

About the theory of the Big Bang

Burago Sergey Georgievich

D.Sc., Prof.

State University of Aerospace Technology, Moscow, Russia

Email: buragosg@yandex.ru

Site: ResearchGate Working Paper · [March 2017](#)

DOI: 10.13140/RG.2.2.26288.35840

Abstract

The article is devoted to the history of the emergence of the Big Bang theory and attempts to modernize it from the notion of the explosion of a hypothetical elementary particle with incomprehensible properties that occurred 15 billion years ago, to the idea of an explosion of space itself between distant galaxies. This explosion, according to the theory of the Big Bang, gave birth to the universe. The weaknesses of this theory are shown. We proposed a new hypothesis of the Big Bang, in which the center of the explosion is absent. Because of the interaction of the atoms of the baryonic substance with the dark matter of the surrounding space, the growth of their mass, size and speed of rotation occurs over time. As a result of counteracting of the centrifugal forces that increase with time and the restraining forces of pressure in the dark matter of the surrounding space, a moment comes when the centrifugal forces tear apart the atoms. This can occur throughout the universe at the same time by astronomical measures. This will be a big explosion that will stir up the substance of the whole universe. This explosion will be followed by a quiet period of organization of baryons from dark matter, cosmic bodies, growth of their mass and sizes up to the next Big Bang. The age of the modern universe is estimated and the time period until the next Big Bang is estimated.

The representations about the Big Bang

At present, the astrophysics claims that our universe was formed as a result of the "Big Bang". This belief arose from the astronomical observations of distant galaxies, in the spectra of which a large redshift was observed, which meant an increase in the wavelength of light coming from these galaxies to the observer on Earth. The Hubble's law related the increase in wavelength with the distance to these galaxies. On the basis of the Doppler law, physics linked the cosmological redshift in the spectra of distant galaxies with their Active removal from each other, including from the observer on Earth. In addition, the belief that in the distant past there was a Big Bang is confirmed by the detected relic radiation and gravitational waves that have survived to our time after the explosion

There are two points of view on what constituted the Big Bang. According to the first of these, known as the Gamow Big Bang theory (1946), about 15 billion years ago an ultra-dense elementary

particle exploded. From the products of the explosion, our universe was formed. Since then, it has been continuously expanding and as a result of this, the galaxies scatter and signal it with a red shift in their spectra. Over time, as the distance from the observer on Earth increases, the expansion rate increases. As galaxies approach the edge of the visible universe, the wavelength of light increases much faster than predicted by Hubble's law. For the discovery of the accelerated expansion of the universe, to the authors of this discovery in 2011 were awarded the Nobel Prize. The question remained as to how the matter and energy were in this superdense elementary particle? It is considered incorrect to ask, what was around this particle before the explosion and where the universe does expand? Because space and time in the universe also arose as a result of the Big Bang. It is assumed that protons, neutrons, positrons, electrons and other long-lived elementary particles formed 15 billion years ago and have reached our days unchanged.

The second point of view arose from the insolvency of ideas about the explosion of a kind of "cosmic egg", which was the explosion of the largest nuclear bomb. This point of view boils down to the assertion that "space" exploded, and not a material object. At the same time, the authors of this idea do not bother explaining what they think is a "space" and what can explode in an empty space? The authors of these ideas need to reckon with the fact that astrophysics today views space as empty, at best filled with electromagnetic radiation. Within the space available to observations, astronomers observe the explosions of stars, but do not observe explosions of space between the stars. According to the second point of view, the expanding space entrains the galaxies. Because of this, galaxies disperse and, in accordance with the Doppler law, signal this by extending of the length of the light wave. At the same time the mechanism of interaction of material objects with space is not developed. Sometimes authors and supporters of space expansion was agreed with fantastic ideas that space expands, and galaxies remain in their places and do not scatter. They argue that the cosmological redshift is in no way connected with the Doppler effect and does not bother explaining what in this case causes a red shift in the spectra of distant galaxies? Therefore, the second point of view is no better than the first.

