A Full-Scale Fifth Spacetime Dimension: The Key to the Theory of Everything?

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Introduction

There exists a full-scale fifth spacetime dimension where the universe expands along two degrees of freedom, parallel and normal to light. While the dimension is very real, it can be difficult to picture in one's mind. The following example helps with the concept. A tetherball's path around its pole (the origin of the universe) is the parallel direction. The radial path, away from the pole, increasing by one radius per revolution, is the normal path. These two paths alter the equations of gravity - gravitational constant, deleting the cosmological constant, and adding a dimension to the Riemannian geometry. They may redefine how time, and space are perceived and help address other unexplained phenomena.

At the inception of the Universe, near infinite mass density created near infinite spacetime curvature. Since then, the universe has expanded through the fifth dimension with decreasing mass density, thus unwinding spacetime, the illusion of dark energy. This is one example of the many enigmas answered by the fifth spacetime dimension.

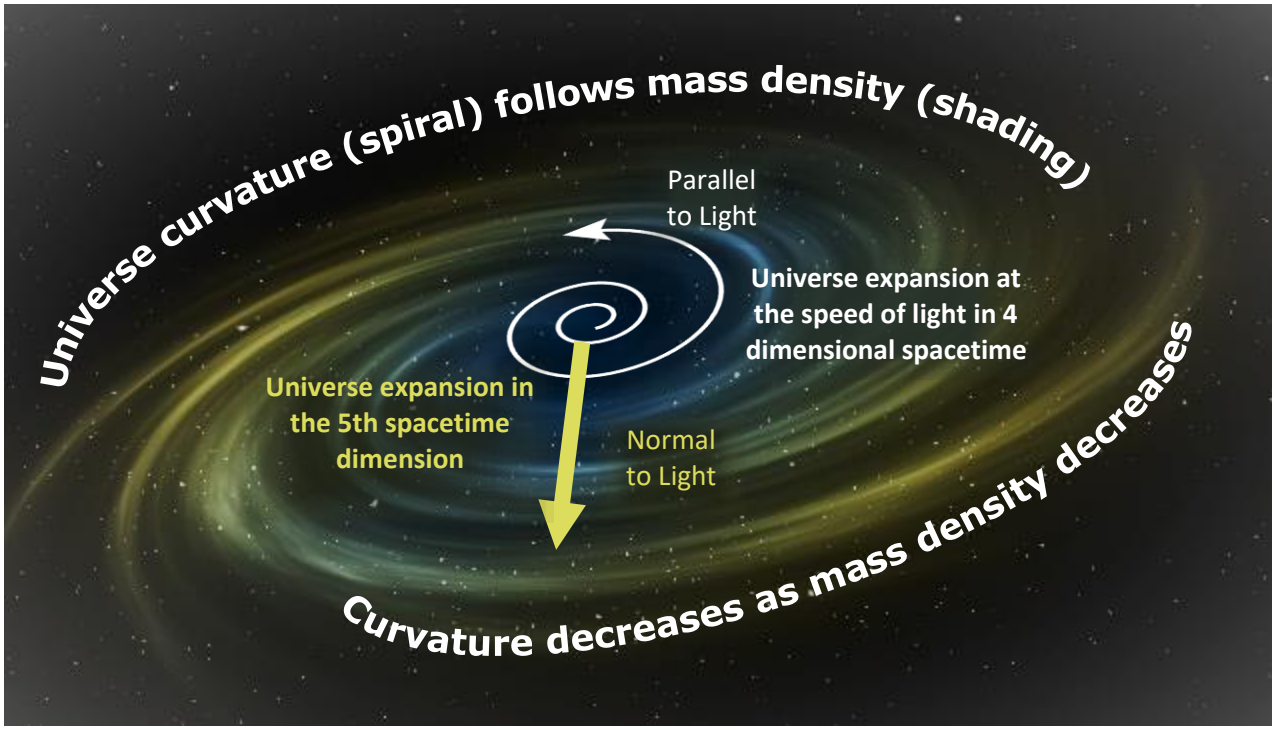

Figure 1. The universe expands along two degrees of freedom – parallel and normal to light. Parallel is at the speed of light. Normal is many orders of magnitude slower.

Gravity acts in the axis normal to light, whereas light on this axis only moves through the fifth spacetime dimension via quasi tunneling. Parallel expansion holds standard gravity where normal expansion contributes to composite gravity. Different magnitudes of gravity results in different rates of time with equilibration events that convert time directly into energy. This might explain certain high energy events like gamma-ray bursts possibly down to time crystals accounting for unchanging entropy with no energy input. Further fifth spacetime implications may help develop the theory of everything. It would advance precision of measurement key to developing practical quantum computers, fusion reactors, and better health care.

Discussion

Each spatial dimension can be thought of as being normal (perpendicular) to the previous dimension. A line (one dimension) is normal to a point (zero dimensions). A plane (two dimensions) is normal to a line. A volume (third dimension) is normal to a plane. And “4 space” (fourth spatial dimension) is normal to three-dimensional space.

We only see in two dimensions, but sensory input makes the third dimension evident. The attributes of the fourth spatial dimension are too large for sensory recognition. Here other information is required to perceive the fourth spatial dimension like the illusion dark energy. Dark matter, composite gravity, and quantum foam are attributes of the fifth spacetime dimension.

