A Revision of the Friedmann Cosmology

1. The Parametrisation of the Friedmann Equation

It is well known, that the Radius of Curvature in the Field Equations of General Relativity relates to the Energy-Mass Tensor in the form of the critical density $\rho_{critical} = 3H_o^2/8\pi G$ and the Hubble Constant H_o as the square of frequency or alternatively as the time differential of frequency df/dt as a cosmically applicable angular acceleration independent on the radial displacement.

The scientific nomenclature (language) then describes this curved space in differential equations relating the positions of the 'points' in both space and time in a 4-dimensional description called Riemann Tensor Space or similar.

This then leads mathematically, to the formulation of General Relativity in Einstein's field Equations:

$$R_{\mu\nu} - \frac{1}{2}g_{\mu\nu}\, R + g_{\mu\nu}\Lambda = \frac{8\pi G}{c^4}T_{\mu\nu}$$

for the Einstein-Riemann tensor

$$G_{\mu\nu} = R_{\mu\nu} - \frac{1}{2}Rg_{\mu\nu},$$

and is built upon ten so-called nonlinear coupled hyperbolic-elliptic partial differential equations, which needless to say, are mathematically rather complex and often cannot be solved analytically without simplifying the geometries of the parametric constituents (say objects interacting in so called tensor-fields of stress-energy $\{T_{\mu\nu}\}$ and curvatures in the Riemann-Einstein tensor $\{G_{\mu\nu}\}$, either changing the volume in reduction Ricci tensor $\{R_{ij}\}$ with scalar curvature R as $\{Rg_{\mu\nu}\}$ for the metric tensor $\{g_{\mu\nu}\}$ or keeping the volume of considered space invariant to volume change in a Tidal Weyl tensor $\{R_{\mu\nu}\}$).

The Einstein-Riemann tensor then relates Curvature Radius R to the Energy-Mass tensor $E=Mc^2$ via the critical density as $8\pi G/c^4=3H_o^2V_{critical}.M_{critical}.c^2/M_{critical}.c^4 = 3H_o^2V_{critical}/c^2 = 3V_{critical}/R^2$ as Curvature Radius R by the Hubble Law applicable say to a nodal Hubble Constant $H_o = c/R_{Hubble}$.

The cosmological field equations then can be expressed as the square of the nodal Hubble Constant and inclusive of a 'dark energy' terms often identified with the Cosmological Constant of Albert Einstein, here denoted $\Lambda_{Einstein}$.

Substituting the Einstein Lambda with the time differential for the square of nodal Hubble frequency as the angular acceleration acting on a quantized volume of space however; naturally and universally replaces the enigma of the 'dark energy' with a space inherent angular acceleration component, which can be identified as the 'universal consciousness quantum' directly from the standard cosmology itself.

The field equations so can be generalised in a parametrization of the Hubble Constant assuming a cyclic form, oscillating between a minimum and maximum value given by H_o=dn/dt for cycle time $n=H_o t$ and where then time t is the 4-vector time-space of Minkowski light-path x=ct.

The Einstein Lambda then becomes then the energy-acceleration difference between the baryonic mass content of the universe and an inherent mass energy related to the initial condition of the oscillation parameters for the nodal Hubble Constant.

$\Lambda_{Einstein} = G_o M_o/R(n)^2 - 2cH_o/(n+1)^3$ = Cosmological Acceleration - Intrinsic Universal Milgröm Deceleration as: $g_{íí}\Lambda = 8\pi G/c^4\, T_{\mu\nu} - G_{íí}$

then becomes $G_{ìí} + g_{ìí}L = 8\pi G/c^4\, T_{ìí}$ and restated in a mass independent form for an encompassment of the curvature fine structures.

Energy Conservation and Continuity:

dE + PdV = TdS =0 (First Law of Thermodynamics) for a cosmic fluid and scaled Radius $R=a.R_o$; $dR/dt = da/dt.R_o$ and $d^2R/dt^2 = d^2a/dt^2.R_o$

$dV/dt = \{dV/dR\}.\{dR/dt\} = 4\pi a^2 R_o^3.\{da/dt\}$

$dE/dt = d(mc^2)/dt = c^2.d\{\rho V\}/dt = (4\pi R_o^3.c^2/3)\{a^3.d\rho/dt + 3a^2\rho.da/dt\}$

$dE + PdV = (4\pi R_o^3.a^2)\{\rho c^2.da/dt + [ac^2/3].d\rho/dt + P.da/dt\} = 0$ for the cosmic fluid energy-pressure continuity equation:

$d\rho/dt = -3\{(da/dt)/a.\{\rho + P/c^2\}\}$ ....(1)

The independent Einstein Field Equations of the Robertson-Walker metric reduce to the Friedmann equations:

$H^2 = \{(da/dt)/a\}^2 = 8\pi G\rho/3 - kc^2/a^2 + \Lambda/3$ ....(2)

$\{(d^2a/dt^2)/a\} = -4\pi G/3\{\rho + 3P/c^2\} + \Lambda/3$ ....(3)

for scale radius $a=R/R_o$; Hubble parameter H = {da/dt)/a}; Gravitational Constant G; Density ρ; Curvature k ; light speed c and Cosmological Constant Λ.

Differentiating (2) and substituting (1) with (2) gives (3):

$\{2(da/dt).(d^2a/dt^2).a^2 - 2a.(da/dt).(da/dt)^2\}/a^4 = 8\pi G.(d\rho/dt)/3 + 2kc^2.(da/dt)/a^3 + 0 = (8\pi G/3)(-3\{(da/dt)/a.\{\rho + P/c^2\}\} + 2kc^2.(da/dt)/a^3 + 0$

$(2(da/dt)/a).\{(d^2a/dt^2).a - (da/dt)^2\}/a^2 = (8\pi G/3)\{-3(da/dt)/a\}.\{\rho + P/c^2\} + 2\{(da/dt)/a\}.(kc^2/a^2) +0$

$2\{(da/dt)/a\}.\{(d^2a/dt^2).a - (da/dt)^2\}/a^2 = 2\{(da/dt)/a\}\{-4\pi G.\{\rho + P/c^2\} + (kc^2/a^2)\} +0$ with $kc^2/a^2= 8\pi G\rho/3 + \Lambda/3 - \{(da/dt)/a\}^2$

$d\{H^2\}/dt = 2H.dH/dt = 2\{(da/dt)/a\}.dH/dt$

$dH/dt = \{[d^2a/dt^2]/a - H^2\} = \{-4\pi G.(\rho+ P/c^2) + 8\pi G\rho/3 + \Lambda/3 -H^2\} = -4\pi G/3(\rho + 3P/c^2) + \Lambda/3 - H^2\} = -4\pi G/3(\rho + 3P/c^2) + \Lambda/3 - 8\pi G\rho/3 + kc^2/a^2 - \Lambda/3\} = -4\pi G.(\rho + P/c^2) + kc^2/a^2$

$dH/dt = -4\pi G\{\rho+P/c^2\}$ as the Time derivative for the Hubble parameter H for flat Minkowski space-time with curvature k=0

$\{(d^2a/dt^2).a - (da/dt)^2\}/a^2 = -4\pi G\{\rho+ P/c^2\} + (kc^2/a^2) + 0 = -4\pi G\{\rho + P/c^2\} + 8\pi G\rho/3 - \{(da/dt)/a\}^2 + \Lambda/3$

$\{(d^2a/dt^2)/a\} = (-4\pi G/3)\{3\rho + 3P/c^2- 2\rho\} = (-4\pi G/3)\{\rho + 3P/c^2\} + \Lambda/3 = dH/dt + H^2$

For a scale factor $a=n/[n+1] = \{1-1/[n+1]\} = 1/\{1+1/n\}$

$\mathbf{dH/dt + 4\pi G\rho = - 4\pi GP/c^2}$ .... (for $V_{4/10D}=[4\pi/3]R_H^3$ and $V_{5/11D}=2\pi^2R_H^3$ in factor $3\pi/2$)

$a_{reset} = R_k(n)_{AdS}/R_k(n)_{dS} + ½ = n-\sum\prod n_{k-1}+\prod n_k +½$

Scale factor modulation at $N_k=\{[n-\sum\prod n_{k-1}]/\prod n_k \} = ½$ reset coordinate

$\{dH/dt\} = a_{reset} .d\{H_o/T(n)\}/dt = - H_o^2(2n+1)(n+3/2)/T(n)^2$ for k=0

$\mathbf{dH/dt + 4\pi G\rho = - 4\pi GP/c^2}$

$-H_o^2(2n+1)(n+3/2)/T(n)^2 + G_oM_o/\{R_H^3(n/[n+1])^3\}\{4\pi\} = \Lambda(n)/\{R_H(n/[n+1])\} + \Lambda/3$

$-2H_o^2\{[n+1]^2-¼\}/T[n]^2 + G_oM_o/R_H^3(n/[n+1])^3\{4\pi\} = \Lambda(n)/R_H(n/[n+1]) + \Lambda/3$

$-2H_o^2\{[n+1]^2-¼\}/T(n)^2 + 4\pi.G_oM_o/R_H^3(n/[n+1])^3 = \Lambda(n)/R_H(n/[n+1]) + \Lambda/3$

For a scale factor $a=n/[n+1] = \{1-1/[n+1]\} = 1/\{1+1/n\}$

$$\mathbf{\Lambda(n)/R_H(n/[n+1]) = - 4\pi GP/c^2 = G_oM_o/R_H^3(n/[n+1])^3 -2H_o^2/(n[n+1]^2)}$$

and $\Lambda = 0$

for $-P(n) = \Lambda(n)c^2[n+1]/4\pi G_onR_H = \Lambda(n)H_oc[n+1]/4\pi G_on = M_oc^2[n+1]^3/4\pi n^3R_H^3 - H_o^2c^2/2\pi G_on[n+1]^2$

For n=1.13271:............ - (+6.696373x10^{-11} J/m^3)* = (2.126056x10^{-11} J/m^3)* + (-8.8224295x10^{-11} J/m^3)*

Negative Dark Energy Pressure = Positive Matter Energy + Negative Inherent Milgröm Deceleration(cH_o/G_o)

The Dark Energy and the 'Cosmological Constant' exhibiting the nature of an intrinsic negative pressure in the cosmology become defined in the overall critical deceleration and density parameters. The pressure term in the Friedmann equations being a quintessence of function n and changing sign from positive to negative to positive as indicated.

For a present measured deceleration parameter q_{dS}=-0.5586, the DE Lambda calculates as -6.696x10^{-11} (N/m^2=J/m^3)*, albeit as a positive pressure within the negative quintessence.

2. An expanding multi-dimensional super-membraned open and closed Universe

The expansion of the universe can be revisited in a reformulation of the standard cosmology model Lambda-Cold-Dark-Matter or LCDM 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 space time in a multi timed connector dimension.

The resulting multiverse or brane world so 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 space-time.

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 derives 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 so change as a function of the imposed cyclicity by the boundary conditions of the paired Calabi Yau mirror duality; where the end of a 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 dS space-time in 12-dimensional brane space (F-Vafa 'bulk' Omnispace) with negative curvature k=-1 and cancels with its inner boundary as a positively curved k=1 spheroidal AdS space-time in 11 dimensions to form the observed 4D/10-dimensional zero curvature dS space-time, encompassed by the first Calabi Yau manifold.

A bounded (sub) 4D/10D dS space-time then is embedded in a Anti de Sitter (AdS) 11D-space-time of curvature k=+1 and where 4D dS space-time 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.

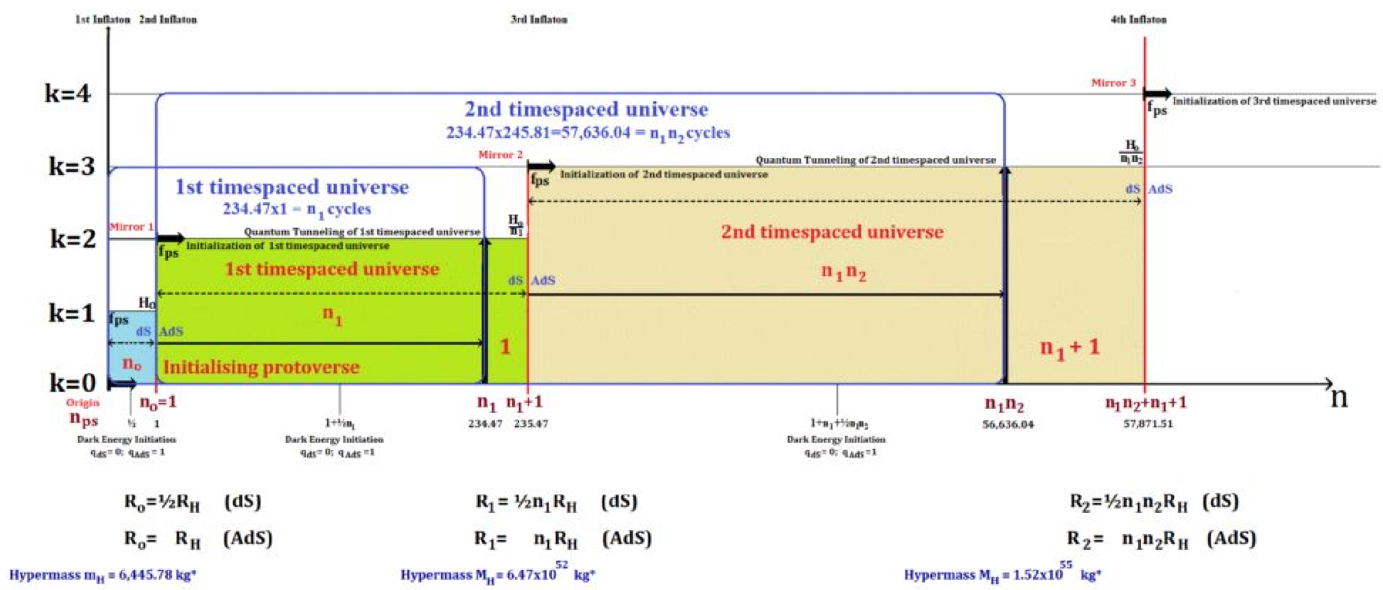
Every Inflaton defines three Hubble nodes or time-space mirrors; the first being the 'singularity - wormhole' configuration; the second the nodal boundary for the 4D/10D dS space-time and the third the dynamic light path bound for the Hubble Event horizon in 5D/11D AdS time-space.

