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An Integrated Model of a Light Speed Rotating Universe

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Authors' contributions

This work was carried out in collaboration between both authors. Author UVSS designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author SL managed the analyses of the study and managed the literature searches. Both authors read and approved the final manuscript.

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Short Communication

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ABSTRACT

With reference to Stoney scale, Wien's displacement law and considering a light speed rotating black hole universe, in this letter, an attempt is made to estimate cosmic expansion rate, galactic dark matter, galactic flat rotation speeds and galactic radii. It can be appealed that, as 'spin' is a basic property of quantum mechanics, from the subject point of quantum gravity, universe must have 'rotation'. If it is assumed that, universe is a 'growing black hole', it is quite natural to expect 'cosmic rotation'. Based on the proposed assumptions, cosmic radius seems to be shortened by a factor of 148 and cosmic age seems to be shortened by a factor of 147. Independent of the galactic redshift data and its controversial analysis and by continuously measuring the rate of decrease in current cosmic temperature, future cosmic expansion rate can be understood confidently.

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1. INTRODUCTION

Even though standard model of cosmology is standing on 5 pillars namely, Big Bang, inflation, super luminal expansion, dark matter and dark energy, it is emphasized that,

1) James Peebles, the famous cosmologist and 2019 Nobel laureate, strongly believes that Big bang is an inappropriate concept in understanding the universe. Readers are encouraged to visit, https://phys.org/news/2019-11-cosmologist-lonely-big-theory.html
2) Theoretically Big Bang, Inflation, Dark energy and Super luminal expansion are no way connected with Planck scale which is having a major role in understanding quantum cosmology having information passing at speed of light.
3) Experimentally so far no one could understand Big Bang, Inflation, Dark energy, Dark matter and Super luminal expansion with reference to any underground or ground or satellite based experiment.
4) Big Bang, Inflation and Super luminal expansion are no way giving a clue for unifying general theory of relativity and quantum mechanics.
5) Even though most of the cosmological observations are being studied and understood with photons that propagate with speed of light, it is very unfortunate to say that, most of the cosmologists are strongly believing in hypothetical 'super luminal expansion' of space. Recently detected gravitational waves that are supposed to originate from massive black holes are also confirmed to be moving at speed of light. If so, superluminal expansion can be considered as a pure human intellectual concept having no experimental support.
6) Big Bang, Inflation and Dark energy are inference based intellectual concepts having no proper physical base and probably may misguide the future generation.
7) Compared to Big Bang, Inflation, Dark energy and Superluminal expansion, Dark matter is having some sort of physical support in terms of an unknown, unidentified and unseen elementary particle having an heuristic gravitational attractive property. In addition to that, ultimately somehow, one should suppose the existence of some kind matter for understanding the unexpected massive nature of trillions of observed galaxies.
8) Kurt Gödel [1] put lot of efforts in developing a realistic universe model with rotation and expansion. His heuristic results were presented at International Congress of Mathematics held at Cambridge (Massachusetts) from 30th August to 5th September 1950. According to S. W. Hawking, Godel's models could well be a reasonable description of the universe that we observe [2], however observational data are compatible only with a very low rate of rotation. The first experimental evidence of the Universe rotation was done by Birch in 1982 evidently [3]. According to Birch, there appears to be strong evidence that the Universe is anisotropic on a large scale, producing position angle offsets in the polarization and brightness distributions of radio sources. These can probably be explained on the basis of a rotation of the Universe with an angular velocity of approximately 10^{-13} rad/year.
9) According to Kansas State University's very recent study conducted by Lior Shamir [4], an analysis of more than 200,000 spiral galaxies has revealed unexpected links between spin directions of galaxies and the structure formed by these links might suggest that the early universe could have been spinning. For a brief report readers are encouraged to visit: https://www.k-state.edu/media/newsreleases/2020-06/study-suggests-universe-has-defined-structure.html.
10) It is better to understand and develop models of cosmology based on well supported physical concepts rather than extraordinary physical hypothesis that demand super-normal efforts.

