Review paper on Space-time continuum

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Abstract

The space time continuum is actually the hypothetical model of a higher dimension proposed by some of the most renowned astrophysicists. The piece of information regarding gravity is provided in order to reach to the inference. The concepts of higher dimensions will be discussed further in the literature review.

Keywords:-*Cosmos, Continuum, Black hole, Wormhole.*

1. Introduction

Now moving to the topic of gravity, we were told from the starting that Gravitational force is the root cause of any force existing between two heavenly spatial bodies. The introduction in space time continuum starts with the concept of understanding how gravity works. The pretty much obvious things to understand is that the how would be the world if there would be a fourth dimension? What if we are able to visualize how are world's going to look if we have more than 3 dimensions? Does gravity plays a crucial role in these unrecognizable dimensions with different sets of manipulation that each of an individual (especially the astrophysicists) is representing?

UNDERSTANDING GRAVITY-To really get a crystal clear perspective we need to understand that gravity is not actually a force, yes from a long time we are told that the only existence of our universe is because of a force that we all know is gravity but what if I told you that gravity is actually a layer. A fabric layer of space-time, a layer in which when an object is placed its density gets distorted & the change in density actually creates an automatic bend in this space-time layer due to which the other heavenly spatial bodies co-exist & what we know exerts a force which we call as gravitational force. The illustration is given below with the help of the figure 1

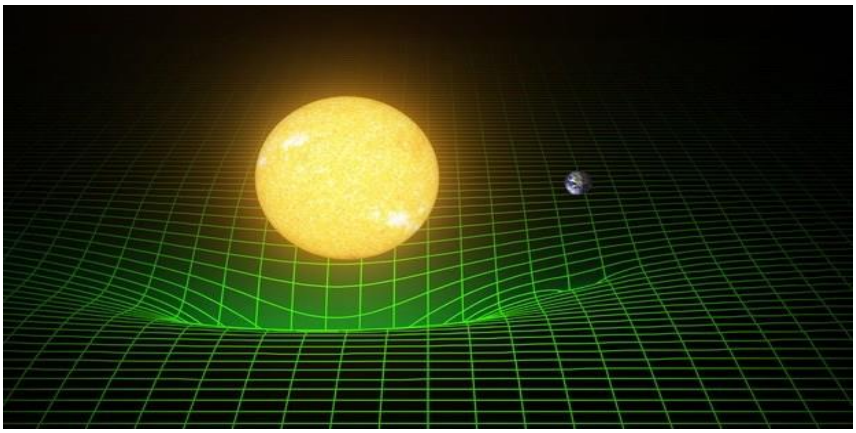
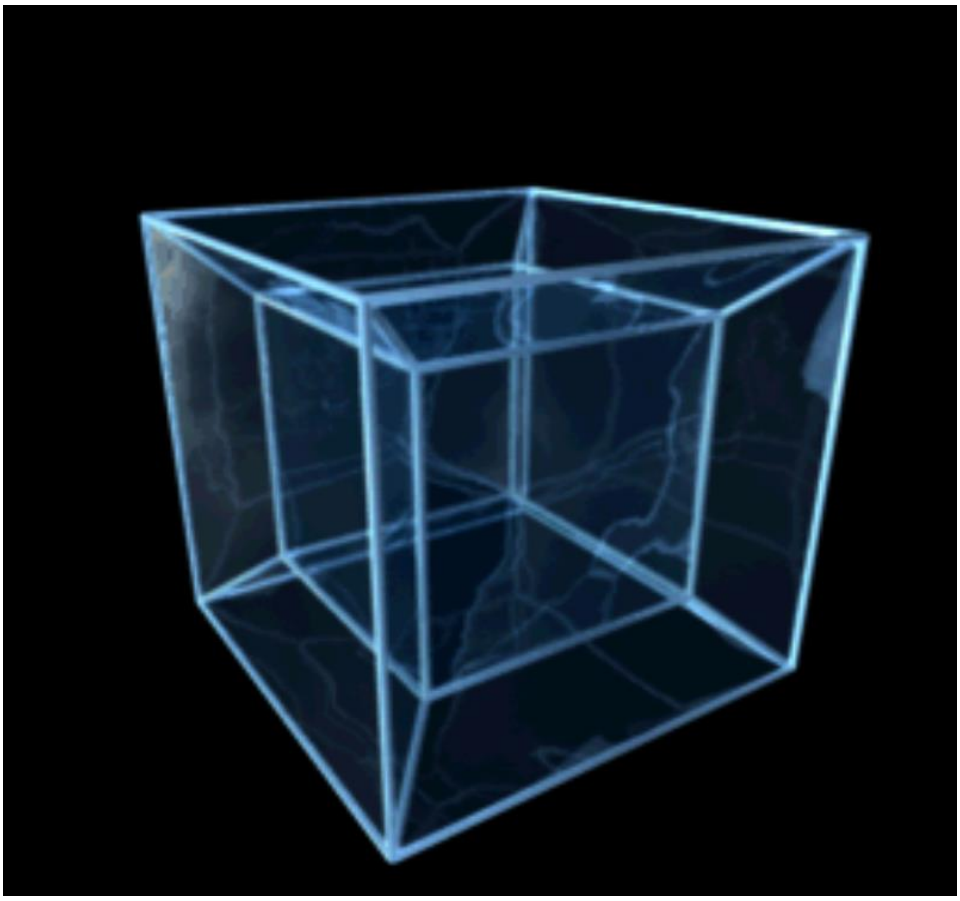