The big bang hypothesis that rejects the expansion of space

The work proposed by us has a different point of view on this phenomenon of nature. We believe that the reason for the appearance of ideas about the expansion of the universe lies in the insufficient knowledge of the properties of light. The astrophysics does not know what happens to a quantum of light during its long movement, measured in billions of light years, from a distant star to an observer on Earth through a space filled with gaseous dark matter. The gap in knowledge allows various interpretations of this phenomenon, including those considered earlier in this article. Now in physics and cosmology it is believed that the atoms of baryonic matter formed as a result of the Big Bang. Since then, and to our days, these atoms have come down unchanged in its original form. In contrast to these ideas, we have a different view of this phenomenon of nature. **Our ideas are based on the idea that baryon bodies, up to the smallest ones, constantly absorb dark matter from the surrounding space and, as a result, increase their mass, in accordance with the law previously obtained by us in [3,4]:**

$$\underline{m = m_0 \cdot e^{\frac{\alpha \cdot t}{k}}} \tag{1}$$

The value m_0 is the mass of the body at the time $t = 0$, i.e. at the beginning of time. The minus sign on the right side is omitted, since The direction of speed to the center of the body is stipulated in words. According to [3,4], the quantity is $\frac{\alpha}{k} = 2,97 \cdot 10^{-18} [c^{-1}]$. It was obtained by us from the analysis of changes in the movement of the Moon that have taken place over the centuries and has nothing to do with the ideas of expanding the universe. **The expression (1) defines the law of increasing the masses of all bodies of the universe with increasing time, including photons of light.**

Those, we believe that the universe is not as static as the astrophysicists currently think about it. Over time, not only the living beings, plants, bacteria, viruses are changing. The inanimate matter, for example, stars, planets, moons, meteorites, up to atoms and elementary particles also change with time. The reason for these changes lies in the interaction of all these bodies with dark matter. The knowing this opens up additional opportunities for understanding the dynamics of the world around us.

We believe that leaving the radiating atom at a speed of $C = 3 \cdot 10^8$ m/s, the photons of the light wave carry with them the amount of motion J . This amount of motion is equal to the product of the photon mass m_0 by the speed of light C and it persists until the meeting with the observer

$$J = m_0 C = m \cdot C' = Const \quad (2)$$

During the motion of a light wave from a radiation source to an observer on Earth, the mass of photons, like all other baryonic bodies, increases with time due to the absorption of dark matter from the surrounding space according to the revealed law (1). As the mass grows, the speed of light decreases; the amount of motion remains constant

$$C' = \frac{m_0 C}{m} = \frac{m_0 C}{m_0 e^{\frac{\alpha}{k} t}} = \frac{C}{e^{\frac{\alpha}{k} t}} \quad (3)$$

Here $C = 3 \cdot 10^8 [m/s]$ is the speed of light in a moment $t = 0$. It is the same as that speed of light in terrestrial conditions. The value $\frac{\alpha}{k} = 2,97 \cdot 10^{-18} s^{-1}$ is very small [3,4]. It was obtained by us from an analysis of the changes in the motion of the moon occurring during a long time of observations of this cosmic object.

The number of waves passing by the observer's device in one second will be determined by the expression

$$\nu' = \frac{C'}{\lambda} = \frac{C}{e^{\frac{\alpha}{k} t} \cdot \lambda} = \frac{C}{\lambda'} \quad (4)$$

The new wavelength λ' after time elapses t will

$$\lambda' = e^{\frac{\alpha}{k} t} \cdot \lambda \quad (5)$$

The wavelength in the path from the radiation source to the observer on Earth will increase by an amount

$$\Delta\lambda = \lambda' - \lambda = e^{\frac{\alpha}{k}t} \cdot \lambda - \lambda = \lambda(e^{\frac{\alpha}{k}t} - 1) \quad (6)$$

The Hubble law for Increments of the length of the light wave in this case is written in the forms

$$\frac{\Delta\lambda}{\lambda} = e^{\frac{\alpha}{k}t} - 1 = e^{H^* \cdot L} - 1 \quad (7)$$

This new version of Hubble's law more correctly reflects the realities of the world around us than the well-known original version of this law.

