Macro String Theory: Superstrings and Single Field Theory

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Abstract: The physics community has seemingly been faced with an unsolvable conundrum for the past century. Its two fundamental theories of reality, the quantum and relativity, for all intents and purposes seem incompatible as normally defined by their discreteness and continuity, respectively. This conundrum is not an unsolvable mystery as nearly everyone believes but only a simple challenge for scientists to overcome. When this problem is considered at a lower and more fundamental level of physical reality it disappears, yet scientists swear it is already being considered at the lowest level of fundamentality so they look for nothing more fundamental. Points or point-elements are not discrete in our three-dimensional Riemannian surface, which is distinguished in physics by its internal continuity, but our infinitesimally thin surface is discrete from the similar parallel three-dimensional surfaces that collectively constitute the fourth or embedding dimension of our space. Therefore, a Kaluza A-line constituting a macrostring can be constructed of discrete points relative only to the fourth dimension of space. while the three-dimensional surface of our world remains continuous. This structure then requires a change in how the different quantities and concepts are defined and understood in quantum theory for a complete unification to occur.

Keywords: Unification, String theory, Macrostrings, Kaluza-Klein, suppressed variables, expectancy factor, expectancy value

Introduction

Unification is the gold ring of all modern physics, but no one has yet accomplished it, or at least no group of physicists has acknowledged anyone's having achieved that goal. The problem with reaching that goal is that everyone has preconceived notions of what unification could and should entail and what it could not and will not entail, so they are unwilling to look at any cases or claims that do not fit their predetermined guesses as to how to unify the quantum and relativity. But then, it seems that no one has even attempted to analyze the mistakes of others regarding unification since they are completely mesmerized with their own tragic and meaningless assumptions regarding what unification should look like. The truth is that physics is easily unified to a far greater degree than anyone could ever have dreamed of or imagined, but no one seems to care. The key is a simple analysis of where others have gone totally wrong and where others dare not go for some silly reason of misguided logic. No one seems to consider the possibility that the present theories (paradigms of physics) are equivalently successful and equally valid, but they are all incomplete in one way or another so they that cannot be unified as equals as they presently stand unless they are completed.

They are all incomplete on the issue of the point/extension duality of our perception and interpretation of physical reality. In other words, the moment-to-moment variation (discreteness) from continuous linear motion (kinematics) of an orbiting object, except via a center-of-mass point around which it rotates or orbits, defines the discrete nature of a point (and thus the quantum nature of gravity) in classical gravity theory. Since the orbiting object follows the circular path, the vector velocity can only exist within the discrete point at any moment along its orbital path even though as a vector, since its velocity is non-zero and thus extended.

On the other hand, there are no such things as dimensions in quantum theory and quantum mechanics as represented by the Heisenberg uncertainty principle. Predicted values only become dimensional after collapse of the wave packet by consciousness and/or entanglement, both of which are universal. That is because the

quantum theory is by its very own nature and admission non-geometrical. This works fine for time, which is connected discrete point-to-point (moment of time) rather than extended like a spatial geometric dimension, but it causes problems for spatial observations, measures, experiments and theoretical predictions. This fact also means that each and every moment (a point of time) is a reflection, indication, product or mirror, or exact and precise duplicate of every other discrete point in the universe which is a collection of all such points. In other words, any possible change in a discrete point at any position in the universe is simultaneously copied by each and every other discrete point in the universe, such is the entanglement through the single-pole in the fourth spatial dimension of space and the universe as a whole, as well as in its parts, is constantly evolving. Evolution is then the true 'arrow of time', if not time duration itself.

In the case of relativity theory, as exemplified by both the special and general theories, time is considered the fourth dimension which raises invalid questions of a possible backward movement of time. But time is not, in itself, a dimension as are the geometrical dimensions of space. It is only the forward evolution of the universe that gives time similarity to a spatial dimension and its conscious interpretation of duration of time. This truth of nature and our reality is exemplified by the simple mathematical equation of proper distance:

$$(ds)^2 = (x)^2 + (y)^2 + (z)^2 – (ct)^2$$

or

$$(ds)^2 = (x)^2 + (y)^2 + (z)^2 + (ict)^2.$$

The negative sign for the time dimension of space-time demonstrates the fundamental dimensional difference between the three dimensions of space, designated by x, y, z, and time. That difference invokes the imaginary number i (such that $i^2 = -1$) to justify the negative sign. In other words, considering time a dimension equivalent to the three of normal space is at least a mathematical convenience, if not a figment of our imagination.

Duration or lengths of time thus take on a totally different meaning in relativity and classical mechanics than time in the quantum theory, and this point is seldom, if ever, considered in physics where time is just a matter of fact and not analysis in all any and all cases, without variation of interpretation of adequate definition. This fact alone throws the common scientific interpretation of determinism and indeterminism into doubt, while in reality they are both metaphysical assumptions and have no meaning or place in real physics. These are merely a few of the reasons to reinterpret the basic theories and assumptions of modern physics, but the most important are the false assumptions regarding the differences between point and continuity.

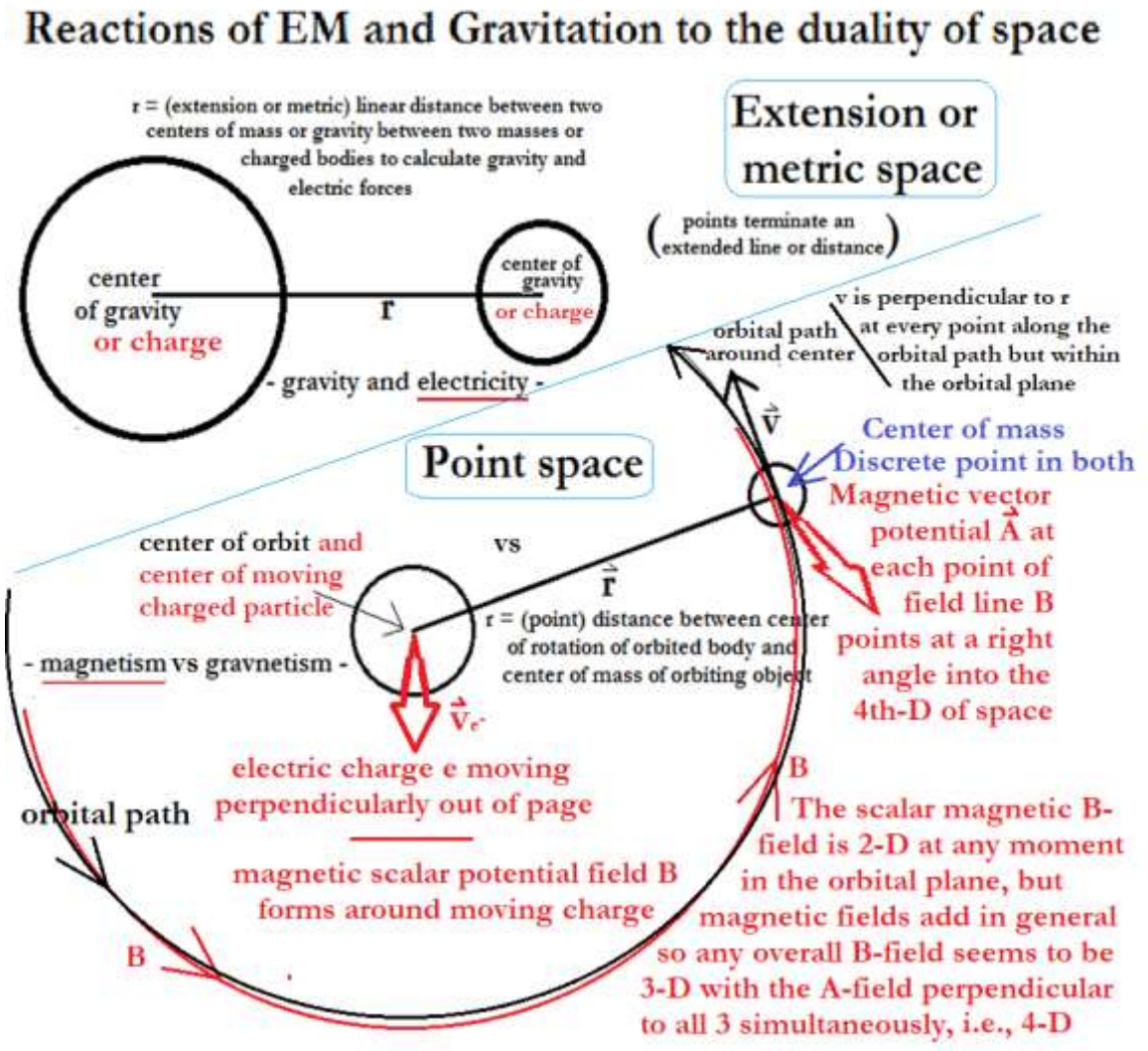
In other words, the answer to this dilemma is that three-dimensional physical space is dualistic, as related to point and extension, and that distinction disappears and becomes a moot point when the four-dimensional nature of the embedding spatial manifold is correctly considered in the mathematics, *i.e*., physical space requires both extension as well as point expression for any force that acts within a three-dimensional surface. Electromagnetism already expresses both, but gravity is only expressed by its extension (metric) in space. Therefore, the gravity theories of both Newton and Einstein are incomplete, as is the quantum theory which relies solely on discrete points, and the two common traditional natural forces cannot be unified by using only non- or anti-symmetric tensor components for electromagnetism as Einstein and others attempted. Once this problem is solved for the natural forces, the discrete nature of the quantum is naturally revealed within the classical theories and unification can be accomplished.

The discrete-point nature of gravity

The concepts of (discrete) point and extension are even more fundamental than point and continuity and this fact can be easily demonstrated in by a proper interpretation of classical Newtonian gravity. This problem is not unique to physics but is a fundamental problem concern for both classical and non-Euclidean geometries as well as arithmetic where it is related to the assumed integrity and continuity of a simple number line, *i.e.*, there is no mathematical proof that the assumption that the number line, as presently defined, is completely without

breaks, discontinuities, or interruptions by discrete points. This problem is no different than the major point/extension discrepancy in Newtonian gravity theory.

The continuous orbital path of any object cannot be mathematically represented in a three-diemsnional space so the pseudo-forces of centripetal and centrifugal forces were invented to explain orbits and all rotational and circular motions in nature. All such motions, which includes all real motions except straight linear motions (kinematics) display continuities of seed but discrete-point direction changes along their paths of motion. So discrete points and continuous points can coexist in nature but have never been considered as consequential in three-diemsnional physics, although ultimately, they must be to have any success in unification.



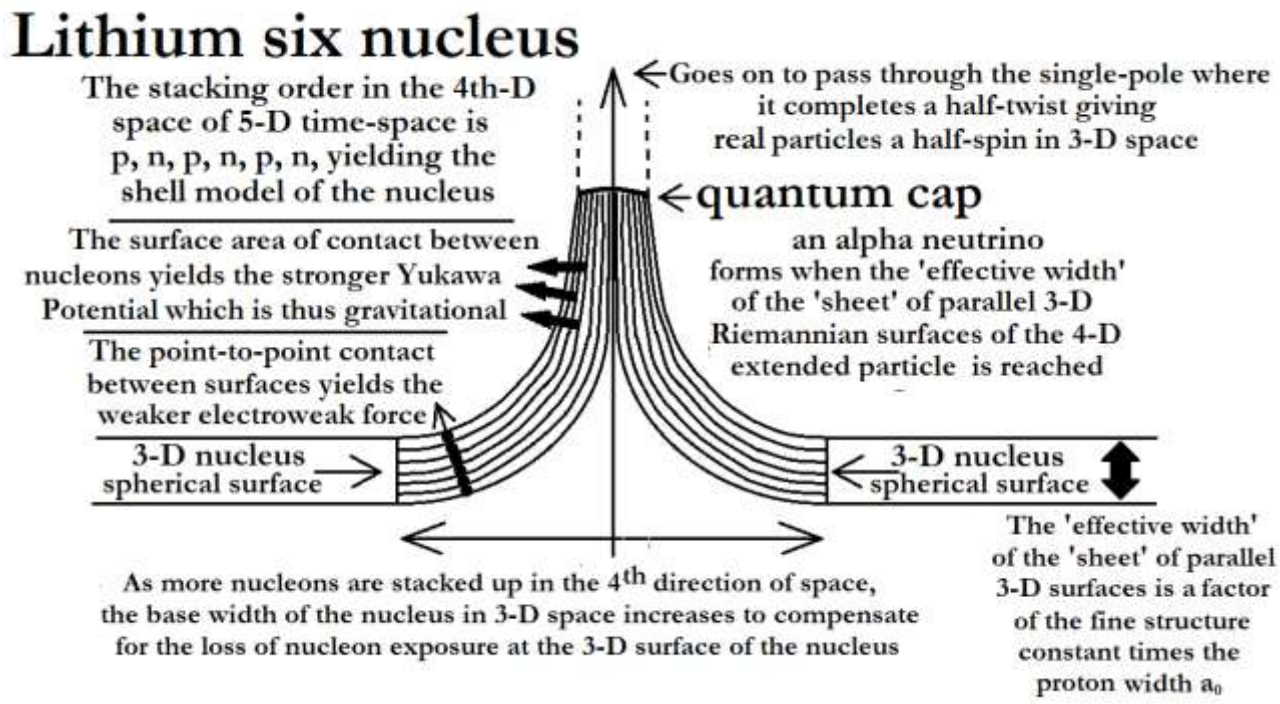
Quite simply, gravity and electromagnetism are both affected by this difference, but neither has been considered at all in the history of physics and science. So, all of our present theories of gravity are incomplete but not wrong within the context of their present applications (except for gravitons which are bad science based on false assumptions).

A similar situation occurs when a moving electrically charged particle moves along a linear path. Such a particle generates a scalar magnetic **B**-field around it, but a magnetic vector potential **A** also exists at every discrete point in the **B**-field, although it is commonly ignored and barely defined at the discrete points of the **B**-field. So, electromagnetism accounts for the extension/point duality of space, although it still neglects the

magnetic vector potential **A**-field which extends from every discrete point in the magnetic scalar potential **B**-field into the fourth dimension of space. This accountability was lost when Maxwell's original quaternion model of electromagnetism was converted to its present vector interpretation. On the other hand, gravity, in both its forms of Newtonian theory as well as Einstein's general relativity, totally ignore the point part of that duality (because the effect is so weak that it was not noticed until the 20th century detection of DE and DM) and model gravity as an effect of extension space only.

The existence of the fundamental point/extension duality in nature also helps to explain the hierarchy problem within the context of single field theory and the macrostring model. The strong nuclear force is 10^3 times stronger than electromagnetism, 10^{13} times stronger than the weak nuclear force and 10^{40} stronger than gravity, Given the present theories and paradigms of modern physics, this discrepancy cannot be explained satisfactorily. However, it is easily explained with the macrostring theoretical model. The single potential field which is the collective of all macrostrings emanating from discrete points in the three-dimensional Riemannian surface of our natural reality, is also subject to the common point/extension duality. A discrete point in the macrostring is discrete point gravnetic relative to the three-dimensional gravity field or surface it intersects (curvature of the space-time continuum), and electromagnetism is an extension from that point along the fourth dimension of space. So that extension is 10^{37} power stronger than the discrete point from which it originates. This answers the question of how many discrete points does it take to reach a measurable extension or metric quantity in an n+1 dimensional Riemannian embedding space.

Each and every proton and neutron is three-dimensionally spherical and four-dimensionally a curved cone shape. An atomic nucleus consists of protons and neutrons stacked in the fourth dimension of space and the stacking order yields the shell model of a nucleus. As more and more neutrons and protons are stacked one upon the other, they press down in their three-dimensional configuration yielding wider and wider spherical nuclei in three-dimensional space.



