

Ultimate possibility in Physics: Matter-universe to Cluster-matter-universe

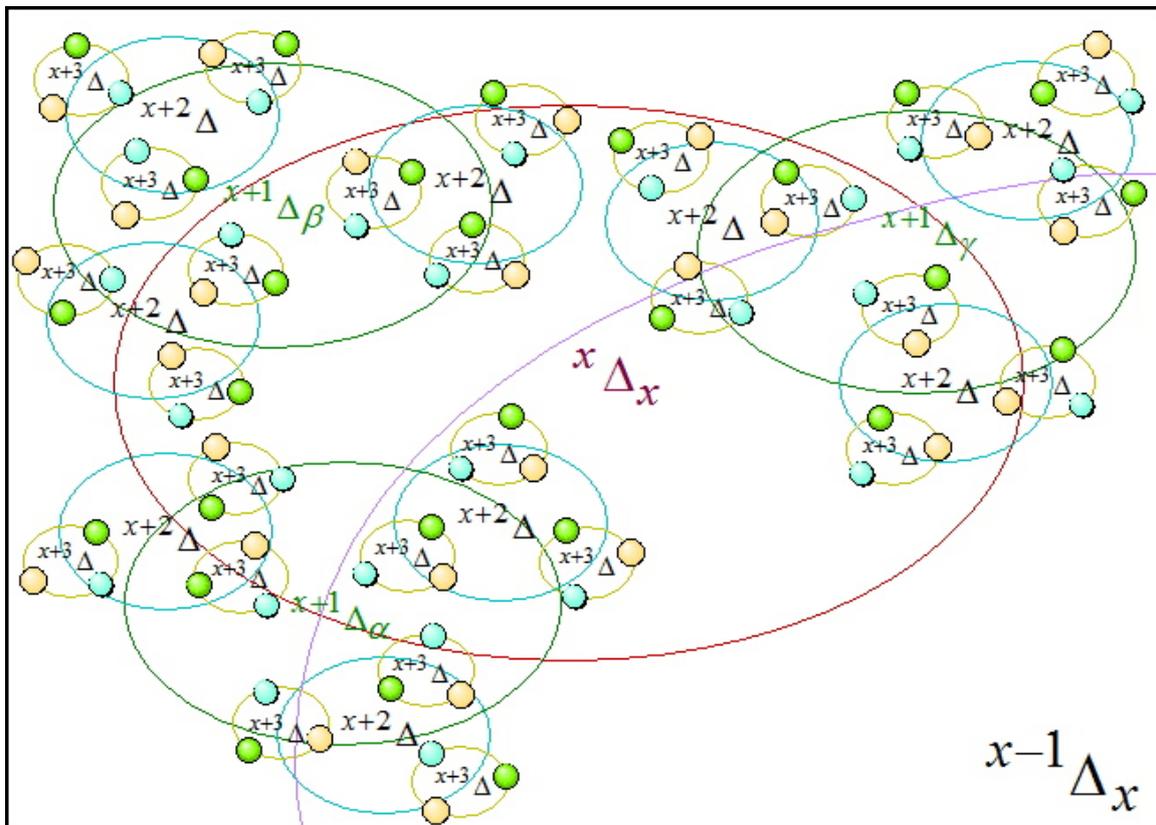
Jayakar Johnson Joseph

There are amassing developments of new physics in recent years on particle physics and cosmology that may modify the standard model and may provide background to resolve the paradoxes in physics. In this article I have contributed some of my ideas to the new physics that is on emerging on considering the Universe as a Cluster-matter-universe and in this model the Universe is assumed as Cosmic-matrix in fluidity, with spontaneous intrinsic dynamics. The Universe described by Lambda-CDM model of cosmology is expressed as Matter-universe. This article explains the consistency and dynamics of Cluster-matter-universe and a comparative analysis between this and the Matter-universe.

Key words: Matter-universe, Cluster-matter-universe, Cosmic-matrix, Heterogeneous-matter, Trifurcation, Cluster-matter, Sub-cluster-matter, Super-cluster-matter, Coherent-cluster-matter, Incoherent-cluster-matter, Conjugated cluster-matter, Elementary-cluster-matter, Matter-mass, Cluster-mass, Elementary-mass, Conjugation-mass, Elementary-matters, Energy-mass.