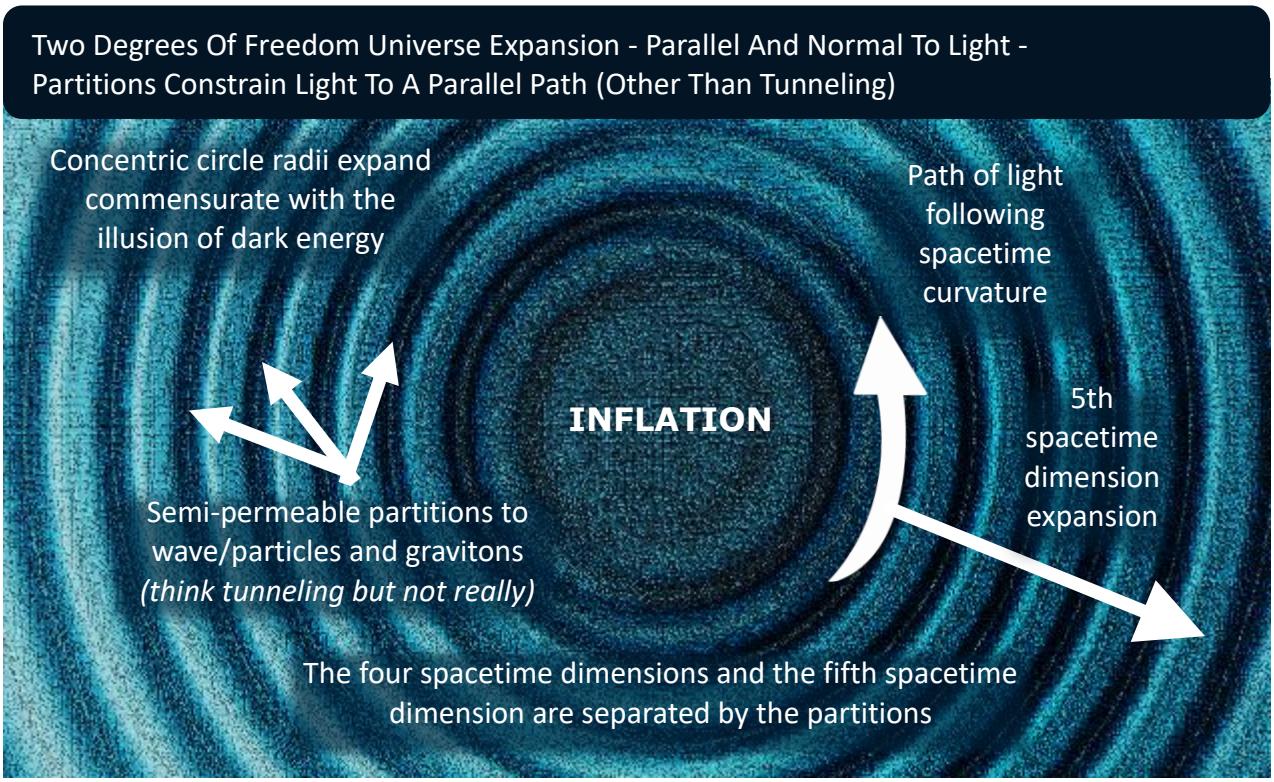

Figure 2. Partitions are required to keep what we know within four dimensional spacetime.

The key to the fifth spacetime dimension is the Universe attributes we understand are confined to four dimensional spacetime by the barrier interface. The paths of energy and matter are confined within the curved barrier interface except for quasi tunneling like how quantum tunneling functions but on a larger scale. The barrier concept is shown in Figure 2.

Figure 3 shows how quasi tunneling is in play for both particle/waves and gravity. Conservation of energy is in effect for particle/wave tunneling of the barrier interface. It is not in play for tunneling of gravity – gravity is never consumed, only felt.

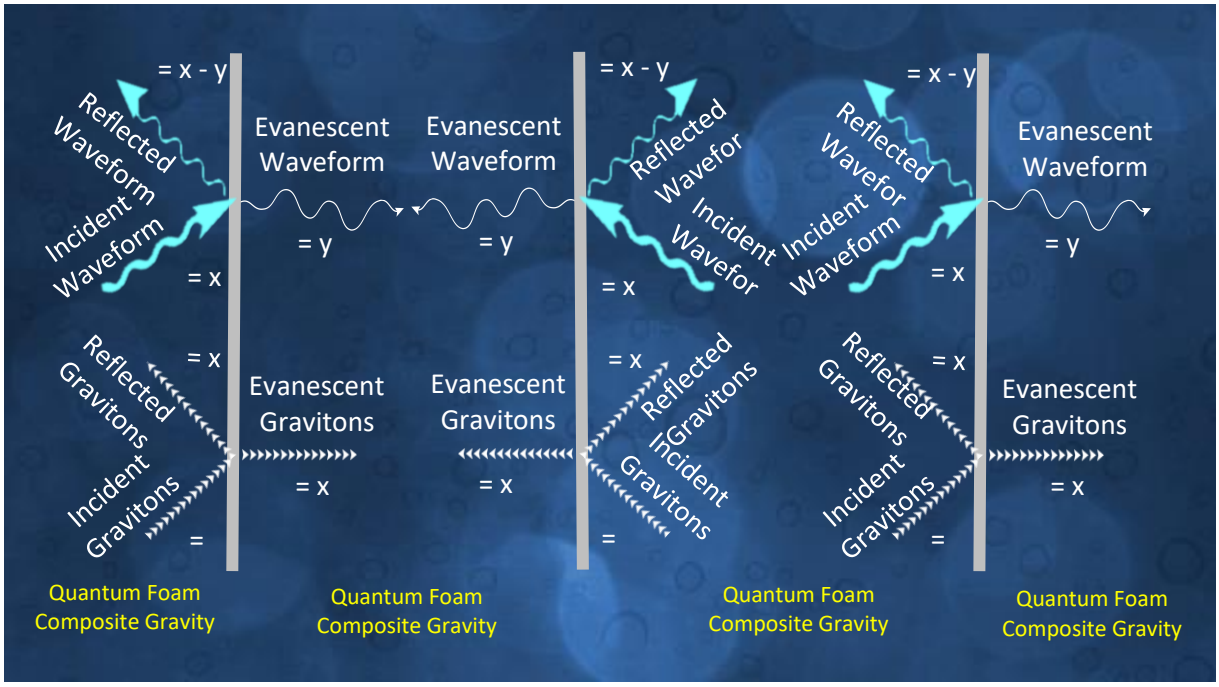

Figure 3. How gravity and wave/particles interact with the partition resulting in quantum foam and composite gravity.

