Anthropic principle as a consequence of the time emergence

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Abstract

The paper considers the philosophical component of the approach to the time as an emergent phenomenon absent at the fundamental level. The anthropic principle is shown as arising from the time emergence. Consciousness is shown as an epiphenomenon in such a model, although it is more fundamental than matter in this case. An answer to the question about the prime cause is suggested.

Introduction

What is time? There are many attempts to answer this question. Aristotle and Newtonian mechanics considered the time to be absolute, a container of events equal for everyone. Einstein's relativism considers the time to be relative, and the simultaneity of events depends on the reference frame. There are some other models of time. All of these models have a common component. This common component is consideration of time as an objectively existing phenomenon. In some theories, there is a difference in the properties of time at micro and macro levels. However, time exists in a certain form, and it is a fundamental phenomenon.

There are phenomena called emergent. For example, the second law of thermodynamics. The properties of thermodynamics are based on the properties of individual atoms and molecules described by quantum mechanics. However, the equations of thermodynamics can be applied almost independently of the equations describing individual atoms and molecules.

At present, all theories known to me in physics consider the space-time and matter as fundamental phenomena. But do they really fundamental or they are manifestations of something even more fundamental?

There is a point of view formulated in the theory of emergent space-time-matter [1]. According to this theory, time is an emergent phenomenon caused by some more fundamental physical entity. In the theory of emergent space-time-matter, time is completely absent at the fundamental level. This distinguishes this theory from models including some time at the fundamental level, even if time at the macro level is emergent from times at the microlevel in such models. The emergence of time is considered in this article only as a complete absence of time and, accordingly, movement at the fundamental level. Therefore, the conclusions of the article cannot be applied to the models with emergent time, where time is the fundamental phenomenon, albeit having peculiarities at the micro level.

Are there any philosophical consequences of the time emergence? The purpose of this article is to show that such consequences really exist and find such consequences.

To begin with, we need to understand the relationship of time, space and matter.

Time, space and matter

The special theory of relativity establishes the relationship between time and space. Events that occur in one reference frame at the same time can occur at different times in another reference frame. Proceeding from this, if we assume that time is an emergent phenomenon and manifestation of something more fundamental, the space observed by us is also an emergent phenomenon and manifestation of the same.

Now we need to recall the general theory of relativity. The general theory of relativity establishes the relationship between space-time and matter. If both space and time are emergent phenomena caused by some more fundamental essence, the presence of such relationship means that matter is a phenomenon emergent from the same physical essence.

Thus, I conclude that any physical theory considering time not as fundamental, but emergent phenomenon must inevitably consider space and matter as emergent phenomena.

Emergent space-time-matter

In the previous parts of the article, I spoke about the emergence of time, but it was not explained.

If time is emergent phenomenon, it is based on something more fundamental. As shown above, if time is emergent phenomenon, space and matter are also emergent. The question is how to construct theories with emergent space, time and matter.

In the equations of physics, time is a parameter of the system evolution.

Let us suppose that some space with some number of dimensions and some field or fields has no time as fundamental phenomenon. Here I would like to emphasize that I consider a timeless system. This means that the system has neither time nor movement.

I will call this space Metauniverse:

The Metauniverse is an objectively existing timeless system that includes everything existing objectively.

In this definition, I use the phrase "objectively existing". This phrase means that something exists, and can exist with an observer, without him and regardless of him. However, usually this term implies the possibility of the observer’s existence. However, an observer able to observe the Metauniverse cannot exist, because it is not clear how the mind can exist without time. "Existence" also usually implies that something is happening in time, some object exists in time. There is no time in the Metauniverse, so it means that the Metauniverse exists out of the typical meaning of the word existence. So, "objectively existing" is not a phrase accurately describing the Metauniverse, but it has the nearest meaning among the available ones. This phrase means here that the Metauniverse exists without any possibility of direct observation by any observer and the word "existence" does not imply any processes in time or the existence of time in the Metauniverse.

The space of the Metauniverse has some number of dimensions. The space of the Metauniverse is not the same as the space of the Universe, the space of the Universe arises as an emergent phenomenon from the Metauniverse.

Let us suppose that in this space of the Metauniverse it turned out to be possible to find emergent space and time providing complete coincidence between the equations of physics in such emergent space-time with the observed ones. The paper does not consider the ways to realize it.

