Ether as the Fundamental Substance of the Creation of the Universe

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Abstract

The paper analyzes the concept of Ether and substantiates the necessity of its existence as a physical reality, which arises within the framework of the concept developed by the authors of the work. The authors come to the conclusion that the existence of Ether in two different forms, plays an exceptional role in the formation of Dark Matter and Dark Energy and leads to the emergence of exotic cosmological structures and their hierarchy in energy, temporal, and spatial scale. The mechanism of the formation of physical structures before the Big Bang and their further evolution, up to the formation of worlds of galaxies and stars, is considered. The necessity of the emergence of exotic structures, such as 3 spheres of the Primary Relict, is shown, its structure and dynamic properties leading to the formation of Order from Chaos are considered. The role of the 1st and 2nd type Ether in the formation of the mechanism of transformation of cosmic energies and quantum phase transitions, in the process of the birth and evolution of the Universe is discussed. The conclusion is made about the existence of universal properties of matter, at the level of Macro and Microcosms, and a multidimensional cosmological model with an isothermal temperature distribution is constructed, leading to a discrete distribution of matter separated by transitions, by analogy with Black-and-White Holes. It is shown that the postulate of the constancy of the speed of light in any inertial system is a consequence of the principle of covariance.

Keywords

Ether, Speed of Light, Black and White Hole, Quantum Transitions, Primary Relict, Chaos and Order, Primary Atom, Big Bang, Dark Matter and Energy, Borromeo Rings

1. Introduction

The criterion of truth in physics is an experiment, but this is an obvious and

generally accepted statement, sometimes it does not work properly if the accuracy of the measurements does not allow for an unambiguous conclusion. It is worth mentioning here the story of how, at the beginning of the 20th century, heated debates broke out regarding the existence of Ether and it was assumed that it certainly exists and is stationary, as a light-bearing medium in which electromagnetic vibrations propagate. However, its existence led to numerous paradoxes, such as the fact that the phenomenon of polarization of light suggests that the Ether, as a medium, should be a solid body, which contradicted the observed motion of planets and stars. Or that the optical refractive index of light should change depending on whether the body in which the refraction occurs is moving relative to the radiation source (and vice versa), or not. Then, the existence of a stationary Ether leads to the fact that the movement of the Earth relative to the Ether should affect the refractive index of the prism. Arago has shown by direct experiments that there is no such influence. At the same time, Fresnel theoretically obtained that such an effect exists, but it is small and in the 1-st approximation is compensated by partial entrainment of the Ether and manifests itself only in the second order of approximation, but the accuracy of the experiment at that time was not enough to detect it. In this example, the situation is clearly visible when the experiment objectively did not allow making an unambiguous and correct conclusion, and the theory turned out to be deeper and gave a radically different answer. All subsequent development of physics was connected with the study of electrodynamics' phenomena in moving bodies and the interaction of matter and Ether. This led to a number of famous experiments (Fizeau, Michelson-Morley, etc.) and the creation of a special theory of relativity, which answered many questions and eventually led to the rejection of Ether as a physical entity that is not necessary [1] [2]. The rejection of the Ether necessarily leads to the fact that there is no dedicated frame of reference, what is one of the basic concepts of the special theory of relativity. All the more surprising is the fact that the creation of the general theory of relativity forces Einstein to return to the necessity of the Ether [3]. The question arises, what made Einstein, who actually closed the topic of Ether when creating the special theory of relativity, return to it again? Einstein made his position very clear in his work [3], saying that space has physical properties and in this sense, it is the carrier of Ether. As a result of these and subsequent discussions, the idea was established in physics that the Ether, as a material physical reality, has no right to exist. It would seem that the ethereal debates have long been heard and are in the distant past, but its ghost appears again and again, arising in a different capacity, under the pressure of new experimental facts and observations. Thus, the nature of the vacuum is still the most difficult task facing modern physics, the discovery of effects that are associated with Dark matter and Dark energy, the nature of the originals in cosmology and the birth of the Universe, all this brings us back to the revision of the concepts underlying modern physics.

In this work, we return to the analysis of problems within the framework of

the approach we are developing [4] [5] [6] [7] [8], in which the Ether necessarily arises as a substance that forms the main characteristics of the universe we observe. At the same time, we will begin our consideration with an analysis of the foundations of the special theory of relativity, within the framework of which a conclusion was made about the exclusion of the Ether as an object of physical reality.

The article is organized as follows: the first chapter examines the chronology of the emergence, development and rejection of the concept of Ether in physics and raises the question of the need to introduce this concept.

In the second chapter, the postulate of the constancy of the speed of light in an arbitrary inertial system is critically analyzed and it is shown that, in principle, it can be derived from the principle of covariance. Assuming that the speed of light $c = c(v)$, where v is the speed of motion of an inertial reference frame relative to a conditionally stationary one, it is shown that it is necessary to fulfill a universal relation $\frac{dc}{dv} = 0$. Also, other considerations are given, showing that such a conclusion necessarily follows from the introduction of 4-dimensional manifold describing causally related physical events.

In the third chapter, the necessity of introducing Ether is considered, arising from the concept of the hierarchy of nested worlds developed by the authors, and it is shown that Ether should exist in two forms, as Ether of the 1st and 2nd type. The role of Ether in the formation and evolution of physical structures in the Universe is shown. The mechanisms of quantum transitions and transformation of cosmic energies in the Universe, the role of Black and White holes, the nature of accelerated expansion of the Universe, Dark energy and Dark matter are considered.

The fourth chapter examines the universal characteristics of the Micro and Macro world, which follow from the principle of hierarchy and nested worlds. The idea is formulated that the universe has a structure similar to the structure of an atom, at a much larger scale.

In the fifth chapter, a cosmological model of the universe is constructed, within which the distribution of matter has a discrete character, which confirms the validity of the hypothesis put forward in the previous chapter.

At the end of the article we discuss obtained results and formulate final conclusions.

2. About the Constancy of the Speed of Light

In the special theory of relativity, the constancy of the speed of light relative to any inertial frame of reference is postulated. This statement is based on the results of the Michelson-Morley [9] experiments, where Einstein acted constructively, generalizing these results and introducing the postulate of the constancy of the speed of light as a universal law of nature, laying it at the foundation of his theory. The measurement of the speed of light was undertaken in order to prove the existence of ether as a light-bearing medium in which light propagates. The

result of these measurements was an experimental fact that established the immutability of the speed of light from the movement of the radiation source, which eventually became the first step towards denying the necessity of the existence of ether. Let us dwell in more detail on the question of the constancy of the speed of light in inertial reference frames. In itself, this fact is not trivial and goes beyond the usual empirical experience of our daily life, where the considered speeds of movement are much less than the speed of light. Here, we want to show that this postulate is not independent and can be deduced from the principle of covariance and other concepts of special relativity. Indeed, let's consider two inertial reference systems K and K', moreover, at the initial moment both reference systems coincide, we will consider the reference system K to be at rest, and let the system K' move along the axis x of the system K at a speed V_0, as shown in Figure 1.

