

Parallel Universes: A Way to Travel in Time

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Abstract— From the past centuries understanding our universe is brainstorming task, many scientists explained their ways and derived the laws of physics for understanding our universe but till now these laws are modifying. In modern times, a new theory suggests that apart from our universe there are another universes that are separated from our universe which can be identical to our universe. In this paper we are going to explain the facts behind our universe and our identical parallel universe, using a portal to travel in time with some modified concepts.

Key words: Observable universe, parallel universe, many worlds interpretation, many- worlds theory, quantum physics, WMAP, dark matter, dark energy, Hubble volume, cosmic horizon, horizon volume, multiverse, identical parallel universe, land universe, star ship, antimatter star ship, space-time curvature, Einstein-Rosen bridges, theory of general relativity, wormhole, time travel, teleportation, special theory of relativity, 4th dimension, Einstein-Cartan-Sciama-Kibble Theory, Einstein-Cartan Theory, general relativity theory, fermionic matter, black hole, intrinsic angular momentum, gravitational effects, white hole

I. INTRODUCTION

Will you believe if one tells you that there are similar versions of ourselves which are similar to us but difference lies in the fact that they are at the different point of space & time i.e. beyond our observable universe. Which will tend you to think it will be at the same point in space but the difference of time will be beyond the limits of our imagination i.e. that time will be same as our time or also that time when Solar system forms building blocks of life (birth of the earth about 4.543 billion years ago). Parallel universes are major challenge in the modern science suggesting that there are many universes which are similar to our universe but where is that universe, where we could find our alter ego.

Hugh Everett III^[1] was the first who proposed Many Worlds Interpretation of quantum physics. In 1952 he came up with a radical idea: that there exists parallel universe, exactly like ours. These universes are all related to ours; indeed, they branch off from us and our universe is branch off of others. With his Many-Worlds Theory, Everett was attempting to answer a rather sticky question related to quantum physics. But discouraged by the scorn of other physicists for many-world interpretation, Everett ended his physics career after completing his Ph.D.

Although the development in science has created many levels, from the ancient times people wondered about the universe thinking what is the shape of our Earth & then after few centuries they found that our earth has oblate ellipsoid shape then they start observing beyond the earth called the Space. Galileo was the first astronomer who used the telescope to observe the outer space; he found many objects that wondered him. In mid of the 18th century scientists observed space & they found that space is endless

in all direction, they called this endless space, the Universe. Now the universe is the major problem that we ever faced in which scientists try to find out the birth, structure & end of the Universe but they are facing many problems concerning that the universe is continuously expanding in all direction. Whenever scientists want to observe the universe they find this as the major problem, they think that this expansion of the universe is due to some type of energy which is opposite to gravity and continuously expanding our universe is called the dark energy who drive the expansion of the universe forever. In June 2001 NASA launched a space satellite called WMAP (Wilkinson Microwave Anisotropy Probe) to make fundamental measurements of cosmology -- the study of the properties of our universe (see fig. 1 & 2.) as whole^[2]. In 2011 WMAP recorded the data that shows the temperature fluctuations in the universe. The amount of atoms in the universe is 4.6% and the remaining amount in the universe is in the form of dark energy and dark matter which is 71.4% and 24% respectively. This calculation shows that our universe is being driven by the dark energy that is continuously expanding our universe. Sometimes this expansion is greater than the speed of light.

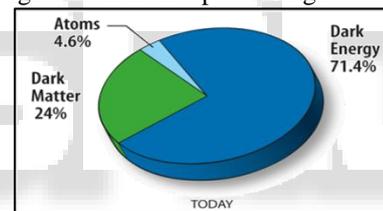


Fig. 1: Universe content-WMAP 9yr Pie Chart Source_ "NASA."

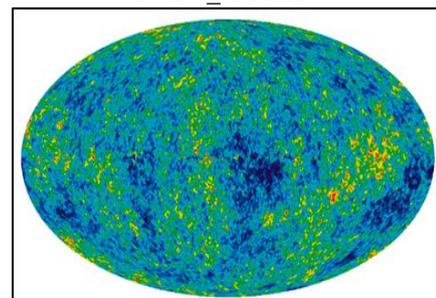


Fig. 2: The detailed all-sky picture of the infant universe created from nine years of WMAP data Source_ "NASA."