In this letter, with reference to beginning of the life cycle of living creatures, un-quantified pre and post physical conditions of 'Big Bang' [5], unidentified reasons pertaining to presumed exponential expansion in cosmic size associated with inflation [6,7], unaccounted exponential increase in cosmic time associated with presumed cosmic inflation and independent of redshift data, an initiative has been taken in developing a quantum model of cosmology associated with time reversed Black holes having Stoney scale origin [8,9], total dark matter and light speed rotation. Compared to Planck scale, by considering Stoney scale, arbitrary numbers can be eliminated and understanding can be enhanced.

2. ASSUMPTIONS

In earlier publications, by considering Planck scale, the authors developed various models of quantum cosmology [10-15]. In this paper, by considering Stoney scale, authors propose a simple variant of quantum cosmology. As per Stoney scale, independent of the Reduced Planck's constant, Stoney mass can be expressed as, $M_s \cong \sqrt{\frac{e^2}{4\pi\varepsilon_0 G}} \cong 1.85924\times10^{-9}\,\text{kg}$.

It can be considered as a representation of mass of the baby universe. With reference to Quantum theory of light, Stoney mass can be expressed as, $M_s \cong \left(\frac{\pi}{x_\lambda y_\nu \sqrt{45}}\right)\sqrt{\frac{hc}{G}} \cong 1.82386\times10^{-9}\,\text{kg}$

where $(x_\lambda, y_\nu) \cong (4.96511423, 2.821439372)$. Error is around 2% and needs further study.

Understanding cosmology with two or three simple assumptions seems to be insufficient and current observations are raising doubts on the basic assumptions of standard cosmology. In this context, authors developed 6 assumptions under three groups. First group constitutes 3 assumptions associated with cosmic geometry, thermal behavior, angular velocity and expansion rate. Second group constitutes two assumptions associated with galactic dark matter, visible matter, flat rotation speeds and radii. Third group constitutes one assumption associated with cosmic radius and age. With these set of assumptions it is possible to understand the observed universe in all aspects. With further study, proposed assumptions can be refined and minimized in a better way. Right from the beginning of Stoney scale, at any stage of cosmic expansion,

2.1 Group-1

Assumption-1: Universe is rotating with speed of light from and about the cosmic centre. If, $R_t \cong 2GM_t/c^2 \cong c/\omega_t$, $M_t \cong c^3/2G\omega_t$ where M_t = cosmic mass, R_t = cosmic radius and ω_t = cosmic angular velocity.

Assumption-2:

$$\left(\lambda_f, \lambda_m\right) \cong \left(\frac{x_\lambda}{y_\nu}\right)^{\pm\frac{1}{2}} \frac{2\pi c}{\sqrt{\omega_t\omega_s}} \cong \left(\frac{x_\lambda}{y_\nu}\right)^{\pm\frac{1}{2}} \frac{4\pi G\sqrt{M_t M_s}}{c^2}$$

where (λ_f, λ_m) represent wavelengths associated with cosmic temperature pertaining to Wien's displacement law and $\omega_s \cong \frac{c^3}{2GM_s}$ = Stoney scale angular velocity.

Note-1: Based on assumptions (1) and (2), it is possible to show that, $\frac{3\omega_t^2 c^2}{8\pi G\left(aT_t^4\right)} \cong 0.9623 \approx 1$

where $\left(\frac{3\omega_t^2 c^2}{8\pi G}\right)$ represents cosmic mass-energy density and $\left(aT_t^4\right)$ represents cosmic thermal energy density associated with temperature T_t.

Note-2: It is also possible to show that,

$$T_t \cong \frac{\hbar c^3}{2\sqrt{x_\lambda y_\nu} k_B G\sqrt{M_t M_s}} \cong \frac{\hbar c^3}{7.486 k_B G\sqrt{M_t M_s}} \cong \frac{\hbar\sqrt{\omega_t\omega_s}}{3.743 k_B}.$$

Assumption-3: Ratio of Hubble parameter to angular velocity can be expressed as, $\frac{H_t}{\omega_t} \cong 1 + \ln\left(\frac{\omega_s}{\omega_t}\right) \cong \gamma_t$ where H_t = Hubble parameter.