The normal gravitogravnetic force is a surface frictional force, so the strong nuclear force is caused by the four-dimensionally curved surfaces of contact between nucleons over their whole contact 'area' which are proportional to its shape or e^{-kr}/r, yielding the Yukawa potential of $ge^{-\alpha mr}/r$ as the strong nuclear force. These

considerations tell exactly why the ratios of the two natural forces, electromagnetism and gravitogravnetism, in each of their applications to fundamental natural processes are so disparate and dissimilar at different size levels of the natural world. It is all dependent on the fundamental point/extension duality of nature.

It may seem paradoxical, but each and every proton and neutron in a nucleus has a nearly equal presence in the three-dimensional spherical surface of nuclei due to this four- to three-dimensional structure. This feature makes the various forms of decay of unstable nuclei easier to understand and explain since decay particles would be ejected at the three-dimensional spherical surface after all without introducing the quantum concept of energy wells and it is expected that this structure would eventually lead to theoretical predictions of nuclear instabilities and calculations of nuclei half-lives.

Discrete points are exactly that, discrete, even when they are infinitely small as opposed to their supposed and theoretical non-existent extension approaching zero (metrics or lengths of $\Delta S \rightarrow 0$ in Riemannian geometry or the lim of $(\Delta x/\Delta t)$ as $\Delta t \rightarrow 0$ as the definition of speed in calculus), even when they form a continuous extension. That is because each and every point, whether considered discrete or continuous (in reality there is no difference), is exemplified by a 'twist' at its center. So, all discrete points are characterized by their 'twist' which results from a 'desire' to enfold back into the Absolute Void from which they emerged at the Big Bang, and that results from their virtual three-dimensionality (Hilbert, 1915) that prevents them from enfolding back into the Void. This fact means that they have a 'primal awareness' of their separateness or disconnectedness and the difference between them and the Void. All of this emerges or proceeds from the initial Big Bang singularity having bound itself to a moment (point location) of time (fundamental change) and thus evolving to the first discrete point with a binding constant of Planck's number and units of energy-seconds. The energy units of this binding constant reflect the potential of the single field in the fourth direction of space manifesting itself in our primary three-dimensional Riemannian surface and seconds that constitute duration of a plural number of moments of time.

Otherwise, the 0-D geometrical points in the gravity field form a continuous three-dimensional surface curved in the fourth embedding (extrinsic) dimension as Einstein concluded later in his life. This means that spatial points in gravity have a dual nature, depending on the interaction being measured or observed at any given time. In the above diagram of an orbiting body this point discreteness was shown to be both natural and inherent in gravitational situations but not included in any classical model of gravity. When taken as a continuous point in three-dimensional space the center-or-gravity of the orbiting object, it is interacting according to normal gravity as either $\mathbf{F}=m\mathbf{g}$ or $\mathbf{T}_{ik} = \mathbf{G}_{ik}$, but when it is taken as a discrete point relative to the circular orbit itself it is interacting according to F=mv cross Γ, where Γ is the curvature of the universe and the gravnetic point is either discrete four-dimensionally or equals Λ_{CDM} and represents the Dark Energy contribution to the motion.

The gravnetic phenomenon that is commonly referred to as Dark Energy is far too small to be easily detected except in cases of very large masses and very large distances, *i.e*., star systems orbiting galaxies, satellites leaving the solar system (*i.e*., Voyagers) and satellites that slingshot around planets and stars and thereby show a very small increase in velocity that cannot be otherwise explained. Yet curvature does affect both point and discrete point measurements and physics at all scales of size down to atoms themselves.

The gravnetic discrete point also becomes the source of zero-point energy in the quantum theories when the four-dimensional single field potential (which is infinite) is liberated and manifests within the three-dimensional surface of our world. This phenomenon occurred naturally for the first time in history when the Big Blowout that ended Cosmic Inflation, or rather slowed it almost to a stop, has been detected today as the Cosmic Microwave Background that permeates the universe. This energy is released through gravnetic points from the total single field potential through a process called frequency coupling, but the frequency must be exact down beyond the nano scale of our physical reality, so it is difficult to calculate and accomplish experimentally.

Any point of motion along a path is discrete and continuous simultaneously, or moment-to-moment with respect to time, relative to every other spatial point in the universe. This is true for both electromagnetism and

gravitogravnetism, the only two real natural forces. It is only our interpretation at any given moment for any given purpose, specific physical interaction or phenomenon that creates this duality. True points in space are both discrete and/or continuous simultaneously within their universal context and this truth necessitates a reinterpretation of the Heisenberg uncertainty principle (HUP), quantum mechanics and the quantum theory as a whole in all of its distinct variations.

Determining the true nature of the quantum

The suppressed variables of time and space artificially create uncertainty when trying to determine space and time, respectively. There is no uncertainty in nature, nature is certainty. Uncertainty it is a purely human mathematical invention which can be easily demonstrated. By the same token, the determinism versus indeterminism and discrete versus continuity paradoxes are not inherent in nature, but only in our interpretation of reality for any given circumstance. This misinterpretation of reality allows us to mathematically split measurements between space (Δx) and time (Δt) in the Heisenberg uncertainty principle (HUP), even though these measured variables of uncertainty are not themselves uncertainties but rather measures or estimates of statistical expectation values.

The HUP should be interpreted as no more than the extent to which we can make accurate measurements of either positions in space or time without direct reference to the other, but not as an inherent property in nature as they are presently interpreted. As such, the dreaded mystery inherent in the use of 'renormalization factors' in quantum theory reduces the process of renormalization to the simple common non-mysterious concept of determining 'expectation factors' as commonly used in statistics. Knowing and accepting this new interpretation of the quantum necessitates a rethinking of the HUP, all of quantum theory and relativity.

In reality, space and time are present, or better yet fully represented in the minutest detail, in the individual discrete points that constitute space-time, so they cannot be split apart for measuring purposes as in the HUP where space is represented by a positions in space Δx and time Δt. The normal excuse for doing so is that their quantum partners momentum Δp and energy ΔE, respectively, are considered more fundamental at the quantum level than either time or spatial positions. This assumption for the sake of philosophical convenience is simply not true. Momentum and energy could not be more fundamental since both space and time are real quantities represented in individual discrete particles by their being bound together with Planck's constant as their binding constant.

The time and spatial positions which energy and momentum replace, respectively, are actually artificially (mathematically but not physically) 'suppressed variables' in the HUP equations rather than 'hidden variables.' The fundamental concept of time is suppressed within momentum and the fundamental nature of space is suppressed within the measurement of energy. So, space and time are still more fundamental than momentum and energy, as they are in classical theory. But even that is not enough of a motive to reinterpret the meaning and interpretation of the HUP. What is needed is a mathematical proof that they are more fundamental and thus suppressed in the HUP. Luckily, such proofs are available.

If the two HUP equations are put back together so that Planck's constant disappears from the resulting equation, which is a mathematically valid procedure, something strange happens.

$$\Delta x \Delta p \geq \frac{\hbar}{2} \quad \text{and} \quad \Delta E \, \Delta t \geq \frac{\hbar}{2}$$

The two HUP equations are brought together to form a single equation, yielding

$$\Delta x \Delta p \geq \frac{\hbar}{2} \leq \Delta E \, \Delta t$$

In this case, Planck's constant isn't just subdued or suppressed, it completely disappears as unnecessary when space and , yielding the mathematical relationship of

$$\Delta x \Delta p = \Delta E \Delta t$$

Since equating the Heisenberg equations, thus reuniting space and time into a single framework representing our true reality, completely removes Planck's constant from the picture such that space (location) and time (location) can be measured (considered real) simultaneously, the only possible conclusion is that Planck's constant (or a factor of it) is related to how space and time are bound together to form the space-time continuum. Hence it must be the binding constant for discrete points in space and moments in time, as stated above.

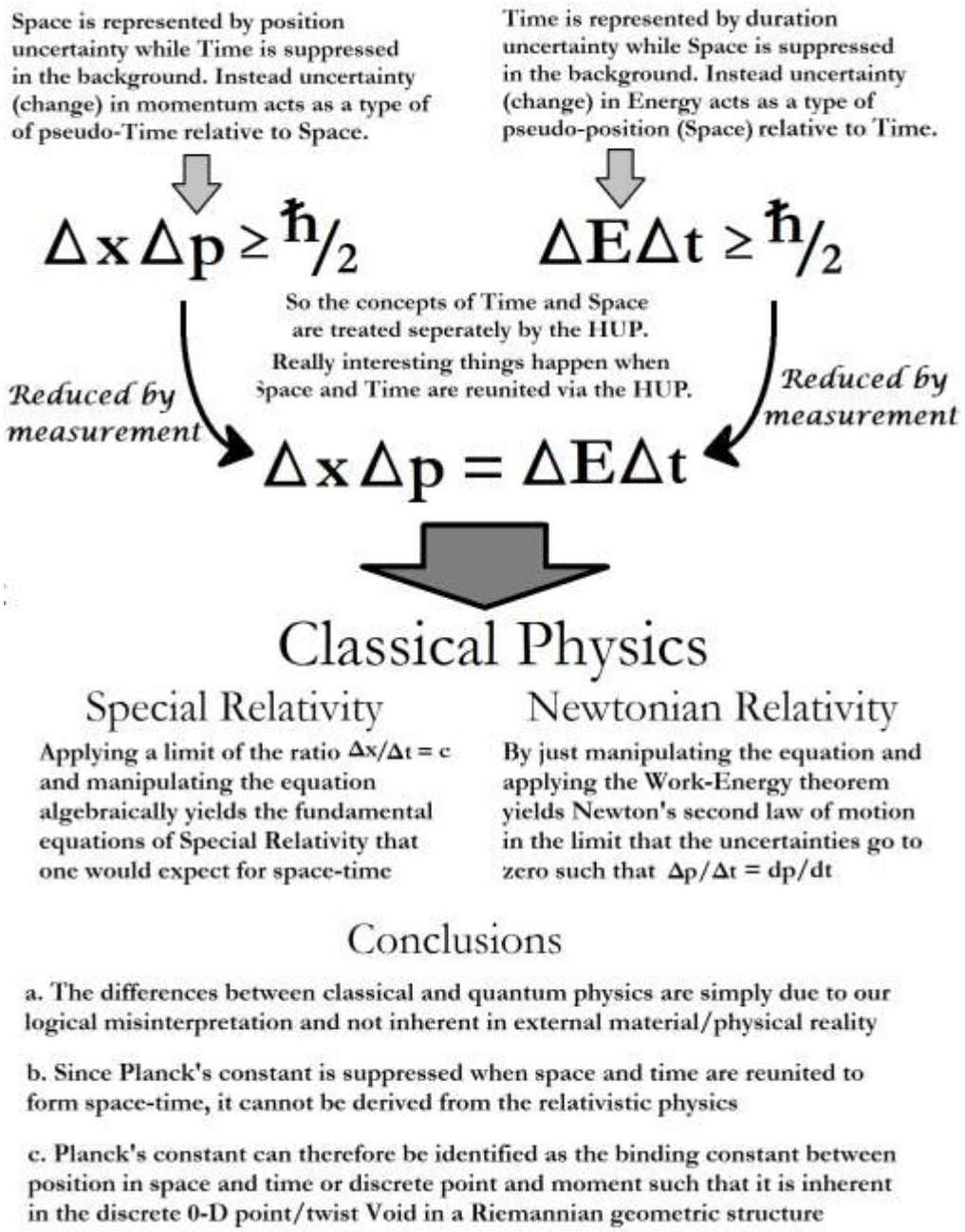
Moreover, both Newton's second law of motion and Einstein's equations for special relativity can be derived by choosing the correct values for position Δx, time Δt, momentum Δp, and energy ΔE for inclusion in the combined equation. If the speed of light c is introduced as a substitution for the quantity Δx/Δt and then using different values for the remaining uncertainties, simple mathematical manipulations yield Einstein's equations for mass increase with relative speed, time dilation and energy-mass equivalence. The quantity 'c' in this case does not represent a speed, but instead just a simple physical constant with the correct units needed to validate the substitution. If instead, we neglect the constant c and apply the work-energy theorem and appropriate values for the remaining uncertainties, we can derive the momentum version of Newton's second law of motion, F= Δp/Δt or F=dp/dt.

Given these mathematical derivations, relativity theory and the quantum theory are demonstrated to be perfectly compatible while philosophical concepts and arguments such as determinism and indeterminism against their compatibility are unfounded, untrue and unnecessary. In all truth, there are no such things as determinism and indeterminism except to the imagination of some illogical scientists and religious fanatics.

This development means that the HUP is completely compatible with both classical Newtonian mechanics and modern relativity theory. So, what is needed is a new interpretation of the HUP that allows unification of the quantum and relativity to proceed naturally. This task is easy since the HUP relationships really tell science about our interpretation and understanding of natural reality is IF there is an extent to which, or a real physical limit, to the degree in which space and time can be considered as separate physical concepts or physical variables independent of each other in any given natural phenomenon, event, measurement or experiment, and no more.

Quantum mechanics is about a limit, the Planck limit to measurement and observation. To separate or consider them individually is completely unnatural, such that doing so introduces artificial conditions that taint our interpretations and understanding of nature. So, the quantum and relativity are completely compatible with each other after all, which is at this time a completely heretical conclusion, yet wholly and just as completely true. This understanding is the first step necessary for a true unification of physics to take place. The second step is understanding the difference between discrete points and extension in space as explained above.

In summary, the use of momentum in conjunction with position in space alone, suppresses time, while the use of energy with change (duration) or position in time suppresses location in space from consideration of time and how they affect each other. These purely mathematical maneuvers lead to misconceptions and delusions about the true nature of space, time and the ultra-minute aspects of both at the fundamental level of the discrete point.



Conclusions

a. The differences between classical and quantum physics are simply due to our logical misinterpretation and not inherent in external material/physical reality

b. Since Planck's constant is suppressed when space and time are reunited to form space-time, it cannot be derived from the relativistic physics

c. Planck's constant can therefore be identified as the binding constant between position in space and time or discrete point and moment such that it is inherent in the discrete 0-D point/twist Void in a Riemannian geometric structure

The HUP as it now stands and is understood as question of WHAT would happen IF we could physically separate space and time when we apply the HUP to a physical experiment, but in reality, we cannot separate them in this manner because they are bound together as a unity at the most fundamental level of all physical reality possible, that of the individual discrete point. In other words, the HUP is creating a physical illusion (indeterminism and probability) based upon a completely non-physical and artificial mental mathematical worldview. This can be seen quite simply because probabilities like certainty (100%) and uncertainty (0%) range from 0.00 for completely uncertain to 1.00 or completely certainty. However, the uncertainties listed in the HUP can range from zero to infinity. That is impossible.