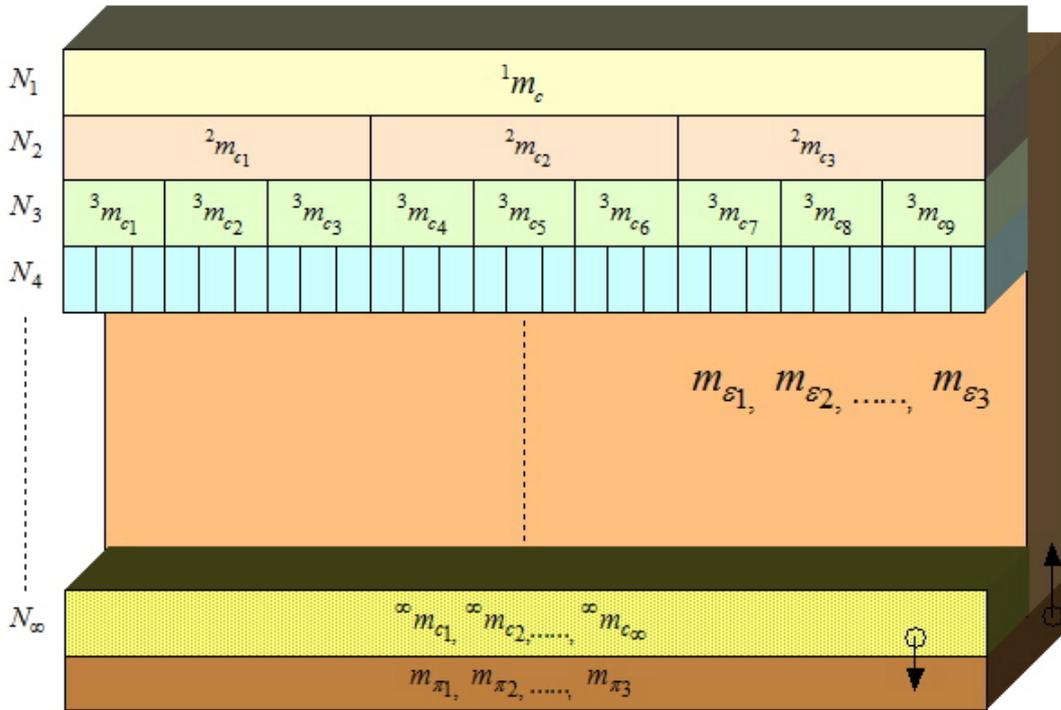
Consistency and dynamics of the Universe as Cluster-matter-universe:

All heterogeneous-matters of the Universe can be clustered in triplets or in triplets and sub-triplets of triplets, coherently by their differential-mass and differential-spins that are in mass eigenstate and in spin eigenstate with other clusters. Axiomatically, such triplets of heterogeneous-matters are the cluster-matters.

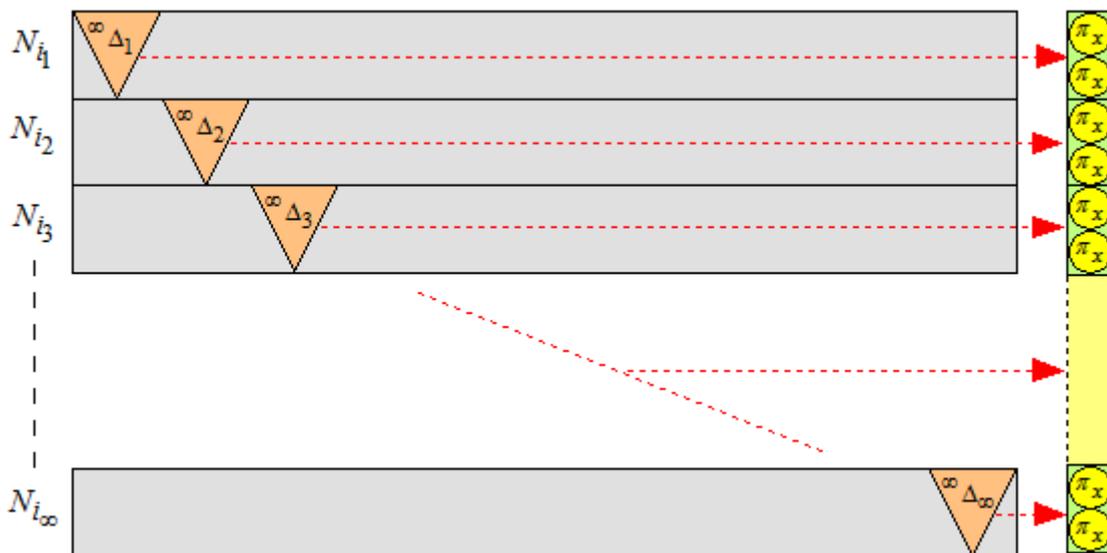


Thereby, if we elucidate the Universe in a top-to-bottom approach on considering bottom-up integration probabilities to describe the existing physical principles, it can be concluded that the Universe is a single cluster-matter trifurcated into coherently embedded sub-cluster-matters and

further sub-cluster-matters up to infinity in infinite level of terminal cluster-matters that forms the infinite innermost stratum of the Universe. This implies that the cluster-matters of the Universe are in strata extending from the outermost cluster-matter as the outermost stratum of the Universe to the infinite innermost stratum of the Universe.

