Gradual Rise and Growth Versus the Sudden Inflation of the Cosmic Globe

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According to the present investigation, the energy (Mc^2) of the Cosmic Globe is a kinetic expression of its Potential Energy (P. E.) in the Vacuum Field (V-Field). It is above the Zero Point Energy (ZPE) of the Vo-Field and due to its dynamic nature expands isotropically in the surrounding Vacuum, increasing the size of the Cosmic Globe. But the progress of Centrifugal Expansion is opposed by the Centripetal drag of the G-Field, which brings the expansion to a halt when the P.E. in the V-Field and the Kinetic Energy (K.E.) of the Cosmic Globe exhaust themself at $Rc = Mc^2 \times G/c^4$. Instead, the G-Field P.E. attains its maximum value $Rc \times c^4/G = Mc^2$ = total mass-energy of the Cosmic Globe - *which triggers the Contraction phase*. **Thus, Rc is the delimiting non-crossable boundary for the mass-energy expanding inside the Cosmic Globe - marking a sharp contrast with the Schwarzschild radius (Rs), which delimits the no-return boundary of the mass-energy collapsing under its g-forces!** And, during the G-compression, the contracting globe squeezes out the voids and discharges its energy into the V-Field to attain its ZPE state. At the Maximum Contraction (Ro), the G-Field P.E. equals zero, while the P.E. with respect to the V-Field attains its maximum value - *which initiates the Expansion Cycle*. In short, the Cosmic Globe perpetuates its expansion and contraction cycle by recycling its total energy through the periodic and gradual interconversion into the P.E. of the V-Field and G-Field.

INTODUCTION: The very fascinating nature of our Universe has captivated the human mind since antiquity. And combined with our curiosity and concerns involving *matters of life and death*, it has engaged the contemplative minds to enquire about its (*and our*) origin and end. Consequently, there are numerous models for the life cycle of our Cosmos, resulting in a vast amount of literature: religious, philosophical, popular, — and during the past 100 years highly professional [1,2]. Thus, it is neither easy nor prudent to advocate yet another model on this theme. But in spite of these limitations and precautions, pondered scrutiny of some intriguing aspects of the earlier **Big Bang** proposals, such as: the ongoing growth of the Cosmos and the independent expansion of space-time – presently attributed to the presence of **Dark Energy** causing the centrifugal pull of the **Vacuum Field -** , vis-a-vis the centripetal nature of the **Gravitational Field;** the hypothetical sudden growth or **Inflation** of the extremely energetic so called "**Primeval Atom or Singularity**"; the proposed **Phase change** and **False Vacuum**, etc., provide some compelling reasons to propose an Unorthodox Scheme for the life cycle of our Universe.

The historical development and discussion of some puzzling aspects of the earlier BB models for the origin and growth of Cosmos from the Primeval Atom or Singularity was reported earlier [3]. The present study describes or refers to the essential parts of those arguments and brings some new insights to create a coherent and compact report. The preliminary analysis and comments based on the conventional as well as some non-conventional supporting arguments leading to the proposed alternatives are described below and detailed in the following sections.

1. **The Eternal Vacuum or the Vacuum Field (Vo–Field)** is devoid of any detectable electromagnetic radiation (EMR) and Matter. Thus, it is neither perceived by our normal senses nor directly detected by our scientific instruments. Consequently, for all practical purposes it is not evident to us. Nevertheless, its presence may be inferred from the behavior of the observable Universe, which is expanding into an apparent emptiness. Hence, "*this transcendent boundless sea of an apparent emptiness*" is the Primary Universal 3D stage in which the phenomenon of the Manifest Universe is played out marvelously by a wide spectrum of **EMR**, dancing as **Energy** waves - and only a very small select cast disguised as **Matter**: Electrons, Protons, and Neutrons (e, p, n).

