Essay

Space time, Consciousness & Creation of Universe

Arup Roy*

Scottish Church College, Kolkata, India

Abstract

Careful consideration of the modern cosmological studies in connection with the origin of the universe reveals some open questions. Answers to some of those are sought in this article in terms of the 'consciousness field' which, in some recent publications, has been elaborated upon.

Keywords: Spacetime, black holes, wormholes, consciousness, entanglement.

1. Introduction

There is a hypothesis which states that the world basically consists of space-time, matter and consciousness, with their own degrees of freedom (Smythies, 2003). For further investigation along this line, with regard to the creation of the universe, information about developments in cosmological investigations are collated here. Correlation and analyses of theoretical predictions and experimental observations, however, indicate certain gaps in understanding the cosmological model(s) of the universe. To address these an idea of a conscious universe is suggested in this article.

2. Existing theories and experimental results

Space and Time: Einstein's general theory of relativity (Tillman et al, 2022) holds that space and time are soft, malleable entities; but space is expanding or contracting over time. The important postulate of this theory is that gravity is a feature of spacetime itself. According to John Wheeler (Taylor & Wheeler, 1992) 'Spacetime grips mass, telling it how to move... Mass grips spacetime, telling it how to curve '. On the basis of a great deal of compelling evidences, astronomers have confirmed that our universe starting from a point is currently expanding. So, if one could set the cosmic history run backwards in time then all the galaxies or their forebears would have come together into a single point called a singularity (breakdown in spacetime) beyond which cosmic ancestry cannot extend. The situation would be analogous to matter descending into a black hole (Curiel, 2021); time line would end at that singularity and spacetime would cease to exist (Penrose, 1965; Schoen and Yau, 1983; Wald, 1984). This singularity becomes obviously a point of infinite density and temperature and of infinite spacetime curvature.

The Big Bang and expanding universe: Modern cosmology delves in understanding the genesis of the universe. In the last seventy to eighty years, there has been enormous progress in

*Correspondence author: Arup Roy, Retired Associate Professor, Scottish Church College, Kolkata, India. E-mail: aryscottish@gmail.com

technology and mathematical theory in this connection. Light emitted from galaxies billions of light-years away are detected and analysed by modern telescopes; using Hubble telescope and techniques like 'gravitational lensing' photographic images of quasars are taken. There are clear evidences that galaxies are actually moving apart. Hubble (1929), using a pool of experimental data, showed that the rate at which a galaxy is moving away from us is roughly proportional to its distance from us. However, the theory that survived all tests to date is the Big Bang cosmology according to which at a particular instant, roughly 13.7 billion years ago, all the matter and energy, concentrated in a point-like region, began to cool at an incredibly rapid rate following huge explosion and expansion. The major claim of the theory is that the universe starting from an extremely dense early state is expanding at accelerating rate (Wall, 2022). The idea of inflationary universe was put forward by Guth (1984) who suggested that 'inflaton' field was responsible for a hyper-accelerated expansion in the first instant after Big Bang and only after that very brief period of acceleration the universe flattened out. Numerous experimental observations support Guth's theory that strengthened the idea that the early universe contained fields that drive inflation.

Although scientists are unclear about its source, the 'dark energy' is claimed to be the prime driver of the accelerating universe; the quantum fluctuations in the 'vacuum' of space have been speculated as the source of the dark energy. Again, the enigmatic 'dark matter' (Blumental *et al.*, 1984; Bertone and Hooper, 2018) that governs the formation of galaxies is accepted as an essential element of the standard cosmological model. In spite of being about six times the total mass of the 'normal matter' of the universe, there is no clue to how it came into existence and why it is only gravity and nothing else that interacts with them.

Black holes & wormholes: Black holes are regions of curved spacetime; in its exterior, spacetime is curved but objects and messages can escape while the interior lies beyond the point of no return. The interior and exterior of a black hole are separated by a surface known as 'event horizon'. Two black hole horizons separate rapidly in case they are extremely close. It was Hawking (1974) who showed that quantum effects would cause black holes to emit radiation, which goes to imply that they have temperature. Therefore, looking at a black hole from the exterior, one should find a quantum system with many microstates. Wormholes are the outcome of the general theory of relativity, which according to Maldecena (2016), is understood to connect two distant regions of spacetime and hence can serve as a link between two black holes; these are curved spacetime only, containing no matter. A wormhole elongates and become thinner as time progresses.

Quantum Entanglement: As in the case of two entangled particles one can conceive of an entangled pair of two microstates. According to 'string theory' (Maldecena, 2016), a pair of black holes with their microstates entangled would result in a wormhole, linking the interior of both the black holes. This would suggest that spacetime itself could have emerged from the entanglement of many microscopic constituents of the universe. In this sense wormholes and quantum entanglements are equivalent.

3. Analysis and the role of consciousness field

The Big Bang did not expand through anything because there was no space to expand through at the beginning of time. It is believed that the Big Bang created and stretched space itself, expanding the universe (Origin, CERN, IDEAS). Space needs to be created even for the 'dark energy' in order to facilitate quantum fluctuations.