II. OUR OBSERVABLE UNIVERSE AND BEYOND

As we see night sky it is dead reckoning that how far the universe has been expanded, what is the boundary of our universe & what the rate of expansion of the universe is? Most of these problems are faced by every person who always wonders about the universe. For example, in ancient times when people don't know what the symmetry of the Earth is, they suppose that our earth is flat in all directions. Horizon is the term that separates the earth from the sky, an imaginary line. Parallel universe^[3] has a similar status

related to their horizon that separates our universe from our alter ego's universe.

A. Hubble Volume

We all accept the existence of things that we cannot see but could see if we moved to a different vantage point or merely waited, like people watching for ships to come over the horizon. Like the horizon that separates the sky from earth, we also say that our universe has its separate horizon that separate our universe from the other universe is called cosmic horizon. The most distant visible objects are now about 10^{26} meters away; a distance that defines our observable universe also called our Hubble volume, our horizon volume or simply our universe. Likewise, the universe of our, our other selves is sphere of the same size centred on their planets. They are the most straightforward example of parallel universes. Each universe is merely a small part of a larger "multiverse."

B. Finding Identical Parallel Universe

We define our universe that we observe as observable universe or Hubble volume but this is not the end of our universe! Our universe is going away from us with the speed that may be greater than the speed of light i.e. it is not only impossible to cross our universe rather it is even impossible to visualise it, then how to go in our parallel universe? There is also the solution of this problem but we first calculate the distance of our identical parallel universe. Our universe should not infinite but confined in a space that is far beyond our observable limit, if this is not true then what to do? Einstein theory of gravity calls this intuition into question. Space could be finite if it has a convex curvature of unusual topology. A spherical doughnut-shaped universe would have a limited volume and no edges. Another possibility is that space is infinite but matter is confined to a finite region around us as the historically popular "land universe" model.

The calculation has been done for determining the distance to our identical parallel universe.

Here we take protons and find out that how many protons can be fitted in our observable universe.

1) Radius of our observable universe

$$= 1.3065780348484 \times 10^{26} \text{ metre}$$

2) Radius of 1 proton

$$= 0.8775 \times 10^{-15} \text{ metre}$$

Now,

The no. of protons that can fit in our observable universe

$$= (1.3065780348484 \times 10^{26} \text{ metre})^3 \div (0.8775 \times 10^{-15} \text{ metre})^3.$$

Which is equal to $3.301145627279 \times 10^{123}$.

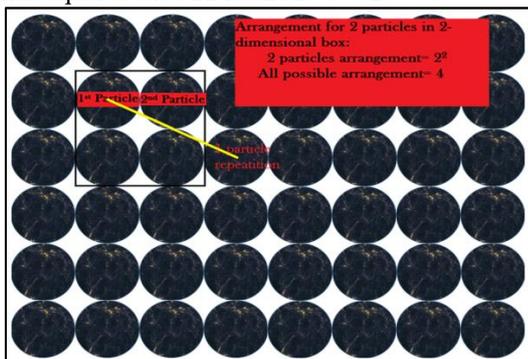


Fig. 3: All the possible arrangement of 2 particles in 2dimensional box

From above calculation, now we can have the total the no. of protons, we have calculated the total amount of protons in our observable universe that has the approximate value of 10^{123} . This value gives us the enormous amount of protons that we have in our observable universe.

Here the figure 3. shows all the possible arrangement of 2 particles in 2-dimensional box concerning all the possible arrangement for protons in the observable universe. This shows all the possible arrangement for 2 particles in 2 dimensional box which is 2^2 or 4. After that arrangement, particles will start repeating their starting position.

Then, all the possible arrangement of protons that can fit in 2 dimensional observable universe would be equal to $2^{10^{123}}$ (approximately 10^{1230}).

Now, The distance to our identical parallel universe= All possible arrangement of protons in our observable universe \times diameter of 1 proton.

$$= 10^{1230} \times (1.7540 \times 10^{-15}) \text{ metre.}$$

$$= 1.7540 \times 10^{1215} \text{ metre} \cong 10^{1215} \text{ metre.}$$

Hence, all the possible arrangement for protons that can fit in the 2 dimensional observable universe would be approximately equal to $10^{10^{123}}$. From this all possible arrangement of protons in 2 dimensional box we have calculated the value of identical parallel universe that would be approximately equal to 10^{1215} meter.

