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To the justification of the Super-strong Anthropic Principle

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Abstract.

Empirical data in situ of recent years indicate that spacetime does not exist physically: they are not material - they do not have any of the characteristics inherent in material objects. At the same time, space-time is the most fundamental and universal mediator between all, without exception, material objects of Nature. In turn, material objects of Nature make up two ensembles of objects that form one Great, stationary (not evolving) and an infinite number of non-stationary (evolving) Small Universes inhabiting it - galaxies and clusters of galaxies. The Great Universe is a system open in an infinite space-time continuum, functioning according to single algorithms - intermediaries of 2,3,4, etc. of order (physical, chemical, biological, social laws and principles). All types of interactions between material objects, including gravitational, electromagnetic, nuclear, chemical, organic, etc., are local in nature, the transmission rate of their "signals" is limited. All relativistic effects also fall into the category of near-interactions. The long-range "phenomena of unlimited scale" include only non-material entities that do not need material carriers, but themselves determine the nature of their interactions: fundamental and particular laws, world constants and prohibitions (the speed of light, the temperature of absolute zero, etc. Pauli's principle, etc.), as well as human imagination capable of "staying" everywhere and at any time. But as space-time serves as a

universal mediator between all of Nature's material objects, so too is a human-like mind called to mediate between the fading star systems of the Small Universes and their "heirs."

Keywords: space, time, matter, evolution, Great Universe, Small Universes, anthropic principle.

Introduction

Three resonant experiments in space, implemented in the last decade, finally brought complete clarity to the nature of space and time. In experiment [1], it was shown that the geometry of the STRICTLY EUCLIDEAN space is very likely. The authors of the work actually joined this conclusion [2]. And the authors of work [3] received irrefutable evidence that the space is NOT DISCRETE, therefore, completely devoid of structure. Thus, experiments proved that SPACE DOES NOT EXIST AS MATTER. It is a perfect (absolute) vacuum. Moreover, if the 4-dimensional Minkowski metric is correct, then it should be recognized that TIME DOES NOT EXIST PHYSICALLY. Thus, the results of the experiments: a) confirmed the fallacy of the original idea of the General Theory of Relativity (GTR), in particular, the Riemann geometry and the materiality of the space on which the Standard Cosmological Model (ΛCDM) is built; b) demanded recognition of the open model of the Universe with Euclidean geometry of space; c) gave additional arguments in favor of the reliability of the Super Strong Anthropic Principle (SAP).

1. Formulation of the Super-strong Anthropic Principle

At a symposium in honor of the 500th anniversary of the birth of N. Copernicus B. Carter formulated a weak version of the anthropic * principle in the form: "Our position in the Universe with necessity is privileged in the sense that it must be compatible with our existence as observers." He also proposed a "strong" version of this principle, "according to which the Universe... should be such that observers are allowed to exist in it at some stage of evolution." [4]

These theses arose from the realization that the structure and dynamics of the Universe are extremely sensitive to some fundamental characteristics of Nature. Two examples: a) the electron mass "has no right" to exceed the existing value by more than double; b) the

geometry of space can only be 3-dimensional. And so on, the list of these prohibitions and requirements regarding key parameters of Nature is extensive. Nevertheless, both variants of the anthropic principle gave rise in the academic environment to diametrically opposed judgments from their full recognition to decisive denial.

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* Here anthropos refers to any reasonable individual, not just of terrestrial origin.

In 1995, I risked suggesting that both versions of the principle presented should be developed into an "super-strong" version due to the need to recognize a certain constructive role in the existence of the Universe as a mind (similar to human). Ignoring this factor contradicts the fact that human behavior is controlled by a DNA molecule composed of standard Mendeleev table atoms. It is therefore universal (with certain variations depending on external conditions, of course) for all intelligent objects of space. Since there is nothing in Nature that is not natural, the expansive "strategy" of the mind of any origin indicates the existence of a certain obligation imposed on it and associated with the existence of space. In other words, the mind (and its carrier) is the result of not only biological evolution, but also a necessary attribute of the evolution of the Universe [5], [6].

