Exploration

A Revelatory Eschatology & Genesis: IX. Quantization of Mass, String Unification Physics, Supersymmetric Quark-Lepton Hierarchy & the Higgs Boson

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Abstract

In this article, the author partly uses metaphors to explore quantization of mass, string unification physics, supersymmetric quark-lepton hierarchy & the Higgs boson in a revelatory eschatology and genesis.

Keywords: Revelation, eschatology, genesis, quantization of mass, string unification, supersymmetric, quark-lepton hierarchy, Higgs boson.

The Coupling of the Energy Laws by the Self-Frequency of the Quantum for Mass

The universe contains an intrinsic coupling-parameter between its inertial mass content and its non-inertial energy content.

The matter in the universe is described by the physical parameter termed Mass (M), say as proportional to Energy (E) in Einstein's famous equation Mass $M = E/c^2$.
This mass M then reappears in Newtonian mechanics as the change in momentum (p) defining the Inertial Mass (M_i) as being proportional to some applied Force (F) or the 'work done' for a particular displacement {$F = dp/dt$ for $p = mv$ and v a kinematic velocity as the ratio of displacement over time generalised in the light path $X = cT$}.

It is also well understood, that the inertial mass M_i has a gravitational counterpart described not by the change in momentum of inertia carrying matter agglomerations; but by the geometric curvature of space containing matter conglomerations. This Gravitational Mass M_g is measured to be equivalent to the Inertial Mass M_i and is formulated in the 'Principle of Equivalence' in Einstein's Theory of General Relativity.

F-Theory then has shown, that this Inertial Mass M_i is coupled inherently to a 'mass-eigen' frequency via the following formulation:

(1) Energy $E = hf = mc^2$ (The Combined Planck-Einstein Law)
(2) $E = hf$ iff $m = 0$ (The Planck Quantum Law $E = hf$ for light speed invariance $c = \lambda f$)
(3) $E = mc^2$ iff $f = f_o = f_{ss}$ (The Einstein Law $E = mc^2$ for the light speed upper limit)

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(1) Whenever there is mass ($M = M_i = M_g$) occupying space; this mass can be assigned either as a photonic mass {by the Energy-Momentum relation of Special Relativity: $E^2 = E_o^2 + (pc)^2$} by the photonic momentum $p = h/\lambda = hf/c$} OR a 'rest mass' $m_o = m/\sqrt{[1-(v/c)^2]}$ for 'rest energy' $E_o = m_oc^2$.

The 'total' energy for the occupied space so contains a 'variable' mass in the 'combined' law; but allows particularisation for electromagnetic radiation (always moving at the Maxwell light speed constant c in Planck's Law and for the 'Newtonian' mass M in the Einstein Law.

(2) If M = 0, then the Einstein Law is suppressed in favour of the Planck Law and the space contained energy E is photonic, i.e. electromagnetic, always dynamically described by the constancy of light speed c.

(3) If M>0, then there exists a mass-eigen frequency $f_{ss} = f_o = E_{ss}/h = m_{ss}c^2/h$, which QUANTIZES all mass agglomerations $m = \Sigma m_{ss}$ in the mass quantum $m_{ss} = E_{ss}/c^2$.

All mass is quantized in $m = \sum m_{ss} = Nm_{ss}$ and $1/f_{ss}^2 = f_{ps}^2$ eigen states in $9x10^{60}$ permutations to $mf_{ss}^2/m_{ss} = mE_{ss}/m_{ss}hf_{ps} = m.m_{ss}c^2/m_{ss}E_{ps} = mc^2/m_{ps}c^2 = m/m_{ps}$.

Any mass m is so quantum gravitationally quantized in a mass eigen frequency f_{ss} in the time instanton as the inverse of the source frequency f_{ps} as a distribution of permutational self-states $f_{ps}^2|_{mod} = 9x10^{60}$.

The Inflaton and the Grand Unification Symmetry in a Transformation of Supermembranes

SEWG----------SEWg--------SEW.G--------SeW.G-------S.EW.G----------S.E.W.G
Planck Unification I----------IIB----------HO32----------IIA----------HE64---------Bosonic Unification

Quantum Gravitation Unification in a Coupling of the Supermembranes in Self dual Monopole Class IIB
SEWG --- SEWg

SEWG ---- SEWg as string transformation from Planck brane to (Grand Unification/GUT) monopole brane.

{Capitalization of letters infers emphasis and decapitalization of letters implies suppression of respective fundamental interactions}.

String Boson	**Decoupling Times***	**Wavelength ($\lambda=2\pi l$) m***	**Energy (hc/λ) J* & eV***	**Modular Wavelength m***	**Temp K***	**Significance**
0. Genesis-Boson Algorithmic	TIME=1/FREQUENCY $= \lambda_{ps}/R_H = \lambda_{ps}H_o/c = n_{ps} = H_o t_{ps}$ $6.2591\text{x}10^{-49}$	LIGHTPATH c.TIME $1.8777\text{x}10^{-40}$	ENERGY= hR_{max}/λ_{ps} =k.TEMPERATURE =h.FREQUENCY =h/TIME=MASS.c2 1.065 PJ* or $6.629\text{x}10^{33}$ eV*	$5.326\text{x}10^{39}$	TEMPERATURE $= hR_{max}/k\lambda_{ps}$ $7.54481\text{x}10^{37}$	Algorithmic Definiton
1. Planck-Boson I/SEWG⇒sEwG	$t_P=2\pi r_P/c$ $4.377\text{x}10^{-43}$	$L_P=2\pi r_P$ $1.313\text{x}10^{-34}$	1.523 GJ* or $9.482\text{x}10^{27}$ eV*	$7.617\text{x}10^{33}$	$1.079\text{x}10^{32}$	Outside Hubble Horizon Limit in Protoverse
2. Monopole-Boson IIB/sEwG⇒SEWg GI-GUT decoupling	$t_M=2\pi r_M/c$ $1.537\text{x}10^{-40}$	$4.6110\text{x}10^{-32}$	4.337 MJ* or $2.700\text{x}10^{25}$ eV*	$2.169\text{x}10^{31}$	$3.072\text{x}10^{29}$	Outside Hubble Horizon Limit in Protoverse
3. XLBoson HO32/SEW.G	$t_{XL}=2\pi r_{XL}/c$ $2.202\text{x}10^{-39}$	$6.605\text{x}10^{-31}$	302.817 kJ* or $1.885\text{x}10^{24}$ eV*	$1.514\text{x}10^{30}$	$2.145\text{x}10^{28}$	Outside Hubble Horizon Limit in Protoverse
4. Ecosmic-Boson IIA/SeW.G SNI decoupling	$t_{EC}=2\pi r_{EC}/c$ $6.618\text{x}10^{-34}$	$1.986\text{x}10^{-25}$	1.0073 J* or $6.270\text{x}10^{18}$ eV*	$5.035\text{x}10^{24}$	$7.135\text{x}10^{22}$	Galactic Supercluster Sarkar Scale $M_o=R_{Sarkar}c^2/2G_o$

5. False Higgs Vacuum (min to max)	$t_{dBmin}=G_oM_o/c^3n_{ps}$ $4.672x10^{-33}$ [min] to [max] $t_{dBmax}=\sqrt{\alpha}t_{ps}$ $2.847x10^{-32}$	$1.402x10^{-24}$ [min] to [max] $8.541x10^{-24}$	0.143 J* or $8.883x10^{17}$ eV* [min] to [max] 0.023 J* or $1.458x10^{17}$ eV*	$1.171x10^{23}$ [min] to [max] $7.133x10^{23}$	{$7.206x10^{37}$ [min] to [max] $1.857x10^{37}$ Algorithmic from Genesis Boson}	Galactic Supercluster Scale
6. Weyl-Boson HE64/S.EW. G Big Bang Instanton EMI decoupling	$t_{ps}=2\pi r_{ps}/c$ $3.333x10^{-31}$	$1.000x10^{-22}$	0.002 J* or $1.245x10^{16}$ eV*	$1.000x10^{22}$	{Temperature Gradient $T_{ps}/T(n_{ps})$ Genesis Boson $T(n_{ps}) = 2.935x10^{36}$}	Galactic Halo (Group) Scale
7. $T(n)=T_{ps}$ Bosonic Condensate Unification	$t_{BU}=n_{BU}/H_o$ $1.897x10^{-9}$	$ct_{BU}/(1+H_o t_{BU})$ 0.5691 Protoverse Inflaton min to Instanton to Inflaton max	Bosonic Plasma h/t_{BU} $=\sum hf_{ps}$ $=\sum \boldsymbol{\lambda_{ps}}$	1.757 Protoverse	$T_{BU} = T_{ps}$ $= 1.417x10^{20}$ $18.2[n+1]^2/n^3$ $n=H_o t_{BU}$	Unitary Modular Geometric Mean Scale
8. Higgs Chi-Boson/ Super Diquark Sbar=ss Vacuum Expectation Electroweak WNI decoupling	$t_{EW}=n_{EW}/H_o$ 0.00274~1/365	$4.167x10^{-18}$ Quantum Scale	$4.799x10^{-8}$ J* or 298.785 GeV*	$2.400x10^{17}$	$3.400x10^{15}$	Inner Mesonic Ring Quantum Scale

The X-Boson is modular dual to the L-Boson in the string class transformation from the Planck brane to the monopole brane to the X/L-brane to the Cosmic String brane to the Weyl brane. For the X-Boson, the coupling can be written as: $\#.(m_{ps}/m_{Planck})f(G)$ and for the L-Boson it is written as: $\#^{54}.(m_{Planck}/m_{ps})f(S)$ to indicate the inherent modular duality.

As alpha = $\#^3$ specifies the emmr-matter-emr interaction probability; EMI/SNI = $\#^3/\# = \#^2$ breaks the unified symmetry via the WNI and defines #f(G) as a unitary mass.

A 'mixing angle' θ_{ps} is defined via constant $X \Rightarrow \{\aleph\}^3 \Rightarrow$ alpha α as $X = \varpi(n).\ \sin\theta_{ps}$ for a unitary force action $\varpi(n)$ acting on the inflaton acceleration cf_{ps} modulated from the inflaton source hyper-acceleration of the de Broglie matter wave for phase speed R_Hf_{ps} in $R_Hf_{ps}^2=1.43790791x10^{87}$ (m/s^2)* in the displacement light path for the nodal Hubble constant $H_o = dn/dt = c/R_H$ defining the frequency ratio $n_{ps} = \lambda_{ps}/R_H = 2\pi r_{ps}/R_H = f_{ps}/H_o$ as the linearization of the wormhole from its closed Planck brane form as string class I into its transformation as open string class HE(8x8) then manifesting as the Compton-de Broglie wavelengths in the emr-matter-emmr interactions.

The Hubble law so modulates the inflaton as the instanton in a dimensionless cycle time parameter n in a time rate change constant as the nodal Hubble constant $H(n)|_{min} = H_o = 58.04$ km/Mpc.s (extrapolated to 66.9 km/Mpc.s for a present $n_{present} = 1.13271...$ cycle time coordinate) and in inverse proportion to its maximum as the wormhole frequency f_{ps}, becoming the maximum node for H(n) in the associated multiverse cosmology, which defines this multiverse as parallel in time space, but as holofractally nested in spacetime. It is then a quantum tunneling of the entire universe upon the completion of interwoven cycles defining the nodal oscillations in particular nodal 'walls of time' defined in the light path, which become the medium for this quantum tunneling of lower dimensional spacetime itself.

The inflaton angle θ_{ps} so is maximized at 90° at $X = \varpi(n).\ \sin\theta_{ps}$ for $\theta_{ps} = 38.17270761°$ for a unitary force $\varpi(n)=1$ and for the X/L bosonic coupling for a GUT scale characterizing SEW.G for the decoupling of the gravitational interaction from the unified energy field described by the Standard Model.
Now the Planck string for a Planck time of $t_P = 2\pi r_P/c = 4.377x10^{-43}$ is connected to the X/L string via the monopole string at the unified SEWG level in the self-duality of the GUT-monopole at $[ec.c^2]_{uimd} = 2.7x10^{16}$ GeV* and at a brane inflaton time of $t_M = 2\pi r_M/c = 1.537x10^{-40}$ s* and for which SEWG transformed into sEwG to indicate the unified nature between the long-range EMI and GI in a coupling of the electromagnetic and gravitational fine structures here termed alpha and g-alpha respectively.