Gravity is in effect in both degrees of freedom universe expansion and as such is subject to vector addition shown in figure 4 where the gravitational constant is redefined; i.e., Gravity is in play in both the $x\Omega$ and $x\phi$ systems, acting as a force multiplier.

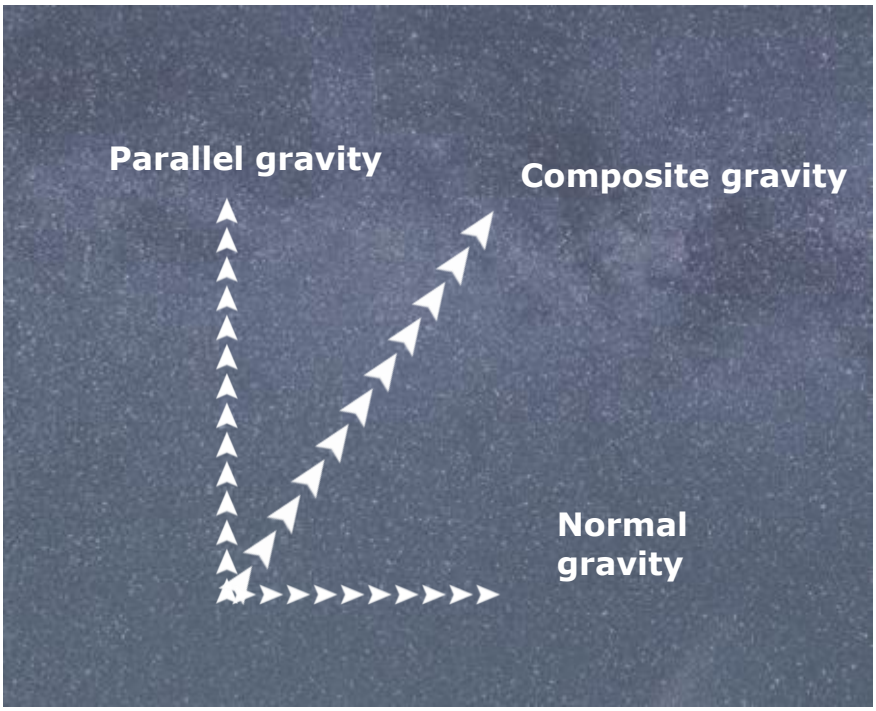

Figure 4a. Composite gravity is the vector addition of parallel and normal gravity/gravitons across the partitions

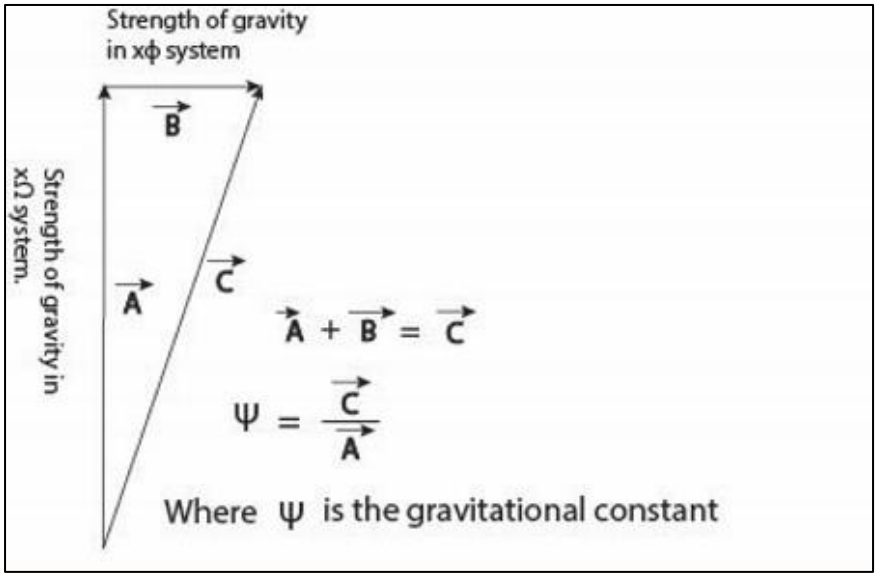

Figure 4b. Simple vector addition resulting is where C is composite gravity.

Figure 5 indicates the rate the fifth spacetime dimension expands as a function of time. This rate would be far less than the speed of light. Recall Zeno's paradox of the tortoise and the hare that Aristotle included in his Physics. Why would Aristotle do that with something so ridiculous on its face? Could he have been referring to no matter how fast the hare travels nor how slow the tortoise, the tortoise always moves normal to the hare keeping it perpetually out of reach. Are there other examples where the ancients seemed to know stuff far beyond what the knowledge of their day supported?