2.2 Group-2

Assumption-4: Galactic dark matter $(M_{Gd})_t$ and visible matter $(M_{Gv})_t$ are interrelated in such a way that, $M_{Gt} \cong (M_{Gd})_t + (M_{Gv})_t$ and $\frac{(M_{Gd})_t}{(M_{Gv})_t} \cong \sqrt{\frac{(M_{Gv})_t}{M_{Xt}}}$ where $M_{Xt} \cong 0.25\left(M_t^3 M_s\right)^{\frac{1}{4}}$ = time dependent dark-visible reference mass unit.

Assumption-5: Galactic flat rotation speed can be expressed as, $\frac{V_{Gt}}{c} \cong \left(\frac{M_{Gt}}{2M_t}\right)^{\frac{1}{4}} \cong 0.841\left(\frac{M_{Gt}}{M_t}\right)^{\frac{1}{4}}$ where M_t = cosmic total mass.

2.3 Group-3

Assumption-6: Cosmic radius can also be expressed as, $R_t \cong \mathrm{e}^{(t\times H_t)} R_s$. Then, $t\times H_t \cong \ln\left(\frac{R_t}{R_s}\right)$. Hence, $t \cong \ln\left(\frac{R_t}{R_s}\right)\left(\frac{1}{H_t}\right) \cong \ln\left(\frac{\omega_s}{\omega_t}\right)\left(\frac{1}{H_t}\right) \cong \left(\frac{1}{\omega_t} - \frac{1}{H_t}\right) \cong \left(1-\frac{1}{\gamma_t}\right)\frac{1}{\omega_t}$.

Note-3: Based on the above assumptions, estimated current cosmic radius and age are approximately 148 times higher than observed magnitudes. Hence observed cosmic radius and age can be considered as 'shortened' forms of actual cosmic magnitudes and can be expressed as, $(R_0)_{short} \cong \frac{(R_0)_{actual}}{\gamma_0} \cong \frac{(R_0)_{actual}}{147.95}$ and shortened cosmic age can be expressed as, $(t_0)_{short} \cong \left(\frac{(t_0)_{actual}}{\gamma_0 - 1}\right) \cong \left(\frac{(t_0)_{actual}}{146.95}\right)$. This is the key point to be understood in this paper. With further study, background reasons can be understood.

3. ISSUES CONNECTED WITH COSMIC RED SHIFT AND HUBBLE'S LAW

It may be noted that, increased redshifts and increased distances forced Edwin Hubble to propose the Hubble's law [16]. With reference to laboratory, appropriate definition of cosmic redshift (z) seems to be, $z_{new} \cong \left(\frac{\lambda_O - \lambda_L}{\lambda_O}\right) \cong \left[1-\left(\frac{\lambda_L}{\lambda_O}\right)\right] \cong \left(\frac{z}{z+1}\right) \le 1$. Here, as usual, λ_O is the wave length of light received from observed galaxy, λ_L is the wave length of light in laboratory and $z \cong \left(\frac{\lambda_O - \lambda_L}{\lambda_L}\right) \cong \left(\frac{\lambda_O}{\lambda_L} - 1\right)$.

Thus, at present, with reference to Hubble's law, (shortened) light travel distances as expected in the standard model of cosmology can be expressed as, $(d_G)_{short} \cong \left(\frac{z_{new}}{\gamma_z}\right)\left[\left(\frac{c}{\omega_0}\right)\right] \cong \left(\frac{1}{\gamma_z}\right)\left(\frac{z}{z+1}\right)\left(\frac{c}{\omega_0}\right)$ where $\gamma_z \cong 1 + \ln\left(\frac{\omega_s}{\omega_z}\right)$, $\omega_z \cong \frac{\omega_0}{z_{new}}$. It may be noted that, at present, their actual distances are higher than the observed distances and can be expressed as $(d_G)_{actual} \cong \left(\frac{\gamma_0 z_{new}}{\gamma_z}\right)\left(\frac{c}{\omega_0}\right)$. It needs further study and validation.

