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A NEW LOOK AT THE COSMOLOGY OF THE UNIVERSE

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ABSTRACT

The theory of local expansion and contraction of the Universe makes it possible to abandon the Big Bang in the standard cosmological model ΛCDM (Λ- Cold Dark Matter), and the inflationary theory of the expansion of the Universe. The mechanism of the birth of matter in an infinite Universe was proposed of Professor Stephen William Hawking, as an effect of radiation of particles by a black hole and experimentally implemented by the Nobel Prize winner Andre Geim under laboratory conditions inside graphene, identical to those, in which matter arises from vacuum in the vicinity of black holes and magentas.

KEYWORDS: *Baryonic Matter; Dark Matter; Black Hole; Great Attractor; Dark Stream*

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1 INTRODUCTION

Despite all the successes of modern astrophysics, the cosmological theory of the birth and evolution of the Universe still remains a territory of delusions, scientific speculations about inflationary theories and pseudoscientific opuses, like the "Universal Law of Antigravity" in the standard cosmological model ΛCDM [1]. Martin Ries, the cosmologist and the astrophysicist, President of the Royal Society of London, believes that the birth of the Universe will remain a mystery to us forever. He declares: "We do not understand the laws of the universe. And we'll never know how the universe appeared and what awaits it. The hypotheses about the Big Bang, which allegedly gave rise to the world around us, or that there may be many others in parallel with our Universe, or about the holographic nature of the world, will remain unproved assumptions." The authors of the new theory of the emergence of the universe N.Anshordi, R. Mann and R. Purhasan suggested that our Universe could have been born as a result of the implosion (explosion inward) of a star from the four-dimensional predecessor of the universe [2]. Such an explosion could create a three-dimensional shell around a four-dimensional black hole, and thus the Universe is a hologram of the collapse of a four-dimensional star into a black hole. The considered model of the holographic Big Bang solves not only the basic cosmological problems of flatness and homogeneity of the Universe without introducing the concept of "inflation", but also the problem of cosmological singulation, making it hidden. Perhaps the physical laws are valid for worlds of other dimensions and transferred to our three-dimensional world. Matter in the enveloping four-dimensional bulk is gravitationally bound to the black hole that gave birth to our universe. Temperature fluctuations in such matter can create fluctuations already in the ordinary three-dimensional matter of our world, which in turn create in homogeneities in the background (relict) radiation. The presence of such in homogeneities of the background radiation was discovered as a result of astronomical observations, which can serve as confirmation of the energetic connection of our Universe with the external enveloping Cosmos. According to the latest data, interaction between parallel universes is possible through wormholes. Physicists divide wormholes into passable and impassable. Traversable wormholes can potentially connect different regions of space-time Fig.1

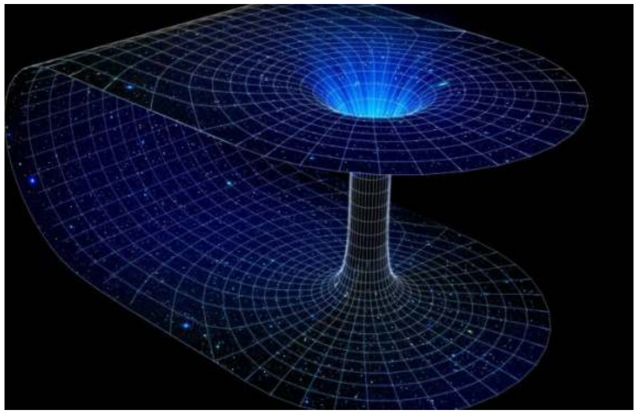

Figure 1: Wormhole (Walkable).