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 space-time 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 {3.3×10^{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 {$t_o+1.4\times10^{-33}$; 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 {$1/H_o+234.472/H_o+5.8\times10^{-36}$ 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.

For a present time-space coordinate of $n_{present}$=1.13271 however; all information in the first universe is being mirrored by the time-space of the AdS space-time into the dS space-time of the second universe at a time frame of $t = t_1-t_o$ = 19.12 - 16.88 = 2.24 billion years and a multi-dimensional 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. The solution to the Dark Energy and Dark Matter question of a 'missing mass' cosmology is described in this discourse and rests on the evolution of a multiverse in matter.



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"The idea of an antigravity force has had a bad rep ever since," says

"In your heart you know this is wrong." Really, it just seemed like a terrible result, a

Kirshner. "People sort of sniggered when it was mentioned, usually because it meant they couldn't explain their results." So when Riess, having checked his figures, suggested this might be the reason he kept showing negative mass, Kirshner, in quiet desperation, emailed the whole team, saying,

"In your heart of hearts, you know this can't be right! We have got to find out where the error is."

horrifying thing

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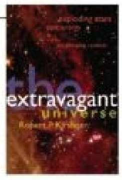
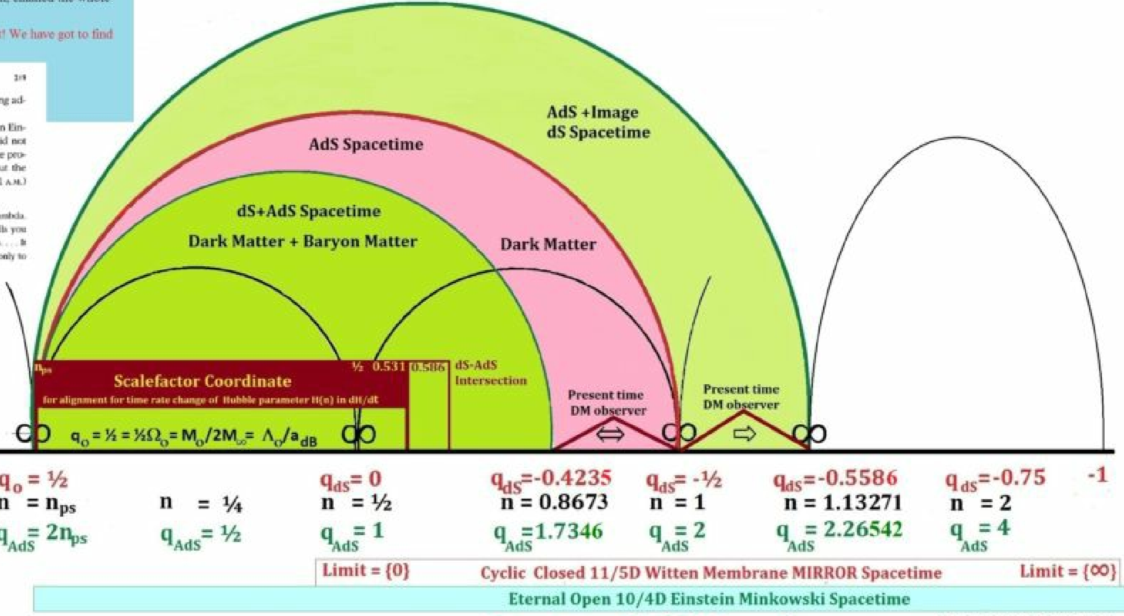
the writing assignments. So we all gave him advice. Conflicting advice. After all, this was a collaboration, not an army.

I didn't like the result. I didn't think we were smarter than Einstein and he had tripped on the cosmological constant. I did not want to make a mistake. I hadn't liked being wrong about the progenitor of SN 1987A and I did not want to be wrong about the history of cosmic expansion. On 12 January 1998 (at 10:18:51 A.M.) I wrote,

> I am worried that the first cut looks like you might need some lambda. In your heart, you know this is wrong, though your head tells you [that] you don't care and you're just reporting the observations. . . . It would be very silly to say "we MUST have nonzero lambda" only to retract it next year.





Continuity in Cyclic Resets of the Initial-Boundary parameters

$$q_{dS} = 1/2n - 1$$

$$q_{AdS} = 2n$$

$$q_{dS} \cdot q_{AdS} = 2n(1/2n - 1) = 1 - 2n$$

$$\frac{q_{dS} + q_{AdS}}{q_{dS} - q_{AdS}} = \frac{1 - 2n + 4n^2}{1 - 2n - 4n^2} = \frac{4\{n-\frac{1}{4}(1+i\sqrt{3})\}.\{n-\frac{1}{4}(1-i\sqrt{3})\}}{-4\{n-\frac{1}{4}(1-\sqrt{5})\}.\{n-\frac{1}{4}(1+\sqrt{5})\}}$$

Roots for T(n)=-1 in n(n+1)-1=0
$n = -\frac{1}{4}(1+i\sqrt{3})$; $n = -\frac{1}{4}(1-i\sqrt{3})$

Roots for T(n)=1 in n(n+1)+1=0
$n = \frac{1}{4}(\sqrt{5}-1) = \frac{1}{2}X$; $n = -\frac{1}{4}(\sqrt{5}+1) = -\frac{1}{2}Y$

The cosmological observer is situated simultaneously in 10/4D Minkowski Flat dS spacetime, presently at the n=0.8676 cycle coordinate and in 11/5D Mirror closed AdS spacetime, presently at the n=1.1327 coordinate.

Observing the universe from AdS will necessarily result in measuring an accelerating universe; which is however in continuous decelaration in the gravitationally compressed dS spacetime for deceleration parameter q_{AdS}=2n. Gravitation is made manifest in the dS spacetime by Graviton strings from AdS spacetime as Dirichlet branes at the 10D boundary of the expanding universe mirroring the 11D boundary of the nodally fixed Event Horizon characterised by $H_o = c/R_H$

The Dark Matter region is defined in the contracting AdS lightpath, approaching the expanding dS spacetime, but includes any already occupied AdS spacetime. The Baryon seeded Universe will intersect the 'return' of the inflaton lighpath at n=2-√2=0.586 for (DM=22.09 %; BM=5.55%; DE=72.36%).

The Dark Energy is defined in the overall critical deceleration and density parameters; the DE being defined in the pressure term from the Friedmann equations and changes sign from positive maximum at the inflaton-instanton to negative in the interval L(n)>0 for n in [n_{ps} - 0.18023) and L(n)> 3.4008 with L(n)<0 for n in (0.1803 - 3.4008)with absolute minimum at n=0.2389.
This DE (quasi)pressure term for the present era (1-0.1498 for 85% DM as 4.85% BM and 27.48% DM and 67.67% DE) is positive and calculates as 6.696×10^{-11} N/m², translating into a Lambda of 1.039×10^{-36} s^{-2} and 1.154×10^{-53} m^{-2}. This pressure term will become asymptotically negative for a universal age of about 57.4 Gy, and for the zero curvature evolution of the cosmos.

The 'naked singularity' can be defined as the ratio of the minimum to the maximum and calculates as the genetic 'NullTime' $n_{ps} = \lambda_{ps}/r_{max} = 6.259093485 \times 10^{-49}$ in dimensionless cycletime units (Tau-Time in General Relativity).
This NullTime precedes the Planck-Time $t_P = h/2\pi c^2 m_P = 6.9653035 \times 10^{-44}$ seconds (s) by a factor of 111,283, should timeunits be assigned to n_{ps}.*
The 'naked singularity' can then be redefined as the GENESIS-BOSON with a pre-Planck energy spectrum of 6.59×10^{24} GeV, an effective 'size' of 3×10^{-41} metres (m) and a preBig Bang temperature of 7.67×10^{37} Kelvin (K).

Timeinstantenuity ends the 'Bosonic Epoch' of the superbranes at $t_{ps} = 3.3301 \times 10^{-31}$ s and renders the Guth-Linde-Inflation as 'classically dynamic' in General Relativity.
The negative curvature of 10D-C-Space is 'flattened' in the positive curvature of 11D-M-Space and an overall observed Euclidean flat cosmos is realised.

Hubble Parameter	$H(n) = \{c/[n+1]^2\}/\{R_H(n/[n+1])\} = H_o/T(n) = H_o/(n[n+1])$
Timerate change Hubble Parameter in AdS without dS	$d(H(n)/dt\|_{AdS} = \{dH(n)/dn\}.\{dn/dt\} = -H_o^2/n^2$ by $H(n) = c/nR_H$ with $A(n) = 0$
Timerate change Hubble Parameter in AdS with dS	$d(H(n)/dt\|_{Ads+dS} = -H_o^2.(2n+1)(n+\frac{1}{2}+1)/(n[n+1])^2 = -4\pi G(\rho+P/c^2) = \rho_{B/DM} + \rho_{\Lambda/DE}$
Dark Energy Parameter with $\Lambda_{(E)instein} = 0$	$\Lambda(n)/R(n) = \Lambda_E/3 - 4\pi GP/c^2 = \rho_B + \rho_\Lambda = G_oM_o/R(n)^3 - 2H_o^2/\{n[n+1]^2\}$

(1) $q(n) = -\ddot{a}.a/\dot{a}^2 = -\{-2cH_oR_H/[n+1]^3\}.\{nR_H/([n+1]\}/c^2/[n+1]^2\} = 2n$ **for AdS spacetime and dS spacetime for $H_o = c/R_{(H)ubble/max}$**

$r(n) = r_{max}(1 - 1/(n+1))$ *(Parametric Scalefactor for Distance)*

$\dot{r}(n) = c/(n+1)^2$ *(Parametrisation for Velocity)*

$\ddot{r}(n) = -2cH_o/(n+1)^3 = a_o(n)$ [Milgrom] *(Parametrisation for Acceleration)*

$n = H_ot$ with $c = f_{ps}\lambda_{ps} = H_or_{max}$ and $H_o = dn/dt = constant = 1.879564359\times10^{-18}$ 1/s]

(2)

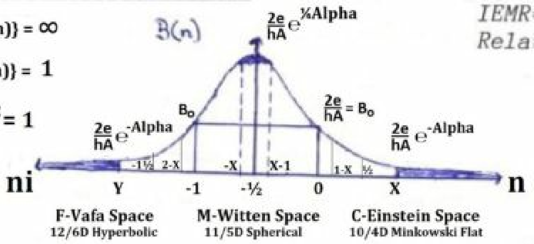
with $T^2(n) = 1 = X(X+1) = -i^2 = -XY$ in the Feynman-Path-Integral as alternative quantum mechanical formulation for the equations of Schrődinger, Dirac and Klein-Gordon by: $T(n)=n(n+1)=|-n|+...+|-3|+|-2|+|-1|+0+1+2+3+...+n$

$B(n) = 2e/hA.exp[-Alpha.T(n)]$ *(Universal Cosmic Wavefunction or IEMR=Inverse-Energy-Magnetocharge-Relation for Superstring HE(8x8))*

Aleph-Null: $\lim_{n\to\infty}\{T(n)\} = \infty$

Aleph-All: $\lim_{n\to X}\{T(n)\} = 1$

$|X+Y|=|XY|= -i^2 = 1$



The universe is 'frozen' in M-Space at the X-coordinate for which $T(n)=1$ and imaged in the Y-coordinate as imaginary time n_i as function $B(n)$

