

Time : Does it really exist ?

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ARTICLE DETAILS

Article History

Published Online: 10 January 2019

Keywords

Astronomy, Cosmological fallacy, Cosmological challenge, Quantum physics, Cosmological natural selection, Laws of nature, String theory

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ABSTRACT

We know many things about the time, more exactly we know many characteristics of time, and we know that we live in a time governed world. Time goes through always in one direction. It is always regular. As time is an inprescriptible thing in our environment it is everywhere around us, we think we know it very properly. But physicists & philosophers have a question in their mind about the real existence of time. Time is not real, it is actually an illusion, and this is the belief of many physicists and philosophers. This idea of the non-existence of time had been first introduced by Greek philosopher Plato after him, in 20th century great physicist Albert Einstein said in his special relativity that time is an illusion, after that there is a long research & argument in this topic of time's real existence but in 2013 this argument almost have come to an end by the book of Dr. Lee Smolin "Time Reborn". In this book Smolin discussed that how the time exists in the whole universe, not only exists actually time is governing our universe. He proves the existence of time with the use of cosmology. Using laws of nature, we have an idea about timeless universe, but Smolin shows that laws of the nature are nothing but the result of evolution, which implies that time is real because one of the greatest condition of evolution is time.

1. Introduction

Anaximander gave a fascinating idea about the nature of time. He said that all things created from one another and vanishes in to one another, that all happens in the importance of the conformity of time. It is quite hard to imagine a time-less nature being a part of the world which is time-bound. There is a question that time is real or it is an illusion? But Smolin's personal realization is something different. He thinks that time is real & it is very important aspect of space, gravity, and quantum physics. In his book he describes about a paradox. The paradox is something like that: we humans, put something out of the time bound world, which we think as very precious. Using this paradox we put justice, real, true, mathematics out of time. We think that mathematics, true, beauty, justice these can transcends time because these all are very precious & valuable to us. So this paradox clearly gives us a way to imagine an idea of timeless world, living in a time-bound world. Smolin here tries to pick the humans out of this paradox. According to him we live in time-bound world, our science is also controlled by time. Whatever we think real in the world that we observe in a moment of time. Everything happens in an interval of time, what we observe that's also in an interval of time. So how we can ignore time as an illusion?

There is one more way to prove the time as an illusion, that's Newton's classical frame work. It says that the nature consists of nothing but particles with unchanging particles whose motions and interactions are bound to timeless laws. In this case we can think that what is actually. The aim of physics, if physics aims to create a theory which is applicable for the whole universe. According to this standard this frame work is not eligible, because this frame work is applicable to the small subset of the universe it collapses when applied to the whole universe. According to the vision of Leibniz, time must be the

result of change governed by causality. Space and time are relational. We must think that time is not relative, it is relational actually, which has relation to everything of the universe.

2. Future of Study

2.1 Cosmology:

Time is real it is not an illusion it is proved by the help of Cosmology. To know the true nature of time we must know some characteristics of the universe. We must know that how our universe is expanding, what the black hole actually is, cosmological fallacy, cosmological challenge, cosmological natural selection which will open a huge Broadway to study the physical cosmology. Cosmology, this subject is about the universe, which is so big that we can't research about it as a whole & it is expanding, so it will be able to create huge interest among the researchers.

There are more two subjects which have their future of study related to this topic.

2.2 Quantum Physics :

There is a very open field of quantum physics to search about the time. Now many scientists are now assuming that time travel can only be possible in quantum state of any matter. So time and it's nature is being the field of interest for many scientists.

Scientists are now trying to see that the behavior of sub atomic particles in time have some differences with the behavior of the macroscopic world in time which may able to challenge the most cherished beliefs about the nature of time, which may able to rewrite the physical nature of time. For example the idea of alternative histories that any phenomena may have many histories instead of a single history. This will

able to challenge the idea that time always goes to one direction.

2.3 Special Relativity:

Einstein's theory of special relativity was the most sensational & celebrated scientific theory which changed the idea of time forever, now we have to see that how this theory able to describe the nature of time in case of multiverses.