Beyond that box of universe, universe including our must repeat. Although this is the distance where the repetition of our identical parallel universe starts but it is possible that our doppelganger may be at the distance which is less than estimated distance because the process in that every possible value of outcomes from all the possible arrangement may be previous from this estimated value. Another cause is the formation of planets in parallel universe, physical constants, different laws of physics etc. that will show all possible doppelganger that we find.

III. WAYS TO GET INTO THE PARALLEL UNIVERSE

If we imagine that we could make a Star ship that will take us to our identical parallel universe would be seem impossible. We can't make a Star ship that can travel this large amount of distance, for once if we suppose that we have made a Star ship by the perfect laws of physics that would conserve the amount of energy with the help of dark energy or an Antimatter Star ship that will repel itself in our desired direction with the help of matter that is distributed in our universe whenever this would take our billions of generations to reach that value! And if we assume that we have made a star ship that has speed equal to the speed of light and we travel at this speed even than we would not able to reach that universe because our universe is expanding greater than the speed of light. So here we discuss the major impediments that are restricting to go to our identical parallel universe.

Hence, it seems impossible to go out from our universe into that universe, so how it is possible to get into our identical parallel universe? Here is a strange solution of this problem that discontinuation our limits of space and time curvature of the universe. If we want to understand that how to travel that large amount of distance without taking our billions of generation, we will have to understand

“Space-time curvature” of the universe that separates the one object to another with few distance to that distance that we have calculated. Scientists thought that the universe distributed in all direction in 3dimensional space. We normally estimate all the calculation based on this 3dimensional space, but a new question arises that there are another dimensions beyond this 3dimensional space in which we can go through? The answer is here!

A. Einstein-Rosen Bridge

In 1935 working on “theory of general relativity” Einstein and his colleague Nathan Rosen used the theory of general relativity to propose the existence of “bridges” through space-time. These paths were called Einstein – Rosen bridges^[4] or Wormholes that connect two different points in space-time, theoretically creating a shortcut that could reduce travel time and very long distance.

We can understand wormholes in a simple manner in the following way:

Wormholes contain two mouths, with a throat connecting the two. The mouth would most likely be spheroidal. The throat might be a straight stretched, but it could also wind around, taking a longer path than a more conventional route might require. Einstein theory of general relativity mathematically predicts the existence of wormholes, but none has been discovered till date. Wormhole would have the strange properties that can solve the problems of travelling the distances that are impossible in real life. Wormholes are the portals to travel billions of light years in just few kilometres or metres, travelling in time that would get us into the past or future, but nobody confirms that how to use these wormholes to go back into the time or go into the future or how to use as “teleportation” in our desired place.

Here we understand what is wormhole, but now the question arises that how we apply these wormholes to go into our identical parallel universe? There is a different solution for this problem! When Einstein was working on his “special theory of relativity”, they took time as another special 4th dimension that always keeps with space (3dimension). From our view wormholes can be assumed as another special dimension apart from the dimensions of space as well as time. This would be 5th dimension! For understanding how wormholes work we will have to understand some real life concept by which we could apply approximately the same conditions to the wormholes.

In our daily life many of us use Radio to listen our audio programs, we use radio waves that are electromagnetic waves to receive our desired channel using variable capacitor. For working of radio there are both transmitter and receiver that transmits the radio waves from one place to another and receiver receives radio waves. Here we use only radio waves in Radio, we match frequency for our desired radio station^[5]. If we don’t do so, our radio receives other frequency which could not be understood and it will be nothing other than the “cosmic noise.”

We can apply the same mechanism in wormholes, i.e., we’ll make a wormhole which works as a transmitter (for transmitting any object) in the form of a special type of energy which will travel through 5th dimension but for travelling in different universes we’ll calculate the energy level of the wormhole and parallel universes that will create

into parallel universe then we could get into that universe. We’ll have to make another wormhole which would work as receiver to receive any object through transmitter parallel universe, if the energy level of both the wormhole will be same we could get into our identical parallel universe (see fig. 4). And if the energy level of wormhole is not same then we may go into another universe (see fig. 5). There will be many of the civilizations that will be trying to create such wormholes, if our wormholes energy level will be same as their wormhole’s energy level then we will go out from their wormhole and will be in a place where we can find an IDENTICAL PARALLEL UNIVERSE.