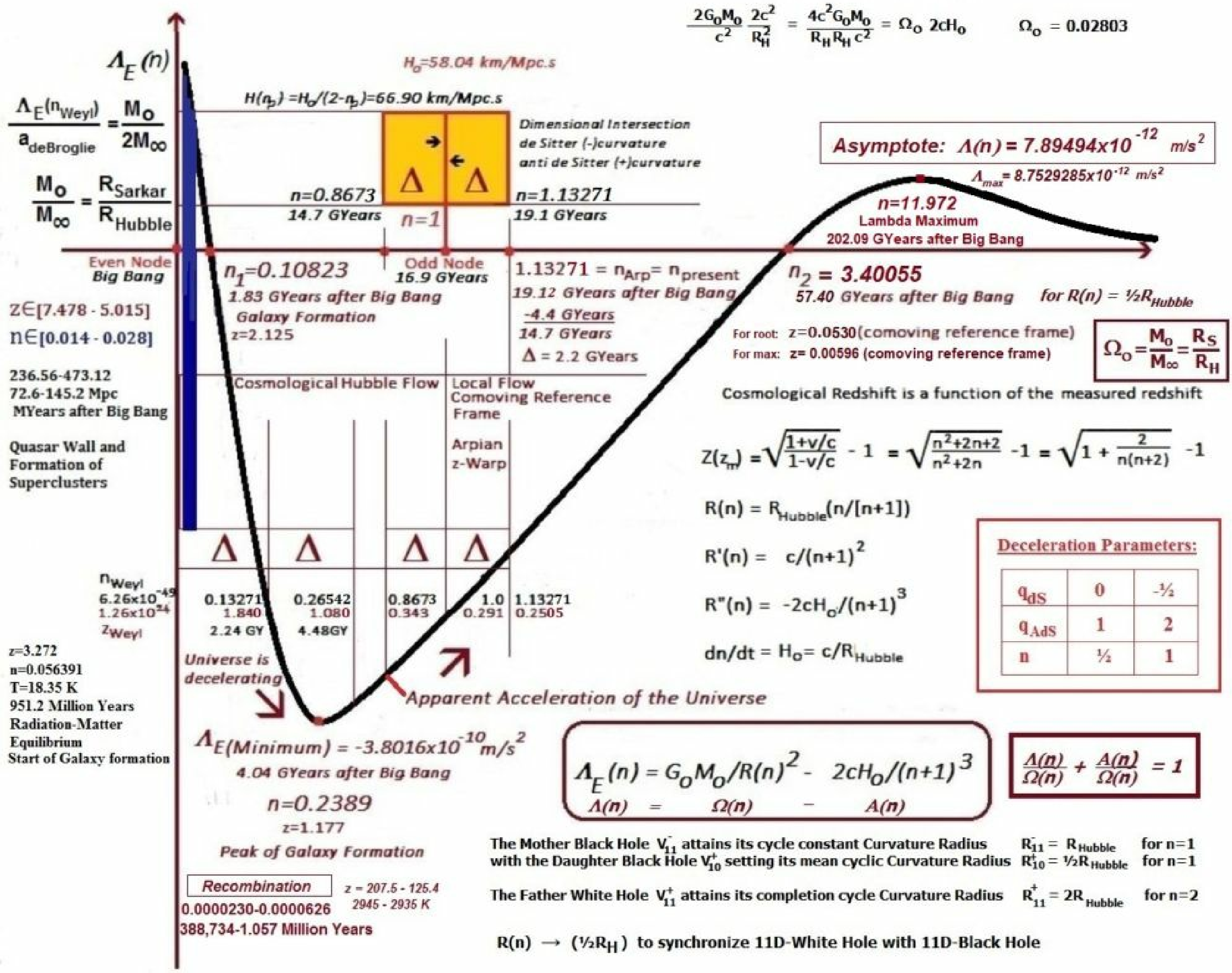
$T(n)=n(n+1)$ defines the summation of particle histories (Feynman) and $B(n)$ establishes the v/c ratio of Special Relativity as a Binomial Distribution about the roots of the $XY=i^2$ boundary condition in a complex Riemann Analysis of the Zeta Function about a 'Functional Riemann Bound' $FRB=-\frac{1}{2}$.

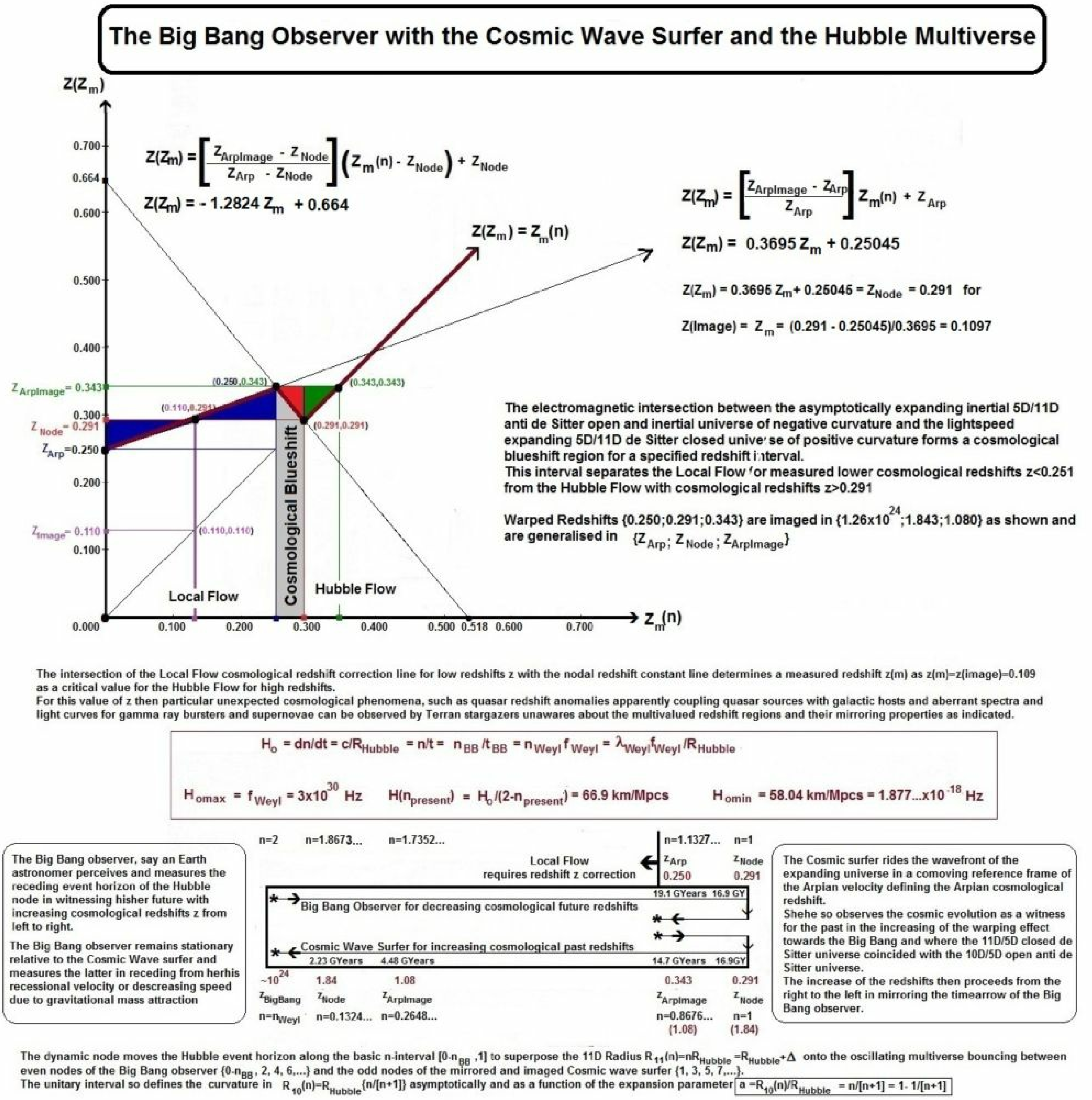
At the instanton t_{ps}, a de Broglie Phase-Inflation defined $r_{max}=a_{dB}/f_{ps}^2$ and a corresponding Phase-Speed $v_{dB}=r_{max}.f_{ps}$.
Those de Broglian parameters constitute the boundary constants for the Guth-Linde inflation and the dynamical behaviour for all generated multiverses as subsets 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, 2.23541620×10^{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).





$Y^n = R_{Hubble}/r_{Weyl} = 2\pi R_{Hubble}/\lambda_{Weyl} = \omega_{Weyl}/H_o = 2\pi n_{Weyl} = n_{ps}/2\pi = 1.003849\text{x}10^{49}$

2nd Inflaton/Quantum Big Bang redefines for k=1: $R_{Hubble(1)} = n_1 R_{Hubble} = c/H_{o(1)} = (234.472)R_{Hubble} = 3.746\text{x}10^{28}$ m* in 3.957 Trillion Years for critical n_k

3rd Inflaton/Quantum Big Bang redefines for k=2: $R_{Hubble(2)} = n_1 n_2 R_{Hubble} = c/H_{o(2)} = (234.472)(245.813)R_{Hubble} = 9.208\text{x}10^{30}$ m* in 972.63 Trillion Years for critical n_k

4th Inflaton/Quantum Big Bang redefines for k=3: $R_{Hubble(3)} = n_1 n_2 n_3 R_{Hubble} = c/H_{o(3)} = (57{,}636.27)(257.252)R_{Hubble} = 2.369\text{x}10^{33}$ m* in 250.24 Quadrillion Years for critical n_k

5th Inflaton/Quantum Big Bang redefines for k=4: $R_{Hubble(4)} = n_1n_2n_3n_4R_{Hubble} = c/H_{o(4)}$ = (14,827,044.63)(268.785)R_{Hubble} = 6.367×10^{35} m* in 67.26 Quintillion Years for critical n_k

...

(k+1)th Inflaton/Quantum Big Bang redefines for k=k: $R_{Hubble(k)} = R_{Hubble}\,\Pi\, n_k = c/H_o\,\Pi\, n_k$

.....

$n_k = \ln\{\omega_{Weyl}R_{Hubble(k)}/c\}/\ln Y = \ln\{\omega_{Weyl}/H_{o(k)}\}/\ln Y$

A general dark energy equation for the kth universe (k=0,1,2,3,...) in terms of the parametrized Milgröm acceleration A(n); comoving recession speed V(n) and scale factored curvature radius R(n):

$\Lambda_K (n) = G_oM_o/R_k(n)^2 - 2cH_o(\Pi n_k)^2/\{n\text{-ÓÐ}n_{k-1}+\Pi n_k)^3\}$

$= \{G_oM_o(n-\Sigma\Pi n_{k-1}+\Pi n_k)^2/\{(\Pi n_k)^2.R_H^2(n-\Sigma\Pi n_{k-1})^2\} - 2cH_o(\Pi n_k)^2/\{n-\Sigma\Pi n_{k-1}+\Pi n_k)^3\}$

$\Lambda_o = G_oM_o(n+1)^2/R_H^2(n)^2 - 2cH_o/(n+1)^3$

$\Lambda_1 = G_oM_o(n-1+n_1)^2/n_1^2R_H^2(n-1)^2 - 2cH_on_1^2/(n-1+n_1)^3$

$\Lambda_2 = G_oM_o(n-1-n_1+n_1n_2)^2/n_1^2n_2^2R_H^2(n-1-n_1)^2 - 2cH_on_1^2n_2^2/(n-1-n_1+n_1n_2)^3$

.....

<u>Lambda-DE-Quintessence Derivatives:</u>

$\Lambda_k'(n) = d\{\Lambda_k\}/dn$ =

$\{G_oM_o/\Pi n_k^2R_H^2\}\{2(n-\Sigma\Pi n_{k-1}+\Pi n_k).(n-\Sigma\Pi n_{k-1})^2 - 2(n-\Sigma\Pi n_{k-1}).(n\text{-ÓÐ}n_{k-1}+\Pi n_k)^2\}/\{(n-\Sigma\Pi n_{k-1})^4\} - \{-6cH_o(\Pi n_k)^2\}/(n-\Sigma\Pi n_{k-1}+\Pi n_k)^4$

$= \{-2G_oM_o/\Pi n_kR_H^2\}(n-\Sigma\Pi n_{k-1}+\Pi n_k)/(n-\Sigma\Pi n_{k-1})^3 + \{6cH_o(\Pi n_k)^2\}/(n-\Sigma\Pi n_{k-1}+\Pi n_k)^4$

$= \{6cH_o(1)^2\}/\{(n-0+1)^4\} - \{2G_oM_o/1.R_H^2\}\{(n-0+1)/(n-0)^3\}$....................................... for k=0

$= \{6cH_o(1.n_1)^2\}/\{(n-1+n_1)^4\} - \{2G_oM_o/n_1.R_H^2\}\{(n-1+n_1)/(n-1)^3\}$................................ for k=1

$= \{6cH_o(1.n_1.n_2)^2\}/\{(n-1-n_1+n_1.n_2)^4\} - \{2G_oM_o/n_1n_2.R_H^2\}\{(n-1-n_1+n_1n_2)/(n-1-n_1)^3\}$...... for k=2

....

For k=0; $\{G_oM_o/3c^2R_H\}$ = constant = $n^3/[n+1]^5$

for roots $n_{\Lambda min}$ = 0.23890175.. and $n_{\Lambda max}$ = 11.97186...

$\{G_oM_o/2c^2R_H\}$ = constant = $[n]^2/[n+1]^5$

for Λ_o-DE roots: $n_{+/-}$ = 0.1082331... and $n_{-/+}$ = 3.40055... for asymptote $\Lambda_{0\infty} = G_oM_o/R_H^2$ = 7.894940128...x10^{-12} (m/s^2)*

For k=1; $\{G_oM_o/3n_1^3c^2R_H\}$ = constant = $[n-1]^3/[n-1+n_1]^5 = [n-1]^3/[n+233.472]^5$

for roots $n_{\Lambda min}$ = 7.66028... and $n_{\Lambda max}$ = 51,941.9..