In particular, a field flux created by objects on opposite sides of the hole can pass through such a hole, so the objects will feel each other long before they fall into the hole. Physicists from China and the United States have evaluated how objects located on opposite sides of the wormhole interact. It turned out that due to the "gluing" of fields at the border of "our" and "alien" spaces, observers feel the electric, scalar and gravitational fields of objects from the opposite edge of the hole [3]. A clarification needs to be made here. Recently, astrophysicists were able to discover the shadow of a black hole's exit caused by the gravitational lensing [4]. This fact suggests that physicists from China and the United States discovered the electric, scalar and gravitational fields of objects your own universe located on the other side of the black hole. Scientists from the Center for Astrophysical Research in the Fermi Laboratory (Fermilab) are now working on creating a Holometer device. With the help of the Golometer device, experts hope to prove or disprove the insane assumption that the three-dimensional Universe, as we know it, simply does not exist, being nothing more than a kind of hologram. In other words, the surrounding reality is an illusion and nothing more. Until the illusory nature of our world is proven, scientists have hope to understand the laws of the universe. The new cosmological theory of Professor Valery Etkin on the local expansion and contraction of the Universe, based on the hypothesis of an uneven distribution of baryonic and non-baryonic matter in the Cosmos, is based on the energy-dynamic theory of the evolution of the Universe, which rejects the Big Bang as the beginning of all things [5].

2. THE THEORY OF LOCAL EXPANSION AND CONTRACTION OF THE UNIVERSE

In the new cosmological model, the quantum vacuum is understood as a superfluid heterogeneous medium of dark matter and dark energy forming a galactic and intergalactic environment, which account for 95% of the average density of matter in the Universe [6]. In this case, ordinary baryonic matter accounts for only about 5%. Possessing the property of gravity, superfluid dark matter forms a halo around galaxies, which, rotating together with them, forms a predominantly flat or nearly flat structure of the Universe [6]. Lawrence Livermore National Laboratory of the United States announced on 2022 about the sensational results. This laboratory has long-term observations and analysis with the Supercomputer. A space model of our entire Universe was created on the Supercomputer, and it turned out that our Universe has a flat structure, and all Galaxies about half a million light years in size are located at a distance of six billion light years from each other and lie in the same plane. Obviously, this picture of our Universe does not correspond to the Big Bang model. Today, with the creation of the largest James Webb space telescope, astrophysicists have the opportunity to look into the depths of the Universe, 13 billion years old in the infrared, and there they did not see the expected picture of the Big Bang.

Astrophysicists are in a panic. In July 2022, a large group of astrophysicists published an article called “Panic!” [7]. According to the latest astrophysical data, the number of small galaxies and their location in the depths of the Universe, aged 13 billion years, does not correspond to the expected picture of the Big Bang. Astrophysicists tend to think that the universe has always existed and the Big Bang, along with the singularity, is Einstein's unscientific fantasy. Based on the latest conclusions of astrophysicists, the nature of the background radiation discovered in 1965 by A. Penzias and R. Wilson cannot be relic, which means that the hypothesis of cold nuclear fusion in the space environment acquires a scientific status. Nature offers mankind various options for nuclear fusion: on the one hand, it is uncontrolled thermonuclear fusion realized in the depths of the sun and accompanied by coronary emissions that have a detrimental effect on all life on the planets, on the other hand, the thermal radiation of the universe realized in the form of cold nuclear fusion in the interstellar medium. The detected thermal background radiation of the Universe, discovered in 1965 A. Penzias and Robert Wilson, in the microwave range from 10 GHz to 33 GHz received in astrophysics an insufficiently convincingly justified name “relict”. This may be a process of cold nuclear fusion occurring in the space environment, with the release of energy sufficient to raise the temperature of the Universe to 2.7 K. The theory of local expansion and contraction of the infinite Universe does not need the Big Bang and the inflationary theory of the expansion of a point into the existing Universe during 13 billion years from the moment of its birth [5]. The official astronomical science does not accept the ideas of F. Hoyle and of some other astronomers (H. Bondi, T. Gold, and P. Jordan) about continuous creation of matter in an endless Universe because it contradicts the Conservation Laws for Einstein's closed universe in General Theory of relativity [8]. Einstein's universe is a closed universe with constant entropy since in such a universe there are no irreversible processes. For a description of the birth of matter in Einstein’s general relativity is necessary to be considered variations in the density of matter due to the production of particles. This leads to disruption in time symmetry. Nobel Prize winner Professor Ilya Prigogine proposed to add the number of variables included in the standard model (the pressure P, the mass-energy density σ and the radius of the universe R (t)) an additional variable n - the density of the particles and an additional equation, which would tie the Hubble function of radius of the universe R (t) and the birth of particles n [9]. In the case of the universe, consisting of particles of the same type of mass M, when the mass-energy density is simply equal to σ, and the pressure P - vanishes, Prigogine offers a simple equation that takes into account the creation of particles:

$$\alpha H^2 = \frac{1}{R^3}\frac{\partial n R^3}{\partial t} \tag{1}$$

Where α - kinetic constant equal to zero or positive

In this equation (1), the value of α and H are positive since we are talking only about the birth (and not destruction) of the particles. Furthermore, in Einstein's Universe the total number nR^3 constant irrespective H values, $\alpha = 0$ [9].

In September 2021, Professors Xavier Calmett and Folkert Kuipers from the Department of Physics and Astronomy at the University of Sussex published a report that the structure of black holes is more complex than previously thought and quantum gravity can lead to pressure black holes on the quantum environment. Xavier Calmett said: “Our finding that Schwarzschild black holes have a pressure as well as a temperature is even more exciting given that it was a total surprise. Hawking's landmark intuition that black holes are not black but have a radiation spectrum that is very similar to that of a black body makes black holes an ideal laboratory to investigate the interplay between quantum mechanics, gravity and thermodynamics” [10]. At the edge of a black hole, the physical vacuum is in a conditionally stressed state, as a result of which it he is polarized in a quantum manner. Nothing of the kind follows from Einstein's General Theory of

Relativity. Einstein's general relativity, in general, is incompatible with quantum concepts. Studying the behavior of quantum fields near a black hole, Stephen Hawking predicted that a black hole necessarily radiates particles into outer space and thereby loses mass [11]. This effect is called Hawking radiation (evaporation). To put it simply, vacuum polarization occurs under the influence of monstrous gravitational and magnetic fields, as a result of which the formation of not only virtual, but also real particle-antiparticle pairs is possible. According to Hawking, on the surface of the event horizon, the direction of expansion of the generated particles ceases to be random, i.e. becomes polarized, namely, orthogonal to the surface of the black hole. [11]. The existence of stable Hawking radiation - the process of emission of various particles by a black hole - was first proved by specialists from the Israel Institute of Technology. The experiment, conducted by Israeli scientists, had to be repeated 97 thousand times over a period of 124 days. To create an analog of a black hole 0.1 millimeter long, the researchers required 800 rubidium atoms. It is assumed that in the future, experts will be able to extract energy from black holes using a singular reactor. According to the theory, the energy will be generated by Hawking radiation. Scientific material describing the creation of a sound-like black hole in the laboratory was published on February 19, 2021 on Phys.org. [12]. As a result, a huge amount of matter is thrown into the surrounding space of the black hole. This matter is plasma of the most elementary particles of the universe. In fact, it is a huge and still very dense cloud of plasma, retaining the shape of a disk. Its rotation speed is close to the speed of light, and the direction of rotation coincides with the direction of rotation of the original black hole. Modern astronomers call such a disk a quasar (Fig. 2).

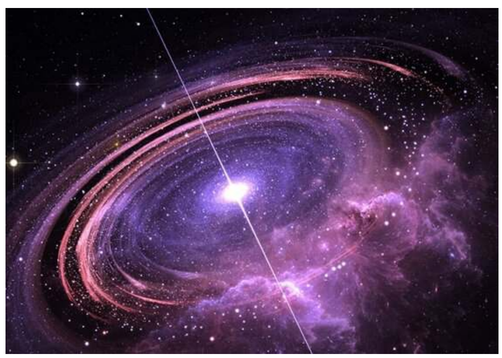

Figure 2: The Light Emitted by the Quasar J1120 + 0641, 13 Billion Light Years from Earth.