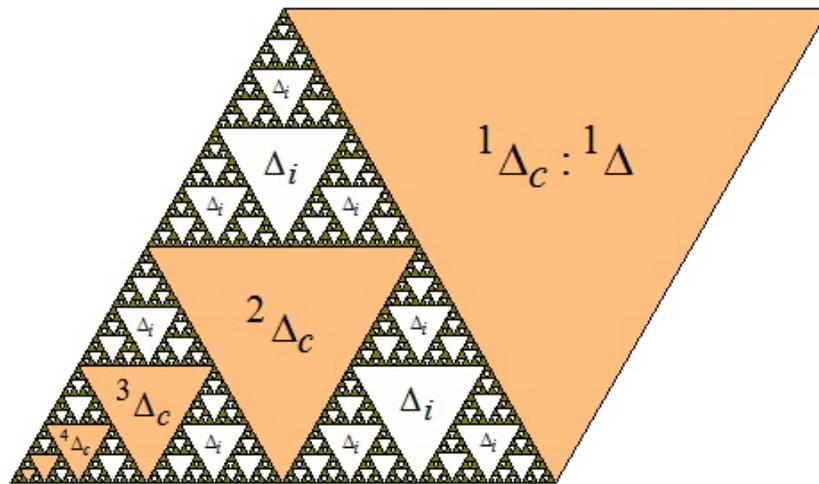


On elucidating further, we can express that the infinite innermost stratum of the Universe itself consists of infinite sub-strata of cluster-matters as the trifurcation branches ends in various levels in infinity; and the sub-cluster-matters of the terminal-cluster-matters dissociates into pairs of elementary-matters (EM) that are not clusters and are unstable.



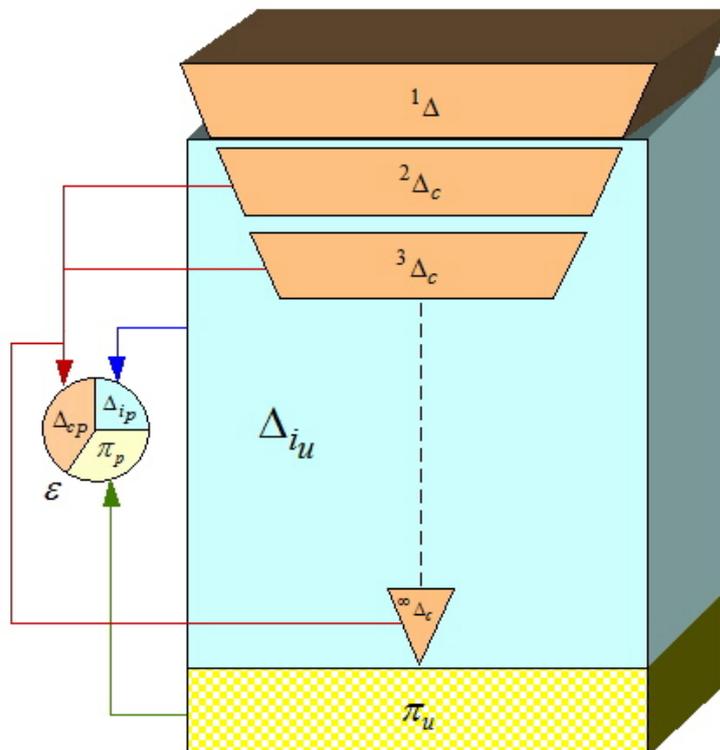
This implies that the Universe does not have any physical shape, as the dimensions of the cluster-matters and the elementary-matters differ. The sub-cluster-matters are also cluster-matters and in

general, a cluster-matter is coherently related to its super-cluster-matters and sub-cluster-matters. That is the cluster-matters in each stratum towards the innermost stratum are more than that in a stratum towards the outermost stratum of the Universe.