$\{G_oM_o/2n_1^4c^2R_H\}$ = constant = $[n-1]^2/[n-1+n_1]^5 = [n-1]^2/[n+233.472]^5$

for Λ_1-DE roots: $n_{+/-}$ = 2.29966... and $n_{-/+}$ = 7,161.518... for asymptote $\Lambda_{1\infty} = G_oM_o/n_1^2R_H^2$ = 1.43604108...x10^{-16} (m/s^2)*

For k=2; $\{G_oM_o/3n_1^3n_2^3c^2R_H\}$ = constant = $[n-1-n_1]^3/[n-1-n_1+n_1n_2]^5 = [n-235.472]^3/[n+57{,}400.794]^5$

for roots $n_{\Lambda min}$ = 486.7205 and $n_{\Lambda max}$ = 2.0230105x10^8

$\{G_oM_o/2n_1^4n_2^4c^2R_H\}$ = constant = $[n-1-n_1]^2/[n-1-n_1+n_1n_2]^5 = [n-235.472]^2/[n+57{,}400.794]^5$

for Λ_2-DE roots: $n_{+/-}$ = 255.5865... and $n_{-/+}$ = 1.15383...x10^7 for asymptote $\Lambda_{2\infty} = G_oM_o/n_1^2n_2^2R_H^2$ = 2.3766059...x10^{-21} (m/s^2)*

and where

$\Pi n_k=1=n_o$ and $\Pi n_{k-1}=0$ for k=0

with Instanton/Inflaton resetting for initial boundary parameters

$\Lambda_o/a_{deBroglie} = G_oM_o/R_k(n)^2/\Pi n_kR_Hf_{ps}^2$

$= \{G_oM_o(n-\Sigma\Pi n_{k-1}+\Pi n_k)^2/\{[\Pi n_k]^2.R_H^2(n-\Sigma\Pi n_{k-1})^2(\Pi n_kR_Hf_{ps}^2)\} = (\Pi n_k)½\Omega_o$

for Instanton-Inflaton Baryon Seed Constant $\Omega_o = M_o^*/M_H^*$ = 0.02803 for the kth universal matter evolution

k=0 for Reset $n=n_{ps}=H_ot$ and $\Lambda_o/a_{deBroglie} = G_oM_o(n_{ps}+1)^2/\{R_H^3n_{ps}^2(f_{ps}^2)\} = G_oM_o/R_Hc^2 = M_o/2M_H = ½\Omega_o$

k=1 for Reset $n=1+n_{ps}$ and $\Lambda_o/a_{deBroglie} = G_oM_o(1+n_{ps}-1+n_1)^2/\{[n_1]^2.R_H^3(1+n_{ps}-1)^2(n_1f_{ps}^2)\} = M_o/2n_1M_H = M_o/2M_H^* = ½\Omega_o^*$

k=2 for Reset $n=n_1+1+n_{ps}$ and $\Lambda_o/a_{deBroglie} = G_oM_o(n_1+1+n_{ps}-1-n_1+n_1n_2)^2/\{[n_1n_2]^2.R_H^3(n_1+1+n_{ps}-1-n_1)^2(n_1n_2f_{ps}^2)\} = ½\Omega_o^{**}$

k=3 for Reset $n=n_1n_2+n_1+1+n_{ps}$ and $Ë_o/a_{deBroglie} = G_oM_o(n_1n_2+n_1+1+n_{ps}-1-n_1-n_1n_2+n_1n_2n_3)^2/\{[n_1n_2n_3]^2.R_H^3(n_1n_2+n_1+1+n_{ps}-1-n_1-n_1n_2)^2(n_1n_2n_3f_{ps}^2)\} = ½\Omega_o^{***}$

......

with n_{ps} = 2ðĐ$_{nk-1}$.X$^n{}_k$ $=\lambda_{ps}/R_H = H_ot_{ps} = H_o/f_{ps} = ct_{ps}/R_H$ and $R_H=2G_oM_H/c^2$

$N_o=H_ot_o/n_o=H_ot=n$

$N_1=H_ot_1/n_1=(n-1)/n_1$

$N_2=H_ot_2/n_1n_2=(n-1-n_1)/n_1n_2$

$N_3=H_ot_3/n_1n_2n_3=(n-1-n_1-n_1n_2)/n_1n_2n_3$

....

$dn/dt=H_o$

.....

$N_k=H_ot_k/\Pi n_k=(n-\Sigma\Pi n_{k-1})/\Pi n_k$

$t_k = t - (1/H_o)\Sigma\Pi n_{k-1}$ for $n_o=1$ and $N_o=n$

$t_o=t=n/H_o=N_o/H_o=nR_H/c$

$t_1=t-1/H_o=(n-1)/H_o=[n_1N_1]/H_o$

$t_2=t-(1+n_1)/H_o=(n-1-n_1)/H_o=(n_1n_2N_2)/H_o$

$t_3=t-(1+n_1+n_1n_2)/H_o=(n-1-n_1-n_1n_2)/H_o=(n_1n_2n_3N_3)/H_o$

....

$R(n)=R(N_o)=n_oR_H\{n/[n+1]\}=R_H\{n/[n+1]\}$

$R_1(N_1)=n_1R_H\{N_1/[N_1+1]\}=n_1R_H\{[n-1]/[n-1+n_1]\}$

$R_2(N_2)=n_1n_2R_H\{N_2/[N_2+1]\}=n_1n_2R_H\{[n-1-n_1]/[n-1-n_1+n_1n_2]\}$

$R_3(N_3)=n_1n_2n_3R_H\{N_3/[N_3+1]\}=n_1n_2n_3R_H\{[n-1-n_1-n_1n_2]/[n-1-n_1-n_1n_2+n_1n_2n_3]\}$

....

$$\mathbf{R_k(n) = \Pi n_kR_H(n-\Sigma\Pi n_{k-1})/\{n-\Sigma\Pi n_{k-1}+\Pi n_k\}}$$

$.....= R_H(n/[n+1]) = n_1R_H(N_1/[N_1+1]) = n_1n_2R_H(N_2/[N_2+1]) =.....$

$$\mathbf{V_k(n) = dR_k(n)/dt = c\{\Pi n_k\}^2/\{n-\Sigma\Pi n_{k-1}+\Pi n_k\}^2}$$

$.....= c/[n+1]^2 = c/[N_1+1]^2 = c/[N_2+1]^2 =.....$

$.....= c/[n+1]^2 = c(n_1)^2/[n-1+n_1]^2 = c(n_1n_2)^2/[n-1-n_1+n_1{}^2n_2{}^2]^2 =.....$

$$\mathbf{A_k(n) = d^2R_k(n)/dt^2 = -2cH_o(\Pi n_k)^2/(n-\Sigma\Pi n_{k-1}+\Pi n_k)^3}$$

$.....= -2cH_o/(n+1)^3 = -2cH_o/n_1(N_1+1)^3 = -2cH_o/n_1n_2(N_2+1)^3=.....$

$..... = -2cH_o/[n+1]^3 = -2cH_o\{n_1\}^2/[n-1+n_1]^3 = -2cH_o(n_1n_2)^2/[n-1-n_1+n_1n_2]^3 =.....$

G_oM_o is the Gravitational Parameter for the Baryon mass seed; Curvature Radius $R_H = c/H_o$ in the nodal Hubble parameter H_o and c is the speed of light

Hubble Parameters:

$H(n)|_{dS} = \{V_k(n)\}/\{R_k(n)\} = \{c[\Pi n_k]^2/[n-\Sigma\Pi n_{k-1}+\Pi n_k]^2\}/\{\Pi n_k.R_H[n-\Sigma\Pi n_{k-1}]/(n-\text{Ó}Pn_{k-1}+\Pi n_k)\} = \Pi n_kH_o/[n-\Sigma\Pi n_{k-1}][n-\Sigma\Pi n_{k-1}+\Pi n_k]$

$H(n)|_{dS} = \Pi n_kH_o/\{[n-\Sigma\Pi n_{k-1}][n-\Sigma\Pi n_{k-1}+\Pi n_k]\}$

$.....= H_o/\{[n][n+1]\}=H_o/T(n) = n_1H_o/\{[n-1][n-1+n_1]\} = n_1n_2H_o/\{[n-1-n_1][n-1-n_1+n_1n_2]\} =.....$ for dS

$H(n)'|_{dS} = H_o/[n-\Sigma\Pi n_{k-1}]$ for oscillating H'(n) parameter between nodes k and k+1 $||n_{ps}+\Sigma\Pi n_{k-1} - \Sigma\Pi n_k||$

$H(n)|_{AdS} = H(n)'|_{AdS} = \{V_k(n)\}/\{R_k(n)\} = c/\{R_H(n-\Sigma\Pi n_{k-1}\}$

$H(n)|_{AdS} = H(n)' = H_o/(n-\Sigma\Pi n_{k-1})$

$.....= H_o/n = H_o/(n-1) = H_o/(n-1-n_1) =.....$ for AdS

For initializing scale modulation $R_k(n)_{Ads}/R_k(n)_{dS} + ½ = \Pi n_kR_H(n-\Sigma\Pi n_{k-1})/\{\Pi n_kR_H(n-\Sigma\Pi n_{k-1})/(n-\Sigma\Pi n_{k-1}+\Pi n_k)\} + ½\Pi n_k = \{n - \Sigma\Pi n_{k-1} + \Pi n_k + ½\}$ reset coordinate

$dH/dt = (dH/dn)(dn/dt) = -\Pi n_k.H_o^2\{(2n-2\Sigma\Pi n_{k-1}+\Pi n_k)(n-\Sigma\Pi n_{k-1}+\Pi n_k+½\Pi n_k)\}/\{n^2-2n\Sigma\Pi n_{k-1}+(\Sigma\Pi n_{k-1})^2+\Pi n_k[n-\Sigma\Pi n_k]\}^2$

$= -2\Pi n_kH_o^2\{[n - \Sigma\Pi n_{k-1} + \Pi n_k]^2 - ¼\Sigma\Pi n_k^2\}/\{(n-\Sigma\Pi n_{k-1})(n-\Sigma\Pi n_{k-1}+\Pi n_k)\}^2$

$dH/dt|_{dS} = -2\Pi n_kH_o^2\{[n - \Sigma\Pi n_{k-1} + \Pi n_k]^2 - ¼(\Sigma\Pi n_k)^2\}/\{(n-\Sigma\Pi n_{k-1})(n-\Sigma\Pi n_{k-1}+\Pi n_k)\}^2$

$.....= -2H_o^2([n+1]^2-¼)/\{n[n+1]\}^2 = -2n_1H_o^2\{[n-1+n_1]^2-¼n_1^2\}/\{[n-1][n-1+n_1]\}^2 = -2n_1n_2H_o^2\{[n-1-n_1+n_1n_2]^2-¼n_1^2n_2^2\}/\{[n-1-n_1][n-1-n_1+n_1n_2]\}^2 =.....$

$dH/dt = (dH/dn)(dn/dt) = -H_oc/\{(R_H(n-\Sigma\Pi n_{k-1})^2\} = -H_o^2/\{n-\Sigma\Pi n_{k-1}\}^2$ for AdS

$dH/dt|_{AdS} = -H_o^2/\{n-\Sigma\Pi n_{k-1}\}^2$

$.....= -H_o^2/n^2 = H_o^2/(n-1)^2 = -H_o^2/(n-1-n_1)^2 = ...$

$dH/dt + 4\pi G_o\rho = - 4\pi G_oP/c^2$

$dH/dt + 4\pi G_oM_o/R_k(n)^3 = \Lambda_k(n)/R_k(n) = - 4\pi G_oP/c^2 = G_oM_o/R_k(n)^3 - 2(\Pi n_k)H_o^2/\{(n-\Sigma\Pi n_{k-1})(n-\Sigma\Pi n_{k-1}+\Pi n_k)^2\}$ for dS with

$\{-4\pi\}P(n)|_{dS} = M_oc^2/R_k(n)^3 - 2\Pi n_k(H_oc)^2/\{G_o(n-\Sigma\Pi n_{k-1})(n-\Sigma\Pi n_{k-1}+\Pi n_k)^2\} = M_oc^2(n-\Sigma\Pi n_{k-1}+\Pi n_k)^3/\{\Pi n_k.R_H(n-\Sigma\Pi n_{k-1})\}^3 - 2\Pi n_kH_o^2c^2/\{G_o(n-\Sigma\Pi n_{k-1})(n-\Sigma\Pi n_{k-1}+\Pi n_k)^2\}$

$\Lambda_k(n)/R_k(n) = -4\pi G_oP/c^2 = G_oM_o/R_k(n)^3 - dH/dt = G_oM_o/\{R_H(n-\Sigma\Pi n_{k-1})\}^3 - H_o^2/\{n-\Sigma\Pi n_{k-1}\}^2$ for AdS with

$\{-4\pi\}P(n)|_{AdS} = M_oc^2/R_k(n)^3 - (H_oc)^2/\{G_o(n-\Sigma\Pi n_{k-1})^2\} = M_oc^2/\{R_H(n-\Sigma\Pi n_{k-1})\}^3 - H_o^2c^2/\{G_o(n-\Sigma\Pi n_{k-1})^2\}$

<u>Deceleration Parameters:</u>

$q_{AdS}(n) = -A_k(n)R_k(n)/V_k(n)^2 = -\{(-2cH_o[\Pi n_k]^2)/(n-\Sigma\Pi n_{k-1}+\Pi n_k)^3\}\{\Pi n_kR_H(n-\Sigma\Pi n_{k-1})/(n-\Sigma\Pi n_{k-1}+\Pi n_k)\}/\{[\Pi n_k]^2c/(n-\Sigma\Pi n_{k-1}+\Pi n_k)\}^2 = 2(n-\Sigma\Pi n_{k-1})/\Pi n_k$

$q_{AdS+dS}(n) = 2(n-\Sigma\Pi n_{k-1})/\Pi n_k$

$q_{dS}(n) = 1/q_{AdS+dS}(n) - 1 = \Pi n_k/\{2[n-\Sigma\Pi n_{k-1}]\} - 1$

with $A_k(n)=0$ for AdS in $a_{reset} = R_k(n)_{AdS}/R_k(n)_{dS} + ½ = \{R_H(n-\Sigma\Pi n_{k-1})\}/\{R_H(n-\Sigma\Pi n_{k-1})/(n-\Sigma\Pi n_{k-1}+1)\} + ½ = n-\Sigma\Pi n_{k-1}+1+½$

Scalefactor modulation at $N_k = \{n-\Sigma\Pi n_{k-1}\}/\Pi n_k = ½$ reset coordinate

$.....= 2n = 2(n-1)/n_1 = 2(n-1-n_1)/(n_1n_2) =.....$ for AdS

$.....= 1/\{2n\} -1 = n_1/\{2[n-1]\} -1 = n_1n_2/\{2(n-1-n_1)\} -1 =.....$ for dS

