OBSERVATIONAL VERIFICATION OF MODIFIED BIG BANG THEORY

Dr. John Daniel, Researcher, Department of Physics, Mumbai University,
GLR complex, Perumal patti colony, Alapiranthan village, Kilanilai post, Pudukottai (Dt.) Tamil Nadu, India.

Abstract: The standard model big bang cosmology is interpreted by applying the Newton's gravitational force laws and the Faraday's lines of forces. The interpreted theory proves the existence of center of universe and this center is at a distance of approximately 13.7 billion light years away from the center of the earth and is in the direction of $62^0 14'31.4"$ and 12h36m25.46s (approximately in the direction of the oldest galaxy known GN-z11) from the earth. The interpreted theory is verified by the observational evidences.

Key words: center of the universe, Newton's theory, Faraday's lines of forces and general theory of relativity

Introduction: Based on the deterministic quantum mechanical theory and the deterministic unified field theory developed in the papers [1-12], a new theory of the cosmos was developed by combining the theory of transient and steady state universes in the papers [13-14]. The standard model of the Universe [15] [16] based on the general theory of relativity [17] [18] [19] [20] leads to a singularity. Singularities usually originate in the mathematical physics due to unrealistic assumptions made. So, the assumption of origin of relative space in the beginning of the world is incorrect or unrealistic. In the following lines an alternative theory is proposed based on [13] [14].

In the standard model cosmology singularity originates at the point of origin of the world. As per the mass energy equivalence principle, world originated from the energy. So, the energy must have originated from the absolute space or vacuum or nothingness. The curved space of the general theory of relativity is associated with the energy or electromagnetic field. In this theory no singularity is generated. So, the curved space assumption made in the general theory of relativity is incorrect.

However, the standard model cosmology begins with a big fire ball of energy and ignores about the origin of the energy or fire ball, even though the space of the particle physics, electromagnetic theories and the theory of the early universe does not create any singularity.[21] [22] [23] So, the standard model cosmology is very much incomplete. All systems have transient and steady states. So, the standard model cosmology too must have a transient and steady states. But the model avoids any such studies due to the limitations imposed by the statistical interpretation of the quantum mechanical theory. So, deterministic theory of quantum mechanics was developed [1] [2] [3] [4] [5]. The special and general theories of relativity were also modified [6] [7] [8] [9] [10] [11] [12]. Finally, all the modified theories were applied to study the transient behavior of the Universe. Theories of transient and steady states of the Universe are integrated. In this way, the standard model cosmology was made as a complete theory [11] [12][13][14].

Expanding balloon analogy mentioned in [24] is used to explain the curvature of the space by the mass of galaxies, etc. As per the general theory of relativity, space and the field are considered as one and the same. So, if the field is curved, the pace is also curved. But if the space and the field are considered as in the case of electromagnetic field theories, the gravitational fields could be described by the Faraday's lines of forces. In this article, the standard model big bang cosmology is interpreted by applying Newton's gravitational force laws and Faraday's lines of forces. Cosmological principle and the cosmic microwave background are explained well as per the new interpretation of the standard model cosmology. The interpreted theory is verified by the observational evidences.

Modified Big Bang theory of cosmology [11-23]: As explained in the introduction, the universe in the form of very hot and high density energy at zero time. So, the velocity of energy or light was infinite. So, at zero time the energy spread all over the world with declining speed of energy. So, the speed of the energy decreased as and when the energy expanded from the point of origin of electromagnetic energy. Soon the speed of the energy reached the constant value of 3×10^8 m/s. Due to the very high speed of energy in the transient period, the energy spread very fast all over the world and cooled down enough to produce elementary particles within few seconds. From that point the energy dominated universe ends and matter dominated world began to grow. The frequency of the waves decreased from the center when the energy began to cool down. So, photon energy decreased with the expansion and spreading of hot and dense energy originated. So, in the energy dominated world, electromagnetic field theory and the Faraday's lines of forces could be used for the purpose of analysis. Similarly, in the matter dominated world, Newton's laws of forces and the Faraday's lines of forces could be used for analysis.