Researchers at the University of Manchester, led by the Nobel Prize Laureate Andre Geim, have found that inside grapheme it is possible to recreate conditions identical to those in which matter arises from vacuum in the vicinity of black holes and other space objects [13]. They reproduced in laboratory conditions during experiments with very narrow strips of grapheme the Schwinger effect, in which super-powerful electric or magnetic fields will act on vacuum in such a way that some of the pairs of virtual particles and antiparticles that form dipole structures - positroniums will break and form quite real positrons and electrons, as well as other types of form of matter and antimatter [13]. The structure of positronium was first discovered experimentally in 1951 by the German physicist Martin Deutsch (Figure 3) and reliably established by Professor D.B. Cassidy and his assistant A.P. Mills Jr. in 2007 [14].

Figure 3: Structure of Positronium

Cassidy and Mills calculated that in their experiment the density of positronium atoms was 10^{15} per cm³. Calculations show that with an increase in this density by three orders of magnitude, these atoms at a temperature of 15 kelvin will merge into a single quantum system - the Bose-Einstein condensate [14].

3. ANISOTROPY OF THE UNIVERSE

Detailed observations reveal significant deviations from isotropy. It has been established that the distribution of matter in one direction is higher than in others. Although this is partly due to our relative movement in outer space, but this does not explain everything. There is another anomalous phenomenon. Experiments related to the determination of the Hubble constant, which is a measure of the rate of expansion of the universe, also indicate that the local universe is special and not the same as in other places. The value of the Hubble constant in nearby galaxies seems to be different from the value measured on the scale of the entire universe. This deviation is called the Hubble stress and is currently one of the most pressing problems in cosmology. Measurements through supernovae indicate that the Hubble constant is about 74 km/s/Mpc (a megaparsec is a distance unit equivalent to about 3.3 million light-years). And observations of relic microwaves are about 67 km / s / Mpc. The reason for this discrepancy remains a mystery. To explain this, a variety of hypotheses are put forward - from the unevenness of the expansion process itself to a systematic error that creeps into the measurements, although it has not yet been discovered by specialists. The main question is whether the non-stationarity of processes in the Universe is the basis for the statement about the non-stationarity of its boundaries. The answer to this question becomes especially clear from the standpoint of the principle of dichotomy (opposite direction) of processes in different regions of the Universe, proven by Professor Valery Etkin [5]. From this principle follows the inevitability of the occurrence in it of simultaneously occurring processes of expansion of some and compression of other parts of it. It is these processes that lead to the concentration of masses in certain parts of the Universe, the formation of star clusters in them, accretion, collapse, the birth of "supernovae" with subsequent dispersion of matter and its clusters in other parts of the universe. The hypothesis of Valery Etkin explains the discrepancy between the results of observations of the Hubble constant 72 km/s/Mpc obtained in 2016 with the Hubble Telescope and the Giant Keck Telescope on Mauna Kea in Hawaii by measuring supernovae and the Hubble constant of 67 km / s / Mpc, obtained in 2013 using the European Planck spacecraft's measurement of the CMB from the Big Bang. The Planck mission observations, which show the universe when it was only 380,000 years old, are considered the gold standard in cosmology (Figure 4).

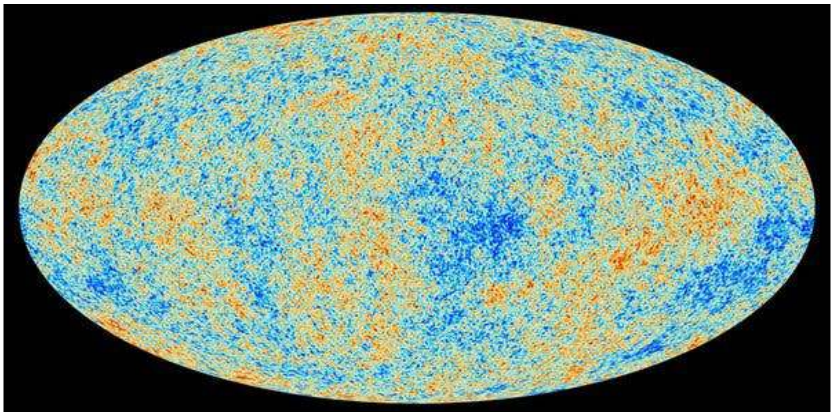

Figure 4: Cosmic Microwave Radiation Left over from the big Bang. the Planck's Mission.