<u>Temperature:</u>

$T(n) =\sqrt[4]{\{M_oc^2/(1100óð^2.R_k(n)^2.t_k)\}}$ and for $t_k = (n-\Sigma\Pi n_{k-1})/H_o$

$$T_k(n) = \sqrt[4]{}\{H_oM_oc^2(n-\Sigma\Pi n_{k-1}+\Pi n_k)^2/[1100\text{óð}^2.R_H{}^2.(n-\Sigma\Pi n_{k-1})^3]\}$$

$$=\sqrt[4]{}\{H_o{}^3M_o(n-\Sigma\Pi n_{k-1}+\Pi n_k)^2\}/\{1100\sigma\pi^2(n-\Sigma\Pi n_{k-1})^3\} = \sqrt[4]{}\{18.199(n-\Sigma\Pi n_{k-1}+\Pi n_k)^2/[(n-\Sigma\Pi n_{k-1})^3]\}$$

$$T(n) \;.....= \sqrt[4]{}\{18.2[n+1]^2/n^3\} = \sqrt[4]{}\{18.2[n-1+n_1]^2/(n-1)^3\} = \sqrt[4]{}\{18.2[n-1-n_1+n_1n_2]^2/(n-1-n_1)^3\} =.....$$

Comoving Redshift:

$$z + 1 = \sqrt{}\{(1+v/c)/(1-v/c)\} = \sqrt{}\{([n-\Sigma\Pi n_{k-1}+\Pi n_k]^2+[\Pi n_k]^2)/([n-\Sigma\Pi n_{k-1}+\Pi n_k]^2-[\Pi n_k]^2)\} =$$

$$\sqrt{}\{([n-\Sigma\Pi n_{k-1}]^2+2\Pi n_k(n-\Sigma\Pi n_{k-1})+2(\Pi n_k)^2)/([n-\Sigma\Pi n_{k-1}]^2+2\Pi n_k(n-\Sigma\Pi n_{k-1})\} = \sqrt{}\{1 + 2(\Pi n_k)^2/\{(n-\Sigma\Pi n_{k-1})(n-\Sigma\Pi n_{k-1}+2\Pi n_k)\}$$

$$z+1 = \sqrt{}\{ 1 + 2/\{[n^2-2n\Sigma\Pi n_{k-1} +(\Sigma\Pi n_{k-1})^2+2n-2\Sigma\Pi n_{k-1}\} = \sqrt{}\{1+2/\{n(n+2-2\Sigma\Pi n_{k-1}) + \Sigma\Pi n_{k-1}(\Sigma\Pi n_{k-1}-2)\}$$

$$....= \sqrt{}\{1+2/(n[n+2])\} = \sqrt{}\{1+2/([n-1][n-1+2n_1])\} = \sqrt{}\{1+2/([n-1-n_1][n-1-n_1+2n_1n_2])\} =......$$

Baryon-Dark Matter Saturation:

$\Omega_{DM} = 1-\Omega_{BM}$ until Saturation for BM-DM and Dark Energy Separation

$$\rho_{BM+DM}/\rho_{critical} = \Omega_oY^{\{[n-\Sigma\Pi n_{k-1}]/\Pi n_k\}}/\{(n-\Sigma\Pi n_{k-1})/(n-\Sigma\Pi n_{k-1}+\Pi n_k)\}^3 = M_oY^{\{[n-\Sigma\Pi n_{k-1}]/\Pi n_k\}}/\{\rho_{critical}R_k(n)^3\}$$

Baryon Matter Fraction $\Omega_{BM} = \Omega_oY^{\{N_k\}} = \Omega_o.Y^{\{[n-\Sigma\Pi n_{k-1}]/\Pi n_k\}}$

Dark Matter Fraction $\Omega_{DM} = \Omega_oY^{\{[n-\Sigma\Pi n_{k-1}]/\Pi n_k\}}\{1-\{(n-\Sigma\Pi n_{k-1})/(n-\Sigma\Pi n_{k-1}+\Pi n_k)\}^3/\{(n-\Sigma\Pi n_{k-1})/(n-\Sigma\Pi n_{k-1}+\Pi n_k)\}^3 = \Omega_oY^{\{[n-\Sigma\Pi n_{k-1}]/\Pi n_k\}}\{(n-\Sigma\Pi n_{k-1}+\Pi n_k)^3-(n-\Sigma\Pi n_{k-1})^3\}/\{n-\Sigma\Pi n_{k-1}\}^3$

$$= \Omega_oY^{\{[n-\Sigma\Pi n_{k-1}]/\Pi n_k\}}\{(1+\Pi n_k/[n-\Sigma\Pi n_{k-1}])^3 -1\} = \Omega_{BM}\{(1+\Pi n_k/[n-\Sigma\Pi n_{k-1}])^3 -1\}$$

Dark Energy Fraction $\Omega_{DE} = 1- \Omega_{DM} - \Omega_{BM} = 1 - \Omega_{BM}\{(1+\Pi n_k/[n-\Sigma\Pi n_{k-1}])^3\}$

Ω_{BM}=constant=0.0553575 from Saturation to Intersection with Dark Energy Fraction

$$\Omega_oY^{\{[n-\Sigma\Pi n_{k-1}]/\Pi n_k\}} = \rho_{BM+DM}R_k(n)^3/M_H = (N_k/[N_k+1]^3 = \{(n-\Sigma\Pi n_{k-1})/(n-\Sigma\Pi n_{k-1}+\Pi n_k)\}^3 = R_k(n)^3/V_H = V_{dS}/V_{AdS}$$

for $\rho_{BM+DM} = M_H/R_H^3 = \rho_{critical}$ and for Saturation at $N_i = 6.541188... = \text{constant} \forall N_i$

$(M_o/M_H).Y^{\{[n-\Sigma\Pi n_{k-1}]/\Pi n_k\}} = \{(n-\Sigma\Pi n_{k-1})/(n-\Sigma\Pi n_{k-1}+\Pi n_k)\}^3$ with a Solution for f(n) in Newton-Raphson Root Iteration and first Approximation x_0

$x_{k+1} = x_k - f(n)/f'(n) = x_k - \{(M_o/M_H).Y^{\{[n-\Sigma\Pi n_{k-1}]/\Pi n_k\}} - (n-\Sigma\prod n_{k-1})/(n-\Sigma\Pi n_{k-1}+\Pi n_k)^3\}/\{(M_o/M_H).[\ln Y]Y^{\{[n-\Sigma\Pi n_{k-1}]/\Pi n_k\}} - 3(n-\Sigma\Pi n_{k-1})^2/(n-\Sigma\Pi n_{k-1}+\Pi n_k)^4\}$

$x_1 = x_0 - \{(M_o/M_H).Y^{[n]} - (n/n+1)^3\}/\{(M_o/M_H).[\ln Y]Y^{[n]} - 3n^2/[n+1]^4\}$

$= x_0 - \{(M_o/M_H).Y^{\{N_0\}} - (N_0)^3/(N_0+1)^3\}/\{(M_o/M_H).[\ln Y]Y^{\{N_0\}} - 3(N_0)^2/1(N_0+1)^4\}$

$x_1 = x_0 - \{(M_o/M_H).Y^{\{[n-1]/n_1\}} - (n-1)^3/(n-1+n_1)^3\}/\{(M_o/M_H).[\ln Y]Y^{\{[n-1]/n_1\}} - 3(n-1)^2/(n-1+n_1)^4\}$

$= x_0 - \{(M_o/M_H).Y^{\{N_1\}} - (N_1)^3/(N_1+1)^3\}/\{(M_o/M_H).[\ln Y]Y^{\{N_1\}} - 3(N_1)^2/n_1(N_1+1)^4\}$

$x_1 = x_0 - \{(M_o/M_H).Y^{\{[n-1-n_1]/n_1n_2\}} - (n-1-n_1)^3/(n-1-n_1+n_1n_2)^3\}/\{(M_o/M_H).[\ln Y]Y^{\{[n-1-n_1]/n_1n_2\}} - 3(n-1-n_1)^2/(n-1-n_1+n_1n_2)^4\}$

$= x_0 - \{(M_o/M_H).Y^{\{N_2\}} - (N_2)^3/(N_2+1)^3\}/\{(M_o/M_H).[\ln Y]Y^{\{N_2\}} - 3(N_1)^2/n_1n_2(N_2+1)^4\}$

....

$n = 1.N_0 = N_i = 6.541188.... \Rightarrow N_i \forall i$ for $\prod n_k = n_0 = 1$

$n = n_1N_1+1 = (234.472)(6.541188...)+1 = 1534.725....$ for $\prod n_k = n_0n_1 = n_1$

$n = n_1n_2N_2+1+n_1 = (234.472 \text{x} 245.813)(6.541172)+1+234.472 = 377{,}244.12....$ for $\prod n_k = n_0n_1n_2 = n_1n_2$

......

<u>Baryon-Dark Matter Intersection:</u>

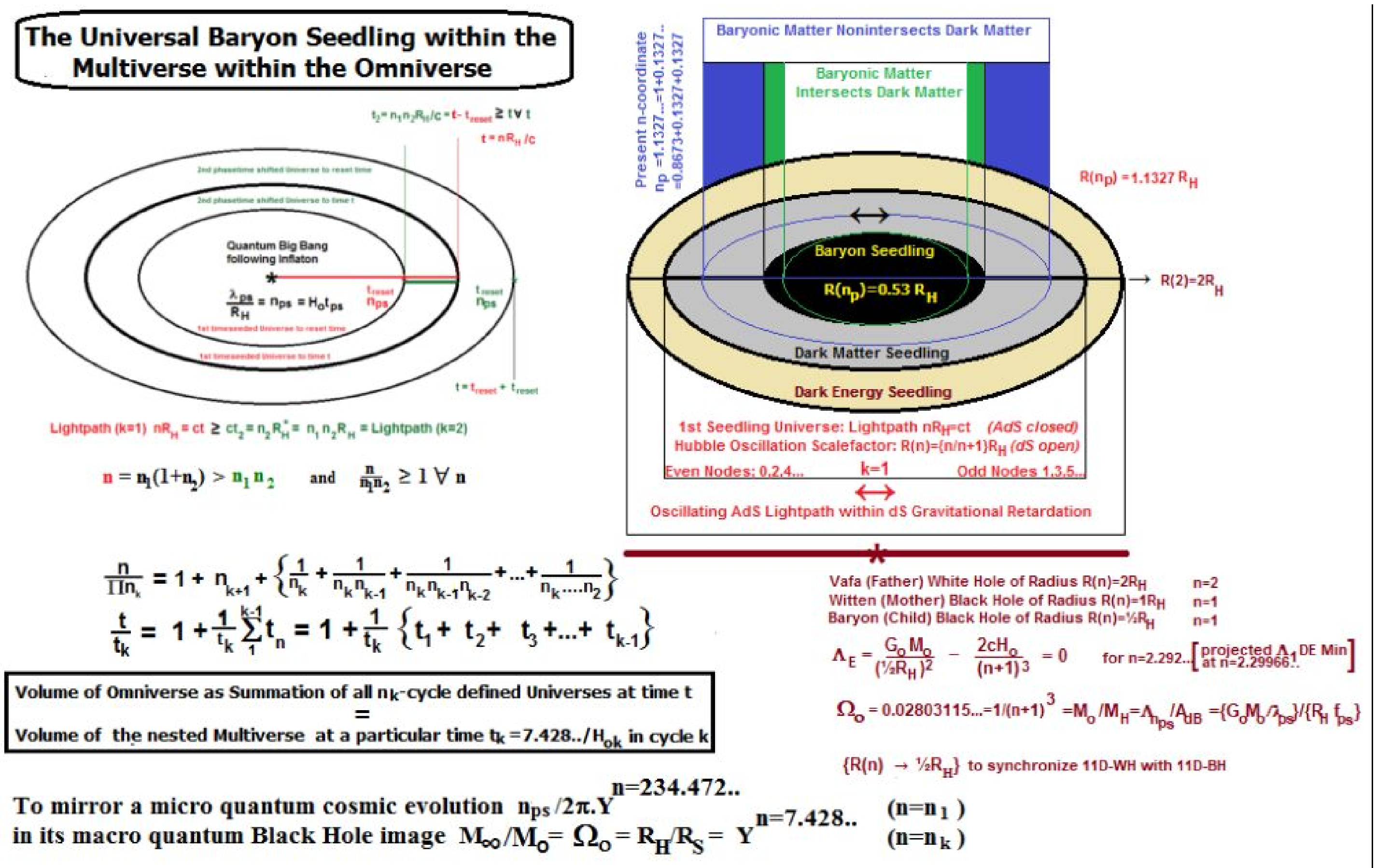
$N_k=\sqrt{2}$ for $n = \sqrt{2}.\Pi n_k + \Sigma\Pi n_{k-1}$

$n = 1.\sqrt{2} + 0 = n_0 =$

$n = n_1\sqrt{2} + 1 = 332.593 = n_1\sqrt{2} + 1$

$n = n_1n_2\sqrt{2} + 1 + n_1 = 81{,}745.461$

.....



Hypermass Evolution:

$Y_k^{\{(n-\Sigma\Pi n_{k-1})/\Pi n_k\}}$ = 2ðĐ$n_k.R_H/\lambda_{ps} = \Pi n_k.R_H/r_{ps} = \Pi n_k M_H{}^{*k}/m_H{}^{*k}$ for $M_H = c^2R_H/2G_o$ and $m_H = c^2r_{ps}/2G_o$

Hypermass $M_{Hyper} = m_H.Y_k^{\{(n-\Sigma\Pi n_{k-1})/\Pi n_k\}}$

$.....= Y^n = Y^{([n-1]/n_1)} = Y^{([n-1-n_1]/n_1 n_2)} =.....$

The Friedmann's acceleration equation and its form for the Hubble time derivative from the Hubble expansion equation substitutes a curvature k=1 and a potential cosmological constant term; absorbing the curvature term and the cosmological constant term, which can however be set to zero if the resulting formulation incorporates a natural pressure term applicable to all times in the evolvement of the cosmology.

Deriving the Instanton of the 4D-dS Einstein cosmology for the Quantum Big Bang (QBB) from the initial-boundary conditions of the de Broglie matter wave hyper expansion of the Inflaton in 11D AdS then enables a cosmic evolution for those boundary parameters in cycle time $n=H_ot$ for a nodal 'Hubble Constant' $H_o=dn/dt$ as a function for a time dependent expansion parameter $H(n)=H_o/T(n)=H_o/T(H_ot)$.