So, on the basis of space with some fields and without time, there is some system with space, some fields and some evolution parameter acting as time. Let us suppose that some part of it includes a system, which will be conscious of itself if its evolution is reproduced in our space-time, where time acts as a parameter of evolution instead of emergent time. Then, the question arises: what are the grounds for asserting that in the system based on the timeless fundamental essence, this system will not be conscious of itself?

The idea of the need for time for the ability to be self-aware is based on our everyday experience. We see changes and movement. It is difficult to imagine the absence of time and movement at the fundamental level since it is contrary to our everyday experience. However, natural sciences have no prohibition for the proposed emergent nature of time.

Let us suppose that the described timeless system exists. In it, it became somehow possible to build the system with emergent time, the physical laws in which are completely identical to the observed ones. Accordingly, objects identical to people can be found in this system with the same transitions between the states of fields and particles. If at some point of emergent time this object is capable of self-awareness, it is capable of self-awareness in subsequent moments of emergent time as well. Because if it is not so, it means that the laws of our world's physics also do not allow the people to think and feel the reality of the surrounding in the subsequent moments of time. This directly contradicts observations, the people are able to think and feel the surrounding reality. Further, if it has become possible to build the system with identical laws of physics, it means that in this system conscious beings will be able to be born, learn and begin to think.

This justification of the capacity for self-awareness in the emergent space-time is not full evidence yet. The reason is the fact that one can try to refute this justification using various philosophical views. Therefore, this means that any theory attempting to avoid time as a fundamental phenomenon must contain the postulate of the self-awareness capacity.

Postulate:

If it is possible to find space-time and matter as emergent phenomena in the objectively existing timeless system that includes everything existing objectively and if such space-time-matter contains something looking like conscious life, such space-time-matter exists, this is emergent space-time-matter. In this emergent space-time-matter, the conscious being can think, feel that it really exists in being.

Consequences of this postulate: for the case when the laws of physics for emergent space-time-matter allow the existence of the conscious life, the conscious being from this space-time will feel itself in the space and feel the time. It will feel the emergent laws of physics. The laws of physics for the fundamental timeless system will be deeply hidden from its sensations.

This postulate also has other consequences. If the conventional approach to physics considers the consciousness to be secondary in relation to space, time and matter, this postulate means that the

consciousness is a more fundamental phenomenon. Thus, the assumption of the time emergence is identical with the assumption that the consciousness is more fundamental in relation to space, time and matter. This postulate does not mean that the consciousness is primary. The consciousness, in this case, is an epiphenomenon, an emergent phenomenon arising on the basis of timeless space with some fields or field.

Since the consciousness is more fundamental than space-time, it can be concluded that existence is possible only for the universes, where the laws of emergent space-time physics allow the conscious life to exist. If the laws of emergent space-time physics do not allow the existence of the conscious life, this space-time remains a mathematical abstraction. The problem of the Universe fine tuning is a serious argument in favor of the time emergence.

It can be noted that the causality principle must also be an emergent phenomenon under the described method of time appearing. The causality principle states that any event can affect another event only if the first one has occurred earlier, if the interval between the events is timelike. However, if time does not exist at the fundamental level, it means that any dependence on time in the emergent space-time is also not fundamental.

Since there is no time at the Metauniverse level, we can assume that the state of the field (or fields) in the Metauniverse is determined at each point by the values of the fields at neighboring points. Taking into account the absence of time at the Metauniverse level, this means that the state of emergent space-time-matter is deterministic. Although this does not mean that all the information needed to predict the state at subsequent moments of time is available in emergent spaces.

Since there is no time in the Metauniverse, it also means that there are no interaction carriers or any elementary particles in general at the fundamental level. If elementary particles existed in the space of the Metauniverse, they were to be located only at some points of the Metauniverse. But then it would mean that in the spaces of generated universes such particles can exist only at some point of time. Since the existence of the evolution parameter regarded as time in this article needs causality, the appearance of some particle without reasons would violate the causality principle and, accordingly, mean that the parameter of evolution does not work here. This means the impossibility of the fundamental elementary particle existence in the models with emergent time. Consequently, the observed elementary particles are also emergent phenomena.

As shown above, the states of the field are completely deterministic at the Metauniverse level.

Anthropic principle

The anthropic principle was proposed [2] [3] for explanation from the scientific point of view why the observable universe has a number of non-trivial relations between the fundamental physical parameters necessary for the existence of the conscious life. There are different formulations; usually, weak and strong anthropic principles are determined.

