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Time, Space & The Big Bang

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Abstract

The Big Bang is a crisis phase which is not the outset of the Universe. It is neither the start of time, nor the materialization of space

Keywords: Infinite or Indefinite; Materiality of space; Origin of time; Void

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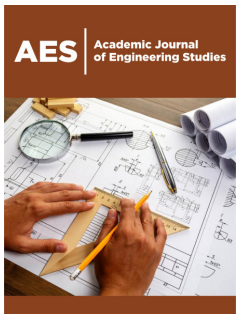

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Introduction

The Big Bang is commonly considered the outset of the Universe, from a state infinitely small, infinitely dense and infinitely hot, between 13.8 and 13.5 billion years ago: an approximate wording for describing a critical phase whose causes are as-yet unknown. In addition, it is alleged that the Big Bang is the start of time and the materialization of space. Actually, time is not a phenomenon, and space has no materiality, which calls into question the knowledge of the Big Bang.

A Lack of Accuracy

The drafting above is dramatically lacking in accuracy, because the simple expression « beginning of the Universe » supposes that there is nothing before the Big Bang; an assertion « a priori » which leads to a formal defect. The Latin poet Aulus Persius (34CE-62) (CE = Common Era) already wrote in Satires (III, 24): « Ex nihilo nihil » (from nothing, nothing comes) [1]. This analysis was a huge step forward in thought. But thought can also regress, when the German philosopher and mathematician Gottfried Leibnitz (1646-1716) asked: « Why is there something instead of nothing? », insofar as he presumed that « nothing » could exist. Leibniz would have avoided this assumption by first defining « nothing », « void », « emptiness », and he would have found out that « nothing » is a view of the mind. Given that the Universe is in expansion, the expression « beginning of the Universe » should be replaced by « beginning of the expanding Universe ».

Additionally, « infinitely » provides no significant information because it is a mathematical concept with no match with physical reality: it does not say how small, how dense and how hot the Universe was. Instead, « infinitely » should be replaced by « indefinitely », which let us know that the size, the density and the temperature were extreme but so far not rated yet.

What was going on before this state of crisis is still unknown: was it preceded by a big crunch?

Actually, we have to be patient until researchers succeed in finding more effective observation procedures as well as in developing new mathematical models. In the meantime, situational awareness is limited to a guesswork.

The following approach is going to explain why the expression « beginning of the Universe » is denied by the facts.

Parameter Invariance

Let's first explain the meaning of invariance. During measures (length, lifetime, temperature, speed, etc) done on a system, values received by an observer are the same as those emitted by the system (Figure 1).

Figure 1: Invariance of the parameters: the value of the length received by the observer is the same as that emitted.

For example:

Length « l » received = length « l » emitted

Lifetime « t » received = lifetime « t » emitted

We say that the parameters are invariant during their travel between the system and the observer. In other words, there is invariance of the parameters between the frame of reference of the observer and the frame of reference of the system.

Parameter Covariance

What does happen when the two frames of reference move relative to each other at a relativistic speed? A speed is « relativistic » when it is close to that of light: v #c#3 108m/s (Figure 2).

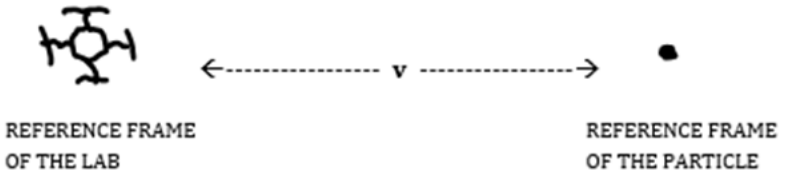

Figure 2: Covariance of the parameters: lifespan of a particle seems greater than its real value.

The baguette would look shorter because of a length contraction. We observe a contraction of durations, therefore there is a longer apparent lifespan. All parameters are covariant, except the speed of light. The phenomenon is caused by the high relative speed between the two reference frames, so that the laws of classical mechanics no longer apply.