It is found, that the Dark Matter (DM) component of the universe evolves as a function of a density parameter for the coupling between the inflaton of AdS and the instanton of dS space times. It then is the coupling strength between the inflationary AdS brane epoch and the QBB dS boundary condition, which determines the time evolution of the Dark Energy (DE).

Parametrization of the expansion parameter H(n) then allows the cosmological constant term in the Friedmann equation to be merged with the scalar curvature term to effectively set an intrinsic density parameter at time instantenuity equal to Λ(n) for $\Lambda_{ps}=\Lambda_{QBB}=G_oM_o/\lambda_{ps}^2$ and where the wavelength of the de Broglie matter wave of the inflaton λ_{ps} decouples as the Quantum Field Energy of the Planck Boson String in AdS and manifests as the measured mass density of the universe in the flatness of 4D Minkowski spacetime.

3. Temperature Evolution in the Multiverse

In the early radiation dominated cosmology; the quintessence was positive and the matter energy dominated the intrinsic Milgröm deceleration from the Instanton $n=n_{ps}$ to n=0.18023 (about 3.04 Billion years) when the quintessence vanished and including a Recombination epoch when the hitherto opaque universe became transparent in the formation of the first hydrogen atoms from the quark-lepton plasma transmuted from the X-L Boson string class HO(32) of the Inflaton epoch preceding the Quantum Big Bang aka the Instanton.

From the modular membrane duality for wormhole radius $r_{ps} = \lambda_{ps}/2\pi$, the critical modulated Schwarzschild radius r_{ss} = 2ðë$_{ss}$ = $2\pi x10^{22}$ m* for $\lambda_{ps} = 1/\lambda_{ss}$

and for an applied scale factor a = n/[n+1] = ë$_{ss}$/R_H = {1-1/[n+1]}

for a $n=H_ot$ coordinate $n_{recombination} = 6.259485x10^{-5}$ or about $6.259485x10^{-5}$(16.88 Gy) = 1.056601 Million years

attenuated by exp{-hf/kT} = e^{-1} = 0.367879 to a characteristic cosmological time coordinate of 0.36788x1.056601 = 388,702 years after the Instanton n_{ps}.

The attenuation of the recombination coordinate then gives the cosmic temperature background for this epoch in the coordinate interval for the curvature radius

$R(n=2.302736x10^{-5}) = 3.67894x10^{21}$ m* to $R(n=6.259485x10^{-5}) = 10^{22}$ m*.

This radial displacement scale represents the size of a typical major galaxy in the cosmology; a galactic structure, which became potentialised in the Schwarzschild matter evolution and its manifestation in the ylemic prototypical first generation magnetar-neutron stars, whose emergence was solely dependent on the experienced cosmic temperature background and not on their mass distributions.

The temperature evolution of the Instanton can be written as a function of the luminosity L(n,T) with $R(n)=R_H(n/[n+1])$ as the radius of the luminating surface

$L(n_{ps},T(n_{ps})) = 6\pi^2\lambda_{ps}^2.\sigma.T_{nps}^4 = 2.6711043034x10^{96}$ Watts*, where σ = Stefan's Constant = $2\pi^5k^4/15h^3c^2$ and as a product of the defined 'master constants' k, h, c^2, π and 'e'.

$L(n,T) = 3H_oM_o.c^2/550n$ and for Temperature $T(n_{ps})$ ----------- $T(n_{ps}) = 2.93515511x10^{36}$ Kelvin*.

$T(n)^4 = H_oM_oc^2/(2\pi^2\sigma R_H^2[550n^3/[n+1]^2])$ for

$T(n)^4 = \{[n+1]^2/n^3\}H_oM_oc^2/(2\pi^2\sigma R_H^2[550]) = 18.1995\{[n+1]^2/n^3\}$ (K^4/V)*

for a temperature interval in using the recombination epoch coordinates $T(n_1=6.2302736\times10^{-5}) = 2945.42$ K* to $T(n_2=6.259485\times10^{-5}) = 2935.11$ K*

This manifests as a 'false vacuum' and as a temperature gradient, as a causation of the Big Bang Instanton on physical grounds.

The metaphysical ground is the symmetry breaking from the source parity violation described in the birth and necessity of the Graviton to resymmetrize the UFoQR.

$T(n_{ps})$ of the singularity is 0.0389 or 3.89% of the pre-singularity.

So the POTENTIAL Temperature manifests as 3.89% in the KINETIC Temperature' which doubles in the Virial Theorem to 7.78% as 2KE + PE = 0:

TEMPERATURE/$T(n_{ps})$=7.544808988..x10^{37}/2.93515511x10^{36}=25.705=1/0.03890...

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**

$e\text{-}1=1/n$ for $n=1/[e\text{-}1] = 1/Y^{n'} = X^{n'}$

n' = ln{e-1}/lnY = 1.12492010..
for a time coordinate 0.0075 or
about 126.58 Million years ago

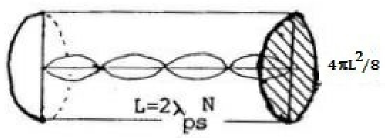
$$\boxed{e^{\frac{hf}{kT}} = 1 + \frac{1}{n} \quad \text{for} \quad n(f,T) = \frac{1}{e^{hf/kT} - 1}} \qquad \text{(Eq.\#26)}$$

Now consider the universe as a Black Body or a particle in a quantum box, the box being of course the quantumspace boundary r_{max}, itself bounded by omnispace as the 11-dimensional supermembrane, with 28 7-spheres relating to 26 bosonic dimensions via the quantization of Prime numbers as encountered.

The U-Field is quantized into 12-intersecting unified current loops and the extent is $4\lambda_{ps}=4\times10^{-22}$ m*.

We so consider the frequency interval $2\lambda_{ps}N$ and the "volume" of the black box is quantized

$N = L/2\lambda = Lf/2c$ with $dN = L.df/2c$ for $N^2 dN = (L^3f^2/8c^3)\,df$



Surface Area of a sphere as octant of a cubic box volume L^3

Now the "volume" of the box is $L^3/8$ and our dimensionless volume becomes the Number of FREQUENCY STATES for a black body with frequencies in the interval df. Since the temperature for a given frequency interval determines the distribution of the radiation spectrum, we determine the spectral distribution dE/df via

As a photon has two quantum polarization spin momenta, the Frequency States are doubled.

Frequency States $\quad 2\times4\pi N^2 dN = 8\pi L^3 f^2/8c^3\, df$

The number of photons in df: $\dfrac{8\pi f^2(V)}{c^3} \times \dfrac{1}{e^{hf/kT} - 1}\, df = dP$

$$dE = hf\, dP = \frac{8\pi h.V}{c^3} \cdot \frac{f^3}{e^{hf/kT} - 1}\, df$$

and the total energy in the cubic black box is: $\boxed{E = \int_0^\infty dE = \frac{8\pi hV}{c^3} \int_0^\infty \frac{f^3}{e^{hf/kT} - 1}\, df}$ (Eq.#27)

Since we evaluate for a given T, we set u=hf/kT and du=(h/kT)df and we need to evaluate the proportionality constant via the integral $\displaystyle\int_0^\infty \frac{u^3}{e^u - 1}\, du$

This can be written as: $\displaystyle\int_0^\infty \frac{u^3}{e^u - 1}\, du = \Gamma(3+1)\zeta(3+1)$

The GAMMA function $\Gamma(x)$ satisfies the form: $x = \dfrac{\Gamma(x+1)}{\Gamma(x)}$ as analogue to our $\dfrac{n+1}{n} = 1 + \dfrac{1}{n}$

generally $\Gamma(x) = \int_0^\infty t^{x-1} e^{-t}\, dt$ and for n a positive integer then $\Gamma(n+1) = n!.\Gamma(1) = n!$

The ZETA function of Riemann is defined as $\zeta(z) = \sum_{n=1}^{\infty} 1/(n^z)$

We require $\Gamma(4).\zeta(4) = 3! \cdot \sum_{n=1} 1/n^4 = 3! \cdot (1/1 + 1/2^4 + 1/3^4 + \ldots + 1/n^4 \ldots)$.

This we derive via the function $f(x)=x^4$ and the application of Fourier Series in $\cos(nx)$

$f(x)=x^4$ with period 2π, then $a_n = \frac{1}{\pi}\int_0^{2\pi} x^4.\cos(nx)dx = \frac{1}{\pi}\left\{\frac{4x^3}{n^2} - \frac{24x}{n^4}\right|_0^{2\pi} = \frac{32\pi^2}{n^2} - \frac{48}{n^4}$

for $n=0$, $a_0 = \frac{1}{\pi}\int_0^{2\pi} x^4\, dx = \frac{32\pi^4}{5}$

$f(x)=x^4 = \frac{1}{2}a_0 + \sum_{n=1}^{\infty} a_n.\cos(nx) = \frac{16\pi^4}{5} + \sum_{n=1}^{\infty}\left(\frac{32\pi^2}{n^2} - \frac{48}{n^4}\right).\cos(nx)$

$f(0)=f(2\pi)=\frac{1}{2}(0+16\pi^4)= 8\pi^4$ (Dirichlet Condition) and we use the result $\sum_{n=1}^{\infty}\frac{1}{n^2} = \frac{\pi^2}{6}$

and obtained similarly in setting $f(x)=x^2$.

Then for $f(0)$, we have $\frac{24\pi^4}{5} = 32\pi^2.\frac{\pi^2}{6} - 48\sum_{n=1}^{\infty}\frac{1}{n^4}$ and $\sum_{n=1}^{\infty}\frac{1}{n^4} = \frac{\pi^4}{90}$

Total Energy $E = \frac{3!\,\pi^4\, V.8\pi k^4 T^4}{90h^3c^3} = \frac{4V}{c}\left[\frac{2\pi^5k^4}{15h^3c^2}\right]T^4 = \frac{4\sigma VT^4}{c}$

Stefan-Boltzmann Constant σ

$\frac{\text{Radiation Energy}}{\text{Matter Energy}} = \frac{4\sigma T^4}{m_c Y^n c^3}$ **for Radiation Pressure = Matter Pressure**

Early Universe Later Universe

$T_{Equilibrium} = \sqrt[4]{18.20\,\frac{(n+1)^2}{n^3}} = \sqrt[4]{\frac{m_c Y^n c^3}{4\sigma}}$ $\frac{n^3 Y^n}{n^2+2n+1} = \frac{72.80\sigma}{m_c c^3} = (1.65107\times10^{-4})\ (K^4/V)^*$

A Cosmic Background temperature of 18.35 Kelvin* for a cycle coordinate of 0.056391 and as 0.056391(16.88 Gy) or 951.2 Million Years after the Instanton to begin the birthing of galaxies

Applying the actual VPE at the Instanton to this temperature gradient:

$r_{VPE}/r_{EMR} = \{4\pi E_{ps}/\lambda_{ps}^3\}/\{8\pi^5E_{ps}^4/15h^3c^3\} = 15/2\pi^4 = 0.07599486.. = 1/12.9878..$ indicating the proportionality $E_{VPE}/E_{EMR} = 2T_{ps}/T_{potential}$ at the Instanton from the Inflaton as a original form of the

virial theorem, stating the Kinetic Energy of the Instanton and the QBB Lambda to be twice the Potential Energy of the de Broglie wave matter Inflaton, then manifesting as the $M_o/2M_{Hubble} = r_{Hyper}/2R_{Hubble}$ Schwarzschild mass cosmo-evolution.

Now reducing the timeinstanton $t_{ps}=n_{ps}/H_o$ of 3.33×10^{-31} seconds by the Temperature Gradient in the Luminosity Function gives you the scalar Higgs Potential Maximum at a pre-singularity time of $t_{HiggsPE}=t_{ps}.T(n_{ps})/\text{TEMPERATURE}=1.297\times10^{-32}$ seconds.

This then extrapolates the Big Bang singularity backwards in Time to harmonise the equations and to establish the 'driving force of the vacuum' as potential scalar Higgs Temperature Field.

All the further evolvement of the universe so becomes a function of Temperature and not of mass.

The next big phase transition is the attunement of the BOSONIC UNIFICATION, namely the 'singularity' temperature $T_{ps}=1.41\times10^{20}$ K with the Luminosity function.

This occurs at a normal time of 1.9 nanoseconds into the cosmology.

It is then that the universe as a unity has this temperature and so allows BOSONIC differentiation between particles. The INDIVIDUATED PHOTON of the mass was born then and not before, as the entire universe was a PHOTON as a macro quantized superstring up to then.

The size of the universe at that time was that of being 1.14 meters across.

Next came the electroweak symmetry breaking at 1/365 seconds and at a temperature of so 10^{15} Kelvin* and so it continued.

The lower dimensional light path x=ct in lightspeed invariance c=λf so becomes modular dualised in the higher dimensional lightpath of the tachyonic de Broglie Inflaton-Instanton $V_{debroglie}=c/n_{ps}$ of the Inflaton.

