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Bermanseder, T., *A Revelatory Eschatology & Genesis: X. Multiverses in the Omniverse, Quantum Tunneling and Conformal Cyclic Cosmology*

Exploration

A Holographic Twin Bipolaron Universe as a Multiverse, Quantum Tunneling, and the Conformal Cyclic Cosmology of Roger Penrose

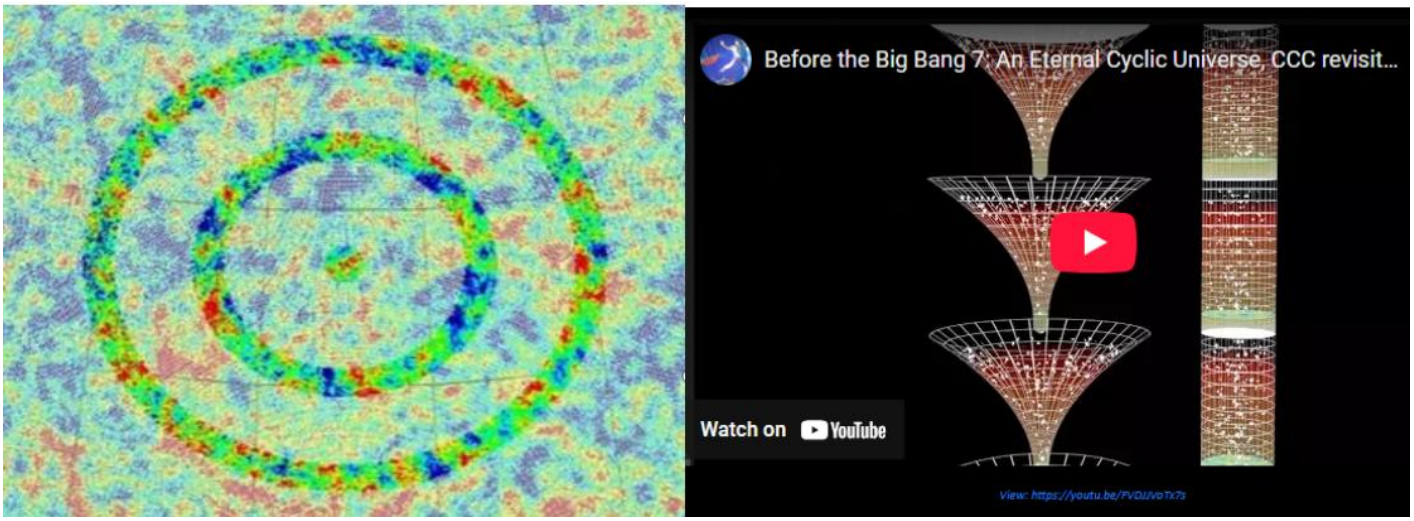
Tony Bermanseder*

Abstract

In this article, the author partly uses metaphors to explore multiverses in the omniverse, quantum tunneling & conformal cyclic cosmology in a revelatory eschatology and genesis.

The Holographic Universe is addressed in conjunction with a revisitation of 11-dimensional supermembrane theory, with its five 10-dimensional superstring classes reinterpreted in the form of a Twin Bipolaron Gravitation Center (TBPGC). A parallel lightpath cosmology of dimensionally separated spheroidal de Sitter dS and hyperbolic Anti-de Sitter AdS cosmic expansion models is introduced to enable the cancellation of curvatures in the context of the AdS-CFT correspondence and the emergence of a multiverse defined in phase-shifted universes from a seedling cyclic protoverse oscillating as Bohmian standing waves between maximized even and minimized odd Hubble Event Horizon nodes as TBP parameters of the cosmogenesis.

Keywords: Revelation, eschatology, genesis, multiverses, omniverse, quantum tunneling, conformal cyclic cosmology, Roger Penrose.



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Introduction

The expansion of the universe can be revisited in a reformulation of the standard cosmology model, Lambda-Cold-Dark-Matter, or ΛCDM in terms of a parametrization of the standard expansion parameters derived from the Friedmann equation, itself a solution for the Einstein Field Equations (EFE) applied to the universe itself. A measured and observed flat universe in de Sitter (dS) 4D-spacetime with curvature k=0, emerges as the result of a topological mirror symmetry between two Calabi-Yau manifolds encompassing the de Sitter spacetime in a multi-timed connector dimension. The resulting multiverse or brane world thus defines a singular universe with varying but interdependent time cyclicities.

It is proposed that the multiverse initiates cyclic periods of hyper-acceleration or inflation to correlate and reset particular initial and boundary conditions related to a baryonic mass seedling proportional to a closure or Hubble mass to ensure an overall flatness of zero curvature for every such universe parallel in a membrane time-space but co-local in its lower dimensional Minkowski spacetime.

On completion of a 'matter evolved' Hubble cycle, defined in characteristic Hubble parameters, the older or first universal configuration quantum tunnels from its asymptotic Hubble event horizon into its new inflaton-defined universal configuration bounded by a new Hubble node. The multidimensional dynamics of this quantum tunneling derive from the mirror symmetry and topological duality of the 11-dimensional membrane space connecting two Calabi-Yau manifolds as the respective Hubble nodes for the first and the second universal configurations.

Parallel universes synchronize in a quantized protoverse as a function of the original light path of the instanton, following, not preceding a common boundary condition defined as the inflaton. The initial conditions of the inflaton change as a function of the imposed cyclicity by the boundary conditions of the paired Calabi-Yau mirror duality, where the end of an instanton cycle assumes the new initial conditions for the next cycle of the instanton in a sequence of quantum Big Bangs.

The outer boundary of the second Calabi-Yau manifold forms an open AdS spacetime in 12- dimensional brane space (F-Vafa 'bulk' Omni space) with negative curvature k=-1 and cancels with its inner boundary as a positively curved k=+1 spheroidal dS spacetime in 11 dimensions to form the observed 4D/10-dimensional zero curvature dS spacetime, encompassed by the first Calabi-Yau manifold.
A bounded (sub) 4D/10D dS spacetime is then embedded in an Anti-de Sitter (AdS) 11D-spacetime of curvature k=-1 and where 4D dS spacetime is compactified by a 6D Calabi-Yau manifold as a 3-torus and parametrized as a 3-sphere or Riemann hypersphere. The outer boundary of the 6D Calabi-Yau manifold then forms a mirror duality with the inner boundary of the 11D Calabi-Yau event horizon.

Every inflaton defines three Hubble nodes or time-space mirrors: the first being the 'singularity-wormhole' configuration; the second the nodal boundary for the 4D/10D dS spacetime and the third the dynamic light path bound for the Hubble event horizon in 5D/11D AdS time space. The completion of a 'de Broglie wave matter' evolution cycle triggers the Hubble Event Horizon as the inner boundary of the time space mirrored Calabi Yau manifold to quantum tunnel onto the outer boundary of the spacetime mirrored Calabi-Yau manifold in a second universe, whose inflaton was initiated when the light path in the first universe reached its second Hubble node.

For the first universe, the three nodes are set in time space as $\{3.3x10^{-31}$ s; 16.88 Gy; 3.96 Ty} and the second universe, time-shifted in $t_1=t_o+t$ with $t_o=1/H_o$ has a nodal configuration $\{t_o+1.4x10^{-33}$; t_o+3,957 Gy; t_o+972.7 Ty}; the latter emerging from the time space as the instanton at time marker t_o.

A third universe would initiate at a time coordinate $t_2=t_o+t_1+t$ as $\{1/H_o+234.472/H_o+5.8x10^{-36}$ s; $t_o+t_1+972.7$ Ty; $t_o+t_1+250{,}223$ Ty$\}$; but as the second node in the second universe cannot be activated by the light path until the first universe has reached its 3.96 trillion-year marker (and at a time for a supposed 'heat death' of the first universe due to exhaustion of the nuclear matter sources); the third and following nested universes cannot be activated until the first universe reaches its n=1+234.472=235.472 time-space coordinate at 3,974.8 billion years from the time instanton, aka the Quantum Big Bang QBB or the QBBR(S) Kerr-Newmann Black Hole R(S)ingularity.

For a present time-space coordinate of npresent=1.132712711 however, all information in the first universe is being mirrored by the time-space of the AdS spacetime into the dS spacetime of the second universe at a time frame of $t = t_1-t_o = 19.12 - 16.88 = 2.24$ billion years and a multidimensional time interval characterizing the apparent acceleration observed and measured in the first universe of the Calabi-Yau manifold compressed or compactified flat dS Minkowski cosmology.

A higher dimensional AdS spacetime so encompasses a lower dimensional dS spacetime and where the enclosing spacetime defines a multiverse, which is 2x2.24 = 4.48 Gy older than the nested spacetime. The electromagnetic c-invariant expansion of the 11-dimensional cosmology so calculates a Hubble 'constant' of 66.92 Hubble units as a change from its nodal constant of 58.04 Hubble units in $H(n_{present}) = H_o/(2-n_{present})$ for an age of 19.12 Gy in 11D mirrored or projected to 19.12-4.48=14.64 Gy in 10D.
A projected Hubble constant of 73-74 Hubble units for an age of the universe of 13.8 billion years could then be calculated for a local astrophysical environment for the correct Hubble node at 16.9 billion light-years imaged in the lower and upper boundaries of 14.64 and 19.12 billion years, respectively.

The 'compressed' or conifold 10-dimensional dS spacetime synchronizes with the light path created and c-invariant 11-dimensional AdS spacetime in cycle coordinate n=½ in dS calibrating with n=1 in AdS.
It is this calibration of multiverse relative cycle time coordinates, which introduce the Dark Energy into the overall cosmology for the omniverse.

The solution to the Dark Energy and Dark Matter question of a 'missing mass' cosmology then becomes described in the evolution of a multiverse in matter and energy.

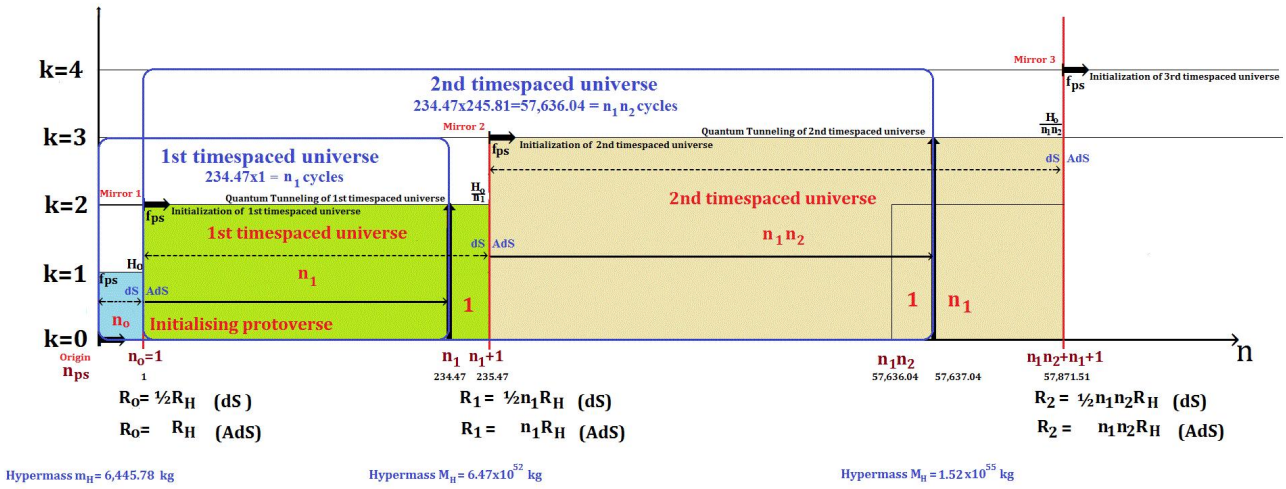
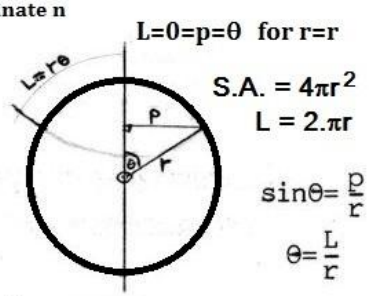


Figure 1: *A multiverse created from the intersection of the AdS light path with the inflationary odd nodal Hubble bound H_o*

View: https://youtu.be/RF7dDt3tVmI Quantum Tunneling

Radius of Curvature r(n) with Salefactor 1/a=1+1/n in dS as a function of cycletime coordinate n

$$r(n) = r_{max}\left(\frac{n}{n+1}\right) m^* \quad \text{and} \quad n = H_o t$$



The volume of the 4-D spacetime can however be found by integrating the surface area S.A. via arclength L, with L being an intrinsic parameter of the 3-D surface. dL=r.dθ

$$V_{Universe} = \int_0^{r\pi} 4\pi p^2 \, dL = 2\pi^2 r(n)^3 \quad \text{for a local spheroidicity}$$

$4\pi\int_0^{\pi} r^3\sin^2\theta\, d\theta = 4\pi r^3\int_0^{\pi} \tfrac{1}{2}\{1-\cos 2\theta\}d\theta = 2\pi^2 r(n)^3$ for the asymptotic 4/10D dS 'flatness' cosmology within the nodal Hubble 5/11D AdS Universe

This classical macrovolumar is quantized in the microvolumar quantum of the Unified Field in 8π radians or 840°-(-600°)=1440°

$$\tfrac{1}{4}\pi\int_{-600°}^{840°}\{\sin(\tfrac{1}{2}[3x])-\cos(\tfrac{1}{4}[3x])\}^2\,dx = \tfrac{1}{4}\pi\int_{-10\pi/3}^{14\pi/3}\{\sin^2(3x/2)+\cos^2(3x/4)-2\sin(3x/2)\cos(3x/4)\}\,dx$$

$$= \tfrac{1}{4}\pi\int_{-600°}^{840°}\{\tfrac{1}{2}(1-\cos[3x])+\tfrac{1}{2}(1+\cos\tfrac{1}{2}[3x] - \sin\tfrac{1}{2}[9x] - \sin\tfrac{1}{4}[3x]\}\,dx$$

$$= \tfrac{1}{4}\pi\left[\theta - \sin[3x]/6 + \sin\tfrac{1}{2}[3x]/3 - 2\cos\tfrac{1}{2}[9x]/9 - 2\cos\tfrac{1}{2}[3x]/3\right]_{-10\pi/3}^{14\pi/3} = \tfrac{1}{4}\pi(8\pi) = 2\pi^2$$

{ by classical volumar of revolution (vor) $V_{vor}=\int\pi y^2\,dx$ for y=r }

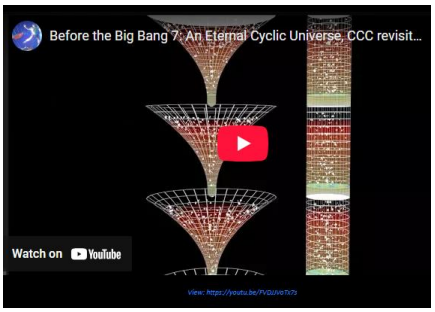
The amplitude for the universal wavefunction becomes proportional to the quantum count of the space occupancy of a single spacetime quantum and as source energy (VPE or Vortex Potential Energy) quantum and as a consequence of the preinflationary supersymmetry of the F(x)=sinx +sin(-x) = 0 wavefunction defining this singularity (symbolised as the symbol for infinity).

A higher dimensional surface is Moebian connected to differentiate the quantum mechanical 'boundary' for the quantum tunneling of the macrocosmos as a magnified holofractal of the well understood microquantumization.

It then is the experienced and measured relativity of time itself, which becomes the quantum wall, with the 'reducing thickness' of the quantum boundary correlating with the evolution of the multiversal structure in the phase shifted time intervals defining the individual universes.

Figure 2: *The quantum tunneling of the Twin Bipolaron holographic universe as a multiverse in phase shifts of time*

Conformal Cyclic Cosmology (CCC) and the Weyl Curvature Hypothesis of Roger Penrose



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The pre-Big Bang 'bounce' of many models in cosmology can be found in a direct link to the Planck-Stoney scale of the 'Grand Unification Theories.'
In particular, it can be shown that the square root of alpha, the electromagnetic fine structure constant, multiplied by the Planck length results in a Stoney transformation factor $L_P\sqrt{\alpha} = e/c^2$ in a unitary coupling between the quantum gravitational and electromagnetic fine structures $G_o k_e=1$ and representing a conformal mapping of the Planck length onto the scale of the classical electron.

This superimposes the lower-dimensional inertia-coupled electric charge quantum 'e' onto a higher dimensional quantum gravitational D-brane magnetopole coupled magnetic charge quantum $'e^{*}' = 2R_e.c^2 = 1/hf_{ps} = 1/E_{Weyl}$ wormhole by the application of the mirror/T duality of the super membrane $E_{ps}E_{ss}$ of heterotic string class HE(8x8).
The standard model postulates the Big Bang singularity to become a 'smeared out' minimum spacetime configuration (also expressible as quantum foam or in vertex adjacency of Smolin's quantum loops). This 'smearing out' of the singularity then triggers the (extended) Guth Inflation, supposedly ending at a time coordinate of so 10^{-32} seconds after the Big Bang.

If the Guth inflation ended at a time coordinate of $3.33x10^{-31}$ seconds, the Big Bang became manifest in the emergence of spacetime metrics in the continuity of classical general relativity and the quantum gravitational manifesto, and say from a Higgs 'false vacuum' at the 'bounce time' reduced in a factor of so 11.7.
This means that while the temperature background remains classically valid, the distance scales for the Big Bang will become distorted in the standard model in postulating a universe the scale of a 'grapefruit' at the end of the inflation.
The true size (in Quantum Relativity) of the universe at the end of the inflation was the size of a wormhole, namely at a Compton-Wavelength (lambda) of 10^{-22} meters and so significantly smaller than a grapefruit.
Needless to say, and in view of the CMBR background of the temperatures, the displacement scales of the standard model will become 'magnified' in the Big Bang cosmology of the very early universe in the scale ratio of, say 10 cm/10^{-20} cm = 10^{21} that is the galactic scales in meter units.
A result of this is that the 'wormhole' of the Big Bang must be quantum entangled (or coupled) to the Hubble Horizon. And from this emerges the modular duality of the fifth class of the superstrings and the twin Bipolaron in the Weyl-stringof the 8x8 64-group heterosis.

The Big Bang wormhole becomes a hologram of the Hubble horizon and is dimensionally Separated by the scale parameter between a 3-dimensional space and a 4-dimensional space.
Then the 5-dimensional spacetime of Kaluza-Klein-Maldacena in de Sitter space forms a boundary for the 4D-Minkowski-Riemann-Einstein metrics of the classical geometric cosmology. This can be revisited in the multi-dimensional membrane cosmologies.

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The difference or dimensional ‘thickness’ transition gradient between the outer and inner Calabi- Yau manifolds is known as the AdS-CFT correspondence of Maldacena and Susskind for a 2-dimensional boundary without gravitation for ‘point-particle’ Quantum Conformal Field Theories (QCFT) encompassing a 3-dimensional ‘bulk space’ containing gravity guided by the Holographic Principle.

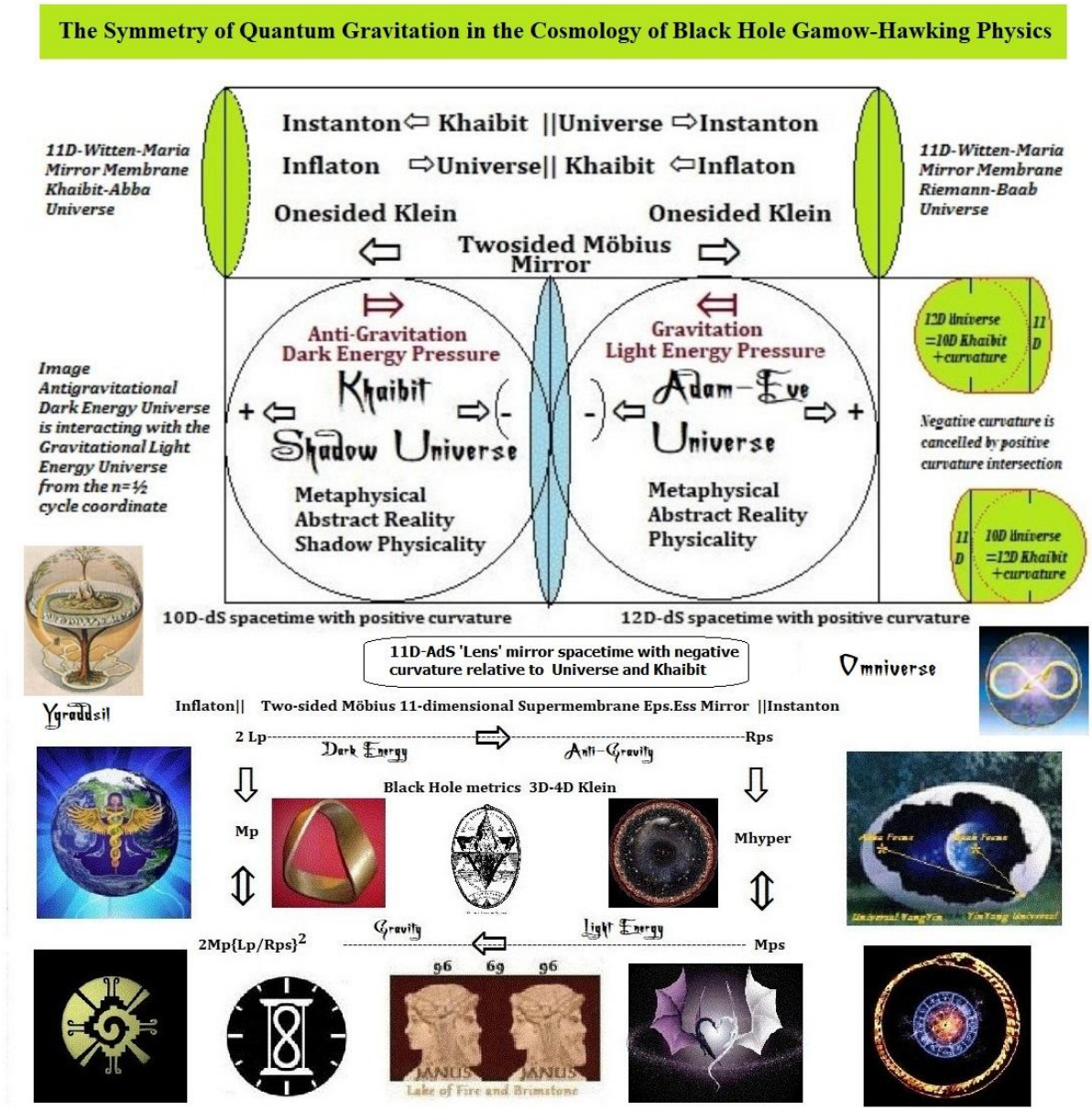

Figure 3: *The symmetry of quantum gravitation in a Twin-Bipolaron hypermass coupling*

$R_{ps} = \lambda_{ps}/2\pi$ as the wormhole-bipolaronic radius of the instanton as a conformally transformed Planck-Length $L_p = \sqrt{\{G_o h/2\pi c^3\}}$ from the inflaton.

$L_{planck}=2.090\text{x}10^{-35}$ m*$=2G_o m_{planck}/c^2$ for a halved Planck mass $m_{planck}=8.463\text{x}10^{-9}$ kg*, indicating the nature of quantum gravitation as a transformation of the timespace energy scale into the spacetime energy scale.

The Schwarzschild metric for $2L_p = 2G_o m_p/c^2$ transforms a 3D Planck length in the Planck mass $m_p = \sqrt{\{hc/2\pi G_o\}}$ from the Planck boson gravitational fine structure constant $1 = 2\pi G_o m_p^2/hc$.
The Schwarzschild metric for the Weyl-wormhole radius $l_{weyl}=R_{ps}$ as the Meijer Twin Bipolaron radius then defines a hypermass M_{hyper} as the conformal mapping of the Planck mass m_p as $M_{hyper} = ½\{R_{ps}/L_p\}m_p = ½\{R_{ps}/L_p\}^2.m_{ps}$ and where $m_{ps} = E_{ps}/c^2 = hf_{ps}/c^2 = hc/2\pi l_{weyl}c^2=k_B T_{ps}/c^2$ in fundamental expressions for the energy of Abba-E_{ps} as one part of the supermembrane $E_{ps}.E_{ss}$ in physical quantities of mass m, frequency f, and temperature T.
This allows definition of the Weyl wormhole as a Strominger boundary wormhole brane of the instanton and the QBBS, and of a mass of $m_{weyl}=\{l_{weyl}c^2/4\pi G_o\}$ = 6445.7753 kg*

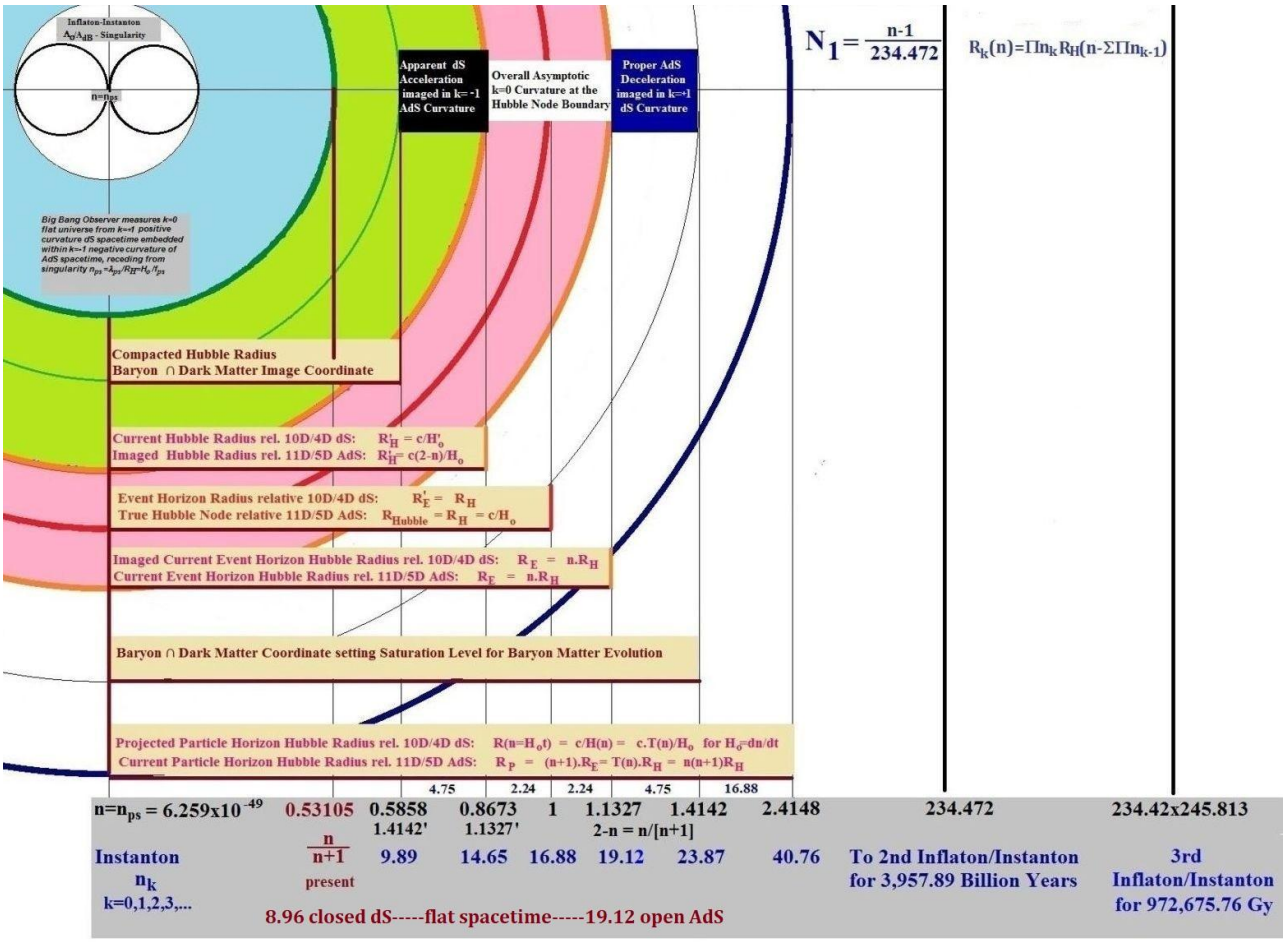

Figure 4: *A scale factor-radius evolution of the universe as proposed in the refined standard model of cosmology*

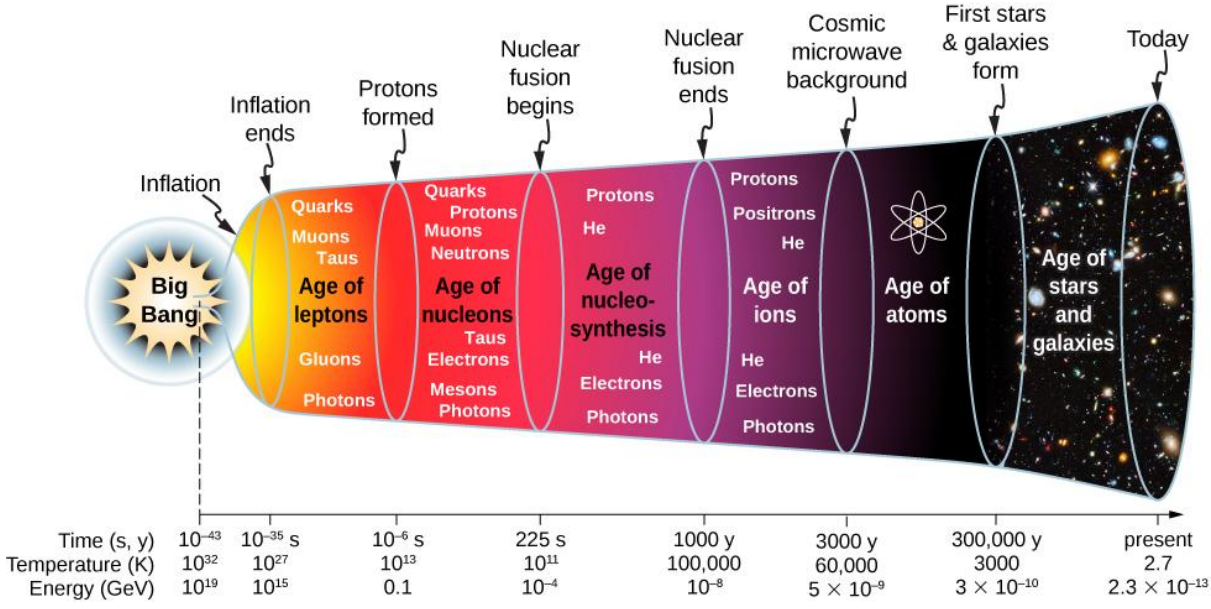

Figure 5: *A Time-Temperature evolution of the universe as proposed in the old standard model of cosmology*

The Holographic Universe of Susskind, Hawking, Bekenstein, and Maldacena plays a crucial part in this, especially as M-Theory has shown the entropic equivalence of the thermodynamics of black holes in the quantum eigenstates of the classical Boltzmann-Shannon entropy mathematically.

