

Creating a Scientific Way to Travel through Time

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Abstract:

Form thousands of years, one of the incredible dreams of the human race is, “to change their past” or “to know their future”. For both of these to happen, there is only one way, that is TIME TRAVEL, which is considered as a myth or an impossible event by many scientists. This opinion was slightly objected by Albert Einstein by proposing some unknown context about the word “Time”. But when Stephen Hawkins came to play the opinion was changed by the introduction of a new topic to science known as “TIME BENDING”. Later on, this topic gained one more way to come true. The way in which time travel was achieved can be explained through equation of TIME DILATION in which the related time of a travelling object behaves abnormally when the object reaches the speed of light. As of present technology the maximum speed achieved by humans is around 24.791 miles/sec which is approximately 0.00000003% of light speed. In this paper we are going to discuss how to attain the speed which is approximately equal to the speed of light by using different techniques and some other possible ways to achieve the forever dream of mankind.

Keywords--- Time travel, Time dilation, Time bending, back holes

I. INTRODUCTION

The word TIME TRAVEL is the one which makes everything in this world possible. Human race can be saved from many disasters. Any impossible things can be achieved by human. But all this makes sense makes true when TIME TRAVEL is possible. At first what is TIME TRAVEL. Before that what is TIME. According to physical laws time is a scalar quantity which had only magnitude but no direction. While most people think of time as a constant, physicist Albert Einstein showed that time is an illusion which can be relative, it can vary for different observers depending on your speed through space. To Einstein, time is the "fourth dimension." Space is described as a three-dimensional arena, which provides a traveler with coordinate, such as length, width and height showing location. Time provides another coordinate, direction, although conventionally, it only moves forward.

But according to STEPHEN HAWKINS time’s movement is not only in forward direction, it alters based on the conditions like gravity and around the objects with high density. This phenomenon is known as time bending. It was also proved by the laws of relativity. According to this time bends or slows down near heavy density objects such as black holes, the minimum bending can also be observed near pyramids and mountains. Which means time can be slowed down under certain circumstances where the gravity and density of the particulars are high. Time travel is defined as creating a path to travel either forward (future) or backward (past) in time. But as of now, according to the present technology time travel can’t be achieved by humans. But there are some techniques to achieve it up to some extent. There is also a chance of disasters to happen when time travel is achieved, this is explained later in detail.

In this paper we are going to discuss about “JUNO” a space vehicle which achieved the highest speed in human history by NASA and also the techniques followed by JUNO to achieve such a great speed.

II. TECHNIQUES TO EXPERIENCE TIME TRAVEL

There are some techniques through which human can experience time travel. They are listed with explanations below:

A. Time Dilation

This technique explains about how an object experiences abnormal behavior of relative time when the object travel with high speed. This dilation can be expressed as an equation which is given below:

$$t' = t\sqrt{1 - V^2 / c^2}$$

Where: t' = dilated time
 t = stationary time
 V = velocity
 c = speed of light

According to this, the related time purely depends upon speed of the object. If the object’s speed is very much less than the speed of light, then it can’t experience any difference in relative time. When the object is approaching the speed of light, it

starts to experience its relative time getting slowed down. This is accepted by theory of relativity. But when it is taken to extremities, when the object reaches speed of light (3×10^8 m/s), the time related to it stops. But what happens if the object reaches more than the speed of light, the time may get reversed. Here there is a chance of formation of “time loops” which may be utilized as “time portals” to travel through. But this is the most controversial assumption, as there is a strong objection which is accepted by the whole world. That is “THE UNIVERSAL LIMIT”. According to that “traveling faster than the speed of light would violate the causality principle.” It may lead to disintegration of the travelling object and many unimaginable disasters too.

B. Time Bending

According to this, time bends or slows down around high-density objects. Which means the observer can see his surroundings move a little bit faster. This can be merely experienced when we sit beside a pyramid or sit on a mountain. But its extent can be increased by increasing the extent of the high-density objects from mountains or pyramids to black holes or stars. This is acceptable one as it doesn't have any objections from physical laws.

When these two techniques were combined and followed a better result can be achieved, which means the high speed should be achieved near a high-density object. This may be better if this is tried in space. The first challenge to be faced is high speed. We have already achieved some extent of speed but this should be improved.

III. RELATED EXPERIMENTAL WORK

The maximum speed achieved by humans up to now was around 25 miles per second. But this is approximately 0.00000003% of light speed. It was achieved by NASA's JUNO space craft in 2011 by becoming the fastest man-made thing ever. The technique followed by NASA was “sling shot technique”, which means projecting an object towards a high gravity object (mars here) and utilizing its gravity to attain high speed. It was one of the most successful mission by NASA.