Until now, this idea has not been taken into account by any cosmological model, including the ΛCDM in which the Universe:

- *finite* (its volume - V, mass - M, number of particles - N are limited);

- *unique* (once "born," it then "swells" indefinitely, dissolving in an infinitely expanding space);

- *is not reproducible* (i.e., the theory describing its evolution is not verifiable).

However, no matter how hard her supporters try to extinguish her insurmountable flaws, they are all persistently making themselves felt. The last "drop" that overflowed the mass of its insoluble internal contradictions was precisely the aforementioned experiments.

2. Unacceptability of ΛCDM

The aporia of the model are reduced to the past, present and future of the Universe [7].

A. "**Origin" of the Universe**: according to the ΛCDM model, it is "born" from a state of singularity. It corresponds to the Planck scales of time $t_0 \approx 10^{-44}$ *s*, space $r_0 \approx 10^{-33}$ *cm*

and density $\rho_0 \geq 10^{94}$ g/cm^{-3}. Accordingly, the mass of a sphere with similar radius and density is small, but NOT equal to zero: $m_0 \approx 10^{-5}$ g. It is also believed that the temperature of this, "point" reaches $T_0 \approx 10^{32}$ K.

Problem No.1: since temperature is a measure of mechanical (rectilinear, oscillatory, rotational) movement, it is asked what kind of movement can occur in a space limited by the Planck length? The answer is obvious: no! Therefore, the condition $T_0 \approx 0$ K must be met for the singularity epoch.

Problem No.2: the hypothesis of an ultra-high temperature (with a spectrum of radiation of an absolutely black body) of the Universe in a state of singularity was expressed by G. Gamow in 1953. Having calculated the rate of drop in its temperature over billions of years of expansion within the framework of classical thermodynamics, he received a modern value equal to 6K. This almost coincided with the value of $T = (3.0 \pm 0.5)$ K for relict radiation found by A. Penzias and R. Wilson in 1967.

It would seem that Gamow "hit the point," confirming one of the key ideas about the features of the universe in a state of singularity. However, his theory predicted a "one-time" synthesis of all elements heavier than 4He immediately following the "explosion," ignoring the reactions of primary nucleosynthesis. Alas, as it turned out later, elements heavier than helium could be formed only during the evolution of the Universe. Therefore, the original hypothesis was not correct, and the proximity of the theoretical prediction of empirical reality was the result of a random combination of circumstances. Thus, no indirect confirmation of the existence of the era of "hot" singularity occurred.

Problem No.3: the problem of the "initial push" - physics still does not know any fundamental interaction in addition to the comparatively well-studied four that could bring the Universe out of the singularity state. The theory of the inflationary phase of its existence, designed to save the ΛCDM, describes the processes that took place AFTER the beginning of expansion. The strangeness, if not absurdity, of the power that once gave the Universe an impetus to such unimaginable power that the latter is expanding today at a speed close to the speed of light, is that this mystical power has never manifested itself more and in nothing. This fact alone should have called into question the whole theory, but this does not happen. Why?

B. Present: the universe is expanding, but its structure as a whole remains homogeneous and isotropic. It is recognized that its age is $t_1 \approx 10^{17}\ s$ (or ≈ 13 billion years), the radius of the sphere

$R_1 \approx 10^{26}\ cm$, the mass of $M_1 \approx 10^{54}\ g$, the $T_1 \approx$ temperature 2.7 *K* and the concentration of particles $n_1 \approx 1\ m^{-3}$.

Problem No.1: the timing of the first moments of the expansion of the Universe leads from 10^{-43} s after the Big Bang. The period from 10^{-40} to $10^{-30}\ s$ is called the inflation phase. We will not delve into the fabulously monstrous "wobbles" of the radius of the Universe, its temperature, density, and particle scattering rate. Let's leave them on the conscience of mathematics. But physics categorically does not accept the statement that 10^{-5} g of stationary "primary matter" acquired the speed of light almost instantly (in a time from 10^{-43} to $10^{-40}\ s$).