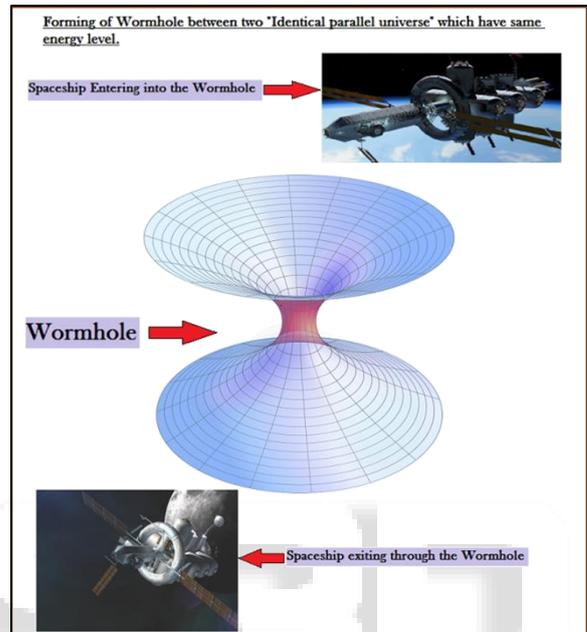


Fig. 4: Warmhole for Identical Parallel Universe

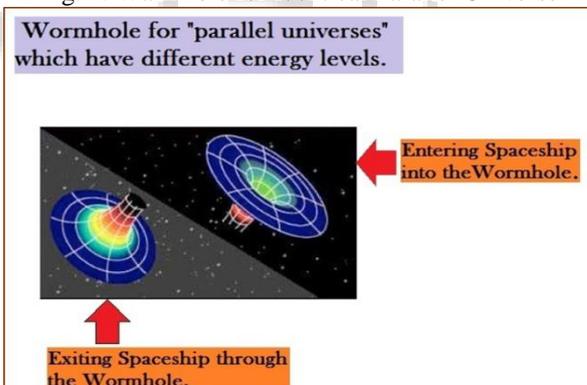


Fig. 5: Warmhole for Parallel Universe

B. Einstein-Cartan-Sciama-Kibble Theory

Einstein-Cartan-Sciama-Kibble Theory or [Einstein-Cartan Theory] [^]([6])(ECT) of gravity is a modification of General Relativity theory (GRT), allowing space-time to have torsion, in addition to curvature and relating torsion to the density of intrinsic angular momentum. This modification was put forwarded by Elie Cartan, before the discovery of spin. Einstein and Elie Cartan jointly worked on torsion of space-time due to massive objects, they thought that these massive objects would have another remarkable feature with curved space-time that twists the fabrics of space-time but this twisting of space-time was at very microscopic level that it could not be calculated and they ended their theory of twisting of space-time.

Now, the theoretical physicist [[Nikodem Poplawski]]^{^(7)} at the University of New Haven most widely noted for the theory that “every black hole is a doorway to another universe and that the universe was formed within the black hole of which itself exists in a larger universe.” Poplawski theory is based on the Einstein-Cartan-Sciama-Kibble theory of gravity which extends general relativity to matter with intrinsic angular momentum (spin). Gravitational effects of torsion on fermionic matter are significant at extremely high densities which exist inside black holes and at the beginning of the universe. The torsion of black hole would be so high that the space-time curvature will be ripped due to black hole’s gravity and would be turned out the matter falling into the black hole originated from a “white hole” that is supposed to be the beginning of the universe.

IV. CONCLUSION

This is based on finding our identical parallel universes & the ways which we use to travel into that universe. We conclude that our identical parallel universe is at very large distance that would be approximately equal to 10^{123} metre. We use different physics laws with our modified concepts to travel in identical parallel universe as well as to travel in past and future. We use Einstein’s general theory of relativity to understanding reason behind time travel & a theory that Einstein & Elie Cartan had been stopped working named Einstein-Cartan theory. We use wormhole as 5th dimension to travel in time (past and future). Hence We conclude that time travel is possible with the help of using different laws of physics and another dimensions apart from our known 3dimensional universe.

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