2. **Electromagnetic Radiation (EMR)** or the EM waves represent the energized and agitated (polarized) state of V_0, conducting momentum ($mc = \hbar/r$), angular momentum ($mc \times r = \hbar$), and energy ($E = \hbar\, c/r = mc^2$), at the speed of light (c). Thus, the top-most possible speed 'c' of EMR and the extremely small values of the Planck constant ($h = 6.63 \times 10^{-34}$ J s/ cycle) or its reduced form ($\hbar = h/2\pi = 1.055 \times 10^{-34}$ J s/ radian), attest to the super-sensitive and super-conducting nature of the of the Vacuum Field V_0, because its undetectable Zero-Point Energy (ZPE) state becomes highly disturbed and polarized by an extremely small input of energy during a very short fraction of time: $h = E\, T$ or $\hbar = E\, t$. The resulting electromagnetic wave flies away at the top-most speed (c) and can be detected by our instruments or even seen as light of different colors.

Presently, the numerous routine and specialized uses of light, heat, microwaves, x-rays, and gamma rays, etc., are familiar to us. But, the great importance of EMR energy lies in its vital link with the very birth and existence of our Cosmos, because the essential building blocks of our Universe: electrons (e), protons (p), and neutrons (n), and their predecessors are packets of confined-energy, as may be deduced from Einstein's very famous equation: $E = mc^2$ or $m = E/c^2$.

And apart from the solitary example of e^- and e^+ **Pair Production** from a suitable gamma-ray photon, the High Energy experiments have provided a long list of unstable transitory particles, which quickly decay into the stable end products: p and e.

3. The Space-Time of the Cosmic Globe represents the occupied Vacuum, populated by EMR, dispersed particles, and all sorts of Celestial bodies. *And the unobservable tenuous boundaries of the Cosmic Globe are determined by the radial progress of EMR flying ahead of Matter in all directions*. Thus, the actual size of the Cosmic Globe is far bigger than that of the luminous or visible universe observed by our instruments! But let us bear in mind that, during the past millenniums and up to the early 1920s, the Visible Universe was just limited to the **Milky Way** and a few undefined clouds and diffuse spots called Spiral Nebulae. Nevertheless, Astronomers in the past strongly believed that our Universe had fixed and stable boundaries – the so-called **Static Universe**. This belief was so strong that even the father of **Relativity**, Albert Einstein, instead of admitting a dynamic universe, found it necessary to add the famous **Cosmological Constant** to his **GRT** equations – to ensure the static solution.

However, the pioneer 1912 onward observations by Vesto Slipher on the redshift of several Spiral Nebulae, indicated that these objects were moving away from Earth. Moreover, new solutions to GRT equations by Alexander Friedmann (1922) and Georges Lemaitre (1927) also pointed to an expanding universe. And in the meantime, the 1924 onward observational studies of distant Spiral Galaxies by Edwin Hubble proved beyond any doubt that our cosmos was indeed expanding. And to estimate the velocity of expansion, he provided the **Hubble Law**: V = H x D, where V is the recessional velocity of the celestial object, D is its distance from Earth, and H stands for the **Hubble Constant**. Thenceforth, the follow-up studies of the past 100+ years reveal that Cosmos has been expanding since its birth, growing bigger and bigger. Furthermore, the space among the gravitationally well-bound structures – galaxies, galaxy clusters and their component Steller systems – does not expand. But the void between the unbound galaxies and galaxy clusters is expanding, maintaining the overall structure and radial order of the observable Cosmic Globe. Consequently, this puzzling independent expansion of space – *which increases the size of the Observable Universe* – has been attributed to an equally puzzling **Dark Energy**, which supposedly exerts the centrifugal pull on the Cosmic Globe!

But to my understanding, there is no need to invoke the Dark Energy, because the Cosmic Globe enclosing EMR and Matter has much higher energy-density and pressure than the surrounding Vacuum Field, which has the lowest zero-point energy density and pressure. Thus, the expansion of the Cosmic Globe into the surrounding emptiness (Vo-Field) is just natural and very much expected. Consequently, the matter-free EMR generated at the birth of Cosmos is flying - ahead of Matter - into the Vacuum Field Vo, extending the invisible boundaries of the Cosmos – leaving far behind the Materialized part as the Observable Universe.