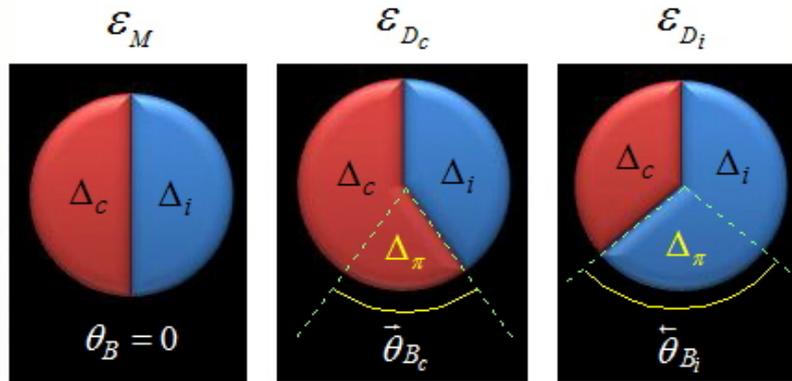
A reference cluster-matter at a branch in the trifurcated tree of the Universe is in coherency with the spin of its super-cluster-matters and that reference cluster-matter is assumed as a Coherent-cluster-matter (CCM), whereas the other cluster-matters at different branches in the trifurcation tree are its Incoherent-cluster-matters (ICM), as their spins are not coherent with the spin of that CCM.

Along with EM, a CCM and an ICM conjugate to form a Conjugated cluster-matter (CnCM) that may be a Monopolar conjugated cluster-matter (MCnCM) or may be a Dipolar conjugated cluster-matter (DCnCM).

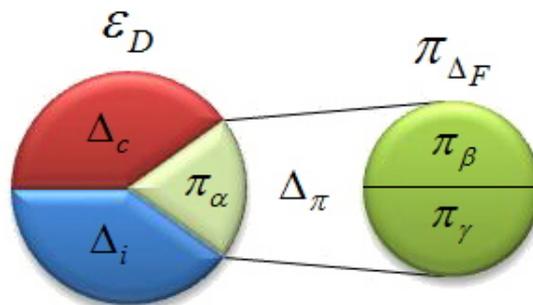


As per this model of Cluster-matter-universe the Universe is in a state of spontaneous dynamics in which the energy and the mass are not in separate entity and in unitarily expressed as energy-mass.

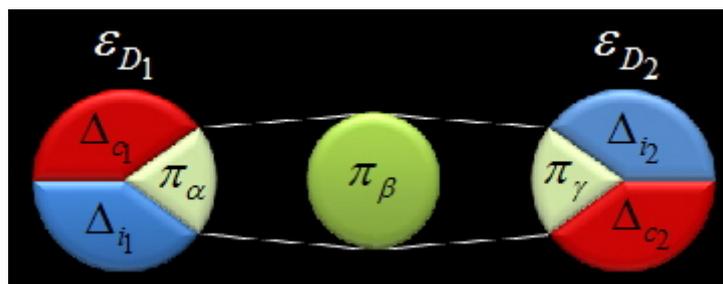
Thereby in a MCnCM the energy-mass of its CCM and ICM are equal whereas their spins are in opposite directions, whereas in a DCnCM either the energy-mass of CCM or the energy-mass of ICM dominates and the probability distribution of the dormant cluster-matter with the dominant cluster-matter is substituted by Elementary-cluster-matters (ECM) that are triplet clusters of EM.



This implies that the polar potential difference of a DCnCM is equivalent to the ECM of it and thereby the EM of ECM is de-coherent with the CCM and ICM of that DCnCM. The Polar potential difference is a vector quantity and its directional derivative is from dominant cluster-matter to the dormant cluster-matter and thereby the Polar potential difference of MCnCM is zero. Excluding the outermost cluster-matter of the Universe, all Heterogeneous matters of the Universe are Heterogeneous CnCM only.