4. UNDERSTANDING COSMIC ROTATION

According to Vladimir A. Korotky, Eduard Masár and Yuri N. Obukhov [17]: "In observational cosmology, the main difficulty for detecting a global rotation is its smallness-less than 10^{-13} rad/year according to the generally accepted assessment. It is impossible in the Universe to distinguish the direction corresponding to the axis of rotation, with respect to which one could notice deviations (in the standard tests) from the Friedman standard cosmology. In theoretical cosmology, the main difficulties are related, on the one hand, to the lack of simple models of an expanding and rotating Universe in general relativity (GR) similar to Friedman–Robertson–Walker models. On the other hand, there are no convincing predictive effects of cosmic rotation that are consistent with the capabilities of the equipment of modern astronomical observatories".

In this context, authors strongly propose that, as 'spin' is a basic property of quantum mechanics, from the subject point of quantum gravity, universe must have 'rotation'. If it is assumed that, universe is a 'growing black hole', it is quite natural to expect 'cosmic rotation'. Considering the 6 major applications of dark matter in view, by estimating the currently believed dark mass of a galaxy with its corresponding visible mass and by replacing the 'acceleration' parameter $\left[\approx (cH_0)/6\right]$ of Modified Newtonian Dynamics (MOND) [18,19] with current cosmic angular acceleration $(c\omega_0)$, authors try to fit the flat rotation speed of a galaxy. One most interesting as well as speculative point is that, even though MOND approach is 'the best' in fitting galactic rotation curves, its back ground physics is unclear with respect to galactic structures and cosmic acceleration parameter (cH_0). It can be confirmed with the conclusion section of recent paper authored by Stacy McGaugh [20]. Here, authors approach is having 5 different actions:

1) To estimate the generally believed dark mass of a galaxy.
2) To implement cosmic angular acceleration in understanding galactic structure.
3) To fit flat rotation speed of a galaxy.
4) To estimate the radius of a galaxy.
5) Finally, to reveal the existence of cosmic rotation.

5. CURRENT COSMIC ANGULAR VELOCITY AND EXPANSION RATE

Matter creation rate can be expressed as, $M_t\omega_t \cong \left(c^3/2G\right)$ and $M_t \cong c^3/2G\omega_t$. With reference to currently believed cosmic temperature of $T_0 \cong 2.7255\text{ K}$ [21,22] and by considering $T_0 \cong \frac{\hbar c^3}{7.486 k_B G\sqrt{M_0 M_s}} \cong 2.7255\text{ K}$, an attempt is made to estimate the current cosmic angular velocity ω_0 and expansion rate H_0. Estimated magnitudes are, $\omega_0 \cong 1.643\times10^{-20}\text{ rad.sec}^{-1}$ and $H_0 \cong 75.0\text{ km/Mpc/sec}$ respectively [18,19]. Corresponding current cosmic radius and mass are $R_0 \cong c/\omega_0 \cong 1.83\times10^{28}\text{ m}$ and $M_0 \cong c^3/2G\omega_0 \cong 1.232\times10^{55}\text{ kg}$ respectively. It may be noted that, based on 'Planck mass' calculations our earlier estimated values [12,15] of current Hubble parameter range is, $H_0 \cong (66\text{ to }70)\text{ km/Mpc/sec}$. Authors would like to emphasize the point that, with this kind of quantum cosmology models, current Hubble parameter can be estimated.

6. TO ESTIMATE THE MAGNITUDE OF GALACTIC DARK MATTER

Galactic dark matter seems to have a major role in understanding 6 different issues pertaining to many massive galaxies. They are:

1) Galactic formation and evolution.
2) Galactic rotational curves.
3) Gravitational lensing.
4) Galactic collisions.
5) Motion of galaxies within galaxy clusters.
6) Cosmic microwave background fluctuations.

In this context, authors would like to suggest the following two points.

1) By giving a priority to galactic 'visible matter', dark matter can be expressed as, $\text{Dark matter} \propto (\text{Visible matter})^{\frac{3}{2}}$.
2) By giving a priority to galactic 'dark matter', visible matter can be expressed as, $\text{Visible matter} \propto (\text{Dark matter})^{\frac{2}{3}}$.