Suppose, at the initial moment (when the system K coincides with the system K'), the clock, in both reference systems, is synchronized and shows the time t and t', respectively. And let, at this moment, at the origin of the coordinates of these systems, there is a flash of light and its wave front propagates, reaching a point A that is stationary in the system K. Consider the propagation of light in the system K and K': $r = ct$, in the system K and $r' = c't'$ in the system K', where r is the distance traversed by light, t is the time and c is the speed of light in the system K, and r' is the distance, t' is the time and c' is the speed of light in the system K'. At the same time, initially we suppose that $c \neq c'$. Introducing the generally accepted concept of the interval of events between the flash of light at the beginning of the reference frame and the arrival of the front of the light wave at the point A, we obtain:

$$S^2 = r^2 - c^2 \cdot t^2, \text{ in the system } K \tag{1}$$

$$S'^2 = r'^2 - c'^2 \cdot t'^2, \text{ in the system } K', \tag{2}$$

Here t and t' is the time of reaching the front of the light wave point A, in the system K and K', respectively. Then the ratio is valid:

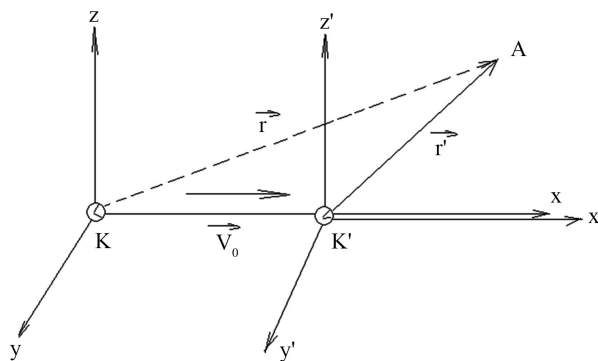$$S^2 = S'^2 \rightarrow r^2 - c^2 \cdot t^2 = r'^2 - c'^2 \cdot t'^2 \tag{3}$$

Figure 1. The motion of the K' system relative K to the V_0 velocity.

At that that relation (3) does not require the simultaneity of the event being recorded by observers in the system K and K', since $t \neq t'$ under the general assumption that $c \neq c'$. However, here we can put forward the position that for the same event, considered in two different inertial frames of reference, the value S^2 that we, following the generally accepted name, will call the interval of events, is an invariant quantity:

$$S^2 = r^2 - c^2 \cdot t^2 = \text{invariant} \tag{4}$$

We introduce the notation: $\boldsymbol{r} = (x, y, z)$, $\boldsymbol{r}' = (x', y', z')$ and determine the relationship between the coordinates $x_i = \{x, y, z\}$ and $x_i' = \{x', y', z'\}$, where $i = 1, 2, 3$, depending on the velocity V_0 of the system K' relative to the system K (see **Figure 1**). Since both systems under consideration are inertial, any free movement in these reference frames is a trajectory in the form of a straight line, which allows us to assert that the relationship between the coordinates x_i and x_i' should be linear $x_i' = \alpha_{ij} x_j$ [10]. In the matrix form, this statement, taking into account the fact that we also have to take time into account, will be written as:

$$\begin{pmatrix} x' \\ y' \\ z' \\ c't' \end{pmatrix} = \begin{pmatrix} \alpha & 0 & 0 & \beta \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ \gamma & 0 & 0 & \delta \end{pmatrix} \begin{pmatrix} x \\ y \\ z \\ ct \end{pmatrix} \tag{5}$$

Then, taking into account the relation (3), we get:

$$x^2 + y^2 + z^2 - c^2 \cdot t^2 = {}'^2 + y'^2 + z'^2 - c'^2 \cdot t'^2 , \tag{6}$$

whence, taking into account $y = y'$ and $z = z'$:

$$x^2 - c^2 \cdot t^2 = x'^2 - c'^2 \cdot t'^2 \tag{7}$$

Taking into account the relations (5), we finally write:

$$x'^2 - c'^2 \cdot t'^2 = x^2 - c^2 \cdot t^2 \rightarrow (\alpha x + \beta t)^2 - c'^2 \cdot (\gamma x + \delta t)^2 = x^2 - c^2 \cdot t^2 \tag{8}$$

The last relation must be fulfilled identically $\forall x, t$ and therefore, takes place:

$$\begin{cases} \alpha^2 - c'^2 \gamma^2 = 1 \\ \alpha\beta - c'^2 \gamma\delta = 0 \\ \beta^2 - c'^2 \delta^2 = -c^2 \end{cases} , \tag{9}$$

where $\alpha, \beta, \gamma, \delta$ are unknown quantities and to determine these quantities we need another equation, which is obtained if we go to the center of the reference frame K', for which we can write down the obvious relation:

$$x' = \alpha \cdot x + \beta \cdot t = 0 \rightarrow \alpha \cdot V_0 = -\beta \tag{10}$$

The joint solution of (9) and (10) leads us to the following values:

$$\alpha = \pm \frac{1}{\sqrt{1 - \dfrac{V_0^2}{c^2}}} ; \quad \beta = \mp \frac{V_0}{\sqrt{1 - \dfrac{V_0^2}{c^2}}} \tag{11}$$

$$\gamma = \pm \frac{V_0}{c \cdot c' \sqrt{1 - \frac{V_0^2}{c^2}}} \; ; \quad \delta = \pm \frac{c}{c' \sqrt{1 - \frac{V_0^2}{c^2}}} \tag{12}$$

Then, the Lorentz transformation will be written in a slightly modified form:

$$x' = \frac{x - V_0 t}{\sqrt{1 - \frac{V_0^2}{c^2}}} \; ; \quad t' = \frac{c}{c'} \frac{t - \frac{V_0}{c^2} x}{\sqrt{1 - \frac{V_0^2}{c^2}}} \tag{13}$$

which at $c = c'$, turn into standard Lorentz transformations. The latter relation is of interest and we will analyze it taking into account $c' \neq c$, which actually means that if the system K' moves relative to the system K at a speed V, then the speed of light in this system can be written as a function of the speed V: $c' = c(V)$. With this in mind, the ratio (13) will be rewritten as:

$$x' = \frac{x - Vt}{\sqrt{1 - \frac{V^2}{c^2}}} \quad \text{and} \quad t' = \frac{c}{c'} \frac{t - \frac{V}{c^2} x}{\sqrt{1 - \frac{V^2}{c^2}}} , \tag{14}$$

For the clocks that are at the beginning of the reference frame K', we write, respectively:

$$x' = 0 \quad \text{and} \quad t' = \frac{c}{c'} \frac{t - \frac{V}{c^2} \cdot Vt}{\sqrt{1 - \frac{V^2}{c^2}}} = \frac{c}{c'} \sqrt{1 - \frac{V^2}{c^2}} \cdot t = \frac{c}{c(V)} \sqrt{1 - \frac{V^2}{c^2}} \cdot t , \tag{15}$$

since the speed of light, under our assumption, depends on the relative motion of the system K' relative to K:

$$c(V) = c(0) + \left.\frac{\partial c}{\partial V}\right|_{V=0} V + \frac{1}{2} \left.\frac{\partial^2 c}{\partial V^2}\right|_{V=0} V^2 + \cdots$$

$$\rightarrow \frac{c(V)}{c(0)} = 1 + \left.\frac{\partial c}{\partial V}\right|_{V=0} \frac{V}{c(0)} + \frac{1}{2} \left.\frac{\partial^2 c}{\partial V^2}\right|_{V=0} V \frac{V}{c(0)} + \cdots \tag{16}$$