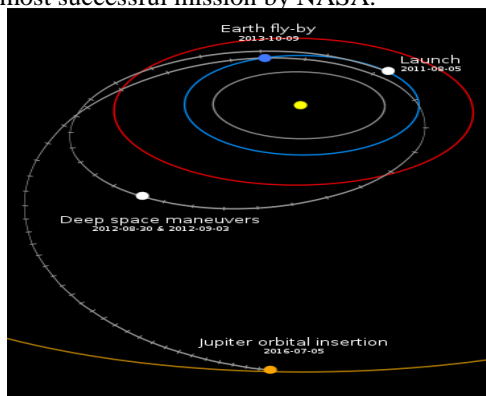


Figure 1: orbit followed by JUNO

A. About Juno

“The name JUNO is taken from Greek and Roman mythology. The god Jupiter drew a veil of clouds around himself to hide his mischief, and his wife, the goddess Juno, was able to peer through the clouds and reveal Jupiter's true nature”

Juno was selected in 2005 as the next New Frontiers mission after *New Horizons*. The desire for a Jupiter probe was strong in the years prior to this, but there had not been any approved missions. The Discovery Program had passed over the somewhat similar but more limited Interior Structure and Internal Dynamical Evolution of Jupiter (INSIDE Jupiter) proposal, and the turn-of-the-century era Europa Orbiter was cancelled in 2002. The flagship-level Europa Jupiter System Mission was in the works in the early 2000s, but funding issues resulted in it evolving into ESA's Jupiter Icy Moons Explorer.



Figure 2: JUNO satellite

Juno completed a five-year cruise to Jupiter, arriving on July 5, 2016. The spacecraft traveled a total distance of roughly 2.8 billion kilometers (18.7 astronomical units; 1.74 billion miles) to reach Jupiter. The spacecraft was designed to orbit Jupiter 37 times over the course of its mission. The mission was a successful mission to NASA. However, this technique gives us a new way to achieve high speed and it even cleared a Guinness world record by achieving high speed. So, the first problem was solved.

The next biggest problem was finding a heavy density object. The densest *objects* in the *universe* are black holes. Black holes can have different masses but their *density* is infinite.

B. Sling Shot Technique

It is the technique followed by JUNO in order to achieve that highest speed in human history. The technique is very simple to increase its speed by using the gravitational speed of the approaching planet or celestial object. By following this technique JUNO created world record by achieving highest speed of 25 miles per second. Juno's **second** record was set on 4 July 2016 as it plunged into Jupiter's massive gravity well. The gas giant's **pull** accelerated the already fast-moving probe to a speed of 265,000 km/h (165,000 mph), making it the Fastest spacecraft.

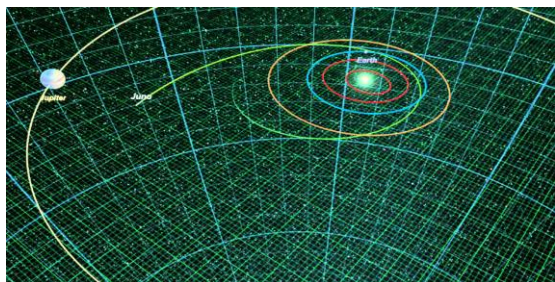


Figure 3: slingshot technique followed by Juno

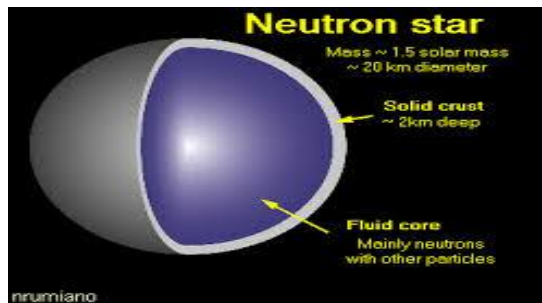


Figure 4: structure of neutron star

C. Black Holes

A black hole is a region of space-time exhibiting such strong gravitational effects that nothing not even particles and electromagnetic radiation such as light can escape from inside it. The theory of general relativity predicts that a sufficiently compact mass can deform space-time to form a black hole. Black holes have a high gravity such that it won't leave anything which crosses its boundary, which is called "event horizon". But the main problem here was the existence of black holes was not proved. According to many scientists' black holes are the ultimate paradoxes of nature, silently mocking our feeble attempts to understand them. The main question was how to find them in this vast black universe when they don't release any energy instead takes all forms of energy near it. By all accounts, black holes should not exist. So, the best next option to go with was a neutron star.

D. Neutron Star

It is a celestial object of very small radius (typically 30 km) and very high density, composed predominantly of closely packed neutrons. Neutron stars are thought to form by the gravitational collapse of the remnant of a massive star after a supernova explosion, provided that the star is insufficiently massive to produce a black hole.

Neutron star forms when a massive star explodes, not all the material is ejected into space. Some of it collapses into an extremely compact object known as a neutron star.

IV. PROPOSED TECHNIQUE AND RESULTS

We have discussed about the high-speed vehicle which is the achievement of mankind and also the technique which it used to achieve the high speed. But the speed achieved by JUNO was only twenty-four miles per second which was only 0.00003% of light required speed. Another technique in which the time itself gets slowed near high density objects. But in order to make a human experience it the object should be kept very near to heavy density objects black holes in this case. But it may be very dangerous as black holes attract and disintegrate matter.