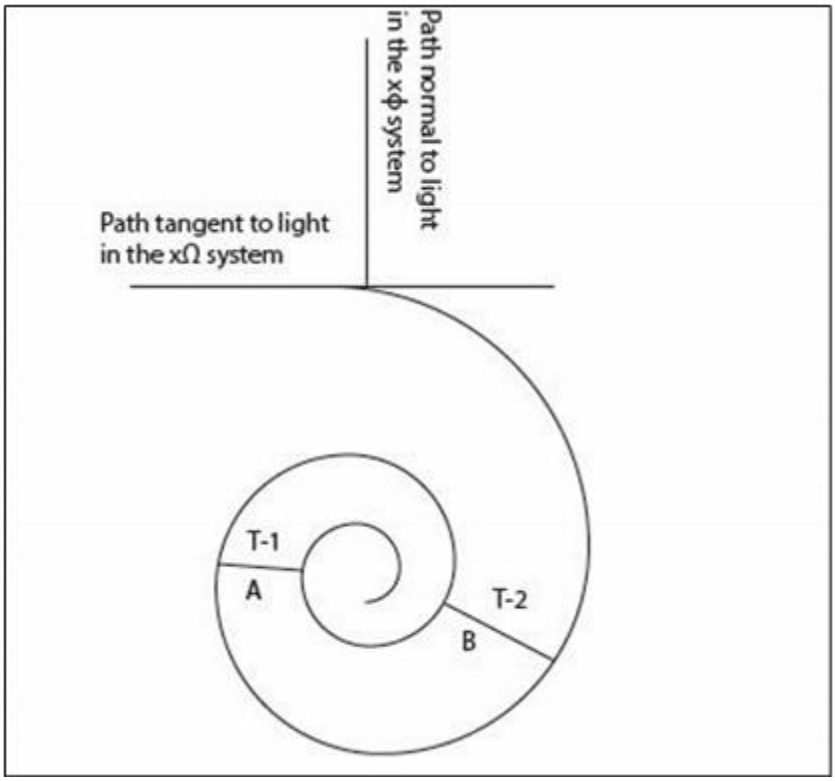

Figure 5. Line A is the magnitude of xϕ dimension at time T-1. Line B is the magnitude of the xϕ dimension at time T-2. B-A is how far the xϕ dimension expanded for T-1 or T-2. Time equilibrium events result in lost time with concomitant loss of distance of travel. The result is a slight reduction of universe volume

Lisa Grossman discusses how dark matter might have originated as antimatter by a process involving X particles[1]. In a similar process, weak force charge parity violation might have decayed antimatter into space dependent information retaining the original gravitational attributes possibly accounting for baryon asymmetry. This would account for the illusion of dark matter.

Baryon asymmetry is believed by some to result from negligible charge parity violations where electroweak symmetry breaking occurred during one ten-billionth of a second after inception[2, 3.] – to be discussed below.

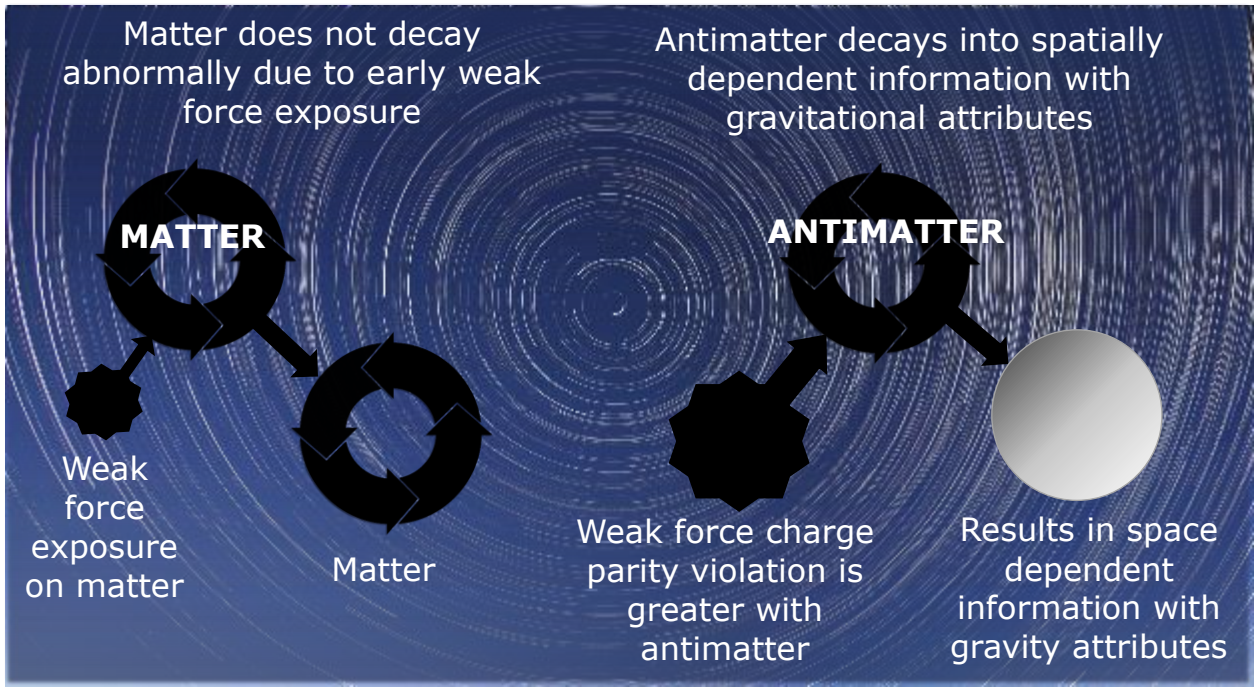

Figure 6. Near inception, antimatter decays to spatially dependent information with gravitational attributes via greater weak force charge parity violation

The addition of a fifth spacetime dimension suggests the dimension should be added to the Einstein field equations that define spacetime curvature as a function of mass density.

Early on there was interest in adding a fifth spacetime dimension to the field equations. The Kaluza-Klein theory tried to unify gravity and electromagnetism and had Einstein's interest[4]. This theory is considered partially false, but the concept of tightly wound space remains today. Had they known about observations suggesting dark energy, they may have succeeded by realizing the fifth spacetime dimensions is full-scale and not tightly wound. Had they incorporated these observations in their analysis, it may have led them to the theory of everything.

Adding a dimension to the already complex field equations may result in complexity beyond reasonable use. This would redefine the gravitational constant and Riemannian geometry would expand to five spacetime dimensions. It likely goes from a four-by-four matrix to five-by-five matrix increasing the number of equations – as if they aren't difficult enough already.