In the approximation, when $V \ll c(0)$, where $c(0)$ is the speed of light in a stationary reference frame K, we get:

$$\frac{c(V)}{c(0)} \approx 1 + \left.\frac{\partial c}{\partial V}\right|_{V=0} \frac{V}{c(0)} \tag{17}$$

Then, from the ratio (15), taking into account (17), we get:

$$\frac{t'}{t} \approx 1 - \left.\frac{\partial c}{\partial V}\right|_{V=0} \frac{V}{c(0)} \rightarrow \left.\frac{\partial c}{\partial V}\right|_{V=0} = 0 \rightarrow c(V) = const \tag{18}$$

Of course, the latter conclusion raises questions, due to which of the conditions:

$$\frac{V}{c(0)} \ll 1 \quad \text{or} \quad \left.\frac{\partial c}{\partial V}\right|_{V=0} = 0 \rightarrow c(V) = const , \tag{19}$$

more ensure the fulfillment of (18)? Condition:

$$\left.\frac{\partial c}{\partial V}\right|_{V=0} = 0 \rightarrow c(V) = const \,, \tag{20}$$

It has a greater degree of universality, therefore, based on this, we conclude that the speed of light does not depend on the inertial frame of reference in which it is measured and is a constant value. It is possible that Einstein was guided by such considerations and condition (20) was elected by him to the rank of a postulate in the special theory of relativity. However, due to the controversy of such a conclusion, another consideration can be proposed that leads to a similar conclusion.

Indeed, in the special theory of relativity, physical phenomena occur in the 4-dimensional Minkowski space. The positions in this space are described by 4 vectors x^μ, where $\mu = \{0,1,2,3\}$. Then it is obvious that all reference systems must have a universal relation between the spatial and temporal components, which reduces to the existence of a dimensional limiting velocity constant on a 4-dimensional cone that limits the space of causally related physical events. This constant is the speed of light.

If we consider the expanding surface of a sphere, then all its points will be equal with respect to the choice of a reference system in any of them. However, the frame of reference associated with the center of this sphere will be allocated for any point on this surface, with the only difference that this point is located outside this surface, in a space of higher dimension. The existence of a dedicated frame of reference is associated with the existence of fixed Ether, which is the reference point for describing any motion. In the next section, we will consider how the concept of Ether arises in the concept we are developing, and what role it plays in the birth and formation of the universe [4] [5] [6] [7] [8].

3. Ether of the 1st and 2nd Types, DE, DM, BM, Accelerated Expansion of the Universe. The Role of Quantum Transitions and the Mechanism of Energy Transformations

In our concept of the birth of the Universe in a "bubble" O_{SP}-space, the central place is assigned to the Ether as a basic building Substance [4] [5] [6] [7] [8]. At the same time, the Black Hole (BH) of O_{SP} space, adjacent from the outside to the "bubble", and the Big Bang (BB), which arose in the "clot" of the White Hole, fulfilled the role of universal space tools (factories) for the production of elementary Ether particles of 2 types: 1) Ether particles of the 1st type "0", "+", "−"; 2) and Ether particles of the 2nd type—"3", "2", "1".

Ether is the fundamental Medium of creation of the Universe. This is an environment consisting of 3 Elementary Particles of different quality, different dynamics and different possibilities of penetration into the spaces of the worlds of the Universe; this is invisible matter of the lowest level, the lowest energy state, which at the beginning of Creation, structuring, turned into Dark energy and

Dark matter, that is, into two matters of the highest level, and then, compacting and acquiring one form or another, it became the materiality of all visible objects of the Universe.

The hypothesis about the Ether as the basic matter of the Universe required an answer to a number of key questions.

1) Why did our Universe need 2 different types of elementary particles at the earliest stage of construction, that is, Ether particles of two different levels—Ether of the 1-st and Ether of the 2-nd type? Ether of the 1-st type is an emanation of the invisible, but most powerful energy—space—the transcendent energy of Borromeo's "rings". The Universe rests on it. In that period of Creation, when our Universe looked like a formless "platform" in an unimaginably huge "bubble" of space, it was from the matter of the Ether of the 1-st type that its "building" was erected. If we imagine a similar picture of the construction of any building on Earth, then it will not seem strange to us when its foundation, double walls, and a frame with interstory ceilings are built from the same strong and durable elements of building matter. Only after the construction of the building, all its floors can be filled with household utensils created from a completely different matter, and only then people settle on different floors and what is commonly called "the functioning of the structure" arises.

According to our hypothesis, the same principle was observed during the construction of the Universe. First of the Ether particles of the 1-st type "0", "+", "−", arising as a result of the decay of Borromeo's "rings" in a Black-and-White Hole (B-WH) [Articles 3, 4], and grouped according to the Principle of 3 Beginnings [4] in the triads of Universal Cosmic Matter (Dark Energy) /, the structure of the Universe itself was erected, consisting of two, "conditionally fixed" structures:

a) – a spherical Double shell of particles "+" and "−", and an adjacent field of "0"–"strings" with lengths comparable to the size of the Universe. If we proceed from the analogy that the Double Shell is the "outer and inner walls of the building", and the Field is the "foundation" with which the Shell naturally creates a "single whole", it is not difficult to understand how the Ether of the 1-st type "0", "+", "−", becoming one a triad ("0", "+", "−"), it automatically turns into matter of a different level, that is, into the Dark energy of the Universe. And here we would like to try to answer one more question: why does it seem to us erroneous to use the term "space-time" (which has become familiar to science), instead of the term "Field"? The double Shell of the Universe of "+" and "−" in conjunction with a Field of "0"–"strings", where each separate "0"–"string" connects on opposite sides of the Shell with its "+" and "−", ensures the entire existence of the Universe as a self-sufficient totality with an unimaginable number of potential possibilities. The field of "0"–"strings" is the basis, the "foundation" for the "outer and inner walls of the building" of the Double Shell of "+" and "−". Just as the "outer and inner walls" cannot be built in the air (in some "space-time"), that is, without support on a solid foundation, in the same way the Double Shell of the Universe of "+" and "−" cannot exist in some "space-time", in isolation from its "foundation"—the unique gravitons of the

Field of "0"−"strings". If it were possible to look at the Shells "+", "−" with the "infinite '0'-strings" attached to them, using the scale principle, then a remote observer would see only 2, differently glowing spheres of the Universe of particles "+" and "−" connected by a Field of infinitely long "strings-'0'". But the same observer, approaching these objects, would see in the spheres of these 2, differently glowing Shells, an innumerable number of the thinnest "rings", in a peculiar way intertwined into triads. At the same time, all the "rings" of the Shell of the Universe of unimaginable dimensions, together with the same immeasurable "0"−"rings" of the Field, only repeat the method of connecting the Primary Parent Matter-Space—3 inseparable "rings" of Borromeo.

b) – 3 spheres of the Primary Relict (that is, the "frame of a 3-storey building"), consisting of ("0"), ("+") and ("−"), in their unity, too, personifying the power of the interweaving of Borromeo's "rings" from space as one of the most important properties of the Dark energy of the universe. In his mathematical calculations [8] we were able to confirm the presence of the relative immobility of the 3 Spheres of the Primary Relict in the "building" of the Universe with the existence of the dynamics of transitions within its layers.