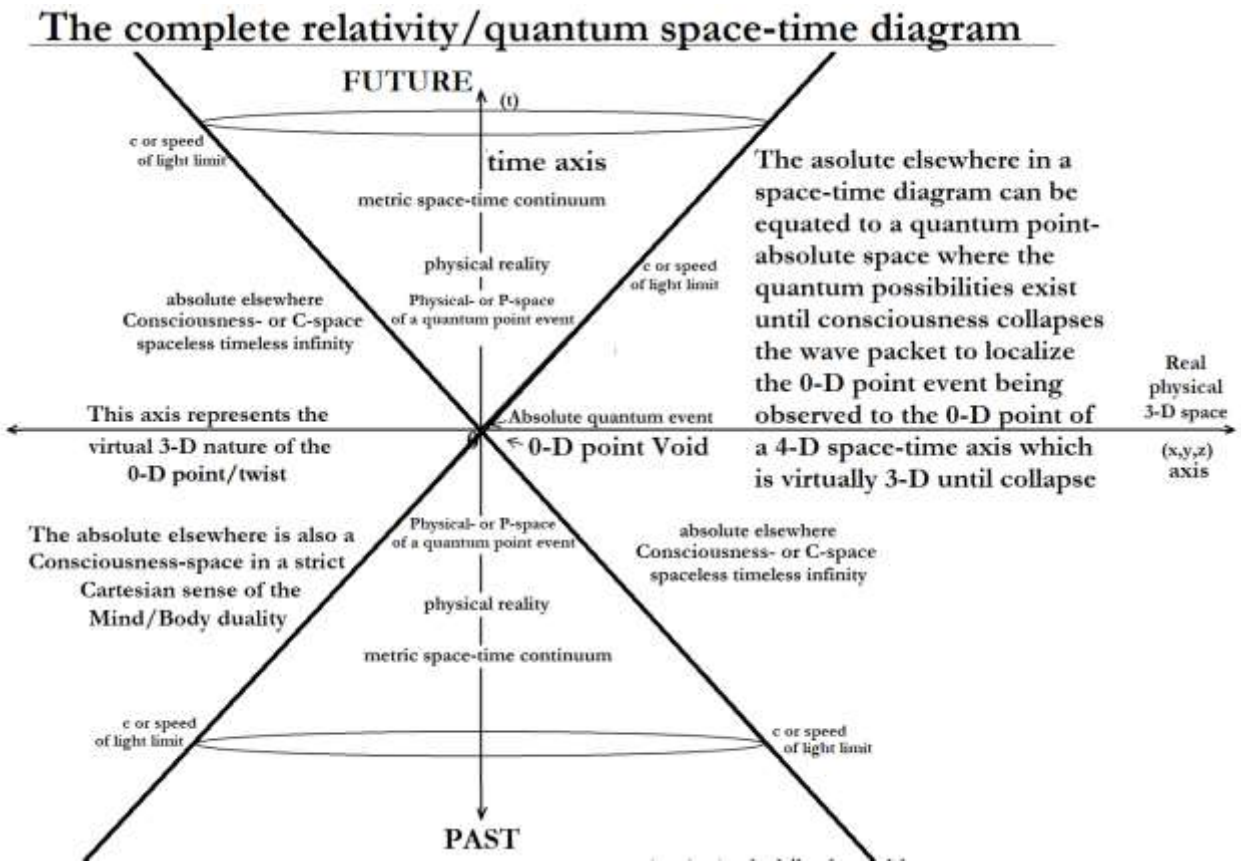
However, there is a quantity related to uncertainty and certainty in statistics that does range from 0 to infinity: It's called "expectation" which is defined as "The expected value (or mean) of X, where X is a discrete random variable, is a weighted average of the possible values that X can take, each value being weighted according to the probability of that event occurring. The expected value of X is usually written as E(X) or m." The expected value requires a consciousness or observer to do the 'expecting' during a measurement, which does sound more like what the HUP actually means. The HUP is not about uncertainty: It is about what is expected to be found by the experimenter or observer conducting an experiment under the specific conditions that define the experiment. Without an observer or experimenter there is no expectation, which also fits the Copenhagen Interpretation of the HUP, which requires an observer or consciousness to 'collapse the wave packet' of quantum possibilities for a point event in space-time which essentially overcomes their suppression in the HUP and renders them possible in the relative space-time continuum.

The conclusion that is reached in this endeavor is that Heisenberg uncertainly principle is merely a limiting condition that applies when conditions are established to artificially measure separate changes in time and space where the Planck constant is interpreted as the binding constant for space and time to yield space-time. (Beichler 1992, 2015) However, another path can be followed: In the original equations of the HUP, when Δx and Δt are simultaneously allowed to go to zero, which signifies and exact discrete point location in space and time equivalent to the origin of a space-time diagram that represents a specific quantum event in space-time, both Δp and ΔE become infinite (undefined). This may seem a trivial concept, but it is instead full of useful information.

There has always been a specific philosophical question regarding the relationship between the quantum and Newtonian mechanics and/or relativity. The answer to that question has always been assumed to depends on the size-level where the quantum mechanical answer gives way to the classical relativistic nature of Newtonian mechanics. In other words, how big must a quantum system be before the quantum system can also be regarded as a classical system ruled by classical physics. It should now suffice to say that this point is not size related as has always been assumed, but rather mathematically dependent as shown above with the concept of artificially suppressed variables. Suppressing variables in this manner is a strict act or action inaugurated by a consciousness or rather a conscious act of willful thought with respect to the HUP. Consciousness, according to the Copenhagen Interpretation (CI) wave mechanics is also thought to play a part in this debate, but not the part assumed by Bohr and Heisenberg when the developed the CI. In other words, it seems for all intents and purposes that quantum mechanics and theory is incomplete without the existence of consciousness and the intervention of consciousness into the physics involved. But what form does consciousness take under these circumstances?

Consciousness, relative space-time and the absolute elsewhere

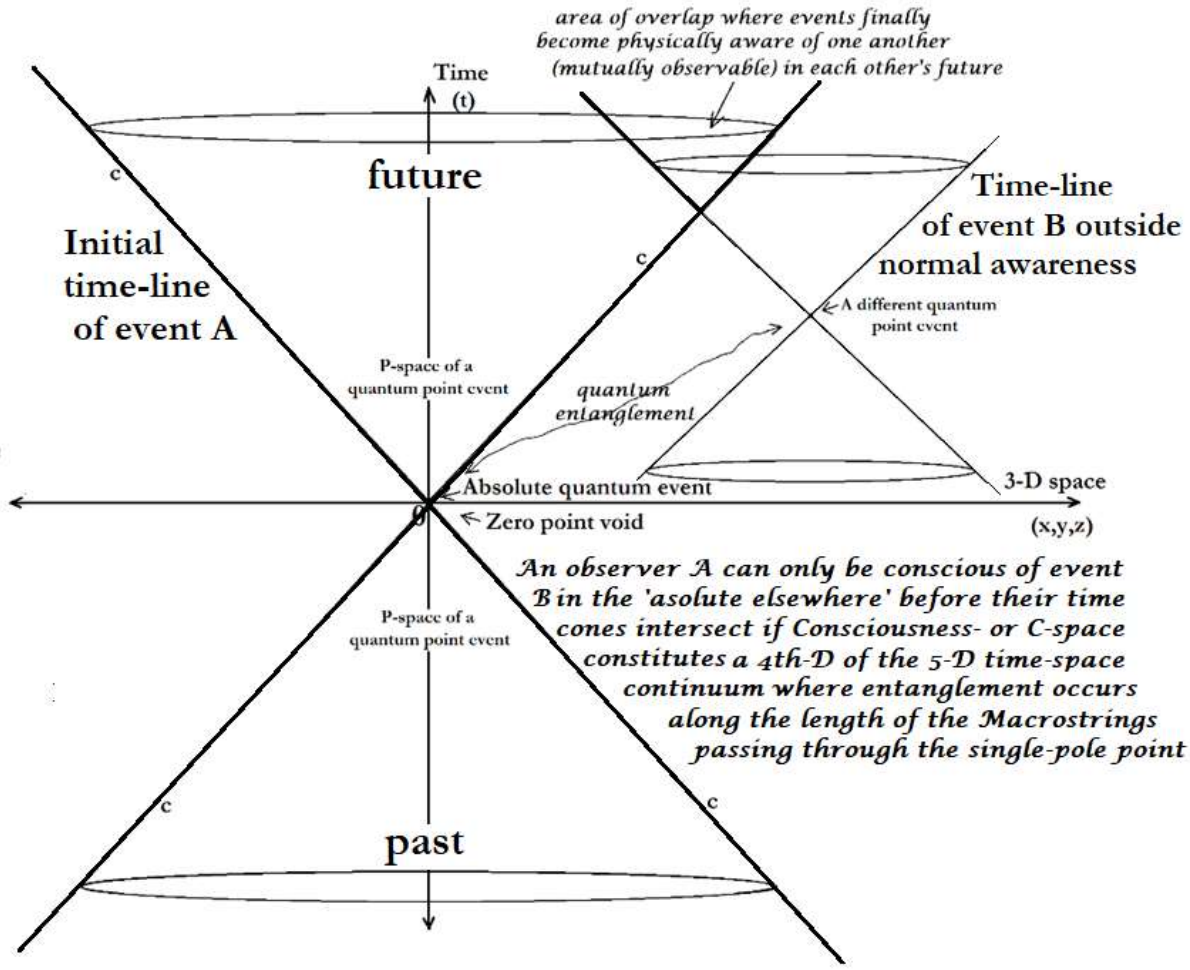
On a space-time diagram, this would correspond to an area outside of the light cone marking the physical range of any particular quantum point event that is normally called the ‘absolute elsewhere’ and thus never considered viable or even relevant (thus uncertain) in relativity physics. This implies that the discrete points (locations in space and time) of the quantum theory form a quantum point-absolute space (partially corresponding to the absolute elsewhere in the space-time diagram) from which individual events and experimental measures become relative to the rest of reality when the wave packet is collapsed to the zero point on a space-time diagram by either conscious choice or entanglement.



Before the collapse is completed, the even would have two values of probability associated with it. One for one of the two axes in the space-time diagram (Δx or Δt) depending on the particulars of any experiment, measurement or observation, and the other (Δt or Δx, respectively) projected into the 'absolute elsewhere'. Upon collapsing the weave packet, these two probabilities reduce to one reality on the space-time diagram.

If we localize the quantum event to a discrete point (a point particle or a simple void in terms of Riemannian geometry), then what's left of space-time either outside of or beyond the light cone, the so-called irrelevant 'absolute elsewhere' can be interpreted as physically equivalent to an infinite uncertainty $\Delta E = \Delta p = \infty$ that results from absolutely certain measurement of the point at the space-time axis. Or rather, $\Delta E/\Delta p = \infty/\infty$ corresponds to the area of the graph beyond the limits set by the speed of light c, where $\Delta x/\Delta t > c$. This area of the space-time diagram could also be interpreted as a higher embedding dimension relative to our Riemannian surface or space since the speed of light only applies in our normal three-dimensional surface of space, *i.e.*, an embedding four-dimensional double-polar spherical point-absolute space as shown in a later diagram relating the probabilities of ψ and ψ*.

Yet this space-time diagram alone is still incomplete and misleading since it only refers to the reference frame of one particular quantum point event. In reality, many other many other point events that are just as real but lay outside of any one point-particle event's light cone within its area of 'absolute elsewhere' even though all point particle events together constitute the physical universe or P-space, our three-diemsnional Riemannian surface. These points are still entangled by the three-diemsnional geometry but unobservable to each other at the moment of the event because any observable or detectable signal between them is limited by the speed of light, c. The event B in the absolute elsewhere only becomes observable at a future time when their light cones overlap, so they are still part of the same Consciousness-space as well and within each other's 'absolute elsewhere' but unverifiable until that future time when their light cones intersect.



So, the 'absolute elsewhere' is relative the whole universe simultaneously and the corresponding C-space must lie somewhere behind the whole of Physical- or P-space, not just simply beyond the light-cone of any one particular quantum event.

The only 'place' that can fulfill this requirement is a higher dimension that is not only an embedding dimension for our three-dimensional reality but is 'leaking' into (entangling with individual points) P-space through individual discrete points such as are analyzed by a non-Riemannian geometry. This is not so much a higher dimension but is coupled to the other fourth dimension of physical space in such a manner that together they form a quantum point-absolute space that is double-polar spherical compared to the real fourth dimension of space which is single-polar spherical. This quantum point-absolute space is a mathematically manufactured product of consciousness and is thus spaceless and timeless since it lies outside of both normal four-dimensional space-time and the embedding fourth dimension of space which gives us a five-dimensional time-space.

Faggin has also developed a concept of a Consciousness or C-space. In the case of Faggin's concept, C-space creates the four-dimensional space-time reality or P-space (our Physical-space of experience) through a corresponding discrete point (Sperry Andrew's quantum point void) space to generate our perceived four-dimensional (metrically extended) reality from the 'absolute elsewhere' (a spaceless and timeless nothingness) by way of a point-geometry based on the amplituhedron. Faggin's consciousness units would then correspond would then correspond to the consciousness/mind complexity patterns of the single field potential in five-dimensional time-space which then manifest as consciousness (magnetic) vector potential patterns (domains) that correspond to three-dimensional material living bodies of the brain/mind complex in P-space.

So, the C-space that Faggin hypothesizes is not especially a sixth embedding dimension of the five-dimensional time-space continuum (as described in normal Riemannian metric/extension geometry) that constitutes P-space, but a sixth parallel manifold that manifests through the individual points within the whole of five-dimensional time-space. In that way, Faggin's C-space can be outside of all space and time yet still generate (manifest as) all material 'things', phenomena, events and such that constitute our physical existence or being as defined and described in physics.

In the second space-time diagram the separate points, observer A and quantum event B, are also too far apart to be entangled through any three-dimensional mechanism, *i.e*., they can have no simultaneous knowledge of each other because the speed of light limit to signal transmission forbids normal contact via normal space at such distances. They cannot even know of each other until the future, that is if and when their light cones intersect. Event B is in the 'absolute elsewhere' of observer A, so quantum mechanically all that can be done from the Observer's light cone is to derive the 'problem' of point B proceeding and not knowing if it represents reality, *i.e*., collapse of the wave function until their cones intersect in the future and event B becomes measurable. However, A and B are still entangled even though separated in each other's 'absolute elsewhere', by way of their four-dimensional macrostrings, Kaluza A-lines coming into contact through their intersection at the single-pole if four-dimensional space. So, they can know of each other simultaneously (paranormally), in the moment that the event B occurs, via the entanglement of their macrostrings.

Since the discrete points which form macrostrings along Kaluza's A-lines in the fourth dimension of space are characterized by a 'primal awareness' and collectively a virtual pre-consciousness potential field, we can say that consciousness is an evolutionary characteristic of discrete points in three-dimensional space which 'pushes' time forward into the future. In other words, every discrete point in all four dimensional of space are bound together or rather proceeding forward into the future fully entangled with each other via the macrostrings and thus simultaneously in full concert with each other. This favors knowledge of all and everything in the moment in the absolute elsewhere, or rather that the 'absolute elsewhere' corresponds to a Consciousness-space which serves as a background for all physical possibilities to manifest themselves in our relative P-space. Furthermore, the macrostring structure of our four-dimensional space yields a four-dimensional curved surface that pictured externally would be characterized by one-dimensional superstrings with diameters of the proton radius (a_0) times the fine structure constant. Thus, the overall structure of the four-dimensional surface is five-dimensionally a surface of superstrings.

Newtonian quantum gravity

In the HUP, momentum and energy are normally considered more fundamental than space and time, hence quantum physics does not recognize nor even care about the suppression of space and time in Heisenberg's equations. So, If we instead go back to the Heaviside equation or its modern equivalent, we can literally quantize it by looking at the additional gravnetic term which is expressed in terms of momentum, and the quantization of classical gravity theory becomes an extremely easy and informative task to perform

$$\vec{\mathbf{F}}_{gr} = m\vec{g} + m\vec{v} \otimes \vec{\Gamma}$$

$$\text{but since} \quad \lambda = \frac{h}{mv}$$

$$\vec{\mathbf{F}}_{gr} = m\vec{g} + \frac{h}{\lambda}\vec{r} \otimes \vec{\Gamma}$$

This result reflects quantization on gravity in the form of gravnetics on the cheap. While only an approximation, the result does have significant meaning. First of all, normal Newtonian gravity (**F**=m**g**) as well as Einstein's original version of general relativity ($\mathbf{T_{ik}}$=$\mathbf{G_{ik}}$) is ONLY about an extension-geometrical version of gravity. These theories only describe, a static gravity structures universe, a fixed picture at any given moment in time of a dynamical universe.

Variational and other mathematical tricks need to be applied to this gravitational picture of the universe to determine how gravitational attractions evolve over time. However, the second term of gravity introduces a new dynamical aspect to gravity surrounding a point-geometry that indicates a quantum perspective of the world. The unit vector **r** has been added since this new dynamical form of quantized gravity must be expressed in polar coordinates, which are more natural to this physical example.

The implications of this simple quantization are quite profound. First of all, the Dark Matter halo around galaxies, represented by the second term in the equation, can now be viewed as a wave interaction or superposition of outgoing quantized gravity waves from the core mass due to the changes in velocity of the orbiting masses interacting with the incoming gravity wave (represented by **Γ** in "/sec" units). In this case, the quantity **Γ** could be likened to David Bohm's concept of the quantum potential field which is a background field consisting of all possible quantum waves.