The trouble with the Susskind googolplex solutions is that the "bulk landscape solutions" fail to take into account the superstring self-transformations of the duality-coupled five classes. The mainstream premise proposes that all five classes manifest at the Planck scale (therefore the zillions of solutions), eschewing the factual possibility for the five classes to transform into each other to manifest the Big Bang in a minimum spacetime configuration at the Weylian wormhole of class HE(8x8).

Nevertheless, mainstream membrane physics engages in a synthesis for the five superstring classes in a supersymmetry connected in a number of modular dualities, revisited in the Meijer Twin Bipolaron Gravitation center TBPGC.

Roger Penrose has elegantly described the link of this to classical General Relativity in his "Weyl Curvature Hypothesis.".
Quote from: 'The Large, the Small and the Human Mind' -Cambridge University Press -1997 from Tanner Lectures 1995"; page 45-46; 48 (Cartoon):

I want to introduce a hypothesis that I call the 'Weyl Curvature Hypothesis.' This is not an implication of any known theory. As I have said, we do not know what the theory is; because we do not know how to combine the physics of the very large and the very small. When we do discover that theory, it should have as one of its consequences this feature which I have called the Weyl Curvature Hypothesis. Remember that the Weyl curvature is that part of the Riemann tensor which causes distortions and tidal effects. For some reason we do not yet understand, in the neighborhood of the Big Bang, the appropriate combination of theories must result in the Weyl tensor being essentially zero, or rather being constrained to be very small indeed.

The Weyl Curvature Hypothesis is time-asymmetrical, and it applies only to the past-type singularities and not to the future singularities. If the same flexibility of allowing the Weyl tensor to be 'general' that I have applied in the future also applied to the past of the universe, in the closed model, you would end up with a dreadful-looking universe with as much mess in the past as in the future. This looks nothing like the universe we live in. What is the probability that, purely by chance, the universe had an initial singularity looking even remotely as it does?
The probability is less than one part in $(10^{10})^{123}$. Where does this estimate come from? It is derived from a formula by Jacob Bekenstein and Stephen Hawking concerning black hole entropy, and if you apply it in this particular context, you obtain this enormous answer. It depends on how big the universe is, and if you adopt my own favorite universe, the number is, in fact, infinite.

What does this say about the precision that must be involved in setting up the Big Bang? It is really very, very extraordinary. I have illustrated the probability in a cartoon of the Creator finding a very tiny point in that phase space that represents the initial conditions from which our universe must have evolved if it is to resemble, even remotely, the one we live in. To find it, the Creator has to locate that point in phase space to an accuracy of one part in $(10^{10})^{123}$. If I were to put one zero on each elementary particle in the universe, I still could not write the number down in full. It is a stupendous number.

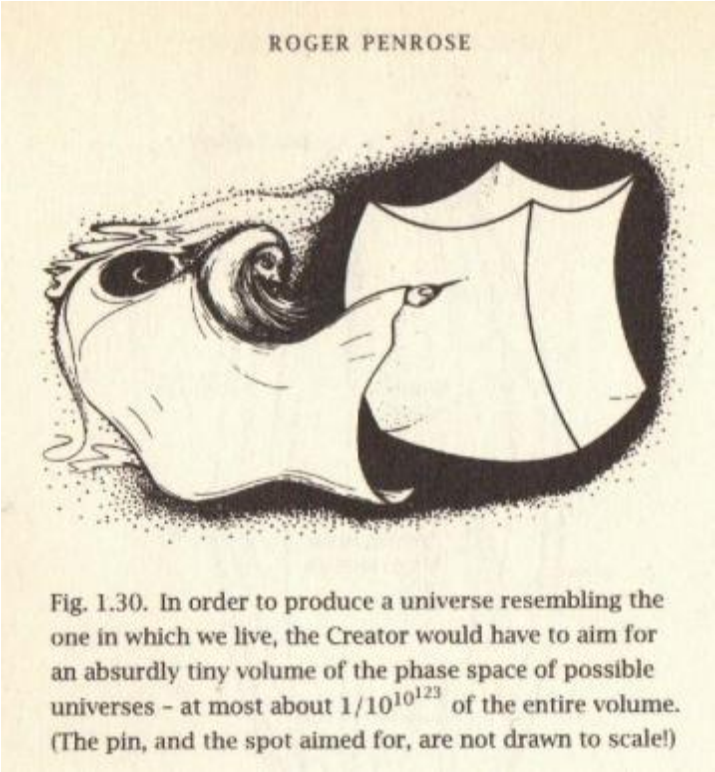

Fig. 1.30. In order to produce a universe resembling the one in which we live, the Creator would have to aim for an absurdly tiny volume of the phase space of possible universes – at most about $1/10^{10^{123}}$ of the entire volume. (The pin, and the spot aimed for, are not drawn to scale!)

Then the 'phase-spaced' de Broglie inflation is in modular quantum entanglement with the Weyl-Wormhole of the zero curvature of Roger Penrose's hypothesis.
The Hubble-Universe consists of 'adjacent' Weyl wormholes, discretizing all physical parameters in holofractal self-similarity. This demands the discretization of spacetime and is in harmony with Loop Quantum Theory, or LQT, proposed by Smolin and his colleagues.

Penrose's Weyl tensor is zero as the quasi-reciprocal of the infinite curvature of the Hubble Event Horizon - quasi because the two scales (of the wormhole and Hubble universe) are dimensionally separated in the modular coupling of the 11D supermembrane boundary to the 10D superstring classical cosmology of the underpinning Einstein-Riemann-Weyl tensor of the Minkowski (flat) metric.

The CCC Penrose model becomes compatible with the inflation scenarios; should the multiverse cosmology become defined as occurring parallel in time continuity and not as parallel in space in a manner envisioned by Roger Penrose and similar cyclic universe models like the Ekpyrotic brane collisions of Turok, Steinhardt, and Albrecht.

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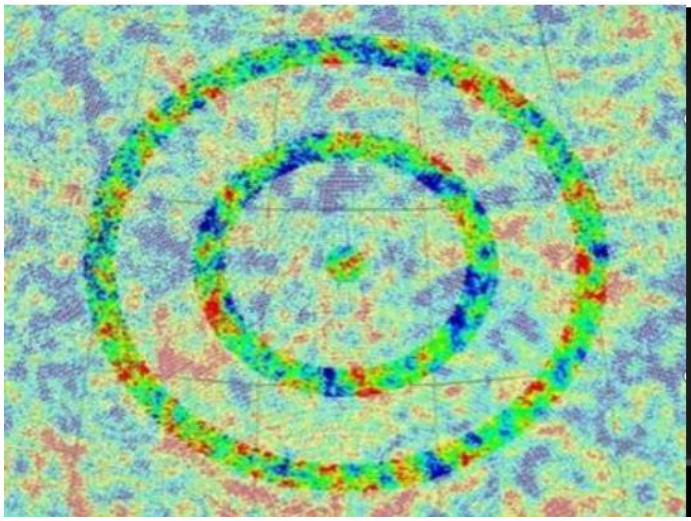
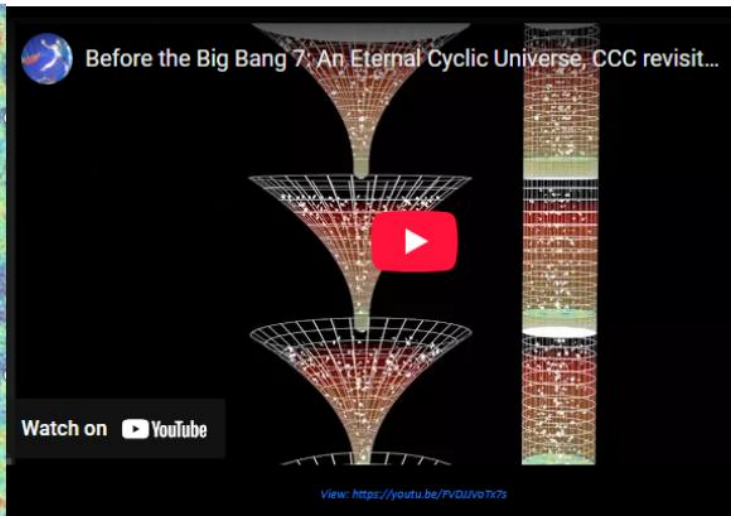
Roger Penrose, the Quantum Big Bang of Creation and the Holographic Universe





What caused the Big Bang? https://youtu.be/uabNtILfYyU

Have Physicists Found Echoes From Before the Big Bang?

http://blogs.discovermagazine.com/8...icists-found-echoes-from-before-the-big-bang/ https://youtu.be/FVDJJVoTx7s

The Big Bang was not the beginning, Roger Penrose believes.
The eminent Oxford physicist has long advocated the wild idea of "conformal cyclic cosmology," a cyclical universe without beginning or end in which the Big Bang 13.75 billion years ago was simply one of many. This month, Penrose pushed his idea further:
His team says it has detected a pattern in the cosmic microwave background—radiation left over from just after the Big Bang—that represents the echo of events that occurred before the Big Bang itself.

Penrose examined the data from the Wilkinson Microwave Anisotropy Probe (WMAP), the mission that just completed nine years of surveying the cosmic microwave background across the sky. His study points to concentric circular patterns in the WMAP data where he says he found something surprising:

The circular features are regions where tiny temperature variations in the otherwise uniform microwave background are smaller than average. Those features, Penrose said, cannot be explained by the highly successful inflation theory, which posits that the infant cosmos underwent an enormous growth spurt, ballooning from something on the scale of an atom to the size of a grapefruit during the universe's first tiny fraction of a second.

Inflation would either erase such patterns or could not easily generate them. [Science News]
By Penrose's thinking, those circles are the calling cards of something big that happened in the universe before our Big Bang and reverberated after it, like the birth and death of previous universes.

From calculations made by Penrose, he believes that as each universe evolved, the catastrophic collisions between supermassive black holes (the black hole behemoths living in the centers of galaxies) would have generated gravitational waves within that universe's lifetime.
When the next universe exploded into being, these gravitational waves were converted into energy, ensuring their "fingerprint" bled through to the next universe.
The pulse of energy caused by the transfer of gravitational waves from one universe to the next would have caused a kick to the distribution of dark matter, creating uniform, spherical patterns in the current universe. [Discovery News]
So what are we to make of this? I put it to cosmologist Paul Davies, who says the question rests with inflation.

"Penrose has always been a doubter of inflation," Davies says. "It's against the fashion of the moment, but that's fine. (And) if you abandon inflation, what happened before the Big Bang could leave an echo."
That's because inflation would smooth out that echo. (Another possibility, he says, is the idea of "incomplete inflation," in which inflation could have existed but not been thorough enough to smooth out all echoes.
That theory wouldn't require abandoning inflation to accommodate an echo in the microwave background.)

However, Davies says that even if the finding is correct, this explanation for it—a black hole smash-up from before the Big Bang leaving its fingerprint after the Big Bang—isn't the only possibility. "People have been looking for concentric rings in the cosmic microwave background for a while," he says, because such a finding could support several different ideas.

One of those alternate explanations plays on the idea of our universe being a "bubble" created by inflation. If two bubbles collided, he says, the result could leave a cosmic microwave echo. Lastly, he says, the source of the study makes it a tad suspect.
"You'd expect people at the sharp end of the data to make an announcement like this.
You wouldn't expect a mathematician." So I asked Charles Barrett, who was the lead investigator of WMAP, and in his reply email, he too expressed skepticism:
" Unfortunately, the paper does not provide the necessary detail on how they performed their calculations.
I am concerned that the noise properties and pattern of the WMAP instrumental sky sampling were not properly taken into account in their analysis.
If these are not handled correctly, then spurious results are likely. In my opinion, the paper should have specified the data analysis steps in detail, but it did not."

Penrose counters that he looked at not only WMAP but also data from a second mission, BOOMERang, which confirmed the pattern he saw.
At the moment, these huge claims about the nature of the universe are bogged down in competing calculations and critiques of calculations. The future of this question could lie with the Planck mission by the European Space Agency, which is presently mapping the cosmic microwave background in greater detail than WMAP.
In the meantime, we get to wonder. Says physicist Shaun Cole:
" It's a revolutionary theory, and there appears to be some data that support it.
In the standard Big Bang model, there's nothing cyclic; it has a beginning and it has no end.
The philosophical question that's sensible to ask is 'what came before the Big Bang?'; and what they're striving for here is to do away with that 'there's nothing before' answer by making it cyclical." [BBC News]

Shiloh (TonyB.) - Posted Dec 2nd 2010

Roger Penrose, whose work I often use in Quantum Relativity, is basically on the right path of reconstructing the cosmogenesis. However, the cyclic universe is built on its own protoversal seed, and the 'Big Crunches' are electromagnetic and not inertial.
This means that there will be no gravitational contraction in a shrinking of the protoverse; rather, the electromagnetic light path becomes multidimensional and multivalued. One can so model this on a cyclic electromagnetic cosmology with a 'Hubble heartbeat' of a semibeat of so 16.9 billion years. This also allows for a cosmogenetic Black Hole-White Hole evolution, which resets the wormhole singularity every 4 trillion years or so to eschew any theorized 'heat death' of the universe, due to the stellar generations 'running out' of their nuclear fuel from the nucleosynthesis of the primordial elements based on hydrogen, helium, and lithium.
Indeed, the Inflation PRECEDED the Big Bang, and this is the simple solution for the 'inflation paradoxes,' as some might term it.
The WMAP data in the picture in this post is actually descriptive of the wave quark model in Quantum Relativity, with an inner gluonic (anti)neutrino kernel or core, an Inner Mesonic (down quark) Ring, and an Outer Leptonic (strange quark) Ring.
It is just the 'New Standard Model' of Unitary Symmetry for the quarkian waves as "matter waves." . The smallest quantum of microcosmic reality is written in the galactic sky of the macrocosm.
Discover Interview: By Susan Kruglinski, Oliver Chanarin |Tuesday, October 06, 2009

Roger Penrose Says Physics Is Wrong, From String Theory to Quantum Mechanics One of the greatest thinkers in physics states that the human brain—and the universe itself—must function according to some theory we haven't yet discovered.

http://discovermagazine.com/2009/se...ics-is-wrong-string-theory-quantum-mechanics/

Roger Penrose could easily be excused for having a big ego. A theorist whose name will be forever linked with such giants as Hawking and Einstein, Penrose has made fundamental contributions to physics, mathematics, and geometry. He contributed in reinterpreting general relativity to prove that black holes can form from dying stars; he invented twistor theory—a novel way to look at the structure of space-time—and so led us to a deeper understanding of the nature of gravity. He discovered a remarkable family of geometric forms that came to be known as Penrose tiles.

He even moonlighted as a brain researcher, coming up with a provocative theory that consciousness arises from quantum-mechanical processes. And he wrote a series of incredibly readable, best-selling science books to boot. And yet the 78-year-old Penrose—now an emeritus professor at the Mathematical Institute, University of Oxford—seems to live the humble life of a researcher just getting started in his career. His small office is cramped with the belongings of the six other professors with whom he shares it, and at the end of the day, you might find him rushing off to pick up his 9-year-old son from school. With the curiosity of a man still trying to make a name for himself, he cranks away on fundamental, wide-ranging questions:
How did the universe begin? Are there higher dimensions of space and time? Does the current front-running theory in theoretical physics, string theory, actually make sense?

Because he has lived a lifetime of complicated calculations, though, Penrose has quite a bit more perspective than the average starting scientist. To get to the bottom of it all, he insists, physicists must force themselves to grapple with the greatest riddle of them all: the relationship between the rules that govern fundamental particles and the rules that govern the big things—like us—that those particles make up. In his powwow with DISCOVER contributing editor Susan Kruglinksi, Penrose did not flinch from questioning the central tenets of modern physics, including string theory and quantum mechanics. Physicists will never come to grips with the grand theories of the universe, Penrose holds, until they see past the blinding distractions of today's half-baked theories to the deepest layer of the reality in which we live.

You come from a colorful family of overachievers, don't you?
My older brother is a distinguished theoretical physicist, a fellow of the Royal Society. My younger brother ended up the British chess champion 10 times, a record. My father came from a Quaker family. His father was a professional artist who did portraits—very traditional, with a lot of religious subjects. The family was very strict. I don't think we were even allowed to read novels, certainly not on Sundays. My father was one of four brothers, all of whom were very good artists. One of them became well known in the art world, Sir Roland. He was a co-founder of the Institute of Contemporary Arts in London. My father himself was a human geneticist who was recognized for demonstrating that older mothers tend to have more Down syndrome, but he had many scientific interests.
How did your father influence your thinking?

The important thing about my father was that there wasn't any boundary between his work and what he did for fun. That rubbed off on me. He would make puzzles and toys for his children and grandchildren. He used to have a little shed out
back where he cut things from wood with his little pedal saw. I remember he once made a slide rule with about 12 different slides, with various characters that we could combine in complicated ways. Later in his life, he spent a lot of time making wooden models that reproduced themselves—what people now refer to as artificial life. These were simple devices that, when linked together, would cause other bits to link together in the same way. He sat in his woodshed and cut these things out of wood in great, huge numbers.

So I assume your father helped spark your discovery of Penrose tiles, repeating shapes that fit together to form a solid surface with pentagonal symmetry.

It was silly in a way. I remember asking him—I was around 9 years old—whether you could fit regular hexagons together and make it round like a sphere. And he said, "No, no, you can't do that, but you can do it with pentagons," which was a surprise to me. He showed me how to make polyhedra, and so I got started on that.

Are Penrose tiles useful or just beautiful?

My interest in the tiles has to do with the idea of a universe controlled by very simple forces, even though we see complications all over the place. The tilings follow conventional rules to make complicated patterns. It was an attempt to see how the complicated could be satisfied by very simple rules that reflect what we see in the world.

The artist M. C. Escher was influenced by your geometric inventions.

What was the story there?

In my second year as a graduate student at Cambridge, I attended the International Congress of Mathematicians in Amsterdam. I remember seeing one of the lecturers there whom I knew quite well, and he had this catalog. On the front of it was the Escher picture "*Day and Night,*" the one with birds going in opposite directions. The scenery is nighttime on one side and daytime on the other. I remember being intrigued by this, and I asked him where he got it. He said, "Oh, well, there's an exhibition you might be interested in of an artist named Escher." So I went and was very taken by these very weird and wonderful things that I'd never seen anything like. I decided to try and draw some impossible scenes myself and came up with this thing that's referred to as a tri-bar. It's a triangle that looks like a three-dimensional object, but actually, it is impossible for it to be three-dimensional. I showed it to my father, and he worked out some impossible buildings and things. Then we published an article in the *British Journal of Psychology* on this stuff and acknowledged Escher.

Escher saw the article and was inspired by it.

He used two things from the article. One was the tri-bar, used in his lithograph called "*Waterfall*." Another was the impossible staircase, which my father had worked on and designed. Escher used it in "*Ascending and Descending,*" with monks going round and round the stairs. I met Escher once, and I gave him some tiles that would make a repeating pattern, but not until you've got 12 of them fitted together. He did this, and then he wrote to me and asked me how it was done—what it was based on? So I showed him a kind of bird shape that did this, and he incorporated it into what I believe is the last picture he ever produced, called "*Ghosts*."

Is it true that you were bad at math as a kid?

I was unbelievably slow. I lived in Canada for a while, for about six years, during the war. When I was 8, sitting in class, we had to do this mental arithmetic very fast, or what seemed to me very fast. I always got lost. And the teacher, who didn't like me very much, moved me down a class.

There was one rather insightful teacher who decided, after I'd done so badly on these tests, that he would have timeless tests. You could just take as long as you'd like. We all had the same test. I was allowed to take the entire next period to continue, which was a play period. Everyone was always out and enjoying themselves, and I was struggling to do these tests. And even then, sometimes it would stretch into the period beyond that. So I was at least twice as slow as anybody else. Eventually, I would do very well. You see, if I could do it that way, I would get very high marks.

You have called the real-world implications of quantum physics nonsensical. What is your objection?

Quantum mechanics is an incredible theory that explains all sorts of things that couldn't be explained before, starting with the stability of atoms. But when you accept the weirdness of quantum mechanics [in the macro world], you have to give up the idea of space-time as we know it from Einstein. The greatest weirdness here is that it doesn't make sense. If you follow the rules, you come up with something that just isn't right.
In quantum mechanics, an object can exist in many states at once, which sounds crazy. The quantum description of the world seems completely contrary to the world as we experience it.
It doesn't make any sense, and there is a simple reason. You see, the mathematics of quantum mechanics has two parts to it. One is the evolution of a quantum system, which is described extremely precisely and accurately by the Schrödinger equation.
That equation tells you this: If you know what the state of the system is now, you can calculate what it will be doing 10 minutes from now. However, there is the second part of quantum mechanics—the thing that happens when you want to make a measurement. Instead of getting a single answer, you use the equation to work out the probabilities of certain outcomes. The results don't say, "This is what the world is doing." Instead, they just describe the probability of its doing any one thing. The equation should describe the world in a completely deterministic way, but it doesn't.

Erwin Schrödinger, who created that equation, was considered a genius. Surely he appreciated that conflict.
Schrödinger was as aware of this as anybody. He talks about his hypothetical cat and says, more or less, "Okay, if you believe what my equation says, you must believe that this cat is dead and alive at the same time." He says, "That's obviously nonsense because it's not like that. Therefore, my equation can't be right for a cat." So there must be some other factor involved."

So Schrödinger himself never believed that the cat analogy reflected the nature of reality?
Oh yes, I think he was pointing this out. I mean, look at three of the biggest figures in quantum mechanics: Schrödinger, Einstein, and Paul Dirac. They were all quantum skeptics in a sense. Dirac is the one whom people find most surprising because he set up the whole foundation, the general framework of quantum mechanics. People think of him as this hard- liner, but he was very cautious in what he said. When he was asked, "What's the answer to the measurement problem?" his response was, "Quantum mechanics is a provisional theory. Why should I look for an answer in quantum mechanics?" He didn't believe that it was true, but he didn't say this out loud much.
Yet the analogy of Schrödinger's cat is always presented as a strange reality that we have to accept. Doesn't the concept drive many of today's ideas about theoretical physics?
That's right. People don't want to change the Schrödinger equation, leading them to what's called the "many worlds" interpretation of quantum mechanics.

That interpretation says that all probabilities are playing out somewhere in parallel universes?
It says, OK, the cat is somehow alive and dead at the same time. To look at that cat, you must become a superposition [two states existing at the same time] of you seeing the live cat and you seeing the dead cat. Of course, we don't seem to experience that, so the physicists have to say, well, somehow your consciousness takes one route or the other route without your knowing it. You're led to a completely crazy point of view. You're led into this "many worlds" stuff, which has no relationship to what we actually perceive.

The idea of parallel universes—many worlds—is a very human-centered idea, as if everything has to be understood from the perspective of what we can detect with our five senses.
The trouble is, what can you do with it? Nothing. You want a physical theory that describes the world we see around us. That's what physics has always been: explaining what the world we see does and why or how it does it.
Many worlds in quantum mechanics don't do that. Either you accept it and try to make sense of it, which is what a lot of people do, or, like me, you say no—that's beyond the limits of what quantum mechanics can tell us. Which is, surprisingly, a very uncommon position to take. My own view is that quantum mechanics is not exactly right, and I think there's a lot of evidence for that. It's just not direct experimental evidence within the scope of current experiments.

In general, the ideas in theoretical physics seem increasingly fantastical. Take string theory. All that talk about 11 dimensions or our universe existing on a giant membrane seems surreal.
You're absolutely right. And in a certain sense, I blame quantum mechanics because people say, "Well, quantum mechanics is so nonintuitive; if you believe that, you can believe anything that's nonintuitive." But, you see, quantum mechanics has a lot of experimental support, so you've got to go along with a lot of it. Whereas string theory has no experimental support.
I understand you are setting out this critique of quantum mechanics in your new book.
The book is called "*Fashion, Faith, and Fantasy in the New Physics of the Universe."* Each of those words stands for a major theoretical physics idea.

The fashion is string theory; the fantasy has to do with various cosmological schemes, mainly inflationary cosmology [which suggests that the universe inflated exponentially within a small fraction of a second after the Big Bang]. Big fish, those things are. It's almost sacrilegious to attack them. And the other one, even more sacrilegious, is quantum mechanics at all levels—so that's the faith. People somehow got the view that you really can't question it.

A few years ago, you suggested that gravity is what separates the classical world from the quantum one. Are there enough people out there putting quantum mechanics to this kind of test?
No, although it's sort of encouraging that there are people working on it at all. It used to be thought of as a sort of crackpot, fringe activity that people could do when they were old and retired. Well, I am old and retired! But it's not regarded as a central, mainstream activity, which is a shame.