And only after the construction of the "building" ("foundation", "external and internal walls", "frame with inter-floor internal ceilings") A universe of Dark Energy Triads "0", "+", "−" (that is, the double Shell of the Universe with a field attached to it and 3 spheres of the Primary Relict), the creation of triads of another kind (another level) of universal cosmic matter—Dark matter of 6 types /ITM 3 (1, 2), ITM 3 (2, 1); TTM 1 (3, 2), TTM 1 (2, 3); RTM 2 (3, 1), RTM 2 (1, 3)/, which were formed only on the basis of Type 2 Ether "3", "2", "1", originated in the "seeds of Creation" as a result of BV. This explosion, recorded by science as a fact, became the visible, but far from the last transition that eventually led to the formation of baryonic matter of different worlds [5] [6].

2) What qualities (in addition to the above-mentioned "invisibility", "transcendence", "total self-sufficiency") do elementary Ether particles of the 1st type possess "0", "+", "−", that is, the particles from which 70% of the Dark energy of the Universe is created? According to our concept:

a) Particles "0" are a source of colossal dynamism, a form of movement of a special nature, the personification of "eternal movement". In addition, they embody the ability: to unite (integrate, glue) any matter, freely penetrating into all corners of infinite space; it is easy to deform it in space, which is especially important for the effective functioning of the field of the universe, the structures of multidimensional worlds, galaxies, etc.

b) The "+" particles represent the ability to create, to fill with life and meaning everything that exists.

c) The particles "−" represent the ability to charge any creation of the cosmos with intelligence.

And yet, apparently, in the Ether particles of the 1-st type, despite the unimaginable properties shown above, there was something that did not allow space to be limited only to this matter for the successful Creation of the worlds of the

Universe. It is possible that the elementary particles of Ether of the 1-st type possessed excessively rigid definiteness of their qualities, which prevented flexible modification, adaptation to the conditions of worlds of different dimensions for the creation of an infinite variety of their materiality. And then, according to our hypothesis, new conditions were created in the B-WH, that is, another "transition" in the form of a Big Bang in the "seeds of creation" for the possibility of the formation of a second type Ether and the birth of six types of Dark Matter.

3) How did the substance of Ether of the 2-nd type arise at the initial stage of the creation of the Universe? This happened in the process of further self-decomposition of the remaining 30% of Ether particles of the 1-st type "0", "+", and "−", accumulated in the central part of the B-WH space. Initially, an equal number of "+" and "−" particles appeared in this zone (10% each). Then a rapid "0" (another 10% of particles) burst into their environment, forming special ("swaddled") triads with "+" and "−" ("0", "+", "−"). The unique energy of bonds-"staples", which for a very short time preserved in each triad a single and close interaction of particles of 3 different qualities inside a closed space, created conditions for the unhindered transition of the energies "0", "+" and "−" into each other. This allowed each particle in each triad of the "clot" to acquire not one natural, but three different properties at once. Moreover, these qualities were recorded in them as a code of Universal Cosmic laws of the process of self-disintegration of particles in the upcoming creation of the worlds of the Universe. Self-unfolding included: a) Code as a way of storing information; b) Code as a system of information transformation; c) and code as a way of transmitting information [6] [7].

The "swaddled" triads of Dark Energy were called by us "seeds of Creation". After BV, they changed their appearance, turning first into the matter of Chaos—Substance "3", "2", "1", and then—into the matter of Order, that is, into the Ether of the 2nd type [4] [5].

4) But how did the Chaos that reigned immediately after the BB turn into an Order that formed the Ether of the 2nd type? In this, according to our hypothesis, a special role was played by the amazing properties of two relatively stationary structures—a double Shell "+", "−" together with a Field of infinite "0"−"strings" and a Primary Relict of 3 Spheres "0", "+", "−".

These basic, most stable parts of the mechanism of the Universe still "supervise" all its internal processes, and, if necessary, "regulate" them. But in the period immediately after the BB, the role of these structures in restoring Order in conditions of Chaos could hardly be overestimated. From some physical experiments on Earth, we know that the right order can be created by a fixed frame on which devices with initially randomly oscillating pendulums are installed. Similarly, the basic part of the Universe (a stable double Shell with a Field adjacent to it and three relatively stationary spheres of the Primary Relict), some time after the BB, were able to restore proper order in a chaotically moving Substance, transforming it into a second Type of Ether "3", "2", "1" [5].

How did it happen? Substance "3", "2", "1", being in the process of decreasing chaotic movement in the zone of influence of one or another sphere of the Primary Relict ("0"), ("+"), ("−"), it was subject to 2 conditions (laws) of the self-deployable Universe: the law the "place" and the associated law of the main "Force" (Beginning, Energy) manifested in this "place". If the particles of the Substance "3", "2", "1" if, for example, in the sphere of the Primary Relict consisting of "0", then under the influence of specific vibrations and the structure of the energy spectrum of this sphere (the most powerful of all 3 spheres of the Primary Relict), elementary particles of the Substance "3" (the former "0" of Dark Energy) naturally acquired the functions of a guiding force (Beginning, Energy), that is, a leader who sees the Goal and is able to achieve it. The knowledge about the necessity of such behavior was stored in the self-unwrapping code of the particles "3".

The other part of the vibration "3", "2", "1", caught in a zone consisting of elementary particles of the Primary Relict ("+"), obeyed the vibrations and structure of the energy spectrum that operated in this area, and hence the discipline and intentions laid down in the particle code "1" (former "+" Dark Energy), responsible for the ability to Create, fill with Life and Meaning Everything That Exists.

The third part of the Substance "3", "2", "1", having fallen under the influence of the vibrations of the zone "−" and the two named Conditions (laws) of the Creation of the Universe, it was rebuilt, choosing as leaders particles with the sign "2" (former "−" of Dark Energy), in the self-unfolding code of which was laid the possibility of introducing Reason and Consciousness into All Things. [5] [6].

5) Could the Ether, as the basic building matter, remain unchanged during the birth of absolutely different materiality of the Worlds of the Universe in the Descending Rays of Creation, that is, in the World of rapid Flows of Integration Dark Matter (ITM), in the World of Giant stars or in the World of Yellow Dwarfs with gas planets like Jupiter or planets like Earth and her moon companion? How could 6 types of invisible Dark matter of the Universe be formed from the Ether of the 2nd type? What is the mechanism of this phenomenon? Here everything explains the process of transformation of energies, which underlies the birth of any Universal Cosmic matter. Let's look at these issues in more detail.