Summarizing what has been said, it can be argued that none of the points of view on the phenomenon, called the "Big Bang", can convincingly, in accordance with the earthly practice of man and the accumulated physics and astronomy knowledge, explain what exploded 15 billion years ago and Spawned the universe? Both of these points of view converged on only one thing, that the universe expands after the explosion. And the expansion of the universe is strange. Galaxy "Milky Way" and the nearest galaxy "Andromeda" approach, but do not disperse and, therefore, it contradicts the law of Hubble. Far from the Earth, the galaxies scatter according to the Hubble law, and at a very large distance from the Earth, near the visible edge of the universe, the galaxies cease to obey the Hubble law and begin to scatter itself off at an increased speed. There is no explanation for this.

Returning further to the more accurate form of the Hubble law (7), we note that, in contrast to the Hubble law, the wavelength increases nonlinearly with time. The Hubble law is written as

$$\Delta\lambda / \lambda = H^* \cdot L = H \cdot t, \quad (8)$$

Here $H \approx 3 \times 10^{-18} [1/s]$ is the Hubble constant, $H^* = H / C \approx 10^{-26} [m^{-1}]$, $L[m]$ is the distance from the galaxy to the Earth, $t = \frac{L}{C} [s]$ – is the time for travel of light from the galaxy to the Earth.

A wavelength of light is more than longer she is on the way, then she more intense increases its length. This is explained by a growth of a mass of a photons that make up a light waves. It is this property of light that leads to a more intense growth of the wavelength with increasing distance between the observer on Earth and the source of radiation near the visible edge of the universe. And this does not mean that an universe is expanding. Especially that it does not mean that this expansion occurs the more intense than the farther away it is moved outside the boundary of an universe. The convergence of the galaxies "Milky Way" and "Andromeda", which are close to the observer on the Earth, is explained by the own velocities of these galaxies, and not by the expansion of the space of the Universe. **Hence the conclusion follows that the expansion of the universe space no occurs. Everything is explained by the properties of light. The main question remains open whether the "Big Bang" happened 15 billion years ago, which is signaled by relic radiation and gravitational waves?** In this regard, we will describe our hypothesis about the "Big Bang".

It is based on the idea that baryonic bodies, including the elementary particles are surrounded by an ocean of dark matter and they constantly absorb gaseous dark matter from the surrounding space. In this process, their mass and dimensions increase with the passage of time. The radial flow to the centers baryon bodies are unstable and therefore the vortices were formed around these bodies. These vortices force atomic nuclei to rotate with high angular speed.

The nuclei of atoms baryonic matter is rotated very quickly, because dark gas is supplied to them with great peripheral speed. Apparently, transition a dark gas from gaseous to liquid state (solid) state occurs at the outer boundary of the atoms ($r_0 = 10^{-10}[m]$). Here dark gas jet velocity reaches the speed of light $C = 3 \cdot 10^8 m/s$ (in a vacuum). Angular velocity of rotation is $\omega = \frac{C}{r_0} = \frac{3 \cdot 10^8}{10^{-10}} = 3 \cdot 10^{18} [rad/s]$. The same angular velocity there is the nuclei of atoms.