In the energy dominated world, energy flow was in the radial direction from the center of the universe and the electromagnetic fields expanded in the spherical form from the center. When the energy became matter in the matter dominated world, the matter expanded in the spherical form like the spherical energy expanded in the energy dominated world. So, in the spherical volume of the matter dominated world, spherical gravitational field lines were expanding like the spherical electromagnetic waves. The gravitational field lines were growing up from the center in the radial direction of expansion. So, the Newton's gravitational field lines of the universe could be described in the spherical coordinate system. In the case of general theory of relativity, the radial Newton's field lines are split into two spherical surface fields in the mutually perpendicular directions. The spherical surface is constant field spherical surfaces. Due to uniform distribution of matter in the spherical surface directions, the fields are constant on the spherical surfaces. So, if the radial Newton's field is split into spherical surface fields, all the Newton's gravitational fields are converted into spherically expanding fields, the space could be considered as expanding space as in the case of general theory of relativity, if the space and the field are assumed to be one and the same. So, the general theory of relativity is very well derived from the Newton's gravitational field theory. Mathematically, Newton's gravitational field theory is very simple as compared with the general theory of relativity. So, the standard model big bang theory of the Universe is interpreted using Newton's gravitational laws and the Faraday's lines of forces. Moreover, the singularity arising in the general relativity big bang theory is removed.

Interpretation of Big Bang Theory based on the classical field theory [24-26]: In the previous paragraph, the gravitational field lines of the matter dominated universe were described. At any point in the spherical volume, circular field lines with the center of the universe as their center will be running through the point of interest. These circular lines together will form a sphere with the point of interest as one of the poles of the sphere. So, the circular field lines are the longitudinal lines of the sphere. The radial field lines will be running from the center of the universe. So, any point of the universe could be expressed by the point of intersection of the spherical surface with the radial line from the center of the universe. So, a point on the spherical surface is expressed by two angles of the spherical coordinate system and the radius of the sphere. Radiation from any matter particle will flow through the longitudinal lines passing through point of radiation and the radial line from the center of the universe. Similarly, radiation from the matter dominated universe will flow as spherical waves from the center of the universe and also through the radial lines from the center of the universe. All matter particles too will be moving in the same way as the radiation.

Suppose, we observe a very long distant star from the earth, the plane wave radiated by the star in the direction of the line connecting the center of the star and the center of the universe will be received by the earth based telescope. The same plane wave will be received by the telescope from wherever the point of observation (wherever is the location of the telescope). So, the universe looks the same from wherever is the point of observation. So, cosmological principle is satisfied by the proposed model of the universe. The matter particles are expanding with the expanding spherical fields like they expand on the expanding balloon if all the radial field lines are converted into spherical field lines and the space and field are considered to be one and the same. So, Hubble's law of expanding universe is satisfied and cosmological principle is also satisfied in the universal longitudinal line directions passing through the earth. So, the cosmological principle is satisfied in both the directions of spherical longitudinal lines and the universal radial line directions. The radiations of objects are red shifted due to the expansion of the universe.

As per the Hubble's law red shift increases with the increasing distance. So, the matter at very large distances will radiate in the frequency range of Terahertz and millimeter waves. So, at the end of observable universe, matter can radiate only in the microwave region. Frequency of radiation of the matter is shifted to microwave region at the end of observable universe due to the expansion. So, cosmic microwave radiation is observed from all the directions of observation from the earth.

Observational verification of the center of the Universe [24-33]: Radiated plane waves from the galaxies at a very long distance from the center of the world and moving towards the center of the universe will observed from the earth. So, as the distance of observation increases, galaxies move away from each other and the red shift of the galaxies increases with the increased distance of observation. Similarly, the radiated plane waves from the galaxies at very long distances from the center of the earth and moving away from the center of the universe will be observed from the earth. So, as the distance of observation increases, galaxies move away from each other and the red shift of the galaxies increases with the increased distance of observation. So, the Hubble's law is satisfied in the radial direction of the universe