Earlier we showed that in the Substance "3", "2", "1", who found herself after BB in one or another Sphere of the Primary Relict ("0"), ("+"), ("−"), the order began to be looked after by that particle-leader, whose vibrations they were related to the energy background of this Sphere. It was this event that transformed the previously aimlessly moving Substance "3", "2", "1" into the Ether that obeys certain rules of the medium, that is, into the Ether of the 2nd type. But how was the matter of the Ether of the 2nd type able to rise to a new level, becoming Dark matter of 6 types? What had to happen to the triads of this Ether to change the quality of particles in them, and hence the properties of matter? In the real world,

the transformation of energies is a very complex process. The fact is that each category of energies of any world of the Universe has its own sublevels; any energy that actually occurs is a mixture of several shades of the same quality; there are various secondary transformations with their own destiny, etc. But if the process of transformation of cosmic energies is artificially simplified, the following patterns will be revealed:

a) The concept of "uniting into triads of higher-quality matter" for each particle, first of all, means "to determine your specific place in the triad and the possibilities associated with this place." According to the Main Rule of Transformation, at the "assembly point" of the triads of future matter, each particle that possessed three energies at once (integrating, creative and intelligent), previously acquired in the closed space of the "seeds of Creation", now received the right to establish for itself only one of the 3 possibilities—to become in the triad of a new material level or "neutral", or "active" or "passive";

b) the process of energy transformation is the interaction of 3 Principles (3 energies), leading to an increase in the level of one of the energies (anabolic transformation) due to a decrease in the level of another energy (catabolic transformation); at the same time, the third energy does not change its usual level. The main meaning of the transformation is that the power of the leader, his Strength increases due to the energy that he shared earlier (back in the "seeds of Creation"), and which he now takes away from the passive (only from the passive!) particles. But, what is especially important, an increase or decrease in the level of energies in the triad does not just mean an increase (or decrease) in the quality of these energies, but leads to a change in the properties of matter as a whole!

Let's consider the process of transformation of energies by the example of the transformation of the Ether of the 2nd type "3", "2", "1" into one of two types of Integration Dark Matter 3(1, 2). Matter of this quality could arise only in a "place" (sphere). The Primary Relict that radiated the energy of "0"-gravitons, where the leaders of the Ether, who established Order in this sphere after BB, were particles numbered "3". To really become energy (matter) Of the highest level in the Universe, which means that it is even more gravitationally saturated than it was within the framework of Type 2 Ether (after all, ITM is designed to "glue" the baryonic matter of galaxies…and not only!), the "neutral" particle of Ether "3" in the process of transformation gained a double portion of this energy (anabolic transformation), having selected for this purpose a part of the integration (binding) property of the "passive" particle "2" (catabolic transformation); at the same time, the "active" particle "1"—as it possessed all three properties, and remained at the same level and in the same quality. Thus, in the Universe, the triads of Ether of the 2nd type are subordinated to the cosmic Law of Energy Transformation, that is, the Law of Energy Level Change, which means changes in the quality of matter. Thus were born two types of Integration Dark Matter (ITM) of the Universe 3 (1, 2); 3 (2, 1) and two other types of Dark Matter—TTM 1 (3, 2); 1 (2, 3) and RTM 2 (3, 1); 2 (1, 3).

How different types of invisible Dark matter became the basis for the formation of conditional "atoms"—"bricks" of the visible materiality of all the worlds of the Universe, we have considered in detail in our previous works [5] [6] [7].

Here we only recall that each "brick" of the Higher World (the world of ITM, the world of "Flows of ITM") was created from 3 Forces (Principles, Energies) "3", "2" and "1" of the Ether of the 2nd type, located in the Higher Sphere of the Primary Relict "0", but passed the process of transformation of energies in conditions when the particles numbered "3" were the leader in the triads, which allowed the triads to transform into Integration Dark Matter 3 (1, 2); 3 (2, 1). The special power of the conditional "atoms"−"bricks" of this world of the Universe consisted in the fact that 3 Forces (3 particles of the ITM world) participated in their construction, which in their qualities most corresponded to the properties of 3 Borromeo "rings" from space, and hence their capabilities.

The materiality of the Middle World (the TTM world, the world of "Giant Stars") was built from "bricks", which already included 6 Forces (Beginnings, Energies): these were 3 "atoms"−"bricks" of ITM that descended into the Middle World from the Upper World, united with the 3rd Forces belonging to the Middle World (the middle Sphere of the Primary Relict "+"). At the same time, every 3 forces of the Ether of the Middle World, in which the number "1" particles were the leaders, previously went through the process of energy transformation and turned into matter of a higher level—into Creative Dark Matter 1 (3, 2); 1 (2, 3). The formula of the conditional "atoms"−"bricks", from which the baryonic matter of the objects of the world of Giant Stars in the Ray of Creation was created, looked like this: 3 particles of the ITM of the Higher World + 3 particles of the TTM of the own, Middle world = 6 particles of the "atom"−"brick" of the TTM world.

And finally, each conditional "atom"−"brick" of the Lower World of the Ray of Creation (the world of RTM, the world of Yellow Dwarfs) was formed from a "brick" of the world of ITM + a "brick" of the world of TTM + a triad belonging to the Lower World / lower Sphere of the Primary Ether "−", where the leaders were the particles "2", have undergone the process of transformation and turned into the Dark Matter of the Lower World – Intelligent Dark Matter 2 (3, 1); 2 (1, 3)/. "Atom"-the "brick" of the Lower World consisted of the following parts: 3 ITM of the Upper World + (3 ITM + 3 TTM) The middle world + 3 RTM of its own world = 12 particles of the "brick" of the RTM World.

The method of creating the baryonic matter of the Universe indicates that the own (local) matter of a particular world was formed each time from the Ether of the 2nd type. Externally, in each sphere of the Primary Relict ("0"), ("+"), ("−") mass accumulations of Ether of the 2nd type have always looked monotonous, like "3", "2", "1", but we have seen that under the influence of the energy background of the Spheres of the Primary Relict (and the allocation of the figures of the leader particles responsible for the Order), there were changes at the deep level in the type 2 Ether triads. This radically changed everything, starting from the quality of the new (dark) matter being created and ending with the goals and

objectives of the created worlds, the level of their transcendence and self-sufficiency. This allowed us to draw an important conclusion: if our hypothesis about the existence of Ether is correct, then the worlds of the Universe are not created simply from 2 types of Ether, as we showed earlier. A crucial role in the creation of the Universe was played by the alternation of quantum transitions, thanks to which the Ether of different types and subtypes was formed, transforming into invisible Universal Cosmic Dark Matter of various qualities, part of which was then transformed into the visible baryonic matter of the worlds (see in Table 1 and Table 2).

Alternating Quantum Transitions as a way of Creating the Universe

Table 1. Creation of the worlds of the universe from the Ether of the 1st type.

The Substance of Chaos, as a result of the functioning of Black-and-White Holes in the bubble of O_{SP} space "0", "+", "−" (100%)		
Ether of the 1st type, as a Substance of the Order "0", "+", "−" (70%)		Ether of the 1st type, as a Substance the Order "0", "+", "−" (30%)
The Double Shell of the Universe "+", "−" and the "0" Field attached to it	The Three Spheres of the Primary Relict "(0)", "(+)", "(−)"	"Clot", "Seeds of Creation", "Birth in the seeds" of the self-unfolding code of the Universe
Dark Energy "0", ("+", "−")	Dark Energy "0", ("+", "−")	Big Bang (transition)

Table 2. Creation of the worlds of the universe from the Ether of 2nd type.