Problem No.2: since the space of the Universe is strictly Euclidean, and its initial volume was localized at the "point," then the further "scattering" of local masses of matter should have occurred strictly along the radial ones. In this case, in order for their distribution to remain uniform, it is necessary that the expansion rate spectrum of local masses u overlaps the range from zero to the speed of light c. But then the preservation of the observed isotropy is excluded. One thing contradicts the other. By the way, the recognition of the singularity requires the existence of the beginning of the spatiotemporal (r-t) coordinates of the expanding Universe, in fact - an absolute coordinate system. But after all, to refute its reality, the General Theory of Relativity (GTR) was created.

Problem No.3. "Space without masses does not exist," states A. Einstein. If in the era of singularity the size of the "material" space was limited to the Planck length, then where did it come from later and where did it expand? Believers in the GTR repeat as a mantra: the space of the universe stretches like an inflatable ball, like a soap bubble. But if the space is material, it must be discrete (Everything material differs from intangible precisely in that it is quantized, discrete, corpuscular). When expanding such a discrete space, its divergent "quanta" cannot but form "holes," which must be immediately filled with new portions of "quanta." The natural question arises: what and how produces them? Alas, the theory does not go down to explanations: for it is too small a problem.

C. Distant future. It is claimed that the "finest hour" of the Universe will end in the $\approx 10^{14}$ years. In 10^{19} years, all galaxies will scatter, and in 10^{32} years, all nucleons of the universe will disintegrate. Finally, in 10^{96} years, the last black hole will evaporate.

Problem No.1. According to ΛCDM, in 10^{100} years only electrons and positrons will remain in the Universe, and each of these elementary particles will occupy a volume of space equivalent to 10^{191} volumes of space of the entire current Universe!!! Here is another illustration (in addition to inflation theory) that mathematics is far from always identical to physical reality. Sometimes not noticing the physical nonsense lurking in its claims, it unwittingly discredits the theory it is called to defend.

Problem No. 2: The physicochemical aspect of the existence of the Universe is subject to strict laws in accordance with the "constitution" unified for all its objects. Therefore, both the biological and even cultural algorithms of their evolution also had to be embedded in the original state of the singularity. In this regard, the question is: where did the *information* about the gigantic sum of "*instructions*" that guided the Universe for billions of years come from and what did it store as favorable conditions were created for their "entry into the game" if its space in the past was limited to Planck size? There is no answer, since the question is not even posed - it is too inconvenient.

Problem No. 3. If the physicochemical and sociocultural algorithms of the being of the Universe are "in demand" only once, moreover, only for a brief moment in comparison with eternity, then the question is, *why were they even compiled*? What an inexplicably strange display of Nature's "whim"!

Conclusion: So, as you can see, *ΛCDM contains unacceptably many artificial tensions and contradictions to facts*. The past of the Universe is dark, the present is inexplicable, the future is uncertain. The model is satisfactory from the point of view of mathematics, but resolutely does not meet the criteria of logic and empirical data of physics.

Our key thesis is the statement: Nature has a "super-goal" - it "wants" to be forever. This, however, is hampered by the limited lifetimes of the stars and the deterioration of their energy quality. * This difficulty can be avoided only if we recognize the fact that there are two kinds of Universes. One of them is the Great Universe, spatially infinite, stationary and consists of infinitely large mass-energy of matter (at a sufficiently low average density), concentrated in an innumerable set of gravitationally separate Small Universes. These latter have a finite volume, mass and lifetime. In other words, their existence must be cyclical in nature, so that, having stopped for moments, over and over again to revive to a new life with renewed matter - radiation.