Invariance is restored thanks to a concept called space-time interval « ds », which is a mathematical combination of space « dl » and time « dt », such as:

$$ds^2 = c^2dt^2 - dl^2, \text{ with } dl^2 = c^2dx^2 + dy^2 + dz^2$$

The alteration of the values is corrected by the equations of the French mathematician Henri Poincaré (1854-1912) and the Deutsch Physicist Hendrik Lorentz (1853-1928), in order to obtain the right values of the parameters observed.

For example:

$$t = t0(1 - v2/c2) - 1/2$$

- If « v » is much smaller than « c », t # t0 : « t » is almost invariant.
- If « v » = 0, then t = t0 (Figure 1): « t » is invariant.
- If « v » is close to « c », then « t » is much higher than « t0 »: the covariance is important.

Example with a particle moving at speed c/2, that is to say 150,000 km/s, then t = 1.155 t0 , which means that the particle seems to age 15.5 % less quickly.

The Beginnings of Time, Space and Space-Time

The Big Bang is also considered the start of time, space and space-time. But we have shown that time, space and space-time have no physical properties: they are concepts instead of physical phenomena; therefore, they have no physical beginnings.

a) Time and space were invented by Sumerians between 4800 and 4500 years ago with the month, after observing the repetitions of the movement of the Moon, and with the Nippur's map on a clay tablet [2].

b) Space-time was invented by Einstein in 1905 with Special Relativity, in order to explain the covariance and re-establish a relativistic invariance.

Therefore, the big bang is not the beginnings of time, space and space-time.

It leads to another hypothesis according to which, models might be too weak due to the use of time, space and space-time. Einstein wished a theory with no time and no space [3]. Nevertheless, it must be emphasized that the development of physics was made possible thanks to the inventions of time and space; additionally, the awareness of the « indefinitely large » and the « indefinitely small » has done a considerable leap thanks to the invention of space-time.

The Curvature of Time

The curvature of a bow of radius '' R '' is the inverse of the radius: '' 1/R ''. The larger the radius, the smaller the curvature; and vice versa: if the radius is indefinitely small, the space curvature is indefinitely large. We see that it does not provide any additional information, it's just another way to say the same thing. Let's illustrate with the Big Bang: a null radius means an infinite space curvature; it does not help.

The inverse of time ''1/t'' introduced the idea of ''time curvature''. It leads to a muddle, because ''curvature'' is a spatial concept: zero time means infinite time curvature; it does not help either. Special relativity introduced "1/ds" called curvature of space-time.

Criticism of the Concept of Beginning

The Latin philosopher Lucretius (c.96-55) writes: « Nothing ever comes from nothing by divine intervention » (Song I, 150), and he wonders: « Was there a birth and origin of the world? » (Song V, 1214) [4].

The « beginning » is a conventional concept. For example, life on Earth means that there are living systems; it started about 4.4 billion years ago. A living system results from a complex and provisional organization of matter and energy. Life is a concept, and there is no life without living systems. But it will never be possible to decide precisely where and when the first organized system came to life, because they were billions and billions to organize simultaneously. Consequently, the beginning of life is an approximate concept. The separation between pre-human and human is impossible to decide with accuracy. The advent of mankind did not involve a single individual, but populations of individuals, and it was not an instant event.

Conclusion

Special Relativity is quite difficult to understand because we learned that 1 + 1 = 2, which is no longer true; for example c + c = c, instead of 2c ; with very high speeds, classical laws of physics are wrong.

Given that time is a concept, it has no physical origin. In particular, the zero time has no physical existence. The same reserves can be done on the concept of physical space, which we have shown has no physical existence. We now know when time, space and space-time were invented.

We can't say if it's going to modify the way of studying what is currently called the Big Bang; but the Big Bang can no longer be considered as the beginning of the Universe.

References

1. Persius: Satires. Italy.
2. Dassonville PF (2017) The Invention of Time & Space. Origins, Definitions, Nature, Properties.
3. Klein E (1996) Time and it's Arrow. Flammarion.
4. Lucretius On the Nature of Things. Italy.