Big Bang (transition)		
Substance "3", "2", "1" (Chaos)		
Ether of the 2nd type as a Substance of the Order (compliance with the conditions of "place" and "leader")		
Ether The Higher World "3", "2", "1"/"3", "1", "2"	Ether Middle World "1", "3", "2"/ "1", "2", "3"	Ether Lower World "2", "3", "1"/"2", "1", "3"
Activation of the transformation mechanism for the formation of DM (25%)		
Formation of DM ITM 3 (2; 1), 3 (1; 2)		
Creation of "atoms-bricks" of the baryonic matter of the Higher world (the World of Flows)—3 ITM. Occurrence "ITM Flow"		
The formation of "Dark Stars" from the "Stream" (its initial form—the source). The goal is to rehit the Ether of the Middle World The emergence of B-W Holes from "Dark Stars". The goal is to increase the reserves of Ether of the 2nd type. Resumption of the flow of ITM.		
Formation of DM TTM 1 (3; 2), 1 (2; 3)		
Formation of "clumps-nuclei" of future galaxies. Explosions and splashing of matter clots.		
Creation of "brick atoms" of the baryonic matter of the Middle World (Giant stars) – 3 ITM + 3 TTM		
The emergence of B-W holes from "Giant stars". The goal is to increase the reserves of Ether of the 2nd type of the Lower World for the construction of the world of Yellow Dwarfs		
Formation of DM RTM 2 (3; 1), 2 (1; 3)		
Creation of "brick atoms" of the baryonic matter of the Lower World (the World of Yellow Dwarfs) – 3 ITM + (3 ITM + 3 TTM) + 3 RTM		

In Table 2, it is continued description of the transition modes which are under the Big Bang production and all further matter structures are formed due to the Ether of the second type, consisting from the particles of the Substance "3", "2", "1".

6) Analyzing the Scheme presented above, we tried to briefly answer one of the most important questions: what is the specific feature, what is the nature of the mechanism that allowed the Indefinable and Infinite space to create universal cosmic matter (Dark Energy; Dark Matter) and the materiality of the 3 Higher Worlds of the Universe from the Ether of the 1st and 2nd types?

As can be seen from the diagram, the process of creating the early Universe was of a wave–like nature, in which changes in external conditions—pressure, temperature, etc.—were accompanied by the transition of matter from one phase to another. The descending Rays of Creation, in essence, represented a series of phase transitions associated with a gradual compression, an increase in the density of matter of infinite space (that is, a gradual limitation of the World itself as it moves down the Ray of Creation), and a sharp change in the properties of this substance, increasingly weighing matter and reducing the density of its vibrations. This process was carried out on the basis of information about the self-unfolding of the Universe, embedded in the code of elementary particles of Ether 1 - 2-type, and the inclusion in the work of the mechanism of energy transformation.

This is how, according to our concept, these numerous phase transitions could look like during the construction of our Universe.

1st transition. Indefinable and Boundless—a space possessing zero, incomprehensible to the human mind, extremely sparse ("Indefinable") density of matter, and unimaginable, boundless ("Infinite") density of vibrations, for the first time limited itself by compressing and destroying in the narrow space of the funnel of a Black Hole n-th number of "rings" Borromeo. Following this, a powerful exhaust of already modified matter – Substance occurred in the White Hole "0", "+", "−" as a type 1 Ether with a density of vibrations significantly different from the properties of matter of the Indefinable and Boundless-space. The density of newly formed matter has increased, and the density of its vibrations has decreased.

2nd transition. The formation of a special "Clot" in the White Hole—a new restriction—by the space of oneself (that is, the creation of "swaddled" "seeds of Creation" ("0", "+", "−") of 30% Ether of the 1st type. This was followed by a Big Bang and a spontaneous expansion of the White Hole space with the formation of Substances "3", "2" and "1".

At the same stage, 70% of Type 1 Ether was formed: a) The field of the Universe of infinite "0"−"strings" combined with the double shell of the Universe ("+", "−"); b) and 3 Relict Spheres of "0", "+" and "−". These 2 types of cosmic structures are "+(0)−" and ("0"), ("+"), ("−") They represent the Dark energy of our Universe.

Under the influence of the Law of "place" and "leading Force" (Origin, Energy), as well as under the influence of specific vibrations and structures of the energy spectra of the 3 Spheres of the Relict, the lightest, fastest triads of the Ether of the 2nd type were placed in the Sphere "0", others—in the Sphere "+", and the most heavy and slow—located in the Lower Sphere of the Relict ("−"). So Chaos turned into Order.

In the Zero ("0") Sphere of the Relict, the triads of Ether particles of the 2nd type transformed into the fastest, brightest powerful and, so to speak, "hot" matter of the Universe—two types of Integration Dark Matter (ITM) 3 (1, 2) and 3 (2, 1)—the matter of Luminous Streams of ITM. "Atoms"–"bricks" of this matter, consisting of 3 ITMS, were intended for the construction of objects of the Middle and Lower worlds: the world of Giant Stars and the world of Yellow Dwarfs. During this period, the universe was illuminated, the Era of recombination came.

But then, an unforeseen circumstance intervened in the process of self-unfolding of the Universe. Approximately about 380,000 years after BB, the Universe cooled down so much that it affected the mobility of Type 2 Ether located in the Relict Spheres "+" and "−". And this meant that the sedentary Ether, for example, the middle Sphere "+" (not to mention the Ether of the Lower Sphere "–"), Did not have the strength to engage in the process of energy transformation and turn into triads of Dark Matter—TTM, which were supposed to participate in the creation of "atoms-bricks" of the world Giant Stars. And then another quantum transition was required.

3rd transition. The formation of Luminous Streams of ITM was temporarily interrupted. The period of Darkness has come. At this stage of self-deployment of the Universe, all the matter of the ITM Streams was transformed into clusters of "Dark Stars" of gigantic size, emitting transcendent "black light". Further change (compaction) of matter took place in 2 stages: a) the formation of "Dark Stars" allowed for a powerful heating, which means that the frozen ether particles in the Middle Sphere of the Relict "+" were brought into a mobile, working state; this, in turn, created the necessary prerequisites for their transformation into Creative Dark Matter (TTM) of two types—1 (3, 2) and 1 (2, 3); b) at the 2nd stage, an even greater condensation of Dark Stars occurred, the formation of Black-and-White Holes on their basis made it possible to multiply the reserves of Ether 2-th type in order to resume the movement of luminous streams of ITM.

The 4th transition is associated with the rapid movement of matter flows ITM down the Ray of Creation, culminating in another self-limitation of space—the creation of special "clumps"—the "cores" of future galaxies [5] [6]. The compaction and subsequent overflow of the "cores" by triads of matter ITM led to powerful explosions and splashing in the space of the Universe. This was the period when the matter of the ITM Streams, combining with the TTM triads of the Middle World, created "atoms"—"bricks of 3 ITM + 3 TTM", and from them—the materiality of the Middle World—the Stellar world, like our Milky Way.

5th transition. The newly created Stellar World by the very fact of its existence prepared 2 conditions for the further functioning of the worlds of the Universe: a) "stellar worlds" were a natural, convenient way to warm up elementary particles of Ether of the 2nd type of the lower Relict zone ("−"), which led to the formation of two types of Dark matter of the Lower World—2 (3, 1) and 2 (1, 3), that is, the triads of Intelligent Dark Matter (RTM); separate small "splashes" of ITM Streams in the world of forming Giant Stars, connecting with the RTM triads, formed materiality—"bricks" of 3 ITM + (3 ITM + 3 TTM) + 3 RTM of the world of Yellow Dwarfs like our Sun; b) the transformation of individual Giant Stars or Galaxies into Black-and-White Holes made it possible to create "waste-free production factories" of elementary Ether particles of the 2nd type for the construction of new star systems and galaxies.

