plus a vertical y-axis with "imaginary" ends i and -i. Whenever a point on this complex plane is multiplied by i, it moves a quarter rotation

around the origin or center of the plane (counterclockwise). Start with 1, multiply by i then by i again (i^2 = -1), then add the 1 and -1 to get 0 (cancellation of gluon mass).

How might an Optimized Simulation be created? A model of the cosmos might be built that uses the infinite number pi and imaginary time, and resides in Virtual Reality (artificial, computer-generated simulation). The entanglement (both quantum and macroscopic) in the simulated universe is unable to remain separate from the entanglement existing in our perceived reality because computers using so-called "imaginary time" (which is defined by numbers with the property i^2 = -1) remove all boundaries between the two universes. This enables them to become one Augmented Reality (known now as technology that layers computer-generated enhancements onto an existing reality but seen here as the related layering of virtual reality onto other points in time and space). The poorly named imaginary time of physics and mathematics unites with pi (both are necessary to generate a non-Big-Bang cosmos i.e. an infinite universe which, because space and time can never be separated, is eternal). This manipulation of time, space, and the universe with virtual and augmented reality might possibly be produced by the two-valued binary-digit system used in electronics traversing a wormhole, or shortcut between folds in space and time, designed by humans of the far future. The augmented reality which is layered on "other" points in space-time actually isn't transmitted to other points - because of the quantum entanglement of every particle (massive or massless) in spacetime, only one ever exists. This point is reminiscent of the sentence near the start of this Communication which says, "Then all the universe's gravitational fields could be regarded as a single graviton". Thus, transmissions to any (apparently other) places or times wouldn't be restricted to the speed of light but are instantaneous [4].

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