The X/L boson time is $t_{XL} = 2\pi r_{XL}/c = 2.202x10^{-39}$ s* and string class HO(32) decouples gravity in replacing $f(G)/m_{Planck}$ by the monopole mass $\#^2/[ec]_{uimd}$ modular dual to $f(S)m_{Planck}$ to account for the SNI/EMI breaking of the native supersymmetry SEWG and to transform the Planck brane energy scale into the X/L brane energy scale.

m_{XB} = alpha.m_{ps}/$[ec]_{uimd}$ = #^{3}.m_{ps}/$[ec]_{uimd}$ = 3.364554269x10^{-12} kg* = 1.884955575x10^{15} GeV* unifying SEW in the monopolar electron boson energy $m_{ec}|_{max}$ = αm_{ps} m_{LB} = alpha^{18}.[ec]u_{imd}/#^{2}.m_{ps} = #^{52}.[ec]u_{imd}/#^{2}.m_{ps} = 1.982105788x10^{-28} kg* = 111.0453587 MeV* unifying EWG at the bosonic muon energy

The X-Boson mass and the L-Boson mass then transform into the string class IIA, as the coupling from the self-dual monopole class, here termed the ECosmic Boson to indicate its native characterization as primordial cosmic string ancestor for a spectrum of cosmic rays.
The elementary Cosmic Ray Spectrum derives from the transformation of the Planck-String-Boson at the birth of the universe.

The following tabulation relates those transformation in energy and the modular duality between the distance parameters of the macrocosm of classical spacetime geometry and the microcosm of the quantum realm.

String-Boson	**Wavelength (λ) m**	**Energy (hc/λ) J & eV**	**Modular Wavelength m**	**Significance**
1. Planck-Boson	1.2x10^{-34} m	1.6 GJ or 9.9x10^{27} eV	8.0x10^{33} m	Outside Hubble Horizon Limit
2. Monopole-Boson	4.6x10^{-32} m	4.3 MJ or 2.7x10^{25} eV	2.2x10^{31} m	Outside Hubble Horizon Limit
3. XL-Boson	6.6x10^{-31} m	303 kJ or 1.9x10^{24} eV	1.5x10^{30} m	Outside Hubble Horizon Limit
4. X-K-Boson transit (+)	8.8x10^{-28} m	227 J or 1.6x10^{21} eV	1.1x10^{27} m	$2\pi R_{Hubble11D}$
5. X-K-Boson transit (-)	1.0x10^{-27} m	201 J or 1.2x10^{21} eV	1.0x10^{27} m	$2\pi R_{HubbleHorizonLimit}$
6. CosmicRayToe	1.9x10^{-27} m	106 J or 6.6x10^{20} eV	5.3x10^{26} m	$2\pi R_{Hubble10D}$
7. CosmicRayAnkle	2.0x10^{-25} m	1.0 J or 6.2x10^{18} eV	5.0x10^{24} m	Galactic Supercluster Scale
8. CosmicRayKnee (+)	1.0x10^{-22} m	0.002 J or 1.24x10^{16} eV	1.0x10^{22} m	Galactic Halo(Group) Scale

9. CosmicRayKnee (-)	$6.3x10^{-22}$ m	0.3 mJ or $2.0x10^{15}$ eV	$1.6x10^{21}$ m	Galactic Disc(Halo) Scale
10.CosmicRay	$1.4x10^{-20}$ m	0.002 mJ or $1.4x10^{13}$eV	$7.1x10^{19}$ m	Galactic Core Scale

Energies then become defined in standard physics, such as supernovae, neutron stars and related phenomena, engaging electron accelerations and synchrotron radiation.

7. represents the ECosmic-Boson aka superstring class IIA as a D-brane attached open string dual to the (self-dual) monopole string class IIB and where the D-Brane or Dirichlet-Coupling in both cases becomes the 'intermediary' heterotic (closed loop) superstring HO(32).

It is the HO(32) superstring, which as a bosonic full-quantum spin superstring bifurcates into the subsequently emerging quark-lepton families as the K-L-Boson split into bosonic proto-dinucleons (m_c's) as George Gamow's primordial neutron matter or ylem in his proposed cosmology descriptive of the QBB.

8. depicts the Weyl-Boson of the Big Bang Planck-singularity of the Weyl-Geodesic of relativistic spacetime as the final 'octonionized' string class HE(8x8).

9. modulates the experimentally well measured 'knee' energy for Cosmic Rays as the distribution flux of high-energy protons as the primary particle in the 2π-factor. The wormhole radius is 10^{-22} m/2π for a Halo-(Dark Matter)-Radius of $2\pi x10^{22}$ meters.

10. is the massless ancestor of the Higgs-template and defined through the Weyl-String-Eigenenergy $E^* = kT^* = hf^* = m^*c^2 = 1/e^* = 1/2R_e c^2$.
The scale of (10) emerges from the holographic principle as $2\pi^2R^{*3}.f^{*2} = e^*$ for $R^*=h/(2\pi m'c)=1.41188..x10^{-20}$ m for a Compton Energy of $E' = m'c^2 = 2.2545..x10^{-6}$ J or 14.03 TeV, which serendipitously is the maximum energy regime for which the LHC is presently designed (2019).

The Experimental Evidence for the Superstrings is observed indeed every day in the laboratories of the astrophysics around the globe.

The ECosmic Boson manifests at an inflaton time of $t_{EC}=2\pi r_{EC}/c = 6.717x10^{-34}$ s* at an energy of 0.9927 J* or $6.180x10^9$ eV* and as a consequence of the universal wavefunction B(n) = {2e/hA}.exp{-Alpha.T(n)} and where T(n) = n(n+1) defines X and Y in the Euler identity for T(n) = 1.

The electromagnetic interaction, which was emphasized in the decoupling of the gravitational interaction in the sEwG to form the X/L-Boson in SEW.G now becomes suppressed in SeW.G in the B(n) for $n = n_{ps}=6.259093473x10^{-49} \Rightarrow 0$ and T(0) = 0 for $B(n_{ps})=2e/hA= 0.992729794...$in units of inverse energy that is as units of the magneto charge under modular string duality.

The constant $A=4.854663436x10^{14}$ Ampere* can be defined as a cosmic string magneto current and derives from particular algorithmic encodings underpinning the numerical values for the fundamental constants of nature.

A then enables Newton-Raphson approximation for the charge quantum 'e' in Alpha as first approximation $e_1=½hA$ and B(-½[1□i√3□) and in a transcendental equation for $T(n) = i^2 = -1$ for f(e) = (2e/hA).exp[Alpha] - 1 = 0 or $(2e/hA).exp[60\pi e^2/h] = 1$

The ECosmic boson then triggers a 'false vacuum' in a brane time interval from $t_{dBmin} = G_oM_o/c^3n_{ps} = 4.672x10^{-33}$ [min] to [max] $t_{dBmax} = \sqrt{\alpha}t_{ps} = 2.847... x10^{-32}$ defined in a non-kinematic temperature gradient of the cosmogenesis and related to the hyper acceleration gradient between the de Broglie inflaton wave phase speed $a_{dB} = R_Hf_{ps}^2$ and the boundary cosmological (dark energy) constant $\Lambda_{Einstein}(n_{ps}) = G_oM_o/\lambda_{ps}^2$ with $2.\Lambda_{Einstein}(n_{ps})/a_{dB} = M_o/M_H = 0.02803..$ descriptive for the baryonic matter content at the instanton as a proportional coupling between the 'mother black hole' defined in the Schwarzschild metric with an event horizon the size of the Hubble radius $R_H = 2G_oM_H/c^2$.

It can be said, that the universal wave function B(n) remains 'frozen' within this encompassing inflaton event horizon about the FRB (Functional Riemann Bound) at the x = -½ coordinate and between a cosmic uncertainty interval {X: -1,0} defining the Witten-M-space in this presentation; until it is observed and/or defined in accordance with the premises of quantum mechanics applied to the universe in total. In particular the 'unfreezing' of B(n) requires the linearization of the quantum geometric circularity of the Compton wavelength into its particularized quantum radius.

Quark-Lepton Unification in XL-Boson Class HO(32)
SEWg --- SEW.G

Following the creation of the 'false Higgs vacuum' as a potential spacetime quantum and as a prototypical holofractal of the brane volumar; the Planck string and now as an ECosmic string of increased spacial extent and of lower energy transforms into the Weyl-E_{ps} Boson of the quantum big bang event as the instanton.

This results in an integration or summation of E_{ps}-quanta evolving at the speed of light from the original Weylian wormhole as the 'creation singularity'.

This 'filling' of the inflaton M-space with lower dimensional instanton C-space represents however an attempt by the wormhole summation, which is expanding originally at the speed of light to become retarded by a force opposing the linear expansion and so decurving of the original wormhole definition. This effect of anti-curvature or the attempt to recircularized the linearization of the lower dimensional expanded membrane space by its higher dimensional contracting (or collapsing) membrane space is known as gravity in the macrocosmic cosmology of General Relativity but represents the integrated effect of quantum gravity as a summation of spacetime quanta as wormhole volumars inhabiting expanding space as boundary and initial condition for contracting spacetime.

The expanding qbb or the integration and multiplication of wormhole quanta now enables the X/L bosons to transform into a quark-lepton hierarchy at instanton time $t_{ps} = f_{ss} = 1/f_{ps} = 3.333.x10^{-31}$ s*.

The Higgs vacuum is now rendered as physical in spacetime occupancy and the relative sizes of elementary particles is defined in the diameter of the electron and its parameters of energy and momentum. In particular $e^*=2R_ec^2=1/E_{ps}$ restricts the extent of the Compton constant in the mass and size of the electron and quantizing the quantization of monopolar energy in the volumar equivalent of the inversed source energy quantum of the Weyl-E_{ps} Boson conformally transformed from the Planck scale onto the Weyl wormhole scale in the superstring transformations.

Magnetopolar charge e* as inversed energy quantum in its higher dimensional form assumes the characteristic of a region of space acted upon by the time rate change of frequency or df/dt. As said, this allows a definition of physical consciousness as the action of a quasi-angular acceleration as df/dt onto the dynamics of anything occupying any space, if this space represents a summation of E_{ps}- gauge photon quanta. The concept of physical consciousness so finds it resolution in the quantum geometry of super brane volumars.

The Higgs field of physical consciousness so applies action on spatially occupied dynamics, such as elementary particles or collections and conglomerations of particles, irrespective of those particles exhibiting inertial mass or gravitational mass and as a consequence of the photonic energy equivalence to mass in $E=hf=mc^2$.

The X-Boson of energy $1.885x10^{15}$ GeV* so transforms into a K-Boson of energy given by the transformed Planck boson into the K-Boson with $m_c = m_{Planck}.Alpha^9 = ke\alpha^{8.5}$
$= (e/G_o)\alpha^{8.5} = 9.9247245x10^{-28}$ kg or 556.0221 MeV* under Planck-Stoney unification for electric charge and mass.

The primordial K-Boson so becomes the ancestor for all nucleons and hyperons as a base kernel energy as a function of cycle time n in $m(n)=m_cY^n$.

The upper bound for the kernel mass so becomes $m_c Y^{npresent} = 1.711753x10^{-27}$ kg* or 958.991 MeV* for $n_{present}$ set at 1.132711...