By considering current cosmic mass as 'complete dark matter' and considering visible matter as a cosmological action of transformation of dark matter, an attempt is made to estimate galactic dark matter associated with galactic visible mass via a characteristic reference mass unit [13,14,15] of $M_X \cong 0.25\times\sqrt[4]{M_0^3 M_s} \cong 3.4\times10^{38}\text{ kg}$. It needs further study.

7. GALACTIC APPLICATIONS OF COSMIC ANGULAR VELOCITY

By considering the sum of galactic dark matter and visible matter along with current cosmic angular acceleration $c\omega_0$, an attempt is made to fit galactic flat rotation speeds, radii and angular velocities. Corresponding relations can be expressed as follows. For the present case,

$$\left.\begin{array}{l} V_G \cong \left(\dfrac{M_G}{2M_0}\right)^{\frac{1}{4}} c \cong \sqrt[4]{GM_G\left(c\omega_0\right)} \\ r_G \cong \sqrt{\dfrac{GM_G}{c\omega_0}} \text{ and } \omega_G \cong \dfrac{V_G^3}{GM_G} \end{array}\right\}$$

where, M_{Gv} = Visible mass of galaxy

M_{Gd} = Dark mass of galaxy= $(M_{Gv})^{\frac{3}{2}}/\sqrt{M_X}$

$M_G = M_{Gv} + M_{Gd}$

r_G = Radius of galaxy

ω_G = Angular velocity of galaxy

It may be noted that, based on assumptions (4) and (5), it is possible to show that, massive galaxies dark matter content is (90 to 97)% of their total matter. Considering galactic flat rotation speeds authors observed that, currently believed standard ruler of 490 Mly associated with Baryonic acoustic oscillations [23,24] can be understood with an expression of the form $\frac{1}{\gamma_0}\left(\frac{\sqrt{cV_G}}{\omega_0}\right) \cong \frac{\sqrt{cV_G}}{H_0}$. For Milky Way, if $V_G \cong 200$ km/sec, $\frac{\sqrt{cV_G}}{H_0} \cong 336$ Mly. Authors are working in this direction and it needs further study.

8. TIME LINE OF NUCLEOSYNTHESIS AND EARLY GALAXIES FORMATION

According to standard model of cosmology, primordial nucleosynthesis seems to be happened in between first (3 to 20) minutes of Big Bang [25]. Expected approximate cosmic temperature range for this characteristic time period is $\left(10^9 \text{ to } 10^7\right)$K. Based on our assumptions, without considering time shortening, i.e. without considering corresponding $(\gamma_t - 1)$ values, for 10^9 K, estimated actual cosmic age is 7.47 minutes and for 10^7 K, estimated actual cosmic age is 0.142 years. For a temperature of 3000 K, estimated actual cosmic age is 15,80,000 years. Clearly speaking, there exist two time scales, 'actual' and 'shortened'. Standard model of cosmic age can be refereed to 'shortened' time scale. Respective shortened time for $\left(10^9 \text{ to } 10^7\right)$K are 4.17 seconds and 640 minutes respectively. For a temperature of 3000 K, its shortened age is 11,885 years. Here authors would like to emphasize the point that, with reference to shortened cosmic age- first hydrogen atoms formed at 11885 years from the beginning of cosmic evolution but not at 3,80,000 years. Considering this point, early galaxies formation can be understood.