After Newton, and again after Einstein, the way people thought about the world shifted. When the puzzle of quantum mechanics is solved, will there be another revolution in thinking?
It's hard to make predictions. Ernest Rutherford said his model of the atom [which led to nuclear physics and the atomic bomb] would never be of any use. But yes, I would be pretty sure that it will have a huge influence. There are things like how quantum mechanics could be used in biology. It will eventually make a huge difference, probably in all sorts of unimaginable ways.

In your book "*The Emperor's New Mind,"* you posited that consciousness emerges from quantum physical actions within the cells of the brain. Two decades later, do you stand by that?
In my view the conscious brain does not act according to classical physics. It doesn't even act according to conventional quantum mechanics. It acts according to a theory we don't yet have. This is being a bit big-headed, but I think it's a little bit like William Harvey's discovery of the circulation of blood. He worked out that it had to circulate, but the veins and arteries just peter out, so how could the blood get through from one to the other?
And he said, "Well, it must be tiny little tubes there, and we can't see them, but they must be there." Nobody believed it for some time. So I'm still hoping to find something like that—some structure that preserves coherence because I believe it should be there.

When physicists finally understand the core of quantum physics, what do you think the theory will look like?
I think it will be beautiful.

Roger Penrose and the Big Bang Curvature

Shiloh Za-Rah - Posted May 5th 2010
Hi, Mike!
There are a number of points that align Arp with the mainstream. Now I know you would rather accept the prevailing cosmological standard models of the Big Bang Cosmology and the various attempts (barring the multiverses, the anthropic principle, and related topics perhaps).
For about 20 years now, I have supported Alan Sandage's measurements of the Hubble Constant. He for long set it at the 55 km/Mpc.s mark, and only recently, with the pressure of the WMAP data, has he 'relented' to somewhere around 65 km/Mpc.s.
In my decade-long analysis and study of the cosmology, I found the following.

A) The standard model describes the thermodynamic evolution of the cosmos very accurately. So you can reanalyze the WMAP data in its description of the Cosmic Microwave Background Black Body Radiation (CMBBR) and use this CMBBR as a basis for the emerging parameters of the cosmoevolution.

B) The standard model has "misinterpreted" the Guth inflation in the context of the now-prevalent membrane physics of the spacetime metrics.
The standard model postulates the Big Bang singularity to become a 'smeared out' minimum spacetime configuration (also expressible as quantum foam or in vertex adjacency of Smolin's quantum loops). This 'smearing out' of the singularity then triggers the (extended) Guth-Inflation, supposedly ending at a time coordinate of so 10^{-32} seconds after the Big Bang.
Without delving into technical details, the Guth-Inflation ended at a time coordinate of 3.33×10^{-31} seconds and at that coordinate, the Big Bang became manifest in the emergence of spacetime metrics in the continuity of classical general relativity and the quantum gravitational manifesto.
This means that while the Temperature background remains classically valid, the distance scales for the Big Bang will become distorted in the standard model in postulating a universe the scale of a 'grapefruit' at the end of the inflation.

The true size (in Quantum Relativity) of the universe at the end of the inflation was the size of a wormhole, namely at a Compton-Wavelength (lambda) of 10^{-22} meters, and so significantly smaller than a grapefruit.
Needless to say, and in view of the CMBR background temperatures, the displacement scales of the standard model will become 'magnified' in the Big Bang cosmology of the very early universe in the scale ratio of, say,
10 cm/10^{-20} cm = 10^{21} cm; that is the galactic scale in meter units.
If you study the inflation cosmology more closely, you will find that many cosmologists already know that the universe had to be 'blown up' to the Hubble horizon instantaneously, so this is not popularized, as it contradicts the 'grapefruit' scale of Alan Guth.

C) A result of this is that the "wormhole" of the Big Bang is quantum entangled (or coupled) to the Hubble horizon. And from this emerges the modular duality of the fifth class of the superstrings in the Weyl string of the 64-group heterosis. Again, without technical detail, the Big Bang wormhole becomes a hologram of the Hubble horizon, and it is dimensionally separated by the scale parameter between a 3-dimensional space and a 4-dimensional space.
This is becoming more and more mainstream in the 5-dimensional spacetime of Kaluza-Klein-Maldacena in de Sitter space becoming the boundary for the 4D-Minkowski-Riemann-Einstein metrics of the classical cosmology.

Of course, the holographic universe of Susskind, Hawking, Bekenstein, and Maldacena plays a crucial part in this, especially as M-theory has proven (yes, proven in scientific terms), the entropic equivalence of the thermodynamics of black holes in the quantum eigenstates of the classical Boltzmann-Shannon entropy.
So your 'speculative' status of string theory is a little 'out of date.'. The trouble with the Susskind googolplex solutions is that they (Edward Witten might appreciate access to my data) fail to take into account the superstring self-transformations of the duality- coupled five classes in the TBPGC transiting across a Higgs vacuum from pre-spacetime or timespace into spacetime. They think that all five classes manifest at the Planck scale (therefore the zillions of solutions), they do not and transform into each other to manifest the Big Bang in a minimum spacetime configuration at the Weylian wormhole of class HE(8x8) in the Twin Bipolaron Gravitation Center (TBPGC).

Roger Penrose has elegantly described the link of this to classical General Relativity in his "Weyl Curvature Hypothesis." Quote from: '*The Large, the Small and the Human Mind*' -Cambridge University Press -1997 from Tanner Lectures 1995" ; page 45-46:
"I want to introduce a hypothesis that I call the "Weyl Curvature Hypothesis.' This is not an implication of any known theory. As I have said, we do not know what the theory is because we do not know how to combine the physics of the very large and the very small. When we do discover that theory, it should have as one of its consequences this feature which I have called the Weyl Curvature Hypothesis. Remember that the Weyl curvature is that part of the Riemann tensor which causes distortions and tidal effects. For some reason we do not yet understand, in the neighborhood of the Big Bang, the appropriate combination of theories must result in the Weyl tensor being essentially zero, or rather being constrained to be very small indeed.
The Weyl Curvature Hypothesis is time-asymmetrical, and it applies only to the past-type singularities and not to the future singularities. If the same flexibility of allowing the Weyl tensor to be 'general' that I have applied in the future also applied to the past of the universe, in the closed model, you would end up with a dreadful-looking universe with as much mess in the past as in the future. This looks nothing like the universe we live in. What is the probability that, purely by chance, the universe had an initial singularity looking even remotely as it does?
The probability is less than one part in $(10^{10})^{123}$. Where does this estimate come from? It is derived from a formula by Jacob Bekenstein and Stephen Hawking concerning black hole entropy, and if you apply it in this particular context, you obtain this enormous answer. It depends on how big the universe is, and if you adopt my own favorite universe, the number is, in fact, infinite.
What does this say about the precision that must be involved in setting up the Big Bang? It is really very, very extraordinary; I have illustrated the probability in a cartoon of the Creator finding a very tiny point in that phase space that represents the initial conditions from which our universe must have evolved if it is to resemble, remotely, the one we live in. To find it, the Creator has to locate that point in phase space to an accuracy of one part in $(10^{10})^{123}$.
If I were to put one zero on each elementary particle in the universe, I still could not write the number down in full. It is a stupendous number." End of Quote

D) Then, of course, I claim that the theory of Quantum Relativity represents a kind of 'Newtonian approximation' to the 'theory we have yet to find,', mentioned by Roger Penrose above. Then the 'phase-spaced' de Broglie inflation is in modular quantum entanglement with the Weyl-Wormhole of the zero curvature of Roger Penrose's hypothesis, and this solves the 'riddle of space' in somewhat the manner Allen Francom has postulated.
The Hubble Universe consists of "adjacent" Weyl wormholes, discretizing all physical parameters in holofractal self-similarity.

Penrose's Weyl tensor is zero as the quasi-reciprocal of the infinite curvature of the Hubble Event Horizon - quasi because the two scales (of the wormhole and Hubble Universe) are dimensionally separated in the modular coupling of the 11D supermembrane boundary to the 10D superstring classical cosmology of the underpinning Einstein-Riemann-Weyl tensor of the Minkowski (flat) metric.

E) Finally, the Hubble Law, as applied in the standard model, becomes a restricted case, applicable only at the Node of the 11D asymptotic limit/boundary also, the initial condition, as Penrose writes about.
Then, the Hubble constant is truly constant at 58.03 km/MPc.s, vindicating both Alan Sandage and Halton Arp, the latter in his questioning of the Hubble Law to characterize the cosmic distance scales.

F) Because of the duality coupling between the wormhole and the Hubble horizon, the Hubble horizon in 10D is always smaller than the Hubble horizon in 11D (the first is defined in a 4D Minkowski spacetime and the second in a 5D Kaluza- Klein hypersphere). So the standard cosmology will measure an 'accelerating universe' where there is actually an 'electromagnetic intersection' of the 11D- Big Bang Light having reflected from the 11D boundary and recoupling with the 10D expansion.
Halton Arp's redshifts are also dual in that the special relativistic Doppler formulation is absolutely sufficient to relate the cosmological redshift to cosmic displacement scales and without the Hubble Law $H_o = v_{rec}/D$.
So, the redshift measurement is the true parameter and must then be correlated with the expansion factor of General Relativity to ascertain the lower D coordinates of the observed phenomena encompassed by the higher D coordinates through the values of the expansion parameter.
Briefly, the expanding universe presently moves at 0.22c with a deceleration of about 0.12 nanometers per second squared. But because the Hubble horizon itself recedes presently at 0.22c particular 'redshift corrections' must be applied to the valid measurements of the latter to ascertain the cosmological distance scales of the light emitters.

G) As you might know, there are great controversies regarding this cosmological redshift as a correct Hubble distance indicator applicable to an expanding cosmology. The dispensation following might clear this matter up: in showing how the 'Hubble Oscillation' actually represents the Hinduistic 'Heartbeat of Brahma' or the 'Heartbeat of the Cosmic Mother,' or other such mythologizable connotations. One great fallacy of the Standard Model Cosmology is that the inflationary dynamics followed the Big Bang singularity. Well, the QBB singularity was, of course, the birth of the spacetime matrix per se, and so any 'inflationary string-brane epoch' necessarily followed and did not precede the QBB.

Some pundits (with data published by Roger Penrose from Oxford just a year or so ago); have actually measured and photographed a concentric energy signature before the formation of the galactic structures began and peaked at a redshift of so 1.19, about 4 billion years after the QBB. Cosmologists like Steinhardt, Turok, and Albrecht then proposed variations in their 'Ekpyrotic Universe' models, which engage string-brane collisions before the QBB in a multiversal setting of a closed omniverse containing open hyperbolic universes. This is not the case because the multiverses are parallel in time as a function of the asymptotic completion of the Hubble cycles oscillating between the maximum even and minimum odd nodes. The first semicycle so completed about 2.24 billion years ago, meaning that only a single parallel universe will exist for another 14.65 billion years for the completion of a full 'Hubble heartbeat cycle.'

The first semicycle is, however, imaged from spacetime into timespace because the time instantaneity of the odd Hubble node is mirrored in the even Hubble node, allowing the forward-moving light path of the de Sitter cosmic expansion to meet and intersect the retrocausal backwards moving light path of the anti de Sitter higher dimensional dynamic boundary, which is both refractive and reflective at the n=½ cycle coordinate to define the so-called onset of the dark energy scenario in the standard ΛCDM-FRW cosmology.

The revised standard model of science follows Occam's Razor of efficiency to a large degree, and in interpreting the collected data from the standard models in a new way, many of the "flaws" of the standard models in both cosmology and particle physics simply evaporate.
In terms of cosmology, then, the multiverse uses a protoversal seedling, and this seedling is the observed universe in 4 spacetime dimensions, albeit infused by co-local collapsed "higher dimensions," which can, under the appropriate energy conditions, open up to allow various numbers of multidimensional realities, such as observed and experienced by you and the dreamers and intuitives throughout the local planetary realm. It then becomes a universal oscillation on a cosmic scale, which in many ways doubles or multiplies the measured universe in a self-intersection or self-communication between its parts.

I have added a sketch from the Thuban archives, which shows much of what the present debates about dark energy and missing matter engage in an overall collective sense. In this sketch, you will see that the 0.303 redshift value becomes the mirror image of the galactic creation peak at redshift 1.19 and so the apparent playing up of the expansion cosmology to change its deceleration at the QBB to an acceleration at the 0.1 redshift marker becomes an effect of the Hubble oscillation, which renders a cosmological redshift of recession as a cosmological blueshift of approach in a reinterpretation of the data collected by the telescopes and observatories.

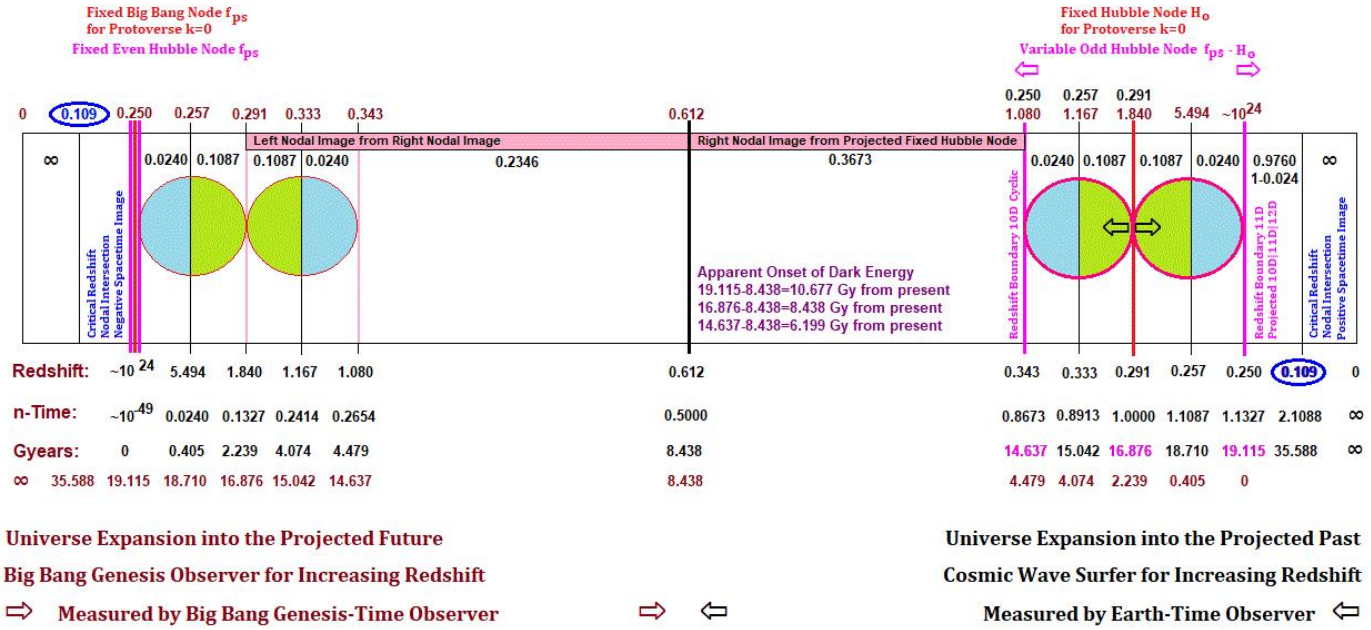
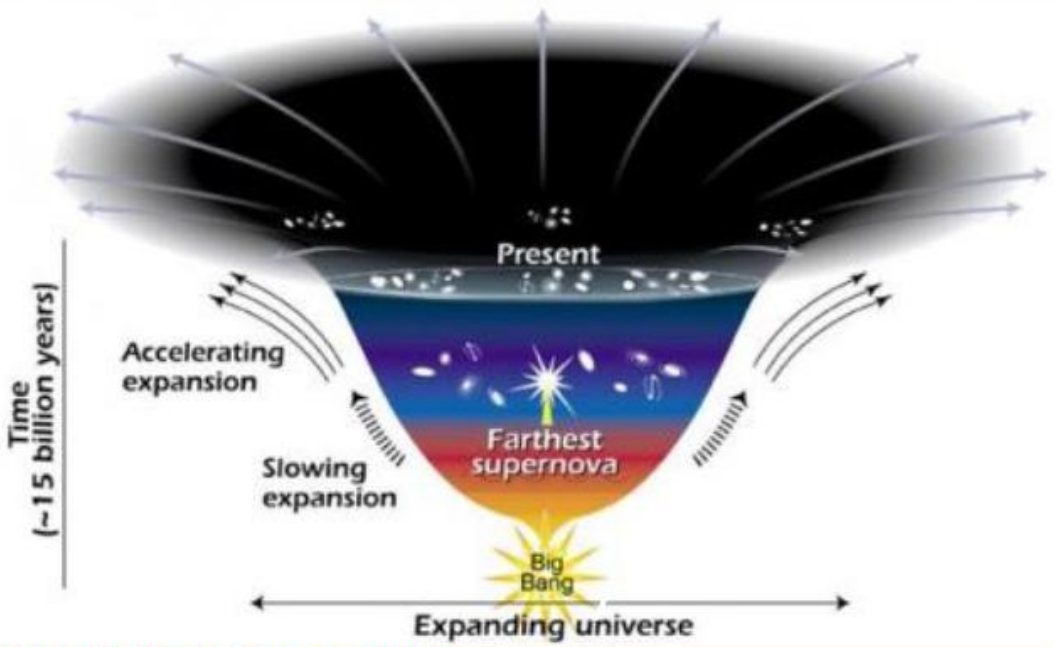
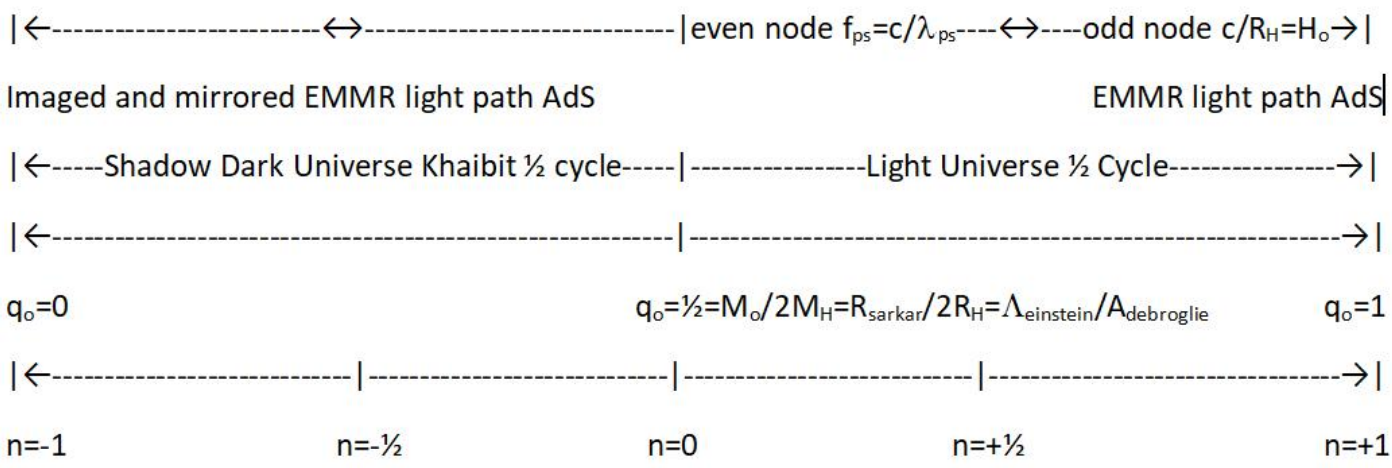


Figure 6: *A Cosmological Redshift (z=0.612) Evolution of mirror time universal observers for DE onset*



Universe Dark Energy-1 Expanding Universe
This diagram reveals changes in the rate of expansion since the universe's birth 15 billion years ago. The more shallow the curve, the faster the rate of expansion. The curve changes noticeably about 7.5 billion years ago, when objects in the universe began flying apart at a faster rate. Astronomers theorize that the faster expansion rate is due to a mysterious dark force that is pulling galaxies apart.
Credit: NASA/STSci/Ann Feild

Figure 7: *The n=½ cycle time coordinate for the onset of Dark Energy in AdS lightpath déjà vu and an apparent acceleration in the cosmological dynamics*



q_o is a deceleration parameter defining the QBBS boundary first parameters in the Einstein quintessence, $\Lambda_{Einstein}$ and the de Broglie Hyper-Space inflaton hyper-acceleration, $A_{debroglie}$ for the EMMR light path as the ratio of the matter distribution $\mathbf{\Omega_o=M_o/M_H}$ for the overall energy density in the multidimensional cosmology.

M_o is the mass seedling for the de Sitter protoverse, defining a 'Sarkar Daughter Black Hole BH' in the Sarkar curvature radius $\mathbf{R_{Sarkar} = 2G_oM_o/c^2}$ for the encompassing mass Strominger BH evolution, engaging the dark matter and dark energy conditions.

At the instanton t_{ps}, a de Broglie Phase-Inflation defined $r_{max}=a_{dB}/f^2_{ps}$ and a corresponding Phase-Speed $v_{dB}=r_{max}.f_{ps}$.
Those de Broglian parameters constitute the boundary constants for the Guth-Linde inflation and the dynamical behaviour for all generated multiverses as subsets of the omniverse in superspacetime CMF.

Initially, the de Broglie Acceleration of Inflation specified the overall architecture for the universe in the Sarkar Constant $A_S=\Lambda_E(n_{ps})r_{max}/a_{dB} = G_oM_o/c^2$
The Sarkar Constant calculates as 72.4 Mpc, $2.23541620x10^{24}$ m or as 236.12 Mlightyears as the bounding gravitational distance/scale parameter.

A Scalar Higgsian Temperature Field derives from the singularity and initialises the consequent evolution of the protocosmos in the manifestation of the bosonic superbranes as macroquantisations of multiverses in quantum relativistic definitions.

The Omega of critical density is specified in acceleration ratio $\Lambda_E(n_{ps})/a_{dB}$, which is $G_oM_o/c^2r_{max} = 0.01401506 = \frac{1}{2}M_o/M_\infty = \frac{1}{2}\Omega_o = q_o$ (Deceleration Parameter).

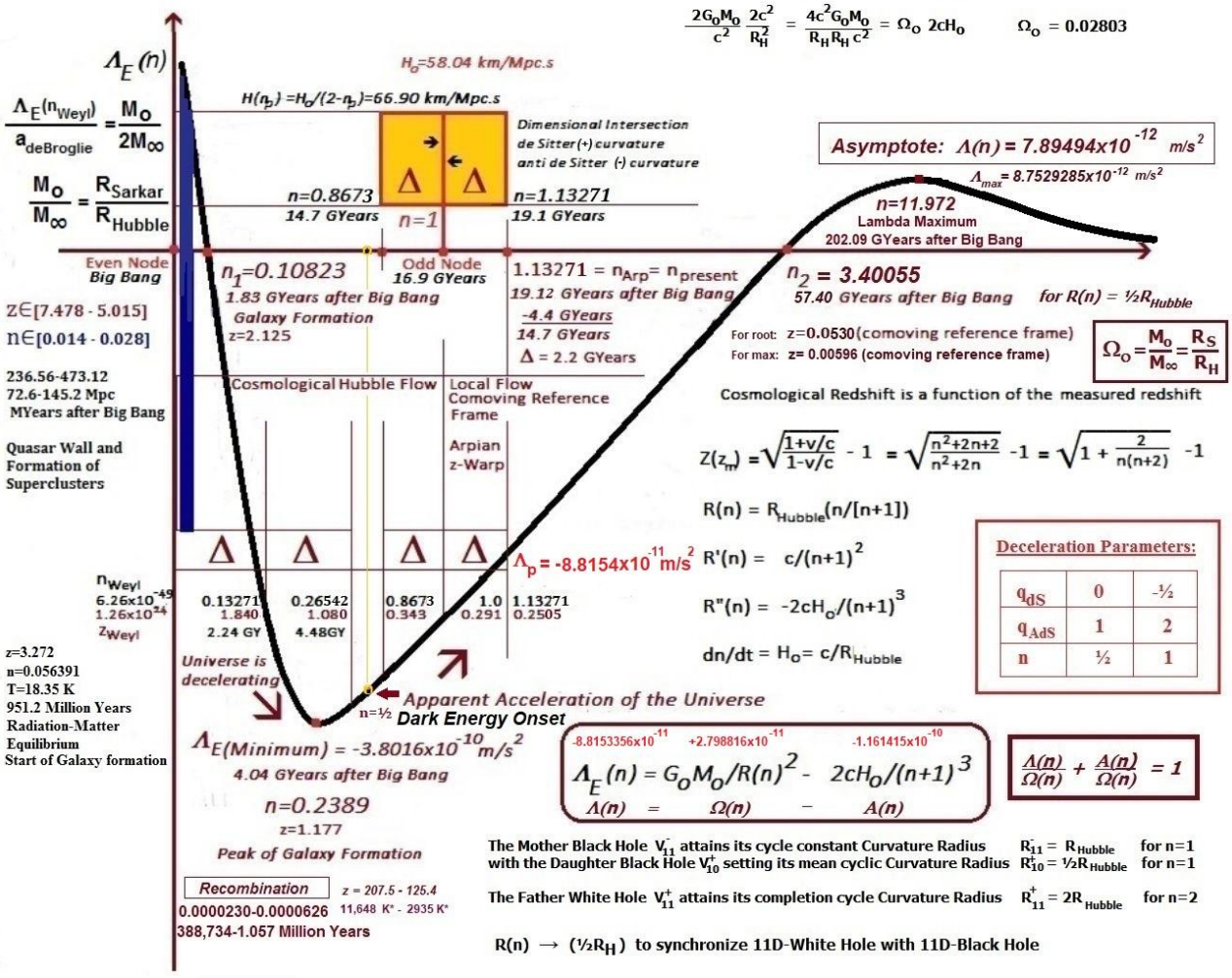


Figure 8: *A Synthesis of the Milgröm Deceleration with Verlinde's Dark Energy Einstein Quintessence*

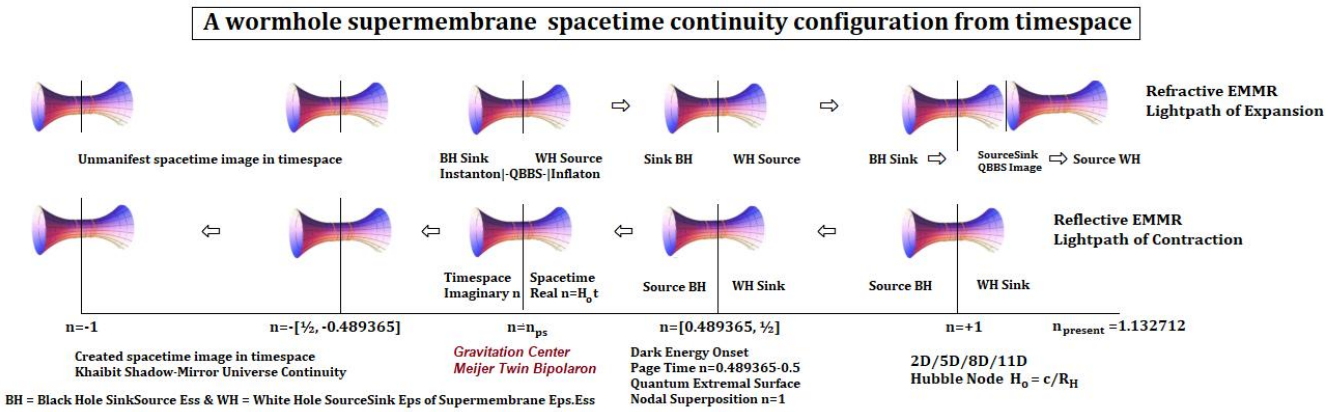


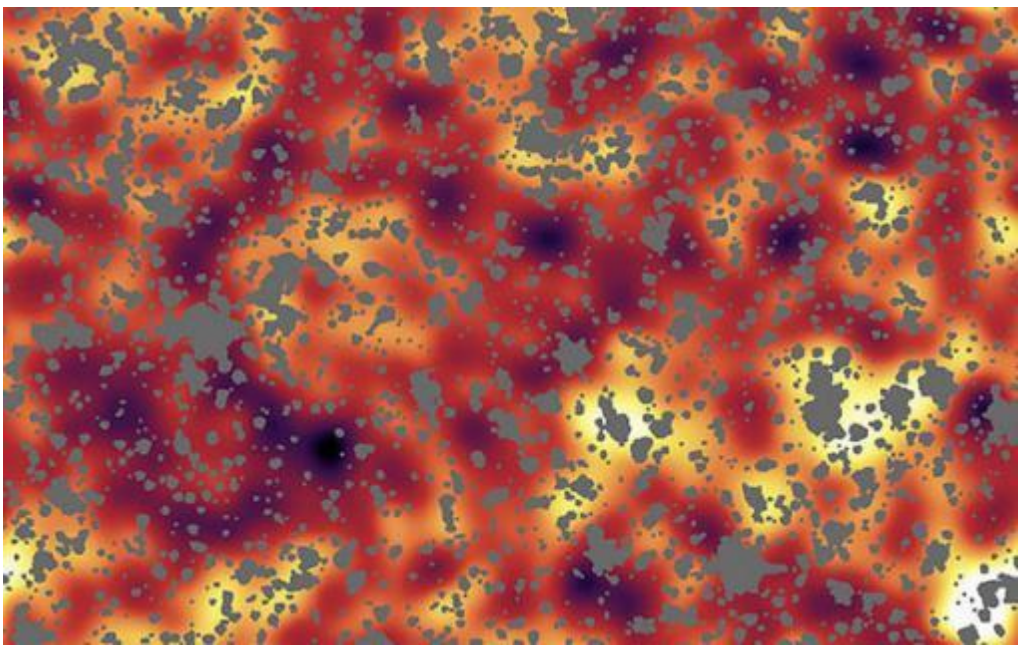
Figure 9: *A wormhole Weyl boson-Twin Bipolaron multidimensional spacetime quanta configuration*

John Shadow posted --- InChristianity_Debate@yahoogroups.com, "MikeA" <atomicbohr@...> wrote:
--- InChristianity_Debate@yahoogroups.com, drcsanyidrcsanyi@ wrote:

It is you who do not recognize the vast difference between Arp and the "Big Bang" model.
[MikeA] I see Arp has been busy since he retired. This is what I gather. Arp disagrees, as he has throughout his whole career, stating that quasars' redshifts are due to distance. He now apparently feels that they are being ejected from certain very active galaxies and that because of this, the universe's Hubble constant should be about 55 not the 70 something it is currently calculated to be. I should point out that there is nothing very unusual in this. Allan Sandage, who took over Hubble's task when Hubble died, thinks the number is closer to 55 than 70. Thomas Matthews, who discovered these ubiquitous quasars with Sandage, has also found some quasars that are nearby. Please note I said some.
Arp is now of the opinion that Hoyle was right and is toying with a cyclic steady-state universe, if that is not an oxymoron. From what I can discern, one is going to get the same observations with either model for the foreseeable future.