A hydrogen atom has an axis of rotation and has poles respectively. We select the segment of the core of the atom wide Δr near the equator, as shown in Fig.3.3.1. The mass of this segment $dm = \rho_o r_o^2 \Delta r \cdot d\theta / 2$. This segment has angular velocity. He has a centrifugal force. (mass center located at a distance $r_m = \frac{2}{3} r_o$ from the axis of rotation), rotating with an angular velocity ω , centrifugal force acts

$$dF_z = \frac{3u_o^2 dm}{2r_o} = \frac{3}{4} \omega^2 r_o^3 \rho_o \Delta r \cdot d\theta \quad (9)$$

This force is balanced by the external pressure. It is acting upon the surface segments

$$dF_p = p_{e-v} \cdot r_o \cdot \Delta r \cdot d\theta, \quad (10)$$

where the pressure of the dark gas p_{e-v} in the jet at a speed $V = C$ becomes smaller compared with the pressure p_e in the dark gas at a rate $V = 0$. These pressures are equal

$$p_{e-v} = p_e \left(1 - \frac{C^2}{V_{\max}^2}\right)^{\frac{\kappa}{\kappa-1}} = 2,64 \times 10^{25} [Pa];$$

The pressure in the calm gaseous dark matter of the surrounding space was determined by us in [3,4] as $p_e = 6,426 \times 10^{25} [Pa]$, The circumferential velocity at the outer edge of the atom is $u_o = \omega \cdot r_o = C = 3 \cdot 10^8 [m/s]$. The density of the nucleus of an atom of matter can be expressed by the ratio of its mass m to the volume $\rho_o = 3m / 4\pi \cdot r_o^3 \approx 10^{18} [kg/m^3]$. Segment nucleus of an atom will be broken by centrifugal force when it exceeds the pressure force

$$dF_{y,\delta} / dF_p \geq 1 \quad (11)$$

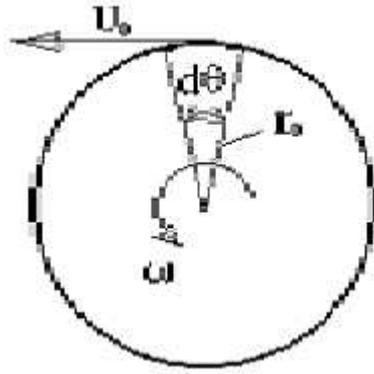


Fig.1

Substitute (9) and (10) into (11). We was obtained the condition of destruction of atomic nucleus by centrifugal force

$$\frac{dF_z}{dF_p} = \frac{9\omega^2 m}{16\pi \cdot r_o p_{to} (1 - \frac{C^2}{V_{max}^2})^{\frac{\kappa}{\kappa-1}}} \geq 1 \quad (12)$$

The hydrogen atom (Nucleon) and the pressure in a dark gas characterized by the following parameters: mass is $m = 1,673 \times 10^{-27} [kg]$, angular velocity is $\omega = 3 \times 10^{18} [s^{-1}]$, the core radius is $r_o = 10^{-15} [m]$, the radius of the atom is $r_A = 10^{-10} m$, the pressure in the dark gas $p_{eo} = 6,426 \times 10^{-25} [H/m^2]$. For a nucleus of a hydrogen atom we have $dF_{y,\delta} / dF_p = 0,0187 < 1$. Consequently, the nucleus of an atom can not be broken by centrifugal forces.

The transition process gaseous dark matter into the liquid phase at the boundary of the atoms increases their weight and dimensions. Next we estimate how long it took to fill the nucleus of atom by liquid dark matter to its present size. From expression (1) the growth rate is determined $\frac{dm}{dt} = \frac{\alpha}{k} m$. The mass of atom in accordance with the law (1) increases in time is not uniform. As the average value of this increase will take the value of $(\frac{dm}{dt})_{mdl} = 0,7 \frac{\alpha}{k} m$. Mass of atom considering this value will be increased in the time interval in accordance with the expression is $m = (\frac{dm}{dt})_{mdl} \Delta t$. The present value of the mass of an atom of hydrogen $m = 1,67 \cdot 10^{-27} [kg]$. This mass accumulates over time $\Delta t = \frac{m}{(\frac{dm}{dt})_{mdl}} = 0,48 \cdot 10^{18} [s] = 15,3 [Gyr]$. This time is of the order of life of the Universe, from birth to the present day

The process of filling nuclei of atoms by a liquid of dark matter will be increased its weight and volume to the limit value . This is brings us to the hypothesis of the "Big Bang. We are believe that **"the act of creation of baryonic matter from dark gas"** is **simultaneously throughout the universe.**

Liquid dark matter is fills the nuclei of atoms in a long time. For all matter in the universe annihilation of matter can also to occur at the same time (in astronomical terms). It is likely that this will be accompanied by a simultaneous explosion. It will be a "Big Bang ." In this case, of course, do not need an explosion of a "superdense elementary particle", the structure of which could not even imagine the scientists with the most violent imagination. You also do not need an explosion of empty space with its subsequent expansion?