A variant of the strong anthropic principle is the anthropic participation principle formulated by John Wheeler [4]:

Observers are necessary to bring the Universe into being.

In the case of time emergence, the anthropic principle of participation is a necessary consequence, it is directly derived from the postulate proposed above.

Conclusion

The assumption that there is no time at the fundamental level leads to a number of conclusions in the field traditionally related to philosophy. If this assumption is true, the corresponding fields of philosophy will pass from philosophy to physics.

It is shown that the anthropic principle inevitably appears as a consequence of the assumption that time is not a fundamental phenomenon.

It is shown that the principle of causality also appears as a consequence of the assumption that time is not a fundamental phenomenon.

In the model under consideration, a new interpretation of Being is proposed. If this model is correct, humans have no real freedom of will. This model is completely deterministic, so the people do not have free will. This model offers an answer to one of the big philosophical questions - how space-time and our sensations are related to each other.

Does the model correspond to the long-term trend in the development of philosophy?

Some time ago, the most common theory was the Ptolemy's theory, where the Earth was the center of the universe, and the Sun turned around the Earth. The human was in the center of the universe, the animals were separated from the humans.

Later, erosion of the human's central role in the universe began. The Earth began to turn around the Sun and the Sun became the center of the universe. Then it was discovered that the Sun is just one of many billion stars, and the Sun turns around the galaxy center, and there are billions of galaxies. Darwin demonstrated that the humans have common ancestors with other animals.

Thus, the science and philosophy have a long-term tendency to reduce the humans' role in the universe.

At present, the humans' role in the universe still remains quite important. This is mainly due to the concept of free will, person's freedom of actions.

In the model with the emergent time, the human mind is an epiphenomenon emergent by the Metauniverse.

Consequently, in relation to the Metauniverse, the human's role is much less important than in modern theories related to the Universe.

However, in addition to the human role reduction in the Metauniverse to the level of epiphenomenon, there is also a directly opposite component related to the humans' role in the Universe. This component makes the humans' role in the Universe exceptional and again, same as in Ptolemy's time, puts the human in the center of the Universe.

According to this model, space, time and matter are subjective, they do not exist independently of the observer. Moreover, they are generated by the observer. Thus, the absolutely exceptional

role of humans and other conscious beings, if any, in the Universe is generation of the Universe by the mind.

In Marxism, there is a so-called fundamental question of philosophy. It is usually formulated as follows: "What is primary, spirit or matter?" My answer to this question has already been formulated and substantiated above. Choosing between consciousness and matter, consciousness is primary. However, consciousness is also an emergent phenomenon, although it is a step higher than matter.

Considering the human from the Metauniverse point, the person and his or her consciousness exist forever. Although it is not clear if it is correct to talk about eternity regarding the essence without time. However, in the Universe as the generated essence, human existence is limited.

The question arises: what is the real age of the universe, how long has it been in the existence?

To answer this question means to answer the question of how long ago the mind has appeared in the universe.

According to Darwin and the theory of evolution, the humans originated from animals. As far as I know, none of the animals including primates has the consciousness. If we assume that the humans are the only conscious creatures in the universe, the universe has appeared when the first person has acquired the consciousness.

As far as I understood reading Wikipedia, paleoanthropologists agree that the first human acquired the consciousness no more than 1 million years ago. It means that the universe is no older than 1 million years. Before that, the universe did not exist because of the absence of observers. Let us name the state of the universe when it existed only potentially as pre-existence. It means that before the appearance of conscious beings, the Universe was in the state of pre-existence. In this case, various estimates of the universe's age, such as 13.77 billion years, etc., answer the question of how far the cause-effect relationships can hypothetically be extended in the possible past. However, the existence of the universe requires an observer, therefore the estimates that do not take into account the observers refer to the total duration of the universe's existence and the time of pre-existence, when the universe existed only potentially.

The following situation is also possible: the periods of conscious life existence in the universe were replaced by periods when there was no conscious life. In this case, the Universe existed only when there was the conscious life. In between, the universe was in the pre-existence, which was only potential.

The model considered in the article also offers an answer to the philosophical question of the prime cause.

Considering this question from the point of the emergent time model, this question does not make sense. The rationale is the following: the causality principle, as this model assumes, is an emergent phenomenon and does not exist at a more fundamental level of the Metauniverse.

Thus, the answer to the question "What is the prime cause?" is "The question does not make sense".

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