Measurability and Computability of the Universe

Amrit Šorli Srečko
Bijective Physics Institute
www.bijectivephysics.com
https://orcid.org/0000-0001-6711-4844
sorli.bijective.physics@gmail.com

Essay for FQXI 2020

Abstract

Measurability and computability of the universe show that Big Bang cosmology is in serious troubles. It is time to re-examine Big Bang cosmology and solve the troubles that the computability of the Big Bang cosmology has shown.

The aim of cosmology is to build adequate models of the universe. In cosmology measurability and computability are of high importance. We are trying in cosmology, first to measure universe and then to develop the mathematical models that are computable. Measurement without computability will not give any results, computability without using obtained measured data also leads nowhere.

In building an adequate model of the universe measurement and computability are of equal importance, two wings that allow physics to "fly high" and have a clear picture of the eagle sight of the terrain.

What we can measure for sure exists. In order to build most accurate computable picture of the universe I propose in this essay a bijectivity principle: in the modelling of the universe we will use only what is measurable. We will use only obtained data.

NASA has measured back in 2014 universal space has Euclidean shape. This is very important measurement of the universe. It means we can travel in straight light for eternity and we will never come back to the same point. Universal space has infinite volume and this is computable.

We will do a thought experiment, in this essay, we will imagine we have a good computer which can simulate different systems if we put in the main data of a given system. The first data we will put in is "universe has Euclidean shape".

The second data we will put in is the age of the universe which is 13.7 billion years which is $4,3 \cdot 10^{17} s$.

The third data we will put in is the radius of the observed mapped universe which is 46,6 billion light-years which is $4,4 \cdot 10^{26} m$.

Having this basic data in the computer we press ON and computer will start computing received data. In a fraction of a second we will receive message ERROR. Computer will tell us that such a system cannot exist.

To reach the size of today's observed and mapped universe, according to the Big Bang model, the universe should expand since its beginning with the speed of $1,02 \cdot 10^9 m s^{-1}$. The velocity of light is $3 \cdot 10^8 m s^{-1} s$. To reach today radius universe should expand with the velocity v which should be 3,34 times bigger than light speed. Our computer is "clever" he has in the program all knowledge of physics where it is postulated light speed is the maximum speed possible in the physical world.

Measurability and computability of the universe shows that Big Bang model does not fit into the mapped universe. The velocity of accelerated expansion of the universe today is valued between $6,78 \cdot 10^3 \ m s^{-1}$ to $7,4 \cdot 10^3 m s^{-1}$ [1].

- velocity of expansion accordingly to the BB model $1,02 \cdot 10^9 m s^{-1}$
- velocity of expansion with the light speed $3 \cdot 10^8 m s^{-1}$
- velocity of expansion that is measured $6,78 \ (7,4) \cdot 10^3 m s^{-1}$

The discrepancy between measured velocity of expansion and calculated velocity of expansion accordingly to the BB model (so that BB model could fit in existent measured model) is of the rate $10^6 m s^{-1}$. The BB model seems to be a prediction without experimental data support. BB cosmologists try to defend this discrepancy between the measured diameter of the universe and diameter calculated accordingly to the BB expansion with the proposed Non-Euclidean shape of the universal space (see figure 1 below) which won't work. NASA has measured extremely precisely universal space has Euclidean shape [2].
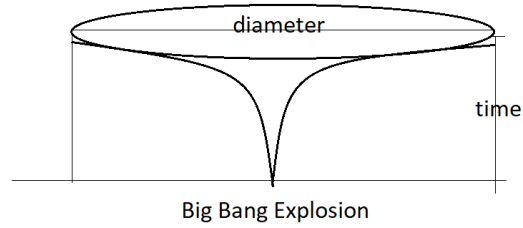
Figure 1: Inadequate picture of the universe expansion based on Non-Euclidean shape of universal space

Measurability and computability of the universe confirm cosmology of the Big Bang is in serious difficulty. It is time now for the re-examination of Big Bang cosmology. If the troubles will not be solvable, we have to be open to accepting a Stationary universe without begging and without an end is a good model.

References:

1. Castelvecchi D., How fast is the Universe expanding? Cosmologists just get more confused, Nature **571**, 458-459 (2019) https://www.nature.com/articles/d41586-019-02198-z
2. NASA https://wmap.gsfc.nasa.gov/universe/uni_shape.html

   (2014)