By the end of 1920s, the theoretical and observational studies put the expansion of the universe on firm grounds. But, soon after in 1931, the pioneer of the Cosmic Expansion, Georges Lemaitre – *who besides his scientific pursuits was also a Catholic priest* – suggested that the extrapolation of the observed expansion backwards in time leads to a smaller & smaller universe till one reaches a single point having infinite values for mass-energy density, temperature, and g-forces, etc. - *a state where the known laws of Physics break down and operate no more*! He named this extreme endpoint the **Primeval Atom**, from where the present universe sprang-up somehow, despite its lawless state! But the origin of an expanding universe from the Primeval Atom was strongly contested by its opponents. And an ardent protagonist of the rival **Steady State** model – Fred Hoyle – nicknamed it the **Big Bang**, during his BBC talk in 1949. Since then, the very forceful and catchy *misnomer* has become very popular both in the mainstream and the scientific media, *despite having undergone several amendments and updates of the original proposal*, aiming to align it with the ongoing astronomical observations.

Nevertheless, there are many puzzling unanswered questions during the Expansion and Contraction cycle, which demand an adequate explanation. I shall focus on some of these problems with the help of **Table 1**, based on total mass-energy of 2×10^{54} kg (1.8×10^{71} J), which is

conserved during all the stages of the Expansion & Contraction cycle, as discussed in my previous report [3].

Table 1: Some Exemplary Stages during the Cosmic Expansion and Contraction#

Entry	**R (m)**	**D (kg/ m^3)**	**P.E. (J/kg); V^2 (m^2/s^2)**	**'g' (m/s^2); $V^2/R=Tan\ \theta$**	**θ°; Space-time gradient**
1.	2.966×10^{27} (Rs)	1.83×10^{-29}	4.5×10^{16}	1.5172×10^{-11}	8.7×10^{-10}
2.	1.483×10^{27} (Rc)	1.464×10^{-28}	9×10^{16}	6.0688×10^{-11}	3.477×10^{-9}
3.	1.3065×10^{26} (13.8 Gly)	2.141×10^{-25}	1.02×10^{18}	7.82×10^{-9}	4.48×10^{-7}
4.	1.483×10^{18}	0.1464	9×10^{25}	6.0688×10^{7}	~ 90
5.	1.483×10^{17}	1.464×10^{2}	9×10^{26}	6.0688×10^{9}	90
6.	1.483×10^{16}	1.464×10^{5}	9×10^{27}	6.0688×10^{11}	90
7.	1.483×10^{15}	1.464×10^{8}	9×10^{28}	6.0688×10^{13}	90
8.	1.483×10^{12}	1.464×10^{17}	9×10^{31}	6.0688×10^{19}	90
9.	1.483×10^{11}	1.464×10^{20}	9×10^{32}	6.0688×10^{21}	90
10.	1.6478×10^{10}	1.0672×10^{23}	8.1×10^{33}	4.915×10^{23}	90
11.	2.966×10^{3}	1.83×10^{43}	4.5×10^{40}	1.5172×10^{37}	90

(#Reproduced and adapted from reference 3)

Just a cursory glance on the Table shows that the energy density and the gravitational potential energy profile of the Cosmos was extremely high during its infancy – even without invoking the 'Primeval Atom'. But the advocates of Big Bang models argue that in spite of being extremely dense when very young and during part of its early expansion – far denser than required to form a

black hole – the universe did not re-collapse, because calculations for g-collapse are based upon constant size stars and do not apply to the rapidly expanding space of the Big Bang [4].