The galaxies at the beginning of the matter dominated universe will be the closest ones to the center of the universe. The curvature of expansion will be greater. So, all the matter formed from the energy will be within relatively smaller volume as compared with the volume of the expanded volume. So, only a very few galaxies can be observed from the earth in the direction and at the center of the universe. As universe expands from the center the newly formed galaxies will be moving away from each other and galaxies may split and more number of galaxies formed. So, number of galaxies increases with the expansion of the universe and move away from the direction of line connecting the center of the earth and the center of the universe. As the universe expands from its center and moves towards the center of the earth the curvature of the universe decreases and becomes a plane in the direction perpendicular to the line connecting the centers of earth and the universe. If this plane ends and the spherical curvature begins, galaxies attached with the spherical curvature can't be observed from the earth because the galaxies have moved away from the observable directions from the earth. In the direction of the line connecting the centers of the earth and the universe, galaxy formed in the beginning will move towards earth without any split. These predictions could be verified from the data of the following table. [25-33]

Location of 7 oldest galaxies

Serial Number	Name of Galaxy	Distance from the Earth (Billion light years)	Declination	Right Ascension
1.	IOK-1	12.88	27°24'56"	13h 23m 59.8s
2.	GN-108036	12.9	62°08'07.5"	12h 36m 22.68s
3.	SXDF-NB1006-2	12.9	-05°19' 58.9"	2h 18m 56.5s
4.	z8 GND 3296	13.1	62° 18' 8.54"	12h 36m 37.892s
5.	EGS-zs8-1	13.1	53° 00' 15.4"	14h 20m 34.89s
6.	EGS Y8 p7	13.2	52° 53' 26.6"	14h 20m 8.5s
7.	GN – z11	13.4	62° 14' 31.4"	12h 36m 25.46s

Seven oldest galaxies observed are listed in the above table in the order of increasing distance from the earth. The oldest galaxy observed so far is GN-z11. Directions of galaxies from the earth are also mentioned with the distances. The universe is estimated to have originated some 13.7 billion years ago. So, the distance of the center of the universe from the earth is 13.7 billion light years. So, the galaxy observed closest to the center of the universe is GN-z11. Matter particles in the universe close to the center must be denser as compared with the galaxies at a far away distance from the center of the universe because of the expansion of the universe. So, galaxies split as the universe expands and number of galaxies increases as the radius of expansion grows. So, the number galaxies observed decreases as the distance from the earth increases in the direction of line connecting the centers of the earth and the universe. Since the galaxy GN-z11 is closest to the center of the universe and the distance between the galaxy and the center is about .3 billion light years which is negligibly small as compared with 13.4 light years, the direction of the center of the universe from the ceter of the earth is approximately the direction of location of GN-z11. So, the center of the universe is located at a distance of 13.7 light years and in the direction of 62° 14' 31.4" and 12h 36m 25.46s. As the galaxy of the type GN-z11 moves from the distance of 13.4Bly to 13.1 Bly, the galaxy split into three galaxies EGS Y8 P7, EGS-zs8-1 and z8 GND 3296. The galaxy EGS Y8 P7 split from GN-z11 at a distance of 13.2 Bly and then the galaxy EGS-zs8-1 split from GN-z11 at a distance of 13.1 Bly and moved away from the direction of GN-z11 to 52° 53' 26.6" & 14h 20m 8.5s and 53° 00' 15.4" & 14h 20m 34.89s respectively. The remaining part of GN-z11 which moved along the direction of the line connecting the centers of earth and the universe is z8 GND 3296. When the galaxy z8 GND 3296 moved from the distance of 13.1 Bly to about 12.9 Bly, it split into three galaxies SXDF-NB1006-2, GN-108036 and IOK-1 and SXDF-NB1006-2 and IOK-1 moved to 05°19' 58.9" & 2h 18m 56.5s and 27°24'56" & 13h 23m 59.8s respectively from the direction of GN-108036 which is in the direction of line connecting the centers of earth and the universe.

Conclusion:[24-26] As per the present version of big bang theory of cosmology, we don't know whether there is a center of the universe or not and that can't be found even if there is a center []. This is because of the interpretations of Hubble's law and the cosmic microwave background radiation based on the general theory of relativity which is different from the interpretation made in this article. In this article, general theory of relativity is derived from the Newton's laws of gravitational forces and the Faraday's lines of forces. Interpretation of the cosmological principle, Hubble's law and the cosmic microwave background also made based on Newton's gravitational field laws and Faraday's lines of forces. So, the interpretation of the big bang theory based on the classical physics proves the existence of the center of the universe. This center is predicted to be at a distance of 13.7 billion light years from the center of the earth. This theoretical prediction is verified with the observed data of 7 oldest galaxies. General theory of relativity is also proved to be a special case of Newton's gravitational physics.