Figure 1: Fabric layer of space time

DIMENSIONS

Before explaining the layer of these space-time continuum we need to understand the dimensions in our universe/multiverse. How do we see any object defines how we're going to categorize it? For instance if an object is having only one dimension i.e. a point on x- axis we will be able to visualize that point in our mind very easily. Similarly for 2 dimensional object its quite easy for us to visualize but when a 3 dimensional object is there our human mind needs to visualize one surface at a time. Now to understand a 4^{th} dimensional object like tesseract is pretty much difficult. To understand 4^{th} dimension we can take 3 dimension as usual & time is actually 1 dimensional which adds up to being our 4^{th} dimension. Given below is the image of a 4^{th} dimensional object a tesseract represented on a 2 dimensional surface which actually changes its shape with time.



(5)Image of a tesseract

2. LITERATURE REVIEW

Sten Odenwald works for NASA education & public outreach program stated that space time does not really evolve it just exists. Hence Space time layer does not alter in its formation being a timeless quantity. This can also be proved by their geometric qualities of space time which in

reality remains constant. Space time specifically gives a kind of flexibility to move back & forth in time, providing us with information which in reality are coded in dimension. The behaviour or the characteristic that our universe is showing are actually interfacing with the space-time continuum thus "Gravity still moves our head round & round" forcing us to consider it a very crucial factor. Talking about gravity we can mainly recall the Einstein general theory of relativity which described gravity as a layer of fabric in which the heavenly bodies are actually distorting this layer fabric, so when in space-time continuum the gravity distorts, the alteration in time takes place- as it might get squeezed or it might get stretched & act as the 4^{th} dimension in space where the density of this fabric layer of gravity is so much high that if any experiment is done in this space like bombardment of charged particles the energy formed will be much greater because of the density factor, thus the time which I am referring as the 4^{th} dimension comes into action in order to measure the distortion in the layer of gravity. Now this type of space actually occurs inside a black hole or at the level of horizon. The earlier views about gravity was that it is a kind of force but after Einstein's theory the perspective about it was changed but due to some limitations we still use it as the most conventional form of representing or defining gravity. But the main thought is that if the energy which is the cause of expansion of universe is not greater than our "Gravitational force" caused by density of these black holes then it might be one of the reason of how our universe is going to end.

In cosmos the interactions of matter with the surrounding universe made astrophysicists think about different ways in which our universe will react or alter any kind of spatial arrangements like making gateways. Gateways to different place in space time continuum in the same universe or in a parallel universe. The black holes are one of the major gateways but these are only unidirectional because the density at these black holes are so much that they end up into nothing whereas if we talk about wormhole, we can understand it as a door. For example the door in your home lets you enter from your living room to your bedroom same thing is with wormholes, wormholes are actually pathways into the fabric layer of space-time continuum which we can imagine it as if a sheet of paper is having two marked points & the shortest distance between them would be a straight line but what if think this paper as a flexible space time continuum, hence we can bend it until the two marked points come face to face giving us the smallest distance between them & between them will be space formed by intense density due to the bending of fluctuated space-time continuum. Last year in 2017 the scientists proved their hypothesis regarding wormholes by actually creating a wormhole. But the wormhole was not made in space-time but it was actually a magnetic worm hole which actually interfaced with electromagnetism. The magnetic worm hole has not been able to transfer any kind of matter or stuff but it proves the concept of wormhole. To make a wormhole in space-time continuum there's the need of an exotic particle – It is actually a negative mass which basically repulse the fabric layer of space time creating & joining the two end gateways in space.

3. Conclusion

The conclusion of the topic that space-time is curved is equivalent to a question like which came first the egg or the chicken? The alteration in the geometric quantities of space-time were the contradiction part of the theory which was not able to withstand the Einstein's general theory of relativity which came into existence in 1915 & was also able to govern the rules of gravity until space- time geometry was introduced

by Minkowski universe. All the thesis made till now about how our universe came into existence & how the nature of our universe will lead us to a new future, all of them are the most probable thesis made till date hoping that one of them might be true & will reveal the nearby future we're going to have. In cosmology concepts like black hole, multiverse theory, spatial arrangements of galaxies in the space-time experiencing different kinds of forces onto each other formed a type of vision in the minds of astrophysicists that these concepts actually are the pathways to new discoveries & explanations to the problems of one another.

4. References

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