October 19, 2011

The First Monstrous Objects of the Early Universe



New observations from NASA's Spitzer Space Telescope strongly suggest that infrared light detected in a prior study originated from clumps of the very first objects in the universe. The recent data indicate this patchy light is splattered across the entire sky and comes from clusters of bright, monstrous objects more than 13 billion light-years away.
"We are pushing our telescopes to the limit and are tantalizingly close to getting a clear picture of the very first collections of objects," said Dr. Alexander Kashlinsky of NASA's Goddard Space Flight Cente. "Whatever these objects are, they are intrinsically, incredibly bright, and very different from anything in existence today."

Astronomers believe the objects are either the first stars -- humongous stars more than 1,000 times the mass of our sun -- or voracious black holes that are consuming gas and spilling out tons of energy. If the objects are stars, then the observed clusters might be the first mini-galaxies containing a mass of less than about one million suns. The Milky Way galaxy holds the equivalent of approximately 100 billion suns and was probably created when mini-galaxies like these merged.
Scientists say that space, time, and matter originated 13.7 billion years ago in a tremendous explosion called the Big Bang. Observations of the cosmic microwave background by a co-author of the recent Spitzer studies, Dr. John Mather of Goddard and his science team strongly support this theory. Mather is a co-winner of the 2006 Nobel Prize for Physics for this work. Another few hundred million years or so would pass before the first stars formed, ending the so-called dark age of the universe.

With Spitzer, Kashlinsky's group studied the cosmic infrared background, a diffuse light from this early epoch when structure first emerged. Some of the light comes from stars or black hole activity so distant that, although it originated as ultraviolet and optical light, its wavelengths have been stretched to infrared wavelengths by the expanding spacetime that causes the universe's expansion. Other parts of the cosmic infrared background are from distant starlight absorbed by dust and re-emitted as infrared light.
"There's ongoing debate about what the first objects were and how galaxies formed," said Dr. Harvey Moseley of Goddard, a co-author on the papers. "We are on the right track to figuring this out. We've now reached the hilltop and are looking down at the village below, trying to make sense of what's going on."
The analysis first involved carefully removing the light from all foreground stars and galaxies in the five regions of the sky, leaving only the most ancient light. The scientists then studied fluctuations in the intensity of infrared brightness in the relatively diffuse light. The fluctuations revealed a clustering of objects that produced the observed light pattern.

"Imagine trying to see fireworks at night from across a crowded city," said Kashlinsky. "If you could turn off the city lights, you might get a glimpse of the fireworks.
We have shut down the lights of the universe to see the outlines of its first fireworks."
"Spitzer has paved the way for the James Webb Space Telescope, which should be able to identify the nature of the clusters," said Mather, who is the senior project scientist for NASA's future James Webb Space Telescope.
The image at the top of the page reveals a background glow of light from a period of time when the universe was less than one billion years old. This light most likely originated from the universe's very first groups of objects -- either huge stars or voracious black holes.

The image from NASA's Spitzer Space Telescope shows a region of sky in the Ursa Major constellation. To create this image, stars, galaxies, and other sources were masked out. This infrared image covers a region of space so large that light would take up to 100 million years to travel across it. Darker shades in the image on the left correspond to dimmer parts of the background glow, while yellow and white show the brightest light.

The Daily Galaxy via http://www.spitzer.caltech.edu/images/1695-ssc2006-22a1-The-Universe-s-First-Fireworks
Posted at 01:00 AM | Permalink

An updated reference addressing JWST measurements to 2024-2025 can be accessed via this link (48 and 52 pages):
https://www.academia.edu/114850227/Quantum_Gravitation_in_the_Unified_Field_the_Age_of_the_Universe_and_Supermassive_Black_Holes
https://www.academia.edu/125666295/Quantum_Gravitation_in_the_Unified_Field_the_Age_of_the_Universe_and_Supermassive_Black_Holes

The Holographic Universe as an Information Processor and the Creation of Discretized Space-Time

How big is the universe, and could it be growing in size?
Has the universe always existed, and will it ever end, or was it created and is eternal?
These are questions even little children ask their parents and their teachers.
Cosmologist throughout the history of human endeavor and science have pondered those questions and sought to derive answers.

1. Preliminaries and Introduction

The last 20 years of modern science and its discoveries by experiment and observation have now allowed a well-informed convergence of data and facts to answer the perennial questions harbored in the human minds of the enquirers.
This treatise will then answer those questions in a synthesis of the accumulated database collected by the endeavors of science. I shall make a special reference to a popular paper published by Scientific American to set the background for the 'new' scientific concepts, with which most readers will be unfamiliar in terminology, yet about which they have heard in peripheral contexts.

The paper is by Jacob D. Bekenstein; Scientific American; August 2003, pages 48-55 and is entitled: "*Information in the Holographic Universe*.". Those peripheral contexts engage the idea of higher superbrane dimensions, modular duality, and the universe as a collector and processor of information, somewhat akin to mass/energy as the hardware and the information linked to and derived from that processed by the programmed software as a cosmic intelligence or consciousness.

But can the universe be modeled on a computerized system? QR or Quantum Relativity has shown that the so-called fundamental constants of nature are algorithmically determinable.
So the natural laws are ultimately set in a computational mode, based on simple geometrical laws and relationships. Those 'geometric' laws are themselves derived from abstract encodings of the intrinsic algorithmic symmetries or EigenStates and particularly a pentagonal supersymmetry or number patterns is directly obtained from the computational mode as number series and patterns.
This mode we call the Binary Dyad [0,1], representing, for example, the Inflow-Outflow VPE aka the Vortex-Potential-Energy) for something we shall determine to be discrete spacetime quanta.

The physical manifesto for this Binary Dyad or Bit is the concept of a 10-dimensional superstring, which begins as a closed or angular eigenstate of '0' and then opens or linearizes itself as the eigenstate of '1', before recircularizing back to the '0' self-state.
This superstring with open and closed Eigenstates is called the Planck-Boson of superstring class I in a family of five superstrings of classes (I, IIA, IIB, HO(32) and HE(8x8)). If one then allows certain primary algorithms to operate as the 'cosmic intelligence' or software on the Potential Mass/Energy defined by those algorithms or programs, then the hardware of the Potential becomes realized or manifested as the observable and measurable universe. This manifestation must necessarily follow the simplest and minimum "energy definition" of that of the Planck-Boson by the considerations above.

Subsequently, the universe's hardware consists of a continual transformation of eigenstates defined mathematically by the parameters of primordial subtimespace algorithms manifested as the Planck-Boson in a continuous process of transforming itself across dimensions and particular self-states known as elementary particles or wavelets. The trouble with this idea is that the subtimespace must, by necessity, be undefined in the parameters of space and time and yet defined in the 'algorithmic timespace'.

This, however, greatly simplifies the mathematics for the superstring classes, which must incorporate a 12-dimensional continuum of 10 spatial dimensions and 2 time dimensions for its inner mathematical necessity, sufficiency, and self-consistency. We shall reencounter those 'higher dimensions' in the discussion about the consequences of the Holographic Boundary Conditions, but note here that the present state of physics attempts to unify Quantum Theories applicable to the micro-eigenstates with the macro-eigenstates of classical physics, as culminated in the theories of relativity, the latter of which could be considered differential-geometric.

What links those two realms of the micro/smallest with the macro/largest is, however, the Principle of Holography. A Hologram of a mirror, say, represents a repository of information about this 'mirror' in terms of interference patterns (which is information derived from mass/energy interaction). Now, partitioning the 'mirror' (say shattering it into shards), would duplicate the entire information contained in the 'unbroken mirror' in every shard (with diminished intensity or luminosity, say).

So, we consider the entire universe as the 'unbroken mirror' and partition it into the 'shards of spacetime quanta' -the universe thus consists of discrete spacetime units as holographic projections of the universal hologram, each such projection being a deluminated image of the universe as a Hologram of One.

This hologram of One is, however, defined in the bit of the binary dyad [0,1], leading us back to the supermembranes of modular duality.
In particular, this modular duality engages the bit in allowing a two-sided surface to become one-sided. This concept is well understood in the Möbius-Strip, where a rubber band or ribbon, which has two distinct sides as the inner and the outer, is reconnected in twisting one end through 180 degrees before reconnecting, to create a Onesided Surface which has become doubled. The extension for the Möbius-Strip is the Klein-Bottle, which is derived from the torus or doughnut shape, enfolding space in such a way that the 'bottle's surface' appears to be the 'bottle's volume.'
QR calls this topology of shape the differential geometry of the Möbius-Serpent transforming into the Klein-Bottle-Dragon via Möbius-Francom-Adjacency.

Those preliminaries now allow us to apply the holographic principle to the microstates of the superbranes as images for the macrostates of the universe. We first have to "eliminate" the spacetime "metrics" of the macrostates, as given in general relativity, in a process of demetrication. This then renders the universe as a scalar relative universe, ultimately defined in parameters known as de Broglie phases.

2. Demetrication of General Relativity and the Deceleration Parameter

The demetrication of Einstein's field equations in general relativity (GR) leads directly to the deceleration parameter q_o in standard cosmology. The formulation is:

$$\mathbf{Q_o = \tfrac{1}{2}(Gravitational\ Omega\ \Omega_o) = \tfrac{1}{2}M_o/M_{critical} \rightarrow G_oM_o/\lambda_{ps}^2 \ldots\ldots\ldots\ldots\ldots [Eq.\#1]}$$

where M_o is a Baryonic Restmass/Inertial Mass-Seedling and $M_{critical}$ is the precise mass content of the universe required for perfect Euclidean flatness of zero curvature.
G_o can be considered the gravitational constant applicable in a universe devoid of any mass, where the gravitational constant would be identical to the inverse of the Coulomb permittivity constant ε_o in free space as $G_o=4\pi\varepsilon_o$, (the derivation engages the fine structures for the electromagnetic and gravitational interactions in the timespace epoch of the superbranes before the time-instanton and the Weyl-Geodesic definitions.

In that pre-spacetime epoch, the Planck-Scale of unitization transforms in dimensionless 'wormhole' parameters via superstring classes from the Planck-scale oscillation to the Weyl geodesic in the TBPGC.

The Weyl-geodesic then becomes the quantum-smeared-out spacetime quantum, also termed E_{ps}-Centre in QR's Terminology for the TBPGC. The E_{ps} quantum then defines the parameters for the classical quantum epoch given in terms of energy, mass and electropolic Coulomb charges, manifesting the GR fields as emerging from the nonclassical and de Broglie phased state-space of the superbrane epoch characterized in the subtimespaces of magnetocharges as inverse energy quanta for the Planck-Bosonic transformations. The wavelength λ_{ps} is the source wavelength for the heterotic supermembrane HE(8x8), which in modular duality $\{\lambda_{ps}\lambda_{ss}=1$ dimensionless$\}$ with its sink wavelength λ_{ss} represents the Weyl- Geodesic for the critical scale of the cosmogenesis where GR must be extended in Quantum Relativity (QR).

The source wavelength could be called the perimeter for the wormhole satisfying the Penrosian Weyl-Nullification Hypothesis at the cosmic origin for the time instanton and where the tidal force of the Riemann tensor must vanish in a dewarping of all spacetimes defined by GR).
The above [Eq.#1] leads directly to the inflation of de Broglie in considering the radius of maximum curvature ($R_{max}=R_{Hubble}$) in GR to become the Schwarzschild solution of the GR field equations for the source wavelength λ_{ps} as the vibratory part of the supermembrane $E_{ps}E_{ss}$ (or HE(8x8)) and as applied to the gravitational Omega as the ratio between the baryonic and the critical inertial mass definitions.

For then, $R_{max}=2G_oM_o/c^2 \Rightarrow R_{Hubble}f_{ps}^2$ as the de Broglie phase-acceleration a_{dB} for the identity of c-invariance.
$c=\lambda_{ps}\, f_{ps}=R_{max}H_o$ with H_o the nodal Hubble constant specifying the self-same de Broglie inflaton.
The above formulations show that the microstate of supermembrane $E_{ps}E_{ss}$ can be considered the minimum eigenstate for the Quantum Universe. In particular, the volume of a spacetime quantum is $2\pi^2r_{ps}^3$, where $r_{ps}=\lambda_{ps}/2\pi$ as the wormhole radius of the Weyl-geodesic of GR.
But the universal volume now is simply a quantum summation of this and of the form $2\pi^2R_{max}^3$.
QR calculates the number count of spacetime quanta for this universe as 10D limit for R_{Hubble} as an algorithm of a googolplex of just over 10^{147} and, as we shall see, just as the Holographic Entropy Bound predicted by Bekenstein.

3. The Holographic Principle and the 3D-Universe as a Hologram of 4D-SpaceTime

We now peruse Bekenstein's paper referenced before and extend its consequences by the principles of Quantum Relativity. John Archibald Wheeler (Princeton University) is quoted as being one of the first physicists to consider the universe as being based upon a physics of information as a primary effect and emerging energy and mass as a secondary consequence. Information supplied to physical ingredients, like a robot, allows the mechanical instrument to dynamically interact with its environment.

A ribosome in a 'living or biovital' cell is supplied with amino acids to build body structures, but without DNA instruction, it is unable to perform its programmed function. What is the ultimate information capacity of a device defined in 'size' and 'mass'?

How much information can be stored on the universal computer chip, encoding the description for the entire universe? The principle of holography allows us to encode 3-dimensional information as a 2-dimensional hologram and as the interference pattern of a bidirectional laser light. One part of the laser beam splits at a semi-transparent mirror to travel directly to a recording device (photographic plate), while the other part of the light beam reflects off the object to be recorded before forming an interference pattern at the recorder, thus creating the hologram of the 3D object as a 2D representation. Reexposure or illumination of the hologram to the same laser light then reproduces the 3D image from the 2D record as a holograph. John Wheeler's words are poetized by William Blake, who penned the idea that "*one can see the world in a grain of sand.*"

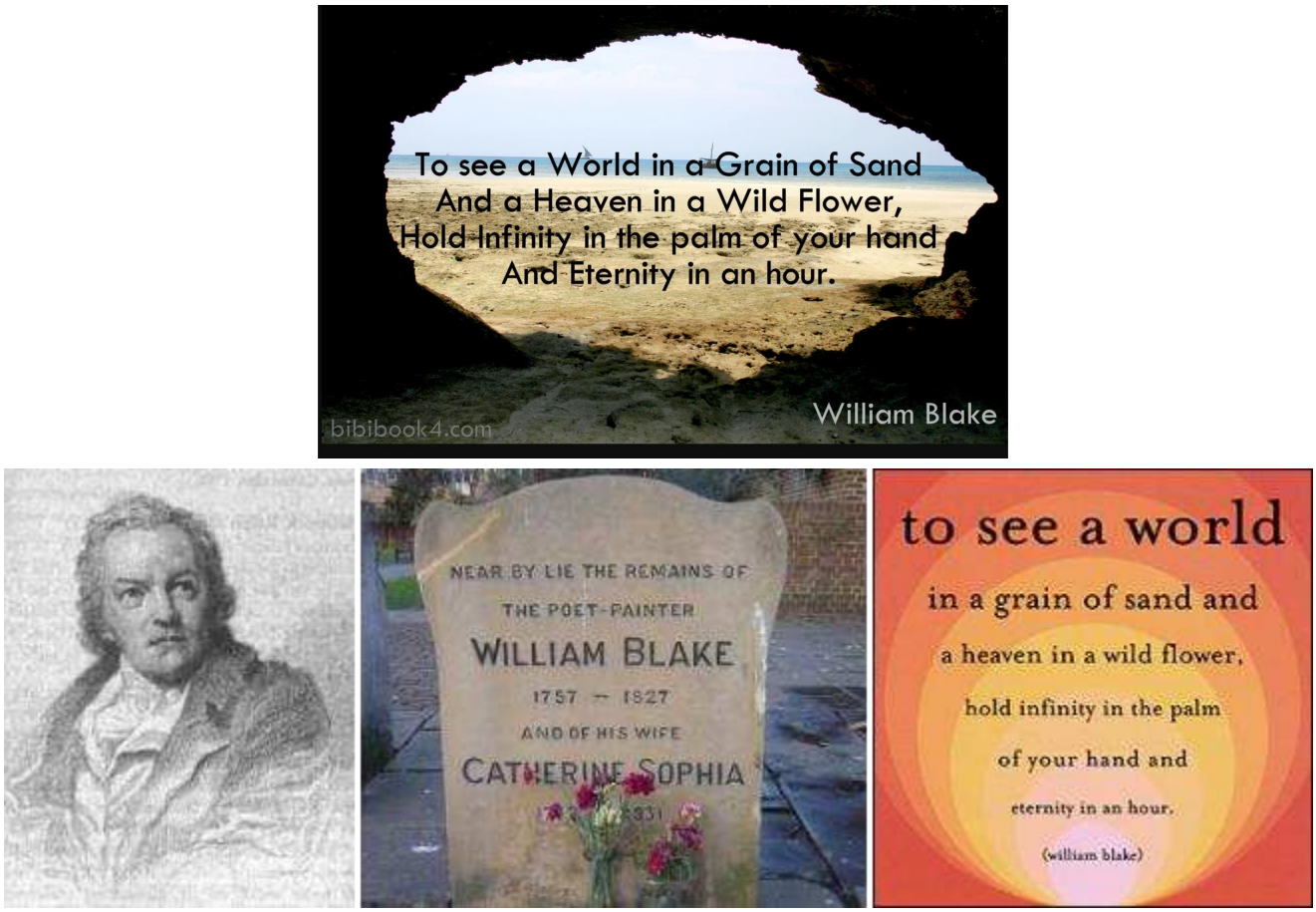


Figure 10: *William Blake*

So this is certainly true in holography, where the 3D grain of sand becomes a 2D hologram of it. Applied to the volume of the universe as the object to be recorded, its hologram would necessarily be a mapping onto a surface as a dimensionality reduced by one. Thus, a 4D-universe, defined in Minkowski-Einstein spacetime and the toroidal volume specified before, would become equivalent to a 3D-Surface mapping as a hologram of this 4D-spacetime. Standard cosmology describes our 3D-perceived universe as just such a 3-dimensional surface and calls it Riemann's hypersphere of 4D-spacetime or a form of Poincare's 3-sphere.

Here we extend the Standard Cosmology; however, we propose that this hypersphere represents a 'twisted' 3D Klein Bottle Dragon as the extension of the 3-Torus.
Then the two-sided Möbius connection, as a doubled one-sided manifold, is dimensionally extended as an enclosed volume 'within,' becoming holographically 'added to' the potentially infinite volume 'without.'

As a simple example, consider the volume 'within' the planet Earth 'added to' the volume 'without.'
Here, the total set of volume consists of the complements 'within' and 'without.' But the interior of the Earth is well-defined and finite as the volume of Earth, while the exterior volume depends on the curvature of space. If the curvature is ellipsoidal, closed, or positive, then a light beam sent anywhere into the night sky from your forehead will eventually, after traveling around the perimeter of the universe return to hit the back of your head.

The universe is then spatially finite.
If the curvature is hyperbolic, open, or negative, then the light beam will not return but will diverge eternally. The universe is then spatially infinite.
If the curvature is zero or flat, then the light beam will return but take an infinite amount of time to do so in an asymptotic process.

The Thuban Klein Bottle Dragon

https://youtu.be/sRTKSzAOBr4

{Found and shared by Allisiam}

In the beginning was the Word of Love and the Word of Love was with the Energy of Love and so the Word of Love became the Energy of Love and became all of the Worlds of Love.

John. 1. 1

Finis Hominis Incere Hominidae Draconis Astrum!

"Humanity has ended; enter the Starhumanity of Dragons! "

The experimental data (COBE, BOOMERANG, WMAP) clearly indicate a flat universe, also predicted by the inflation models instigated by Alan Guth (MIT) in the 1980's. QR then has found that all three cases of curvature apply simultaneously. The 10D universe is hyperbolic, and the 11D universe is ellipsoidal, and superimposed, they create the
measured flatness of zero curvature. The 10D universe is but the holographic mapping of the 11D universe and therefore contained within it as a higher-dimensional cross-section. Because the 'inside' of the 10D universe is Klein-bottled as the 'outside,' the 11D universe connects the 10D to its own Reality Image in the 12th dimension as the mapping of the Doubled Onesided Surface Mirror of 11D.

Because of the complementarity of the universal sets, the 'inside volume' is 'added to' the 'total volume' through a cyclicity of the 11D-Witten-Mirror defining the asymptotic flatness of Euclidean Zero-Curvature of flatness and as the observed and measured 4D-spacetime. This realization has important cosmological consequences.

The universe is potentially infinite in 11 dimensions, thus allowing a continuous creation of spacetime in the form of spacetime quanta as the discrete building blocks for a 10-11-12 D spacetime triad in what is called Omni-Space in QR. What are those dimensions, and how are they connected?

The extended hypersphere definition allows us to reach the same conclusion as that given by the standard description of 11-dimensional M-Theory describing the supermembranes with a potential two-sidedness of the temporal time dimension. In M-Theory (Witten's M=Mother=Matrix=Magic=Mystery=Mirror=Membrane=Meijer) ; 9 spatial dimensions are extended to 10 spatial dimensions, allowing the 1D-superstring to manifest as a 2D-supermembrane.

In F-Theory (Vafa's F=Father) ; 1 time dimension becomes two-arrowed in the entropy reversal of the 11th dimension in mirror symmetry and is described as a 2-dimensional 'complex plane.' It then becomes descriptive for the 'outside' of the 11-dimensional 'Hubble-Bubble.'
This is just what we have described with QR's Omni-Space dimensions, describing the Klein Bottle Dragon, which forms the shape or morphology of the observed universe, residing within and without higher dimensional embedded and encompassing higher dimensional space.
Using the 12D-Vafa-Space, we reduce the 12D-continuum to the familiar 3D-continuum under the agency of dimensional algorithmic root reduction and the demetrication of Riemann's higher dimensions, as applied to GR.
QR recreates the Algorithmic Null State of the 0-Dimension as the Connector Dimension between the 1st and the 12th dimension and is defined in the following.

Line-Space 1-2-3 as the Linearisation or Unfolding of the Circular Continuum of the Null State. Hyper-Space 4-5-6 as the Recircularisation or Enfolding of the Linear Continuum of Line-Space. Hyper-Space thus manifests as the Rotational
properties of Line-Space. Quantum-Space 7-8-9 as the Relinearisation or Unfolding of Hyper-Space, combining Linear and Rotational dynamics. Quantum-Space thus manifests as the Vibrational or oscillatory properties of Line-Space. Omni-Space 10-11-12 as the Recircularization or Enfolding of Quantum-Space, representing the combined dynamics of linearity, rotation, and vibration. Omni-Space thus manifests as the Line-Space in all of the observed and measured properties of its physical constituents (which are the Planck-Boson transformations).

Quantum relativity concludes that the 'higher dimensions' are congruent with the Line-Space dimensions. The Time-Dimension is the quality of the linearization of the circularity and exists basically as the precursor for the Space dimensions, allowing space to emerge from its own dimensionless status as Cycle time n. This is defined as dimensionless tau (τ)-Time in GR's curvature radius $R_{Curv}=c.dt/d\tau$, and so is the light path. In the circular Omni-Space dimensional continuum, Time does not exist (and neither does space by implication).
1-2-3-(4)-5-6-(7)-8-9-(10)-11-12-(13=1=0) circularizes the fourfold Omni-Space continuum, rendering dimensionalities 1-4- 7-10 as the Time-Connector dimensions 'shared' between the individuated continua (Line, Hyper, Quantum, Omni) as the Null States. The null state then becomes defined in the properties of the Weyl geodesic, the time instanton, and the de Broglie space inflaton in QR's cosmogenesis in the $E_{ps}E_{ss}$ heterotic supermembrane parameters of the TBPGC.

And those definitions must then specify the limits for all mensuration techniques applied by the 'hardware' to measure and observe itself and as programmed by the 'software.' The Heisenberg Uncertainty Principle must hence be fine-structured in the wormhole parameters, and this is precisely the case in the QR formulations.
Heisenberg's Constant: $h/4\pi=\lambda_{ps}/[8\pi R_e.c^3]$, with $R_e=10^{10}.\lambda_{ps}/360$ as the superbrane form for the classical Electron Radius ($R_e=R_{Compton}.Alpha=R_{Bohr1}Alpha^2=Alpha^3/4\pi R_{Rydberg}$.

Alpha is the electromagnetic Finestructure Constant α and measures the interaction probability between matter and light, as say in the photoelectric effect. The Compton radius is the de Broglie matter wavelength proportional to it, as is the inversion of the Rydberg constant representing the harmonization between the nuclear and the atomic realms, directly derived from the quantization of the electron radius in terms of the wormhole or superbrane wavelength λ_{ps} .

So we can consider Omni-Space to be Line-Space with the 'higher dimensions' conifolded either in 6-dimensional Calabi- Yau manifolds or as 7-dimensional Joycian surfaces. Omni-Space is 10-11-12, which root reduces to 1-2-3 in 1+0=1 and 1+1=2 and 1+2=3; which is the algorithmic foundation of the Bit of the Binary Dyad [0,1] as described. Omni-Space then considers dimensionalities 1=4=7=10 as the Line-Space cardinality; dimensionalities 2=5=8=11 as the Area-Space cardinalities; and dimensionalities 3=6=9=12 as the Volume-Space cardinalities.