Secondly, this equation indicates that the static gravity view of **F** = m**g** cannot be quantized in any normal way within the three-dimensional space where normal gravity acts. Gravity can only be quantized through the higher embedding dimension and has absolutely nothing to do with gravitons or other imaginary/hypothetical point particles. From a purely static point-of-view, normal gravity is purely structural in our world while the quantum immediately invokes an interaction or change which is wholly dynamical and non-structural at points of interaction in space, except in the fact that it changes structure through the interaction.

And thirdly, this confirms the interpretation of the quantum as a point-geometric version of space rather than truly discrete unconnected physical and thus indeterministic reality. In other words, individual quantum-point phenomena can be considered independent (and thus discrete) of the overall curvature of space-time as if they are matter waves moving across the background of a fixed space-time curvature. Quantum phenomena are dynamic point-by-point interactions that occur against the backdrop of curved space, but in order to understand them they must be integrated into the overall curvature of the space-time continuum to make any sense. With these new clues of information in hand, a more comprehensive view of curvature and particles can be rendered.

The initial unification of general relativity and electromagnetic theory is quite simple when the problems faced by Einstein and others are considered. Quantum theory cannot be unified with either Newtonian or Einsteinian gravity because both theories completely ignore the point portion of the point/extension duality that governs all physics in space and time, space-time and time-space. However, Oliver Heaviside, one of the men who rewrote Maxwell's electromagnetic theory in terms of vectors instead of Maxwell's original four-dimensional quaternions, did suspect that gravity had such a problem and rewrote Newtonian gravity in the correct form of

$$\mathbf{F = mg + p \times S},$$

Where p is momentum and S the rest of matter in the universe (according to Mach's principle and thus the result of a real centrifugal force).

So, Heaviside instinctively although not necessarily consciously sensed or intuited the duality of space within the Lorentz equation and reasoned that gravity needed to account for that same duality in the fundamental structure of space. So, he rewrote Newton's gravity theory in the form of

$$F = mg + p \times S,$$

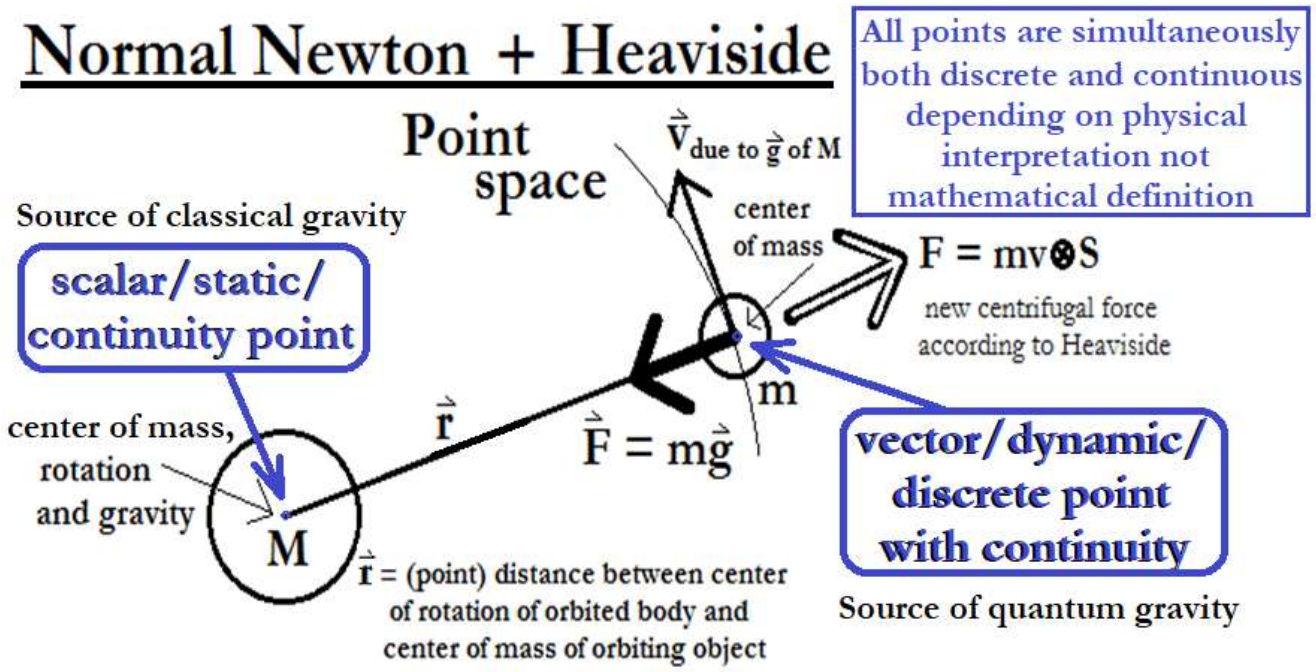
mimicking the duality as it was expressed by the Lorentz equation. The quantity ***p*** represented the momentum of a body orbiting a central mass and Heaviside correctly described the second term as a true centrifugal force whereby the quantity ***S*** represented the gravitational attraction of the rest of the universe on the orbiting body in the mathematical language of his new three-dimensional vector algebra.

The rest of the mass in the universe established equilibrium on the orbiting masses such that the orbits remained stable at a fixed distance from the central orbited mass. Thus, the second term can be used as a modern mathematical expression of how Mach's Principle contributes to the mechanics of ordinary massive objects, but it can also be used to account for the Dark Matter haloes around galaxies.

Within a more modern context the equation can be rewritten as

$$\boldsymbol{F}_{gr} = m\boldsymbol{g} + m\boldsymbol{v} \otimes \boldsymbol{\Gamma}.$$

In this case, the small mass represented by 'm' is more distinct than in Heaviside's equation, where it is incorporated into the momentum as an individual fundamental quantity much as in the Heisenberg's uncertainty principle, but the velocity of 'm' as denoted by '***v***' that contributes to its orbit is just the velocity or vector speed due to the mass m's gravitational attraction to the central body mass 'M' which contributes to, or is wrapped up in, the vector **g** in the first term.



If the velocity '**v'** goes to zero and the mass 'm' is just falling due toward 'M' due to gravity, then the Heaviside term goes to zero and does not contribute at all to gravity. However, the non-zero or infinitesimally small value of the perpendicular vector speed approaching zero of the orbiting mass is still tied up in the discrete point at which the direction alone is changing, and that discrete point is discrete relative to the fourth dimension of space while remaining continuous relative to the three-dimensional physical space where the mass is orbiting the central body M. So, Heaviside's solution implied the reality of the fourth dimension of space, as did the

quaternions, and Heaviside was probably aware of this fact, if only intuitively, but unaware of its real physical implications.

Perhaps this can be more easily visualized by looking at the new Newtonian equation for the interaction of the material universe with a particular piece of local matter, which is a modern modification of Heaviside's equation. The new gravity equation

$$\vec{F} = m\vec{g} + m\vec{v} \otimes \vec{\Gamma}$$

can be rewritten in terms of simple kinetic energy of the star or system as

$$\vec{F} = m\vec{g} + \frac{2(KE + \mathrm{DE})}{v}\hat{r} \otimes \vec{\Gamma}$$

.

Dark Energy is a four-dimensional contribution to the normal three-dimensional moving body of an orbiting or rotating mass due to the fact that the kinetic energy KE is compensated for by a pseudo three-dimensional centripetal force that does not otherwise include the four-dimensional contribution of Dark Energy or DE. It should be quite clear from this equation that the contribution of the global curvature to the total force in the form of kinetic energy plus applied Dark Energy increases as a function of the radius and the slowing of gravitationally derived speed from the central body or local curvature (gravitational field). As each star or star system is added to the galaxy and orbits the galactic core, it has a component of gravitationally derived velocity as well as an extra component that corresponds to the four-dimensionality of the galactic plane.

This interpretation is fine for the macroworld but has to be further modified for the microworld of the atom. Given the new complete equation for gravity that considers both geometrical points and extensions, the dependence of the electron orbital or shell structure on gravitational curvature is easy to demonstrate. The normal Newtonian force of gravity (**F** = m**g**) can still be ignored within the atom because it is so much smaller than the electrical contribution, but the second term regarding the orbit speed cannot be ignored because as small an amount, by comparison negligible, as it can contribute to the attraction of the negatively charged electrons to the positive nucleus, it affects the structure of the surface curvature at the same quantum-sized magnitude as the electrical forces. By substituting DeBroglie's equation for a matter wave, the gravnetic part of the gravitational force becomes

$$\frac{h}{\lambda} \otimes \vec{\mathbf{\Gamma}}.$$

This equation readily implies a quantum structure, or rather a quantized four-dimensional quantum-sheet structure, for the orbits such that,

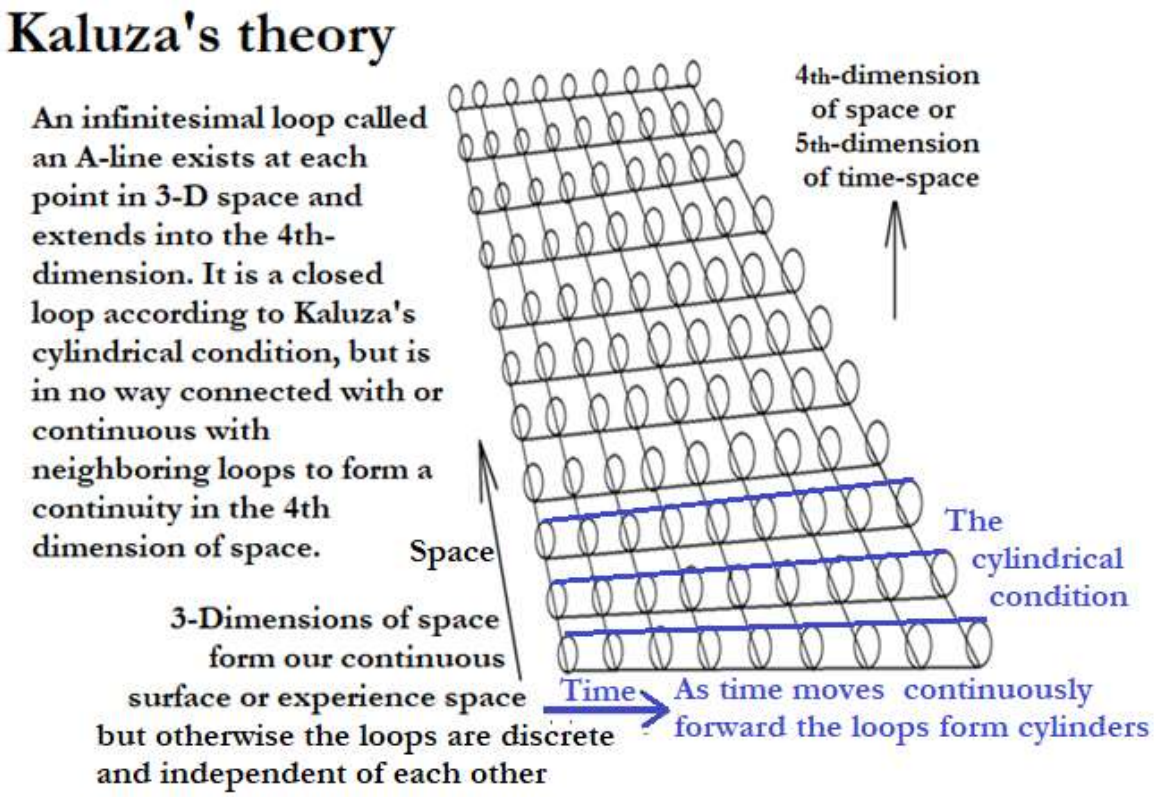
$$\frac{h}{n\lambda_v} \otimes \vec{\mathbf{\Gamma}}$$

where n = 1, 2, 3, …. Each succeeding orbital radius represents a different quantum numbered 'n' matter wavelengths ($\boldsymbol{\lambda_v}$) of that orbital electron at the speed the electron travels in that orbit. The wavelength $\boldsymbol{\lambda_v}$ is not constant from orbit to orbit but does vary in wavelength numbers as fixed by the quantum from one orbit to another. This equation is essentially quantized by definition since the various levels of electron orbits in the atom represented by the principal quantum numbers (n = 1, 2, 3, …) already correspond to whole number wavelengths of the electron matter wave.

From Kaluza-Klein to Macrostrings

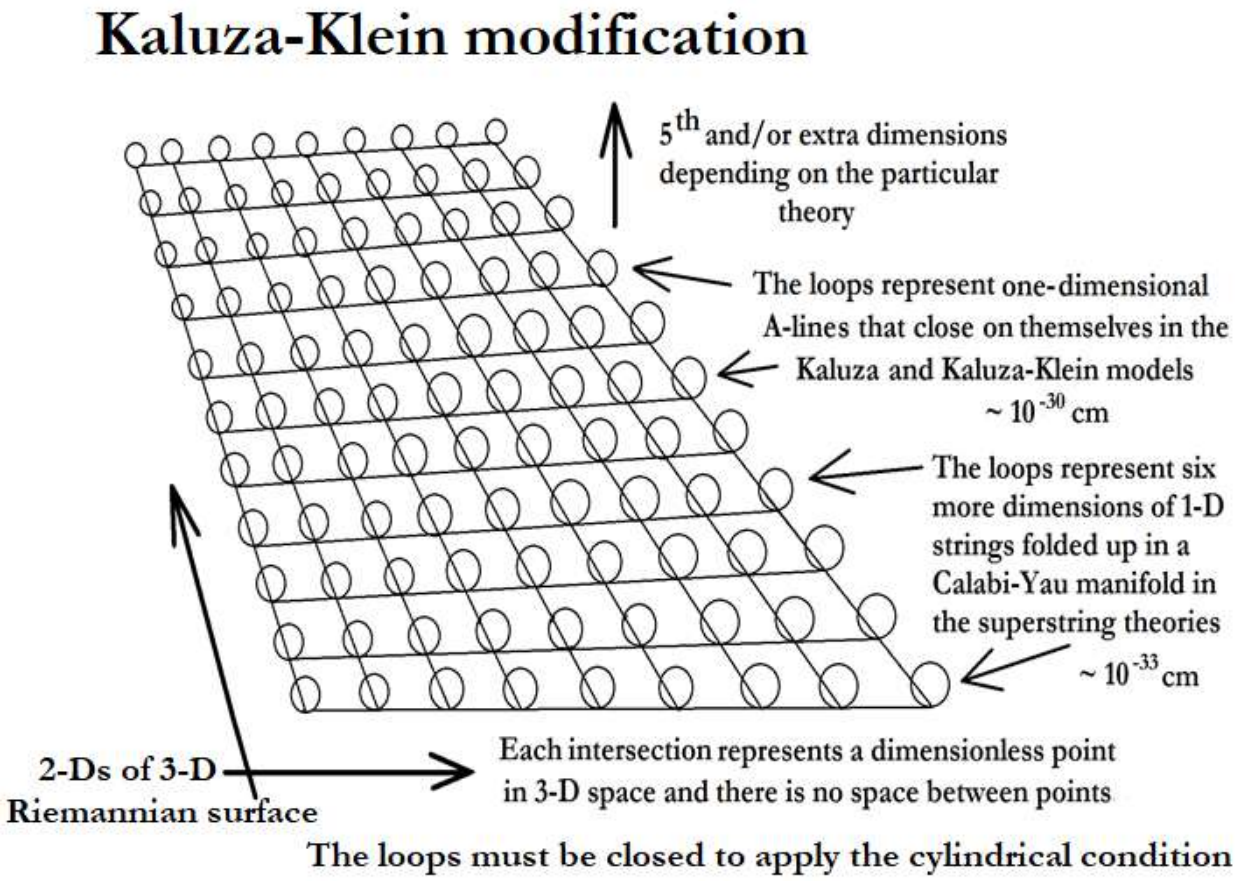
All 0-D geometrical points are virtually three-dimensional and their three-dimensionality manifests itself linearly to form the continuous three-dimensional space which is our normal reality. But in that moment-to-moment reality of change, a moment being a discrete point of time, and thus all relative non-linear motion stresses the discrete nature of those 0-D geometrical points and thus the natural twist inherent in them that guarantees their individuality whether forming a continuous line or non-continuous discrete collective of points, *i.e*., space. However, even though our common shared three-dimensional space is continuous, the geometrical 0-D points that constitute that space initiate perpendicular lines in the fourth direction of space that are constituted of non-continuous or discrete points.