$\{(2-n)(n+1)\}^3/n^3 = V_{dS'}/V_{dS}$ ......(4.36038 for $n_{present}$) in the first completing Hubble cycle

$n^3/(2-n)^3 = V_{AdS}/V_{dS'}$ .... (2.22379 for $n_{present}$) in the first completing Hubble cycle

$(n+1)^3 = V_{AdS}/V_{dS}$ ....(9.69657 for $n_{present}$) in the first completing Hubble cycle

$\rho_{critical} = 3H_o^2/8\pi G_o$ {Sphere} and $H_o^2/4\pi^2 G_o$ {Hypersphere-Torus in factor 3π/2} (constant for all n per Hubble cycle)

$\rho_{critical} = 3.78782\times10^{-27}$ [kg/m^3]* and 8.038003×10^{-28} [kg/m^3]*

$\rho_{dS}V_{dS} = \rho_{dS'}V_{dS'} = \rho_{AdS}V_{AdS} = \rho_{critical}V_{Hubble} = M_{Hubble} = c^2R_H/2G_o = 6.47061227\times10^{52}$ kg*

A general dark energy equation for the kth universe (k=0,1,2,3,...) in terms of the parametrized Milgröm acceleration A(n); comoving recession speed V(n) and scalefactored curvature radius R(n):

G_oM_o is the Gravitational Parameter for the Baryon mass seed; $R_H=c/H_o$ is the second nodal Hubble parameter H_o curvature radius and c is the speed of light

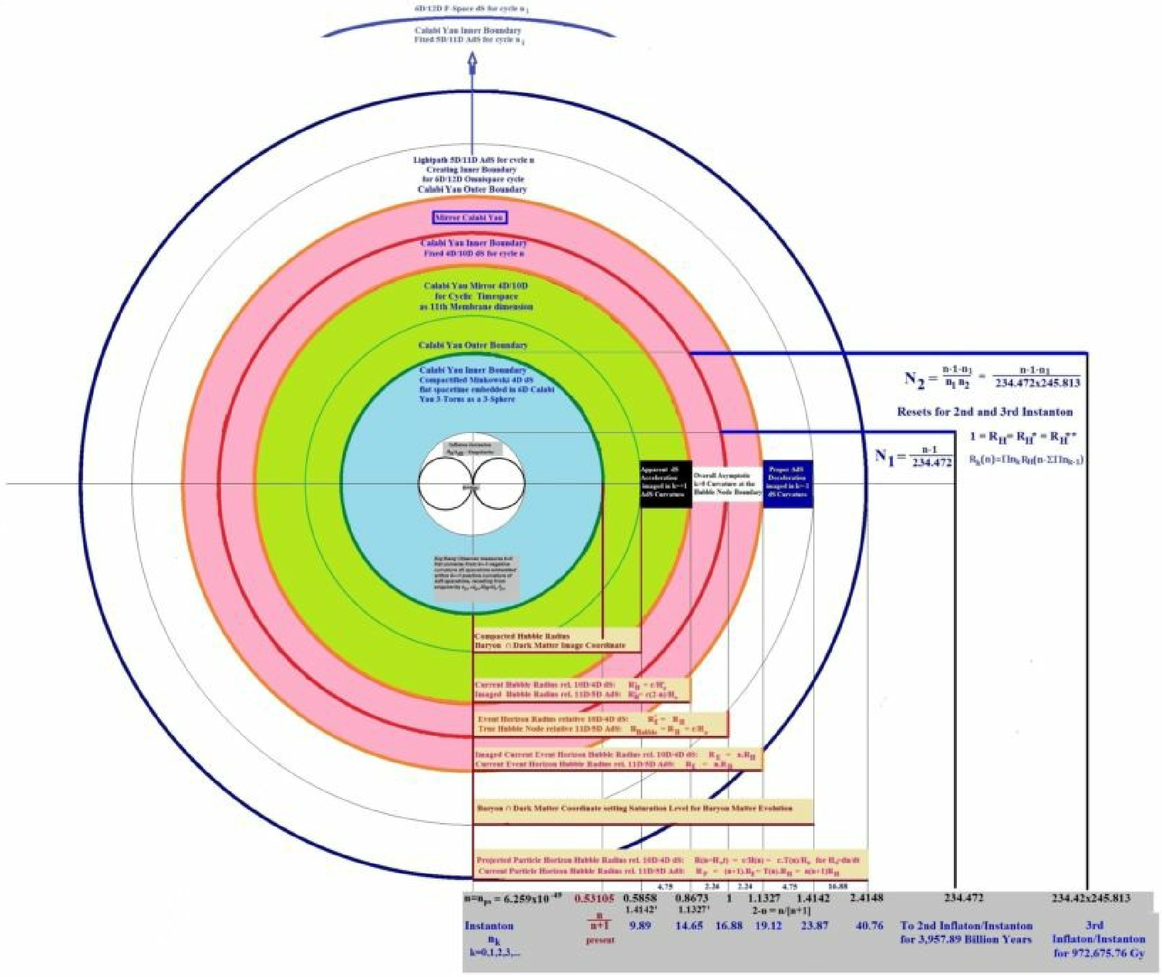
$\Lambda_k(n) = G_oM_o/R_k(n)^2 - 2cH_o(\Pi n_k)^2/\{n-\Sigma\Pi n_{k-1}+\Pi n_k)\}^3$ and where $\Pi n_k = 1 = n_o$ for k=0

$$N_k = \frac{H_o t_k}{\Pi n_k} = \frac{n - \Sigma\Pi n_{k-1}}{\Pi n_k}$$

$R_k(n) = \Pi n_k R_H(n-\Sigma\Pi n_{k-1})/\{n-\Sigma\Pi n_{k-1}+\Pi n_k\} = R_H(n/[n+1]) = n_1R_H(N_1/[N_1+1]) = n_1n_2R_H(N_2/[N_2+1]) = ...$

$V_k(n) = dR_k(n)/dt \; ..... = c\{\Pi n_k\}^2/\{n-\Sigma\Pi n_{k-1}+\Pi n_k\}^2 = c/(n+1)^2 = c/(N_1+1)^2 = c/(N_2+1)^2 = ...$

$A_k(n) = d^2R_k(n)/dt^2 \; ..... = -2cH_o(\Pi n_k)^2/(n-\Sigma\Pi n_{k-1}+\Pi n_k)^3 = -2cH_o/(n+1)^3 = -2cH_o/n_1(N_1+1)^3 = -2cH_o/n_1n_2(N_2+1)^3 = ...$



3. The first Ylemic Stars in the Universe

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 a used to describe the stability conditions for collapsing molecular hydrogen clouds to form stars say, are well known in the scientific data base, say in formulations such as:

M_J=3kTR/2Gm for a Jeans Length of: R_J=√{15kT/(4πρGm)}=R_J =√(kT/Gnm^2).

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=NkT for n moles of substance being the Number N of molecules (say) divided by Avogadro's Constant L in n=N/L .

Since the Ideal Gas Constant R divided by Avogadro's Constant L and defines Boltzmann's Constant k=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 2.KE=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).(NkT)=GMm/R with m the mass of a nucleon or Hydrogen atom and M=M_J=3kTR/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 is Boltzmann Constant, T is the temperature of the cloud, r is the radius of the cloud, μ is the 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 is 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 analyse this expansion in the form of the Jeans Radius of the first proto-stars, 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 say molecular level.

This analysis so defines the ylemic neutron stars as 'Gamov proto-stars' 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)kT for molar volume as $N=(R/R_e)^3$ for $dH=3kTR^2/R_e^3$.

$\Omega(R)= -\int G_oMdm/R = -\{3G_om_c^2/(R_e^3)^2\}\int R^4dR = -3G_om_c^2R^5/R_e^6$ for

$dm/dR=d(\rho V)/dR=4\pi\rho R^2$ and for $\rho=3m_c/4\pi R_e^3$

For equilibrium, the requirement is that dH=dΩ in the minimum condition dH+dΩ=0.

This gives: $dH+d\Omega=3kTR^2/R_e^3 - 16G_o\pi^2\rho^2R^4/3=0$ and the ylemic radius as:

$$\mathbf{R_{ylem}=\sqrt{\{kTR_e/G_om_c^2\}}}$$

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 proto-stars 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.

For long a cosmological conundrum, it could not be modelled 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 1 km mass concentrations, required for 'ordinary' gravity to assume control.

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

The stellar evolution from the ylemic (di-neutronic) 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 derived from the Stefan-Boltzmann-Law and the related statistical frequency distributions.

We have the GR metric for Schwarzschild-Black Hole Evolution as $R_S=2GM/c^2$ as a function of the star's Black Hole's mass M and we have the ylemic Radius as a function of temperature only as $R_{ylem}\sqrt{(kT.R_e^3/G_o m_c^2)}$.

The nucleonic mass-seed $m_c=m_P.\text{Alpha}^9$ 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 then indicates a specific mass a specific temperature and a specific radius.

Those we call the Chandrasekhar Parameters:

$M_{Chandra}$=1.5 solar Masses=3×10^{30} kg and $R_{Chandra}=2G_oM_{Chandra}/c^2$ or 7407.40704..metres, which is the typical neutron star radius inferred today.

$T_{Chandra}=R_{Chandra}{}^2.G_o m_c{}^2/kR_e{}^3=1.985\times10^{10}$ K for Electron Radius R_e and Boltzmann's Constant k.

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:

$R_{ylem}=0.05258..\sqrt{T}=(0.0753).[(n+1)^2/n^3]^{[1/8]}$

$R_{ylem}(n_{present}=1.132711..)=0.0868..$ m* for a $T_{ylem}(n_{present})=2.728$ 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 proto-stars (say as $n_{Chandra}'$), defined not in manifested mass (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 $n_{Chandra}'=4.64\times10^{-23}$ and so a time of $t_{Chandra}'=n_{Chandra}'/H_o=n_{Chandra}'/1.88\times10^{-18}=2.47\times10^{-5}$ seconds.

QR defines the Weyl-Temperature limit for Bosonic Unification as 1.9 nanoseconds at a temperature of 1.4×10^{20} Kelvin and the weak-electromagnetic unification at 1/365 seconds at $T=3.4\times10^{15}$ K.

So we place the first ylemic proto-star after the bosonic unification (before which the plenum was defined as undifferentiated 'bosonic plasma'), but before the electro-weak unification, which defined the Higgs-Bosonic rest mass induction via the weak interaction vector-bosons and allowing the di-neutrons 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:

$T^4=18.20(n+1)^2/n^3=1.16\times10^{17}$ 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 we 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 $n_{Chandra}=4.89\times10^{-14}$ and $t_{Chandra}=26{,}065$ seconds or so 7.24 hours.

The Radius $R(n_{Chandra})=7.81\times10^{12}$ metres or 7.24 lighthours.

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 super giants 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 an ylemic radius of 1.8 km as the di-neutronic 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 towards this size, where then 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. So neutrino- and quark blueprints micro-macro dance their basic definition as the holographic projections of the space-time quanta.

Now because the Electron Radius is directly proportional to the linearised wormhole perimeter and then the Compton Radius via Alpha in

$R_e=10^{10}\lambda_{wormhole}/360=e^*/2c^2=Alpha.R_{Compton}$, the Chandrasekhar White Dwarf limit should be doubled to reflect the protonic diameter mirrored in the classical electron radius.

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 Black Hole phase transition at the $R_e/2$ scale, corresponding to a mass of $8M_{Chandra}=24x10^{30}$ kg* or 12 solar masses.

The maximum ylemic radius so is found from the constant density proportion ρ=M/V:

$(R_{ylemmax}/R_e)^3=M_{Chandra}/m_c$ for $R_{ylemmax}$=40.1635 km.

The corresponding ylemic temperature is 583.5 Billion K for a CMBBR-time of 287 seconds or so 4.8 minutes from a $n=5.4x10^{16}$, 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 2,334 Billion K for a n-cycle time of $8.5x10^{17}$ and a CMBBR-time of so 45 seconds and when the universe had a radius of 13.6 Million km or was so 27 Million km across.

The first ylemic proto-star 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 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 and 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 $1/\lambda_{wormhole}=\lambda_{antiwormhole}=\lambda_{galaxyserpent}=10^{22}$ metres or so 1.06 Million ly 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 $2\pi\lambda_{antiwormhole}$ metres in the linearisation of the Planck-length encountered before in an earlier discussion.

$R(n_{decoupling})=R_{max}(n_{decoupling}/(n_{decoupling}c+1))=10^{22}$ metres for $n_{decoupling}=6.26\times10^{-5}$ and so for a CMBBR-Temperature of about T=2935 K for a galactic proto-core then attenuated in so 37% for $n_{decouplingmin}=1.0\times10^{-6}$ for $R=\lambda_{antiwormhole}/2\pi$ and $n_{decouplingmax}=3.9\times10^{-4}$ 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 initialisation of the VPE and the birth of the first ylemic proto-stars as a decoupling minimum. The ylemic mass currents were purely monopolic and known as superconductive cosmic strings, consisting of nucleonic neutrons, each of mass m_c.

If we assign this timeframe to the maximised ylemic radius and assign our planetesimal limit of fusion temperature 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 proto-stars at a temperature of the CMBBR of about 744 Kelvin.

The universe had a tremperature of 744 K for $n_{decouplingmax}=3.9\times10^{-4}$ 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 proto-stars of so 7 Million years after the Big Bang.

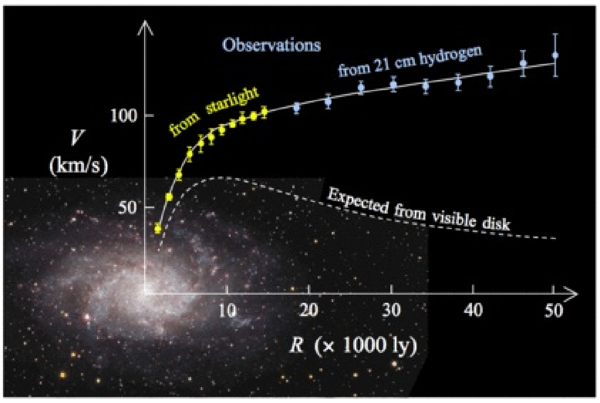
The important cosmological consideration is that of distance-scale modulation.

The Black Hole Schwarzschild metric is the inverse of the galactic scale metric.