The types of interactions and life forms in the broadest sense can be divided into 4 large sections - physical, chemical, organic and cultural. And at least the first three impose strict requirements on the structure and existence of the Great Universe, "forcing" it to be stationary in general and non-stationary in parts. Whereas control over the transitional processes of the birth of the "new" Small Universes from the "old" seems to be able to carry out only the fourth, cultural form of life, which has the technologies necessary for this mission. (We should not be confused by doubts about the ability of the mind to

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* The threat of "thermal death" predicted by the Universe R. Clausius is actually due to the inevitable process of cooling stars as their hydrogen fuel burns out.

influence the situation in space due to the incommensurability of their scale, since the entire vast Universe is subject to the laws of the world of tiny elementary particles).

3. Reasons for unsatisfactory ΛCDM

The foundation of ΛCDM, as you know, is GTR, therefore, weaknesses should ΛCDM be found in it. As A. Friedman showed, the GTR equations give two stable solutions for the universe. Both suggest its NON-EXISTENCE in the form of: a) an indefinitely prolonged singularity phase ($t \leq 0$ *s*); b) infinite "great emptiness" ($t \approx \infty$ *s*). Whereas its EXISTENCE is determined by the intermediate state of evolution. It is limited to a very short active phase period for the Universe ($t \approx 3\ 10^{21}$ *s*), moreover, it is extremely unstable. So, for example, if at the initial moment of expansion (t_0) the density of the Universe ρ exceeded the critical value by $\rho_к$ only $10^{-55}\rho_к$, then "the Universe would be closed... and by now it would have to collapse long ago. On the other hand, if the density at time to was less $\rho_к$ on $10^{-55}\rho_к$, then the modern density of matter in the Universe would be vanishingly small and the origin of life in the Universe would become impossible," states A. Linde [8].

This conclusion is confirmed by S. Hawking: "If a second after the Big Bang the expansion rate was at least one hundred thousand million million less, then the universe would be re-compressed, and it would never reach its modern state" [9]. In other words, according to GTR, Nature exists due to a vanishingly low probability, close to, or actually equal to zero. Everyone who is not enthusiastic about ΛCDM can see that this concept of its history of the

World is not so much absurd as cartoonish. And the reasons that led to such a paradoxical interpretation of the existence of the Universe are connected, first of all, with the ideas of A. Einstein, which prevailed in classical physics of the late XIX - early XX centuries. Among them, the most controversial was the idea of the origin of the *principle of equivalence* - the equality of gravitational and inertial masses.

GTR error of equivalence principle interpretation. Both E. Mach and after him, Einstein believed that the equality of gravitational and inertial masses is explained by the property of space to be a transporter of interaction between bodies [10], [11]. This, in their opinion, imposed on space the requirement to be material and show geometric properties, in particular, to bend. Einstein worked on his theory in 1906 ÷ 1916. The concept of the back, as a fundamental characteristic inherent in all elementary particles and forcing them to remember and maintain their orientation in space - that is, to be inertial, was formulated only in 1922 ÷ 1927. Therefore, Einstein could not know that gravitational (Mg) and the inertial (Mi) masses of bodies, defined as the sums of m_g, m_i of their elementary particles, must strictly coincide with each other, leading to the equivalence of Mg ≡ Mi. Of course, later Einstein could not help but learn about the back and its features, but his categorical rejection of quantum mechanics prevented him from admitting his delusion.

Meanwhile, the fact of the existence of a spin makes *erroneous* not only the interpretation of inertia by long-range action, but also the endowing of space with geometric properties. Einstein neglected that the idea of the global curvature of the space of the universe leads to a contradiction with the two fundamental laws of Nature - the laws of conservation of energy and momentum!!! He closed his eyes to the fact that the curvature of space leads to their violation. As a result, *nonsense unheard of in science arose*: the unresolved problem of time heterogeneity and, accordingly, the conservation of energy by theorists is recognized and sluggishly discussed. The problem of the heterogeneity of space, therefore the law of conservation of momentum, is still not even posed today, since... not recognized. How to understand this actual crisis of physics?