References and Bibliography:

[1]. John Daniel, 2019, Deterministic Quantum Theory, JETIR, Vol.6, 883-887.

[2]. John Daniel, 2019, Velocity and Energy of Particles, JETIR, Vol.6, 844-848.

[3]. John Daniel, 2019, Fundamentals of Deterministic Quantum Mechanics, JETIR. Vol.6, 506-510.

[4]. John Daniel, 2021, "Deterministic interpretation of quantum mechanics", I.J.I.R.M.F., Volume-7, Issue-10, pp.120-122.

[5]. John Daniel, 2021, "Statistical interpretation is disproved", I.J.I.R.M.F., Volume-7, Issue-10, pp. 123-126.

[6]. John Daniel, 2019, Particles and Fields, JETIR, Vol.6, 985-990

[7]. John Daniel, 2019, Theory of Fields and Energy, JETIR, Vol.6,

[8]. John Daniel, 2019, General theory of gravitational and other fields and it's applications to astrophysics, JETIR, Vol.6, 681-686.

[9]. John Daniel, 2019, General Deterministic Theory of Fields, JETIR, Vol.6, 1-4.

[10]. John Daniel, 2019, General theory of fields, JETIR, Vol.6, 701-706.

[11]. John Daniel, "Unified Field Theory and Its Applications" under preparation for publication.

[12]. John Daniel, "Experimental and Observational Verification of the Unified Field Theory" under preparation for publication.

[13]. John Daniel, 2019, A modified theory of the early universe, JETIR, Vol.6, 685-689.

[14]. John Daniel, 2019, Analysis of the material universe, JETIR, Vol.6, 706-710.

[15]. J.V.Narlikar (2002) An introduction to Cosmology Cambridge University press.

[16]. Andrew Liddle (1999) An Introduction to Modern Cosmology John Wiley & Sons.

[17]. Albert Einstein (1990) Ideas and Opinions Rupa & Co. New Delhi.

[18]. George Gamow and J. M. Cleveland (1989) Physics Prentice Hall of India Pvt. Ltd., New Delhi.

[19]. Robert Resnick, David Halliday and Krane (2000) Physics – I.Vol.1, John Wiley & Sons, Singapore.

[20]. Robert Resnick, David Halliday and Krane (2000) Physics – II.Vol.2, John Wiley & Sons, Singapore.

[21] P.T.Mathews (1974) Introduction to Quantum Mechanics. Tata McGraw Hill Edition, New Delhi..

[22] Robert Eisberg and Robert Resnick (2003) Quantum Physics. John Wiley & Sons, Singapore.

[23] Richard Feynmann (1990), Quantum Physics, Rupa& Co., New Delhi.

[24] Where is the centre of the universe? - UCR Math Department, https://math.ucr.edu › home › baez › physics › Relativity, Original by Philip Gibbs, 1997.

[25] Oldest.org, "7 oldest galaxies in the Universe" https://www.oldest.org/nature/galaxies/

[26] Patrick Grant, "Big bang timeline" http://patrickgrant.com › BBTL

[27] Wikipedia, "IOK-1" https://en.wikipedia.org/wiki/IOK-1

[28] Wikipedia, "GN-108036" https://en.wikipedia.org/wiki/GN-108036

[29] Wikipedia, "SXDF-NB1006-2" https://en.wikipedia.org/wiki/SXDF-NB1006-2

[30] Wikipedia, "z8 GND 3296" https://en.wikipedia.org/wiki/Z8_GND_5296

[31] Wikipedia, "EGS-zs8-1" https://en.wikipedia.org/wiki/EGS-zs8-1

[32] Wikipedia, "EGS Y8 p7" https://en.wikipedia.org/wiki/EGSY8p7

[33] Wikipedia, "GN – z11" https://en.wikipedia.org/wiki/GN-z11.