Well, though these arguments expressly acknowledge that cosmos was born and grew up under the gravity-free conditions or during the predominance of the Vacuum Field over the g-forces, yet there is no plausible explanation neither for the absence or weakness of the g-forces, nor for the ongoing expansion of space-time. Instead, these arguments point out the inaptness of GRT and its Schwarzschild and other solutions for the formation of black holes in the expanding cosmos - which is understandable, because these studies describe g-interactions, g-forces, and g-collapse of the celestial bodies very much larger than their respective black holes! Consequently, these solutions are not appropriate for the Cosmos, which is growing in the V-Field and is smaller than its theoretical Black Hole!

Furthermore, the above referred arguments do not reflect the vital role gravitation has been playing for the ongoing development, differentiation, and evolution of the cosmos, since the very early stages of the expanding universe: the Big Bang Nucleosynthesis (**BBN**) in the 1st few minutes, followed by gathering/clumping of the fleeting Hydrogen and Helium – the lightest of the gases – to form successively trillions of proto galaxies and galaxies; igniting the cascade of uncountable celestial fusion reactors – forging the chemical elements of the Periodic Table –, then extinguishing the light-weights as cinders of the dead stars, while forcing the blow up of the heavy-weights as supernovae, resulting in neutron stars or even some black holes - ***a very impressive list of accomplished celestial tasks, indeed***! And let us bear in mind that during all these very significant transformations carried out on Matter - caught up in the grip of gravity –, the expansion of the universe has been going on independently, all the time!

Therefore, looking into the present and past history of the universe and based on its ongoing expansion – since its very birth -, one can safely conclude that during the Expansion Phase, cosmos has never been subjected to the g-grip of its total mass-energy supposedly contained in the extremely energetic and intensely hot hypothetical starting points: Primeval Atom, Singularity or the Plasma Soup of EMR and Matter.

Instead, the foregoing evidence and arguments lead to the conclusion that our cosmos woke up under g-free conditions from a very 'Cold State', coaxed by the centrifugal pull of the Vacuum Field. *And in the beginnings, it rose-up (emanated) as pure EMR - free of any Matter-, which rushed unimpeded into the surrounding Void and Vacuum*. But, soon after the Materialization of

some suitable Energy packets (photons) and the formation of the Primary building blocks of the universe – neutrons, protons, and electrons (n, p, e) -, the local g-forces caught up with Matter due to its inertia, resulting in trillions of matter-nuclei as g-centers, which have been carrying on the well-documented ongoing development and evolution of the cosmos we presently observe and admire!

Well, one important support for this view comes from the Astronomical observations carried out during the past 100+ years, which reveal that at present - and during the past billions of years – our cosmos has been populated by billions of well-scattered galaxies, separated by lot of empty spaces (void). Consequently, its fast-expanding inhomogeneous total mass-energy does not create just one mega-center of gravity. Instead, its diverse g-centers created around aggregated matter have been well-scattered as trillions of galaxies, each containing several billions of Steller systems, which are controlled by an intricate hierarchy of local g-forces as already discussed in my previous reports [3, 5].

However, examination of **Table 1** shows that, though the low-density states of Entries 1 – 5 (and possibly 6) can accommodate billions upon billions of well-scattered g-centers, the accommodation turns tighter to impossible at smaller radii – *especially during contraction*. For instance, around R = 10^{12} m (Entry 8), the cosmic globe has the density of Neutron stars – the densest known celestial objects – and is even more dense at smaller radii, which makes it hard to imagine trillions of g-centers at its origin and during the infancy of the growing cosmos.

Therefore, there must be some other reason for the lack of g-forces, at its very origins, and for the ongoing expansion. Fortunately, the fleeting radiation (EMR) comes to mind to indicate EMR as a perfect solution – as suggested above in the preceding paragraph.