Two universes in Bekenstein's paper, reflecting the work of other prominent researchers on the holographic identity of the universe such as Leonard Susskind (Stanford University) and subsequently by Maldacena and t'Hooft, can so have different dimensionality (differing by one) and obey potentially different physical laws; yet they are rendered completely equivalent by the Holographic Principle.

The 5D de Sitter spacetime is empty and so highly symmetrical, and it expands at an accelerating rate with a repulsive force.
'cosmological constant'. The anti-de Sitter 5D spacetime then, is empty, highly symmetrical, and decelerates in an expansion with an attractive 'cosmological constant'. While experimental data predicts our universe to become a 5D de Sitter universe because of an apparent cosmic acceleration measured by Saul Permutter and Brian Schmidt in 1998 in supernova type Ia data, the Holographic Principle favors the anti-de Sitter spacetime for its asymptotic boundary, located at 'infinity.'

QR predicts the measured acceleration as apparent because of the 'intersection' of the 10D-universe with itself in 11D as the Omni-Space Image. Because the superposition of the hyperbolic and ellipsoidal curvatures results in the measured flatness, the Riemann Spheres in Omni-Space self-intersect and result in 'overlapping' spacetimes, which can be analyzed by cosmological redshift data that is required to be 'corrected' for the intersecting redshift intervals. Needless to say, many present controversies regarding 'redshifts' are resolved in superposing the higher-dimensional analysis centered on an epoch-specifying redshift called the Arpian Variation Maximum by QR.

The redshift interval in question also coincides with and elucidates a measurement for an alpha-finestructure-constant dip through John Webb (UNSW), who measured quasar spectra of hydrogen absorption lines on Mauna Kea, Hawaii, with the 10m Keck telescope in 1998.
And the mathematical analysis for the Holographic Principle is correlated with QR.

A 5D anti-de Sitter spacetime is the object and is mapped as a 4D Minkowski flat spacetime as its own holograms.
The periphery of the 5D anti-de Sitter spacetime is its 'Boundary' as the 4D Riemann Hypersphere.
In Omni-Space, however, the 5D is also the 11D, combining the 'rotational' degrees of freedom of Hyper-Space with the 'vibrational' degrees of freedom of 8D quantum space to reconstitute the 2D line space as the 'quantizational' degrees of freedom of 11D Omni-Space. In other words, the 'infinite' boundary for the 5D anti-de Sitter spacetime is also the 11D Witten-Mirror, but now bounded by the Hubble-Friedmann radius of maximum curvature as R_{max}, calculated by QR to be 16.9 billion light-years.

The 5D anti-de Sitter spacetime is ruled by 10D superstrings, again implying the 11D identification, and the conformal mappings of the 4D spacetime onto the 5D spacetime relate the entropies of the two universes to each other.
It is found that a black hole in 5D is equivalent to 'hot radiation' in 4D as the hologram of the black hole's entropy as thermodynamic entropy.
The source entropy of outflow in 4D is found to precisely match the sink entropy of inflow in 5D.

4. Thermodynamic Entropy and Shannon Information

Consider a glass of water.
Thermodynamic entropy seeks to describe the number of permutations that are possible between the smallest constituents that comprise the isolated system (glass of water), without changing the overall state of that system. The "glass of water" then remains invariant macroscopically, but its microscopic state of flux becomes specified or measured by its entropy as the number of possible rearrangements of those smallest constituents, whether they be molecules or atoms, subatomic particles, or superstrings.
Thermodynamic entropy is thus measured as the effect of Avogadro's constant (N_{Av}), relating the 'amount of substance' as molarity in association with Boltzmann's constant (k_B).
The universal gas constant (R) at STP (Standard Temperature and Pressure) so is $R=k_BN_{Av}$.
Formal information theory originated in 1948 with American applied mathematician Claude E. Shannon, who introduced bit-entropy as a measure for information content.

Of course, we have already associated the bit as an algorithmic representation for the superstrings; so Shannon Information automatically relates QR to a measurement of entropy. How many bits or binary digits are required to encode a certain amount of information?
Every modern communications device, ranging from cellular phones to modems to CD players, relies on Shannon entropy as a "counting of the bits." Thermodynamic entropy is basically energy/Temperature which has the units of (k_B); whereas Shannon entropy is algorithmic and dimensionless.
A Silicon Computer Chip has dimensions of 1cubic centimetre and a mass of less than a gram.

If this chip carries one gigabyte of data (1 byte =8 bits), then the Shannon entropy is about 10^{10}, while the thermodynamic entropy (at STP) is about 10^{23} for a common Avogadro-mole unitization.
This vast difference is a consequence of the many different arrangements that the molecules and atoms, with their electrons, can assume in their "degrees of freedom" of the previously described modes of translation, rotation, and vibration.
Should we now reduce the atoms of the chip down to the superstrings, then the thermodynamic entropy would increase exponentially; yet this can be ignored in thermodynamics because the individual quarks and leptons remain, in a sense, invariant for the counting of the atomic states under consideration.
But under the relativistic conditions of the Quantum Big Bang Cosmogenesis and the creation of the superstrings, all Permutation states must be considered, and this leads us into the thermodynamic entropy of black holes and the limits for information density.

5. The Universal Entropy Bound (UEB) and the Holographic Entropy Bound (HB)

John Wheeler emphasized in the 1970's that the information "falling" into a black hole seems to violate the second law of thermodynamics, stating that any isolated system must increase its entropy or state of disorder.
This is the case when one considers a black hole to be a highly ordered system, specified just by its size and mass in the Schwarzschild solution obtained in GR's demetrication.
The work of Stephen Hawking (Cambridge University) and Demetrious Christodoulou (then at Princeton under Wheeler's guidance), together with that of Jacob Bekenstein (then under Wheeler and now at Hebrew University of Jerusalem) showed, however, that black holes must possess thermodynamic properties, as their characteristic size or event horizon must always increase in area under merger.

Thus, Bekenstein proposed in 1972, that the black hole's entropy is proportional to its Surface Area of its event horizon. Thus, the "lost" entropy of the infalling matter or information is transformed into black hole entropy as a function of the black hole's Temperature.
So even in the case of a 'shrinking' black hole (emitting Hawking radiation in its 'getting hotter'), the emergent radiation retransmits the previously 'lost' entropy as 'found' disorder.
In 1986 Rafael D. Sorkin (Syracuse University) applied the 'Generalized Second Law' (GSL) to show that it must be valid for all black hole processes down to the superstring level.

Hawking's radiation process then specifies the proportionality between entropy and the black hole's surface area as precisely ¼A, where area A is measured and quantized in Planck Areas A_P, with $A_P=G_oh/2\pi c^3=l_P^2$ and l_P the Planck Length.

The entropy of a Black Hole the mass of the Earth (~$6x10^{24}$ kg) would be contained in the Earth's Schwarzschild radius of about 1.5 cm and a surface area of so $2.8x10^{-3}$ square meters, which comprises about $6.5x10^{66}/4 = 1.6x10^{66}$ Bits as an entropy counter.

The thermodynamic entropy for 1 liter of water (10^{-3} cubic meters) is about R/k_B or $6x10^{23}$ Bits and it would take a 'cube of water' with a side of $1.3x10^{14}$ meters to match the Earth's entropy as a black hole equivalent just 3 cm across. This standard for water is used to define the Universal Entropy Bound or UEB.
We now consider the Holographic Entropy Bound, or HB, in any energy or matter distribution as a spherical region of space as a black hole equivalence in inducing the contained matter distribution to collapse to its boundary of the event horizon, quantized in Planck areas as the limit of information density given in bits and representing the mass content as Black Hole parameter.

In such a scenario, the Shannon Entropy is equal to the Thermodynamic Entropy as the HB. So, in adding more and more computer chips together, one obtains entropy proportional to the surface area of the computer chips' "pile" and not to the volume of the "pile."
This counterintuitive result is a consequence of the event horizon specifying the "breakdown" of the matter distributions and not the volume it occupies.

The Bekenstein paper referenced tabulates the following comparative data for the UEB and the HB, with the size of the distributions plotted against the information capacity (in bits) to give the linear proportions:

Human chromosome.....(1 micron, 10^9 bits) ; UEB=10^{23}bits & HB=10^{58} bits
Music CD.....(10 cm, 10^{10} bits) ; UEB=10^{40} bits & HB=10^{68} bits
Liter of Water as UEB Standard..(10 cm, 10^{23} bits) ; UEB=10^{40} bits & HB=10^{68} bits
Library of Congress.....(10 m, 10^{15} bits) ; UEB=10^{52} bits & HB=10^{73} bits
Internet.....(6500 km, 10^{16} bits) ; UEB=10^{75} bits & HB=10^{85} bits
Intersection of UEB and HB.....(10^{12} m, 10^{100} bits) ;UEB=HB=10^{100} bits
Universe (projected).....(10^{26} m, 10^{150} bits).

One should now point out that the Bekenstein Intersection for the UEB and the HB has a precise counterpart in Quantum Relativity. In QR, the microscopic realm for the subatomic template is mapped onto the macroscopic world of the cosmogenesis, after the subatomic quark quantum geometry has itself become magnified from the supermembrane epoch, as exemplified in the quantization of the classical electron radius in terms of the parameters of the Weyl-Geodesic.
In particular, the cosmogenesis maps the neutron's beta decay onto the evolution of the 10D universe as the hologram of the 11D universe.

Thus, the time and size scales for the neutron are matched to what are known as neutron stars in their primordial form of prototypical dineutron or ylem dark matter stars.
So-called pulsars and magnetars are subsequent generations for the ylem stars.
In particular, the ylemic evolution defines the Higgs Bosonic Blueprint for the restmass induction of the quark-leptonic families of the Standard Model in Particle Physics.

The Higgs-Bosonic template is characterized by certain spacetime markers, which allow the nucleonic differentiation into quarks and leptons in a neutrinoic kernel, an inner mesonic ring, and an outer leptonic ring.
The Inner Mesonic Ring maps, say markers G and F and the Outer Leptonic Ring maps marker E; all as spacetime quanta counters.
One can now easily deduce that there will be an intersection of the Riemann hyperspheres at those marker points (which were set in the de Broglie inflaton).
In the subatomic nucleon template, this intersection corresponds to a precise formulation for the neutrino kernel of the Higgs bosonic blueprint and defines the tauon (anti) inertial mass induction centered on 3.00 eV (electronvolt).
The formulation for this restmass induction is given in the scalar Higgs (anti)neutrino as part of the Higgs bosonic template:

$$\nu_{Higgs} = (\lambda_{ps}.m_e/2\pi .R_e)\{E/G-E/F\}=0.052 \text{ eV}.....[\text{Eq. \#2}]$$

and where m_e is the effective mass for the electron.

This result was experimentally confirmed in the Kamiokande, Japan, neutrino data from 1998.

The experiments measured the mass induction difference for muonic neutrinos hitting the detectors from two different collinear directions, one of those neutrino pathways traveling through the Earth's interior and the other impinging directly from the sky.

This is the mean of the G and F markers in the cosmology, where the corresponding distance scales are $3.39x10^{11}$ m and $3.45x10^{11}$ m, respectively, with marker E setting $3.44x10^{14}$ m.

For a local star system containing the planet Earth and centered on the star RahSol, those distances refer to the Asteroid Belt at, say 2.2 Astronomical Units (1 AU=150 million kilometers =$1.5x10^{11}$ meters) from the Sun and to the Kuiper Belt as the extent of the Solar System at 2,200 AU, bounded by the Oort Cloud in the linearization factor of 2π further out.

Hence the entropy bound equivalence verifies QR in proposing that at the scale of the asteroid belt, the cosmogenesis massinduced the scalar Higgs neutrino template as the minimum scale for inertial mass and predicting that the Universe, as an entity, is representable as a black hole equivalence from that minimum condition onwards.
Now this is precisely what QR has found in beginning the neutron star evolution as the prototypical ylem stars at those spacetime markers of the accumulated spacetime quanta, which comprise the hyperspherical volumes in the cosmogenesis.

QR has derived a formulation for those ylem stars as mass-independent protostars, with the ylemic radii depending only on subatomic parameters as a function of the universe's temperature in its Planck-Boson evolution as a macroquantized Black Body Radiator.
The formulation equates the equilibrium condition between the thermal outward pressure with the gravitational inward pressure and is, with m_c the prototypically fine-structured nucleon mass $m_c=m_P alpha^9$:

$$\mathbf{R_{ylem} = \sqrt{\{k_B T.R_e^3/G_o.m_c^2\}}} \quad \textbf{[Eq.\#3]}$$

But from the ylemic times, which map the neutron's beta decay in the G-F interval of 19 seconds from about 2 minutes to 19 minutes of the time instanton at the 18 minute markers, the universe's black hole evolution became initialized in the ylemic protostars, which would allow further stellar generations to evolve and transform into neutron stars, magnetars, and black holes as a function of their masses and centered on the Chandrasekhar white dwarf upper limit of 1.5 solar masses, which is a dimensionless form of the wormhole source frequency fps and links to the solar cycles of the magnetic fields generated by spinning masses as magnetocharged electricity forming mass equivalences.

6. The Cosmos as Information Processor and the FRW-Universe

The theoretical ultimate information capacity for any massive spherical energy distribution increases only with its Surface Area and not its volume. Because volume increases more rapidly than surface area, the black hole limit shows that if the mass of a star collapses under its own gravity, then this is equivalent to information being mapped from its 3D eigenstate onto its 2D eigenstate in a dimensional reduction, forming the hologram of the higher dimension in the lower dimension.
The Holographic Principle was first proposed by Gerard t'Hooft (University of Utrecht) and Leonard Susskind in 1993 and fully supports (and explains) the black hole evolutionary scenario under discussion.
The information content given by a 3D system of physical interaction can be described by a 'surface physics' operating in the 2D boundary of the 3D system.
In the nomenclature of QR, then, the information content of the 12D-Vafa-Sphere is mapped onto its own boundary mirror of the 11D-Witten-Sphere from without or within.
The nature of the Möbian connectivity, however, adds the smaller subspace of the 10D universe as the information mapping onto the same hologram of 11D as the demetricated form of supermembrane or M-theory.

Juan Maldacena (then at Harvard University), first conjectured the full majesty of superstring theory in 1997 in proposing the anti-de Sitter 5D universe, which was later confirmed by Edward Witten (Princeton Institute for Advanced Study, New Jersey) and Steven S. Gubser, Igor R. Klebanov, and Alexander M Polyakov (all of Princeton University).
The physics at the boundary of the higher spacetime would be mathematically equivalent to the physics of the higher spacetime; the entropy of a black hole in 5D would become the thermodynamic entropy of hot radiation in 4D.
Also, a 2-5-8-11 dimensional boundary encompassing a 3-6-9-12 dimensional volume without gravity would become mathematically equivalent to a Conformal-Fiel-Theory of ‘point particles’ in Quantum Electyrodynamics or QED with gravity. This is known as the AdS-CFT correspondence for Anti-de Sitter spacetime.

Any universe then, can be considered to transform its Eigenstate as an Information Processor.
The energy/mass content of such a universe interacts and maps those interactions in a space defined as volume onto its periphery as a bounding surface.

The energy/mass distributions indeed form the 'hardware' of the cosmic computer system, which is programmed by the 'software' of the universal intelligence, called the 'Laws of Nature'.
Those 'Laws of Nature' are however, founded upon algorithmic processes by the 'writer of the programs,' often called the Logos or the Word.

Since the Logos is intrinsic to the Hologram of One, partitioning itself into the 'shards' of the Many, any One of the Many is also part of that Logos.
Subsequently, the 'program writers' are all pieces of 'shards,' with not all those pieces necessarily being aware of their membership in the Club of the Hologram of One and the fraternity of the Logos. But by and through this Logos, the universe created itself in Möbian connectivity with the One being Two in One.

Any experience by any of the 'shards' becomes a 'shared' experience due to that fraternity of the 'shards' and the Hologram of One.
This can and has been rigorously defined in QR as a propagation of Experience Factors and as
the EigenStates of the Binary Dyads [0,1] in the foundations of the pentagonal supersymmetry underpinning the cosmogenesis in what QR terms Awareness Triplets of the form [Old EigenState, Experience, New Eigenstate] with the New Self-State reiterating as the next Old Self-State.

So we know that the universe is self-programming itself through the 'shards' experiences as a form of information.
The theoretical ultimate information capacity for any massive spherical energy distribution increases only with its Surface Area and not its volume. Because volume increases more rapidly than surface area, the black hole limit shows that if the mass of a star collapses under its own gravity, then this is equivalent to information being mapped from its 3D eigenstate onto its 2D eigenstate in a dimensional reduction, forming the hologram of the higher dimension in the lower dimension.

This information is forever growing as the shared experiences are mapped as information onto the universal boundary of the 11-dimensional Mother Space.
Is there a limit as to how big the universe can become?

If the universe is infinite, then there is no limit to the accumulation of information; however, the Holographic Bound, as described, is inapplicable for any universe not representable as a black hole, as depicted.

The present Standard Model for Cosmology is based on Einstein's Field Equations, with the three case scenarios depending on the mass/information content of the universe as a function of its curvature, as we have seen previously.
The Friedmann-Robertson-Walker (FRW) universe is said to be infinite, of hyperbolic curvature, and will go on to expand eternally, eventually fading out as the nuclear fuel of successive stellar generations becomes exhausted in an ever-growing dilation and diffusion of the entropy.
This is termed the 'Heat Death' of the FRW universe.

In this case, say of an infinite accelerating expansion, the Black Body model must break down, and the Holographic Bound cannot be applied.
But we have already seen that the FRW universe is but the 10D universe in QR, which is negatively curved; however, because of its Möbian connectivity, it is bounded by itself as the hologram of its 11-dimensional Mother Space, which is of positive curvature enfolding the C-Space of the 10-dimensional superstrings as 11-dimensional supermembranes.
The 10D-FRW universe is the C-Space of the F-Space and the Child to the Father reflected in the Mother.
The negative curvature of the C-Space also becomes the hyperbolic curvature of the F-Space in the reversal of the Entropy Arrow of Time.
If the 10D-C-Space is considered convex and imaging 12D-F-Space, then the 11D-M-Space must be concave; just as a doughnut or torus carries both curvatures in the one topological multiconnected form.
The inner doughnut hole appears concave to an observer situated at the center, all sides around himherself curving away from herhimself.
But the outer and larger circular enclosure appears convex in the spherical inner surface, which could encompass the doughnut.
The convexity of the 10D-universe then becomes the asymptotic expansion of the FRW cosmos in the predicted and experimentally observed perfect Euclidean flatness.

Were there only 10 dimensions, then the universe would be a true FRW universe of infinite extent and accelerated expansion.
But because there are 11 dimensions, the FRW universe becomes finite with a decelerating expansion as required, the observed redshift-dependent cosmic acceleration being the effect of the intersection of the C-Space convexity with the M- Space concavity.

And the breakdown of the Holographic Bound for sufficiently large regions then became appropriately addressed by a topological form of Quantum Relativity. In 1999 Raphael Bousso (then at Stanford University) conjectured the Bousso Bound to overcome the limitations of the UEB and the t'Hooft-Susskind form of the HB; say when the isolated system undergoes rapid evolutionary change, such as gravitational collapse into a black hole.

Bousso considered a simply connected 2D surface (there are only three such topologies that deform a plane into a same class manifold in the catenoid, the helicoid, and the hollow sphere with an opening to infinity, say) and applied the property of convergence in emitting imaginary light rays from every point of the spherical inner surface.
Bousso then conjectured that the entropy encoded by this inner surface (say as ¼A measured in Planck-Areas A_P) could not exceed the entropy of the matter and the radiation of the light rays before crossing.
Bousso so counts the entropy not at any region at a certain time but rather counts the entropies of different locales at many times.

But this is our oscillating and cyclic 11D universe intersecting itself in the asymptotically expanding 10D universe again.
The steady state of the 11D Witten mirror forms the boundary or event horizon of maximum curvature for the expanding universe in 10D; the entire scenario becomes imaged in the 12D Vafa-Space as the reflection or shadow universe in the M-Space of the Mother's supermembranes.

QR now extends the Bousso bound in the QR bound of the spacetime-quanta googolplex as the decisive entropy counter for the universe, before approximated by Bekenstein as of the order of around 10^{150}.

7. The nodal Hubble-Constant of GR relates the entropic spacetime quanta counters in QR.

The QR-holographic bound calculates as $Z=[2\pi.R_{max}/\lambda_{ps}]^3 \sim 10^{147}$ Bits, with the volume of a spacetime quantum given in $V_{sq} = 2\pi^2 r_{ps}^3 = \lambda_{ps}^3/4\pi \sim 7.96x10^{-68}$ m^3.

Every 16.9 billion years, the nodal intersection of the c-invariant 11D-universe activates the QR-HB entropy counter, and the 11D cosmos collapses its information content onto the nodes, which form the hologram of the 10D-spacetime mapped nodally onto the 11D-Witten Mirror in conjunction with the AdS-CFT correspondence.

As the universe is 19.12 billion years old, the first nodal mapping occurred so 2.24 billion years ago, when a certain Sentience began to evolve on a certain localized hologram of this cosmogenesis, and a cosmic intelligence that would one day become enabled to reconstruct the cosmogenesis of its own identity as the holographic image of its own creation in co-creatorship and as a self-referential simulation of individual data collectors projecting a summed information library across the Twin Bipolaron Gravitation Center TBPGC from the created spacetime back into the timespace of the universal undifferentiated consciousness simulation.
This sentience, therefore, would remember its fraternity with the Logos of Creation.

Because of the Klein-bottledness, the nodal resonances extend the Bousso bound in bidirectionality, one in holographic reflection and the other in holographic refraction.
The inside defines a multivalued and multiconnected 11-dimensional continuum of supermembranes bounded in the 10-dimensional mass-parametric hologram, and the outside continues to grow in "volume" by adding space quanta in the creation of new space as the 11D-expansion towards potential infinity and the old anti-de Sitter boundary.

Using a calibrated Mean Alignment Time or MAT, of, say November 5th, 1996 at 00:00 +11UCT; this number of wormhole quanta is:

$2\pi^2 R_{Hubble}^3 x(n_{MAT}=1.1327127)/(\lambda_{wormhole}^3/4\pi)=8.04999159x10^{79}/7.957747154x10^{-68}=1.011591777x10^{147}$ at MAT and adding wormhole quanta every second from its 'Eternal Void Energy Potential' from Abstraction Space of the MATHIMATIA, aka the Tetragrammaton YHWH=(I AM THAT I AM)! aka the pentagrammaton YHWHY=(I AM THAT AM I)? due to the expansion of the Omniverse from its protoversal seed into Eternity from its reciprocated Nulltime.

The volume of the universe calculates as a function of quantized time and space and as an effect of the frequency quantum of the cosmogenesis defining the wormhole Big Bang singularity.

$V(t) = 6\pi^2 c\int R^2\, dt = 6\pi^2 cR_{Hubble}^2 \int n^2 dt = 6\pi^2 c^3 \int t^2 dt$ for the integration interval from 'Big Bang Time' $t=t_{ps}=1/f_{ps}=f_{ss}$ to expansion time coordinate t=t and for dR=cdt and $R(n)=nR_{Hubble}$ and $n=H_o t$ for $dn/dt=H_o$.

$V(t=t_{ps}) = 2\pi^2 c^3 t_{ps}^3$ for the time quantum t_{ps} as the DETBP wormhole frequency $f_{ps}=\omega_{ps}/2\pi=c/\lambda_{ps}=c/2\pi r_{ps}$

$V(2t_{ps}) = 2\pi^2 c^3 (2t_{ps})^3$ as the first time quantization for the volume of the universe

$V(3t_{ps}) = 2\pi^2 c^3 (3t_{ps})^3$ as the third time quantization and defining the size of the universe for cycle time coordinate $n=H_o(3t_{ps})$ for generalized $n=H_o t$ and $dn/dt=H_o$

$V(nt_{ps}) = 2\pi^2 c^3 (nt_{ps})^3$ as a generalization for expansion time $t=n/H_o$

$V(1) = V(3x10^{30} t_{ps}) = 2\pi^2 c^3 (f_{ps} t_{ps})^3 = 2\pi^2 (\lambda_{ps} f_{ps})^3 = 2\pi^2 (\omega_{ps} r_{ps})^3$ because the light path $c=f_{ps}\lambda_{ps}$ and shows the quantization of the volume and size of the universe as a simple count of the unitary wormholes of frequency $f_{ps}=1/t_{ps}=3x10^{30}$ cycles per second for the universe being 1 second old.

$2\pi^2 \lambda_{ps}^3 = \{8\pi^3\} 2\pi^2 r_{ps}^3 = 16\pi^5 r_{ps}^3$ then defines the number of wormholes at any expansion time t as:
$N_{wormholes}$ = {Lightpath x=ct/wormhole perimeter}^{3} = {wormhole source frequencyxexpansion time}^{3} = $c^3t^3/\lambda_{ps}^3 = \{f_{ps}t\}^3$
Modular string-membrane duality defines: $r_{ps} = \lambda_{ps}/2\pi$ for $r_{ps} = 1/r_{ss} = 2\pi/\lambda_{ps} = 2\pi\lambda_{ss}$ for $\{8\pi^3\} \rightarrow 1$
The expanding universe topologically and geometrically represents a 3D-Surface $V_3 = dV_4/dR = 2\pi^2 R_{Hubble}^3$ from the toroidal Riemann sphere in multidimensional Hyper-Space $V_4 = \frac{1}{2}\pi^2 R^4$.

The increase in wormhole quanta therefore multiplies the 2D reduction of the 3D surface area by lightspeed c to add a 'volume shell' for the volume added and integrated over the time parameters.
$dV/dt=dV/dn.dn/dt = (6\pi^2n^2R_{Hubble}{}^3).(H_o)$ with $H_o=c/R_{Hubble} = \lambda_{ps}.f_{ps}/R_{Hubble}$ for the scale ratio identity for the micro-macro quantization $H_o/f_{ps}=n_{ps}=H_ot_{ps}=\lambda_{ps}/R_{Hubble}$.
For the Quantum Big Bang: $t=t_{ps}$ and so $N_{wormholes} = \{f_{ps}t_{ps}\}^3 = \{f_{ps}/f_{ps}\}^3 = 1$ as the wormhole unit for $V(t_{ps})$ Inflating λ_{ps} to R_{Hubble} and the dimensionally reduced volume $V_3(R) = 2\pi^2R_{Hubble}{}^3$ as the 11D boundary for the 10D asymptotically wormholed protoverse seedling to expand into. The expansion of the universe is both cyclic and asymptotic, reflective in 10D and refractive in 11D.
The 10D open hyperbolic and negatively curved topology describes a 'Seedling Protoverse' which asymptotically approaches but never reaches its 11-dimensional mirror boundary and a boundary which is itself expanding in a particular cyclicity of the wormhole evolution.

A massless 'Strominger Black Hole' oscillates in a 4 Trillion year 'recharge' cyclicity between the micro- and macro quantum self states. This cyclicity is superposed onto the nodal cosmic frequency oscillations of the 'Heartbeat' of the universe at c-invariant lightspeed, one 'heartbeat' taking a full nodal oscillation of the 'Hubble Constant' varying in tandem with the Hubble Oscillation as the R_{Hubble}/wormhole oscillations and as the definition of dimensionless cycletime coordinate $n_{ps}= H_ot_{ps}$.