The better results may be experienced when the both above techniques were combined and used. In order to achieve the speed for TIME DILATION the slingshot technique or any other improved techniques can be used. In order to achieve TIME BENDING the object is made to move near a heavy density object either a black hole or a neutron star. If the object is made to revolve around a small black hole with high speed then it may get worked out. But this is not an easy way, many obstacles arise in this way but if all those were cleared and avoided, the final destination TIME TRAVEL can be experienced. But this may be up to some extent. Not like the one in movies goes to past or future to change something. Not even light speed is necessary in this case to achieve a different behavior in related time as we are using the gravitational pull of the terrestrial object. The results and techniques are discussed below:

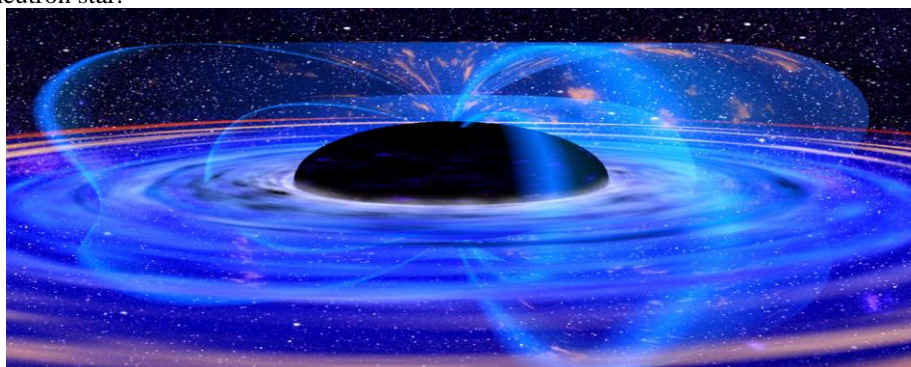


Fig 5: CENTAURUS A a super massive black hole near our universe

V. RESULTS

The results may be favorable to us but the further consequences should be faced by us. One of the main

problems was, this technique was a very sensitive one, if any unwanted things happen that may result in fatal disaster. It may tear the layer between time and

space which would result in disastrous collapse of universe.

VI. DISCUSSIONS

Once this topic TIME TRAVEL was raised there were many discussions happened on this topic. The main points on which the discussion happened was “consequences faced after TIME TRAVEL”. There were many points raised on “PARADOXES”, which are defined as the non-existing ones which exists. Mathematically the word paradox is defined as “a true statement which contradicts itself.” But up to now, as it was not achieved these discussions were ended. But if time travel is possible the paradox should be answered. Some of the best examples of time paradoxes were

A. Grandfather Paradox

This time paradox gives rise to a ‘self-inconsistent solution’, because if one traveled to the past and killed the traveler’s grandfather, he would never have been born and would not have been able to travel to the past- a paradox.

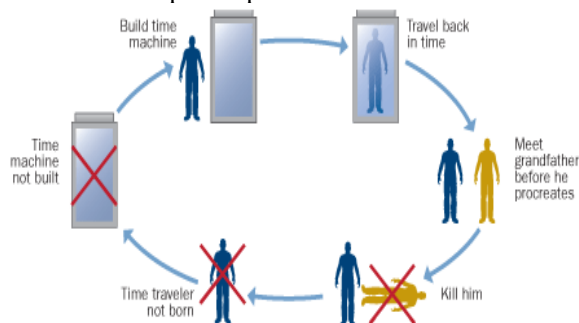


Figure 6: time travel paradox

B. Kill yourself Paradox

If the one who travelled back in time kills himself before he started travelling. Then who killed him. He was killed before he started travelling. A paradox.

These questions can be answered by the “THEORY OF DESTRUCTION OF MULTIPLE PARALLEL UNIVERSES” designed by me in which it was described as, if any changes were made in the time line to which the traveler had travelled, as soon as the change happened the universe he belonged to gets destroyed and replaced by the universe which is the resultant of the change made by him.

VII. THEORIES SUPPORTING THE RESULTS

There are many theories which supports the following results, but according to me, my theory “THEORY OF DESTRUCTION OF MULTIPLE PARALLEL UNIVERSES” answers many questions raised in any discussion about time travel.

According to this theory, if time travel happens and if anyone goes to past, for example and

he made a change in the past, just as asked in grandfather paradox, the universe which we came from, gets destroyed and the universe which is the resultant of the change is been created and obviously the one who made the change remains as a paradox or a left out particle in unimaginable flow of time.

Destruction of universe is nothing but a destruction of dimension which may lead to unimaginable catastrophes. The travel may destroy the layer between time and space.

VIII. CONCLUSION

Time travel may be a dream as of now but once if the technology improves it may be possible. As many scientists suggested that, TIME TRAVEL was not possible, as of now. Who thought before 50 years that JUNO achieves maximum speed? So this may not be possible as of now but it may be possible in future after some invention.

If the above technique was followed some extent of variation in relative time behavior can be achieved but not exact time travel. The variation in the sense the traveler feels his relative time to be slowed down when compared to the original time, just like the twin travelling ages slow when compared to the twin on earth.

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