Nevertheless, during the Contraction of the Cosmic Globe, there remain several other puzzling questions, especially after the presently well-scattered galaxies and galaxy-clusters coalesce to form a single compact system (Entries 6 – 11). Thenceforth, the shrinking compact globe will be technically many orders of magnitude smaller than its calculated **Schwarzschild radius** (Rs) and very much deep inside its own black hole – and possibly on the road to "Singularity"! However, by considering several important issues – such as, the contribution of the **Binding Energy** (B. E.), **Negative Mass** or **Mass Defect**, **Time Dilation** and slower and slower EMR propagation, extreme densities, and outright **Melt Down**, etc. - *ignored by the proponents of the Primeval Atom* -, my earlier proposals postulate a halt to extreme contraction and a **Phase Change**, very much short of the zero dimensions (**Table 1, Entry 10**). I have discussed these and several other related issues in my previous investigation [3].

Therefore, avoiding excessive non-essential repetitions, I shall now focus on some new insights gathered during the past few years. The new ideas are based on the inter-change of the Potential Energy (P. E.) of the Cosmic Globe with respect to the Vacuum Field (V-Field) and the Gravitational Field (G-Field), during the Expansion and Contraction cycle.

1. According to the new insight, the energy of the Cosmic Globe is a kinetic expression of the P. E. contained in the V-Field. It is above the Ground State or the Zero Point Energy (ZPE) state of the Vo-Field. And due to its dynamic nature (mc^2) expands in the surrounding Vacuum, increasing the size of the Cosmic Globe. However, the Cosmos does not blow up at once with the total energy (Mc^2) of the final globe. Instead, the P.E. in the V-Field gradually activates the ZPE state of the V-Field and sustains the expansion of the Cosmic Globe in the surrounding Vacuum.

2. The progress of Centrifugal Expansion is opposed by the Centripetal drag of the G-Field, which brings the expansion to a halt at $Rc = Mc^2 \times G/c^4$, because the P.E. with respect to the V-Field exhausts itself at Rc. Instead, the G-Field P.E. attains its maximum value = $Mc^2 = Rc \times c^4/G$ = total mass-energy of the Cosmic Globe - *which triggers the Contraction phase*. And, during the G-compression, the contracting globe squeezes out the voids and discharges its energy into the V-Field to attain its ZPE state.

3. At the Maximum Contraction (Ro), the G-Field P.E. equals zero or ZPE-state, while the P.E. with respect to the V-Field attains its maximum value - *which initiates the Expansion Cycle*.

The maximum P.E. at the two extremes – Maximum Contraction (Ro) and the Maximum Expansion (Rc) - are equal to the total mass-energy of the Cosmic Globe: $Mc^2 = Rc \times c^4/G$.

4. Thus, Rc is the delimiting non-crossable boundary for the mass-energy expanding inside the Cosmic Globe - marking a sharp contrast with the Schwarzschild radius (Rs), which delimits the no-return boundary of the mass-energy collapsing under its g-forces! Furthermore, while the Black Hole inside a galaxy is surrounded by all sorts of celestial bodies, the intra-galactic matter, energy, dust and particles - the non-crossable boundary of the Cosmic Globe (Rc) is surrounded only by the Eternal Vacuum at its ZPE-state – devoid of any detectable energy or matter.

I would like to call your attention to a recent article in the Scientific American, which describes a "A Tale of Two Horizons" [6]. But that tale is entirely different from the non-crossable boundary of the expanding cosmos (Rc) described in the present investigation – and discussed in my previous reports [3, 5].

5. The energy contained in the cosmic globe at any stage (Rt: Ro to Rc) of expansion or contraction is directly proportional to Rt: $mc^2 = Rt \times c^4/ G$, while the volume varies as $(Rt)^3$. Therefore, the mass-energy density of the Cosmic Globe (D-Cosmos) is inversely proportional to the square of Rt. Consequently, it decreases sharply on expansion, while the reverse is true during contraction. **Table 2** illustrates this point for some stages during the Expansion and Contraction Cycle.