All dark matter field will be agitated by gas explosion and immediately the vortex formation will begin, ie a conversion of gas dark matter into a baryonic matter will begin. The process can be repeated an infinite number of times. You can try to estimate how much time is left until the next "Big Bang". To do this, use the condition disrupt the nucleus of an atom (12).

At the same time, we is note that with an increasing time the mass of the nucleus of an atom will be increase in accordance with the law $m = m_o e^{\frac{\alpha}{k}t}$. With increasing of a mass will be increase the radius of the nucleus in accordance with the expression

$$r = \sqrt[3]{\frac{3m_o e^{\frac{\alpha}{k}t}}{4\pi \cdot \rho_o}} \quad (13)$$

Angular velocity is not changed, as it has been defined for the circumferential speed at the far edge of the atom, but not to its nucleus. With these remarks, the expression for destruction of the nucleus of an atom (hydrogen) takes the form

$$\frac{dF_z}{dF_p} = \frac{9m_o \omega^2 e^{\frac{\alpha}{k}t}}{16\pi \cdot \sqrt[3]{\frac{3m_o e^{\frac{\alpha}{k}t}}{4\pi \cdot \rho_o}} \cdot p_{eo} \left(1 - \frac{C^2}{V_{\max}^2}\right)^{\frac{\kappa}{\kappa-1}}} \geq 1 \quad (14)$$

where $\kappa = 5/3$, $p_e = 6,426 \times 10^{25} [Pa]$, $u_o = C = 3 \times 10^8 [m/s]$, $m_o = 1,673 \times 10^{-27} [kg]$, $\omega = 3 \cdot 10^{18} [s^{-1}]$, $\alpha/k = 2,97 \cdot 10^{-18} [s^{-1}]$. Calculations was been shown that this condition is satisfied when the size of the nucleus of the atom was increased 2.02 times. By this point the time must pass $t = 32 [Gyr]$.

Thus from the previous "Big Bang" was passed 15,3[Gyr]. The next "Big Bang" you have to wait more 32[Gyr]. Thus it is necessary to reckon with the fact that we had not a exact calculation, but we have a estimate. The values obtained can be refined.

This hypothesis of the nature of the Big Bang partly coincides with one of the two previously considered theories of the Big Bang in that the explosion occurs simultaneously and everywhere in the entire Universe. **The fundamental difference is that not empty space explodes, but all atoms of the baryonic matter of the Universe or most of it explode as if by a clock signal. But this does not lead to an expansion of the space of the Universe.**

Bibliography

1. Bronshten VA Hypotheses about the stars and about the Universe- M .: Science, 1974.
- 2 Agyekyan TA Stars, galaxies, metagalaxy.-M .: Nauka, 1981.
3. Burago S.G. Gravity, dark matter and dark energy balance. The General Science Journal. Astrophysics. 2014. April. pp. 20. ResearchGate. Working Paper Oct 2016 . DOI: 10.13140/RG.2.2.16857.52327
4. Burago S.G. The cosmic objects into the continuum dark matter. ResearchGate. Working Paper DOI: 10.13140/RG.2.2.21497.88160
5. Burago SG A refinement of the Hubble law on redshift in the spectra of distant galaxies ResearchGate. Working Paper Mar 2016. DOI: 10.13140/RG.2.2.16857.52327
- 6 .. N.E. Kochin, N.V, Roze I.A, Cable I.A. Theoretical hydromechanics. M.: Fizmatgiz 1963 year