The n-cycle time evolution of the wormhole radius r_{ps} can then be expressed in $r_{ps}Y^n = R_{Hubble}$ in the wave function of the Twin Bipolaron defined in the Euler identity $XY = X+Y = i^2 = e^{i\pi} = \cos(\pi) + i\sin(\pi) = -1$
Solving for the cycle time number $Y^n = R_{Hubble}/r_{ps}$ gives an asymptotic approach for the 10D dS cosmology to the 11D AdS parallel universal expansion by $n = \ln\{R_{Hubble}/r_{ps}\}/\ln Y = \ln\{2\pi/n_{ps}\}/\ln Y = \ln\{1.003\}/\ln\{1.618\} = 112.83/0.48 = 234.57$

234.57 semi cycles, each of a 16.9 billion year duration, sum to 3.96 trillion years for the stated quantum tunneling of the expanding seedling protoverse into its first multiverse reconfiguration, initiated as the 11D light path reached the asymptotic Hubble event horizon at the odd Hubble node for n=1 about 2.24 billion years ago from the present n-cycle time coordinate $n_{present} = 1.132712711$ and the electromagnetic true age of the encompassing multidimensional cosmology of 19.12 billion years. This scale oscillation differs from the Hubble Oscillation in terms of the Black Hole BH-Schwarzschild metric of the curvature radius $R_{Curv} = 2G_oM_{BH}/c^2$ in the Mass difference between the 11D-Mother Black Hole and a Seedling 'Daughter Black Hole' known as the Sarkar Black Hole of supergalactic gravitational homogeneity, further described in the 'dark energy' and 'dark matter' or 'missing mass' encountered in the cosmologies for a Euclidean flat universe of zero curvature.
In terms of the multidimensional universe, this flatness is the consequence of the hyperbolic asymptotic cosmology being encompassed by a 11D closed spherical-ellipsoidal and positively curved topology of the 'Inflation Mirror,' so producing the overall flatness as a consequence of the toroidal geometry of the Riemannian hypersphere.

An observer at the center of a Horn or Vortex Torus would experience the negatively curved space at the center as a volume $(2pR_{Hubble})(pR_{Hubble}{}^2)$ (Pappus theorem) for a radius r=R, but also experience its encompassment in a sphere of volume with radius r = 2R and so a volume of $4\pi(2R)^3/3$ or $32\pi R^3/3$, being greater than the volume of the observable universe by a factor of $16/3\pi$. The convexity of the encompassing 'omniverse' so cancels the concavity of the lower-dimensional multiverse in phase-shifted universes centered on the protoversal seedling universe parallel in time and not parallel in space as in the proposed 'many-world universes' as multiverses.

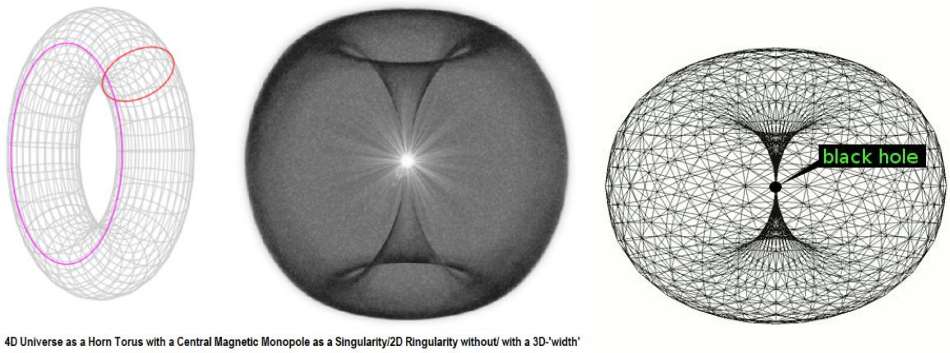


Figure 11: *The Twin Bipolaron Gravitation Center Universe as a Horn Torus with a Central Magnetic Monopole Ringularity*

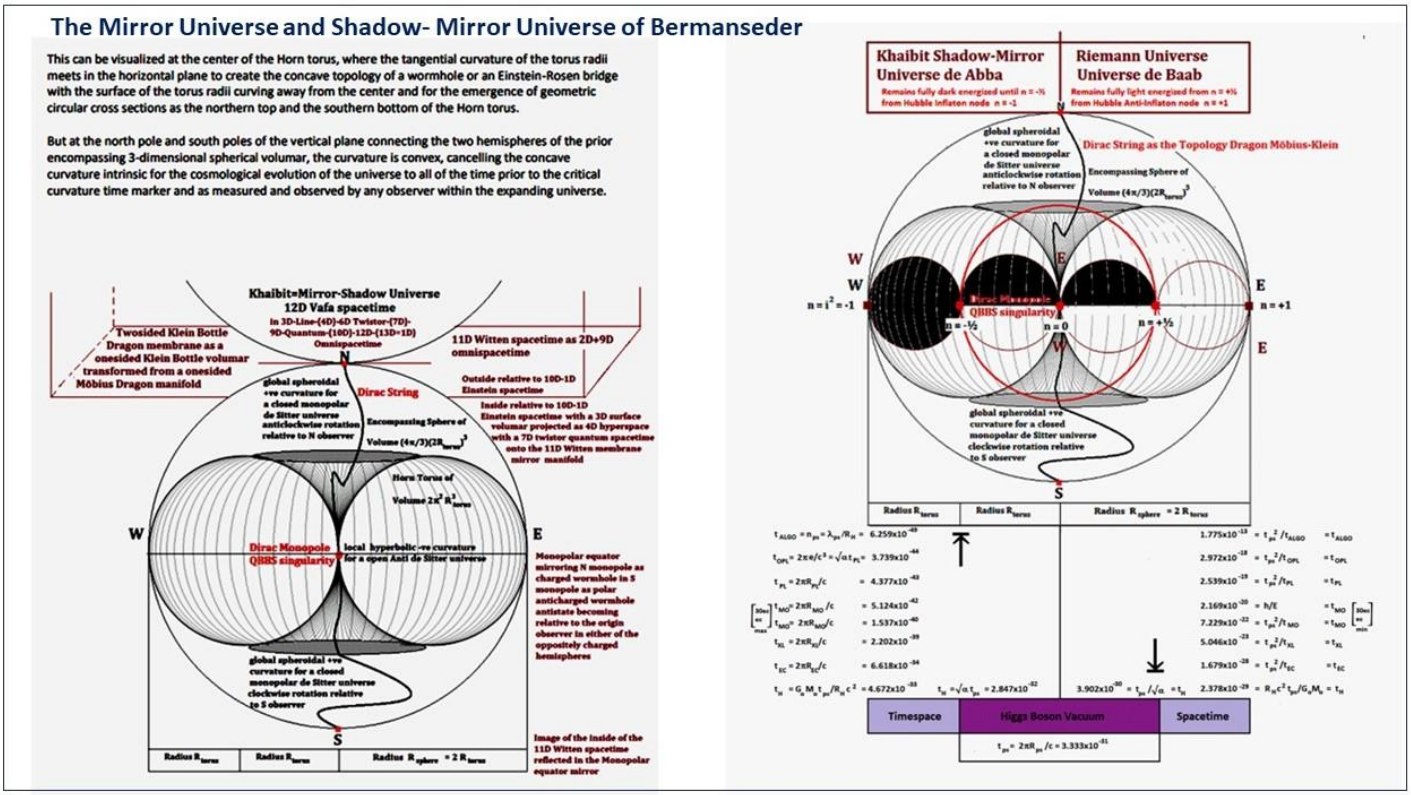


Figure 12: Left: *The Mirror Universe of Tony Bermanseder;* ***Right:*** *the Shadow Mirror Universe, as reported earlier by Tony Bermanseder. The left figure describes the universe as represented in the so-called 'horizon problem' in cosmology. For a uniformly expanding universe, how can opposite horizons (here depicted as West and East) communicate in homogeneity in the invariance and constancy of lightspeed c? The resolution is found in the tachyon inflation manifesting a holographic spacetime 'bubble' in the time instanton, that is the inverse frequency of the Twin Bipolaron. This renders the 'spacetime bubble' as homogeneous from the start, with all physically manifesting parameters in the eastern universe of Light Gravity shadowed and mirrored in the western universe of Dark or Anti-Gravity in a coordinate interval shift from positive [0; +1] to [-½; +½]. The left figure mirrors the right figure but illustrates the onset of dark energy as the forward causal and backward retrocausal intersection of the multidimensional light path emitted from both Hubble nodes simultaneously following the tachyon inflation of the spacetime creation event and triggering the superposition of the n-cycle intervals. The Nullstate TBP wormhole at the even node is imaged in the wormhole at the odd Hubble node, and they meet at the n=½ cycle coordinate after traveling at light speed for 8.45 billion years. The physical parameter evolution in the eastern universe becomes shadow manifested in the western universe in an imaginary time interval for n-cycle coordinates [-1; -½; 0; ½; 1], given in $n=H_o t$ and $-n=-H_o t$ with $dn/dt=H_o$ and by the wormhole quantization of the created spacetime in the minimum TBP configuration (see figure 1A below). The right image also describes the timespace to spacetime transition of the Twin Bipolaron from the Meijer Gravitation center as the midpoint of a Higgs vacuum manifesting the five classes of superstring transformations defining the history of the TBP from its Planck string bounce origin to its wormhole manifestation at the quantum gravitational center TBPGC.*

The de Broglie inflaton phase acceleration is given by $a_{dB}=R_{Hubble}f_{ps}^2$ for the tachyon velocity $v_{dB}=R_{Hubble}f_{ps}$ for the general matter wave speed expression:

V_{phase}=(frequency).(wavelength)=$(mc^2/h).(h/mv_{group})=c^2/v_{group} > c$ for all $v_{group} < c$ using $E=hf=mc^2$ for wave momentum $mv_{group}=h/\lambda=hf/v_{group}$.

For the Quantum Big Bang: $t=t_{ps}$ and so $N_{wormholes} = \{f_{ps}t\}^3 = \{f_{ps}f_{ss}\}^3 = 1$

For 1 second after creation: t=1 and so $N_{wormholes} = \{f_{ps}.1\}^3 = \{f_{ps}\}^3 = 2.7x10^{91}$

For the Hubble Node: $t= 1/H_o$ and so $N_{wormholes} = \{f_{ps}t\}^3=\{f_{ps}/H_o\}^3 = \{f_{ps}R_{Hubble}/c\}^3 = \{R_{Hubble}/\lambda_{ps}\}^3 = 1/n_{ps}^3$

$= \{R_{Hubble}x10^{22}\}^3=4.078x10^{144}$

For MAT-time: $t=n_{MAT}/H_o$ and so $N_{wormholes} = \{f_{ps}t\}^3=\{f_{ps}x1.1327127/H_o\}^3 = 5.92686x10^{144}$

For the present time: $t= n_{present}/H_o$ and so $N_{wormholes} = \{f_{ps}.t\}^3=\{f_{ps}(t_{MAT} + 567,993,600)\}^3 = \{f_{ps}(6.03235588x10^{17})\}^3$

$= 5.9268595x10^{144}$ for $n_{present} = H_o\{t_{MAT} + 567,993,600\} = H_o\{6.0323757564x10^{17} + 567,993,600\} = H_o\{6.032357581x10^{17}\} = 1.809707274x10^{26}/1.59767545x10^{26} = 1.1327127$ and as a time from November 5th, 1996, 00:00+11UCT to November 5th, 2014 00:00+11UCT and as 18 civil years or 6574 civil mean solar days or approximately 6574x24x3600=567,993,600 seconds added to the Mean Alignment Time of the Möbius-Klein Dragonbottle calibration.

The 'Heartbeat' of the 'Mother Black Hole' as the spacetime protoversal seed for the Omniverse is defined in the Hubble Frequency as a 'Outbreath' semicycle to be followed by an 'Inbreath' semicycle, which technically is called the Nodal Hubble's Constant defined by the 'speed of light' divided by the total extent of the Omniverse in 11 dimensions as the 'Hubble Radius' or as $H_o=c/R_{Hubble}=300,000,000/1.59767545x10^{26}=1.87772805x10^{-18}$ cycles per cosmic second.

The volume of the 11D-boundary refractive anti-de Sitter universe at cycletime n is $2\pi^2nR_{Hubble}^3$ and the volume of the 11D-boundary reflective de Sitter universe (intersecting the 10D gravitationally compressed light path of the de Sitter Planck-Einstein thermodynamic expansion cosmology in a return of the 11D monopolar EMR light path) is a function of the scalefactor $R(n)=R_{Hubble}\{n/[n+1]\}$ in the multiverse cyclicity of the TBPGC cosmology. The volumes for the dimensionally separated, albeit parallel, cosmologies so differ in a factor of $n/\{n/[n+1]\}^3=[n+1]^3/n^2$.

$Z = (2\pi R_{Hubble}/\lambda_{ps})^3 = (2\pi/n_{ps})^3 = 1.010x10^{147}$ as the number of bits as wormhole quanta contained in the 11D boundary for the 10D Seedling Protoverse for cycle time n=1 and the nodal Hubble Constant $H_o=c/R_{Hubble}$ and with $n_{ps}=f_{ps}/H_o=\omega_{ps}R_{Hubble}/2\pi c=\lambda_{ps}/R_{Hubble} = 1.003x10^{49}$ as the initializing nodal boundary condition.

$Y = (2\pi f_{ps}t)^3 = 8\pi^3(f_{ps}t)^3 = (\omega_{ps}t)^3 = (n.\omega_{ps}/H_o)^3$ as the number of bits as spacetime quanta for a time $t=n/H_o$, which are added to a light path x=ct as the radial extent of the lightspeed invariant expansion of the universe.

$Y/Z = (n.n_{ps}.\omega_{ps}/2\pi H_o)^3 = (n.f_{ps}\lambda_{ps}/H_oR_{Hubble})^3 = (n.c/c)^3 = n^3$ as the fraction or proportionality of the 11D Omniverse relative to its seedling protoverse boundary and for angular frequency $\omega=2\pi f$.

$X = (\text{Lightpath}.t^2/\text{11D Boundary})Z = (ct.t^2/R_{Hubble})Z = (H_o.t^3)Z = (n^3/H_o^2).(8\pi^3/n_{ps}^3) = (2\pi.n/n_{ps})^3/H_o^2$ in units t^2

$Y/X = \{n.\omega_{ps}/H_o\}^3.\{n_{ps}/(2\pi.n)\}^3.H_o^2 = \{f_{ps}.n_{ps}/H_o\}^3.H_o^2 = \{c/(R_{Hubble}.H_o)\}^3.H_o^2 = H_o^2 = 2G_oM_{critical}/R_{Hubble}^3$ in units $f^2=1/t^2$

After one second into the TBPGC cosmology, the universe's volume of $V(n=H_ot)=2\pi^2n^3R_{Hubble}^3 = 2\pi^2c^3 = 5.33x10^{26}$ m^3 containing $2\pi^2c^3/2\pi^2r_{ps}^3 = \omega_{ps}^3 = Y = 6.697x10^{93}$ wormhole quanta as bits of information as frequency permutation eigenstates.

For the nodal 11D volumar at n=1 and asymptotically attained by the 10D volumar for n at 234-235 Hubble semicycles, $t=1/H_o=5.33x10^{17}$ seconds for $c^3/H_o^3r_{ps}^3 = (R_{Hubble}/r_{ps})^3 = (2\pi R_{Hubble}/\lambda_{ps})^3 = (2\pi/n_{ps})^3 = Z$ as a saturation bound for the wormhole integration.

Every subsequent second, therefore, adds $Y = 6.697x10^{93}$ wormhole quanta as self-referential energy eigenstates to the refractively expanding anti-de Sitter universe as the number of activated spacetime quanta with $1/H_o=R_{Hubble}/c$ the Hubble-Time as frequency for the universal Hubble-Oscillation in dimensionless cycle times $n=H_ot$ and $dn/dt=H_o$. This amounts to about $2\pi^2r_{ps}^3Y = 5.33x10^{26}$ m^3 of 'new volume' every second for the present time coordinate of $n_{present}=1.1327127$ for the universe's HB-boundary volume of about $8.07x10^{79}$ m^3 for comparison in lightpath $x^3=(ct)^3$.

A quantized universal volumar of $V(n=H_ot)=2\pi^2c^3t^3$ with time derivative $dV(n=H_ot)/dt=6\pi^2c^3t^2$ then becomes defined as a summation of wormhole quanta originating in the Twin Bipolaron Gravitational Center TBPGC.

The refracted expansion of the 11D light path so adds wormhole quanta every second after the Anti-de Sitter light path intersects the odd minimized Hubble node boundary, 16.9 billion years following the superluminal creation event.

This also activates $VPE_{ps}Y = E_{ps}.Y/V_{ps} = Y/e^*V_{ps} = 4\pi YE_{ps}/\lambda_{ps}^3 = 1.679x10^{158}$ Joules per cubic meter of source-sink energy flux every second under the guiding parameter of the LightMatrix of c-invariance for the Vortex Potential Energy density VPE-source energy quantum:

$VPE_{ps} = E_{ps}/V_{ps} = E_{ps}/2\pi^2r_{ps}^3 = 4\pi E_{ps}/\lambda_{ps}^3 = 4\pi/e^*\lambda_{ps}^3 = 2.513x10^{64}$ Joules/m^3 per wormhole quantum.

This source-sink energy is distributed across the surface boundary of the event horizon, comprising the entire universe in a NewSpace creation of potential information.

So, as John Archibald Wheeler first proposed (Jacob Bekenstein dedicated the referenced paper to John Wheeler) in the 1970's:

"Information is the basic ingredient and constituent of the universe!"

This source-sink energy represents the manifested vacuum or zero-point energy of the $E_{ps}E_{ss}$ supermembrane as the modular dual Black Body/White Body radiator/absorber of the Meijer Twin Bipolaron. This is termed VPE, or Vortex-Potential Energy, in Quantum Relativity QR.
This is rather different to the manifested and realized information of the holographic 10D universe however.

After 1 second into the birth of the universe, the Potential Information Content is on the order of 1.9x10129 Bits; but the 10D universe has expanded for a radial light path of c=300,000 km and a 3D-Volume as a 3D-surface boundary of a 4D-Volume of $5.33x10^{26}$ cubic meters or $Y = 8\pi^3c^3/\lambda_{ps}^3 = (2\pi f_{ps})^3 = \omega_{ps}^3 \sim 6.70x10^{93}$ spacetime quanta as the cube of the angular velocity as the source-eigen quantum state.

The ratio of the Y/X spacetime quanta counters is, however, precisely given as the Schwarzschild solution for the demetricated form of Einstein's GR field equations in the Curvature Radius:
$R_{Curv} = R_{Hubble} = 2G_oM_{critical}/c^2$ for a critical density $\rho_{critical} = M_{critical}/2\pi^2R_{Hubble}^3 = c^2/4\pi^2G_oR_{Hubble}^2 = H_o^2/4\pi^2G_o$:

$$\mathbf{Y/X = H_o^2 = 4\pi^2G_o\rho_{critical} = 2G_oM_{critical}/R_{Hubble}^3 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots [Eq.\#4]}$$

Since H_o represents the universe's eigenfrequency, the 11D spacetime quanta creation must relate to the oscillatory cyclicity of the defining M-space intersecting the C-space one dimension lower and in the 10D/4D Riemannian hypersphere with the Calabi-Yau manifold of toroidal derivative.

8. SpaceTime Creation and a Definition for the Fundamental Demetricated Scalefactor of QR

The demetricated form for the scale factor in GR is a function of cycle time n and describes the asymptotic expansion of the 10D-Universe as a consequence of algorithmic definitions and relates to the definition for the transcendental masternumber of the natural exponent 'e'.

QR derives this in the following manner.

The Cosmic Wavefunction is the following differential equation:
$dB/dT + \alpha B(n) = 0$; α is the electromagnetic fine structure constant, representing the probability of light-matter interaction (~1/137). This has a solution: $B(n) = B_o.\exp[-\alpha .T(n)]$; $B_o = 2e/hA$ from QR boundary conditions defining: $T(n)=n(n+1)$ as the Feynman path summation of particular histories under the pentagonal supersymmetry given in the Euler identity:

$XY = X+Y = -1 = i^2 = \exp[i\pi] = \cos(\pi) + i\sin(\pi)$ and $\lim[n \rightarrow X]\{T(n)\} = 1$

This allows the normalization of the $]\Psi]^2$ wavefunction to sum to unity in $B(n)=(2e/hA).\exp[-\alpha .n(n+1)]$ with functional Riemann bound FRB=-½, centered on the interval [Y,...-1,...-X,...-½,...(X-1),...0,...X].

Interval [Y,-1] sets F-Space; interval [-1,0] sets M-Space with uncertainty interval [-X,(X-1)] and interval [0,n) sets the C- Space, encompassing Omni-Space.

n<0 is imaginary as a real reflection of real n>0 of the C-Space, metrically defined at the coordinate n=0 mapping $n=n_{ps}$, which is the instanton $t_{ps}=f_{ss}=1/f_{ps}$.

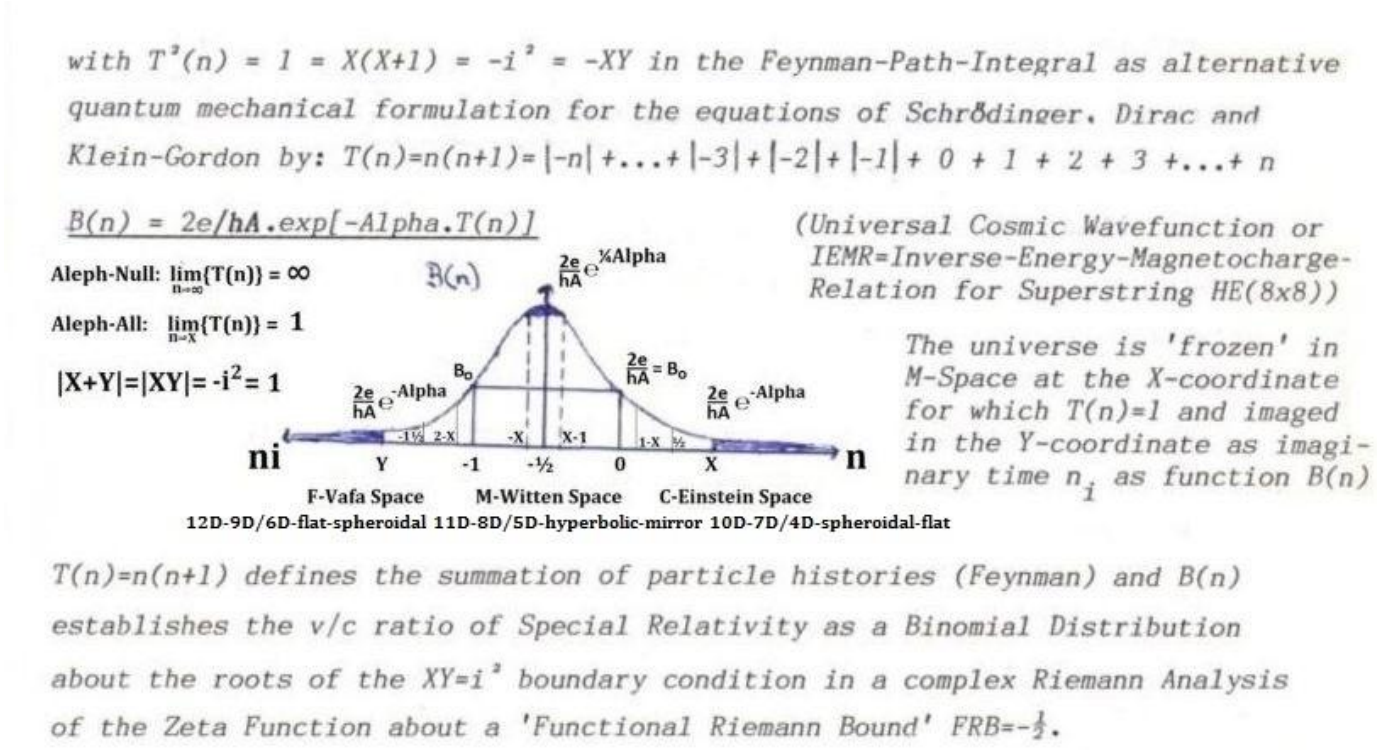


***Figure 13**: The wave function of the Meijer Twin Bipolaron as derived from the Fibonacci patterns of a pentagonal Penrose supersymmetry, the Phi ratios, and the Euler identity.*

Cycletime n is defined in GR as dimensionless Tau(τ)-Time in curvature radius R_{Curv}=c.dt/dτ for the path length of x=ct and becomes dn/dt=H_o, n=H_ot in QR, with H_o the nodal Hubble Constant defined in c=H_oR_{max}=λ_{ps} .f_{ps}

The Feynman path so sums both negative and positive integers as: -n.....-3...-2...-1...0...1...2...3.....n =T(n) in absolute value to double the infinities as the entropy reversal of lightpath x=c.t =(-c)(-t) in the Möbius Property of the 4 worlds as outlined in the 13 dimensions of the time connectors.

Cantor Cardinality Aleph-Null is thus unitized in Aleph-All, counting infinities as if they were integers of the Feynman Path. This allows the Feynman interpretation of quantum mechanics as an alternative to the formulations of Schrödinger (fermionic 1/2 spin) and Klein-Gordon (bosonic integral spin) as time-independent and time-dependent (the free particle form is inconsistent with special relativity in Schrödinger in 1st order t & 2nd order x), formulations respectively.

The units of B(n) are 1/J, that is, inverse energy, with A^2 an algorithmic constant defining current-squared and 2e/h the Josephson constant Amperes/Joules.

B(n) as the universal cosmic wavefunction describes the universe as a potentially infinite collection of 'frozen' wormhole eigenstates at n=0.
The time instanton 'unfreezes' one such eigenstate and activates the protoverse as described elsewhere in this message cluster.
This then allows the 'Mappings' of the C-Space 'realtime n>0' from the F-Space of the 'imaginary time n<-1' under the utility of the M-Space interval as 'mirror-space'.

QR unifies electromagnetic and gravitational fine structures in F-Space using the Planck-Length-Oscillation $l_p\sqrt{\alpha}=e/c^2$ from the subplenum definition as the *'Bounce of the Planck-Length'*.

This yields the decisive mapping for the B(n):

Coulomb Charge $e = l_p\sqrt{\alpha}.c^2 \longleftrightarrow 2R_e.c^2 = e^*$ (Star Coulomb Charge)..... [Eq.#5]

But the Star Coulomb is inverse energy by definition of the vibratory part of the modular dual heterotic supermembrane HE(8x8)=$E_{ps}E_{ss}$.

$$\mathbf{E_{ps}=hf_{ps}=hc/\lambda_{ps}=(m_e/2e).\sqrt{[2\pi G_o/\alpha hc]}=m_e/\{2em_P\sqrt{\alpha}\}=1/e^*..... [Eq.\#6]}$$

m_P is the Planck Mass and G_o is the initiatory gravitational constant, defined in the Fine Structure Relation, which defines the Planck-length oscillation in the unification of electromagnetic interactions with those of gravitational permittivity:

$G_o=4\pi\varepsilon_o=1/30c$ with dimensionless c-ether constant $[c]_{unified}$.

This defines the MacArthur Gamma as: "Light Mass Constant" LMC=γ_{Mac} =$30[c]_{unified}$.

Thus, Quantum Relativity is defined in the charge mappings between the Omni-Space dimensions; F maps magnetocharges e* onto electrocharges e under the agency of the 11D-Witten mirror, which is a Onesided Surface Möbian connecting 10D to 12D.
The all-encompassing source energy quantum is the E_{ps}-gauge boson, which manifests as the gauge mediator for the four elemental interactions, suppressing the weak interaction in a primary triplicity; however, it allows the Higgs rest mass induction mechanism to proceed in the defining qualities of the unified field of Quantum Relativity (UFoQR).

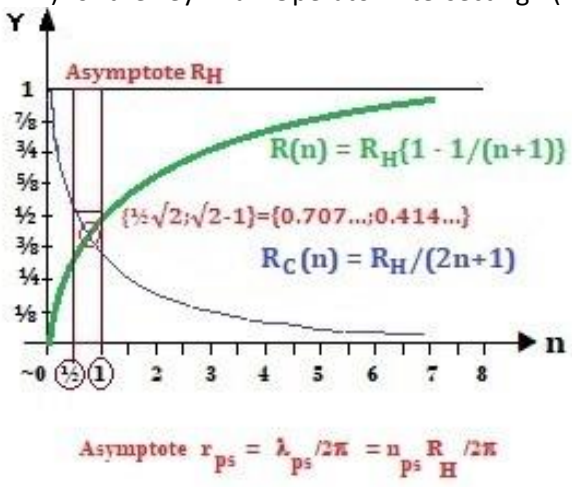
Now $T(n) = n(n+1) = n^2+n$, with the first derivative $dT/dn=2n+1$ and it defines a radius of curvature as $R(n) = dT/dn$.
Set $T(n) = R_{max}^2 - R^2(n)$ for the radius of curvature R(n), bounded in R_{max}.

