

# Prisoners of Space and Time



Dr. Prabir Rudra  
Faculty  
Department of Mathematics  
Asutosh College  
prabir.rudra@asutoshcollege.in

## Prisoner of time

Right from the dawn of the ages, human beings have always been a prisoner of time. Time has kept on flowing uni-directionally, unconditionally, and above all monotonously without giving us any break at all. Probably it presents us with the best natural example of continuity. Great men like Albert Einstein have pondered over the nature of time and tried to understand its fabric. But it is unfortunate that the mystery of time remains unsolved till date. Man has almost reconciled to his fate of not being able to gain control over the flow of time and use it to his advantage. There is no going forward or backward in time for a man. Once a moment passes it will be lost forever in the infiniteness of time. All of us long for our childhood days and hope against hope that it would be great to be able to relive those days once more in a lifetime. Likewise, a point of time in the future cannot be lived before it actually arrives by the natural flow of time. We are the captives of time in a helpless situation. The invisible prison holds us tight and we have no way out. This victory of time over man is so comprehensive that it has compelled him to live within the vicious cycle of life and death. The much-awaited time machine is just an item of fiction for the time being and probably for many years to come. Our knowledge of time is so constrained that even the thought of a time machine seems to be an utter luxury for the time being. Our ignorance has pushed us to such a point that time itself seems to be an illusion to us!!! The illusion of time keeps wielding its magic over us.

## Prisoner of Space

Most of us will think that we are free to move

around in space with unlimited freedom. Indeed we can move freely in the directions forward and backward, up and down, left and right. That allows us three-dimensional motion through space. In that sense, we are really free to move spatially. Here we will consider a different point of view of motion through space.

We know that we can move through space. No doubt about that! Now we ask a question: how far can we move or how far have we moved till now? We know that we have travelled to the moon whose distance is 3,84,400 kilometres from Earth. Maybe we will travel to Mars in the near future which is at a distance of 179.3 million kilometres from us. That's all!! Which is our nearest star? Most of us know that it is Proxima Centauri situated in the Alpha Centauri system. It is situated at a distance of 4.2 light years away from us. Now one light year is the distance that light travels in a year at an enormous speed of 300,000 kilometres per second. Now if we calculate we see that, 1 light year = 9461,000,000,000 kilometres.

## Our Latest Technology

Nasa's Juno probe is currently one of the fastest spacecrafts built by man. It was placed into an orbit around Jupiter in July 2016. It briefly clocked around 2,66,000 kilometres per hour (1,65,000 miles per hour) making it one of the fastest till date. This was certainly assisted by the sun's own gravity. Helios I and II, which started their journey way back in the 1970s reached speeds of around 2,41,000 kilometres per hour (1,50,000 miles per hour). Nasa's Parker Solar probe is set to beat all these records. By December 2024 it will be at its

peak speeding at around 6,92,000 kilometers per hour (4,30,000 miles per hour). With that speed, we can travel from Washington DC to Tokyo in under a minute. Now that is very fast!! Other latest technology spacecraft that we have built are Deep Space, New horizon, Voyager, etc. These have a maximum speed of around 60,000 kilometres per hour.

### **Our biggest Nightmare**

Even if we consider the highest speed attained or to be attained by our latest technology spacecraft (Parker solar probe in 2024) using repeated gravity assists the time taken to reach our nearest star (Proxima Centauri) will be around 6555 years. With an average human life span of 80 years, it will amount to more than 100 human generations. That's ridiculous!! This means that an astronaut who decides to travel to Proxima Centauri or its exoplanet Proxima B will never reach it in his lifetime or in a few lifetimes. He or she is defeated by his or her biological setup. In other words, the human life span seems to be totally uncondusive to interstellar travel. These numbers are so staggering that space travel seems to be beyond the realm of practicality. Although we are free to move around at will our movement in space seems to be highly constrained when large-distance travel is considered. In a sense, we are the prisoners of space as well probably destined to live and die on Earth.

### **Very little time in hand**

With the expansion of the Universe, the stars, the planets, the moons, and the galaxies are all moving away from us every second. With the passage of time, it becomes more and more difficult for research and for any realistic chance of interstellar travel. We have to act very fast otherwise it might be too late. Everything might go beyond our reach and we will be left contemplating in despair.

### **What if we fail!**

The result of our incapability will be terrifying. It will have far-reaching consequences than it seems. Probably our future generations are going to see a dark starless sky, only to live and die believing that they are alone in this universe with nowhere to go. What a boring life that would be deprived of the beauties of the heavens!! The stories of stars, planets, and galaxies will only become fantasy tales for them which they will pass on from generation to generation as legends. Slowly and silently time is leading us towards such a terrible situation.

### **Space Travel: A choice or a compulsion for us?**

With the advent of science and technology human civilization has reached new heights. But every success has its disadvantages as well. Pollution, deforestation, ozone layer deflation, use of nuclear weapons, etc. have led to global warming on a large scale. This has eventually led to the melting of the polar ice cap and the rise in sea levels all over the planet. The effect on life is already visible. Already a lot of species of animals have become extinct and the number is on the rise as the days go by.

Slowly but surely this will catch up with humans in the near future. The end of the days is not very far away! Earth will not be a suitable place to sustain life for a long time unless we take serious steps to preserve it. In such a situation we have to think of an alternative home for us. We should attempt more and more space travel in the quest for some other planet that can sustain life and think of colonizing it. Some exoplanets like Kepler-452b have shown promising signs and are already on the list. So space travel will no longer be a choice but soon a compulsion for the human race in order to save it from extinction.

We know that we have already thought of warp drives, wormholes, etc that can assist in our venture. But unfortunately, they are still mere theories and are considered objects of science

---

fiction pictured in Hollywood movies. We need to get practical results from our theories very soon. Let us hope that we will soon understand the secrets of the fabrics of space and time and

reveal the mysteries of nature. This along with our technological advances will help us realize our dream of interstellar travel and liberate us from the invisible prison of space.