So, in our opinion, thanks to the phase transformations of one medium into another, the Indefinable and Infinite O_{SP}-space created the worlds that we call our Universe.

7) How does our concept of the existence of ethers of the 1st and 2nd type answer one of the unsolved problems of physical cosmology—are these types of Ether evenly distributed in the Field of the Universe?

The field of the basic matter of the ether of the 2nd type, which actively participated in the formation of the materiality of the worlds of the early Universe, was not distinguished by some noticeable inequality in its large-scale structure, exceeding several hundred million light-years. The same can be said about the field of the modern Universe, which at large scales appears homogeneous, isotropic.

But if the Observer is not located at such a huge distance, the isotropy of the ether of the 2nd type in some parts of the Universe is replaced by anisotropy… The reason is that the physical conditions at different points of the Universe are different. This leads to a deviation from uniformity, to anisotropy. Is it possible to assume that there is a type 2 ether in our Solar System? But why would he be here? After all, the Solar System was built relatively recently, new stages of growth, development, and evolutionary transformations await it… It is quite another matter – the ancient worlds of Giant stars, individual objects of which, having self-destructed in Black holes and turned into elementary particles of Ether of the 2nd type, become the basic material for the construction of new stars and galactic systems of the Middle worlds of the Universe.

Does the idea of the absence of type 2 Ether in the Field of our Solar System mean that there is no ether in it at all? Of course not. There are no regions in the Universe where ether of the 1st type, whose particles are elements of the Dark Energy of the Universe, would not be present. This type of Ether is always isotropic and does not depend on the principle of scale. The cosmological principle in its classical sense does not work with this type of Ether.

And finally, our concept of the existence of a type 2 Ether allows us to answer one more of the unresolved questions of cosmology: we believe that it is the ev-

er-increasing (in comparison with the Early Universe) number of B-WH and the ever-increasing accumulation and movement of type 2 Ether emissions associated with their activities that caused the accelerated expansion of the Universe space.

4. About the Unity of the Micro and Macro Worlds

The central idea of our concept [4] [5] [6] [7] [8] is the idea of the unity and integrity of the entire Universe, which includes the same principle of operation, the law in Macro and Micro cosmos, a single way of constructing their structures, the identity of types of matter of different levels both in the worlds—"matryoshka dolls" of the Universe, and in the shells of primary "atoms"–"bricks", from which all space objects were built in the early Universe.

Let's consider this idea by the example of the structure of the conditional "Core" and the location of the "shells" of conditional electrons in the "primo atoms"–"bricks" from which the objects of the worlds of our Solar system, including the world of the Earth, were created [v.2].

The "primordial atom"–"the brick" of the Higher World (the world of the Source of the "Luminous Streams") consisted of only one shell, inside which there were 3 ITM (Integration Dark Matter). It is the most dynamic, brightest, rarefied and gravitational universal cosmic matter of our universe. It was she who became the Beginning of all Beginnings. It was her "bricks", successively descending into the Middle Worlds and attaching to themselves the triads of Creative Dark Matter (TTM), created primo atoms from 6 particles that formed the World of Giant Stars: 3 ITM + 3 TTM = 6 particles, which, taking into account the shell structure of the atom, can be depicted as: 3 – the triad of matter of Giant Stars) 3 – triad of ITM/Flows = 6 particles of the Universe.

Having descended to the Lower World, the same matter of the Higher World continued to form the primordial atoms of Yellow Dwarfs.

Thus, the primary atoms of the Sun were formed from the following types of universal cosmic matter: 3 ITM + (3 ITM + 3 TTM) + 3 RTM = 12 particles, where RTM is Intelligent Dark Matter.

If this equality is represented by depicting the "primary"–"bricks" of the Yellow Dwarf Sun in the form of shells, then schematically it will look like this:

3 – the triad of the matter of the Sun) 6 – the matter of Giant Stars) 3 – the triad of ITM / Streams = 12 particles of the Universe.

Extending this principle to the gas and crystal planets of the Solar System, we will get the following two structures of the shell formation of "primoatoms"–"bricks" that took part in the construction of objects of these worlds at the earliest stages of the creation of the Universe.

Gas planets (Jupiter, Saturn, Uranus): 3 – gas planet triad) 12 – matter of Suns) 6 – matter of Giant Stars) 3 – triad of ITM/Streams = 24 particles of the Universe.

Crystal planets (Mars, Earth, Venus, Mercury):

3 – the triad of a crystalline planet) 24 – the matter of gas planets) 12 – the matter of the Sun) 6 – the matter of Giant Stars) 3 – the triad of ITM / Streams = 48 particles of the Universe.

If we now try to consider the structure of our Galaxy through the eyes of a Remote Observer and compare it, for example, with the structure of the "primoatoms"-"bricks" of the Earth, we can see that it, built on the principle of a huge "matryoshka", is also a giant atom.

The smallest "Matryoshka" shell consists of the aggregate matter of crystalline planets, which is embedded in the "Matryoshka" shell of all gas planets. The next shell is made up of all the Yellow Dwarfs of our Galaxy, which, in turn, are part of a huge "Matryoshka"-the shell of the entire Stellar galactic World. But this world is also placed in the world of ITM/Streams – mysterious, super dynamic and still unsolved, partially represented in the form of a Black Hole.

If a Remote Observer rises above our entire Universe, he will see its model in the form of a shell structure, also resembling a "Matryoshka" Atom.

Below, let's consider an example of a cosmological model demonstrating the possibility of the physical realization of such an idea.

5. About the Model of the Universe in the Form of "Matryoshka Doll" or an Atom

In [11], a class of isothermal, spherically symmetric, static inhomogeneous models of universes in which the pressure gradient is compensated by gravity is constructed. The interest in these models is caused by the fact that they can describe the final stages of the Einstein-de Sitter-type state of the universe, before phase transitions that lead to the clustering of matter. In [11], a 4-dimensional case is considered, which is directly related to the Universe we observe. However, in the light of string theory and alternative theories of gravity, it is of interest to study generalizations of this model to the multidimensional case. This may be especially important in the framework of the approach developed in [5] [6] [7], when it is possible for the Universe to be born from a multidimensional domain with subsequent degeneration or compactification of additional spatial dimensions, with dimensions $n > 4$. At the same time, interesting features are found that are absent in the models with $n = 4$, but manifest themselves at higher dimensions.