3. Review of literacy

In the book "Time Reborn" Smolin tries to give a final destination of decision on a very fundamental question, that is "Does the time really exist? Or it is an illusion." Smolin's book is a very high thought provoking book. It starts with some very fundamental questions on the nature of time like, these questions will not only give a free field to think about the real existence of time also gives a huge field to think about the true nature of time. With that this book also provokes the readers to have a free thinking about cosmology with the specific topic described in the book like cosmological fallacy, cosmological challenge, and the heat death of the universe. So it actually gives two fundamental questions to think about, they are what is time? & what is the role of cosmology to prove the existence of time in the universe? The most important thing is the book is very well written but it is also true that this book has some lack of simplicity, there is nothing complexity in literature but in the topics like quantum physics or quantum cosmology. It is a little bit hard thing to understand those topics for a person who doesn't have the fundamental ideas of physics.

4. Main Work

Smolin tries to give a conclusion to this very long standing question on the existence of time in the book starting it with some fundamental questions as we said it.

Questions:

- Does the future really exist?
- Is novelty real?
- Does time emerged from timeless laws?
- Do laws evolve & emerge in time?
- Do our laws apply only to small parts of the universe?

Here he tries to give suitable answer to give answer to these questions using old Newtonian paradigm and showed that it can't applied to the whole universe then he tried answer these questions using cosmology.

5. Disappearance of time

5.1 We know that our nature loves to hide but in case of gravity we are wrong. We all can feel and observe it. Gravity can be observed without any need of special instrument. Gravity was first observed by Galileo. Galileo also discovered that gravity trace a parabola with earth's surface. This characteristic of gravity also proves the existence of law of nature. This is a clear indication to the timeless nature.

5.2 It was first observed by Johannes Kepler that the cosmological bodies move along ellipses rather than circles that once more proves the existence of laws of nature, the timelessness.

5.3 According to special relativity, time is not reality, it is relative. The time interval of an event depends on the speed of the observer.

5.4 The laws of physics are time reversible that also proves the non-existent of time.

6. Argument against timelessness: Time is reality

6.1 Cosmological fallacy:

It is a very challenging work to take a principle or law and apply it successfully to the whole universe it is called cosmological fallacy. No theory or principle can do that, Newtonian framework of timeless nature falls.

6.2 Measurement System:

According to Newtonian framework, the nature is timeless. One of the most important aspect of physics is measurement. When we want to measure the timeless nature we have to stay outside the system as observer and measuring equipment should also stay outside the system.

Here the whole universe is considered as the system so how can we stay outside universe? So the idea of timeless nature falls.

6.3 Cosmological Challenge:

The cosmological challenge is: to create a background free theory which can be applied successfully to the whole universe. Essentially we need a theory in which time will be the central element.

6.4 The new Cosmological principle

The new cosmological theory must have some principles.

- i. No explanation should point outside the universe.
- ii. All influences or forces should be reciprocal. (Relationalism)
- iii. Two things those have same relationship to anything else to the universe must be the same thing

The laws of the nature has evolution that shows that the time is reality.

6.5 Against Quantum Mechanics:

In case of quantum mechanics, the measuring instruments must stay outside the system, we also can't apply quantum mechanics to the whole universe. That proves the real existence of time.

6.6 Cosmological natural selection:

We know that there are many stages of a star's life. At last of their life there can be two stages of a star it depends on its mass. The low mass stars forms White dwarf and the high mass stars form black holes. Black holes lead us to create new universes that is called the cosmological natural selection. Black holes are the birth place of new universes with different physical laws. Black holes also give birth to new physical laws. The new universe can form carbon, Oxygen these and other important elements for life support. We know that there is a large path of evolution to form a black hole from a star. That proves the existence of time.

This also proves the evolution of laws with the evolution of the universe. More accurately the laws changes in time with the evolution of universe.

7. Conclusion

The final observation says that the time really exist. That is the governor of the whole universe, that it is the governor of gravity, physical laws, relativity & quantum physics. Time also controls all scientific researches & observations of the world. We live in a small subsystem of the universe. So we can't understand the huge influence of it over every incident of the universe.

8. Limitations

8.1 Physical laws:

The physical laws shows us that the time is an illusion, the reality of physical laws are greater than time. According to

Smolin it falls when we apply it to the whole universe. But these laws are extremely successful to invent aeroplanes televisions and many more machines. So how can we fully inhibit the existence of the physical laws?

8.2 String theory:

According to string theory there is not only one universe but infinite number of universes. Which gives us the idea about multiverse. Smolin proves the existence of time using the idea of only one existing universe, he doesn't prove it in the idea of multiverse. So clearly is explanation can't satisfy the string theory.

Acknowledgement :

I am grateful to my parents and friends to help me to write the paper. I also want to thank my guide Professor Dr. Amit Dasgupta former professor of T. D. B college,

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