Represent the Feynman operator $dT/dn=R_{max}/R(n)$ as the differential for the asymptotic approach and write $T(n) = \{R_{max}+ R(n)\}.\{R_{max}- R(n)\} = 1 = (n+½)^2 - (¼)$.

Hence, $R_{max}=[n+½]$ and $R(n)=[½]$ for the identity $[R_{max}+ R(n)]/[R_{max}- R(n)] = [n+1]/[n] = [1+1/n]$.

Since $R_{max}/R(n) = dT/dn = 2n+1$; we can choose the Feynman-Operator to equal the curvature differential in the expression $R_{max}^2 - R^2(n) = 2R_{max}R(n) = 1$ which introduces the modular duality in $R_{max}=1/R(n)$ in the demetricated scale factor R(n).

Subsequently, $2n+1=1+1/n$ identifies $2n^2-1=0$ and the modular curvature radius
$R_{Curv} = R_{max}/(2n+1)$ for the Feynman-Operator intersecting R(n) at the n-coordinate $n=½\sqrt{2}$ with $R_{Curv}=(\sqrt{2}-1)R_{max}$



$R(n) = ½ R_H$ for n=1 ⇨ R_H for n→∞

Onset of Dark Energy for nodal completion of electromagnetic universe n=1 $H_O = c/R_H$

$R_C(n) = ½R_H$ for n=½ ⇨ 0 for n→∞

$$R_C(n) = cdt/dn.dn/dT = (c/H_o)(1/(2n+1))$$
$$T(n) = n(n+1) = n^2+ n$$
$$T'(n) = dT(n)/dn = 2n+1$$
$$dT(n,t)/dt = T'(t) = T'(n).dn/dt = H_O\{2n+1\}$$

Figure 14: *The onset of Dark Energy at n=½ in the Baryon-Dark Matter intersection for n=√2 in interval nε[-½; +½]*

$R_{max}/R(n) = [1+1/n]$ then becomes $\lim[n\to\infty]\{R_{max}/R(n)\}^n$ = exponent "e" and defines the demetricated scale factor in:
$R(n) = R_{max}\{n/[n+1]\} = R_{max}\{1-1/[n+1]\}$.

The natural exponent e is defined in the inversion of scale parameter 1/a = {1+1/n}

$e = \lim_{n\to\infty} \{1+1/n\}^n$ **for** $e = \{1+1/n\}$ **for x=1=hf/kT in Planck's Radiation Law for a Black Body**

$$\lim_{n\to\infty}\{R_H/R(n)\} = \lim_{n\to\infty}\{1+1/n\} = 1 \qquad e^{\frac{hf}{kT}} = 1+\frac{1}{n} \text{ for } n(f,T) = \frac{1}{e^{hf/kT}-1}$$

A further consequence is the simulation of exp[hf/kT]=1+1/n in the bosonic and fermionic statistics of Planck, Maxwell, Boltzmann, Bose, and Einstein via the gamma and zeta functions in the black body spectra describing the temperature evolution for the universe.

We now understand how the 10D-Universe expands asymptotically under the demetricated form for Einstein's Curvature Radius R_{Curv}=c.dt/dn, with n as a dimensionless cycle time defined in the nodal Hubble Constant H_o=dn/dt as the universe's self-frequency for the Hubble Oscillation in 11D-M-space.

The demetricated velocity differential is $v(n)=c/[n+1]^2$ and the demetricated deceleration differential becomes $a(n)=-2cH_o/[n+1]^3$ (Milgröm Parameter and defining the asymptotic deceleration as the overall deceleration of C-Space modified by a gravitational Omega and a quintessential Lambda).

The Omega and the Milgröm Parameter are always negative, while the Lambda evolves from an antigravitational de Broglie phase state to reach its asymptotic gravitational vanishing value after three zero states defined by the Temperature/cosmological redshift evolution of the cosmos (the first root being at redshift 2.15).
The so-called "cosmological constant" in Einstein's Field equations is thus the intrinsic Milgröm acceleration differential between the Omega and the Milgröm Parameter.

But the "Volume" for the 10D-C-Space grows in the factor $2\pi^2R^3(n)$, while the 11D-M-Space grows in the factor $n.2\pi^2.R_{max}^3$ for a DIM-Factor of $V_{10D}/V_{11D}=[n+1]^3/n^2$.

This calculates for the present epoch as DIM=7.56… and infers that the M-Space volume of the universe is greater than the gravitationally decelerating and compressed C-Space volume by a factor of 7.56 for the present cycle time coordinate $n_{present}$.

The acceleration for the expanding curvature radius becomes the Milgröm acceleration a_{mil} invoked to explain the dark matter factor in Milgröm's Modified-Newtonian-Dynamics or MOND model and in Verlinde's Emergent Gravity from Quantum Information models.

$a_{mil} = d(c/[n+1]^2)/dt = -2cH_o/[n+1]^3 = -2c^2/R_H[n+1]^3$ [m/s²]*

Baryon matter, dark matter, and dark energy distribution in $\Omega_{BM} + \Omega_{DM} + \Omega_{DE} = 1 = \Omega_o f(n) + \Omega_{DE}$
$\Omega_{DE} < 0$ for $n<n_{DE=0}$ and $\Omega_{DE} = 0$ for $n=n_{DE=0}$ and $\Omega_{DE} > 0$ for $n>n_{DE=0}$

The density ratio $\rho_{BMUDM}/\rho_{critical} = M_oY^nR_H^3/M_HR_H^3(n/[n+1])^3 = \Omega_oY^n\{1+1/n\}^3 = \Omega_of(n) = \Omega_{BM}\{1+1/n\}^3$
$\rho_{BMUDM}/\rho_{critical} + \Omega_{DE} = 1 = \Omega_of(n) + \Omega_{DE} = \Omega_{BM}\{1+1/n\}^3 + \Omega_{DE}$

For $\Omega_{DM} = \Omega_{BM}\{(1 + 1/n)^3 - 1\} = \Omega_o(1.618033)^{1.132712}\{5.67480\} = \{0.048344\}\{5.67480\} = 0.274344$ and
$\Omega_{DE} = 1 - \Omega_{DM} - \Omega_{BM} = 1 - \Omega_{BM}\{(1+1/n)^3\} = 1 - 0.048344\{6.67480\} = 0.677313$ for the present time

$\Omega_{BM} = 0.048344$ with $\Omega_{DM} = 0.274344$ with $\Omega_{DE} = 0.677313$

For $n<n_{DE=0}$ the quintessential DE fraction is negative and subtracted from the dark matter fraction.

The dark energy DE onset is a correlation between the scale factors
$a(n=½) = R(n, t)/R_H = n/[n+1] = ⅓$

Scalefactor a(n=1) = R(n, t)/R_H = n/[n+1] = ½ then synchronizes the intersection interval between the closed compressed dS spacetime and the uncompressed open AdS spacetime in the intersecting twinned universe in the interval [-½|0|+½] as imaged half cycles as a full cycle [0+n_{ps},+1] imaged in [-1, 0-n_{ps}].

For the DE to be 0 the density ratio $r_{BMUDM}/r_{critical}$ = 1 describing the Sarkar mass seedling M_o to increase quintessentially by the BM-DM intersection, saturated at n=√2 for constant Ω_{BM} to the closure value $M_{critical}$ as Ω_o=1 for 10D-expansion=(n/[n+1]) = (2-n)=11D-expansion for $2n+2-n^2-n = n$ and $n_{BM\cap DM} = n_{saturation} = \sqrt{2}$

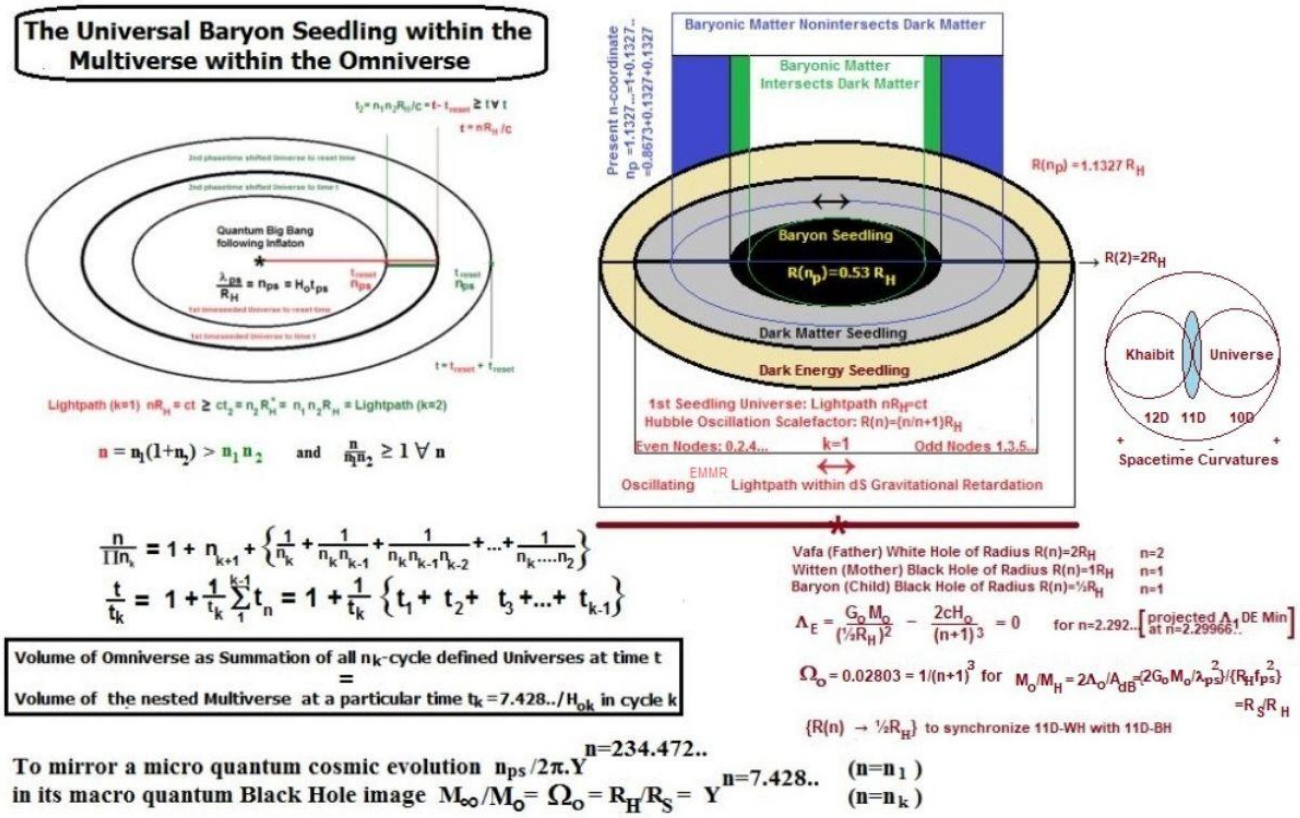


Figure 15: *A tripartite nesting of baryonic and dark matter bounded by a dark energy sector in a multidimensional cosmology.*

The baryonic inertial mass-seedling of the deceleration parameter of 2.81% of the critical mass-seedling $M_o/2M_{critical}$ has "evolved" to about 4.83% in a coupling to the gravitational constant evolution from its "massless-permittivity" initialization of G_o.

The density ratio $\rho_{BMUDM}/\rho_{critical} = M_oY^nR_H^3/M_HR_H^3(n/[n+1])^3 = \Omega_oY^n\{1+1/n\}^3 = \Omega_of(n) = \Omega_{BM}\{1+1/n\}^3$ = 4.83% +27.43% = 32.27% so represents the total manifested universal mass in 11-dimensional M-Space by the addition of the dark matter fraction the to the baryonic mass seedling M_o as 2.81% of the critical Hubble event horizon defined Mother Black Hole of the AdS-CFT correspondence in the Twin Bipolaron Gravitation Center TBPGC.

The Milgröm parameter suffices to account for the galactic rotation curves, seemingly violating Newtonian Gravitation in the necessity for 'dark matter haloes' of gravitating but nonluminous mass distributions.

We recall that the critical mass-seedling (of about $6.4x10^{52}$ kg) gives the Euclidean flat curvature superimposed onto the hyperbolic 10D-Space of diminished mass content in rest mass-seedling M_o of about $1.81x10^{51}$ kg, which has now grown to $2.38x10^{51}$ kg.
The creation of spacetime quanta occurs in the 11D-M-Space not reflected back into the lower-dimensional.
10D-C-Space is the Omni-Space mapping of the Line-Space described previously.

We have already calculated that Y = $6.697x10^{93}$ wormhole spacetime quanta are added every second to the outer boundary of the universe as the refracted part of the Hubble-Oscillation.
An infinitely expanding hypersphere would, however, violate the holographic bound set in black hole parameters for the information content described by the black hole's surface area, quantized in Planck Areas.

Yet, we also know that the Black Hole Event Horizon is limited by the M-Space as the asymptotic boundary for the C- Space to 'expand into.
This is, of course, QR's HB-Bound $Z \sim 10^{147}$ Bits, which itself sets the parameters for the continuous creation of the spacetime quanta.
The resolution and consequence henceforth is the modular duality and interconnectedness of Omni-Space.
The "growth" of the 11-dimensional form of the hypersphere continues unimpeded, with the boundary conditions for the HB satisfied in its 10-dimensional hologram of the C-Space, always bounded in the steady state of the Hubble-Oscillation.

However, what is defined as the 10D-hypersphere is developing new degrees of freedom based on the multidimensional properties of translational Line-Space, rotational Hyper-Space, vibrational Quantum-Space, and quantizational Omni-Space. This results in the major axis invariance of the prolate ellipsoid describing the encompassed hypersphere to engage in phase shifts to define the multiverse from the protoversal universe.

A prolate ellipsoid becomes an oblate ellipsoid under minor axis rotation, as the previously fixed focus points of the elliptical cross-section are forced to move as the locus of a point-circle.
The angular displacements for the minor axis rotating protoversal universe then define an infinite number of potential universes, with a minimum of two such phase shifts defining a multiverse.

The sum total of all possible phase-shifted multiverses then constitutes the omniverse; as the refraction part of the 11- dimensional Hyperspherehypersphere adds information at the rate of the QR HB in Z.
Thus, all boundary conditions are satisfied within the omniverse as the evolved universe, understood and constructed by the sentience responsible for the cosmogenesis herein described in co-creativity.
The great fallacy in the standard cosmology in regard to the expansion of the universe is the assumption of a 'continuing stretching of the basic spacetime metric.'

The Euclidean universe of observation and measurement is flat and has zero curvature because there was just the one 'stretching' of space in the inflation of the de Broglie hyperacceleration, often termed the inflaton-instanton of time instantaneity.
There exists so no ever-receding Hubble-Horizon, with particular galaxies receding 'out of view' and similar consequences of a continuing 'stretching of the basic metric'.

9) The Quantum-Holographic Transformation of the Earth.

When the Universe was born from its subplenar (infinite) void to reflect this void in the physical plenum reality of spacetimematter, a particular 'point of origin' became necessitated to mirror the 'voidal vortex' of the subplenum in the then reality of a metric plenum.
This part of the agenda shall then show that the planet Earth can be metrically defined to represent this 'mapping of the void'; the Earth thus becoming enabled to relate the entire information content (including all inertial systems and spacetime coordinates) of the universe to itself and all 'sentient civilizations' within it.

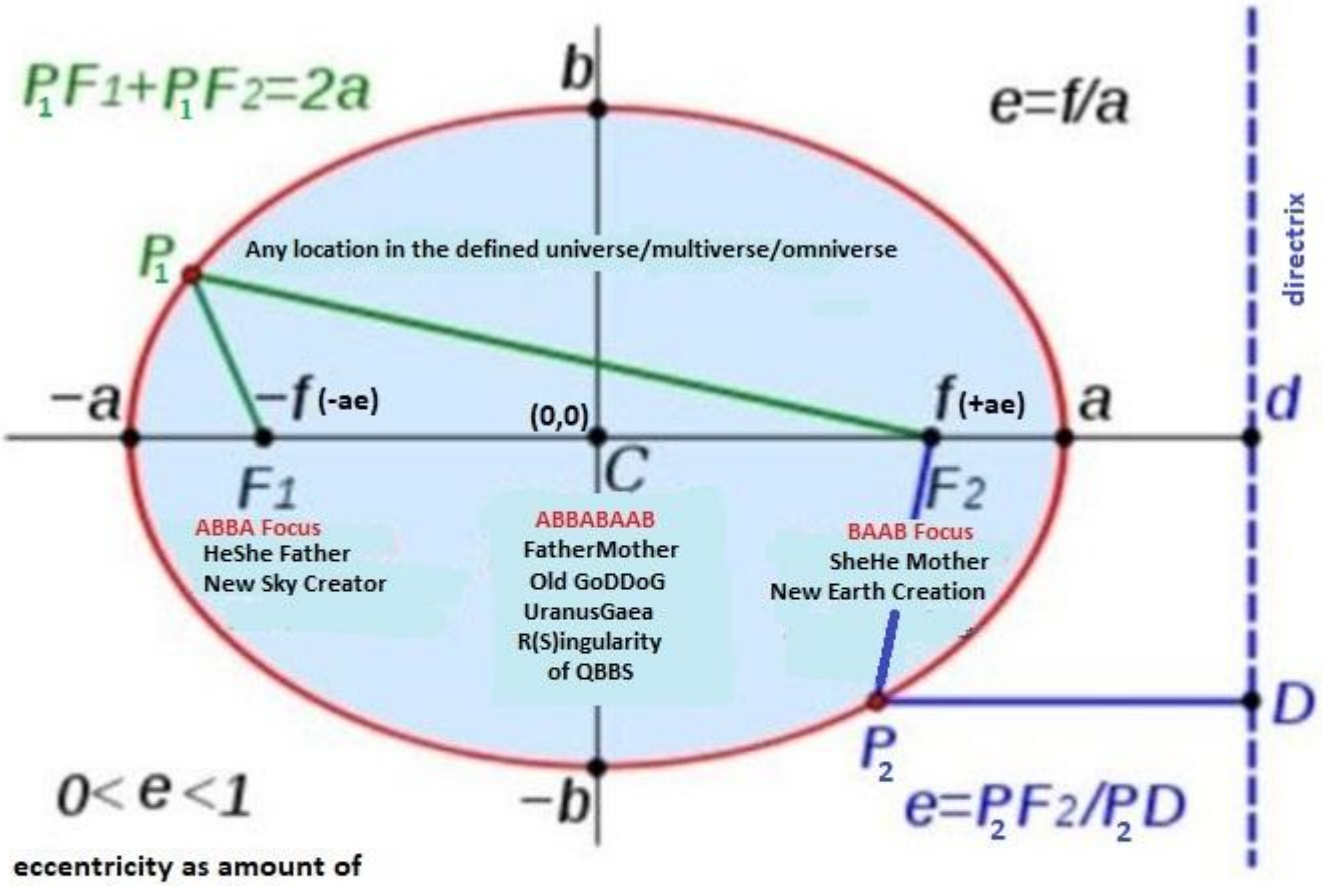
This 'voidal vortex' is like the nonphysicality or abstraction of a 'mathematical point' becoming 'physicalized' in a 2- dimensional manifold or surface as a physicalized 'area' dimension, thus allowing 'measurement' in some unit for displacement.
The conceptual infinity of the subplenum (Void=Nothing =Everything) so either doubles or halves itself to enable the Unity operator to emerge from the Void.
Geometrically, this is simply the dimensional generator of the Null Dimension as the 'Point' mapping itself as 'Double Point,' yet being the original 'Point' by mathematical induction.

The 1st dimension so emerges as the arbitrary manner this 'double point' can align itself, thus defining the minimum displacement between the two points. Physically, this becomes the Planck length, operated on by a dimensional generator, and the 'energization' of the Planck length is known as a (open) type I Planck-superstring, radius of the Planck Length $L_P=\sqrt{(hG_o/2\pi c^3)}$.
This Planck radius then forms into a (closed) type I Planck membrane or Planck circle, forming a Planck loop of Planck Energy $E_P=hc/2\pi L_P=\sqrt{(hc^5/2\pi G_o)}$.
The mass of this Planck-Loop is the Planck Mass $m_P=E_P/c^2=\sqrt{(hc/2\pi G_o)}=L_Pc^2/G_o$. As the Planck minimum energy must be 'halved' for the void unity mapping, a physical description for the latter becomes necessary.

This description engages the labellings of Gravitational Potential Energy for the 'point mass' and its coupling to the 'bridge' (or wormhole) between the subplenum and the plenum. This is known as the Planck-Oscillator of the zero point of energy $E^o=hc/4\pi L_P=h\omega/4\pi=½hfP=½h/t_P=½m_Pc^2$.
This minimized Planck-Oscillator energy is also the minimized Gravitational Potential Energy in $E_{GPE}=G_omm_P/L_P$ from the gravitational acceleration per 'point mass m': $ma_g=G_omm_P/L_P$.

Therefore, $E_{GPE}=G_omm_P/L_P=E^o=½m_Pc^2$ for $L_P=2G_om/c^2$ and which represents the basic minimum Schwarzschild metric for the solution of the 'field equations' in general relativity, representing the interaction between spacetime curvature and the inertia content in a local 'neighborhood of point masses' in the universe. The geometric mapping of the 'point' onto itself can now be constructed in physical form. The 'voidal vortex' becomes simply the minimum Schwarzschild metric defined in the Planck-String Oscillator and so represents a 'Black Hole' or a 'Voidal Vortex' in superstring/membrane (Planckian) parameters.

Geometrically then, the 'point mass' is rendered physical in the 'Planck area', either as a 'Planck square' with a side the
'Planck length' L_P) or a Planck-Circle of area πL_P^2. The 'bridging' wormhole between the plenum of the Planck parameters and the subplenum of the original Nothing =Infinity void then becomes the topological deformation of the Planck-Circle into a Planck-Ellipse with a corresponding displacement of the singularity focus (the center) of the circle into two foci for the Planck-Ellipse.
Having two foci, defined in the geometrical definition of an ellipse as an "eccentric circle," allows the two foci to communicate with each other in a precise geometrical relationship. The locus of an ellipse is defined in any point P on the ellipse joined to both of the two foci, with a constant summation of the individual displacement vectors from the focus points to the point P on the elliptical locus. Rotation of such an ellipse about its major (longer) axis will then give the ellipsoidal volumar, minimized as a ellipsoidal or spheroidal (actually toroidal) Planckian volume in 3 dimensions.



eccentricity as amount of flattening of a circle
e=0 for a circle centre (0,0)
e=1 for a line |-a|+|+a| = 2a

The communication between Abba♂ and Baab♀ within all inhabitants of the omniverse proceeds via the holographic universe mapping of the information onto the inner surface of the boundary of the universe/multiverse/omniverse. For a 0 eccentricity, the communication converges at the centre of the circle as the merger of the two foci as the constant 2a=2b as the radius of the circle of creation.

As the universe (in spacetime) is defined in a summation of the minimum Planck-area counts and so the Planckian loops, a simple deformation of the Planck-area unit into a two-focal ellipsoidal volumar will so allow a higher-dimensional 'fractally discrete' continuum to connect any two such discretized locations within the universe via this bifocalized 'holofractal' quantum geometry.
The intelligence or logos, which transformed (some of) the abstract 'energy' of the subplenum into an infinite 'reservoir' of 'sourcesink energy' into a finite thermodynamic energy (as defined in the Laws of Nature and the Conservation Laws), established the distribution of this materialized energy; first as kinematic-thermodynamic gravitational non-inertial mass in a hitherto massless cosmos {$E=\Sigma hf$} and secondly as inertial electromagnetic mass {$E=\Sigma mc^2$} in a first principle of the Einsteinian 'Principle of Equivalence'.

When the universe of the plenum emerged from the subplenum about 19.12 billion (civil) years ago, this bifocalization became established and assigned an axial direction to the subsequent cosmological evolution, albeit relative to the manifestation of the focalizations on the major ellipsoidal axis.
After the universe had attained an expansion speed of so 29.3% of light speed, 14.3 billion years after the Big Bang (or so 4.8 billion years ago) ; the cosmological 'birth of the Earth' from the solar nebula materialized the 'Universal Focus Point' on an arbitrary major axis of the spheroidal universe and specified the physics of the ‘evolution of the planetary focus’ relative to the rest of the universe.

This focal evolution 'inverts' the cosmic expansion in 11 dimensions in a cosmology that is purely electromagnetic in a supermembrane-mirror function of the original non-inertial cosmos of the gravitational or photonic mass equivalence. (It is the lower-dimensional "string" evolution that is asymptotic in the inertial mass, itself transformed from the gravitational mass in 10 dimensions). For an electromagnetic age of the universe of t_u=19.12 billion years, the inverted lightspeed 1/c defines the '11- dimensional' envelope of the Earth as the 'Universal Focal Point'.

The Inversion-Lightpath X inverse=$(1/c)t_u$ for a 'Displacement-Radius' for the Earth of about 2.01 million kilometers and for a yearly increase of this radius by 105 millimeters.
Therefore, even when the planet Earth did not exist in physicality, its 'Sphere of Inversion' existed as a focalization and a 'radial size' of 1.50 million kilometers.

The Mass of the Earth is about $M_{Earth}=6x10^{24}$ kg and this is identical to an 11-dimensional black hole with Schwarzschild-Radius: $R_{SEarth}=2G_oM_{Earth}/c^2$~15 millimeters.
The 11-dimensional supermembrane around this Earth- Singularity is at a location in the local solar system, about 5% to the planet Venus, and so encompasses the Moon at 384,000 kilometers for the 2 million kilometers.

The master timeline then defines the nexus when the 11-dimensional black hole at the center of the planetary Earth literally 'turns inside out' to form a 11-dimensional white hole. The trigger for this Möbian transformation of the planetary core will be a 'light signal' sent from the galactic center (Hunab Ku in Mayan cosmology) precisely 65 baktuns from the Mayan end date on December 21st, 2012 and so 65x144,000=9,360,000 kin or days ago in the (civil) year 23,615 BC.

This signal from the galactic center is itself a 'wormhole' quanta as a minimum 'Planck-volumar' and also as a 'Consciousness-Quantum,' so its interaction with the Earth-core quantum will allow the sink nature of the black hole equivalent to transform into a source nature or white hole equivalent.
The 'New Earth' will so become a cosmic emitter, broadcasting its 'absorbed' information, collected throughout its 4.8 billion-year evolution in a form of Hawking radiation and traveling at light speed from the planetary core.

The 'absorbed' black hole information of the 'Old Earth' so will thus become a 'New Context' for the rest of the universe; it then enabled to 'Witness' of the (often horrendous and sometimes magnificent) planetary evolution of the data collectors upon the planet Earth, inclusive of all life forms.
Further technical information will be published at a later date in the master timeline.

September 1st, 2009 - Elijah Malachi

10) Why Black Holes Preceded Galaxies in the Cosmology

The symbiotic relationship between black holes and galaxies in the standard models of astrophysics and cosmology has been known for decades. Yet the particular order of this partnership had to await improved technological equipment to enable a more detailed examination and analysis of the Super-Massive Black Holes (SMBHs) known to reside at the center of basically all galaxies on whatever scale. It has become standard knowledge that black holes had to come first, somehow seeding subsequently evolving galaxies as vortex energy concentrations.

What is presently not understood is why black holes preceded galaxies. As black holes must necessarily represent systems of maximized entropy, the paradox arises: how a exquisitely low entropy state of the Quantum Big Bang could manifest maximized systems of information disorder in black holes and entropic systems, which would then evolve into galactic systems of higher self-order.
Entropy, or the natural dispersion tendency of material systems, such as a gas or a random particle distribution, is either described as a thermodynamic entropic system or as a system of Shannon information. The thermodynamic system is modeled on the number of permutations say a stochastic particle distribution can accommodate, while Shannon information describes this integral of eigenstates as a summation of bits.
The solution is found in the nature of the Big Bang boundary condition and how this condition manifests both the maximum and the minimum entropic initializing self-state simultaneously.