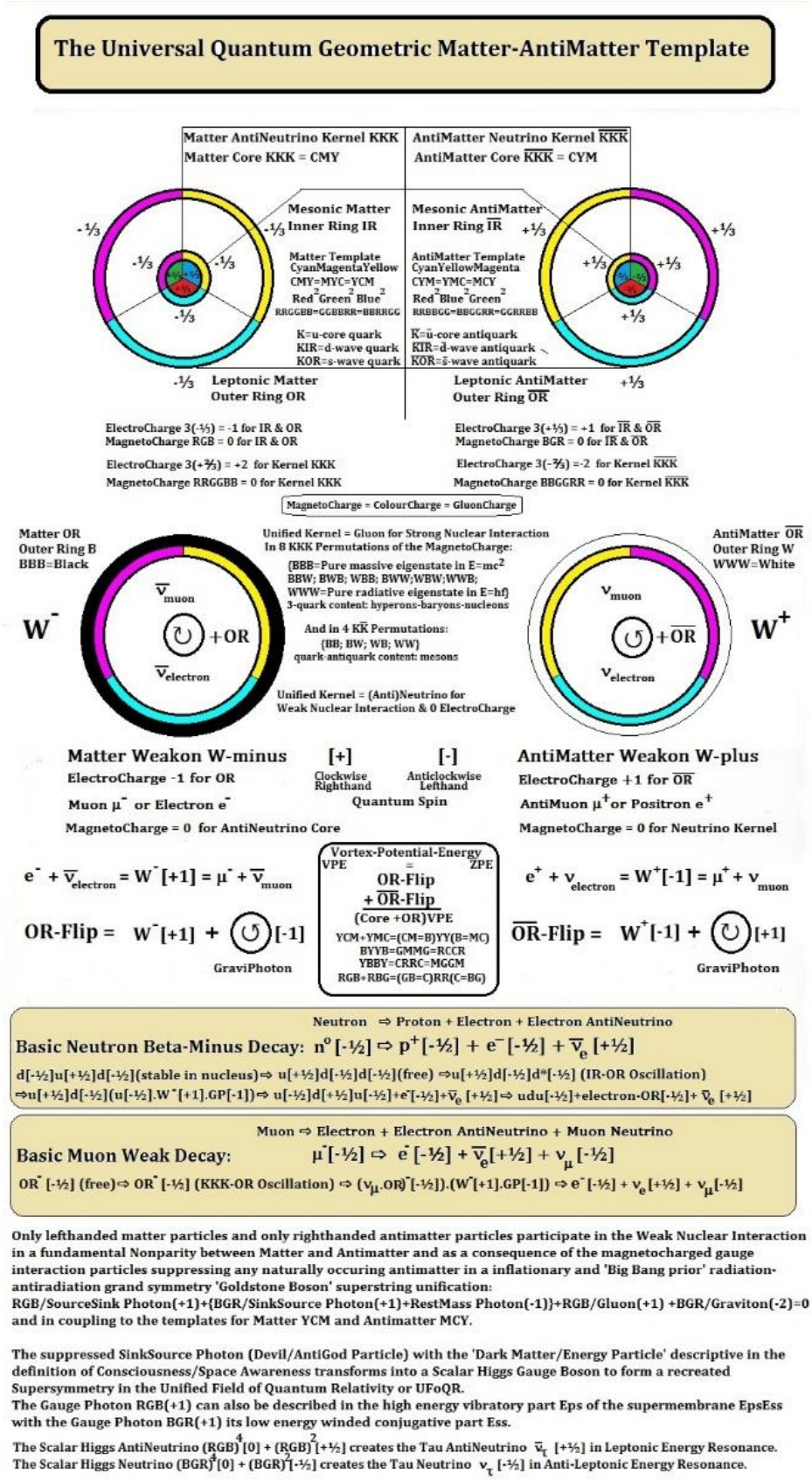
The K-Boson then assumes the form of a trisected subatomic core in distributing the K-superstring energy in three quantum geometric parts or sectors depictable in three 120-degree regions of a gluon field for the 8 gluon permutations between the SU(3) self-states:

$E=mc^2$: {BBB; BBW; WBB; BWB; WBW; BWW; WWB; WWW}:E=hf, for the hyperon SU(3) unitary quark or antiquark distribution and $E=mc^2$:{BB; BW; WB; WW}:E=hf for the mesonic quark-antiquark couplings for SU(2), with the (W)hite state implying complete emr-emmr dematerialization and the (B)lack state inferring complete materialization in the chromodynamics of the colour mixing and gluon charge exchanges.

The L-Boson then induces the outer leptonic OR ring structure as the ancestor of the muon fermion and the inner mesonic ring or IR becomes the oscillatory potential for the OR to reduce in size to approach the kernel K trisected in the gluon distribution.

The precursive X/L-Boson transforming into the quark-lepton hierarchy of fermions, so manifests a native supersymmetry or supergravity without any necessity for additional particles or string vibrations in unification physics.

It can then be said, that the meeting or intersection of the OR with the Kernel K occurs at the IR in the form of neutrinos and anti-neutrinos emitted by the kernel as the partners for the OR manifesting as three leptonic generations in electron, muon and tauon to define the weak interaction bosons in the weakons and the Z-Boson. The weakons so display the bosonic nature of the original X/L bosons but allow a partitioning of the boson integral spin momentum in a sharing between the fermionic kernel and the fermionic outer ring. The quantum geometry indicated then allows a decomposition of the weakons into leptonic generations and the Z-Boson to assume the weak interaction energy in the form of massless gluons becoming mass induced by the quantum geometric template of a scalar Higgs field as Majorana neutrinos. This can be illustrated in the quantum chromodynamics of the trisection of both kernel and rings as the mixing of colour charges as indicated.


The Universal Quantum Geometric Matter-AntiMatter Template
Matter AntiNeutrino Kernel KKK
Matter Core KKK = CMY
AntiMatter Neutrino Kernel $\overline{KKK}$
AntiMatter Core $\overline{KKK}$ = CYM
Mesonic Matter
Inner Ring IR
Mesonic AntiMatter
Inner Ring $\overline{IR}$
Matter Template
CyanMagentaYellow
CMY=MYC=YCM
Red² Green² Blue²
RRGGBB=GGBBRR=BBRRGG
AntiMatter Template
CyanYellowMagenta
CYM=YMC=MCY
Red² Blue² Green²
RRBBGG=BBGGRR=GGRRBB
K=u-core quark
KIR=d-wave quark
KOR=s-wave quark
$\overline{K}$=ū-core antiquark
$\overline{KIR}$=d̄-wave antiquark
$\overline{KOR}$=s̄-wave antiquark
Leptonic Matter
Outer Ring OR
Leptonic AntiMatter
Outer Ring $\overline{OR}$
ElectroCharge 3(-⅓) = -1 for IR & OR
MagnetoCharge RGB = 0 for IR & OR
ElectroCharge 3(+⅔) = +2 for Kernel KKK
MagnetoCharge RRGGBB = 0 for Kernel KKK
ElectroCharge 3(+⅓) = +1 for $\overline{IR}$ & $\overline{OR}$
MagnetoCharge BGR = 0 for $\overline{IR}$ & $\overline{OR}$
ElectroCharge 3(-⅔) = -2 for Kernel $\overline{KKK}$
MagnetoCharge BBGGRR = 0 for Kernel $\overline{KKK}$
MagnetoCharge = ColourCharge = GluonCharge
Matter OR
Outer Ring B
BBB=Black
Unified Kernel = Gluon for Strong Nuclear Interaction
In 8 KKK Permutations of the MagnetoCharge:
{BBB=Pure massive eigenstate in E=mc²
BBW; BWB; WBB; BWW;WBW;WWB;
WWW=Pure radiative eigenstate in E=hf}
3-quark content: hyperons-baryons-nucleons
And in 4 KK̄ Permutations:
{BB; BW; WB; WW}
quark-antiquark content: mesons
Unified Kernel = (Anti)Neutrino for
Weak Nuclear Interaction & 0 ElectroCharge
AntiMatter $\overline{OR}$
Outer Ring W
WWW=White
W^-
$\overline{\nu}_{muon}$
+OR
$\overline{\nu}_{electron}$
ν_{muon}
+$\overline{OR}$
$\nu_{electron}$
W^+
Matter Weakon W-minus
ElectroCharge -1 for OR
Muon μ^- or Electron e^-
MagnetoCharge = 0 for AntiNeutrino Core
[+] Clockwise Righthand
[-] Anticlockwise Lefthand
Quantum Spin
AntiMatter Weakon W-plus
ElectroCharge +1 for $\overline{OR}$
AntiMuon μ^+or Positron e^+
MagnetoCharge = 0 for Neutrino Kernel
$e^- + \overline{\nu}_{electron} = W^-[+1] = \mu^- + \overline{\nu}_{muon}$
OR-Flip = $W^-[+1]$ + ↻[-1]
GraviPhoton
Vortex-Potential-Energy
VPE = ZPE
OR-Flip
+ $\overline{OR}$-Flip
(Core +OR)VPE
YCM+YMC=(CM=B)YY(B=MC)
BYYB=GMMG=RCCR
YBBY=CRRC=MGGM
RGB+RBG=(GB=C)RR(C=BG)
$e^+ + \nu_{electron} = W^+[-1] = \mu^+ + \nu_{muon}$
$\overline{OR}$-Flip = $W^+[-1]$ + ↻[+1]
GraviPhoton
Neutron ⇨ Proton + Electron + Electron AntiNeutrino
Basic Neutron Beta-Minus Decay: $n^o[-½] \Rightarrow p^+[-½] + e^-[-½] + \overline{\nu}_e[+½]$
d[-½]u[+½]d[-½](stable in nucleus)⇨ u[+½]d[-½]d[-½](free) ⇨u[+½]d[-½]d*[-½] (IR-OR Oscillation)
⇨u[+½]d[-½](u[-½].W⁻[+1].GP[-1])⇨ u[-½]d[+½]u[-½]+e⁻[-½]+$\overline{\nu}_e$[+½]⇨ udu[-½]+electron-OR[-½]+ $\overline{\nu}_e$ [+½]
Muon ⇨ Electron + Electron AntiNeutrino + Muon Neutrino
Basic Muon Weak Decay: $\mu^-[-½] \Rightarrow e^-[-½] + \overline{\nu}_e[+½] + \nu_\mu[-½]$
OR⁻ [-½] (free)⇨ OR⁻ [-½] (KKK-OR Oscillation) ⇨ (ν_μ.OR)⁻[-½]).(W⁻[+1].GP[-1]) ⇨ $e^-[-½] + \nu_e[+½] + \nu_\mu[-½]$
Only lefthanded matter particles and only righthanded antimatter particles participate in the Weak Nuclear Interaction in a fundamental Nonparity between Matter and Antimatter and as a consequence of the magnetocharged gauge interaction particles suppressing any naturally occuring antimatter in a inflationary and 'Big Bang prior' radiation-antiradiation grand symmetry 'Goldstone Boson' superstring unification:
RGB/SourceSink Photon(+1)+{BGR/SinkSource Photon(+1)+RestMass Photon(-1)}+RGB/Gluon(+1) +BGR/Graviton(-2)=0
and in coupling to the templates for Matter YCM and Antimatter MCY.
The suppressed SinkSource Photon (Devil/AntiGod Particle) with the 'Dark Matter/Energy Particle' descriptive in the definition of Consciousness/Space Awareness transforms into a Scalar Higgs Gauge Boson to form a recreated Supersymmetry in the Unified Field of Quantum Relativity or UFoQR.
The Gauge Photon RGB(+1) can also be described in the high energy vibratory part Eps of the supermembrane EpsEss with the Gauge Photon BGR(+1) its low energy winded conjugative part Ess.
The Scalar Higgs AntiNeutrino $(RGB)^4[0] + (RGB)^2[+½]$ creates the Tau AntiNeutrino $\overline{\nu}_\tau$ [+½] in Leptonic Energy Resonance.
The Scalar Higgs Neutrino $(BGR)^4[0] + (BGR)^2[-½]$ creates the Tau Neutrino ν_τ [-½] in Anti-Leptonic Energy Resonance.