So, the 0-D geometrical points that constitute lines in the fourth direction of space are discrete but still form collectives of discreteness or macrostrings. These macrostrings, unlike the infinitesimally short strings constituting discrete points in three-dimensional space called superstrings are extended to the same extent as the three dimensions of normal observational and experiential space because they expand at the same rate as three-dimensional space. They form parallel infinitesimally thin three-dimensional surfaces, that like pages in a book, fill the overall fourth dimension of space (the single field). The fourth-dimensional macrostrings emanating from our three-diemsnional surface form closed macroloops of macrostrings that intersect each other at one common point such that the fourth dimension is closed with respect to our three-dimensional surface. This loop closure is commonly called Kaluza's 'cylindrical condition,' (Kaluza, 1921) are the common point where they intersect is the single pole of a single-polar spherical embedding space or manifold for our three-dimensional space.



All of these discrete points are simultaneously entangled, reflecting their continuing commonality and equivalency, despite their separation, via these macrostrings and their intersection at the single pole. Kaluza's cylindrical condition was seen by Oscar Klein as a convenient way to quantize our three-dimensional space or surface. (Klein 1925, 1926) All he did was say that the closed A-line loops had a measure proportional to the quantum, implying that doing so quantized the three-dimensional surface internally. But neither Kaluza's model nor Klein's modification went far enough to make predictions that could be tested. This was their major, but not their only, short falling.

By contrast, the superstring theorist adoption of the Kaluza-Klein model features major differences but looks the same. Each A-line loop is a one-dimensional string with four or more internal dimensions



But there is no connectivity or continuity between distinct points either inside the three-dimensional surface that is our space or in the higher spaces, rendering each point discrete after its own fashion. Higher physics is related to various vibrational modes within the loops (which is unexplained by the superstring theorists) whose frequencies are related to different physical particles and phenomena. The vibrational modes must be internal to the strings because they would need yet more dimensions to be vibrating within if the strings as a whole were vibrating in the surrounding quantum vacuum. This discreteness allows the superstring theory to adopt the standard model of point particles and supposedly unify general relativity with the quantum paradigm.

There are many problems with this model, but the most difficult one to overcome is the simple fact that the superstring model and its extensions (the brane models) are so vastly over limited, like the Kaluza and Kaluza-Klein models before them, that it (they, including all of the different possible versions) is neither feasible, falsifiable nor predictive. Superstring theory has made no predictions that can be used to verify its claims, nor will it ever because it is flawed at the most basic and fundamental levels as were the original Kaluza and Kaluza-Klein theories or models. Put simply, it over restricts the hyper-dimensional extensions that it proposes to discrete particles alone and thus says nothing about the geometrical structure of the embedding higher fourth or other dimensions of space. Yet the definition of the geometrical structure is necessary to gain any insights into the physics of the higher dimension/s and their influences on our three-dimensional Riemannian surface or space.

From moment to moment of change, which collectively gives us the sense of passing time and duration, each discrete point reflects or remains the same physically relative to the collective of all those points which we call the universe. They thus reflect the oneness and wholeness of the universe within themselves through their common entanglement, or quantum entanglement, but it has never been mechanically or otherwise explained.

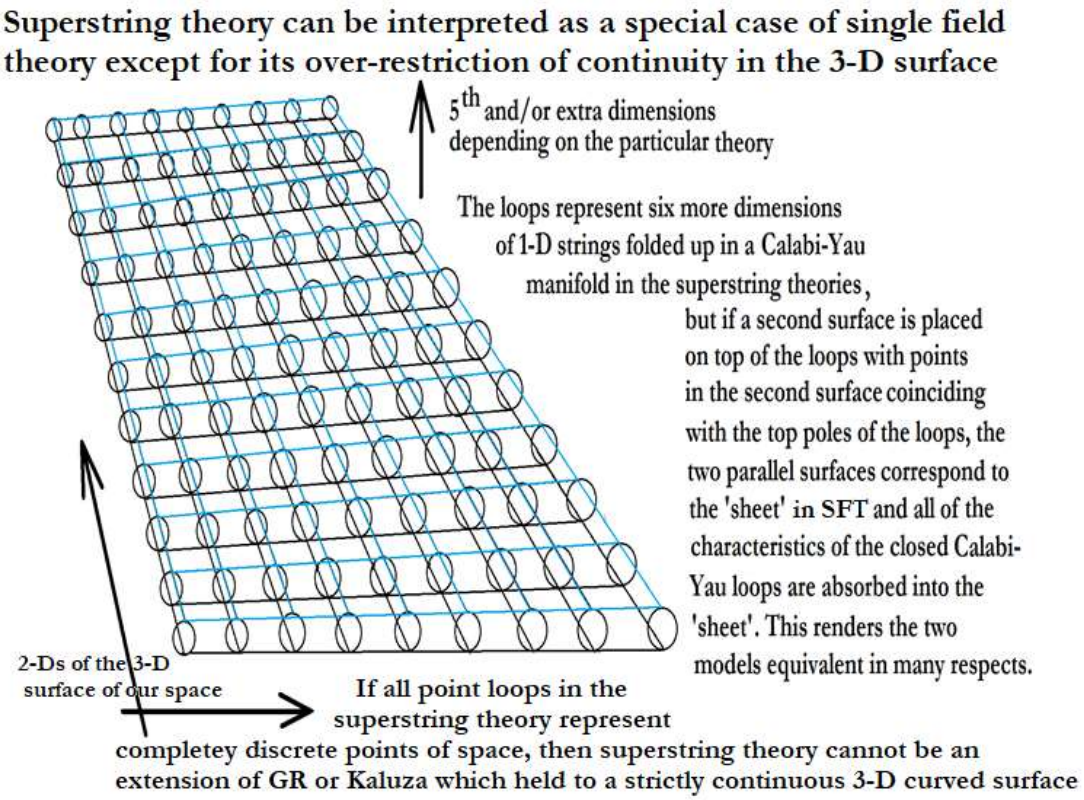
There is no difference between discrete and continuous points because all are distinguished equally by their virtual three-dimensionality and the resulting twist at their centers which defines and guarantees their individuality, whether discrete or continuous.

Entanglement is never defined as a physical mechanism and merely taken for granted as physical reality, but that attitude changes with the macrostring theory. Entanglement occurs as a collective property of the discrete points that constitute the fourth dimension of space and converge to a single-polar point of the spherical structure. Entanglement links to each-and-every discrete point in the universe through the single polar point simultaneously.

Each moment of time is bound to each discrete geometrical point in space within any given dimension, whether continuous or non-continuous, to form our overall sense of the space-time continuum. Planck's constant is the binding constant of a moment of time to each-and-every discrete geometrical 0-D point in space-time. So, time is constant or entangled three-dimensionally and its passage as duration in three-dimensional space is experienced the same everywhere in the material world. This three-dimensional entanglement of time allows our clocks and physical laws to be measurable and consistent throughout the universe. However, the speed of light is a limitation only within the three-dimensions of the Riemannian surface our experiential space and has no application along the fourth dimension of space even though time is bound to each discrete point. The fourth-dimension experience of time is therefore 'specious', and entanglement along the fourth dimension is instantaneous so we can commonly talk about four-dimensional space-time but five-dimensional time-space.

However, the measurement of length along the fourth direction of our five-dimensional time-space is impossible because we measure things relative to the material bodies that constitute and fill our three-dimensional space and four-dimensional space-time, but there are no material bodies in the fourth direction of space to refer to for measurement. Similarly, time is specious and highly questionable along the fourth direction of space that constitutes our experience of five-dimensional time-space. This property is reflected in the fact that the speed of light only exists as a universal constant in three-dimensional space and along the fourth dimension of space. For all intents and purposes, positions as measured at points of space and collectively as duration in time during events and physical phenomena denote change and are change itself, whereas the universe as a whole changes from moment to moment in the geometrical 0-D points that collectively constitute the universe as a whole.

Within this context, any uncertainty of the psi wave function in quantum theory reduces to expectations of possibilities along the fourth direction of space that develop from the potential of the single field that fills all four dimensions of space, our three-dimensional surface or commonly experienced space being the manifestation of that potential in the form of matter (protons, electrons and neutrinos), and the electromagnetic and gravito-gravnetic fields. This material manifestation justifies the quantization of our universe only along the fourth direction of space as Klein surmised before he was convinced to abandon his theoretical work along this line at the Solvay Conference by Nils Bohr and Werner Heisenberg. However, quantizing space in its fourth physical dimension forces quantization as a property of matter in three-dimensional space. Individual discrete geometrical 0-D points, even though they are bound to moments of time by Planck's constant, cannot be quantized themselves because they have zero extension. However, a collection of discrete points in the fourth direction of space can be quantized, which quantizes the infinitesimally thin three-dimensional surfaces representing those discrete points as perpendicular intersections of macrostrings perpendicular to three-dimensional surfaces at those discrete points.



Modern superstring theory

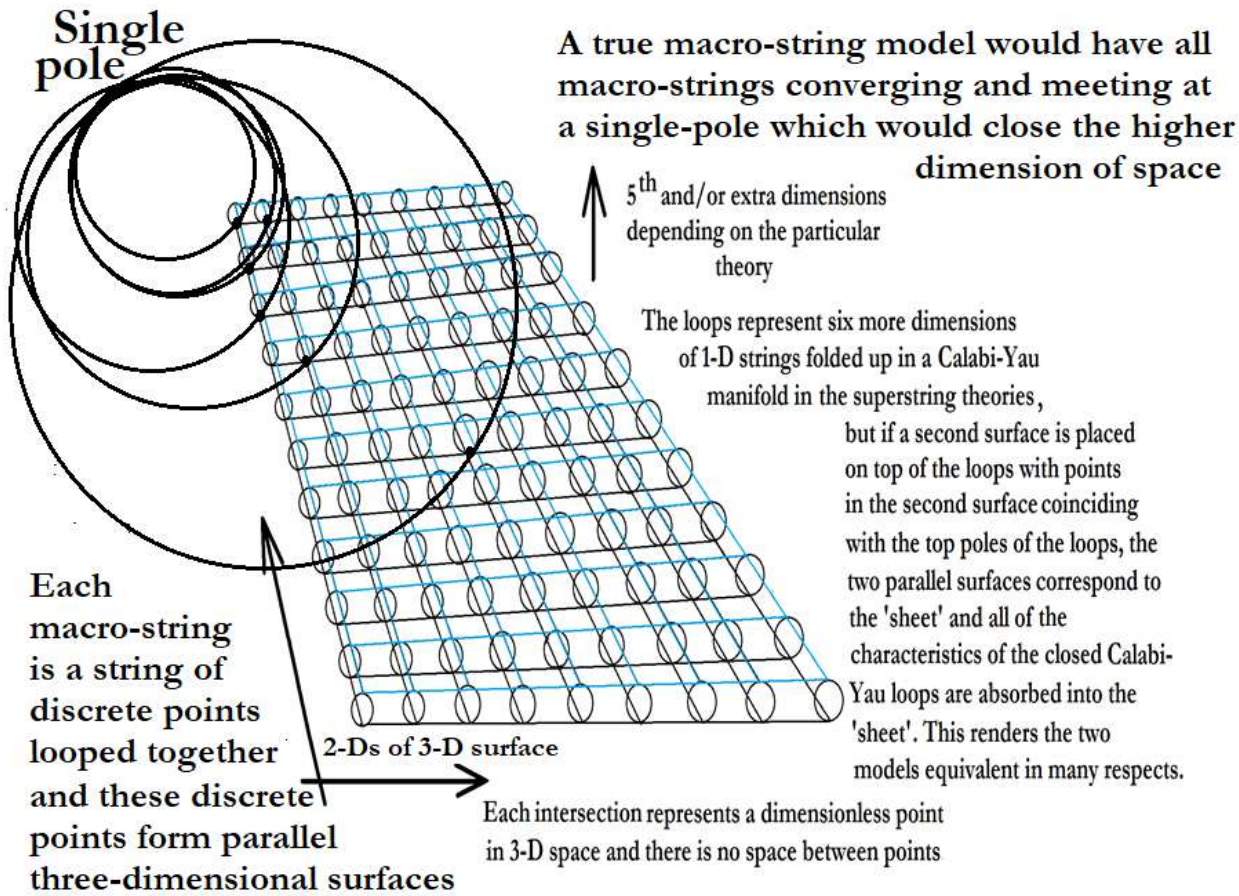
Although many scientists found Kaluza's theory quite interesting, including Einstein, it was very quickly dismissed because Kaluza seemed to introduce Maxwell's equations from the outside even though he was able to calculate and duplicate their effectiveness in mathematical examples by applying his concept of the cut-transformation and the four-transformation. In other words, his theoretical model just duplicated Maxwell's theory without adding anything new instead of developing Maxwell's equations from the fundamental principles and physical characteristics of the higher-dimensional model. Kaluza's original model was thus far too limited (within the discrete points in the three-dimensional surface) to be of any use for developing new physics that would lead to the predictions needed to test his hypothesis. (Beichler, 1980) In short, he needed to say something more about the extended geometry of his higher-dimensional embedding manifold or space, at least something more than just his 'cylindrical condition' which provided point-closure, that would demonstrate that the higher dimension as a whole or collectively was closed with respect to the embedded three dimensions of normal space.

Yet Kaluza's cylindrical condition was exactly what Klein found the most interesting feature: The cylindrical condition was repetitive or recurring so he could use it to define the quantum. But still, the Kaluza-Klein model that he developed, like the Kaluza model before, had no predictive powers and was not falsifiable. Given this fact, Klein was easily convinced to abandon his model at the Solvay Conference of 1927, although he returned to it several times in later years without doing any better. The Kaluza-Klein model or theory basically remained fallow for the next five decades, all but ignored in physics, until it was adopted by the string theorists in the 1980s and used to further develop the new superstring theory that emerged, or rather the various superstring theoretical models that resulted.

The problem with these new developments was that the modern superstring theories and their descendants shared same problem of over limiting the geometry by restricting It to the interior of a discrete point in three-dimensional space and not defining a specific geometrical (extension) model for the embedding

higher dimension/s. This was the same mistake made by both Kaluza and Klein, leaving their new theories and theoretical models without any predictive power. Instead, they put all of the geometry into or within the discrete mathematical quantum points that collectively constituted the three-dimensional Riemannian surface of our material and physical world. In essence, they only developed another non-Riemannian geometry to do physics that was already unable to do any new physics by design. In order for their model to have any geometrical validity, the strings would need to be extended macroscopically, such that the specific geometry and geometrical properties of the higher embedding dimension as well as our three-diemsnional Riemannian surface or space could be developed.