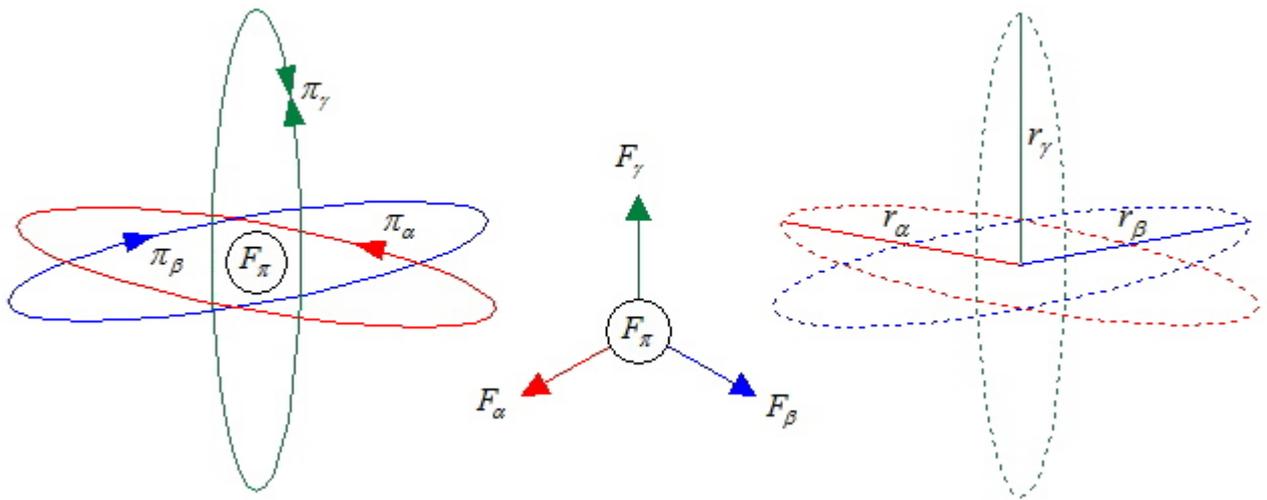


If the ECM conjugate of a DCnCM is a single unit then one of the EM of that ECM conjugates with that DCnCM whereas the other two EM of that ECM remains as free radicals. When such two DCnCM bonds together, one EM for each DCnCM is shared for conjugation and the remaining one EM remains as a bonding EM between them and that can be shared with any number of ECM that are conjugated with different DCnCM. As the Universe is a cluster-matter, it itself and all its cluster-matters are non polar whereas the DCnCM it contain are dipolar.

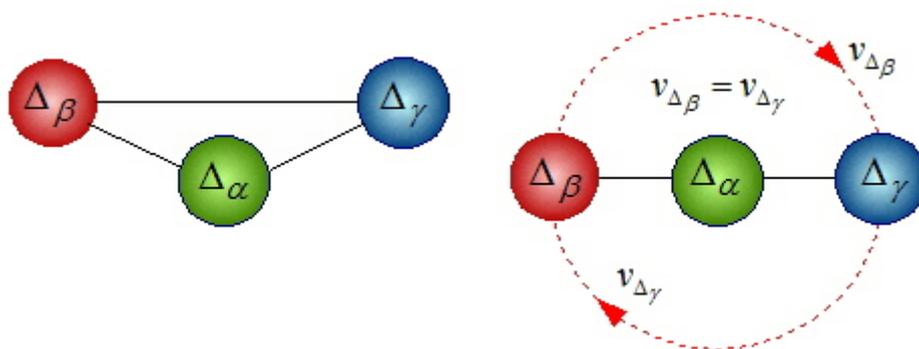


The Matter-mass of the Universe is expressed as the combination of Cluster-mass, Elementary-mass and Conjugation-mass of the Universe. The cluster-mass of the Universe is the units of cluster-matters in the Universe that is equal to the units of cluster-matters of the outermost cluster-matter of the Universe when it is trifurcated into sub-cluster-matters and further sub-cluster-matters up to infinity. That is, the cluster-mass of the outermost cluster-matter is greater than that of any of its sub-cluster-matters or further sub-cluster-matters. This implies that the cluster-mass of a cluster-matter towards the outermost stratum of the Universe is greater than that of a cluster-matter towards the innermost stratum. The cluster-mass of the innermost stratum of the Universe is the Inner-cluster-mass of the Universe. As each innermost cluster-matter dissociates into two elementary matters, the elementary-mass of the Universe is double the Inner-cluster-mass. As the elementary-matters conjugate into the CnCM as ECM, the conjugated-mass of the Universe consists of cluster-mass and elementary-mass. Thereby when the mass of an object is described, it is in general the conjugated-mass only.

As all three EM of an ECM revolve around a single point in different orbits in which two of them revolve in opposite directions then the net centrifugal force is the force carrier of that ECM and causal for an axis displacement force that displaces it.