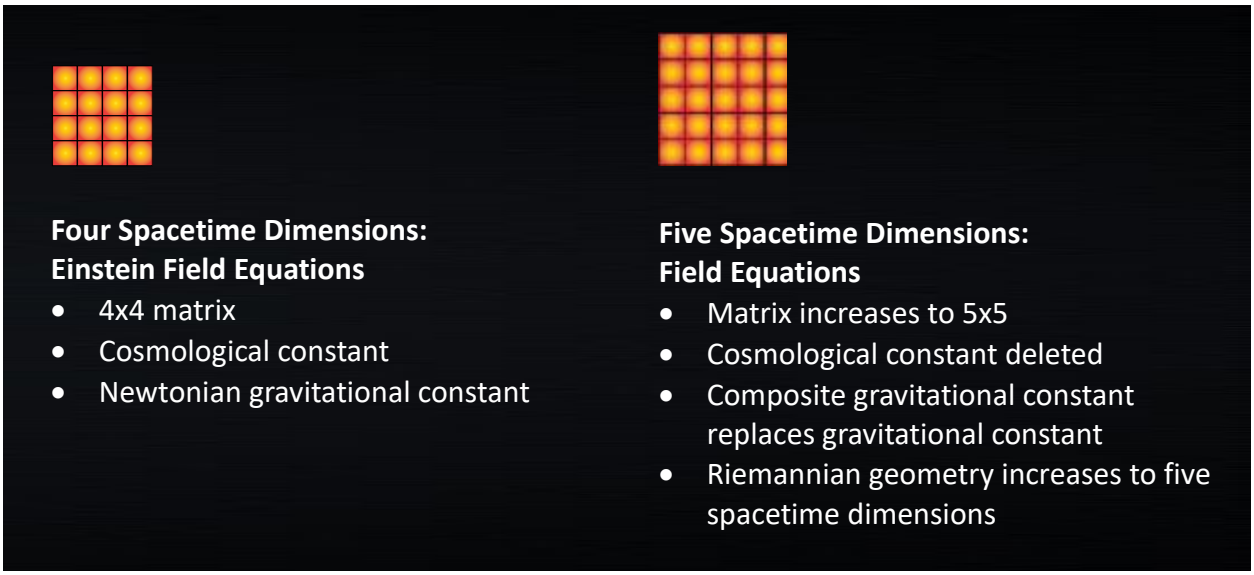

Figure 7. Four vs fifth spacetime dimension field equations

By using the altered field equations, it might be possible to extrapolate universe expansion from inception to now. The following shows how the existing field equations might be altered in the three epochs of universe expansion. The key is recognizing that all is composed as attributes of the primal element - information.

The field equations in the unconstrained epoch

$$G_{\mu\nu} + g_{\mu\nu} = \frac{8\pi G}{0} T_{\mu\nu}$$

Only information (not constrained by the speed of light) is present in the unconstrained epoch. As the speed of light has no meaning it is represented as zero. The field equations are undefined in the unconstrained epoch.

The field equations in the opaque epoch

$$G_{\mu\nu} + g_{\mu\nu} = \frac{8\pi G}{c^4} T_{\mu\nu} + RadiationPressure$$

Photons are constrained by free electrons not allowing the photons to escape, creating added radiation pressure.

The field equations in the transparent epoch

$$G_{\mu\nu} + g_{\mu\nu} = \frac{8\pi G}{c^4} T_{\mu\nu}$$

The SLAC BaBar project[5] and others have found small amounts of charge parity violations with B mesons and are far too small to account for baryon asymmetry. It might be possible that the weak force charge parity violation on antimatter could have been sufficient at inception to decay it back into the primal element information maintaining spatial and gravitational attributes. The fifth spacetime dimension might have been in play with this given other effects it may have elsewhere.

Dark matter is the resultant vector of the xΩ and xϕ gravity applied to antimatter remnants. Xϕ gravity needs to be multiplied by a gravitational constant sufficient to account for all known matter and dark matter, see Figure 4.

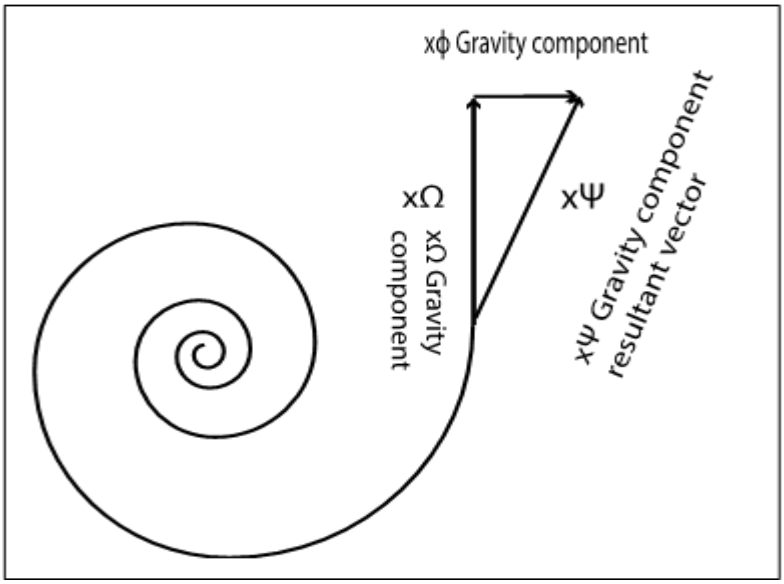

Figure 8. The vector sum of the xΩ and xϕ system gravity is resultant xΨ gravity where Ψ is the new gravitational constant superseding Newton's gravity constant. This is how much xϕ gravity must be multiplied by to account for all known matter and dark matter. Time equilibration discharges may need to be considered for dark matter.

Continuing in this line of reasoning, five spacetime dimensions could be in play for particle physics. As Minkowski's four dimensional spacetime acquires a new dimension it may be possible to limit Hilbert space to five spacetime dimensions, possibly reducing the number of free parameters and thus simplifying quantum mechanics. As everything may be depicted as attributes of the same thing, information, it may be possible to view string theory in this respect and bring that down to five spacetime dimensions or replace it all together.