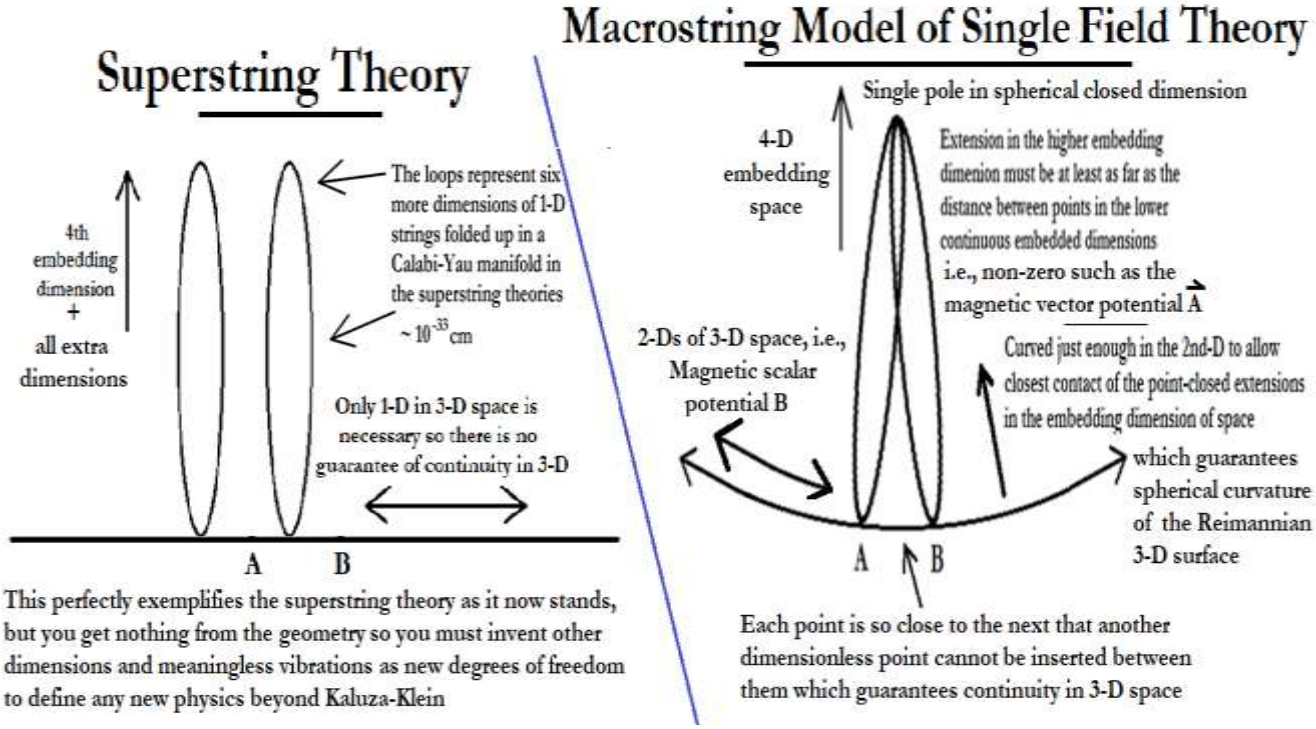
As the situation now stands, just extending the strings macroscopically as extended from individual discrete points in the three-dimensional Riemannian surface would be insufficient and would not do any better, because the discrete points so extended would still not contribute to or demonstrate the continuity of either our three-dimensional space and/or the higher-dimensional embedding dimension manifold allowing them closure. However, closing the higher dimension in this manner would yield strings with an infinite number of different lengths and thus destroy Kaluza's 'cylindrical condition' which still remains the best and most important feature of the original five-dimensional time-space model.



So, extending the lengths of the strings to macroscopic distances alone would not be enough without further conditions and changes because they still need to meet at a single-polar point and have equal lengths to fulfil the 'cylindrical condition'. From the diagram above it is clear that a flat quantum space of discrete points would not work because the strings would need different lengths to meet at a single-polar point. The single point is

necessary to close the embedding space as a whole, not just the individual loops, and thereby guarantees that the points in the three-dimensional embedded space that constitute the surface are indeed continuous with each other as in general relativity. The only way to do this would be to curve three-dimensional space equally in all of its three dimensions which yields a positively and constantly curved spherical curvature, just as Einstein employed in the general theory of relativity.

Macrostrings of this type, which still maintained the 'cylindrical condition' but were extended to macroscopic lengths would not work either, because the single discrete point in which the super to macrostring modification was made would be of nearly infinite extension in the fourth direction of space itself. Even making that string vibrate would be of little use to develop new physics.



The only possible answer to this dilemma, would be to adopt the Einstein-Bergmann model with an infinite number of discrete parallel three-dimensional surfaces stacked one upon the other like pages in a book.

In this structure, Kaluza A-lines made of separate discrete points, like pearls on a string, with each discrete point located where the A-line intersects and crosses the next parallel three-dimensional surface. This form of mega-superstring this becomes the only possible form of macrostring that has direct physical consequences that would lead to new physics and possible verification of the model. This modification also necessitates a change on how to express the quantum that deals with discrete points. So, the answer to developing a macrostring model comes directly from Einstein and Bergmann and directly implies the single field structure already used in the single field theory. Klein's notion of quantizing the fourth dimension of space to force the quantization of our three-dimensional space and world in its individual parts (fundamental particles) thus becomes a physical reality, but in a slightly different manner than Klein originally proposed.

Our three-dimensional experiential space, as observed and measured, reflects a collection of parallel three-dimensional surfaces (Einstein and Bergmann, 1938; Einstein, Bergmann and Bargmann, 1942) with a fourth-dimensional thickness equal to the fine structure constant times the width of a proton. Such a structure is possible since Einstein and Bergmann demonstrated that each parallel surface in such a four-dimensional relationship would have the same physics. The stability of this first sheet forms the ground energy state of the universe and thus constitutes the n=1 quantum state of the universe. Our experiential space will always tend to

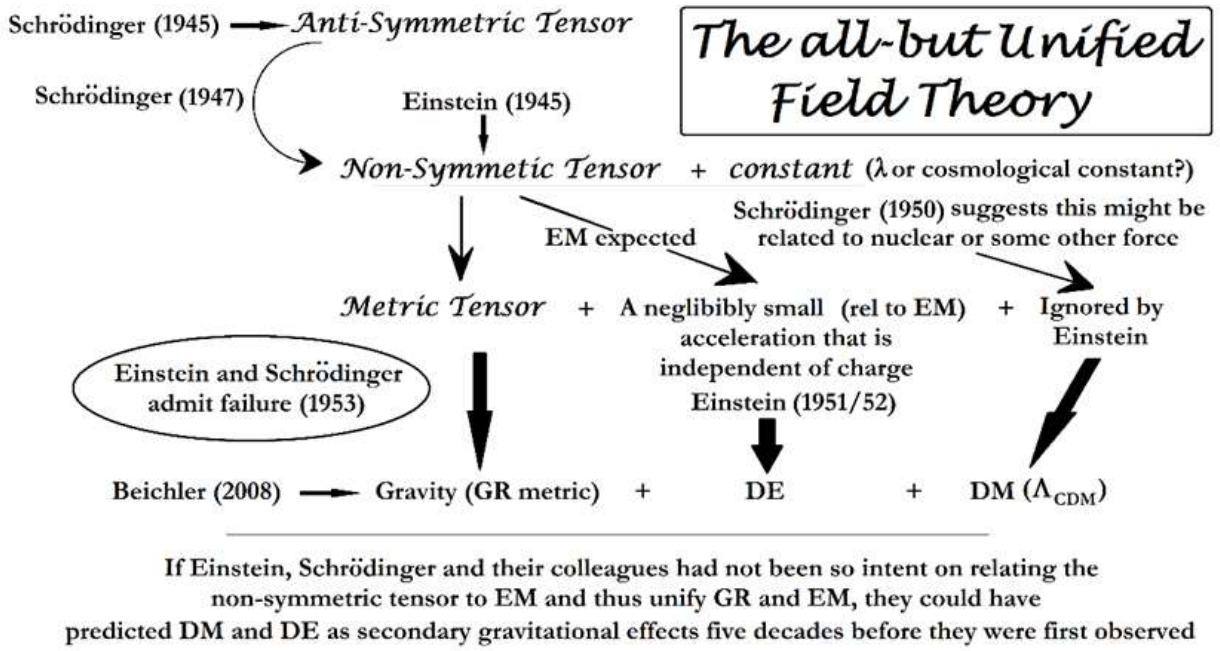
seek the lowest energy or n=1 quantum state which constitutes a fundamental principle of the universe itself. This thickness of surfaces forms a three-dimensional 'sheet' which constitutes our material reality as described by both the quantum theory and relativity theory, with modifications, and unified with the other paradigms of physics, *i.e.*, Newtonian mechanics, Maxwell's electromagnetic theory (as originally configured using quaternion algebra) and thermodynamics.

Each surface is less dense in single field potential in the fourth direction of space than the previous surface, such that the n=1 or ground state sheet is four-dimensionally the densest sheet of pure potential that constitutes our reality. Each successive sheet is half the density of the preceding quantum sheet along the fourth dimension of space, as counted by their quantum numbers. This single field density structure gives the elementary particles, nuclei and atoms their characteristic shapes and determines their physical properties and relationships to one another, *i.e.*, their physics.

In fact, that physics is the same physics already derived in earlier theories and accepted by science as valid and verified since single field theory is built upon and absorbs (incorporates) these earlier theories, but only in so far as they have been partially or wholly verified. As such, single field theory and the macrostrings model predicts why earlier theories have produced mistakes, *i.e.*, unverified and unverifiable predictions. Those portions and predictions of the earlier quantum theories that have failed to be verified can now be explained by single field theory and macrostrings model, such as the non-existence of an equal number of anti-particles in the universe resulting from the event that ended cosmic inflation.

Schrödinger's generalized unification

While working on a unified field theory in conjunction with Einstein's efforts in the mid-1940s to early 1950s, Erwin Schrödinger also happened across the correct equation for the energy-stress tensor in general relativity while looking for the most general possible tensor equation that supported distant parallelism and … . (Schrödinger, 1951)



He determined that the most general tensor possible to accurately and completely describe matter and the natural fields associated with matter would have three components: A symmetric part, an anti-symmetric part and a constant.

$$\textbf{Energy-Stress tensor} = G_{ik} + \hat{\Gamma}_{ik} + \textbf{a constant}$$

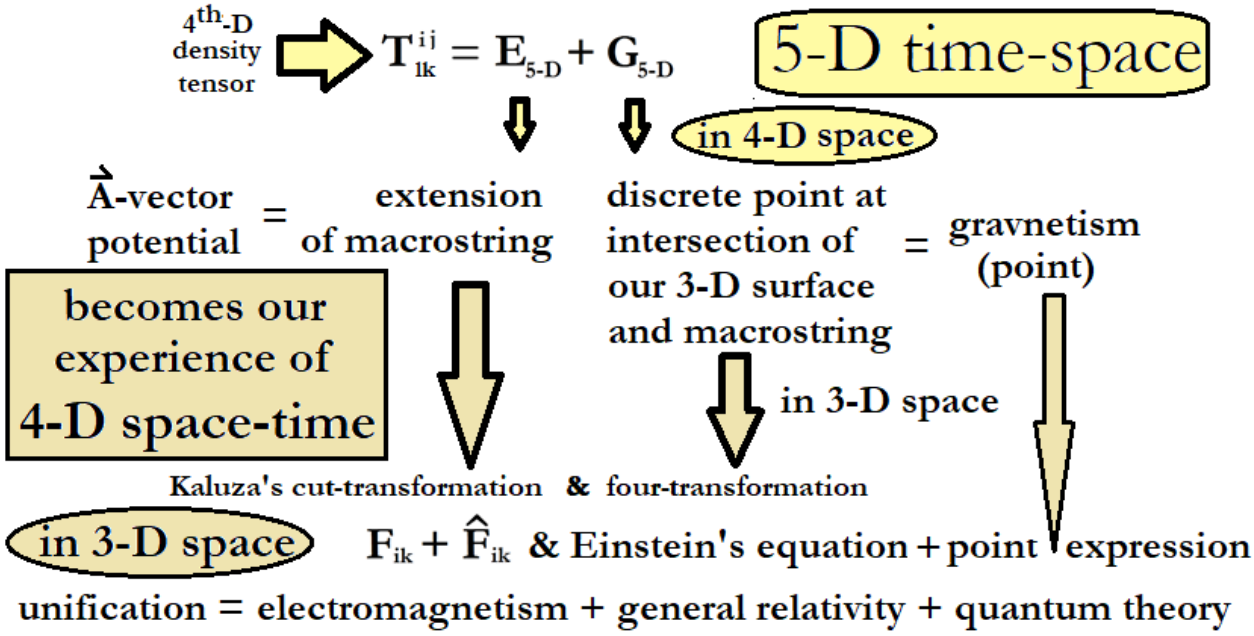
Instead of just Einstein's original symmetric tensor, his most general solution included the symmetric tensor (G_{ik} for gravity), an anti-symmetric tensor (Γ_{ik} for electromagnetism) and a constant. He even suggested that the constant might be equated to something new, possibly a nuclear force, but Einstein rejected Schrödinger's solution because of the problems he had encountered with his Lambda constant for stabilizing the extent of the universe in the 1920s. Of course, the Lambda constant is now used to represent and describe the effects of Dark Matter (sometimes called quintessence) in the general theory of relativity.

Physicists seem to understand equations rather than words because they are compact and precise and everyone can draw their own conclusions regarding the validity of the concepts, but equations are actually just shorthand forms of the concepts that can be mathematically and accurately manipulated, unlike the words that describe the fundamental concepts of physics and nature. There a single equation is needed to explain this all. This equation represents the fact that four-dimensional physics **T** (the density tensor) and thus by implication three-dimensional physics, is determined by single potential field density variations **S**.

$$T^{i}_{jkl} = S^{ne\hbar}_{\mu\epsilon}$$

In the context of five-dimensional time-space, those density variations are a function of (controlled by) the quantum number **n**, the mathematical exponential **e**, Planck's constant **h-bar**, the three-dimensional electric permittivity ϵ of free space (a viscosity constant between discrete points in the three-dimensional surface), and the magnetic permeability constant μ (a viscosity constant along the fourth direction of space) along the fourth direction of space in the five-dimensional time-space. Since Plank's constant of **h-bar** equals $\mathbf{h/2\pi}$, the mathematical constant π is also a fundamental universal constant from the single field cosmological structure and thus tied to the nature of the universe, and of course the speed of light **c** is equal to $\mathbf{(\epsilon\mu)^{-1/2}}$, so all of the important natural constants are accounted for in the physics.

From this equation, the density variations and changes along the fourth direction in space become the become the curved surface of the three-dimensional surface that is our experiential observed universe, our material world. The curved surface follows lines of constant density in four dimensions that define the energy-stress tensor that defines the general relativity of our four-dimensional space-time continuum.



Two tensors represent the single field in the five-dimensional configuration. They basically determine the density structure of the overall five-dimensional single field. The primary surface that represents our experiential three-dimensional space is the densest along the fourth direction of space, with each successive surface less dense all the way to the single pole where the density goes to zero.

$$T^{i}_{jk} = E_{5\text{-}D} + \hat{G}_{5\text{-}D}.$$

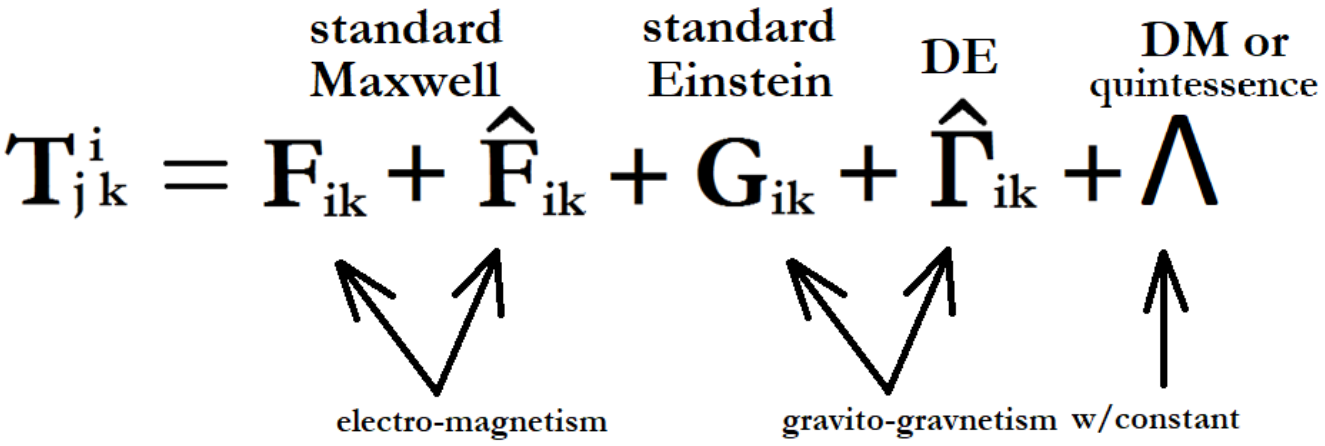
The five-dimensional tensor splits into two reflecting the point/extension duality on the fourth dimension, the first part or the discrete point is gravnetic (the potential that gives rise to Dark Energy) and the second part representing extension from the discrete point into the fourth dimension of space is the magnetic **A**-vector potential.