The idea that space is capable of curvature prompted Einstein, who worked on the creation of GTR and did not suspect about its dynamism, to create a static model of the structure of the Universe. And like any mathematical model, it required the indication of boundary conditions, therefore, the rejection of an open (Euclidean) model of space with space-time axes going to infinity, in favor of a closed (Riemannian) space with bounded r-t axes. For which Einstein introduced the Λ term into the equations of G. Ricci-Curbastro and T. Levy-Civita, which was

supposed to balance the gravitational attraction of massive bodies (Until the beginning of the twentieth century, the Universe was believed to be homogeneous, isotropic and stationary).

Error ΛCDM interpretation of galactic redshift. Friedman's derivation of solutions to the GTR equations, however, caused Einstein to abandon this term. But the irony of fate - under the influence of E. Hubble's discovery of the redshift of distant galaxies, Einstein was forced to admit his mistake for the second time, now to agree with the reality of this mystical Λ member. Thus, the question of the speed of expansion of the "fabric" of the Universe (as some ΛCDM supporters gracefully express) is recognized as the most relevant in modern cosmology. In this regard, two points should be noted. First, redshift is from the expression:

$$z = (\lambda - \lambda_0)/\lambda_0$$

where λ is the observed wavelength and λ_0 is emitted. The radial speed of vr at which the light source moves away from us is:

$$v_r = c\, z$$

where c is the speed of light.

"In 1930, Edwin Hubble participated in determining the distribution of galaxies in space and its curvature. Those data seemed to indicate that the Universe is flat and homogeneous, but still there was a noticeable deviation from the flat type in cases with a large amount of redshift. According to Allan Sandidge: *Hubble believed that... redshift "is the still unidentified principles of the universe*" [12]. Nevertheless, having established the dependence of the magnitude z of the galaxies closest to us on the distance D to them, he had the imprudence to associate it with the speed of their removal from the Earth observer, in fact with the Doppler effect:

$$v_r = \mathrm{HD}$$

where v_r is the rate of removal of the galaxy, H ≈ 75 km/s·Mps is the Hubble constant.

Thus, he gave a trump card in the hands of supporters of the GTR in the form of confirmation of the reality of not only expansion, but even accelerated expansion of the Universe (Λ-member). However, as astronomers began to find redshift magnitudes of distant galaxies $z \geq 1$, it became obvious that one Doppler effect could not explain them, since this led to an absurd $v_r \geq$ c.

And then, instead of agreeing that the binding of z to v_r in the case of distant galaxies was erroneous, supporters of ΛCDM called for help a saving cosmological redshift resulting

from... expansions of the Universe. In other words, what required independent evidence itself became an *argument* for proof!!! This substitution of concepts takes theory beyond strict science, turning it into the free art of illusion.

At one time, they tried to attract the effect of aging light to explain the large *z*. But with the light hand of the authors of the work [13], it was found unsatisfactory, since... contradicted the theory of the expansion of the Universe. This verdict was delivered by them in 1975 when, in their opinion, "in cosmology, we still do not face any intractable contradiction of theory and experience or internal logical difficulties." Alas, in just 7-8 years, A. Guth, P. Steinhardt and A. Linde had to refute such an optimistic statement and impose on the scientific community the idea of the existence of a fabulous phase of inflation in the early history of the Universe. Therefore, references to the independence of redshift from wavelength or the absence of light scattering from distant sources, designed to "discredit" the mechanism of light aging, cannot be recognized as wealthy.

This, by the way, is confirmed by images of galactic objects obtained using the Hubble Space Telescope in 2009. As can be seen from Figure 1, there is not a single object of any color, from blue to red, exceeding the size of the point - a single star that would not be blurred. This is direct evidence of both a whole spectrum of waves that have reached the Earth's observer from very distant galaxies, and their scattering in the processes of interaction with the cosmic background when they travel very long distances.