Given time equilibration may result in energy discharges, it is possible that matter and energy might begin and end in the primal element information. This would fit well with space independent information being the state prior to universe inception and within black hole singularities. Working under this assumption the universe could be thought of as:

(I)Information = (T)Time = (E)Energy = (m)Mass x (c)Speed of Light Squared.

Time is the information attribute that allows for a continuum for attribute changes. I = T = E = mc^2 can be based on E=mc^2 as a foundation on the equation for the equivalence of mass and energy.

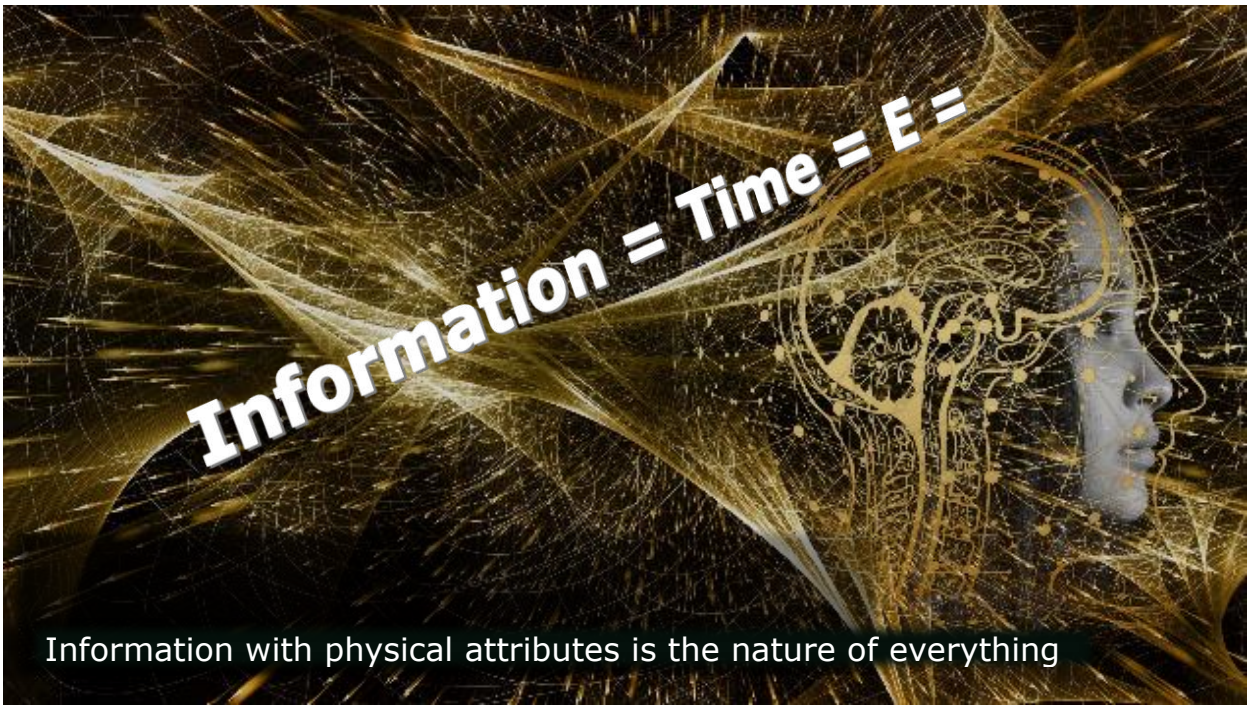

Figure 9. The origin of everything is information, the primal element prior to universe inception and in singularities

The Magnitude of gravitational fields regulates the rate of time[6]. The rate of time is slower in the xϕ system than in the xΩ system because gravity is stronger in the ϕ system. The different rates of time will require equalization much like how earthquake faults equalize stress. This may explain puzzling energy discharges such as gamma ray bursts, ultra-high energy cosmic rays and gamma ray activity in thunderstorms.