At any given moment, each and every geometrical point in the continuum of space-time is a center-of-mass of some sort within a direct straight line connecting with a near infinite number of other such center-of-mass points establishing the geometrical space structure expressed by Newton's **F** = m**g** or the geometrical space-time structure expressed by Einstein's symmetric equation $\mathbf{T_{jk}} = \mathbf{G_{jk}}$. At the exact same moment, each and every quantum discrete point is a geometric point relative to the circular, orbital or rotational point-center of some of a near infinite number of point-centers of off-line moving material objects relative to other center of motion points in the universe. The difference between these two types of points at that single moment in time is only in our minds as expressed by our physics.

Each and every one of these points is also coexistent with points in the **E-**, **B**-and **A-**fields that distinguish the electromagnetic structure of the universe with respect to all other fields as well as a stacking-point of a macrostring intersecting our three-dimensional surface extending into the fourth dimension of space and through the single-pole point and forming a closed loop. Each one of these points in a single moment and in every single moment of time reflects all other such points in the universe according to their physical and mathematical equivalence and sameness, even though they hold different non-overlapping positions in three- and four-dimensional space. These truths are undeniable as they are both logically and intuitively, both cognitively and subliminally, interpreted by our higher conscious and lower conscious concepts of reality. For

this reason, science assumes that the laws of nature, theories and hypotheses that it develops are equally valid throughout the whole of the universe.

In any case, these fundamental particles further differentiate the single potential represented by electromagnetism and gravitogravnetism in four-space into the electric, magnetic, gravity and gravnetic fields in three-space where they act as field point-centers to the forces that we associate with matter according to the four-dimensional equation of



When Kaluza's cut-transformation is applied to the general equation for the stress-energy tenor, the electromagnetic properties of matter are prioritized and Maxwellian electromagnetism emerges in three-dimensional space.

On the other hand, when Kaluza's four-transformation is applied to the general stress-energy/curvature equation gravitation emerges. In order to save (complete) the cylindrical condition for defining macrostrings in the fourth-dimension of space that intersect the three-dimensional Riemannian surfaces of our space at discrete points in our surface or space must be and can only be double-polar spherically curved as Einstein hypothesized in the general theory of relativity. Then the macrostring/sheet (fourth dimension/three-dimensional) of the Single (Operational) Field Theory or SOFT is the direct logical and only realistic result (conclusion) of applying Kaluza's cylindrical condition and Klein's method of quantification of space-time to the extended superstring hypothesis.

This structure yields the fundamental equation, as stated above, of

$$\mathbf{T}^{\mathbf{i}}_{\mathbf{jkl}} = \mathbf{S}^{\mathbf{ne\hbar}}_{\boldsymbol{\mu\epsilon}},$$

where the tensor **T** represents the single field density at a point in the fourth dimension of space specified by its position relative to our three-dimensional surface by the quaternion **i** (number), and **j**, **k**, **l**. That point can be interpreted as the curvature in our three-dimensional surface that represent the greatest possible density in the fourth dimension, as represented by the tensor **S**, although the spatial density within the three-dimensions of our surface is constant if spatial density can even be defined as a real 'thing'. After all, zero or a value of nothing as well as nothingness are very constant. The tensor **S** depends upon the quantities n, e, and h-bar along the fourth dimension of space and the quantities μ and $\in$ within the three-dimensional surface of our space, all as defined above. Whereas the magnetic permeability μ is a quantity associated with the extension of the magnetic vector potential **A** in the fourth dimension, it is also the value associated with the discrete point in three-

dimensional space where the macrostring intersects the three-dimensional surface, while the electric permittivity constant ∈ is a completely three-dimensional value.

This five-dimensional time-space equation reduces to the four-dimensional space-time equation representing the energy-stress on the three-diemsnional surface due to the four-dimensional density variations in single field potential, or

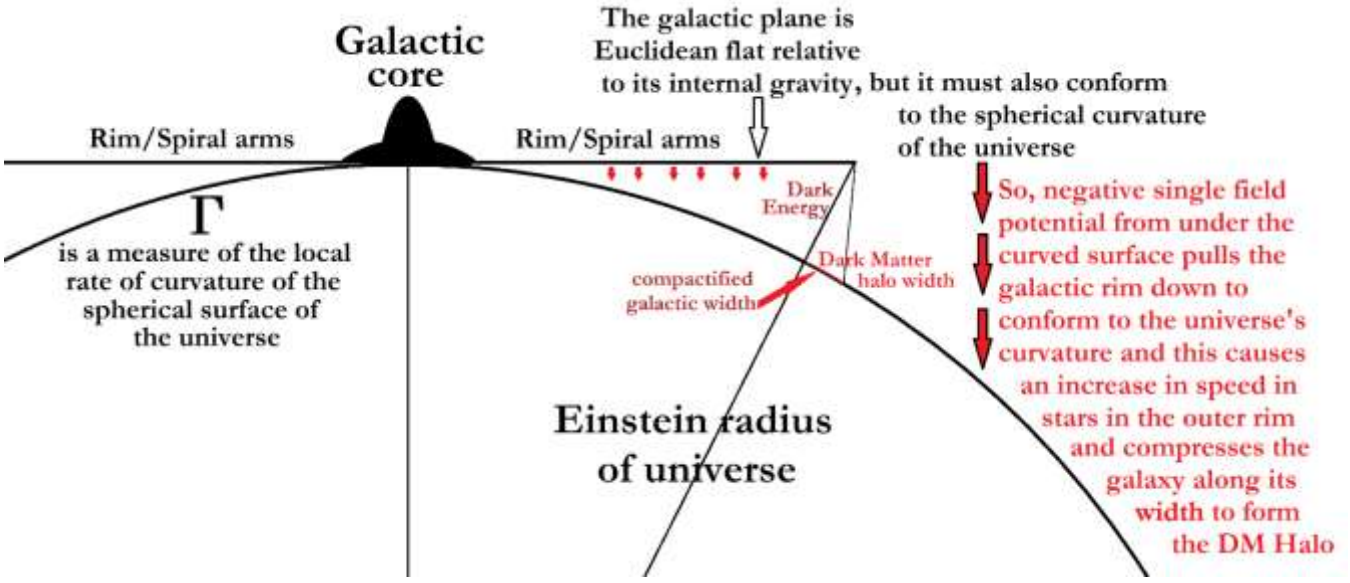
$$\mathbf{T^{i}_{ik} = G_{ik} + \Gamma_{ik}} .$$

G and **Γ** are both anti-symmetric tensors representing the extension/point duality of the macrostring that separated electromagnetism (**A**-vector extension) from gravitogravnetism (discrete gravnetic point) in the fourth dimension, respectively. These break down further in their three-diemsnional versions as

$$\mathbf{T_{ik}} = (\mathbf{F_{ik}} + \mathbf{F_{ik}}) + (\mathbf{G_{ik}} + \mathbf{G_{ik}} + \text{a constant}),$$

which is Schrödinger's most general solution to the anti-symmetric tensor in the Cartan geometry that supports distant parallelism. The quantity ($\mathbf{F_{ik}}$ + $\mathbf{F_{ik}}$) is the standard tensor equation for electromagnetism and the quantity ($\mathbf{G_{ik}}$ + $\mathbf{G_{ik}}$ + a constant) yields Einstein's gravity equation plus a constant representing Dark Energy and a constant representing the Dark Matter (a mere shadow of the interaction between galaxies core matter, the orbiting star systems and throughout rest of the matter in the universe along the extended line between them, not real matter) that seems to surround galaxies. $\mathbf{G_{ik}}$ is just Einstein's symmetric tensor for gravity, the $\mathbf{G_{ik}}$ is Einstein's non-symmetric tensor which yields a very small acceleration ($\mathbf{\Lambda_{HDM}}$) that accounts for the Dark Energy effect, (Einstein, 1952) and a constant ($\mathbf{\Lambda_{CDM}}$) that is normally associated with the Dark Matter Halo surrounding galaxies.

DE is real but it is potential rather than energy, positive potential above our surface and negative potential below or surface because of the half twist at the single pole. That potential only becomes energy when manifesting as a force or interaction with matter in our three-dimensional surface or experiential space. It is associated with the continuing expansion of the universe which is the source of single field potential in four-dimensional space, while DM is an illusion or shadow, *i.e.*, neither material nor particulate, but merely the secondary or discrete-point effect of gravity called gravnetism (as discussed and described above). This leads to two simple methods for testing and verifying this theoretical model.

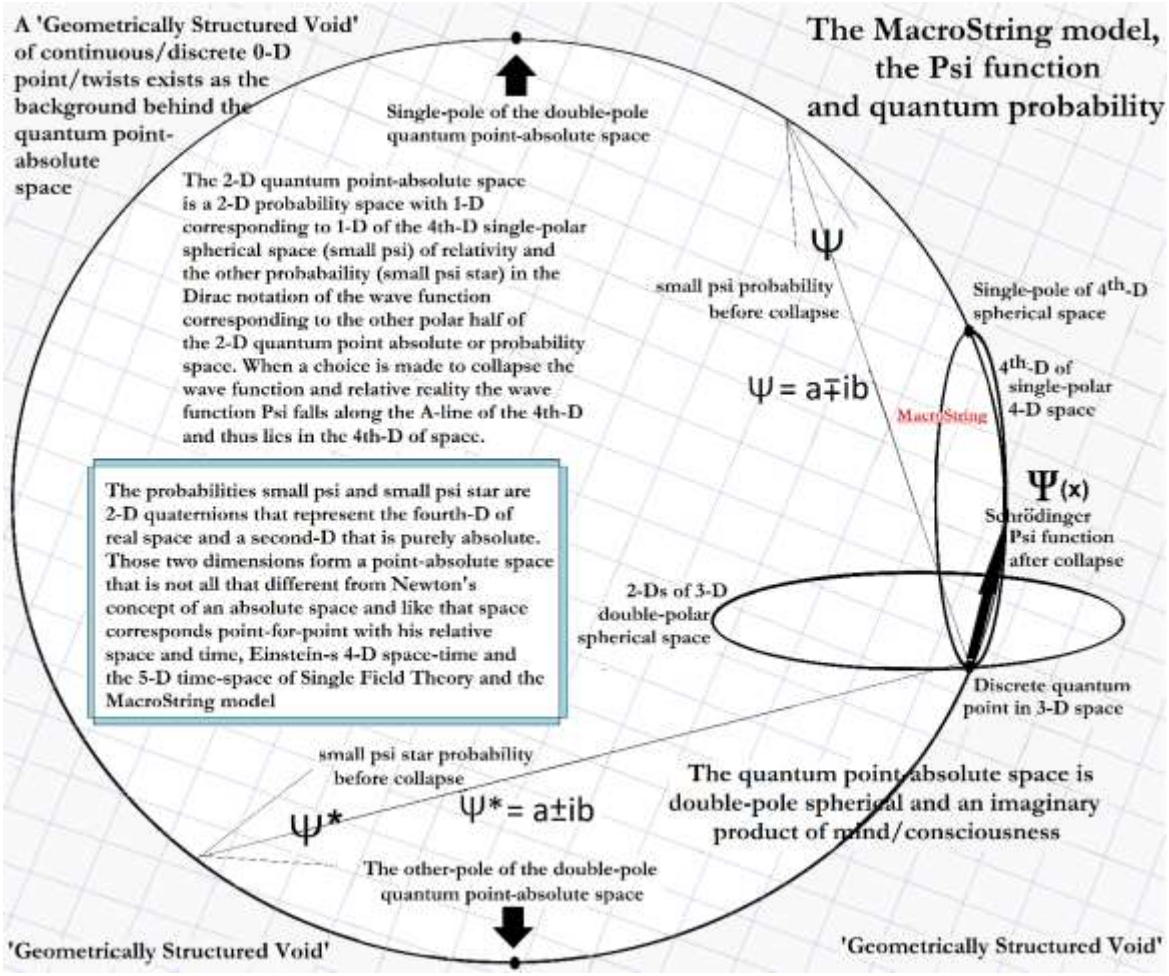


The positive spherical curvature of the universe demands that galaxies and other material systems with their own gravitational structures conform to its curved surface. Galaxies are the only systems which this would seem to affect because they are do wide.

A galaxy would normally be very close to Euclidean flat within itself which is very slightly off of the local section of universal curvature, the collective product of all the matter in the universe, which is locally flat. But it is above the curvature enough that the negative potential on eh underside of our surface pulls the galactic plane down to conform to universal curvature and this releases the DE that speeds of the stars in the outer rim. Moreover, the width of the galaxy is slightly compressed (lessened) as the galactic plane is pulled down relative to the Einstein radius so it has the same radial length which would be a lesser line length than if it were truly flat. These are predictions and both of these value can be determined from observations and used to confirm the theory. This model is also useful in explaining and the formation and predicting their ultimate shapes and proportions given get distribution of matter before they start to form.

Conclusion

According to the macrostring/sheet models and the single field theory (SOFT) that they exemplify, we live and exist on (in) a three-dimensional surface (space) of a double-polar spherical material world that is embedded in a fourth dimension that has a single-polar spherical and closed structure. But that is part of a larger double-polar spherical discrete point-absolute space that could be said to be a consciousness space because it is associated directly with our consciousness and existence. It is a space of all possibilities that conform to the specific laws of nature that rule our universe, and as such it is the playground or stage upon which our minds ultimately sense and experience reality and from which the different possibilities are probabilistically ‘collapsed’ to form our physical or space of matter.