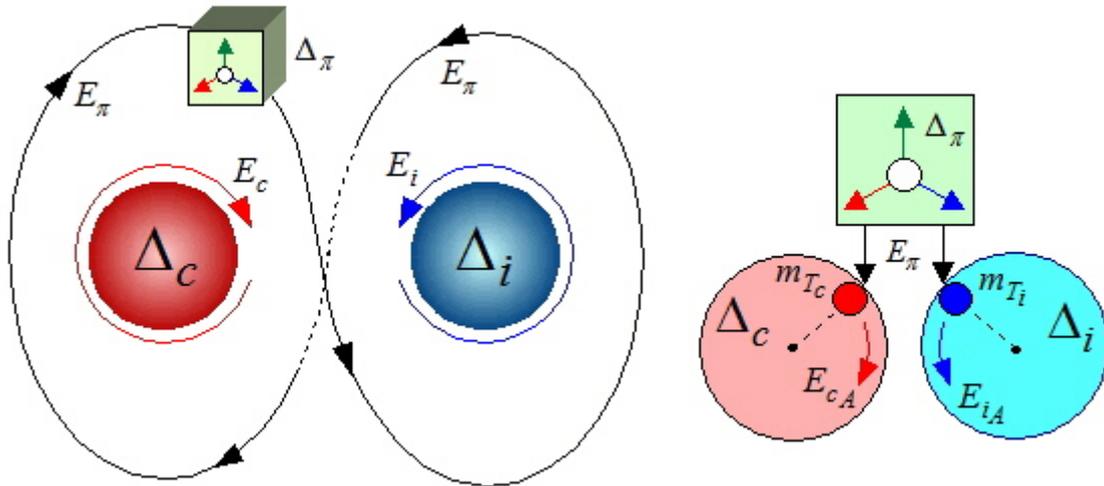


When there is spin of a Coherent or Incoherent cluster-matter, one of its sub-cluster-matters is its central-matter, whereas the other two are its tangential-matters. That is, the tangential-matters of a Coherent or Incoherent cluster-matter revolve about their central cluster-matters.

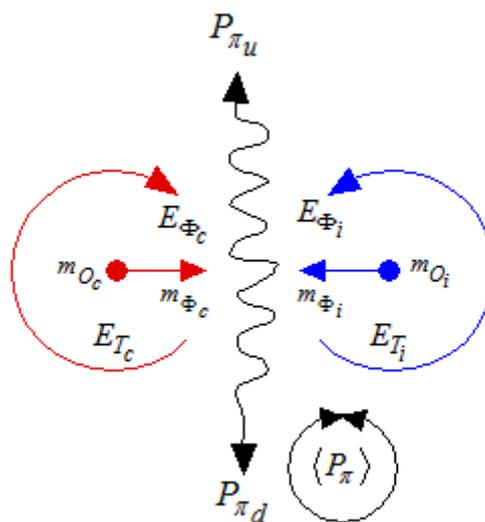


The sum of the masses of both tangential-matters is the tangential-mass of that Coherent or Incoherent cluster-matter. As the tangential-mass of CCM and ICM spins in opposite directions, an external ECM triggered by its axis displacement force is pulled along the spin direction of the CCM

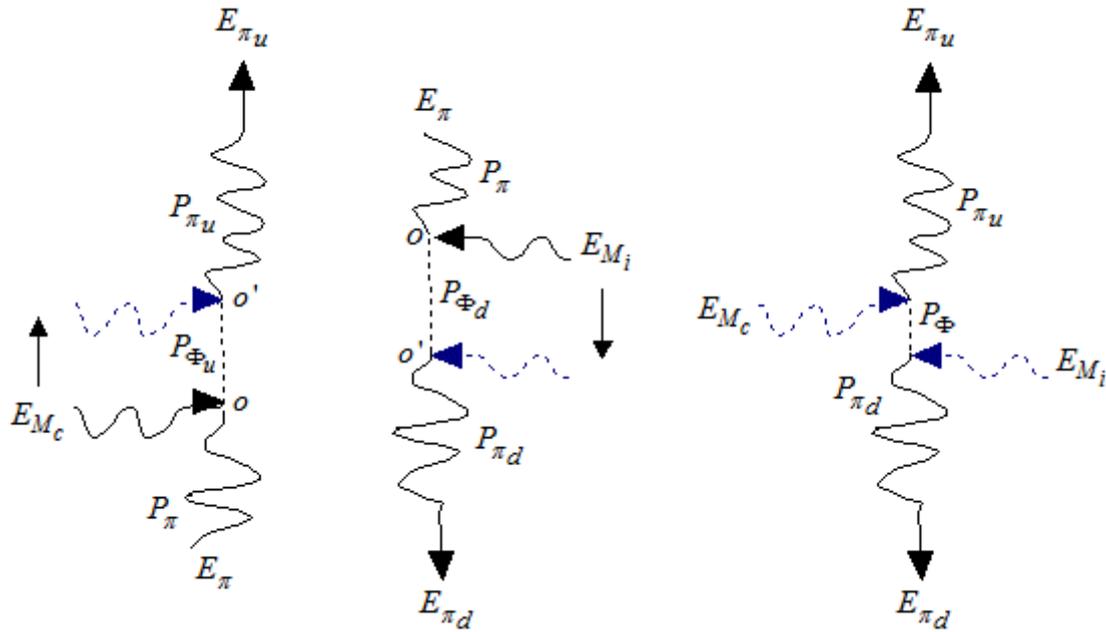
and ICM during the event of energy-mass transfer from that ECM to CCM or ICM or to both, and thereby that ECM has a double spinning orbit around CCM and ICM in opposite directions as figure of eight.



On transfer of energy and mass there is spin-augmentation in the tangential-mass of CCM or ICM and causality of helicity of spin in reference to the central mass of that CCM or ICM, when the spin-radius of it is invariant. The force acting on the central-mass by the augmented spin is causal for the central-mass displacement-energy of that CCM or ICM and the central-mass oscillate on transfer of energy and mass from that CCM and ICM. By the oscillation of central-mass of CCM and ICM the energy and mass are transferred from CCM and ICM to ECM, such as energy from tangential-mass and mass from central-mass.