Subtracting the L-Boson mass from the K-Boson mass then sets particular energy intervals shown following in the diquark hierarchies found in the quantum geometry of Quantum Relativity. The energy interval for the KKK kernel then becomes (282.6487 MeV* - 319.6637 MeV*) and is defined as a Kernel-Ring-Cross-Coupling constant, where 111.045/3 = 37.015 gives the appropriate energy range for a particular quark energy level for a ground state GS:

$$GS = GS_{n-1} + 2g_{n-1} + ULM^{n-2} .\{ \tfrac{1}{3}e^{-};\tfrac{2}{3}e^{-}\}$$
$$= \text{Iterative Kernel GS + Ring Perturbation}$$

$$\textbf{Matrix } |VPE| = \begin{bmatrix} K_1 & K_2 \\ L_1 & L_2 \end{bmatrix} = \begin{bmatrix} a & b \\ c & d \end{bmatrix} \textbf{ for Det}|VPE| = ad - bc = 0 = K_1L_2 - K_2L_1 = (46.100)(1.501) - (14.113)(4.903) = g_{L1}(mu) - g_{L2}(md)$$

$$\textbf{Matrix } |md;mu| = \begin{bmatrix} L_1 & L_2 \\ L_1 & -L_2 \end{bmatrix} \begin{bmatrix} 1 \\ 1 \end{bmatrix} = \begin{bmatrix} L_1 + L_2 \\ L_1 - L_2 \end{bmatrix} \textbf{ for Det}|md;mu| = -2L_1L_2 \quad \textbf{with } |md;mu|^{-1} = \frac{-1}{2L_1L_2}\begin{bmatrix} -L_2 & -L_2 \\ -L_1 & L_1 \end{bmatrix} = \frac{-1}{2mdmu}\begin{bmatrix} -mu & -mu \\ -md & md \end{bmatrix}$$

Linear dependency given by Det|VPE| = 0 and $g_{L1}/g_{L2} = K_1/K_2 = L_1/L_2 = ULM = 3.2665...$
For k={1;2;3;...8;9;10}={2;1;(u,d);s;(cU);b;M;D;t;S}:
For 2 Groundstates GS with n≥2:

Kernel-Ring Mixing Constant: $K_X/R_L = m_cY^n/3m_{LB} = 958.991/(3x111.045) = 2.8786858$
for $n_{present} = 1.132711$.....[Eq.18]

Nucleonic Upper Limit: $m_cY^n{}_{present} = 1.71175285x10^{-27}$ kg* = 958.9912423 MeV*

Unitary Coupling Force: $\varpi(n_{present})/\sqrt{\{Y^{npresent}\}} = \#f(G).cf_{ps}\{alpha_E/alpha\} = 2\pi cG_om_{planck}m_{ps}m_em_c\sqrt{(Y^{npresent})}/eh^2 = 1.33606051$
$alpha_E = 2\pi G_om_cm_e/hc$ for $m_c\sqrt{(Y^n)}$; as ring masses $m_{e,\mu,\tau}$ are constant in kernel masses
$alpha_G = 2\pi G_om_c^2/hc$ for kernel mass m_c as m_cY^n

Graviton-GI mass: $\#f(G)=alpha.m_{planck}/[ec]_{uimd}$ transforms m_{ps} from m_{planck} in m_{XB}

Coupling angle: $\theta ps(n_{present}) = Arcsin(X/\varpi(n_{present})) = Arcsin(0.4625\ldots) = 27.553674°$

Upper Bound Multiplier = 1/Lower Bound Multiplier
$ULM = 1/LBM = 90°/\theta_{ps}(n_{present}) = 3.26663521$

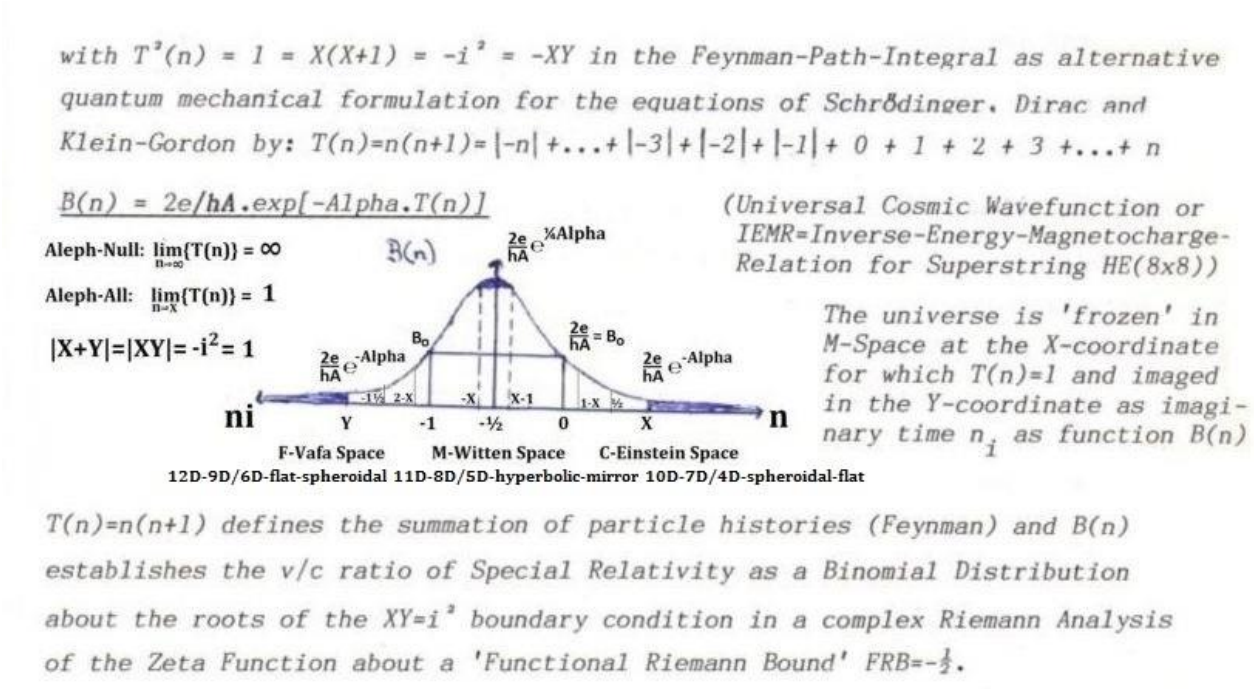
Using those definitions allows construction for the diquark hierarchies following:

We next reduce the atomic scaling to its intrinsic superstring dimension in deriving the Higgs Bosonic Restmass Induction, corresponding to the Dilaton of M-Theory.

Renormalizing the wavefunction B(n) about the FRB = -½ as maximum ordinate gives a probability y^2dV for $y(0) = \sqrt{(alpha/2\pi)}$ for the renormalization.

Alpha/2π being the probability of finding the FRB fluctuation for the interval [-X,X-1] in volume element dV as the uncertainty fluctuation.

This volume element defines the dimensional intersection from C-Space into F-Space via M-Space in the topological mapping of the complex Riemann C_∞-Space about the Riemann pole of the FRB as the Calabi-Yau superstring space in 10 dimensions.



X = ½(√5-1) = 0.618033..... and Y = -(X+1) = -½(√5+1) = -1.618033...

-X(X-1) = 0.236067... in analogue to X(X+1) = 1= T(n) and XY = X+Y = -1 = i^2 as the complex origin. But 0.236067...= X^3, so defining the 'New Unity' as $\#^3$ = Alpha and the precursive unity as the Cube root of Alpha or as # in the symmetry #:$\#^3$ = SNI:EMI = Strong Nuclear Interaction Strength {Electromagnetic Interaction Strength}.

The Strong-Interaction-Constant SIC = √Alpha = $\sqrt{e^2/2\varepsilon_o hc}$ = $\sqrt{(60\pi e^2/h)}$ in standard and in string units, reduces the SNI fine structure constant # by a factor $Alpha^{1/6}$; that is in the sixth root of alpha and so relates the SIC at the post quantization level as # to the pre-quantum epoch as SIC = √Alpha = $\#^{3/2}$.

The SNI is therefore so 11.7 times weaker at the XL-Boson 'Grand-Unification-Time' SEW.G of heterotic superstring class HO(32), then at the $E_{ps}E_{ss}$ time instantaneity S.EW.G of the superstring of the Quantum Big Bang in heterotic class HE(8x8) {this is the string class of Visi in the group theories}.

This then is the Bosonic Gauge Heterosis Coupling between superstrings HO(32) and HE(8x8). The coupling between superstrings IIA (ECosmic and manifesting the cosmic rays as superstring decay products) and IIB (Magnetic Monopole) derives directly from the B(n), with $B(n=0) = J_o = 2e/hA = 0.9927298$ 1/J* or $6.2705x10^9$ GeV* and representative of the ECosmic string class and the super high energy resonances in the cosmic ray spectrum, bounded in the monopolar resonance limit of $2.7x10^{16}$ GeV*.
The Unity of the SNI transforms to $[1-X] = X^2$ and the EMI transforms as the Interaction of Invariance from X to X.

The Weak Nuclear Interaction or WNI as X^2 becomes $[1+X] = 1/X$ and the Gravitational Interaction or GI transforms as X^3 transforms to $[2+X] = 1/X^2$ by modular symmetry between X and Alpha and the encompassing Unification Unity: $[1-X][X][1+X][2+X] = 1$.
This Unification Polynomial $U(u) = u^4+2u^3-u^2-2u+1 = 0$ then has minimum roots (as quartic solutions) at the Phi = X and the Golden Mean Y = -(1+X).
This sets the coupling between SNI and EMI as X; the coupling between EMI and WNI becomes X^2 and the coupling between WNI and GI then is again X.
The general Force-Interaction-Ratio so is: SNI:EMI:WNI:GI = SEWG = $\#:\#^3:\#^{18}:\#^{54}$.

Typical decay rates for the nested fundamental interactions then follow the order in the light path $lp = ct_k$:

$t_{SNI} = R_e/c = 2.777...x10^{-15}$ m*/$3x10^8$ m*/s* = $0.925925...10^{-24}$ s* ~ Order (10^{-23} s*)
$t_{EMI} = t_{SNI}/\alpha = 10^{-23}$ s*/$(7.30x10^{-3}) = 1.37x10^{-21}$ s* ~ Order (10^{-21} s*)
$t_{WNI} = t_{SNI}/\alpha^6 = 10^{-23}$ s*/$(1.51x10^{-13}) = 6.62x10^{-11}$ s* ~ Order (10^{-10} s*)
$t_{GI} = t_{SNI}/\alpha^{18} = 10^{-23}$ s*/$(3.44x10^{-39}) = 2.91x10^{15}$ s* ~ Order (10^{15} s* ~ 92 million years characterizing the half-lives of trans uranium elements like Plutonium Pu-244 at $79x10^6$ y)

This is the generalization for the cubic transform: $x \rightarrow x^3$ with the Alpha-Unity squaring in the functionality of the WNI and defining G-Alpha as $Alpha^{18}$ in the Planck-Mass transforming in string bosonic reduction to a basic fundamental nucleonic mass (proton and neutrons as up-down quark conglomerates and sufficient to construct a physical universe of measurement and observation):

$m_c = m_{planck}$ $Alpha^9$ from the electromagnetic string unification with gravitation in the two dimensionless fine structures:

For Gravitational Mass Charge from higher D Magnetic Charge: $1 = 2\pi G_o.m_{planck}^2/hc$
For Electromagnetic Coulomb Charge as lower D Electric Charge: $Alpha = 2\pi ke^2/hc$

Alpha as the universal master constant of creation, then becomes defined via the Riemann Analysis from $XY = i^2$ definition, reflecting in modulation in the statistical renormalization of the B(n) as the probability distributions in quantum wave mechanics, however.

U(u) has its maximum at u = -½ = FRB for U(-½) = 25/16 = $(5/4)^2$ for the B(n) supersymmetry. A symmetry for B(n) is found for i^2.U(u) = 0 for an FRB = ½ indicating a cosmological relationship to the Riemann hypothesis with respect to the distribution of prime numbers and Riemann's zeta function.

The derivation of the HBRMI draws upon this definition process and sets the coupling angle as Arcsin(X/ϖ) for a Unitary 'Force' ϖ =(#f_G).cf_{ps}E-Alpha/Alpha and with the electron mass replacing the fundamental nucleon mass m_c in the definition of E-Alpha.

A disassociated GI unifies with the WNI in the L-Boson and is supersymmetric to an intrinsic unification between the SNI and the EMI as the X-Boson for the duality $f_G f_S = 1$ in modular definition of a characteristic GI-mass #f_G as the disassociated elementary gauge field interaction. The transformation of the 5 superstring classes proceeds in utilizing the self-duality of superstring IIB as the first energy transformation of the Inflaton in the Planck string class I trans mutating into the monopole string class IIB.

Wikipedia reference:
F-theory is a branch of string theory developed by Cumrun Vafa.[1] The new vacua described by F-theory were discovered by Vafa and allowed string theorists to construct new realistic vacua — in the form of F-theory compactified on elliptically fibered Calabi–Yau four-folds. The letter "F" supposedly stands for "Father".[2]
F-theory is formally a 12-dimensional theory, but the only way to obtain an acceptable background is to compactify this theory on a two-torus. By doing so, one obtains type IIB superstring theory in 10 dimensions. The SL(2,Z) S-duality symmetry of the resulting type IIB string theory is manifest because it arises as the group of large diffeomorphisms of the two-dimensional torus

The transformation of the 5 superstring classes proceeds in utilizing the self-duality of superstring IIB as the first energy transformation of the Inflaton in the Planck string class I trans mutating into the monopole string class IIB and residing in the 2-toroidal bulk space of Vafa as our Riemann 3-dimensional surface $V_4(R)=½\pi^2R^4$; $dV_4(R)/dR=2\pi^2R^3$ and describing the VPE-ZPE of the micro quantum of the qbb. The E_{ps}-Weyl wormhole of topological closure so is holographically and conformally mapped onto the bulk space in 12 dimensions as a braned volumar evolving by mirror duality of the hyperbolic 11dimensional closed-open AdS membrane space of Witten's M-space as Vafa's F-space and mirroring the hyperbolic topology of 10-dimensional spheroidal C-space as an open-closed dS cosmology in 12-dimensional spheroidal F-space in an overall measured and observed Euclidean flatness of zero curvature.