9. ISSUES CONNECTED WITH COSMOLOGICAL CONSTANT

Considering the repulsive nature of Lambda term as $\Lambda_t\left(\frac{c^4}{8\pi G}\right)$, attractive nature of mass energy density as $\left(\frac{3\omega_t^2 c^2}{8\pi G}\right)$ and based on the results of assumption-3, if one is willing to consider the combined role of both terms as $\left(\frac{3\omega_t^2 c^2}{8\pi G}\right) - \Lambda_t\left(\frac{c^4}{8\pi G}\right) \cong 0$, it is possible to show that, $\Lambda_t \cong \frac{8\pi G\left(aT_t^4\right)}{c^4}$. Here authors would like to appeal that, compared to the relation, $\Lambda_t \cong \left(\frac{3\omega_t^2}{c^2}\right)$, $\Lambda_t \cong \frac{8\pi G\left(aT_t^4\right)}{c^4}$ is having more physical meaning where $\left(\frac{c^4}{8\pi G}\right)$ can be considered as a representation of constant gravitational binding force associated with cosmic evolution. Clearly speaking, attractive force being a constant, Lambda term decreases with decreasing thermal energy density. With reference to Stoney scale, binding force being a cosmic constant, $\frac{\Lambda_{pl}}{\Lambda_t} \cong \left(\frac{T_s^4}{T_t^4}\right) \cong \left(\frac{\omega_s^2}{\omega_t^2}\right)$. In this way, it seems possible to understand the issues connected with currently believed cosmological constant problem [26].

10. UNDERSTANDING COSMIC EXPANSION RATE WITH TEMPERATURE DROP

Authors would like to emphasize the point that, galactic red shift data and its advanced analyzing patterns clearly show a serious controversy in understanding the true nature of cosmic rate of expansion. References [27] and [28] indicate an accelerating expansion. Reference [29] indicates a constant rate of expansion and reference [30] indicates a static universe. Most worrying thing is that, all these four references got published in main stream journals having very high impact. In this context, independent of the controversial galactic redshift data,

1) It is absolutely possible to consider cosmic temperature as a probe of understanding the true cosmic expansion rate.
2) By considering the actual rate of decrease in current cosmic temperature, future cosmic expansion rate can be understood.

At present, root mean square error in current cosmic microwave back ground radiation (CMBR) temperature is 18 micro Kelvin and average error is around 60 to 70 micro Kelvin. With further study and observations, it is necessary to continuously monitor the drop in

CMBR temperature. Drop in CMBR temperature can be considered as a standard index for understanding the actual cosmic rate of expansion.

10.1 Issues Connected with Cosmic Shortened Age

Based on our assumptions, current cosmic age is $t_{actual} \cong \left(1-\frac{1}{\gamma_0}\right)\frac{1}{\omega_0} \cong 1915.8$ Gy and its shortened age is $t_{short} \cong \frac{1}{\gamma_0}\left[\left(1-\frac{1}{\gamma_0}\right)\frac{1}{\omega_0}\right] \cong \left(1-\frac{1}{\gamma_0}\right)\frac{1}{H_0} \cong 12.95$ Gy.

Authors would like to appeal that,

1) Cosmic age comparison depends on the accuracy of the present Hubble parameter and assumptions-6 needs a review with respect to other five assumptions.
2) Coupling cosmic time with other cosmic physical phenomena is highly complicated.

10.2 Issues Connected With Nature of Dark Matter

Authors would like to appeal that, when total or most of the cosmic matter is believed to be in the form of dark nature having interactions only with gravitation, it may not be logical to attribute its nature to any known or unknown elementary particle supposed to be originating from interactions involved with elementary mass spectrum having negligible gravity at atomic, nuclear and electroweak scales.

10.3 Issues Connected with Magnitude of Galactic Dark Matter

It may be noted that, with reference to recommended visible mass of Milk Way and its estimated dark mass, estimated flat rotation speed is 200 km/sec and effective radius is 294 kpc [31]. Alternatively, for any galaxy, by knowing the flat rotation speed, its total mass can be estimated with, $M_G \cong V_G^4 / Gc\omega_0$. By considering the relation, $M_G \cong M_{Gv}\left(1+\sqrt{M_{Gv}/M_X}\right)$ and with a simple computer program, visible and dark masses can be estimated. Proceeding further, galaxies whose visible mass approaches the proposed reference mass unit of $(M_X)_0 \cong 3.4\times10^{38}$ kg, seems to possess very little dark matter. It can be confirmed with very recent observations pertaining to NGC1052-DF2 and NGC1052-DF4 galaxies. Recommended visible mass of NGC1052-DF2 [32-34] is $\approx 1\times10^8 M_{\text{Sun}}$ and its estimated dark mass is $\approx \left(\left(2.0\times10^{38}\right)^{\frac{3}{2}} \Big/ \sqrt{3.4\times10^{38}}\right) \approx 1.53\times10^{38}$ kg. Sum of dark mass and visible mass is $\approx 0.35\times10^9 M_{\text{Sun}}$. Corresponding flat rotation speed is 21.9 km/sec and effective radius is 3.15 kpc [35]. It needs further study with respect to NGC1052-DF2 refined data.