Fig. 1

https://jeisport.ru/otkryta-samaya-dal-kaya-galaktika-3-foto/

Meanwhile, there is nothing material whose life time is not limited. This also applies to the photon - the carrier of electromagnetic interaction. As a material particle, it is a compact wave packet consisting of a chain of elementary transverse electric and magnetic fields with

elementary ε energy, the number of n of which is determined by the wavelength of their λ (frequency ν) forming the packet. The total energy of the package E = εn carries the energy of electromagnetic radiation, moving in a straight line and simultaneously rotating.

In this case, the movement of the photon does not occur by inertia, but due to the energy of *its own movement*. This is indicated by: a) its passage through transparent obstacles (glass, water), after which the speed of the photon does not decrease, as would happen with inertial movement; b) dispersion of light, which reduces its frequency during movement in a material medium depending on the wavelength. Therefore, when moving, the photon does a certain job, even when the movement is unimpeded - in a vacuum. In other words, the existence of a photon manifests itself not only in various kinds of interactions, but, above all, in *its own movement*. And to perform any work, including movement, requires the consumption of a certain portion of energy. Thus, the energy of a single photon consists of two parts:

$$\varepsilon = \varepsilon_m + \varepsilon_i = (\omega)\ \varepsilon_m + (1- \omega)\ \varepsilon_i,$$

where ε_m is the fraction of the quantum of energy of a single photon spent on its movement, ε_i is the fraction providing its final interaction with the environment, $\omega < 1$ and can probably vary depending on the radiation spectrum of the photon source.

Taking into account the existence of two ways (methods) of consuming the own energy of photons, in order to explain the large redshifts of distant galaxies, it is not necessary to attract the mystical effect of their scattering with speeds approaching relativistic ones. Moreover, from the registration of cosmic rays - elementary particles of high energies, it is known that specific sources of their acceleration, in particular supernova explosions, are needed to give them speeds close to relativistic ones. The question is: what should be the power of mechanisms that can give entire galaxies such speeds? There is no answer, and there will hardly be.

Therefore, the only plausible explanation for the measured values from $z \geq 1$ is to state the fact that the redshift of distant galaxies is not due to the high speed of their scattering, but to the natural aging of photons during the passage of distances of billions of light years. Currently, the Doppler effect explains the distances to galaxies with $z \leq 5\ 10^{-2}$, which corresponds to D ≤ 5-10 Mps. The choice of this criterion is unclear. At the same time, it is known that in the spectrum of galaxies close to us, not only red, but also violet displacement is observed. This indicates the randomness of their motion vectors (in particular, the Andromeda Nebula approaches us from $v_r \approx 300$ km/s) with speeds up to 1000 km/s. The

latter are determined by the most accurate method in astronomy - by changing the brightness of variable stars - cepheid. Thus, only the peculiar velocities of galaxies found in this reference method and not exceeding 1000 km/s are the only actual velocities of movements of both closest and distant galaxies in the Universe.

In other words, the galactic redshift from $z \geq 310^{-3}$ does not occur due to the mystical accelerated expansion of the Universe, but due to the loss of the self-motion energy of ε_m photons, spent on overcoming long distances even without taking into account their interaction with electrons of the electrically neutral intergalactic medium ε_i. The average density of nucleons in the Universe is estimated at least one particle per cubic meter. The "size" of the electron ~ $3\ 10^{-15}$ m. On a target of 1 m^3, it occupies ≈ 10^{-29} part of its area. A photon that has traveled from a quasar distant from the Earth's observer at ≈ $3\ 10^{26}$ m, has a chance to meet an electron equal to 10^{-3}. And this means that every thousandth photon emitted by a quasar will be absorbed in the bowels of space or interact with a neutral particle, weakening the energy of the entire stream of photons. (By the way, the trajectories of light of distant galaxies should not be straight, but "broken" lines that undergo not only gravitational, but also electromagnetic curvature, as well as absorption near large clusters of masses, like the trajectories of radio signals in the ionosphere of the Earth).

