

M.Hemalatha, Ph.D Scholar, Vision for Wisdom, Temple of Consciousness, Aliyar

Dr.V.Ponnusamy, Guide & Professor, Vision for Wisdom, Temple of Consciousness, Aliyar

Dr. K Perumal, Guide & Director, Vision for Wisdom, Temple of Consciousness, Aliyar

B.Chitraleka, Ph.D Scholar & Assistant Professor, SRM University, Chennai

Abstract

Human beings live on this magnificent and amazing planet earth. Millions of other species also co-exist with us. Mankind assumed to have a very prestigious and superior position than other species. We invented unimaginable innovative stuffs and went to the extent of duplicating human intelligence called Artificial Intelligence(AI). But nature once again proved that we knew very minimum about the universe we live in. All the things we see and explore comprises of only 5% of the ordinary matter and the rest 95% of the universe is completely hidden and are called as “Dark Matter” and “Dark Energy”. Scientists explained these phenomenons in their language. The great spiritual Guru Vethathiri Maharishi explains these terms in his own intuitive way through his self Transformation Philosophy of Divinity. In this way may attempt has been made to explore these.

Keywords: Cosmic inflation- Expanding universe- Hubble constant weakly interacting massive particles – gravitational lensing – Cosmological constant – quintessence – Vethathiri Maharishi

Introduction

The universe appears very perfect and symmetrical with spectacular beauty. The space which surrounds and simultaneously permeates everything in the universe still remains a great mystery to cosmologists and physicists. Though centuries roll on, the scientific community come up with new discoveries and invention, the basic question regarding reality remains unanswered. From ancient times many great scientific and philosophical personalities have pondered over natural phenomenon and resolved some of them. Many such puzzles are still pending to be resolved. Our current scenario confirms the words of the Legend Sir Issac Newton to be true. He quoted once that “I am little boy collecting pebbles here and there on the shore, while a vast ocean of truth lies undiscovered before me.

Albert Einstein’s Contribution

The nineteenth century genius Albert Einstein gave the world a completely new notion and perspective on Gravity. Earlier before him great physicist assumed gravity was one of the other four forces of nature. But Einstein proved that gravity is geometry or curvature of space time. This discovery was a great revolution in the field of cosmology and the Field Equations developed by Einstein changed the perspective of the universe. Originally his equation ended up proving that the universe was not a steady state universe but an expanding one. He altered the equation by including a constant called Cosmological constant and balanced his equation to make it stable. Many years later, his original equation proved to be correct because Hubble discovered that the universe was expanding and also accelerating.

Later after this discovery of the expanding universe, Astrophysicist and cosmologist started working hard in researching this area in particular. Many predictions and suggestions were put forth and analyzed. One such candidate which fits in perfectly with less flaw is the cosmological constant (λ) of the Einstein’s field equation. This predicts that energy density in the universe entirely is homogeneous. It is same and equal throughout the space. Einstein suggested if the Energy density is below a critical value then the universe would be a closed universe and if the energy density is above a critical value then the universe would be an open universe. If the value of the energy density is

equal to one then the universe would be a steady state universe. But the discovery of the Hubble proved that the universe is expanding.

Dark Energy

Scientists for more than four decades tried level best to sort out the reason for the expansion of the universe. In the year 1998 they finally came to a conclusion that the expansion of universe is caused by some mysterious form of energy. They suggested that the nature of this mysterious energy is repulsive in nature. The gravity which is caused by attraction of masses is the cause of formation of galaxies and clusters of stars in the early universe. On the contrary this mysterious energy is acting as Anti gravity and repelling everything against each other causing the cosmic expansion. This is discovered accurately by using what is known as the standard Candles, which are used to measure the distance of the galaxies in the space. In the case of “Dark Energy” this name “Dark” was termed by Turner, the supernova Ia is used to measure the rate of expansion. Recently it was accurately calculated that the Dark Energy comprises of about 73% of the universe mass density, 23% of Dark matter and only less than 4% is the remaining observable universe what we see today. So the centuries of hard work by the astronomers starting from Galileo and many others have only yielded in speculating 4% of the matter in the universe. And the remaining 96% of the cosmos is quite unknown to us.

Causes for Dark Energy

1. The first and the foremost suggested candidate is the cosmological constant discovered by Sir Albert Einstein. This is described as the energy which counter acts Gravity. The gravity tries to keep the universe intact on the other hand the cosmological constant acts opposite to gravity and therefore trying to repel everything from each other. The cosmological constant was assumed to be caused by empty space itself. It can also be called as the vacuum energy. This energy is caused due to the formation of virtual particles in space and their annihilation in short time span. This vacuum energy is considered to be found throughout the universe and it is homogenous.
2. The another candidate which is suggested for the cause of Dark Energy is “Quintessence”. Quintessence is considered to be evolving with time and it is not constant throughout the space. It is a dynamic form of energy. Quintessence can also be considered as a field with kinetic and potential energy. Quintessence can either attract or repel depending on the ratio of the two energies. This word Quintessence was originally used by ancient Greeks to describe a mysterious element other than Air, Fire, Water and land. The fifth element was given this name.

Team Who Discovered Dark Energy

Australian astronomer Brian Schmidt and American astronomers Adan Riess and Saul perlmutter discovered Dark Energy in 1998.