By means of tidal mass loss [36], if dark matter shifts from satellite galaxy to its mother galaxy, based on our proposed concepts, mother galaxy's flat rotation speed must increase significantly due to increase in total matter. It is for future observational testing.

11. UNDERSTANDING COSMIC HORIZON, FLATNESS AND ACCELERATION ISSUES

When it is assumed that, present universe is a light speed rotating black hole, there exists no scope for causal disconnection of galaxies and no scope for 'horizon' problem. According to Phillip Helbig [37,38], "Flatness is not really a problem but rather a misunderstanding". When it is assumed that, universe is a light speed rotating black hole having a positive curvature and drop in cosmic temperature is an index of actual rate of cosmic expansion, with reference to observed current isotropic CMBR temperature, there exists no scope for 'flatness problem' and 'acceleration' [27-29].

12. CONCLUSION

Even though, estimated theoretical cosmic radius is 148 times higher the Hubble radius, estimated angular velocity is 148 times less than the Hubble parameter and is close to field experts' advocated value. It is directly helping in estimating galactic flat rotation speeds and working radii. Authors are working on finding other applications of estimated cosmic total mass and angular velocity. Further study and advanced telescopes may help in thoroughly exploring the deep & dark cosmic space and understanding aged galaxies early formation. Independent of the galactic redshift data and its controversial analysis and by continuously measuring the rate of decrease in current cosmic temperature, future cosmic expansion rate can be understood confidently.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Godel K. Rotating universes in general relativity theory. Proceedings of the international congress of mathematicians in Cambridge. 1950;1:175-181.
2. Hawking SW. Introductory note to 1949 and 1952 in Kurt Gödel, Collected works, Volume II (S. Feferman et al., eds).
3. Birch P. Is the Universe Rotating? Nature. 1982;298:451-454.
4. Shamir L. Patterns of galaxy spin directions in SDSS and Pan-STARRS show parity violation and multipoles. Astrophys Space Sci. 2020;365:136.
5. Abhas Mitra. Why the big bang model does not allow inflationary and cyclic cosmologies though mathematically one can obtain any model with favorable assumptions. New Astronomy 2014;30:46-50.
6. Roger Penrose. Difficulties with inflationary cosmology. Annals of the New York Academy of Sciences. 1989;571:249-264.
7. Steinhardt PJ, Abraham Loeb. Inflationary schism. Physics Letters B. 2014;736:142.
8. Stoney GJ. On the physical units of nature. Phil. Mag. 1881;11:381-91.
9. Seshavatharam UVS and Lakshminarayana S. On the Evolving Black Holes and Black Hole Cosmology-Scale Independent Quantum Gravity Approach. Frontiers of Astronomy, Astrophysics and Cosmology. 2015;1(1):1-15.
10. Seshavatharam UVS. Physics of rotating and expanding black hole universe. Progress in Physics. 2010; 4:7-14
11. Seshavatharam UVS, Tatum ET and Lakshminarayana S. On the role of gravitational self energy density in sphere cal flat space quantum cosmology. Journal of Applied Physical Science International 2015;4(4):228-236.
12. Seshavatharam UVS and Lakshminarayana S. Light speed expansion and rotation of a primordial cosmic black hole universe having internal acceleration. International Astronomy and Astrophysics Research Journal 2020;2(2):9-27.
13. Seshavatharam UVS and Lakshminarayana S. To correlate galactic dark and visible masses and to fit flat rotation speeds via mond approach and cosmic angular acceleration. International Astronomy and Astrophysics Research Journal. 2020;2(3):28-43.
14. Seshavatharam UVS and Lakshminarayana S. Light speed expansion and rotation of a very dark Machian universe having internal acceleration. International Journal of Astronomy and Astrophysics. 2020;10:247-283.
15. Tatum ET, Seshavatharam UVS and Lakshminarayana S. The basics of flat space cosmology. International Journal of Astronomy and Astrophysics. 2015;5:116-124.
16. Hubble EP. A relation between distance and radial velocity among extra-galactic nebulae, PNAS. 1929;15:168-173.
17. Vladimir A Korotky, Eduard Masár, Yuri Obukhov N. In the Quest for Cosmic Rotation. Universe. 2020;6:14.
18. Brownstein JR, Moffat JW. Galaxy rotation curves without non-baryonic dark matter. The Astrophysical Journal. 2006;636:721–741.
19. Milgrom M. A modification of the newtonian dynamics as a possible alternative to the hidden mass hypothesis. Astrophysical Journal. 1983;270:365-370.
20. Stacy McGaugh. Predictions and outcomes for the dynamics of rotating galaxies. Galaxies. 2020;8(2):35.
21. Planck Collaboration: Planck results. vi. Cosmological parameters; 2018.
22. Adam G. Riess et al. Large Magellanic cloud cepheid standards provide a 1% foundation for the determination of the Hubble constant and stronger evidence for physics beyond ΛCDM. ApJ.2019;876:85
23. Eisenstein DJ et al. Detection of the baryon acoustic peak in the large-scale correlation function of SDSS luminous