"Age" of the Universe. The time of life of the Universe, which is so purposefully specified by ΛCDM supporters, is found from the expression:

$$t \approx D/v_r \approx 1/H \approx 1.3\ 10^{10} \text{ years.}$$

where H ≈ 75 km/s·Mps is taken. At the same time, the graph that extrapolates the dependence of z on D, determined by Hubble for $D \leq 2 \cdot 10^4$ ps with the same H for the values z = 10, 100, 1000, shows not the time - "age" of the Universe, but the distance - event horizon that can overcome photons until they completely lose their energy and equal to ~ 13 billion years (z = 1000) - see Figure 2. How to solve why the spectrum of photons reddens: the rate of "expansion" of a dynamic but spatially closed Universe, or the distance traveled by a photon in a spatially unlimited, stationary Universe?

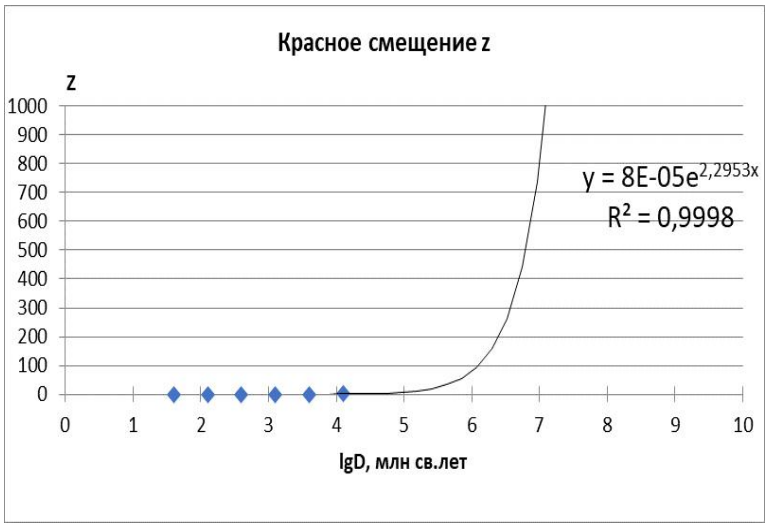

Fig. 2. The dependence z (D) shows the horizon of events (distance) from which light reaches the Earth's observer. Further increasing distance so weakens the energy of photons that they become invisible to us: z goes to infinity, and energy goes to zero. Blue rhombicus show the z and D values set by Hubble.

The "judge" in this matter may be the lifetime of the stars of the Main Sequence (MS) of our Galaxy [14], [15], [16]. It is defined by the expression:

$$t = M c^2 / L,$$

Given the law: mass-luminosity, we get:

$$t = c^2 / M^{2.5-3},$$

or in solar units:

$$t / t_S = 1/(M / M_S)^{2/5-3}.$$

where t_S and M_S are the lifetime and mass of the Sun [17]. Thus, if the estimated lifetime of the Sun on the MS is 10^{10} years, then Spika, whose mass is 10 times that of M_S, will live 1000 times less, i.e. 10^7 years. At the other edge of the MS, the mass of the dwarf Ross128 is $0.2M_S$, and the even smaller Wolf359 is $0.1M_S$. Therefore, the age of Ross128 ranges from 150 to 450 billion years, and Wolf359 - from 450 to 4500 billion years. And since there are a great many stars with a mass of less M_S in our Galaxy, it turns out that it is tens and hundreds of times older than the ΛCDM Universe! Therefore, there can be no question that large red lights testify to the expansion of the real Great Universe.

Relic radiation. According to Gamow's original premise, relic radiation is the temperature of the cooling "corpse" of the Universe ΛCDM with limited mass-energy and space-time, having a beginning, but not having. For an unrestricted ("living") Great Universe, the temperature of relict radiation ~ 2.7 K is a *stationary* temperature background of photons, the density of which is 10^9 - 10^{10} per 1 m^3 over the entire event horizon.