In favor of the local expansion of the Universe, the results of a new study carried out using data from the NASA X-ray apparatus "Chandra" speak X-ray Observatory and ESA's XMM-Newton. Migkas and his colleagues have examined some 842 galaxy clusters during the course of their study, and established that the expansion rate of our universe appeared to differ from region to region. "We managed to pinpoint a region that seems to expand slower than the rest of the universe, and one that seems to expand faster!", Migkas noted [16]. In article "Probing cosmic isotropy with a new X-ray galaxy cluster sample through the LX−T scaling relation" authors write: "In this work, we investigate the directional behavior of the X-ray luminosity-temperature (LX−T) relation of galaxy clusters. A tight correlation exists between the luminosity and temperature of the X-ray-emitting intracluster medium. While the measured luminosity depends on the underlying cosmology, the temperature can be determined without any cosmological assumptions. By exploiting this property one can effectively test the isotropy of cosmological parameters over the full extragalactic sky. Here, we used 313 homogeneously selected X-ray galaxy clusters from the MCXC catalog and obtained core-excised temperatures for all of them. We find that the behavior of the LX−T relation heavily depends on the direction of the sky. Performing a joint analysis of the three samples, the final anisotropy is further intensified (□5σ), toward (l,b)□(303º,−27º), which is in good agreement with other cosmological probes [16]. Professor Webb at the University of South Wales in Sydney stated: "We found a hint that constant fine structure number was different in certain regions of the universe. Not only as a function from the age of the universe, but actually in the direction of the universe, is which really strange. Not only do universal constants appear to be variables at the outer edges of the cosmic universe, anomalies also only occur in one direction. Thus, the Universe cannot be isotropic from the point of view of the laws of physics, that is, it is statistically different in all directions. In fact, it may contain some directions or preferred directions in which the laws of physics change. In other words, the Universe in a sense has a dipole structure." [17].

Among experiments confirming the anisotropy of physical space, known experiment of NASA, carried out in 1989 - 1992 years. using spacecraft Cosmic Background Explorer (COBE) to detect the anisotropy of the thermal background radiation, discovered in 1965 A. Penzias and Robert Wilson. The anisotropy of the background radiation (called relict background radiation) arises from the motion of the solar system with respect to this radiation, which refutes the cosmological principle that the universe is in generally homogeneous and isotropic. The consequent movement of the anisotropy of the background radiation in the microwave range 10 GHz - 33Ggts characterized by a temperature difference in two diametrically opposite directions:

$$\Delta T \approx T_0 \, [1 + (v/c) \cos \Theta] \qquad (3)$$

Where Θ - the angle between the line of sight and the velocity vector of the observer relative to the background radiation of the universe [18] Measurements of the cosmic microwave background show that it is preferably hotter in the direction in which the Earth is moving, and preferably colder in the opposite direction to our movement. (Fig.5)

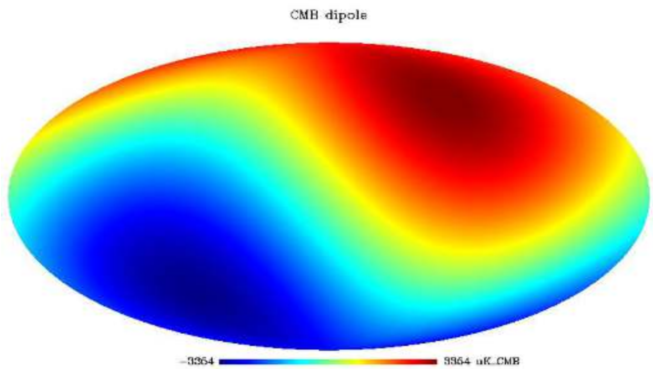

Figure 5: CMB Temperature Dipole

The temperature is considered higher in the direction of travel, and the temperature behind it is lower. Thus, the background radiation in the region of anisotropy of the density of baryonic and dark matter forms a kind of temperature dipole, the top of which is directed towards the movement of the object. For our Milky Way galaxy:

$V_g \approx 600$ km / s

The vector speed of our galaxy relative to the background of the universe is directed to the point with coordinates:

$L_g \approx 260^o$, $B_g \approx +32^o$

This point can be called APEX Galaxy (located in the constellation Hercules).For the solar system:

V☼ = 390 ± 60km / s

The galactic coordinate system heliocentric velocity vector is directed to the point with coordinates:

L☼ = 247º ± 23º, B☼ = + 56º ± 13º

The point with these coordinates is called the absolute apex of the solar system, or just the apex of the sun. This Apex is located in the constellation Leo [18]. According to the latest data, updated in 2020, the speed of the Earth was 227 km/s DPA Agency Madrid, Spain / 11/27/2020. If we ignore the rotation of the Earth and the rotation around the Sun, we find that our solar system is moving relative to the CMB at a speed of 368 ± 2 km/s. When you add the movement of the local group, you get that all of this - the Milky Way, Andromeda, the Triangulum galaxy and all the rest - is moving at a speed of 627 ± 22 km / s relative to the CMB. This large uncertainty, by the way, is mainly due to the uncertainty in the movement of the Sun around the galactic center, which is the most difficult component to measure [19] (Fig. 6).

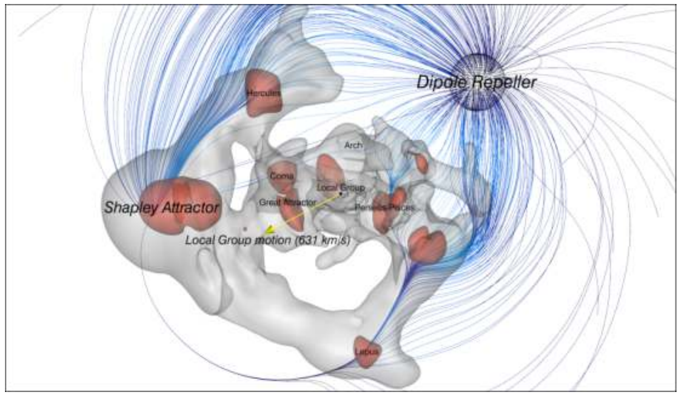

Figure 6: Shapley Attractor.

Maybe Shapley attractor it's a superdense cluster of dark matter? Or is the modern theory of the origin of mass and motion wrong? Astronomer Alan Dressler of the Carnegie Institution called this missing concentration of matter the Great Attractor. Along with the Great Attractor, which is located in the visible region of the Universe at a distance of 250 light years and attracts the Milky Way along with all other galaxies of the Local Group, scientists have discovered a dark stream of galaxies moving to object that is possibly located outside the observable Universe. The authors of this study are Alexander Kashlinsky, Fernando Atrio-Barandela, Daniel Kotsevsky and Harald Ebeling [20]. Peculiar velocities of clusters of galaxies can be measured by studying the fluctuations in the cosmic microwave background (CMB) generated by the scattering of the microwave photons by the hot X-ray emitting gas inside clusters. The researchers studied the movement of 1400 clusters of galaxies (in turn, each cluster can contain from tens to hundreds and even several thousand galaxies!), and for some reason they all moved in the same direction. This strange phenomenon is called the "Dark Stream" - not because it is really dark, but because we know almost nothing about it. Thus, this behavior of galaxies is not compatible with modern ideas about the Universe that it is homogeneous and isotropic.

6. CONCLUSIONS

The astrophysical observations and experiments presented in the article force physicists to approach critically the standard cosmological model ΛCDM and the role of the cosmological constant Λ. The Universe is a dynamic system that continuously generates baryonic masses of matter and dark matter and regulates their density by expanding its boundaries. This circumstance leads to new, more general conservation laws inherent in the physics of open systems.

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