Dark Matter

There is yet another entity in the universe, which is equally mysterious as Dark Energy and that is known as Dark Matter. Scientists have found that in the universe only 5% of the matter is known to us, the rest 24% of the matter is Dark Matter. Originally dark matter was found that in the universe only 5% of the matter is known to us, the rest 24% of the matter is Dark Matter. Originally, dark matter was found when cosmologists studies the movement of galaxies and calculated its mass. They found that the total mass of the galaxies were less and the galaxies ought to be flying apart due to lack of sufficient mass to hold them together. But quiet contrarily the galaxies were held together and the stars at the periphery also moved fastly around the galaxy as the stars at the centre of the galaxy. So this inference made scientists suggest to hold it together more mass if needed but the major part of the mass is invisible.

Regarding Dark Energy Einstein's field equation was able to suggest it a different way. Einstein's equation assumed that new space can be created or new space can come into existence. But regarding Dark matter there is no such predictions from Einstein or other prominent scientists. Recently cosmologist declared that Dark matter interacts with Gravity, but it does not interact with Electromagnetic field and so it does not emit light and so is completely dark and invisible. Though it is invisible, its presence can be calculated by the binding force present inside the galaxies and even in between the clusters of galaxies. Without this dark matter the formation of galaxies and clusters of galaxies are not possible. Because these invisible substance provides the necessary attractive force to hold the stars and galaxies together. Recent research into the area of Dark matter have given concrete evidence regarding the early universe and the formation of galaxies and their clusters.

Dark Matter Constituents and Types

The spectacular Orchestra of the galaxies in the universe are thought to be exerted by their masses. But when calculated the speed of rotation of the galaxies, it is suggested that much more gravitational force should be present to hold the stars intact. If this missing mass is not present then the galaxies would mass is not present then the galaxies would fly apart long back. But cosmologist where not directly able to measure the Dark matter, their effect on the visible known ordinary matter was measured to detect them. The dark matter unlike ordinary matter does not interact with Electromagnetic wave, so it is completely dark. It does not emit, absorb and does not get affected, so it remains mysterious and dark to the rest of the universe. Scientists are working rigoursly to sort and the components which are found in dark matter.

Cosmologists infer the presence of dark matter through the phenomenon of gravitational lensing. The Cosmic microwave Background radiation and the CDM –Lamda model of the universe. It has been found that some candidates for dark matter are present but cannot be experimentally proven yet. One such candidate is the weakly interacting massive particles (WIMPS). Scientists suggest dark matter may be made of baryons like protons and neutrons but their fundamental constituent might be different. As discussed earlier some of the candidates of non-baryonic dark matter are supersymmetric particles, which are symmetrical particles for the corresponding particles in the standard model of particle physics. Other such candidates are known as Massive Compact halo objects (MACHOS), these fall under the category of Bargonic matter, some examples of these MACHOS are Neutron stars, Black holes, White dwarfs and brown dwarfs.

Dark matter is classified into three types they are Cold Dark matter, warm dark matter and hot dark matter. These classifications are done mainly on the basis of their velocity or more technically it is known as free streaming length. Cosmologists mainly support the cold dark matter candidate because it suits more accurately in the formation of the early galaxies than the other two candidates. The above stated are some of the hypothesis regarding the dark matter and its properties. Since they are not yet proved, many other alternative hypothesis have been framed and it also gains confirmation by some of the scientists. Some of the alternative hypothesis are Entropic Gravity, Dark Fluid, Negative mas mond. Specifically the Mond theory was first introduced by physicist Mordehai Milgran. This theory predicts that Gravity alters or varies at certain places like Galactic formation. This theory opposes the theory of Dark Matter.

Vethathirian Model

The great sidha of this century Vethathiri Maharishi is a spiritual scientist. He has stated that space is all pervading, very powerfull and potential. He describes that space has four qualities they are Bountifullness, Force, Consciousness and time. Swamiji explains space exists everywhere and permeates everything. He also narrates space as "Dark Fluid". He gave this phrase for space because he knew intuitively that the nature of space cannot be known completely by human's limited knowledge. We can observe a point of convergence in what cosmologists say about Dark matter and Dark Energy and what Swamiji tries to explain to the humanity. Scientists with all their latest technology and space mission are still gropping in darkness to find the solution for the formation of

the universe and its ultimate end. Swamiji explains clearly about how formative particles called as dust particles are formed continuously and also how space is being created continuously.

Conclusion

Physicists and Cosmologists are progressing rapidly in their mission to unveil the secret of nature. But they try to find the answer through logical reasoning. Ofcourse logical and Analytical approach are necessary in the beginning and to some extent of the progress. These are not the tools to resolve the hidden treasures of the universe. Even in the case of Dark matter and Dark energy many hypothesis have been proposed and no concrete result has been found out yet. Swamiji had once stated that where scientific approach towards reality ends, at that very point spiritual approach to reality starts. The pearls of Truth are embedded in the deep ocean of Consciousness, and only through meditation and intuition they can be fetched. Let science and spiritually travel together to reach the horizon of Divintiy.

References

1. Dark Matter and Dark Energy writtenby Brian Clegg
2. Dark Matter written by Alyssa Hude
3. Tomorrows written by Brian Clegg
4. Manavalakalai Part I, II and III written by Vethathiri Maharishi.