red galaxies. Astrophys J. 2005;633:560-574.

24. César Hernández-Aguayo et al. Measuring the BAO peak position with different galaxy selections. Mon Not R Astron Soc. 2020; 494(3):3120-3130.
25. Gamow G. The origin of elements and the separation of galaxies. Physical Review 1948;74(4):505.
26. Larry Abbott. The Mystery of the Cosmo logical Constant. Scietific American. 1998; 106-113.
27. Perlmutter S et al. Measurements of Ω and Λ from 42 high-redshift supernovae. The Astrophysical Journal. 1999;517:565-586.
28. Riess AG et al. Observational evidence from supernovae for an accelerating universe and a cosmological constant. The Astronomical Journal. 1998;116:1009-1038.
29. Nielsen JT, Guffanti A, Sarkar S. Marginal evidence for cosmic acceleration from type ia supernovae. Scientific Reports. 2016;6. Article No. 35596.
30. Eric J Lerner. Observations contradict galaxy size and surface brightness predictions that are based on the expanding universe hypothesis. Monthly Notices of the Royal Astronomical Society. 2018;477 (3):3185–3196.
31. Laura L Watkins et al. Evidence for an Intermediate-mass milky way from Gaia DR2 Halo Globular Cluster Motions. The Astrophysical Journal. 2019;873:118.
32. Alis J Deason et al. The edge of the galaxy. The Edge of the Galaxy, Mon. Not. R. Astron. Soc 2020;496(3):3929-3942.
33. Pieter van Dokkum et al. A second galaxy missing dark matter in the NGC1052 group. The Astrophysical Journal Letters. 2019;874:L5.
34. Lewis Geraint F et al. The globular cluster population of NGC 1052-DF2: evidence for rotation. Mon Not R Astron Soc Lett. 2020; 495(1):L1-L5.
35. Shany Danieli et al. Still missing dark matter: KCWI high-resolution stellar kinematics of NGC1052-DF2. The Astrophysical Journal Letters. 2019;874:L12.
36. Daneng Yang, Hai-Bo Yu, Haipeng An. Self-interacting dark matter and the origin of ultradiffuse galaxies NGC1052-DF2 and -DF4. Phys Rev Lett. 2020;125:111105.
37. Phillip Helbig. Is there a flatness problem in classical cosmology? Monthly Notices of the Royal Astronomical Society. 2012; 421(1):561–569.
38. Phillip Helbig. The flatness problem and the age of the Universe. Monthly Notices of the Royal Astronomical Society. 2020; 495(4):3571–3575.

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