4. Alternative models of the universe

Throughout the second half of his life, Einstein unsuccessfully tried to create a theory of "Total," which would explain from a unified position all the most important physical processes occurring in the world of both elementary particles and stars and galaxies. Thousands of his followers, who are still trying to combine quantum mechanics with GTR, also did not experience luck. There are two fundamental reasons for the failure of their efforts. The first is that *GTR is a legacy of strictly deterministic classical physics of the 19th century*, *which does not find common ground with probabilistic physics of the 21st century*. The second reason is that the *GTR insists on the materiality of space-time*. For quantum mechanics, the space-time continuum is an external background, and the interaction of elementary particles is in no way dependent on it. For GTR, the structure of this continuum, on the contrary, is determined by the material elements that form the system. Thus, spacetime is included in the system, and itself becomes an integral and dependent part of it. This circumstance creates insurmountable difficulties for all, without exception, attempts to "embrace the immense."

One of the most promising ways out of the cosmology crisis was proposed by K. Charlier (1908,1922), according to which stars are distributed over space not evenly, but in clusters of larger or smaller sizes, forming a hierarchical model of the Universe [18]. Putting forward the idea of the hierarchy of the Universe, Charlier: a) did not put any restrictions on space-time; b) did not know about the existence of the Great Universe, discovered a few years later. But today his hunch is supported by a host of undeniable observational data. Therefore, there are no obstacles to taking his model as a basic one for building a theory of the Great Universe, free from screaming contradictions ΛCDM.

5. Conclusions

Empirical data from recent years, indicating a final solution to the question of the essence of spacetime, allow us to begin a radical revision of the dominant ideas about the structure and dynamics of the universe. Today, there is every reason to recognize the following conclusions.

1. Spacetime is the reality that exists as the most *fundamental, universal*, *non-material intermediary No.1* between all material objects of Nature without exception.

2. Material objects of Nature make up two ensembles of objects forming one a Great stationary (not evolving) and infinite set of nonstationary (evolving) Small Universes inhabiting it - galaxies and clusters of galaxies.

3. The Great Universe is open in an infinite intangible spatial-time continuum system functioning according to single algorithms - intermediaries of 2,3,4, etc. of order (physical, chemical, biological, social laws and principles).

4. All types of interactions between material objects, including gravitational, electromagnetic, nuclear, chemical, organic, etc., are local in nature, the transmission rate of their "signals" is limited.

5. All relativistic effects also fall into the category of near-interactions.

6. The long-range "phenomena of unlimited scale" include only

intangible entities that do not need material media, but themselves determine the nature of their interactions: fundamental and particular laws, world constants and prohibitions (speed of light, temperature of absolute zero, etc. Pauli's principle, etc.), as well as human imagination that can "stay" everywhere and at any time.

7. Dark energy is a fiction of imagination that arose from a false interpretation spacetime.

8. Failure of attempts to combine GTR with quantum mechanics: a) due to the fatal and immanent vice of the GTR ideology; b) reflects the powerlessness of mathematics to overcome the prohibitions of physics.

9. Hubble's constant reflects not the rate of expansion of the Universe, but the rate of aging of photons of light, due to the completion of work to overcome long distances.

10. Relic radiation is not a legacy of the "explosion" of the singularity, but a stationary energy background of the Greater Universe, which is determined by the average density and energy of the entire mass of photons on "our" event horizon.

11. The equations (but not the ideology) of GTR apply bounded and locally to Small Universes. They are unacceptable for the reconstruction of the structure and dynamics of the Great Universe.

12. All of the above, at least, does not contradict the idea of the Super-strong Anthropic Principle, and creates the prerequisites for the inclusion of the problem of studying the consequences of intelligent activity in the aspect of the existence of our Galaxy.

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