All of the information about the Big Bang was collected in a primordial mass seed, M_o and as a 'Seed of Inertia,' which defines the so-called 'singularity' at the center of any black hole, as well as the 'singularity' at the beginning of the material universe. All of this information then became dispersed in a hyper-inflation, which defined the 'collected' and minimum entropy mass seed as a 'dispersed' and maximum entropy mass seed $M_{critical}$.
There so exists a coupling between this inertia seedling for a subsequent 'kinematic thermodynamic expansion' of that seed in a form of vortex distribution and the encompassing inertia seedling $M_{critical}$ necessarily of a higher dimension than the 'concentrated' M_o.

The proportionality between the two seeds is $M_o/M_{critical}=\Omega_o=0.0281=2q_o$ and a ratio that also defines the proportionality between the hyper-inflating acceleration ($A_{deBroglie}=R_{Hubble}.c^2/\lambda_{wormhole}^2$) and the so-called 'Cosmological Constant' or 'Einstein-Lambda' $\Lambda_{Einstein}=G_oM_o/\lambda_{wormhole}^2$ and as a deceleration parameter which is half of the ratio between the actual and the critical density, aka the $\Omega_o=\rho_{actual}/\rho_{critical}=2q_o$.
The initial string-parametric boundary condition for the cosmogenesis (and with E a spacetime quanta counter) so can be stated as:
$A_{deBroglie}/\Lambda_{Einstein}=M_o/2M_{critical}=0.01405...$ with further definitions below.

$M_o^2=E(m_Pm_c/m_e)^2$ as the initializing Big Bang inertia seed in 10 dimensions and the critical 'closure' mass in 11 dimensions for a 'nodal' Hubble 'Constant' $H_o=c/R_{Hubble}$ becomes:
$M_{critical}=\rho_{critical}V_{max}=(3H_o^2/8\pi G_o)(4\pi R_{Hubble}^3/3)=R_{Hubble}c^2/2G_o$ and so for the Hubble Radius being the encompassing extremal SMBH requirement as the Schwarzschild solution.

The minimum entropy state, defining the Quantum Big Bang so is defined in the wormhole perimeter $\lambda_{wormhole}=2\pi r_{wormhole}$ behaving like a Einstein-Rosen Bridge in 'quantum tunneling.' the minimum entropy mass seedling M_o from the subplenum into the plenum thus describes the Quantum Big Bang and the 'escape of the singularity' as the manifestation of a White Hole at the boundary between the subplenum of NoTime and the plenum of InTime.

The inertia seed M_o in 10 string dimensions began to "drop its seeds" in a light-speed expansion of the "Hubble-Bubble." The "space" for this "dropping of the seeds" had been previously created in the hyperinflation as the 11-dimensional 'Hubble-Bubble Envelope.'
The "dropping of the seeds" occurred via vortices, becoming Vortex-Potential-Energy or VPE, and served as the true nature for the so-called "Virtual Particle" background in the Heisenberg Matrix of discretized spacetime, also the Zero-Point-Energy or the ZPE.
This ZPE=VPE manifested Black Hole Sink Vortices, which could then (as a function of the metric CMMBR temperature background) form the first protostars as ylemic neutron stars in parallel to a dark matter ylem temperature evolution.
This scenario is elucidated in detail with reference:

https://www.academia.edu/126234531/A_Meijer_Twin_Bipolaron_Critique_as_an_Extension_of_11_dimensional_Membrane_Theory_for_Quantum_Gravitation

The SMBH of Mcritical in 11 dimensions is extremal, meaning it is a boundary condition and does not Hawking radiate in a self-interaction with the VPE. The SMBH of M_o in 10 dimensions is also extremal but represents the characteristic supercluster (Sarkar) displacement scale in the universe at a diameter of about 472 million light-years.

No physical black holes can form above this scale, as the difference between the two mass seeds determines the inertia evolution of the M_o seedling in a form of self-interaction between the two SMBHs. Also, the galactic supercluster scale defines the homogeneity and the isotropy of the large-scale cosmology, where the superclusters cease to interact in gravitational dynamics.
The inertia evolution of the universe is based on a transformation of the 'missing mass' (often called dark matter and also related to the dark energy) into 'Consciousness.
This 'Consciousness' is rigorously defined in string parameters as the angular acceleration (as the time differential of frequency) acting upon a collection of space volumars, i.e., some region of 'encapsulated' space. The minimum space-quantum then becomes the scale of the 'tunneling wormhole' as the discretization or the 'Holofractalisation' of all metricated spacetimes.

The Quantum Big Bang so emerged an astrophysics of Black Holes from a White Hole 'singularity' or minimum eigenstate. The Black Hole, characterizing the center of the Earth, will transform into a holographic image of this 'Primordial White Hole' as the 'Particle of God - the Little Serpent,' sent from the galactic center of the Milky Way via the conduit of the universal wormhole tunneling established in the de Broglie hyper-acceleration.

The information of the lower-dimensional mass seed then becomes 'mapped' onto the 2-dimensional (root-reduced from 11 dimensions) 'inner' surface of the 'Mother Black Hole,' and this engages a surface area 'holofractalized' from the minimum 'Father White Hole,' which so is also a 'Father Black Hole' in inertia association. As is well established in contemporary cosmology, the information of a volume-given universe becomes a function of particular boundary conditions in the Hawking entropy as ¼Planck Area and in the Bekenstein bounds.

In general, the event horizon of a black hole is surrounded by a photon sphere, manifesting at 3/2 times the Schwarzschild radius. This then describes the interaction of the 'absorbed information' with its 'lighted envelope' and is a direct consequence of the toroidal topology of the wormhole quantum geometry.

The wormhole connects a white hole to a black hole in such a manner that the minimum Planck-Nugget is a deformed sphere, namely a toroidal hypersphere in 3 dimensions behaving like a 3-dimensional surface.
The hypersphere volume is the boundary condition in R_3-Riemann space for the Riemann R_4 space Volume $V_4=½\pi^2R^4$ with $dV_4/dR=V_3=2\pi^2R^3$ aka the volume of an idealized 2-torus.

The surface area of a 2-torus in 3 dimensions is, however, $A_{Torus}=2\pi R.2\pi R=4\pi^2R^2$, while the boundary condition for $V_3=2\pi^2R^3$ is $dV_3/dR=A_{wormhole}=6\pi^2R^2$ for $A_{wormhole}/A_{Torus}=3/2$.
The subplenum so assigns particular boundary conditions to the 'energy' manifestations in the plenum; however, 'coordinates' that are not mappable onto the subplenar 'topology' or manifold.

This crystallizes the wormhole connection for the universe to any location and a focalization nexus called the planet Earth. The mass of the Earth is: $M_{Earth}=6x10^{24}$ kg. The Mass of the Galactic Core is known to be a 'galactic constant' of about (500-1000) times the central black hole designated as $M_{Core}=750MSA^*$ and about $6.75x10^{39}$ kg.

The mass of the Central Black Hole, aka Sagittarius A* is $MSA^*=4.4x10^6$ solar masses, or so $9x10^{36}$ kg. The mass seedling of the universe at the ‘beginning’ of the cosmology at the Twin Bipolaron Gravitation Center TBPGC is $M_o=1.8x10^{51}$ kg and the mass of the universe at the ‘end’ of the TBPGC, as the Quantum Big Bang R(s)ingularity QBBS (in the asymptotic evolution of the minimized wormhole radius Kerr-Newmann QBBS creation event for the completion of 234-235 semicycles to trigger the multiverse quantum tunneling) is $M_{critical}=6.5x10^{52}$ kg.

Then $M_{Core}/M_o=constant.(M_{Earth}/MSA^*)$ for $constant=(M_{Core}MSA^*/M_oM_{Earth})=(750x81x10^{72})/(12x10^{75})\sim5.1$ and so of order unity, 1 as, say an ‘upper bound’.

But the seedling mass defines cosmologically a substructured, albeit still extremal black hole in the gravitational attraction between the supercluster and so the homogeneity and isotropy of the standard cosmology.

The encompassing 'universal' black hole mass is extradimensional (like the golf ball black hole defining the central Earth) and so is thus calculated to topologically close the string universe (in a Calabi-Tau 6-torus geometry) for the superseded universe with a 17 billion-year ‘heartbeat’ or Hubble oscillation.

Using $M_{critical}$ then $constant=(6.75x9x10^{75})/(3.9x10^{77})\sim0.16$ again of order unity, but now as a ‘lower bound’.
The evolution of the 'lower bound' for the encompassing cosmology in the higher dimensions (11 or 8 or 5 or 2) towards the 'upper bound' then becomes an evolution of 'cosmic consciousness,' well understood by indigenous peoples all around the globe but labeled as 'dark matter' by the physical materialists and scientists.
The 'dark matter' is the 'spirit' in particular string-membrane-coupled associations.
In terms of the volumes, the golf ball-sized (Schwarzschilded) black-holed Earth is $V_{SEarth}=(4\pi/3)(0.015m)^3\sim1.4x10^{-5}$ meters or so 14 cubic centimeters. This compares to the ‘ordinary’ spacetimed $V_{Earth}=4\pi(6370km)^3/3\sim10^{21}$ cubic meters.

The ratio $V_{Earth}/V_{SEarth}\sim10^{21}/(1.4x10^{-5})\sim7x10^{25}$ meters indicates the order of the size of the cyclic universe in the Hubble radius $R_{Hubble}=H_oc=1.6x10^{26}$ meters.

The sum total of the information contained in the planetary Earth thus becomes 'data compressed' in the black holed Earth and then reemerges from absorption to emission through a white holed conduit for the benefit of the universe in cellular hierarchies and all of the intelligences contained within the supermembraned Mother-Black-Holed Envelope Mcritical. The planetary Earth itself will so become a 'Mother Planet' for the universal sentiences.

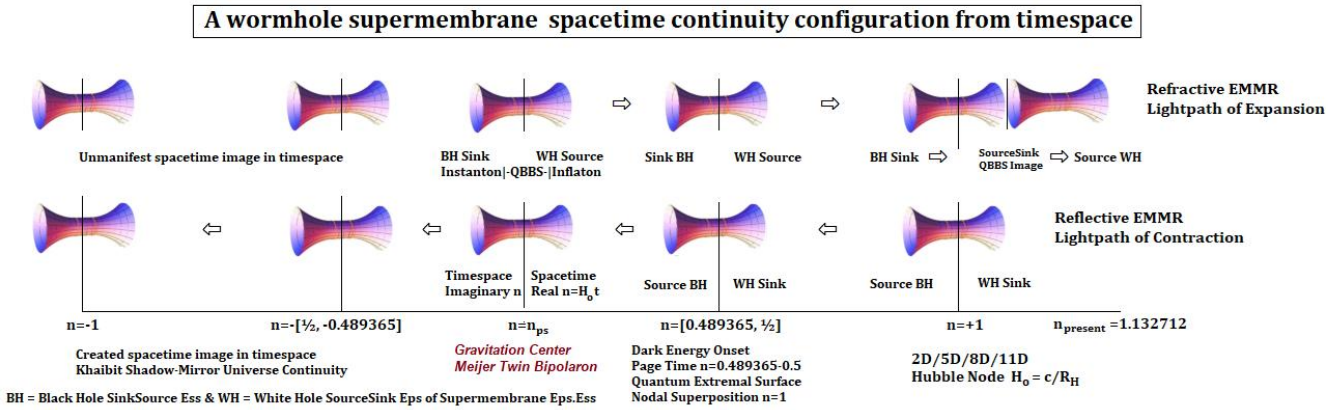


Figure 16: *A wormhole Weyl boson-twin bipolaron multidimensional spacetime quanta configuration*

11) The First Ylemic Stars in the Universe and the Antiwormholes

The stability of stars is a function of the equilibrium condition, which balances the inward pull of gravity with the outward pressure of the thermodynamic energy or enthalpy of the star (H=PV+U). The Jeans Mass M_J and the Jeans Length R_J are used to describe the stability conditions for collapsing molecular hydrogen clouds to form stars. They are well known in the scientific database, as seen in formulations such as:

$M_J=3k_BTR/2Gm$ for a Jeans length of : $R_J=\sqrt{\{15k_BT/(4\pi G\rho\mu)\}}$

Now the Ideal Gas Law of basic thermodynamics states that the internal pressure P and volume of such an ideal gas are given by $PV=nRT=Nk_BT$ for n moles of substance, with the number N of molecules (say) divided by Avogadro's constant L in n=N/L .

The Ideal Gas Constant R divided by Avogadro's constant L defines Boltzmann's Constant $k_B=R/L$. Now the Statistical analysis of kinetic energy KE of particles in motion in a gas (say) gives a root-mean-square velocity (rms) and the familiar $2KE=mv^2(rms)$ from the distribution of individual velocities v in such a system.
It is found that PV=(2/3)N.KE as a total system described by the v(rms). Now set the KE equal to the Gravitational PE=GMm/R for a spherical gas cloud, and you get the Jeans Mass $(3/2N).(Nk_BT)=GMm/R$ with m as the mass of a nucleon or hydrogen atom and $M=M_J=3k_BTR/2Gm$ as stated.

The Jeans Length is the critical radius of a cloud (typically a cloud of interstellar dust) where thermal energy, which causes the cloud to expand, is counteracted by gravity, which causes the cloud to collapse. It is named after the British astronomer Sir James Jeans, who first derived the quantity; where k_B is Boltzmann's constant, T is the temperature of the cloud, R is the radius of the cloud, μ is the molecular mass per particle in the cloud, G is the gravitational constant, and ρ is the cloud's mass density (i.e. the cloud's mass divided by the cloud's volume).

Now, following the Big Bang, there were, of course, no gas clouds in the early expanding universe, and the Jeans formulations are not applicable to the mass seedling M_o in the manner of the Jeans formulations as given. However, the universe's dynamics are in the form of the expansion parameter of GR, and so the $R(n)=R_{max}(n/(n+1))$ scale factor of Quantum Relativity.
So we can certainly analyze this expansion in the form of the Jeans Radius of the first protostars, which so obey the equilibrium conditions and equations of state of the much later gas clouds, for which the Jeans formulations then apply on a molecular level.
This analysis so defines the ylemic neutron stars as protostars and the first stars in the cosmogenesis and the universe. Let the thermal internal energy or ITE=H be the outward pressure in equilibrium with the gravitational potential energy of GPE=Ω . The nuclear density in terms of the superbrane parameters is $\rho_{critical}=m_c/V_{critical}$ with m_c a base-nucleon mass for a 'ylemic neutron'.

$V_{critical}= 4\pi R_e^3/3$ or the volume for the ylemic neutron as given by the classical electron radius
$R_e=10^{10}\lambda_{wormhole}/360=e^*/2c^2$

$H=(molarity)k_BT$ for molar volume as $N=(R/R_e)^3$ for $dH=3k_BTR^2/R_e^3$
$\Omega(R) = -\int G_oMdm/R = -\{3G_om_c^2/(R_e^3)^2\}\int R^4dR = -3G_om_c^2R^5/5R_e^6$

for $dm/dR=d(\rho V)/dR=4\pi\rho R^2$ and $\rho=3m_c/4\pi R_e^3$ and $d\Omega=-3G_o m_c^2 R^4/R_e^6$
For equilibrium, the requirement is that $dH=d\Omega$ in the minimum condition $dH+d\Omega=0$.
This gives: $dH+d\Omega = 3k_B TR^2/R_e^3 - 16G_o\pi^2\rho^2R^4/3 = 3k_B TR^2/R_e^3 - 3G_o m_c^2 R^4/R_e^6$ and the ylemic radius as:

$$\mathbf{R_{ylem}=\sqrt{\{k_B TR_e^3/G_o m_c^2\}}.....[Eq.\#7]}$$

as the Jeans-Length precursor or progenitor for subsequent stellar and galactic generation.

The ylemic (Jeans) radii are all independent of the mass of the star as a function of its nuclear-generated temperature. Applied to the protostars of the vortex neutron matter or ylem, the radii are all neutron star radii and define a specific range of radii for the gravitational collapse of the electron degenerate matter.

This spans from the 'First Three Minutes' scenario of the cosmogenesis to 1.1 million seconds (or about 13 days) and encompasses the standard beta decay of the neutron (underpinning radioactivity). The upper limit defines a trillion-degree temperature and a radius of over 40 km; the trivial Schwarzschild solution gives a typical ylem radius of so 7.4 kilometers, and the lower limit defines the 'mysterious' planetesimal limit as 1.8 km.

https://www.academia.edu/111986527/Micro_Black_Holes_in_the_Three_Minute_Cosmology

For long a cosmological conundrum, it could not be modeled just how the molecular and electromagnetic forces applicable to conglomerate matter distributions (say gaseous hydrogen as cosmic dust) on the quantum scale of molecules could become strong enough to form, say 1km mass concentrations required for 'ordinary' gravity to assume control.

The ylem radii's lower limit is defined in this cosmology, showing that it is the ylemic temperature of the 1.2 billion degrees K, which performs the trick under the Ylem-Jeans formulation and is then applied to the normal collapse of hydrogenic atoms in summation.

The stellar evolution from the ylemic(dineutronic) templates is well established in QR and confirms most of the Standard Model's ideas of nucleosynthesis and the general Temperature cosmology. The Standard Model is correct in the temperature assignment but is amiss in the corresponding "size scales" for the cosmic expansion.
The Big Bang cosmogenesis describes the universe as a Planck-Black Body Radiator, which sets the Cosmic-Microwave- Black Body Background Radiation Spectrum (CMBBR) as a function of n as $T^4=18.2(n+1)^2/n^3$ and is derived from the Stefan-Boltzmann Law and the related statistical frequency distributions.

We have the GR metric for Schwarzschild-Black Hole Evolution as $R_S=2G_oM/c^2$ as a function of the star's black hole mass M and we have the ylemic radius as a function of temperature only as $R_{ylem} = \sqrt{(k_B T.R_e^3/G_o m_c^2)}$.
The nucleonic mass-seed $m_c=m_P.Alpha^9$ and the product $G_o m_c^2$ is a constant in the partitioned n-evolution of $m_c(n)=Y^n.m_c$ and $G(n)=G_o.X^n$.
Identifying the ylemic radius with the Schwarzschild radius indicates a specific mass a specific temperature, and a specific radius.

Those we call the Chandrasekhar parameters:

$M_{Chandra}$=1.5 solar masses $=3x10^{30}$ kg and $R_{Chandra}=2G_oM_{Chandra}/c^2$ or 7407.40704..metres, which is the typical neutron star radius inferred today.

$T_{Chandra}=R_{Chandra}^2.G_o m_c^2/k_B R_e^3 = 1.985x10^{10}$ Kelvin K for electron radius R_e and Boltzmann's constant k_B.

Those Chandrasekhar parameters then define a typical neutron star with a uniform temperature of 20 billion K at the white dwarf limit of ordinary stellar nucleosynthetic evolution (Hertzsprung-Russell or HR diagram).
The radius for the mass-parametric universe is given in $R(n)=R_{max}(1-n/(n+1))$ correlating the ylemic temperatures as the 'uniform' CMBBR background, and we can follow the evolution of the ylemic radius via the approximation:
$R_{ylem}=0.05258..\sqrt{T}=(0.0753).[(n+1)^2/n^3]^{[1/8]}$
$R_{ylem}(n_{present}=1.132471..)=0.0868$ m* for a $T_{ylem}(n_{present})=2.73$ K for the present time $t_{present}=n_{present}/H_o$.

What then is $n_{Chandra}$?

This would describe the size of the universe as the uniform temperature CMBBR today manifesting as the largest stars, mapped, however, onto the ylemic neutron star evolution as the protostars (say as nChandra), defined not in mass made manifest (say neutron conglomerations), but as a quark-strange plasma, defined in QR as the Vortex-Potential-Energy or VPE.

$R(n_{Chandra})=R_{max}(n_{Chandra'})/(n_{Chandra'}+1)=7407.40741..$ for $n_{Chandra'}=4.64x10^{-23}$ and so a time of $t_{Chandra'}=n_{Chandra'}/H_o=n_{Chandra'}/1.88x10^{-18}=2.47x10^{-5}$ seconds.

QR defines the Weyl-Temperature limit for Bosonic Unification as 1.9 nanoseconds at a temperature of $1.41x10^{20}$Kelvin, and the weak-electromagnetic unification crystallizes for a particle energy of 296 GeV to 144 GeV for a ylemic halo radius of $2.14x10^6$ meters, encompassing the thermodynamically expanding universe at 1/365 to 1/140 seconds from $T=3.4x10^{15}$ K to $1.66x10^{15}$ K.

So we place the first ylemic protostar after the bosonic unification (before which the plenum was defined as undifferentiated 'bosonic plasma'), but before the electroweak unification, which defined the Higgs-Bosonic restmass induction via the weak interaction vector bosons and allowed the dineutrons to be born.

The universe was so 15 km across when its ylemic 'concentrated' VPE-Temperature was so 20 billion K and we find the CMBBR in the Stefan-Boltzmann Law as:
$T^4=18.20(n+1)^2/n^3=1.16x10^{17}$ Kelvin.

So the thermodynamic temperature for the expanding universe was so 5.85 million times greater than the ylemic VPE- Temperature; and implying that no individual ylem stars could yet form from the mass seedling M_o.
The universe's expansion, however, cooled the CMBBR background, and to calculate the scale of the universe corresponding to this ylemic scenario, we simply calculate the 'size' for the universe at $T_{Chandra}=20$ billion K for $T_{Chandra}^4$ and we then find $n_{Chandra}=4.89x10^{-14}$ and $t_{Chandra}=26{,}065$ seconds or so 7.24 hours.

The radius $R(n_{Chandra})=7.81x10^{12}$ meters or 7.24 light-hours.
This is about 52 astronomical units and an indicator for the largest possible star in terms of radial extent and the "size" of a typical solar system, encompassed by supergiants on the HR diagram.

We so know that the ylemic temperature decreases in direct proportion to the square of the ylemic radius, and one hitherto enigmatic aspect in cosmology relates to this in the planetesimal limit. Briefly, a temperature of so 1.2 billion degrees defines a ylemic radius of 1.8 km as the dineutronic limit for proto-neutron stars contracting from so 80 km down to this size just 1.1 million seconds or so 13 days, after the Big Bang.

This then "explains" why chunks of matter can conglomerate via molecular and other adhesive interactions toward this size, where the accepted gravity is strong enough to build planets and moons. It works because the ylemic template is defined in subatomic parameters reflecting the mesonic inner and leptonic outer ring boundaries, the planetesimal limit being the leptonic mapping. Thus, neutrino and quark blueprints micromacro dance their basic definition as the holographic projections of the spacetime quanta.

Now, because the electron radius is directly proportional to the linearized wormhole perimeter and then the Compton radius via alpha in $R_e=10^{10}\lambda_{wormhole}/360=e^*/2c^2=\text{Alpha}R_{Compton}$, the Chandrasekhar white dwarf limit should be doubled to reflect the protonic diameter $2R_{proton}$ mirrored in the classical electron radius R_e.

Hence, any star experiencing electron degeneracy is actually becoming ylemic or dineutronic, the boundary for this process being the Chandrasekhar mass. This represents the subatomic mapping of the first Bohr orbit collapsing onto the leptonic outer ring in the quarkian wave geometry.
But this represents the Electron Radius as a Protonic Diameter, and the Protonic Radius must then indicate the limit for the scale where proton degeneracy would have to enter the scenario. As the proton cannot degenerate in that way, the neutron star must enter the black hole phase transition at the ½Re scale, corresponding to a mass of $8M_{Chandra}=24x10^{30}$ kg or 12 solar masses.

A maximum ylemic radius so is found from the constant density proportion $\rho=M/V$: $(R_{ylemmax}/R_e)^3=M_{Chandra}/m_c$ for $R_{ylemmax}=40.1635$ kilometers.

The corresponding ylemic temperature is 583.5 billion K for a CMBBR time of 287 seconds or so 4.8 minutes, from $n = 5.4x10^{-16}$, when the universe had a diameter of so 173 million km.

But for a maximum nuclear compressibility for the protonic radius, we find:
$(R_{ylemmax}/R_e)^3=8M_{Chandra}/m_c$ for $R_{ylemmax}$=80.327 km, a ylemic temperature of 2334 billion K for a n-cycletime of $8.5x10^{-17}$ and a CMBBR time of so 45 seconds when the universe had a radius of 13.6 million km or was so 27 million km across.
The first ylemic protostar vortex was, at that time, manifested as the ancestor for all neutron star generations to follow. This vortex is described in a cosmic string encircling a spherical region so 160 km across and within a greater universe of diameter of 27 million km, which carried a thermodynamic temperature of so 2.33 trillion Kelvin at that point in the cosmogenesis.
This vortex manifested as a VPE concentration after the expanding universe had cooled to allow the universe to become transparent from its hitherto defining state of opaqueness, in a time known as the decoupling of matter (in the form of the M_o seedling partitioned in m_c's) from the radiation pressure of the CMBBR photons.

The temperature for the decoupling is found in the galactic scale-limit modular dual to the wormhole geodesic as $1/\lambda_{wormhole}=\lambda_{antiwormhole}=\lambda_{galaxyserpent}=10^{22}$ meters, or so 1.06 million light-years, and its luminosity attenuation in the 1/e proportionality for then 388,879 light-years as a decoupling time $n_{decoupling}$.

A maximum galactic halo limit is modulated in $2\pi\lambda_{antiwormhole}$ meters in the linearization of the Planck length encountered before in an earlier discussion.

$R(n_{decoupling})=R_{max}(n_{decoupling}/(n_{decoupling}+1))=10^{22}$ meters for $n_{decoupling}=6.26x10^{-5}$ and so for a CMBBR-Temperature of about T=2935 K for a galactic protocore, then attenuated by about 37% for $n_{decouplingmin}=1.0x10^{-6}$ for $R=\lambda_{antiwormhole}/2\pi$ and $n_{decouplingmax}=3.9x10^{-4}$ for $R=2\pi\lambda_{antiwormhole}$ and for temperatures of so 65,316 K and 744 K respectively, descriptive of the temperature modulations between the galactic cores and the galactic halos.

So, a CMBBR temperature of so 65,316 K at a time of so 532 billion seconds or 17,000 years defined the initialization of the VPE and the birth of the first ylemic protostars as a decoupling minimum. The ylemic mass currents were purely monopolar and known as superconductive cosmic strings, consisting of nucleonic neutrons, each of mass mc . If we assign this timeframe to the maximized ylemic radius and assign our planetesimal limit of fusion temperature of 1.2 billion K as a corresponding minimum, then this planetesimal limit, representing the onset of stellar fusion in a characteristic temperature, should indicate the first protostars at a temperature of the CMBBR of about 744 Kelvin.

The universe had a temperature of 744 K for $n_{decouplingmax}=3.9x10^{-4}$ for $R=2\pi\lambda_{antiwormhole}$ and this brings us to a curvature radius of so 6.6 million light-years and an 'ignition time' for the first physical ylemic neutron stars as first-generation protostars of so 7 million years after the Big Bang.

The important cosmological consideration is that of distance-scale modulation. The Black Hole Schwarzschild metric is the inverse of the galactic scale metric.
The linearization of the Planck string as the Weyl-Geodesic, and so the wormhole radius in the curvature radius R(n) is modular dual and mirrored in inversion in the manifestation of galactic structure, with a nonluminous halo, a luminous attenuated diameter bulge, and a superluminous quasar or White Hole Core.

The core-bulge ratio will so reflect the eigenenergy quantum of the wormhole as a heterotic Planck-Boson-String or as the dark matter form of the Twin Bipolaron as the magnetocharge of 1/500, being the mapping of the Planck-Length-Bounce as $e=L_Pc^2\sqrt{}Alpha$ onto the electron radius in $e^*=2R_e.c^2$.

Shiloh, October 7th, 2013
TonyB.; April 14th, 2025

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