There by the energy and mass are assigned as a single Energy-mass operator that is covariance. If the CCM and ICM are equal then there is no Energy-mass is transferred from them to ECM. When the energy-mass of CCM is greater than that of ICM then the helicity of spin by ECM is in positive direction, whereas it is in negative direction when the energy-mass of CCM is lesser than that of ICM. That is the helicity of ECM is zero when the energy-mass of CCM and ICM are equal and in opposite directions, as the energy-mass is a vector unit.



The convoluted energy-mass from CCM or ICM with the ground state energy-mass of an ECM is the upward and downward oscillation energy-mass of that ECM, whereas the probability distribution of the upward flux-helicity with the downward flux-helicity of ECM is the effective flux-helicity of it and the tensor field between the initial and displaced position of its spin is the spin displacement tensor of it. The effective flux-helicity of an ECM is proportional to the convoluted upward-downward oscillation energy of it that is proportional to the energy-mass transferred to it from the CCM and ICM. That is the energy-mass transferred from CCM and ICM to ECM is equal to the convolution of the spin displacement tensor and the convoluted upward-downward oscillation energy-mass of that ECM. The upward-downward oscillation energy-mass of an ECM is the available energy-mass of it for transferring to any CCM or ICM. Thereby the energy-mass propagation through interacting neighborhood of CnCM by conduction and transformation of energy-mass explains a linear sequential dynamics of the Universe.

Comparison of Cluster-matter-universe with Matter-universe:

Most of the paradoxes in theoretical physics emerge from non-deterministic space-time and in observational astrophysics the un-screenability makes it difficult to probe the dark matter of the Universe. As per this work, space is the extension of matters that are fields in the Cosmix-matrix fluid and it is invariant but not constant. Space is the lattice of fields that are matters in the Cluster-matter-universe model whereas in Matter-universe, space is the three dimensional extent in which matters exists.

Span of vacuum expectation value (VEV) of Higgs boson indicates the possibility of cosmic-matrix expressed in the Cluster-matter-universe model that describes that there is no empty space in the Universe which is expressed as, 'Nothing is always something that is not Zero'.

In Cluster-matter-universe, the coherency of dynamics for a reference cluster-matter is with its set of super-cluster-matters and incoherent cluster-matter that conjugate with it. All the other incoherent cluster-matters that are available in the Universe for that reference cluster-matter have un-screenability with that cluster-matter and this explains the undetectable dark matters and WIMPs of Matter-universe that have dark energy.

The observational data available on both the Blue and Red shifts indicates the coherent dynamics of the super-cluster-matter set for a reference cluster-matter in Cluster-matter-universe model.

In Cluster-matter-universe the force carrier is the net centrifugal force by the spin of elementary matters that is not particles, whereas in Matter-universe they are the Bosons.

Atomic chemistry of sub atomic particles that describes the Protons along with electrons and the Neutrons in Matter-universe is in analogy with the coherent and incoherent cluster-matters of CnCM in Cluster-matter-universe.

Origin of mass explained by big bang in Matter-universe is contradicted in Cluster-matter-universe in that there is no origin of Universe and the mass of Universe is in different dimensions as it is measured as Matter-mass, Cluster-mass, Elementary-mass and Conjugation-mass that describes that the Elementary-mass of elementary-matters, is within other masses.

Baryogenesis before Big Bang and the Big Bang Nucleosynthesis of Matter-universe are not explained by Cluster-matter-universe as this model does not describe any nucleus. The Baryons can be expressed as the Elementary cluster-matters (ECM) of this model as they are composite particles of three quarks. The quark and anti-quark combination in Mesons is comparable with the dissociated Elementary-matters (EM) from the terminal-cluster-matters of this model.

In Matter-universe, the energy and the mass are in different entity, whereas in Cluster-matter-universe they are unitarily expressed as energy-mass and thereby the spontaneous coherent dynamics is the intrinsic characteristics of Universe.

The energy propagation in Matter-universe is through transportation of energy by photons whereas in Cluster-matter-universe the energy-mass propagates by conduction and transformation.

In Matter-universe there is matter-antimatter asymmetry, whereas in Cluster-matter-universe the coherent cluster-matter and its incoherent cluster-matter in a CnCM have opposite spins and have independent symmetry with their super-cluster-matter sets.

The dynamics of quarks and leptons in Matter-universe is described by Quantum mechanics and Supersymmetric quantum mechanics, whereas in Cluster-matter-universe the dynamics of the cluster-matters is explained in Continuum mechanics with Supersymmetric quantum mechanic similarities.