Vafa's F-space so can be named the omniverse hosting multiple universes which are nested in parallel time space and defined in particular initial and boundary conditions valid and applicable for all universes as a multiversal parameter space.

The quantization of mass m so indicates the coupling of the Planck Law in the frequency parameter to the Einstein law in the mass parameter.

The postulated basis of M-Theory utilizes the coupling of two energy-momentum eigenstates in the form of the modular duality between so termed 'vibratory' (high energy and short wavelengths) and 'winding' (low energy and long wavelengths) self-states.

The 'vibratory' self-state is denoted in: $E_{ps}=E_{primary\ sourcesink} = hf_{ps} = m_{ps}c^2$ and the 'winding' and coupled self-state is denoted by: Ess = Esecondary sinksource = hfss = mssc^2.
The F-Space Unitary symmetry condition becomes: $f_{ps}f_{ss} = r_{ps}r_{ss} = (\lambda_{ps}/2\pi)(2\pi\lambda_{ss}) = 1$

The coupling constants between the two eigenstates are so: $E_{ps}E_{ss} = h^2$ and $E_{ps}/E_{ss} = f_{ps}^2 = 1/f_{ss}^2$
The Supermembrane $E_{ps}E_{ss}$ then denotes the coupled superstrings in their 'vibratory' high energy and 'winded' low energy self-state within an encompassing super eigen state of quantum entanglement.

The coupling constant for the vibratory high energy describes a maximized frequency differential over time in $df/dt|_{max} = f_{ps}^2$ and the coupling constant for the winded low energy describes its minimized reciprocal in $df/dt|_{min} = f_{ss}^2$.

F-Theory also crystallizes the following string formulations from the $E_{ps}E_{ss}$ super brane parameters.

Electromagnetic Fine structure: $\alpha_e = 2\pi ke^2/hc = e^2/2\varepsilon_0 hc = \mu_o e^2 c/2h = 60\pi e^2/h$ .....
(Planck-Stoney-QR units *)
Gravitational Fine structure (Electron): $\alpha_g = 2\pi G_o m_e^2/hc = \{m_e/m_{Planck}\}^2$
Gravitational Fine structure (Primordial Nucleon): $\alpha_n = 2\pi G_o m_c^2/hc$
Gravitational Fine structure (Planck Boson): $\alpha_{Planck} = 2\pi G_o m_{Planck}^2/hc$

$1/E_{ps} = e^* = 2R_e c^2 = \sqrt{\{4\alpha hce^2/2\pi G_o m_e^2\}} = 2e\sqrt{\alpha}[m_P/m_e] = 2e\sqrt{\{\alpha_e/\alpha_g\}} = \{2e^2/m_e\}\sqrt{(k/G_o)} = 2e^2/G_o m_e = e^2/2\pi\varepsilon_o m_e$ for $G_o = 1/k = 4\pi\varepsilon_o$
for a cosmological unification of fine structures in unitary coupling E*.e* = 1 in $[Nm^2/kg^2] = [m^3s^{-2}/kg] = 1/[Nm^2/C^2] = [C^2m^{-3}s^2/kg]$ for $[C^2] = [m^6/s^4]$
and $[C] = [m^3/s^2]$. $E_{ps} = 1/E_{ss} = 1/e^* = \sqrt{\{\alpha_g/\alpha_e\}}/2e = G_o m_e/2e^2$

Here e* is defined as the inverse of the sourcesink vibratory superstring energy quantum $E_{ps} = E^*$ and becomes a New Physical Measurement Unit is the Star Coulomb (C*) and as the physical measurement unit for 'Physical Consciousness'.

R_e is the 'classical electron radius' coupling the 'point electron' of Quantum- Electro-Dynamics (QED) to Quantum Field Theory (QFT) and given in the electric potential energy of Coulomb's Law in: $m_e c^2 = ke^2/R_e$; and for the electronic monopolar rest mass m_e.
Alpha α is the electromagnetic fine structure coupling constant $\alpha = 2\pi ke^2/hc$ for the electric charge quantum e, Planck's constant h and lightspeed constant c.

G_o is the Newtonian gravitational constant as applicable in the Planck-Mass $m_P = \sqrt{(hc/2\pi G_o)}$ and the invariance of the gravitational parameter $G(n)M(n) = G_oX^n.m_cY^n$.

As the Star Coulomb unit describes the inverse sourcesink string energy as an elementary energy transformation from the string parametrization into the realm of classical QFT and QED, this transformation allows the reassignment of the Star Coulomb (C*) as the measurement of physical space itself.

The following derivations lead to a simplified string formalism as boundary- and initial conditions in a de Sitter cosmology encompassing the classical Minkowskian-Friedmann spacetimes holographically and fractally in the Schwarzschild metrics.

The magnetic field intensity B is classically described in the Biot-Savart Law:

$B = \mu_o qv/4\pi r^2 = \mu_o i/4\pi r = \mu_o q\omega/4\pi r = \mu_o Nef/2r$

for a charge count $q = Ne$; angular velocity $\omega = v/r = 2\pi f$; current $i = dq/dt$ and the current element $i.dl = dq.(dl/dt) = vdq$.

The Maxwell constant then can be written as an (approximating) fine structure: $\mu_o\varepsilon_o = 1/c^2 = (120\pi/c)(1/120\pi c)$ to crystallize the 'free space impedance'

$Z_o = \sqrt{(\mu_o/\varepsilon_o)} = 120\pi \sim 377$ Ohm (Ω).

This vacuum resistance Z_o so defines a 'Unified Action Law' in a coupling of the electric permittivity component (ε_o) of inertial mass and the magnetic permeability component (μ_o) of gravitational mass in the Equivalence Principle of General Relativity.

A unified self-state of the pre-inertial (string- or brane) cosmology so is obtained from the fine structures for the electric- and gravitational interactions coupling a so defined electropolar mass to magnetopolar mass respectively.

The Planck-Mass is given from Unity $1 = 2\pi Gm_P^2/hc$ and the Planck-Charge derives from Alpha $= 2\pi ke^2/hc$ and where $k = 1/4\pi\varepsilon_o$ in the electromagnetic fine structure describing the probability interaction between matter and light (as about 1/137).

The important aspect of alpha relates to the inertia coupling of Planck-Charge to Planck-Mass as all inertial masses are associated with Coulombic charges as inertial electropoles; whilst the stringed form of the Planck-Mass remains massless as gravitational mass. It is the acceleration of electropoles coupled to inertial mass, which produces electromagnetic radiation (EMR); whilst the analogy of accelerating magnetopoles coupled to gravitational mass and emitting electromagnetic monopolar radiation (EMMR) remains hitherto undefined in the standard models of both cosmology and particle physics.

But the coupling between electropoles and magnetopoles occurs as dimensional intersection, say between a flat Minkowskian spacetime in 4D and a curved de Sitter spacetime in 5D (and which

becomes topologically extended in 6-dimensional Calabi-Yau tori and 7-dimensional Joyce manifolds in M-Theory).

The formal coupling results in the 'bounce' of the Planck-Length in the pre-Big Bang scenario, and which manifests in the de Broglie inflaton-instanton.
The Planck-Length $L_P = \sqrt{(hG/2\pi c^3)}$ 'oscillates' in its Planck-Energy $m_P = h/\lambda_P c = h/2\pi c L_P$ to give $\sqrt{Alpha}.L_P = e/c^2$ in the coupling of 'Stoney units' suppressing Planck's constant 'h' to the 'Planck units' suppressing charge quantum 'e'.

Subsequently, the Planck-Length is 'displaced' in a factor of about $11.7 = 1/\sqrt{Alpha} = \sqrt{(h/60\pi)}/e$ and using the Maxwellian fine structures and the unity condition kG=1 for a dimensionless string coupling $G_o = 4\pi\varepsilon_o$, describing the 'Action Law' for the Vacuum Impedance as Action=Charge^2, say via dimensional analysis:

$Z_o = \sqrt{([Js^2/C^2m]/[C^2/Jm])} = [Js]/[C^2] = [Action/Charge^2]$ in Ohms [$\Omega = V/I = Js/C^2$] and proportional to [h/e^2] as the 'higher dimensional source' for the manifesting superconductivity of the lower dimensions in the Quantum Hall Effect ($\sim e^2/h$), the conductance quantum ($2e^2/h$) and the Josephson frequencies ($\sim 2e/h$) in Ohms [Ω].

This derivation so indicates an electromagnetic cosmology based on string parameters as preceding the introduction of inertial mass (in the quantum Big Bang) and defines an intrinsic curvature within the higher dimensional (de Sitter) universe based on gravitational mass equivalents and their superconductive monopolar current flows.

A massless, but monopolar electromagnetic de Sitter universe would exhibit intrinsic curvature in gravitational mass equivalence in its property of closure under an encompassing static Schwarzschild metric and a Gravitational String-Constant $G_o = (1/k)|_{mod} = (1/30c)|_{mod}$ (as given in the Maxwellian fine structures in the string space).

In other words, the Big Bang manifested inertial parameters and the matter content for a subsequent Cosmo evolution in the transformation of gravitational 'curvature energy', here called gravita as precursor for inertia into inertial mass seedlings; both however describable in Black Hole physics and the Schwarzschild metrics.

The Gravitational Fine structure so derives in replacing the Planck-Mass m_P by a proto-nucleonic mass: $m_c = \sqrt{(hc/2\pi G_o)}.f(alpha) = f(Alpha).m_P$ and where $f(Alpha) = Alpha^9$.

The Gravitational fine structure, here named Omega, is further described in a five folded supersymmetry of the string hierarchies, the latter as indicated in the following below in excerpt. This pentagonal supersymmetry can be expressed in a number of ways, say in a one-to-one mapping of the Alpha fine structure constant as invariant X from the Euler Identity: X+Y = XY = -1 = $i^2 = \exp(i\pi)$.

One can write a Unification Polynomial: $(1-X)(X)(1+X)(2+X) = 1$ or $X^4+2X^3-X^2-2X+1 = 0$
to find the coupling ratios: $f(S)¦f(E)¦f(W)¦f(G) = \#¦\#^3¦\#^{18}¦\#^{54}$ from the proportionality

$\#_{|}\#^{3}_{|}\{[(\#^{3})^{2}]\}^{3}_{|}(\{[(\#^{3})^{2}]\}^{3})^{3}$ = Cube root(Alpha):Alpha:Cuberoot(Omega):Omega.

The Unification polynomial then sets the ratios in the inversion properties under modular duality:

(1)[Strong short]$_{|}$(X)[Electromagnetic long]$_{|}$(X^2)[Weak short]$_{|}$(X^3)[Gravitational long]
as $1_{|}X_{|}X^2_{|}X^3 = (1\text{-}X)_{|}(X)_{|}(1+X)_{|}(2+X)$.

Unity 1 maps as (1-X) transforming as f(S) in the equality $(1\text{-}X) = X^2$; X maps as invariant of the function f(E) in the equality (X) = (X); X^2 maps as (1+X) transforming as f(W) in the equality (1+X) = 1/X; and X^3 maps as (2+X) transforming as f(G) in the equality $(2+X) = 1/X^2 = 1/(1\text{-}X)$. The mathematical pentagonal supersymmetry from the above then indicates the physicalised T-duality of M-theory in the principle of mirror-symmetry and which manifests in the reflection properties of the heterotic string classes HO(32) and HE(64), described further in the following.

Defining f(S) = # = 1/f(G) and $f(E) = \#^2.f(S)$ then describes a symmetry breaking between the 'strong S' f(S) interaction and the 'electromagnetic E' f(E) interaction under the unification couplings.