The 1st surprise is that the energy at the Planck length corresponds to the Planck Particle, having extremely high energy density (**Entry 1**). And the mass-energy density will be even higher during the Planck Epoch! Thus, the present model has found a different "Primeval Atom", which has only a tiny amount of energy, instead of all the energy of the Cosmic Globe. *In fact,*

this observation attests to the equivalence of the strong force and g-interactions at the Planck scale!

The 2nd surprise is the close resemblance of the calculated data with the values at the estimated age for our Universe of 13.8 billion light years (Gly) (**Entry 11**). And, it is very pleasing to note that the calculated D-Cosmos (1.886×10^{-26} kg/m^3) is in good agreement with the present estimates of 10^{-26} kg/m^3 [4]. However, I could not find a Tabulation of the estimated values to compare with the calculated values in **Table 2**, during the past billions of years.

Entry 12 corresponds to the assumed total mass-energy of our Cosmos (1.8×10^{71} J). It would expand up to Rc = 1.483×10^{27} m, about 156.644 b Gly, where its total P.E. in the V-Field turned into the Kinetic Energy of the Cosmic Globe would exhaust itself. While the G-Field P.E. would attain its maximum value = Rc x $c^4/G = 1.8 \times 10^{71}$ J, reverting into the Contraction Cycle.

Entry 4 (Rt = 1.6478×10^{10} m) is included just to compare it at the same size with **Entry 10 of Table 1**, where the compression of the Cosmic Globe came to a halt in my previous investigation [3].

Data in **Entry 2*** (Rt =1.000 m) can be used to calculate the values for all the columns of **Table 2**. Furthermore, if the estimated density of Cosmos (D-Estimate) is available, the size (Rt) and age (Rt /c) of the Cosmos can be calculated: $(Rt)^2$ = D-Cosmos* / D-Estimate.

Table 2: Mass-Energy Profile of the Cosmic Globe according to the New Model#

Entry	Rt (m)	E – Cosmos (J)	D–Cosmos (J/m^3)	D-Cosmos (kg/m^3)
1.	1.616×10^{-35}	1.9614×10^{9}	1.11×10^{113}	1.23×10^{96}
2.*	1.000 *	1.2137559×10^{44} *	2.8976×10^{43} *	3.2196×10^{26} *
3.	1.483×10^{3}	1.8×10^{47}	1.3175×10^{37}	1.464×10^{20}
4.	1.6478×10^{10}	2×10^{54}	1.067×10^{23}	1.186×10^{6}
5.	1.483×10^{11}	1.8×10^{55}	1.3175×10^{21}	1.464×10^{4}
6.	1.483×10^{15}	1.8×10^{59}	1.3175×10^{13}	1.464×10^{-4}
7.	1.483×10^{18}	1.8×10^{62}	1.3175×10^{7}	1.464×10^{-10}
8.	1.483×10^{21}	1.8×10^{65}	1.3175×10	1.464×10^{-16}

9.	1.483×10^{24}	1.8×10^{68}	1.3175×10^{-5}	1.464×10^{-22}
10.	1.483×10^{26}	1.8×10^{70}	1.3175×10^{-9}	1.464×10^{-26}
11.	1.3065×10^{26}	1.5857×10^{70}	1.6976×10^{-9}	1.8862^{-26}
12.	1.483×10^{27}	1.8×10^{71}	1.3175×10^{-11}	1.464×10^{-28}

#: $c = 3 \times 10^8$ m/s; $G = 6.6735 \times 10^{-11}$ m^3/ s^2 kg; $E = Rt \times c^4/ G$

Now, let us reflect on a dilemma. Well, it is easy to imagine the size and mass-energy of the Cosmos growing or contracting in infinite Emptiness. But it is difficult to picture the "False Vacuum" or an Abnormal State of the V-Field, having any kind of Kinetic or Potential Energy. Kinetic energy is detectable and has G-interactions – as present in the Cosmic Globe. Potential energy depends on the physical existence, mutual separation, and the respective mass-energy of the interacting bodies. But the Cosmic Globe is embedded in infinite Emptiness, which has no Rest Mass or detectable energy – nor any tangible separation. However, the Cosmic Globe undergoes periodic changes: it oscillates between its minimum (Ro) and maximum size Rc. And according to the new model, its mass-energy varies from zero to maximum and vice versa. Similarly, the G-Field P.E. increases from zero to maximum, while the V-Field P.E. drops from the maximum to its ZPE state - and vice versa.

