Big Bang without Bang

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Abstract

The Big Bang conception of main stream physics states that at the initial point there was an enormously high temperature. This does not explain the very low temperature of CMB radiation and existence of primordial pure hydrogen stars which cannot be generated at high temperatures. The article discloses a new statement that initially there was absolute zero of Kelvin degrees. The matter was in Bose-Einstein condensate state and slowly warmed up.

Keywords: space, gravitation, Big Bang, cosmogony, Universe, Bose-Einstein condensate, CMB

PACS Classification codes:

04. General relativity and gravitation; 03.50.-z Classical field theories; 12.10.-g Unified field theories and models; 01.55.+b General physics; 95.35.+d Dark matter; 95.36.+x Dark energy; 98.80.Bp Origin and formation of the Universe; 98.80.Bp Big Bang theory

Introduction

According to Newton gravitation law [1] the force is: $F = -GmM/r^2$. On the other hand, the force is: $F = gm$. Therefore the acceleration due to gravity g according to Newton gravitation law is equal to the second derivative from distance as shown in equation (1):

$$g = \frac{d^2 r}{dt^2} = -\frac{GM}{r^2} \qquad \textbf{(1)}$$

where: G - gravitational constant
M – mass
r – distance.

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Equation (1) can be transformed into differential equation (2):

$$r^2 \frac{d^2 r}{dt^2} + GM = 0 \tag{2}$$

Differential equation (2) has solution only if at the initial moment of time t=0, initial distance r = 0 and initial velocity $\frac{dr}{dt} = 0$.

If one presumes that M is the mass of the Universe then the Universe is a point-like particle, with the temperature of the absolute zero of Kelvin degrees at the beginning. This explains that the temperature of CMB radiation is equal to 2.7255 K [2] and also explains the existence of primordial pure hydrogen stars SDSS J102915+172927 [3, 4]. The solution of equation (2) is shown in equation (3):

$$\frac{2r^3}{3} = 3GMt^2 \tag{3}$$

Gravitation space emerged After Big Bang at the time moment t from mass M. Since all the directions of space are equal, the shape of Gravitation space is a sphere with a volume as shown in equation (4):

$$V_G = \tfrac{4}{3}\pi r^3 = 6\pi GMt^2 \tag{4}$$

We use the term "Gravitation space" because the physical cause of space is the gravitation of mass [5]. From the initial moment the volume of the Universe increases with acceleration: $a = 6\pi GM$, where: $a = V_G/t^2$. No dark energy is necessary.

The mass of the observable Universe is 10^{53} kg, the time from Big Bang t = 10^{18} s.

From equation (4) the volume of the observable Universe $V_G = 1.26 * 10^{80}$ m^3 and the radius of the Universe r = $3*10^{26}$ m, which well agrees with the observations [6].

Conclusions

At the beginning the Universe is a dimensionless extremely cold point of mass, some kind of a black hole. Gravitation gives rise to an only expanding void. Under such conditions the feasible explanation of matter genesis is the evaporation from the Schwarzschild surface. This explains the finding that the Universe consists only of ordinary matter. The antimatter was drawn into the center of the Universe and annihilated. The ordinary matter got an initial push opposed to the center of the

Universe [7]. The matter got kinetic energy, which increased the temperature of evaporated particles. The birth of the Universe began without bang.

It was only neutrons that evaporated. Some neutrons decayed to protons and electrons. Finally they converted to hydrogen and formed the first generation of stars. The rest of neutrons clumped together in pairs. Probably it was the so-called dark matter. Probably the temperature of primordial hydrogen clouds was about 3 K. They radiated the CMB.

References

1. Newton, I. *Principia: Mathematical Principles of Natural Philosophy,* translated by I.B. Cohen & Whitman, University of California Press, 1999.

2. Tanabashi, M. et al. (Particle Data Group), Phys. Rev. D 98 , 030001 (2018)*(last visited Sept. 26, 2018).*

3. Bromm, V. Larson, B. *The First Stars.* Annu. Rev. Astron. Astrophys. 2004 42, 1056-8700/04/0610-00

4. Lemonick, M. D. *Cosmic Anomaly: The Star That Shouldn't Exist.* http://content.time.com/time/health/article/0,8599,2092027,00.html

5. https://ia601501.us.archive.org/21/items/NewConceptOfSpace/New%20concept%20of%20Space%20v2.pdf

6. Davies, P. C. W. *The Accidental Universe* Ch. 2 (Cambridge University Press, Cambridge, 1982).

7. Hawking S. W. *A Brief History of Time* Ch. 7 (Bantam Press, 1988)

Acknowledgements: We are very grateful to Ieva Mazere and Valda Kalniņa for valuable discussions and assistance.

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