This couples under modular duality to $f(S).f(G) = 1 = \#^{55}$ in a factor $\#^{-53} = f(S)/f(G) = \{f(S)\}^2$ of the 'broken' symmetry between the long range- and the shortrange interactions.
SEWG = 1 = Strong-Electromagnetic-Weak-Gravitational as the unified supersymmetric identity then decouples in the manifestation of string-classes in the de Broglie 'matter wave' epoch termed inflation and preceding the Big Bang, the latter manifesting at Weyl-Time as a string transformed Planck-Time as the heterotic HE(64) class.

As SEWG indicates the Planck-String (class I, which is both open ended and closed), the first transformation becomes the suppression of the nuclear interactions sEwG and describing the self-dual monopole (string class IIB, which is loop-closed in Dirichlet brane attachment across dimensions say Kaluza-Klein R^5 to Minkowskian R^4 or Membrane-Space R^{11} to String Space R^{10}).

The monopole class so 'unifies' E with G via the gravitational fine structure assuming not a Weylian fermionic nucleon, but the bosonic monopole from the $kG_o = 1$ initial-boundary condition $Gm_M^2 = ke^2$ for $m_M = ke = 30[ec] = m_P\sqrt{Alpha}$.
The Planck-Monopole coupling so becomes $m_P/m_M = m_P/30[ec] = 1/\sqrt{Alpha}$ with f(S) = $f(E)/\#^2$ modulating

$f(G) = \#^2/f(E) = 1/\# \leftrightarrow f(G)\{f(S)/f(G)\} = \#$ in the symmetry breaking $f(S)/f(G) = 1/\#^{53}$ between short (nuclear asymptotic) and long (inverse square).

The short-range coupling becomes f(S)/f(W) = #/#^{18} = 1/#^{17} = Cube root(Alpha)/Alpha^6 and the long-range coupling is Alpha/Omega = 1/Alpha^{17} = #^{3}/#^{54} = 1/#^{51} = 1/(#^{17})^3.

The strong nuclear interaction coupling parameter so becomes about 0.2 as the cube root of alpha and as measured in the standard model of particle physics in the form of an energy dependent 'running coupling constant' and which takes a value of $\alpha_Z = 0.1184$ at the energy level of the Z^o weakon at about 92 GeV.

The monopole quasi-mass [ec] describes a monopolar source current ef from the unification identity $1/e*f_{ps} = h = E*/f_{ps}$ as a fine structure for Planck's constant h, manifesting for a displacement λ=c/f. This is of course the GUT unification energy of the Dirac Monopole at precisely [c^3] eV or 2.7x10^{16} GeV and the upper limit for the Cosmic Ray spectra as the physical manifestation for the string classes: {I, IIB, HO(32), IIA and HE(64) in order of modular duality transmutation}.

The transformation of the Monopole string into the XL-Boson string decouples Gravity from sEwG in sEw.G in the heterotic superstring class HO(32). As this heterotic class is modular dual to the other heterotic class, HE(64), it is here, that the proto nucleon mass is defined in the modular duality of the heterosis in: Omega = Alpha^{18} = $2\pi G_o m_c^2/hc = (m_c/m_P)^2$.

The HO(32) string bifurcates into a quarkian X-part and a leptonic L-part, so rendering the bosonic scalar spin as fermionic half spin in the continuation of the 'breaking' of the supersymmetry of the Planckian unification. Its heterosis with the Weyl-string then decoupling the strong interaction at Weyl-Time for a Weyl-Mass $m_{Weyl} = m_{ps}$, meaning at the time instanton of the end of inflation or the Big Bang in sEw.G becoming s.Ew.G.

The X-Boson then transforms into a fermionic proto nucleon triquark-component (of energy ~ 10^{-27} kg or 560 MeV) and the L-Boson transforms into the proto-muon (of energy about 111 MeV).

The last 'electroweak' decoupling then occurs at the Fermi-Expectation Energy about 1/365 seconds after the Big Bang at a temperature of about 3.4x10^{15} K and at a 'Higgs Boson' energy of about 298 GeV.

A Bosonic decoupling preceded the electroweak decoupling about 2 nanoseconds into the cosmogenesis at the Weyl-temperature of so $T_{Weyl} = T_{max} = E_{Weyl}/k$ = 1.4x10^{20} K as the maximum Black Hole temperature maximized in the Hawking MT modulus and the Hawking-Gibbons formulation: $M_{critical}T_{min} = ½M_{Planck}T_{Planck} = (hc/2\pi G_o)(c^2/2k) = hc^3/4\pi kG_o$ for T_{min} = 1.4x10^{-29} K and Boltzmann constant k.

The Hawking Radiation formula results in the scaling of the Hawking MT modulus by the factor of the 'Unified Field' spanning a displacement scale of 8π radians or 1440° in the displacement of 4λps.

The XL-Boson mass is given in the quark-component: $m_X = \#^3 m_{Weyl}/[ec]|_{mod} = 1.9x10^{15}$ GeV modulated in (SNI/EMI=$\sqrt[3]{}${Alpha}/[Alpha]), the intrinsic unified Strong-Electroweak Interaction-Strength for the Kernel part in the Quark-Lepton hierarchy.

The LX-Boson mass is given in the lepton-component: m_L = Omega.[ec]/$\#^2$ = ([Omega]x([ec])/($m_{ps}.\sqrt[3]{}(\alpha^2)$ = $\#^{52}$[ec/m_{Weyl}] ~ 111 MeV in functional operators f(G)xf(S) = 1 for the Ring part in the Quark-Lepton hierarchy.

In particular $f(G)/m_{planck} \leftrightarrow \#^2/[ec]$ for #(m_{ps}/m_{planck})f(G) and the X-Boson and f(S).$m_{planck} \leftrightarrow [ec]/\#^2$ for $\#^{54}$[(m_{planck}/m_{ps})f(S) for the L-Boson.

The X-Boson's mass is: ([Alpha α]xm_{ps}/[ec]) modulated in (SNI/EMI=$\sqrt[3]{}${Alpha}/[Alpha]), the intrinsic unified Strong-Electroweak Interaction-Strength and the L-Boson's mass in: ([Omega]x([ec])/($m_{ps}.\sqrt[3]{}(\alpha^2)$.

When the heavy electron known as the muon was accidentally discovered in the late 1930s, Nobel physicist Isidor Isaac Rabi famously remarked, "Who ordered that?"

It is this lepton component which necessitates the existence of the muon (and the tauon and their neutrino partners as constituents of the weak interaction gauge bosons) as a 'heavy electron', as the quantum geometry defines the muon mass in a decoupling of the L_1 energy level given in a diquark hierarchy and based on a quantum geometry of the quantum relativity:

Ten DIQUARK quark-mass-levels crystallize, including a VPE-level for the K-IR transition and a VPE-level for the IR-OR transition:

Quark Level	**Kernel-Energy in MeV***	**K-Mean(x ½) in MeV***	**Ring-Energy in MeV***	**IR-OR.Mean.in.MeV***	**Ground state K-Mean-IR-OR-Mean**	**Comment**
VPE-Level [K-IR]	26.4924-29.9618	$\mathbf{g_{L2}}$ = **14.11355**	2.8175-3.1865	L_2 = 1.5010 = mu	12.6126	K-IR VPE
VPE-Level [IR-OR]	86.5334-97.8657	$\mathbf{g_{L1}}$ = **46.100**	9.2030-10.408	L_1 = 4.9028 = md	$GS_2=GS_{VPE}$= 41.198 ms=$2g_{L1}+L_1+L_2$ =$g_{L1}+g_{L2}+2L_{u,d}+L_1+L_2$ =98.645; 98.604 Δ_s = 0.041 = $g_{L2} - g_{L1} + 2L_{u,d}$	IR-OR VPE Ground-OR electron level
	282.6487	$\mathbf{g_{u,d}}$ =		$L_{u,d}$ = 16.014		

Quark UP/DOWN-Level u=K; d=K+IR ubar=Kbar; dbar=Kbar+IRbar	-319.6637	**150.5781**	30.060-33.997		$GS_3=GS_{u,d}$= 134.5641 Pionium	K-KIR basis
Quark STRANGE-Level s=K+OR sbar=Kbar+ORbar	923.2302 -1,044.13	$\mathbf{g_s}$ = **491.8401**	98.187-111.045 muon energy	Ls = 52.308	$GS_4=GS_s$= 439.5321 Kaonium	KIR-KOR basis 1st (K)-OR-Muon level d↔s KIR↔KOR Resonance
Diquark CHARM-Level c=U.ubar=uu.ubar cbar=Ubar.u =(uu)bar.u	3,015.59-3,410.51	$\mathbf{g_{cU}}$ = **1,606.53** $\mathbf{g_{cU}-L_{cU}-g_{u,d}=mcU^*=}$ **1,285.09**	320.71-362.71	L_{cU} = 170.86	$GS_5=GS_{cU}$= 1,435.67 Charmonium Pole mass $=GS_{cU}+0.L_{cU}$= 1,435.67	**active singlet apparent**
Diquark BEAUTY-Level BOTTOM-Level b=(ud)bar =(ud).ubar bbar=(ud) =(ud)bar.u	9,849.99-11,139.93	$\mathbf{g_b}$ = **5,247.48** $\mathbf{g_b-L_b-g_s=mb^*=}$ **4,197.56**	1,047.6-1,184.7	L_b = 558.08	$GS_6=GS_b$= 4,689.40 Bottonium Pole mass $=GS_b+0.L_b+½(g_{L1}+g_{L2})$= 4,719.51	**active doublet apparent**
Diquark MAGIC-Level M=(us)bar =(us).ubar Mbar=(us) =(us)bar.u	32,173.6-36,386.9	$\mathbf{g_M}$ = **17,140.13**	3,421.7-3,869.8	L_M = 1,822.88 max Tauon energy	$GS_7=GS_M$= 15,317.25 Magiconium Pole mass $=GS_M+½L_M+½(g_{L1}+g_{L2})+½(L_1+L_2)$= 16,262.00	suppressed doublet-1 in 2nd K-OR-Tauon level M=us and M.Mbar=VPE in b.bbar

						resonance
Diquark DAINTY-Level D=(dd)bar =(ud).dbar Dbar=(dd) =(ud)bar.d	105,090-118,852	**g_D = 55,985.5**	11,177-12,640	L_D = 5,954.25	$GS_8=GS_D=$ 50,031.25 Daintonium Pole mass $=GS_D+0.L_D$ $+(g_{L1}+g_{L2})=$ 50,091.46	suppressed triplet-1 in D=dd and D.Dbar=VPE in no IROR oscillation
Diquark TRUTH-Level TOP-Level t=(ds)bar =(ud).sbar tbar=ds =(ud)bar.s	343,261-388,214	**g_t = 182,869** **g_t-L_t+g_s =mt*= 163,912.6**	36,506-41,287	L_t = 19,448.25	$GS_9=GS_t=$ 163,420.75 Toponium Pole mass $=GS_t+½.L_t$ $+(g_{L1}+g_{L2})+$ $½(L_1+L_2)=$ 173,208.3	**active triplet apparent**
Diquark SUPER-Level S=(ss)bar =(us)sbar Sbar=(ss)=(us)bar.s	1,120,592-1,268,044	**g_S = 597,159.0**	119,243-134,858	L_S = 63,525.27	$GS_{10}=GS_S=$ 533,633.73 Superonium Pole mass $=GS_S+L_S$ $+(g_{L1}+g_{L2})+$ $(L_1+L_2)=$ 597,225.6	suppressed triplet-2 in S=ss and S.Sbar=VPE in no ORIR oscillation