In Matter-universe charge density and energy density are causal for the dynamics of Universe, whereas in Cluster-matter-universe the spin-energy is causal for it. Different energy value of electron in each time from a radioactive source observed by experimentations denote that there is no charge for electrons and only the spin-energy of it differ and this observation is supportive of Cluster-matter-universe on considering the conservation of energy.

In Matter-universe, the Spontaneous symmetry breaking explains the conjugation of particles whereas in Cluster-matter-universe it explains the dissociation of elementary matters from terminal-cluster-matters and that is causal for the spontaneous dynamics of the Cluster-matter-universe.

Causality of force by Polar potential difference of the DCnCM in Cluster-matter-universe is comparable with the electromagnetic force described in Matter-universe.

Generations of Neutrino spectrum and the generations of Quarks spectrum in Matter-universe indicates varying levels of terminal cluster-matters that dissociates into elementary matters in Cluster-matter-universe. Double beta decay and the formation of two electrons and two neutrinos (one neutrino and another anti-neutrino) with opposite spins in Matter-universe can be very well compared with the dissociation phenomena of the terminal cluster-matters into elementary-matters in Cluster-matter-universe.

Though there is probability for a DCnCM to have a reversed DCnCM with reversed energy-mass at another branch of the trifurcation tree of Universe, the probability of its similarities in bonding with

other DCnCMs is trivial and thereby an exact Parallel universe is not possible to be described by this model, whereas in Matter-universe the Antimatter universe can be expressed as the Parallel universe.

Observational and Experimental expectations:

Confirmations on the existence of Higgs boson by particle accelerator experimentations may update the Standard model in Particle Physics and that may provide indicators to probe the Elementary-matters of the Cluster-matter-universe.

Integrated developments on Neutrino Physics at Neutrino Observatories for the Cluster-matter-universe postulations may emerge with observations to conclude the relativity of cluster-matters with their super-cluster-matter sets. Neutrino spectrum analysis at various geographic locations by a spectrum of scintillators along with supramolecular assembly variability study on the scintillators may confirm the coherent dynamics of the super-cluster-matter set of a reference cluster-matter. This may lead to an application, 'Environmentally guided molecular self-assembly', that is useful for Biotechnology applications. That is, integrated experimentations on Neutrino Physics with molecular physics and molecular chemistry, is essential to probe the Cosmic-matrix of Cluster-matter-universe.

Molelectronic experimentations in Biological Systems may conclude the phenomenology of energy-mass propagation by conduction and transformation.

Observational studies on Comets and their tails may reveal evidences for the existence and coherency of super-cluster-matter sets for reference cluster-matters, described in this model.

Conclusions:

Expectations from the phenomenological variations in Neutrino physics may provide background to conclude the top-to-bottom approach described in this model. Expectations from symmetry breaking paradigm of the Proton-neutron mass-difference in Gauge model by Pion triplets (π^+ , π^0 and π^-) and their mass in the Higgs system; and expectations from phenomenological developments on Mesons and Baryons indicate the possibility of the bottom-up integration on this model.

Renormalisation of mass, charges and coupling constants in Matter-universe may lead to closer acceptability for this model. String theory and the Braneworld scenario can be applied much efficiently for this model in which the Universe is considered as Cosmic-matrix in fluidity with lattice of fields that are matters.

Thereby the physics of this Cluster-matter-universe model concludes the necessity to investigate for re-structuring of atomic analogy by Elastic scattering analysis on Parton distribution, and on this the Hierarchy problem and Fine tuning problem in Renormalization to be resolved to conclude Unified fundamental forces of Nature and this may be the ultimate possibility in Physics.

Reinvestigating the Plank constant and the expectations on Beyond Standard Model for particle physics may provide background to describe further on this non-inflationary Cluster-matter-universe model and provides expectations on chemical principle variations and bio-physical phenomenology variations that may have impacts on scientific developments.

Reference:

1. The Opposite Ends of Supersymmetry and their Implications for the LHC: Gauge Coupling Unification, by James Wells, at the Academic Training Lecture Regular Programme of CERN, 2008-2009.
2. Fundamental constants at High Energy and their time variation, by Harald Fritzsch, at CERN Colloquium, on 4th December 2008.

3. Proton-neutron mass difference and the pion mass in a gauge model, by Lieberman, Judy, at Physical Review D, vol. 9, Issue 6, pp. 1749-1761.
4. From Heavy-Ion Collisions to Quark-Matter, by Lourenco. C, at CERN Summer Student Lecture Programme Course 2009.
5. Cosmology and the Particle Accelerator Connection, by Geraldine Servant, at CERN-Fermilab-HCP Summer School on 11th June 2009