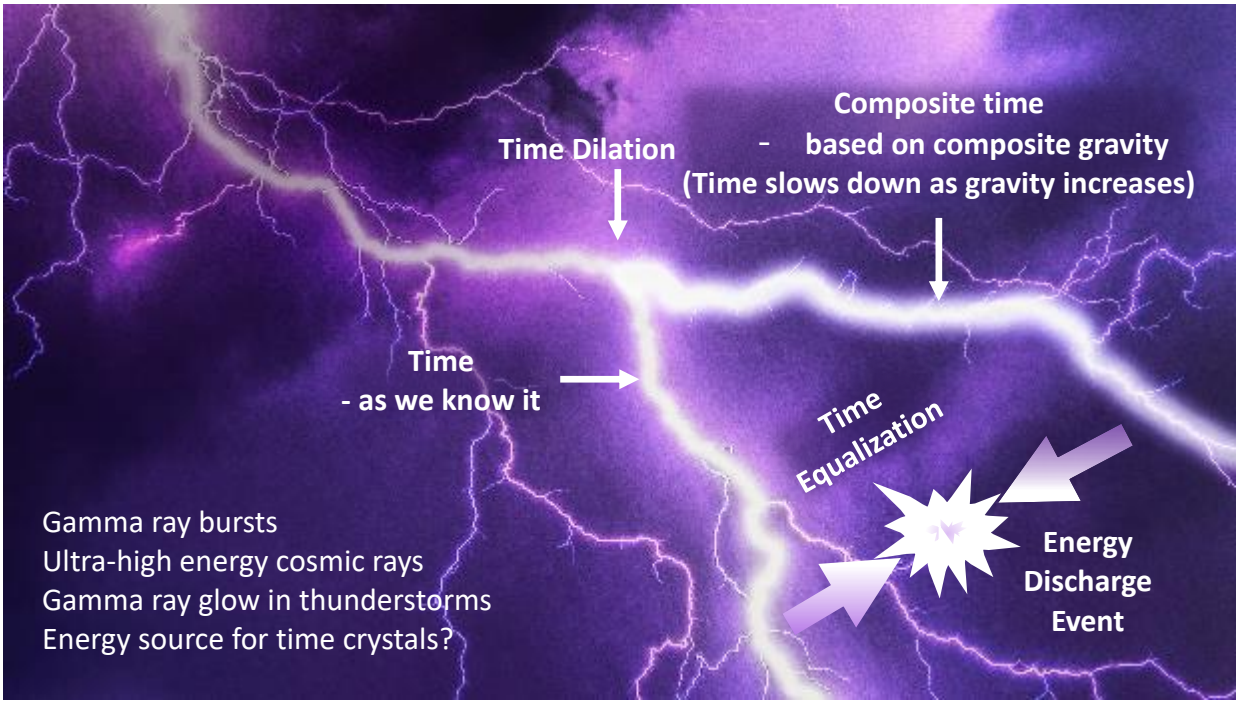

Figure 10. Time dilation equalization creates energy - Time runs at different rates due to the different magnitudes of gravity in 4 vs 5 spacetime dimensions requiring equilibration.

Gamma ray bursts and ultra-high energy cosmic rays are randomly distributed about the sky while the elements of Universe are not. NASA states, "From the early 1970s it has been apparent that gamma-ray bursts come from all parts of the sky with approximately equal probability[7]*."*

Witze describes gamma ray production in thunderstorms[8]. Conditions within thunderstorms might trigger local time dilation equilibration events enabling lightning to span gaps farther than is supported by the electrical charges therein.

This question follows - Do time dilation equalization events happen on the quantum scale? Are there quantum events that appear to defy the second law of thermodynamics where there is no increase in entropy for infinite physical events? If so, time might supply the energy necessary to keep entropy stable. Something to this effect might exist in time crystals where quantum states oscillate as a function of time appearing as a perpetual motion machine[9]. Time dilation equilibration events may be detectable on the quantum scale bringing gravity into particle physics.

Time dilation equilibration may account for the random spatial distribution of ultra-high energy cosmic rays and gamma ray bursts. Razzaque, states the following about ultra-high energy cosmic rays:

> *“A more profound result from the latest Auger data is the near independence of the spectral shape on the angle with respect to the celestial equator. This lack of anisotropy in the arrival directions severely disfavors models that assume that all the UHECRs are produced by a few bright and nearby sources. Instead, the data favor a uniform spatial distribution of UHECR sources, which implies they are extragalactic.”*[10]

There are three epochs of Universe expansion. The three epochs are the unrestrained epoch, opaque epoch, and transparent epoch.

This first epoch of Universe expansion is the period now known as inflation. It is consisted of space dependent non-physical attribute information independent of the speed of light. Space was created first before information acquired physical attributes. Expansion of space containing only information sans physical attributes is not bound by the speed of light. At some volume, information acquired spatial attributes where space expansion became bound by the speed of light. Was this transition instantaneous or gradual?

The opaque epoch blocked light due to free electrons increasing radiation pressure maintaining a higher spacetime curvature thus slowing expansion in the $x\phi$ system. Energy levels were too high to allow non-ionized elements to form. Free electrons stifled photon travel adding radiation pressure that would have been a component of the revised stress energy tensor creating more spacetime curvature than would be otherwise expected. The rate of $x\phi$ system expansion would have been slower due to higher radiation pressure.

The current transparent epoch is free to expand absent the conditions of the first two epochs. This epoch began when the universe became transparent with concomitant reduction of radiation pressure as photons were free to travel.