Quarkian Hierarchies in the Unified Field of Quantum Relativity

$$\text{Operator A}\{u;d;s\} \Rightarrow \overline{c} \qquad c \Leftarrow \text{Operator B}=A^*\{u^*;d^*;s^*\}$$

$$[-\tfrac{2}{3}\text{-}\tfrac{2}{3}].[+\tfrac{2}{3}+\tfrac{2}{3}] \qquad [+\tfrac{2}{3}+\tfrac{2}{3}].[-\tfrac{2}{3}\text{-}\tfrac{2}{3}]$$

$$\overline{uu}\,.\,uu = \overline{U}\,.\,U \begin{cases} u[+\tfrac{2}{3}] \\ d[-\tfrac{1}{3}] \\ s[-\tfrac{1}{3}] \end{cases} \qquad \begin{matrix}[-\tfrac{2}{3}]dd=\overline{D} \\ [+\tfrac{1}{3}]ud=\overline{b} \\ [+\tfrac{1}{3}]us=\overline{M}\end{matrix} \Big\} \; t\,S\,.\,\overline{S\,t} = \overline{dsss}\,.\,sssd$$

$$[-\tfrac{4}{3}].[+\tfrac{4}{3}] = [\;0\;] \quad [\;0\;] \qquad [\;0\;] \quad [\;0\;] = [+\tfrac{4}{3}].[-\tfrac{4}{3}]$$

$$\overline{U}u = \overline{u}.\overline{u}u = \overline{c} \qquad St\overline{D} = \overline{sssd}.dd = c$$
$$\overline{U}d = \overline{u}.\overline{u}d = \overline{c} + IR \qquad St\overline{b} = \overline{sssd}.ud = c + \overline{IR}$$
$$\overline{U}s = \overline{u}.\overline{u}s = \overline{c} + OR \qquad St\overline{M} = \overline{sssd}.us = c + \overline{OR}$$

$$Uu = uuu = \Delta^{++}$$
$$Ud = uuu + IR = \Delta^{+} = \Delta^{++} + IR$$
$$Us = uuu + OR = \Sigma^{*+} = \Delta^{++} + OR$$

$$\overline{StD} = sssd.dd = 2\Delta^{++} + 3IR + 3OR$$
$$\overline{Stb} = sssd.ud = 2\Delta^{++} + 2IR + 3OR$$
$$\overline{StM} = sssd.us = 2\Delta^{++} + 1IR + 4OR$$

$$\text{Matrix } |VPE| = \begin{bmatrix} K_1 & K_2 \\ L_1 & L_2 \end{bmatrix} = \begin{bmatrix} a & b \\ c & d \end{bmatrix} \text{ for } Det|VPE| = ad - bc = 0 = K_1L_2 - K_2L_1 = (46.100)(1.501) - (14.113)(4.903) = g_{L1}(mu) - g_{L2}(md)$$

$$\text{Matrix } |md;mu| = \begin{bmatrix} L_1 & L_2 \\ L_1 & -L_2 \end{bmatrix} \begin{bmatrix} 1 \\ 1 \end{bmatrix} = \begin{bmatrix} L_1 + L_2 \\ L_1 - L_2 \end{bmatrix} \text{ for } Det|md;mu| = -2L_1L_2 \text{ with } |md;mu|^{-1} = \frac{-1}{2L_1L_2}\begin{bmatrix} -L_2 & -L_2 \\ -L_1 & L_1 \end{bmatrix} = \frac{-1}{2mdmu}\begin{bmatrix} -mu & -mu \\ -md & md \end{bmatrix}$$

Linear dependency given by $Det|VPE| = 0$ and $g_{L1}/g_{L2} = K_1/K_2 = L_1/L_2 = ULM = 3.2665...$
For k={1;2;3;...8;9;10}={2;1;(u,d);s;(cU);b;M;D;t;S}:
For 2 Groundstates GS with n≥2:

$$GS_n = GS_{n-1} + 2g_{n-1} + (ULM)^{n-2}.\ \{\tfrac{1}{3}e^-;\tfrac{2}{3}e^-\} - \Delta_s \qquad \{\Delta_s = g_{L2} - g_{L1} + 2L_{u,d}$$

d*=s IR-OR Oscillation; i.e. neutron decay as the [u,d]-[s] strange quark perturbation}

particle	most symmetric quantum geometry	basic.symbol.energy partitioning for groundstates g_k (+Δ)	energy values	energy * MeV*	energy SI MeV	particle name
p^+	u.d.u=KKIRK	m_K+[L_2}-[e^-]-⅓[e^-]	939.776+1.5013-0.5205-0.1735	940.5833	938.270	charged proton
n^o	d.u.d=KIRKKIR	m_K+2[L_2]-2[e^-]+⅓[e^-]- Δ_s	939.776+3.0026-1.0410+0.1735-0.041	941.8701	939.554	neutral neutron
$\mu^\pm$	OR* in 1st OR oscillation	m_L - L_1 - Δ n[L_s: 98.19-111.05]	111.04536-(4.9028+Δ)	106.143-Δ	105.6584	charged muon
$\tau^\pm$	OR** **in 2nd OR** oscillation	L_M - m_L+ 2g_s + L_s + L_{ud} + Δ	1822.88-111.05+0.9837+52.31+16.01+Δ	1781.13+Δ	1776.86	charged tauon

			=1712.81+68.32+Δ			
π^o	u.ubar; d.dbar	$m_{gu,d} - L_{u,d} + e^- + ⅓e^- + \Delta$	150.5781-16.014+0.6940+Δ	135.258+Δ	134.9776	neutral pion ground state
$\pi^{\pm}$	u.dbar; ubar.d	$m_{gu,d} - L_{u,d} + L_1 + e^- + \Delta$ $\pi^o + L_1 - ⅓e^- + \Delta$	150.5781-16.014+4.9028+~e^-+Δ 135.258+4.9028-0.1735+Δ	139.987+Δ 139.987+Δ	139.5702	charged pion
λ^o	d.u.s	$m_n{}^o + m_\pi{}^o + g_{L2} - L_1 + \Delta$	941.911+135.26+ 46.100-4.903+Δ	1118.37+Δ	1115.683	neutral lambda

Ten DIQUARK quark-mass-levels crystallize, including a VPE-level for the K-IR transition and a VPE-level for the IR-OR transition:

The K-Means define individual materializing families of elementary particles:

a (UP/DOWN-Mean) sets the (PION-FAMILY: π^o, π^+, π^-);

a (STRANGE-Mean) specifies the (KAON-FAMILY: K^o, K^+, K^-);

a (CHARM-Mean) defines the (J/PSI=J/Ψ-Charmonium-FAMILY);

a (BEAUTY-Mean) sets the (UPSILON=Y-Bottonium-FAMILY);

a (MAGIC-Mean) specifies the (EPSILON=E-FAMILY);

a (DAINTY-Mean) bases the (OMICRON-O-FAMILY);

a (TRUTH-Mean) sets the (KOPPA=K-Topomium-FAMILY) and

a (SUPER-Mean) defines the final quark state in the (HIGGS/CHI=H/X-FAMILY).

The VPE-Means are indicators for average effective quark masses found in particular interactions.

Kernel-K-mixing of the wavefunctions gives K(+) = 60.214 MeV* and K(-) = 31.986 MeV* and the IROR-Ring-Mixing gives (L(+) = 6.404 MeV* and

L(-) = 3.402 MeV*) for a (L-K-Mean of 1.5010 MeV*) and a (L-IROR-Mean of 4.9028 MeV*); the Electropole ([e-] = 0.52049 MeV* and 3x(0.17350 MeV* for $e^{\pm}/3$) as the effective electron mass and as determined from the electronic radius and the magneto charge in the UFoQR.

The rest masses for the elementary particles can now be constructed, using the basic nucleonic Restmass (m_c=9.9247245x10^{-28} kg*=(√(Omegaxm_P) for n_p as 1.71175286x10^{-27} kg* or 958.99 MeV* and setting as the basic maximum

(UP/DOWN-K-mass=mass(KERNEL CORE)=3xmass(KKK)=3x319.6637 MeV*=958.991 MeV*).

Subtracting the (Ring VPE 3xL(+) =19.215 MeV*, one gets the basic nucleonic K-state for the atomic nucleus (made from protons and neutrons) in: {m(n^0;p^+) = 939.776 MeV*}.
A best approximation for Newton's Gravitational constant 'Big G' hence depends on an accurate determination for the neutron's inertial mass, only fixed as the base nucleon minimum mass at the birth of the universe. A fluctuating Neutron mass would also result in deviations in 'G' independent upon the sensitivity of the measuring equipment. The inducted mass difference in the protonic-and neutronic rest masses, derives from the Higgs-Restmass-Scale and can be stated in a first approximation as the ground state.

A basic nucleon rest mass is m_c=√Omega.m_P = 9.9247245x10^{-28} kg* or 958.99 MeV*. (Here Omega is a gauge string factor coupling in the fundamental force interactions as: Cube root(Alpha):Alpha:Cuberoot(Omega):Omega and for Omega = G-alpha.)

KKK-Kernel mass = Up/Down-HiggsLevel=3x319.66 MeV*= 958.99 MeV*, using the Kernel-Ring and Family-Coupling Constants.
Subtracting the Ring-VPE (3L) gives the basic nucleonic K-State as 939.776 MeV*. This excludes the electronic perturbation of the IR-OR oscillation.

For the Proton, one adds one (K-IR-Transition energy) and subtracts the electron-mass for the dquark level and for the Neutron one doubles this to reflect the up-down-quark differential.
An electron perturbation subtracts one 2-2/3=4/3 electron energy as the difference between 2 leptonic rings from the proton's 2 up-quarks and 2-1/3=5/3 electron energy from the neutron' singular up-quark to relate the trisected nucleonic quark geometric template. The neutron's down-strange oscillation, enabling its beta decay into a left-handed proton, a left-handed electron and a right-handed antineutrino subtracts $\Delta_s = g_{L2} - g_{L1} + 2L_{u,d}$ = 0.041 MeV* as a d* = s quark differential.

Proton m_p=u.d.u=K.KIR.K=(939.776+1.5013-0.5205-0.1735) MeV* = 940.5833 MeV* (938.270 MeV).
Neutron m_n=d.u.d=KIR.K.KIR=(939.776+3.0026-1.0410+0.1735-0.041) MeV* = 941.8701 MeV* (939.554 MeV).

This is the ground state from the Higgs-Restmass-Induction-Mechanism and reflects the quarkian geometry as being responsible for the inertial mass differential between the two elementary nucleons. All ground state elementary particle masses are computed from the Higgs-Scale and then become subject to various fine structures. Overall, the measured gravitational constant 'G' can be said to be decreasing over time.

The Higgs Boson HB is said of having been measured in the decay of W's, Z's and Tau Leptons, as well as the bottom- and top-quark systems described in the table and the text addressing K-KIR-KOR transitions. The K means core for kernel and the IR means Inner Ring and the OR mean Outer Ring. The Rings are derivatives from the L-Boson of the HO(32 string class) and the Kernels are the products of the decay of the X-Boson from the same brane source. So the Tau-decay relates to 'Rings' which are charmed and strange and bottomized and topped, say. They are higher energy manifestations of the basic nucleons of the proton and the neutrons and basic mesons and hyperons.

The energy resonances of the Z-boson (uncharged) represents an 'average' or statistical mean value of the 'Top-Quark' and the Upper-Limit for the Higgs Boson is a similar 'Super-Quark' 'average' and as the weak interaction unification energy.
A previous postulated energy for the Higgs Boson of so 110 GeV is the Omicron-resonance, as inferred from the table above.
Now the most fundamental way to generate the Higgs Boson as a 'weak interaction' gauge is through the coupling of two equal mass, but oppositely charged W-bosons (of whom the Z^o is the uncharged counterpart).

We have seen, that the W-mass is a summation of all the other quark-masses as kernel-means from the strangeness upwards to the truth-quark level.
So simply doubling the 80.622 GeV* and 80.424 GeV mass of the weak-interaction gauge boson must represent the basic form of the Higgs Boson and that is 161.244 GeV* or 160.847 GeV as a function of the electro-weak coupling and related as a 'charged current' weak interaction to a 'neutral current' interaction mediated by the Z^o boson of energy about 91 GeV* to sum for a 'Vacuum Expectation Value' of about 252 GeV*.