If one goes back in cosmological history of time that is, in other words, if one thinks of contraction of the universe, then spacetime will allow entangled black holes to come closer before their horizons touch each other. In the process the wormholes connecting them will become thicker and condition will be created for the black holes to move away from each other. For this to happen spacetime should exist or should be created in the exterior of the so-called singularity. At this juncture the cause for creation of spacetime in the exterior and interior of the black holes can be postulated to be due to the existence of the hypothetical consciousness field [(Roy and Roy (2015, 2019)]. As time progresses the entangled black holes would move away from each other and the wormholes connecting them would elongate. The consciousness field, being always associated with spacetime, would use wormholes as conduits to send information from one point of spacetime to the other. Since this field is devoid of any matter, the wormholes associated intimately with the field, would convey the information. It is to be noted that Roy and Roy (2021) discussed about the consciousness field as the possible source of communication between entangled pairs and proposed 'bit' as one parameter defining consciousness.

Since space was needed to be created for expansion at Big Bang, the omnipresent consciousness field can possibly serve as its source. Similarly, for the 'dark energy' to drive the accelerating expansion of the universe, space bereft of real matter should owe its existence to the consciousness field.

According to Musser (2018), not all phenomena neatly fit within spacetime and some new foundational structure might be needed to complete the revolution that began with Einstein. Therefore, if following the hypothesis by Roy and Roy (2015, 2019), consciousness is accepted as the result of interactions with the consciousness field, then one can interpret dark matter as being differently conscious due to interaction with this hypothetical field.

As an alternative to Guth's idea of inflationary cosmology, Steinhardt and his colleagues (2011) proposed the 'cyclic' theory; they suggest that the Big Bang is not the beginning of space and time. According to them, expansion followed contraction and smoothing of universe took place before the bang. If this be the case, then one does not need to go back in time to speculate the origin of the universe; the contraction would take care of the creation of spacetime with the help of the consciousness field for the universe to expand. It therefore follows that, irrespective of the speculated origin, at every stage of evolution of the universe the ubiquitous consciousness field ensures that the journey is basically a conscious one.

Received November 19, 2022; Accepted December 26, 2022

References

1. Bertone G, Hooper D, History of dark matter, Rev. Mod. Phys., 90 (2018) 045002 1-32
2. Blumenthal G R, Faber S M, Primack J R, Rees M J, Formation of galaxies and large-scale structure with cold dark matter**,** Nature, 311 (1984) 517-525
3. Curiel Erik, "Singularities and Black Holes", The Stanford Encyclopedia of Philosophy (Fall 2021 Edition), Edward N. Zalta (ed.), https://plato.stanford.edu/archives/fall2021/entries/spacetime-singularities
4. Guth A H, Steinhardt P J, The Inflationary Universe, Scientific American, (May 1984) – JSTOR
5. Hawking S W, Black hole explosions?, *Nature*, 248 (1974) 30–31
6. Hubble E. "A relation between distance and radial velocity among extra-galactic nebulae". *PNAS*. **15** (3) (1929) 168–173.
7. Maldecena J, Black holes, Wormholes and the Secrets of Quantum Spacetime, Scientific American, 315 (5) (2016) 26-31
8. Musser G, Nature, 557, (2018) S3-S6. doi: https://doi.org/10.1038/d41586-018-05095-z
9. Origins: CERN: Ideas: The Big Bang, https://bit.ly/3WrmMkA
10. Penrose R, Gravitational Collapse and Space - Time Singularities, Physical Review Letters, 14 (3) (1965) 57-59
11. Roy A, Roy A, Evolution is a conscious process – a perspective in metaphysics, IJTP, 63 (2015) 53-66. http://www.citphy.org/volume-63-nos-12-2015/; https://bit.ly/3DbpuUq
12. Roy A, Roy A, Properties and State of Consciousness, International Journal of Science and Consciousness, 5(4) (2019) 32-40. http://ijsc.net/docs/issue17/properties-and-state-ofconsciousness; https://bit.ly/3WxRkBj
13. Roy A, Roy A, Reality Resides in The Realm of Consciousness, International Journal of Science and Consciousness, 7 (2) (2021) 34-39, https://www.researchgate.net/publication/354687009
14. Schoen R and Yau S T, The Existence of a Black Hole Due to Condensation of Matter, Commun. Math. Phys, 90 (1983) 575-579
15. Smythies J, Space, Time and Consciousness, Journal of Consciousness Studies,10 (3) (2003) 47-56
16. Steinhardt P J, The Inflation Debate, Scientific American, April (2011), 38-43
17. Taylor E F, Wheeler J A, Spacetime Physics, (W. H. Freeman and Company, New York), (1992) pp 275
18. Tillman N T , Bartels M, Einstein's theory of general relativity, Space.com, published January 05, (2022), https://www.space.com/17661-theory-general-relativity.html
19. Wald R M, Black holes, singularities and predictability in Astrophysics, Cosmology and Astronomy (Adam Hilger Limited; Bristol, UK), (1984) pp.160-168
20. Wall M, (2022), https://www.space.com/13347-big-bang-origins-universe-birth.html