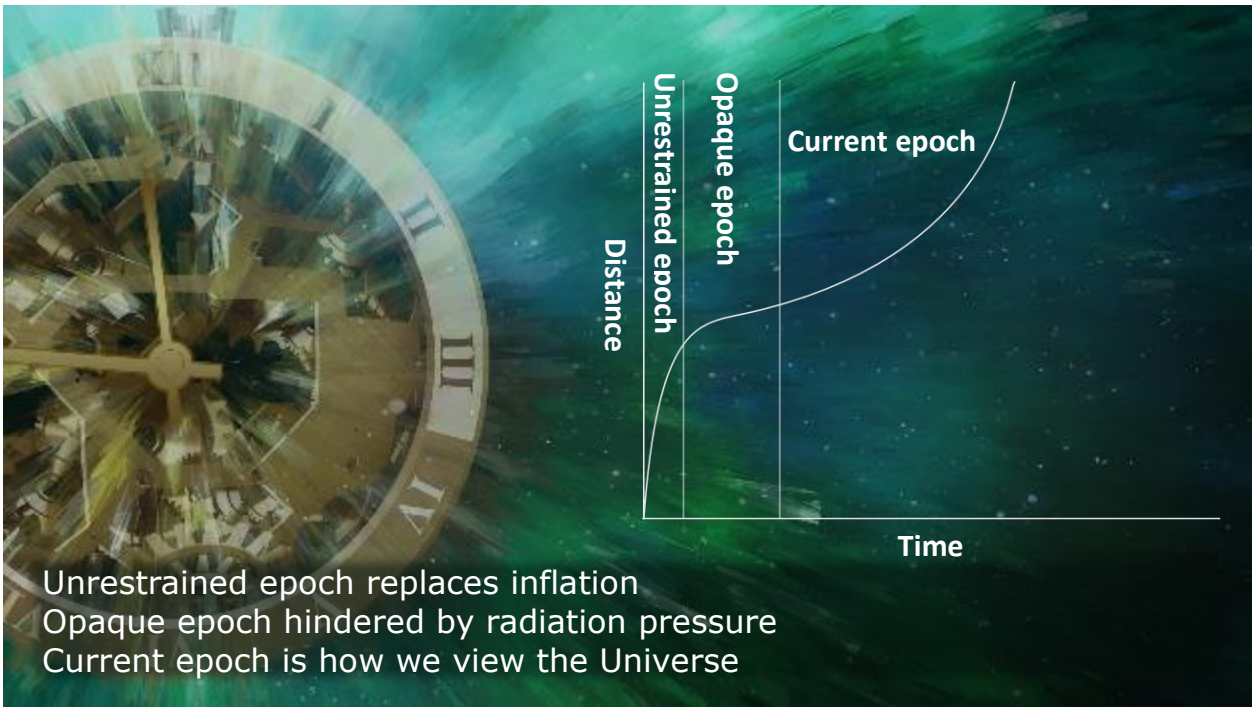

Figure 11. Three epochs of universe expansion. The unrestrained epoch produced sufficient space for information to take on physical attributes. The opaque epoch began with restricted spacetime expansion until the universe became transparent thus releasing radiation pressure. The current epoch accelerates as spacetime curvature decreases with mass density.

If information is indeed the primal element, it might act as the DNA of the universe. If so, it might be manifested in the cosmic microwave background (CMB). Given its constant, albeit small strength, billions of years of this gentle wash of energy overrides relatively short temporal events such as star formation, supernovae, and black holes...

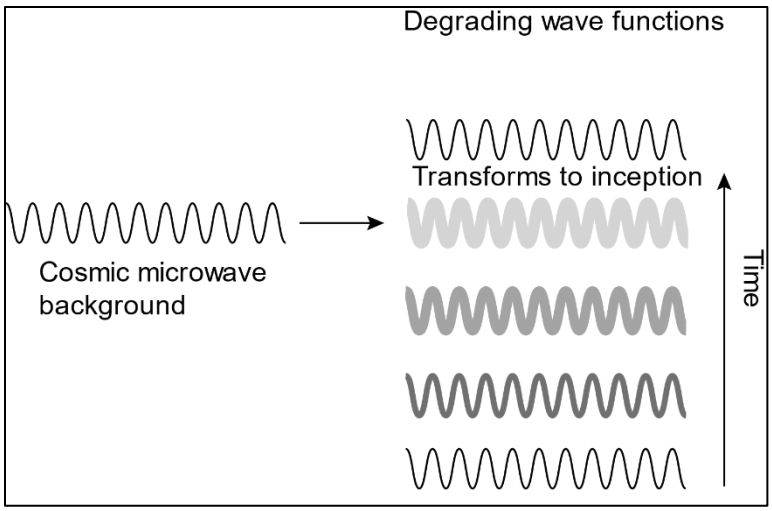

Figure 12. Wave function entropy increases with time. The cosmic background radiation interacts with wave functions via quantum teleportation to bring entropy back to the state of universe inception. This interaction occurs in the fifth spacetime dimension.

Conclusion

The fifth spacetime dimension is easily derivable from the other four. This paper suggests the ramifications of the fifth spacetime dimension. All the ramifications are required to allow the math to work from the large to small scale. The intent here is to suggest an approach to the theory of everything for consideration by those capable of doing the math and physics to determine if any of what is presented here might be valid.

Potential Math Approaches

The following is a list of possible mathematical approaches that would use available data to shed light on the above conjectures:

1. Calculate how much $x\phi$ system gravity must be multiplied by to achieve all known matter and dark matter mass considering antimatter decayed to space dependent information with gravitational attributes. This is the new gravitational constant Ψ. This includes the matter, dark matter spatial distribution delta.

2. Increase the Einstein field equations to five spacetime dimensions and add the Ψ gravitational constant. With known mass and gravitational constant, extrapolate universe expansion along the three epochs using the expanded Einstein field equations.

3. Create a space based on limiting Hilbert space to five spacetime dimensions. Consider all are attributes of information. Explore alternatives to linear operators on vectors in five dimensional spacetime for quantum mechanics as well as constraints defined by Heisenberg.

4. In this new five spacetime dimension space, consider information attributes as an alternative to strings.

5. If the CMB is coupled with particles and fields in the universe, there should be a temporal relationship between the CMB and the universe. If such is the case, it may be most evident in related harmonic components in molecular cloud turbulence. If true, it should be possible to correlate the temporal attributes of the CMB and molecular cloud turbulence by processes like signal averaging. The first step is to determine what the harmonic components of molecular cloud turbulence are, if any.

   The goal is to partition molecular cloud turbulence data in time durations that are an interval of the harmonic attributes. Not knowing the temporal attributes

requires sampling techniques that will zero in on a desired harmonic interval. One way to do so would be to run small increments of time duration samples through the signal processing until the magnitude of the results is significantly greater or less than the magnitudes of random sampled durations.

If a temporal attribute is detected in molecular cloud data, it can be applied in the same way to the CMB to determine if that temporal attribute exists in the CMB. If that is the case, one could conclude that the CMB holds influence over particles and fields in the universe in general. The state of CMB data may make this impossible now, however it is an alternative way to look at the CMB for correlation to known phenomena.

6. General relativity and particle physics are incompatible because precise information on momentum and location are required for the field equations where this is not permitted by the uncertainty principle. This contradicts the uncertainty principle that claims it is impossible to precisely know location and momentum at the same time. The uncertainty principle is based on four dimensional spacetime. This should be explored with respect to five dimensional spacetime.

7. Simulate lightning to scale energy input to create gamma ray after glow. Does energy output exceed energy input? If so, the source might be time equilibration energy discharge.

8. It may be possible to reconsider the uncertainty principle with respect to five spacetime dimensions where additional information about particles might be known. It should be possible to define everything as attributes of information and explore this in context with five spacetime dimensions. While the uncertainty principle will hold for most of particle physics as Newtonian physics holds its sway, there should be cases free of such constraints.

9. Estimate the energy to be generated from time dilation equalization on the quantum scale extrapolated from larger scale potential examples for relevance to keeping entropy at a steady state in time crystals.

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