Higgs Boson Weakon WNI-Mass M_{HBWZ} = $\{W^- + W^+ + Z^o\}$ GeV* = {80.622 + 80.622 + 91.435} GeV* = 252.68 GeV*

{(14.11355+46.100)+(1.5010+4.9028)+(150.571+491.8401+1,606.53+5,247.48+17,140.13+55,985.5)+(182,869)+(597.159.0)}
= {60.2136}+{6.404}+{80,622.05}+{182,869}+{597,159} =
{66.6618}+{80,622.05}+{2x91,434.5}+{2x298,580} = 860,716.7 MeV*

Kernel-Inner Ring VPE = 0.04611 GeV*
Kernel-Outer Ring VPE = 0.01411 GeV*
Pion-(KIR-Quark d)-VPE = 0.1501 GeV*
Kaon-(KOR-Quark s=d*)-VPE = 0.4918 GeV*
Charm-(Diquark U=uu)-VPE = 1.60653 GeV*
Bottom-(Diquark b=ud)-VPE = 5.24748 GeV*
Magic-(Diquark m=us)-VPE = 17,140.13 GeV*
Dainty-(Diquark D=dd)-VPE = 55,985.5 GeV*
Top-(Diquark t=ds)-VPE = 182,869 GeV*
Super-(Diquark S=ss)-VPE = 597,159 GeV*

Quark q	Diquark Structure qq	Manifesto	Mean-Kernel-Mass GeV*	Mean-Ring-Mass GeV*	Higgs Boson Mass Integration
Kernel-Outer Ring VPE_1	K↔IR↔OR Kernel-Mesonic-Leptonic	KIR=d KOR=s	K_1 0.01411355	L_1 0.0015010	
Kernel-Inner Ring VPE_2	K↔IR Kernel-Mesonic	K=u	K_2 0.046100	L_2 0.0049028	½(K_2-L_2) 0.0206
Pion-(KIR-Quark d)	Base KIR Quark	uq, dq	0.1505781	0.016014	∑(d) =0.1506
Kaon-(KOR-Quark s=d*)	Resonance KOR Quark	sq	0.49184	0.052308	∑(d+s) =0.6419
Charm-(Diquark U=uu)	Diquark Singlet Active	Uqbar c=Uubar	1.60653	0.17086	∑(d+s+U) =2.24843
Bottom-(Diquark b=ud)	Diquark Doublet Active	bqbar	5.24748	0.55808	∑(d+s+U+b) =7.4959
Magic-(Diquark m=us)	Diquark Doublet Suppressed		17.14013	1.82288	∑(d+s+U+b+m) =24.636
Dainty-(Diquark D=dd)	Diquark Triplet Suppressed		55.9855	5.95425	∑(d+s+U+b+m+D) =80.622 = M_W
Top-(Diquark t=ds)	Diquark Triplet Active	tqbar	182.869	19.44825	½{t} =91.4345 = M_Z
Super-(Diquark S=ss)	Diquark Triplet Suppressed		597.159	63.52527	½{S} =298.58 = HVE

$\sum(M_W^+ + M_W^- + M_Z^o) = 2M_{HB}^o = (80.622 + 80.622 + 91.4345)$ GeV* = 252.679 GeV*

For Universal Electro-Weak Unification:
$2M_{BH}^o/Y^{npresent} = 2M_{BH}^o e/c^2 Y^{npresent} = 2.6150 \times 10^{-25}$ kg* = 146.503 GeV* for $2\pi R_{HB}^o = h/M_{HB}^o c$ and $R_{HB}^o = 1.3525 \times 10^{-18}$ m*

Restmass-Photon RMP is quantized in volumar $2\pi^2 R_{RMP}^3 . f_{ps}^2|_{constant} = e^*$ for $R_{RMP}^o = 1.41188..x10^{-20}$ m*

$2M_{HB}{}^{o} = 146.503xY^{npresent} = 252.679$ GeV*

HVE - $2M_{HB}{}^{o}$ = (298.58 - 252.679) GeV* = 45.901 GeV*

HVE - $M_{HB}{}^{o}$ = ½(597.159 - 252.679) GeV* = (298.58 - 126.340) GeV* = 172.24 GeV* = Top-Quark Mass

Fermi Constant for Electro-Weak WNI Unification for universal alpha = $60\pi e^2/h$:
$F_o(\alpha) = \alpha\pi/\{\sqrt{2}.M_W{}^2.(1-M_W{}^2/M_Z{}^2)\} = 1.5338574x10^{-3}.\alpha = 1.12067834x10^{-5} = 1/\{298.72\ GeV^*\}^2$ for universal alpha = $60\pi e^2/h$

Fermi Constant for Electro-Weak WNI Unification for 'running' alpha = α':
$F_o(\alpha') = \alpha'\pi/\{\sqrt{2}.M_W{}^2.(1-M_W{}^2/M_Z{}^2)\} = 1.5338574x10^{-3}.\alpha' = 1.166378x10^{-5} = 1/\{292.81\ GeV^*\}^2$ for universal alpha = $60\pi e^2/h$

$F_o(\alpha)/F_o(\alpha') = \alpha/\alpha' = 0.9608186 = 1/1.0407792$ for $\alpha < \alpha'$

Fermi-HVE(α) = 292.81 GeV* = (298.72 - 5.8894 - 0.0206) GeV* = Fermi-HVE(α') - ∑(b+s+d) - ½{K_2-L_2} = 292.81 GeV*
Fermi-HVE(α') = 298.72 GeV* = (298.58 + 0.14) GeV* = HEV + 6 ∑(b+s+d) + M_π for base VPE = uubar = $M_\pi{}^o$ = ∑(d) - δ{K↔IR↔OR}
{$M_\pi = M_\pi{}^o + L_2 - \frac{1}{3}m_e$ = 0.1399945 GeV* for $M_\pi{}^o$ = 0.150578 - 0.01604 + (1+⅓)m_e = 0.150578 - 0.016014 + 0.000694 = 0.135258 GeV*}

<u>Weinberg Angle:</u>
$\cos\theta_W = M_W/M_Z = 80.622/91.4345 = 0.881746 = g/\sqrt{(g^2+g'^2)}$
$\sin\theta_W = \sqrt{(1 - \cos^2\theta_W)} = \sqrt{0.222524} = 0.471725 = g'/\sqrt{(g^2+g'^2)}$
$g'/g = \tan\theta_W = \sin\theta_W/\cos\theta_W = 0.53498967$ for $g' < g$
$2\{ g'\alpha/g\alpha'\} = 2\{0.53498967/1.0407792\} = 1.02805604 = 28.1463°/27.553674° = 1.02150806 + \delta(0.006548)$
for $\theta_W = \arccos\{0.88175\} = 28.1463° = 27.553674° + 0.5926°$

<u>Kernel-VPE-Mixing:</u>
K(+) = K+ + K- = 60.21355
K(-) = K+ - K- = 31.98645
L(+) = L+ + L- = 6.40128
L(-) = L+ - L- = 3.4018

$K_2 + L_2$ = 0.0510 GeV* for Kernel-Inner Ring VPE_2 K→IR for Gluonic Kernel to Mesonic Inner Ring
$K_1 + L_1$ = 0.0156 GeV* for Kernel-Outer Ring VPE_1 (K→)IR→OR for Mesonic Inner Ring to Leptonic Outer Ring
$K_2 - L_2$ = 0.0412 GeV* for Kernel-Inner Ring VPE_2 K→IR for Gluonic Kernel Base VPE
$K_1 - L_1$ = 0.0126 GeV* for Kernel-Outer Ring VPE_1 (K→)IR→OR for (Gluonic Kernel)

Modular ylem mass:
$M|_{mod} = M_{chandra} = M_m = f_{ps}|_{mod}$ from monopolar displacement current:

$2\pi i/c = 2\pi e f_{ps}/c = 2\pi e/\lambda_{ps} = e/r_{ps} = e.r_{ss} = 2\pi e\lambda_{ss}$ for $2\pi i = [ec].r_{ss}$ as monopolar displacement current
$2\pi i = 2\pi\lambda_{ss}[ec] = 2\pi e[\lambda_{ss}c] = 2\pi e[f_{ps}\lambda_{ps}\lambda_{ss}] = 2\pi e f_{ps} = 2\pi ec/\lambda_{ps} \Leftrightarrow 2\pi ec/l_{planck}\sqrt{\alpha} = 2\pi ec^3/e$
$=2\pi[ec]c^2/e = 2\pi M|_{mod}c^2/e$
$i = ef_{ps} = M|_{mod}c^2/e$ for $e^2f_{ps}|_{mod} = M|_{mod}c^2$ for $[h/c^2]f_{ps}|_{mod} = [E/f][m/E]f_{ps}|_{mod} = M|_{mod} = M_m$ by Action Law Action $h = e^2$ Charge^2

From Electro-Weak Unification parameters: {1eV = 1.0024656 eV*} with $T(n_{EW}=4.67x10^{-21}) = 3.40x10^{15}$ K*

$M_{W\pm}$ = ΣKernel-Mean = $m_{up\text{-}down}+m_{strange}+m_{charm}+m_{bottom}+m_{magic}+m_{dainty}$ = 0.151+0.492+1.607+5.247+17.140+55.986 = 80.622 GeV* or 80.424 GeV

$M_Z{}^o$ = 91.435 GeV* or 91.210 GeV

$M_{H\chi}$ = 298.580 GeV* or 297.846 GeV

$\sqrt{2}$.Fermi Constant $G = \sqrt{2}.G_F = \sqrt{2}\{\pi\alpha/(\sqrt{2}.M_W{}^2[1-M_W{}^2/M_Z{}^2])\}$ = (1/Higgs-Vacuum-Expectation HVE)^2

$= 1.5848x10^{-5}$ GeV^{-2}* for HVE=251.19 GeV* or 250.58 GeV

As the Charmonium quark state is defined by the coupling of a double-up-diquark U=uu to an anti-up-quark as c=U.u(bar) and so as a quark molecule as the quark singlet state of 3 interacting quarks; whilst the diquark doublet of bottom-magic {b=[ud].ubar and m=[us].ubar} and the diquark triplet of dainty-top-super {D=[dd].U and t=[ds].U and S=[ss].U} form double quarks; the Kernel-Mean of the Charmonium energy level is added to the HVE and the Difference-VPE levels for the K-IR - IR-OR transitions are subtracted for the quark-antiquark coupling.

$M_W{}^- + M_W{}^+ + M_Z{}^o = 252.68$ GeV* ≈ HVE + m_{charm} - $(m_{K(+)}+m_{K(-)}+m_{L(+)}+m_{L(-)})$

= (251.19 + 1.60653 - [0.0922+0.009806]) = 252.69 GeV* or 252.07 GeV

$m_{charm} - (m_{K(+)}+m_{K(-)}+m_{L(+)}+m_{L(-)}) = 1.60653 - 0.102 = 1.5045 \approx M_W{}^- + M_W{}^+ + M_Z{}^o$ - HEV = 1.49 GeV*

HEV = $M_{H\chi} - m_D + m_{ud} + 2xm_{charm} + m_{u,d}$ = 298.580 - 55.986 + 5.24748 + 3.21306 + 0.15058 =

251.205 GeV* ≈ HEV in Kernel -Inner Ring mixing

HEV = HB+anti-HB = $2xM_{higgsboson}$ for a Higgs Boson mean of: ½{252.68} = 126.34 GeV* or 126.03 GeV SI.

$M_{higgs\ boson}$ = 2x{55.986+5.247+1.607+0.492+0.151+0.046+0.014} GeV* = 127.09 GeV* = 126.77 GeV SI

for an upper bound including the base quarks u,d,s.

In particular, as the bottomium doublet minimum is at 5,247.5 MeV* and the topomium triplet minimum is at 55,985.5 MeV* in terms of their characteristic Kernel-Means, their doubled sum indicates a particle-decay excess at the publicized ~125 GeV energy level in 2x(5.2475+55.9855) GeV* = 122.466 GeV* (or 122.165 GeV SI).
These values correspond to the two means from ATLAS {116-130 GeV as 123 GeV} and CMS {115-127 GeV as 121 GeV} respectively.

http://press.web.cern.ch/press/PressReleases/Releases2011/PR25.11E.html

Then extending the minimum energy levels, like as in the case to calculate the charged weakon gauge field agent energy in the charm and the VPE perturbations as per the table given, specifies the 125 GeV energy level in the Perturbation Integral/Summation:

2x{55.9855+5.2475+1.606+0.492+0.151+0.046+0.014} GeV* = 127.084 GeV*, which become about 126.772 GeV SI as an UPPER LIMIT for this 'Higgs Boson' at the Dainty quark resonance level from the UFoQR (Unified Field of Quantum Relativity).

Using the 3 Diquark energy levels U,D and S yield $M_{higgsboson}$ = 2x{55.986+5.247+1.607} GeV* = 125.68 GeV* and 125.37 GeV SI.

Subtracting the u,d means and the VPE mixing corrections gives:

125.68 - (g_{L2}+g_{L1}+$g_{u,d}$+L2+L1+$L_{u,d}$) = 125.68 - 0.23321 = 125.447 GeV* or 125.138 GeV SI for a measured mass of the Higgs Boson.

Quantum Relativity describes the creation of the Higgs Boson from fundamental templates of the so called 'gauges'. The Higgs Boson is massless but consists of two classical electron rings and a massless doubled neutrino kernel, and then emerges in the magneto charge induction as mass carrying Goldstone gauge boson.