According to the Dirac notation value of Schrödinger's psi function,

$$\Psi(x) = \{\psi | f(x) | \psi^*\}$$

where

$$\psi = a\text{-}ib \quad \text{and}$$

$$\psi^* = a\text{+}ib$$

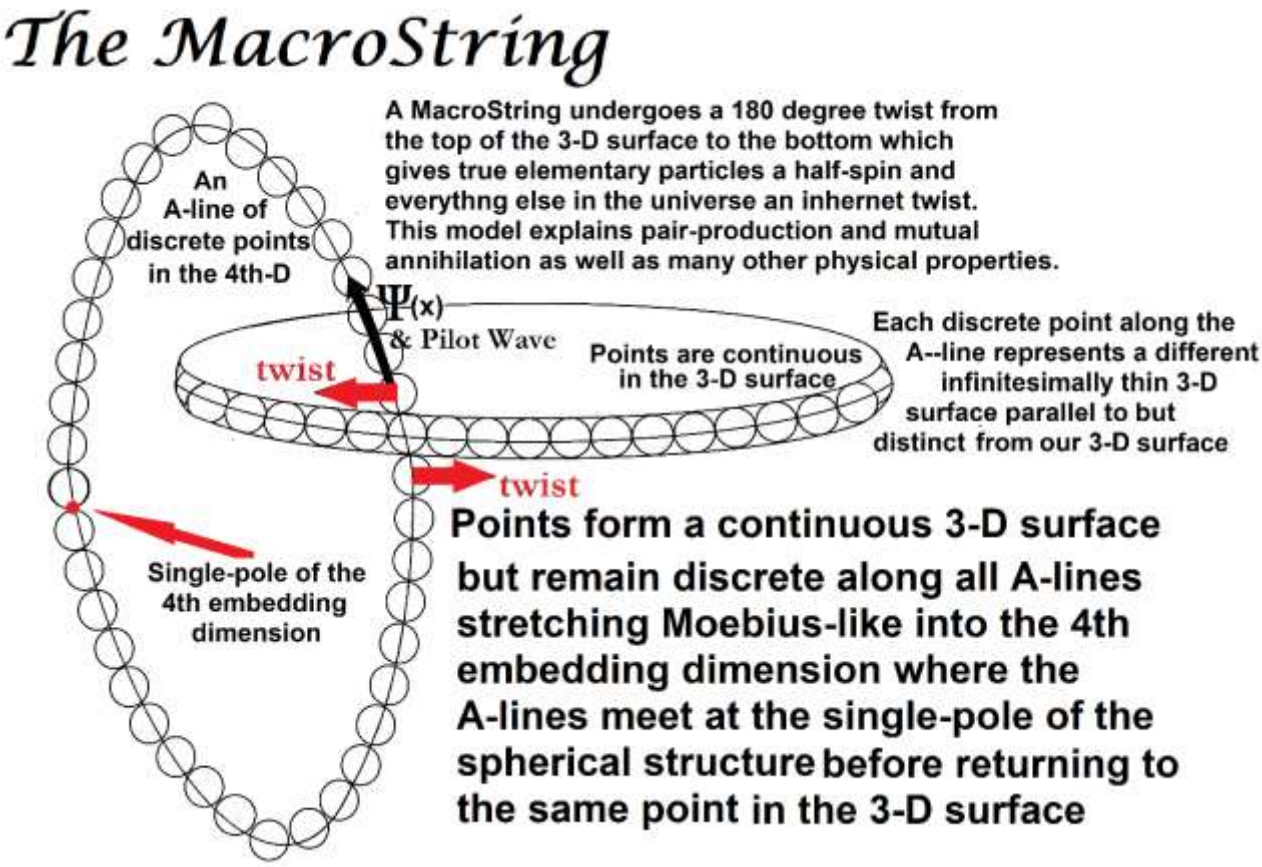
have the uncertainties form of two-dimensional quaternions expressing a four-dimensional (probabilistic) point-absolute space. A normal four-dimensional quaternion would have the form of Q = a + b**i** + c**j** + d**k**, but a discrete point in two dimensions of our normal three-dimensional space would be represented by the normal two-dimensional quantum mechanics as having values in just those normal two-dimensions of the position of the discrete point projected along the fourth direction of space, *i.e.*, Q = a - **i**b and Q = a + **i**b, which perfectly represents our quantum point-absolute space.

That quantum point-absolute space, we find the final stage of reality upon which all of this has evolved: a Geometrically Structured Void within the Absolute Void. This structured portion of the Absolute Void resulted from the Big Bang (probably) which began when the first moment of time was bound to the first discrete point of existence. From that moment of time forward, evolution existence such that each and every moment and this discrete point evolves along with the collective of all such points.

We do not directly sense or rather cognize this higher dimension of the absolute space because our evolution has not yet given us the ability to do so. We only sense and cognize the higher fourth dimension of space subconsciously via our higher consciousness so any signals or sensations of it are only cognized paranormally and thus seem to be random. These are quite literally blind spots in our sensations of the external world of our normal experiences. We do not sense the higher dimensions directly in our minds because our survival has not yet found it necessary to do so, so our evolution has left us with a very strong three-diemsnional bias that is recently limiting our science and knowledge base of physical reality to advance beyond our innate, inherent and inherited three-diemsnional worldview. To make up for the over restriction of our knowledge of our being and reality we have constructed escape goats and partially false philosophical/metaphysical pictures to explain why we cannot advance. Our present interpretation of quantum mechanics and wave mechanics is a good example of this practice and once we see the problems with that interpretation, we will finally be able to move forward in science and in our physical and biological evolution.

We have already analyzed the fundamental problems with the HUP, but when we take a deeper look at how our reality emerges from nothing and the discrete 0-D point/twist bits of Void, considering the twin evolution of the single potential field that fills all of four-dimensional space and five-diemsnional time-space and the virtual pre-consciousness field that drives our evolution and time, w come to the macrostring/sheet model of reality. All of the macrostrings collectively form the single potential field that fills and defines the fourth dimension of space as an infinite number of infinitesimally thin three-dimensional Riemannian surfaces as described by Einstein and Bergmann in 1938 as well as Einstein, Bergmann and Bargmann in 1941. There are only two real ‘forces’ or interactions of nature which manifest themselves in our three-diemsnional reality, not the four which science presently accepts. The strong nuclear force has been reduced to a gravitational (extended surface) effect and the weak or electroweak nuclear force has been reduced to electromagnetic (of consecutive discrete points between surfaces) within nuclei.

The geometrical structure of the five-dimensional time-space continuum and the geometrical relationship between the embedding four-dimensional space and three-dimensional surfaces on or in which we exist, including the macrostring and sheet formations, determines the physics of our experienced reality. It does so without the need to invent higher and higher-dimensional mathematical models to provide extra mathematical degrees of freedom and data points to explain our physical existence. Our reality is thus a specifically geometrically defined conglomerate of 0-D point/twists that are governed by one overriding principle, the point/extension duality which allows discrete points to form continuous extensions (three-diemsnional surfaces) and/or remain discrete (macrostrings) for different physical purposes.



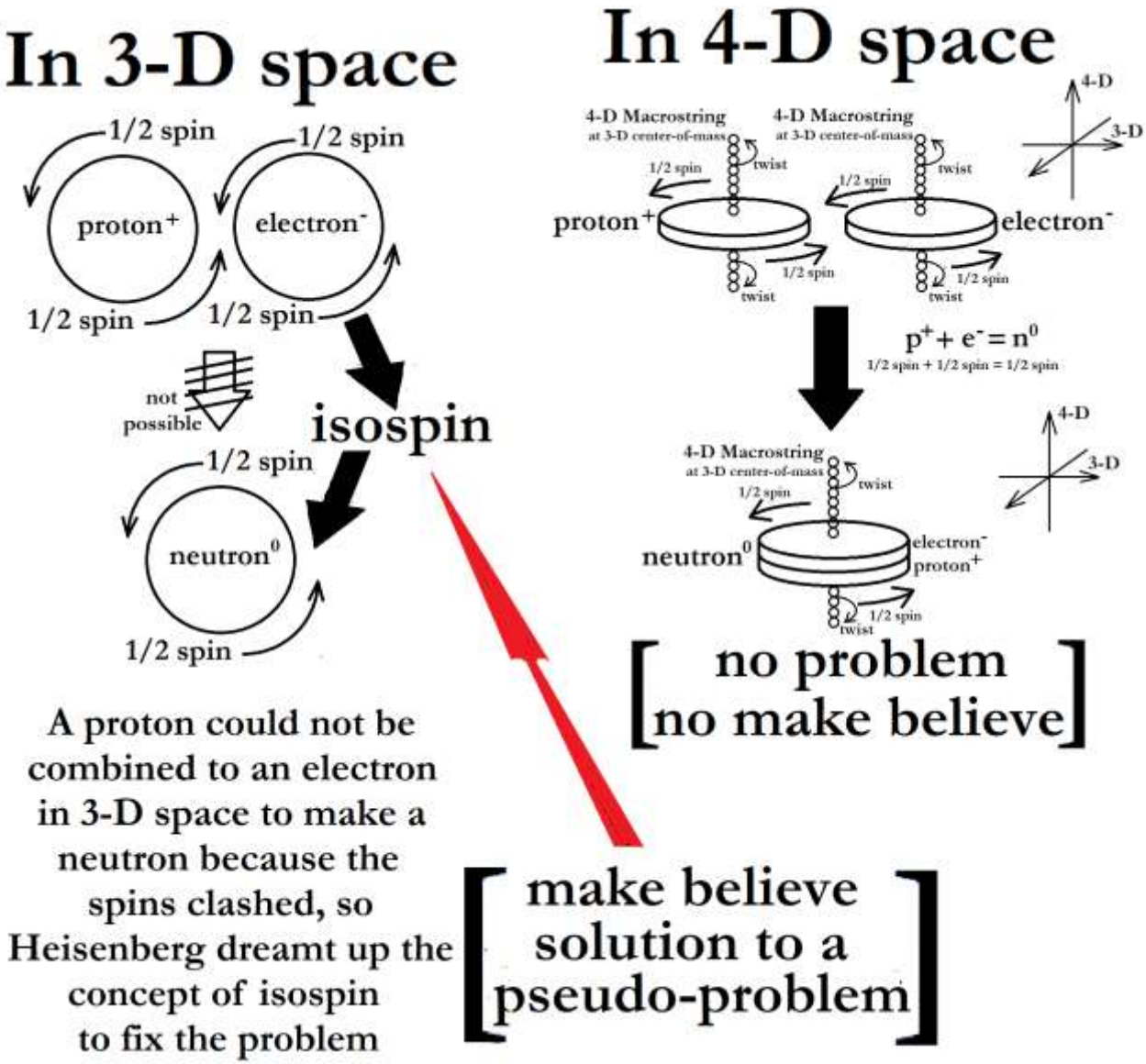
From the three-dimensional perspective of physics, matter only moves according to electromagnetic and gravitogravnetic forces as well as conscious choice and is created by the curvature of the space-time continuum, but from the four-dimensional point-of-view, everything is just density variation patterns of single field potential (four-dimensional holograms that are projected onto our three-diemsnional surface as curvature) that create and manifest as matter, matter in motion, life, mind and consciousness within the three-dimensional surface that we perceive as our common matter-filled space as it changes over the span of time.

Our physical reality of experiences exists within the n=1 quantum 'sheet' of parallel three-dimensional surfaces can be likened to David Bohm's original concept of the quantum field potential. The n=1 'sheet' also represents the ground state energy of the universe as a whole as well as Bohm's explicate order of reality, while the whole of the single field in conjunction with the macrostring model represents his implicate order and the quantum point-absolute space represents Bohm's super-implicate order. Schrödinger's wave function Ψ, which lies along the A-lines projected quantum point-by-point into the fourth dimension of space where it can be collapsed into relative three-dimensional reality by either universal entanglement or conscious action and/or choice, coincides with the DeBroglie-Bohm pilot wave and other related quantum models.

A similar model was developed by William Wilson, one of the early contributors to quantum theory, who demonstrated mathematically that the Schrödinger wave collapse actually yielded the wave volume in the higher fourth dimension of space. Only later did he find out about similar ideas by DeBroglie, Klein and the others. His student at London University, Henry T. Flint, eventually became his collaborator as well as the lead researcher at the University of London in the development of all aspects of five-dimensional theories of space-time. Strangely, Wilson and Flint's work has received little or no recognition in international scientific circles of others, including Einstein, attempting to develop similar theories of unification despite nearly four decades of research and dozens of publications which ended when Flint retired in the 1960s. The fact that their work has

been so overwhelmingly ignored is additional evidence of the three-dimensional bias that controls our perceptions of reality and the science that we have developed to explain our reality.

In 1932, Heisenberg developed (dreamt up) the concept of isospin to explain what he and everyone else could not understand, how two fundamental particles such as a proton and an electron, both with +1/2 spin, could join together in three-diemsnional space to form a +1/2 spin neutron.



There is no other such proof of concept in science rather than a verification of theory and that is what science is based upon. But in this case the above example provides a conceptual proof that the space we observe through the existence of matter and experience is four-dimensional and not just three-dimensional. That is, except for William Rowan Hamilton's development of quaternions, a four-dimensional number system, and quaternion algebra in 1843 to explain circular and rotational motions without invoking pseudo-forces such as centripetal, centrifugal and Coriolis, or their modern equivalents of Dark Matter and Dark Energy. **Our space of experience IS four-dimensional, not just three-dimensional and we need to get over our three-dimensional bias in**

everything we do, including physics, to advance any further beyond the present point of knowledge and understanding to which we have now advanced.

Post Conclusion: Beyond the physics

These are conceptual proofs that go beyond mere theory to explain our physical reality. The related theory that needs verification would be the unification theory called Single Field Theory and its Macrostring model. These theories demonstrate that a simple change in geometry can explain many of the facets of classical and modern physics in simple four-dimensional geometry terms that are presently explained and justified using advanced complicated pure mathematical terms and methods that do not really reflect the reality evident in the universe. The universe is one, that is why it is called a uni-verse and it is uni-fied, made one, by its geometry, not the complicated pure mathematics that is the sole product of the human brain and mind rather than the observation, measurement and experience of that reality like Newtonian calculus.

It is crystal clear, or at least it should be crystal clear, that humans have an extremely strong and domineering three-dimensional bias when considering the physical reality that we experience and observe. So, where does this overriding and vastly limited bias to our mental existence come from and is a flaw us or is it a product of nature? It is natural and comes from our physical evolution which is the simple product of moments of change at the most fundamental level of discrete points that collectively constitute the universe, and only partly biological, even given the fact that the universe is characterized by a point/extension duality in our minds. A long time ago (300,000 years), pre-Homo sapiens had learned enough about the universe, as reflected by their survival within the immediate three-dimensional material environment and evolved through that learning, that they could successfully survive all of the dangers and problems that nature and the world could throw at them. So, they evolved according to a truer picture and understanding of nature with the ability to observe and comprehend a larger and more accurate picture of the universe. We then inheriting a more complex brain that went beyond just the normal experience of our everyday lives and our over restricted and limited three-dimensional experience of our reality.

The new Homo sapiens, the latest incarnation of the human species, began to sense that there was more to out reality than just surviving in the three-dimensional material world. We already had direct contact with and thereby knowledge of the fourth-dimension of space at a very deep subliminal level of our mental processes, but we had not yet evolved the need to know of it for our survival. We then spent a three hundred thousand year period developing mental constructs of the universe to use in our new lives, such as our separate existence (the self) from the environment, our separation from the forces of nature that ruled us, to a belief in animism (how we dealt with the large creatures such as saber-toothed tigers and wooly mammoths that threatened our survived in the world), the possibility of an afterlife that transcended our deaths (forty to sixty thousand years ago according to archeological evidence), and rudimentary religions in the form of human-like gods that controlled the forces of nature. We then developed culture, societies and civilizations that were characterized by Religious doctrine and semi-permanent Religious institutions that became all but impervious to change with subsequent increases in human knowledge, before we moved on to pure philosophy, monotheism and natural philosophy (about two-thousand seven-hundred years ago).

The philosophy that emerged was a mix of religion and pre-science philosophy until four centuries ago when natural philosophy broke away from scholasticism in the form of early science. That early science was responsible for the concept of time was which was invented by Newton, and later the individual sciences emerged from natural philosophy and physics as standalone sciences in the 1840s when their own primary fundamental theories were finally developed beyond pure physics which was based on matter, matter in motion, momentum and energy. Next came the Second Scientific Revolution characterized by relativity theory combining space and time into space-time and quantum theory which attempted but failed to show the differences between time and space inherent in the HUP, *i.e.*, the physical limits to our ability to measure and understand them independent of each other even though they form a single natural whole called space-time. The time has now come for science to accept the inevitability of knowing and understanding time-space and the

fundamental reality of the four-dimensionality of space so it can advance beyond its three-dimensional bias and we can evolve still further beyond mere Homo sapiens.

Maxwell's original theory of electromagnetism was written in the language of quaternions but our three-dimensional bias forced the development of three-dimensional vectors to express it and apply the theory. Heaviside, one of the original developers of vectors and vector analysis, realized that fact at least subconsciously, so he rewrote Newton's theory of gravity in the form of $F = mg + mv \otimes S$, to express the difference between three and four-dimensional spaces. Science now needs to go back to quaternions and rewrite gravity theory and quantum theory in the terms of quaternion mathematics unless we develop a new, more convenient and truer four-dimensional numbering, algebra and calculus system to more accurately express the four-dimensional geometry used in the macrostring model and single field theory. We need to do this simply to survive in a more complex and diverse world than we have ever before known, experienced or even imagined. It is not just about physics, it is about nature as studied and identified by physics, and the word physics originally meant nature. They mean and are the same thing.

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