Thus, it is very important to note that the P.E. - K.E. interconversion cycle of the Cosmic Globe is entirely different from the familiar gravitational P.E. - K.E. cycles, here on Earth or those in the Heavens. In these cases, the mass-energy of the interacting bodies stays virtually constant. And their size and shape - except for the Comets -, is conserved. Their K.E. (mv^2 /2) changes along with their velocity - maximum to zero and vice versa, while their mutual separation and G-Field P.E. increases from minimum to maximum – and vice versa. The K.E. - P.E. cycle is carried out in empty space, but the interacting bodies do not involve the V-Field in any energy exchange or transaction.

In sharp contrast, the Cosmic Cycle is carried out at a constant velocity "c", but the size of the cosmic Globe and its K.E. oscillate between minimum and maximum: (Rt: Ro to Rc); K.E.= $Rt \times c^4 /G$ = G-Field P.E. = Mc^2 – V-Field P.E., where $Mc^2 = Rc \times c^4 /G$ is the maximum energy of the Cosmic Globe. Furthermore, in the case of the cosmic cycle, the V-Field serves as the Potential Energy Reservoir, which pumps energy into the Globe and triggers the G-Field during expansion. And at the end of the 'pumping stroke', the G-Field compresses the Globe, discharging the energy in the V-Field – perpetuating the P.E. - K.E. interconversion cycle.

Thus, apart from being different from my earlier proposal [3], the new model for the cosmic cycle is entirely different from the B.B. models, based on the total mass-energy of the Cosmic Globe blowing up at once from the Singularity or the Primeval Atom.

In sharp contrast, the new model of the Cosmic Globe recycles its energy through a periodic and gradual interconversion of P.E. between the V-Field and G-Field, which recalls some pictures. But only a few survive on further ponderation. One reasonable alternative is that of an automatic 'Hourglass', where the mass-energy of the filled-up G-Field globe flows into the empty V-Field globe and on its exhaustion, the newly filled globe – again a filled-up G-Field globe – flows back into the empty V-Field, perpetuating the cycle. In this case, both the mass-energy and information are conserved! However, it raises an open question: "Does the inversion of cycle also invert the Universe into the Anti-Universe"?

Finally, other symbolic images such as the 'Rhythmic Inhalation and Exhalation of Brahma' or 'Brahma's Day & Night' - though deserving great admiration – belong to the realm of Religion and Philosophy, beyond the scope and expertise of the present investigation.

References and Notes

1. Important topics referred in this investigation are often shown in Bold letters for any up-to--date internet search. Specific references are pinpointed only for some special technical reports. Similarly, new ideas, novel concepts, and important conclusions are also **highlighted** and/ or shown in *italics* to draw reader's attention.

2. "100 Years of General Relativity – Einstein – How Relativity changed the Rules of our Reality", Scientific American, Special Issue, September 2015.

3. Jaswant Rai Mahajan, "Unorthodox Approach and Unconventional Alternatives to Big Bang, Dark Energy, Phase Change, False Vacuum, and Cosmic Inflation", viXra.org/abs/pdf/2008.0170.

4. Wikipedia: "Expansion of the Universe" - look for Density of universe during expansion.

5. Jaswant Rai Mahajan, "True Gravitational Constant, Schwarzschild Radius, Black Holes, and Related Issues, viXra.org/abs/pdf/1702.0279.

6. Edgar Shaghoulian, "A Tale of Two Horizons", Scientific American, September 2022, Vol. 327, Number 3. p.p. 40 – 45.