The linearisation 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 on the scale of 0.002 to 0.001 will so reflect the eigen energy quantum of the wormhole as a heterotic Planck-Boson-Weyl-String or as the magneto charge as 1/500, being the mapping of the Stoney-Planck-Length-Bounce as $e=l_P.c^2\sqrt{Alpha}$ onto the electron radius in $e^*=2R_e.c^2=1/E_{ps}=\lambda_{ps}/hc$ in the modular string-T-duality applied to the self-dual monopole as string class IIB.

4. A Synthesis of LCDM with MOND in an Universal Lambda Milgröm Deceleration



[Excerpt from Wikipedia:

https://en.wikipedia.org/wiki/Modified_Newtonian_dynamics

Several independent observations point to the fact that the visible mass in galaxies and galaxy clusters is insufficient to account for their dynamics, when analysed using Newton's laws. This discrepancy – known as the "missing mass problem" – was first identified for clusters by Swiss astronomer Fritz Zwicky in 1933 (who studied the Coma cluster),[4][5] and subsequently extended to include spiral galaxies by the 1939 work of Horace Babcock on Andromeda.[6] These early studies were augmented and brought to the attention of the astronomical community in the 1960s and 1970s by the work of Vera Rubin at the Carnegie Institute in Washington, who mapped in detail the rotation velocities of stars in a large sample of spirals. While Newton's Laws predict that stellar rotation velocities should decrease with distance from the galactic centre, Rubin and collaborators found instead that they remain almost constant[7] – the rotation curves are said to be "flat". This observation necessitates at least one of the following: 1) There exists in galaxies large quantities of unseen matter which boosts the stars' velocities beyond what would be expected on the basis of the visible mass alone, or 2) Newton's Laws do not apply to galaxies. The former leads to the dark matter hypothesis; the latter leads to MOND.

MOND was proposed by Mordehai Milgrom in 1983

The basic premise of MOND is that while Newton's laws have been extensively tested in high-acceleration environments (in the Solar System and on Earth), they have not been verified for objects with extremely low acceleration, such as stars in the outer parts of galaxies. This led Milgrom to postulate a new effective gravitational force law (sometimes referred to as "Milgrom's law") that relates the true acceleration of an object to the acceleration that would be predicted for it on the basis of Newtonian mechanics.[1] This law, the keystone of MOND, is chosen to reduce to the Newtonian result at high acceleration but lead to different ("deep-MOND") behaviour at low acceleration:

$$\mathbf{F_N} = m\mu\left(\frac{a}{a_0}\right)\mathbf{a} \quad \text{........(1)}$$

Here $\mathbf{F_N}$ is the Newtonian force, m is the object's (gravitational) mass, **a** is its acceleration, μ(x) is an as-yet unspecified function (known as the "interpolating function"), and a_0 is a new fundamental constant which marks the transition between the Newtonian and deep-MOND regimes. Agreement with Newtonian mechanics requires $\mu(x) \rightarrow 1$ for $x >> 1$, and consistency with astronomical observations requires $\mu(x) \rightarrow x$ for $x << 1$. Beyond these limits, the interpolating function is not specified by the theory, although it is possible to weakly constrain it empirically.[8][9] Two common choices are:

$$\mu\left(\frac{a}{a_0}\right) = \left(1 + \frac{a_0}{a}\right)^{-1}$$ ("Simple interpolating function"),

and

$$\mu\left(\frac{a}{a_0}\right) = \left(1 + \left(\frac{a_0}{a}\right)^2\right)^{-1/2}$$ ("Standard interpolating function").

Thus, in the deep-MOND regime ($a \ll a_0$):

$$F_N = ma^2/a_0$$

Applying this to an object of mass m in circular orbit around a point mass M (a crude approximation for a star in the outer regions of a galaxy), we find:

$$\frac{GMm}{r^2} = m\frac{\left(\frac{v^2}{r}\right)^2}{a_0} \Rightarrow v^4 = GMa_0$$ ....(2)

that is, the star's rotation velocity is independent of its distance r from the centre of the galaxy – the rotation curve is flat, as required. By fitting his law to rotation curve data, Milgrom found $a_0 \approx 1.2 \times 10^{-10}$ m s^{-2} to be optimal. This simple law is sufficient to make predictions for a broad range of galactic phenomena.

Milgrom's law can be interpreted in two different ways. One possibility is to treat it as a modification to the classical law of inertia (Newton's second law), so that the force on an object is not proportional to the particle's acceleration **a** but rather to $\mu(a/a_0)$**a**. In this case, the modified dynamics would apply not only to gravitational phenomena, but also those generated by other forces, for example electromagnetism.[10] Alternatively, Milgrom's law can be viewed as leaving Newton's Second Law intact and instead modifying the inverse-square law of gravity, so that the true gravitational force on an object of mass m due to another of mass M is roughly of the form $GMm/(\mu(a/a_0)r^2)$. In this interpretation, Milgrom's modification would apply exclusively to gravitational phenomena.

[End of excerpt]

For **LCDM:**

acceleration a: $a = G\{M_{BM}+m_{DM}\}/R^2$

For MOND:

acceleration a: $a+a_{mil} = a\{a/a_o\} = GM_{BM}/R^2 = v^4/a_o.R^2$ for $v^4 = GM_{BM}a_o$

$a_{mil} = a\{a/a_o-1\} = a\{a-a_o\}/a_o = GM_{BM}/R^2 - a$

For Newtonian acceleration a: $G\{M_{BM}+m_{DM}\}/R^2 = a = GM_{BM}/R^2 - a_{mil}$

a_{mil} = - Gm_{DM}/R^2 = $(a/a_o)(a-a_o)$ and relating the Dark Matter to the Milgröm constant in interpolation a_{mil}

for the Milgröm deceleration applied to the Dark Matter and incorporating the radial independence of rotation velocities in the galactic structures as an additional acceleration term in the Newtonian gravitation as a function for the total mass of the galaxy and without DM in MOND.

Both, LCDM and MOND consider the Gravitational 'Constant' constant for all accelerations and vary either the mass content in LCDM or the acceleration in MOND in the Newtonian Gravitation formulation respectively.

The standard gravitational parameter GM in a varying mass term G(M+m) = M(G+ΔG) reduces to Gm=ΔGM for a varying Gravitational parameter G in (G+ΔG) = f(G).

The Dark Matter term Gm_{DM} can be written as $Gm_{DM}/R^2 = -a_{mil} = a - a^2/a_o$ = DGM/R^2 to identify the Milgröm acceleration constant as an intrinsic and universal deceleration related to the Dark Energy and the negative pressure term of the cosmological constant invoked to accommodate the apparent acceleration of the universal expansion (q_{dS} = -0.55858).

$\Delta G = G_o - G(n)$ in $a_{mil} = -2cH_o/[n+1]^3 = \{G_o-G(n)\}M/R^2$ for some function G(n) descriptive for the change in f(G).

The Milgröm constant so is not constant, but emerges as the initial boundary condition in the Instanton aka the Quantum Big Bang and is identfied as the parametric deceleration parameter in Friedmann's solutions to Einstein's Field Equations in $a_{mil}.a_o = a(a-a_o)$ and $a_o(a_{mil} + a) = a^2$ or $a_o = a^2/(a_{mil}+a)$.

$A(n) = -2cH_o/[n+1]^3 = -2cH_o^2/R_H[n+1]^3$ and calculates as $-1.112663583\text{x}10^{-9}$ $(m/s^2)^*$ at the Instanton and as $-1.1614163\text{x}10^{-10}$ $(m/s^2)^*$ for the present time coordinate.

The Gravitational Constant $G(n)=G_oX^n$ in the standard gravitational parameter represents a fine structure in conjunction with a subscale quantum mass evolution for a proto nucleon mass

$m_c = \text{alpha}^9.m_{Planck}$ from the gravitational interaction fine structure constant $a_g = 2\pi G_o m_c^2/hc = 3.438304..\text{x}10^{-39} = \text{alpha}^{18}$ to unify electromagnetic and gravitational quantum interactions.

The proto nucleon mass $m_c(n)$ so varies as complementary fine structure to the fine structure for G in m_cY^n for a truly constant G_o as defined in the interaction unification.

$G(n)M(n)=G_oX^n.M_oY^n = G_oM_o(XY)^n = G_oM_o$ in the macro evolution of baryonic mass seedling M_o and G_om_c in the micro evolution of the nucleonic seed remain constant to describes a particular fine structure for the timeframe in the cosmogenesis when the nonluminous Dark Matter remains separate from the luminous Baryon mass.

The DM-BM intersection coordinate is calculated for a cycle time $n=H_ot$=1.4142..or at an universal true electromagnetic age of 23.872 billion years.

At that time, the {BM-DM-DE} mass density distribution will be {5.536%; 22.005%; 72.459%}, with the G(n)M(n) assuming a constant value in the Hubble cycle.

The Dark Energy pressure will be $P_{PBM\cap DM} = -3.9300\text{x}10^{-11}$ $(N/m^2)^*$ with a corresponding 'quasi cosmological constant' of $L_{BM\cap DM} = -6.0969\text{x}10^{-37}$ $(s^{-2})^*$.

Within a local inertial frame of measurement; the gravitational constant so becomes a function of the micro evolution of the proto nucleon mass m_c from the string epoch preceding the Instanton.

A localized measurement of G so engages the value of the mass of a neutron as evolved m_c in a coupling to the evolution of the macro mass seedling M_o and so the baryonic omega

$\Omega_o = M_o/M_H = 0.02803$ in the critical density $\rho_{critical} = 3H_o^2/8\pi G_o = 3M_H/4\pi R_H^3 = 3c^2/8\pi G_o R_H^2$ for the zero curvature and a Minkowski flat cosmology.

The fine structure for G so engages both the micro mass m_c and the macro mass M_o, the latter being described in the overall Hypermass evolution of the universe as a Black Hole cosmology in a 5/11D AdS 'closed' spacetime encompassing the dS space-time evolution of the 4/10D 'open' universe.

Details are described in a later section of this discourse.

The Milgröm 'constant' so relates an intrinsic Dark Energy cosmology to the macrocosmic hyper mass evolution of Black Holes at the cores of galaxies and becomes universally applicable in that context.

No modification of Newtonian gravitation is necessary, if the value of a locally derived and measured G is allowed to increase to its string based (Planck-Stoney) value of $G_o = 1/k = 4\pi\varepsilon_o = 1.111..x10^{-10}$ string unification units [$C^* = m^3/s^2$] and relating spacial volume to angular acceleration in gravitational parameter GM.

The necessity for Dark Matter to harmonise the hyper mass evolution remains however, with the Dark Energy itself assuming the form of the Milgröm deceleration.

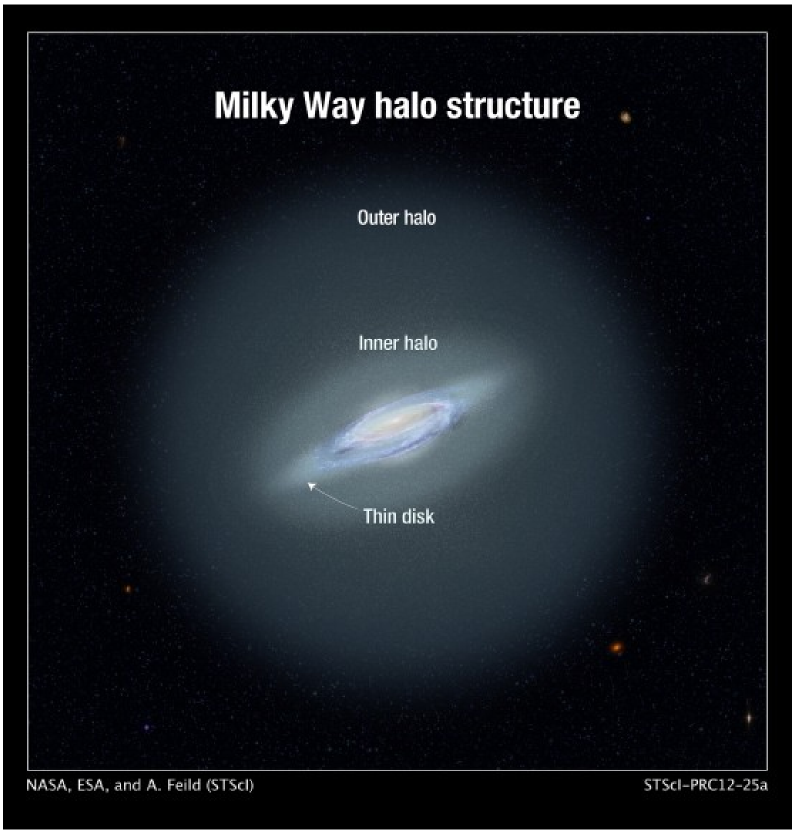
$a_{mil} = -2cH_o/[n+1]^3 = -\{G_o - G(n)\}M/R^2 = -G_o\{1-X^n\}M/R^2$ for the gravitational parameter GM coupled to the size of a galactic structure harbouring a central Black Hole-White Hole/Quasar power source.

$$\mathbf{G_oM/R^2 = 2cH_o/\{(1-X^n)(n+1)^3\}}$$

For a present n=1.132711 ......$\{(1-X^n)(n+1)\}^3 = 4.07617837...$,then for M/R^2 = constant = 2.4875586...

For the Milky Way barred spiral galaxy and a total BM+DM mass of $1.7x10^{42}$ kg, the mass distribution would infer a diameter of $8.2668x10^{20}$ m or 87,321.56 light years, inclusive the Dark Matter halo extension.

For the Andromeda barred spiral galaxy and a total BM+DM mass of $3x10^{42}$ kg, the galaxy's diameter would increase to $1.0982x10^{21}$ m or 116,000 light years for a total matter distribution.



For more details:

https://cosmosdawn.net/forum/threads/a-revision-of-the-friedmann-cosmology.2559/#post-10103

https://cosmosdawn.net/forum/threads/cosmogenesis-a-story-of-creation-in-membrane-mirror-symmetry.1524/

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