A multidimensional generalization of Einstein's equations, for with, is considered in [12] [13], where a system of natural units $8\pi G = c = 1$ is chosen and the metric is represented as:

$$ds^2 = e^{\nu}dt^2 - e^{\lambda}dr^2 - r^2 d\Omega_{n-2}^2 \tag{21}$$

where the metric functions λ and μ define the interval ds^2, n- is the dimension of space-time, and $d\Omega_{n-2}^2$ is the metric on the unit sphere of dimension $n-2$. From the generalized Einstein equations, in the spherically symmetric case, we obtain equations relating metric functions λ and μ to both density ρ and pressure p:

$$\rho = \frac{n-2}{2r^2} \cdot \mathrm{e}^{-\lambda} \left(rv' - (n-3)\left(1 - \mathrm{e}^{\lambda}\right) \right) \tag{22}$$

$$p = \frac{n-2}{2r^2} \cdot \mathrm{e}^{-\lambda} \left(rv' + (n-3)\left(1 - \mathrm{e}^{\lambda}\right) \right), \tag{23}$$

and also the isotropization equation, written as:

$$v'' + \frac{1}{2}v'^2 - \left(\frac{1}{2}\lambda' + \frac{1}{r}\right)v' - 2(n-2)\left[\frac{1}{r}\left(\frac{1}{2}\lambda' + \frac{1}{r}\right) - \frac{\mathrm{e}^{\lambda}}{r^2}\right] = 0 \tag{24}$$

Assuming that the density of the distribution of matter is expressed by the ratio $\rho = \alpha/r^2$, where α—is a parameter of the model that determines the properties of the medium, and r—the distance from a fixed center to the point under consideration, from the ratio (22) we obtain:

$$\mathrm{e}^{-\lambda} = 1 - \beta, \text{ where } \beta = \frac{2\alpha}{(n-2)(n-3)} \tag{25}$$

Equation (24), taking into account (25) can be written in the form:

$$v'' + \frac{1}{2}v'^2 - \frac{1}{r}v' - 2(n-3)\left(\frac{1 - \mathrm{e}^{\lambda}}{r^2}\right) = 0 \tag{26}$$

By introducing an auxiliary function $\psi = \mathrm{e}^{\frac{1}{2}v}$, we come to an equation of the type:

$$r^2\psi'' - r\psi' + \frac{\beta(n-3)}{1-\beta} = 0 \tag{27}$$

the solution of which we will look for in the form of a power function $\psi = C \cdot r^{\gamma}$, where C is a constant. Then we get that:

$$\psi = C_1 \cdot r^{\gamma_1} + C_2 \cdot r^{\gamma_2}, \text{ where } \gamma_{1,2} = 1 \pm \sqrt{1 - \frac{\beta(n-3)}{1-\beta}}, \tag{28}$$

or taking into account the entered designations:

$$\mathrm{e}^{\frac{1}{2}v} = C_1 r^{1+\sqrt{1-\frac{\beta(n-3)}{1-\beta}}} + C_2 r^{1-\sqrt{1-\frac{\beta(n-3)}{1-\beta}}} \tag{29}$$

Then the interval $\mathrm{d}s^2$, taking into account the obtained metric functions, can be written as:

$$\mathrm{d}s^2 = \left(C_1 r^{1+\sqrt{1-\frac{\beta(n-3)}{1-\beta}}} + C_2 r^{1-\sqrt{1-\frac{\beta(n-3)}{1-\beta}}} \right)^2 \mathrm{d}t^2 - \frac{\mathrm{d}r^2}{1-\beta} - r^2 \mathrm{d}\Omega_{n-2}^2 \tag{30}$$

Solution Analysis

We assume that the metric in question is pseudo-Euclidean, and then we necessarily get the condition:

$$1 - \beta > 0 \rightarrow n > \frac{5 + \sqrt{1 + 8\alpha}}{2} > 4 \rightarrow \alpha > 1 \tag{31}$$

which ensures the immutability of the signature and pseudo—Euclidean space $\forall n \geq 5$. At the same time, it is easy to see that at the point $r = 0$ we have an

irreducible singularity, similar to the singularity in the Schwarzschild metric.

$$\text{A) Case} \quad 1 - \frac{\beta(n-3)}{1-\beta} \geq 0$$

Let's assume that $C_1 \neq 0$ and $C_2 \neq 0$. Then, on the asymptotics $r \to \infty$, we have that the metric tensor component $g_{00}(r \to \infty) \to \infty$ and $g_{00}(r \to 0) \to 0$ the physical meaning can only have solutions for the localized distribution of matter when $0 < r \leq R_{Surface}$, where $R_{Surface}$ is the radius of a multidimensional compact object. What is interesting here is the fact that a singularity, such as a Schwarzschild singularity with a finite horizon radius, degenerates into a point with a zero horizon radius and it is unattainable for an external observer. Then, the constants C_1 and C_2 are determined from the matching conditions of solutions obtained in (25) and (29) for an isothermal, spherically symmetric, static fluid with a Tangherlini metric [14] generalizing Schwarzschild vacuum solution for the multidimensional case. If at the same time the ratio is also fulfilled:

$$1 - \sqrt{1 - \frac{\beta(n-3)}{1-\beta}} \geq 0 , \tag{32}$$

then we can describe only localized distributions of matter in the region $0 \leq r \leq R_{Surface}$. This distribution of matter has an external surface. The question arises, under what parameters of the model is this situation realized? It is easy to show that:

$$1 - \frac{\beta(n-3)}{1-\beta} \geq 0 \to 1 < \alpha \leq \frac{n-3}{2} \quad \text{and then} \quad n > 5 \tag{33}$$

And in this case, condition (32) is fulfilled automatically, provided that the signature does not change, *i.e.* $1 - \beta > 0$.

The situation changes if condition (32) is violated and we have that when:

$$1 - \sqrt{1 - \frac{\beta(n-3)}{1-\beta}} \leq 0 \tag{34}$$

and $C_1 \neq 0$ and $C_2 \neq 0$, the distribution of matter can only be localized in some region, however, considering the special case, for $C_1 = 0$ and $C_2 \neq 0$, we see that there is such a solution that the component of the metric tensor is asymptotically $g_{00} \to 0$, which means a singularity on the surface $r \to R_{Surface} \to \infty$ and we get a singularity similar to the Schwarzschild singularity on an infinitely distant surface, while, for $r \to 0$, we get that $g_{00} \to \infty$ the distribution of matter also has a physical meaning at $R_{Surface} \leq r < \infty$, while such a distribution of matter, filling the entire space, has a cavity with an inner surface $R_{Surface}$. In this case, the solution obtained for a region with distributed matter is crosslinked with a vacuum Tangherlini solution on the inner surface $r = R_{Surface}$. From analysis a) it follows that condition (33) is not feasible, taking into account $1 - \beta > 0$ and it requires the fulfillment of the inverse condition $1 - \beta < 0$, then the condition $1 - \frac{\beta(n-3)}{1-\beta} \geq 0$ is transformed into $1 + \frac{\beta(n-3)}{\beta-1} \geq 0$ and it is valid. In this case, condition (33)

is also automatically fulfilled. But this situation is realized when one of the spatial dimensions is similar to the temporal one, that is, the signature changes compared to the usual pseudo-Euclidean signature of a Riemannian manifold. Four-dimensional analogs, for flat spaces, will be the following flat metrics:

$$g_{\mu\nu} = \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 0 & 0 & -1 \end{pmatrix} \text{ and } g_{\mu\nu} = \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 0 & 0 & -1 \end{pmatrix} \tag{35}$$

$$\text{B) Case } 1 - \frac{\beta(n-3)}{1-\beta} \leq 0$$

Let's say $i\varepsilon = \sqrt{1 - \frac{\beta(n-3)}{1-\beta}}$ where $\varepsilon > 0$ and then metric (30) will be written as:

$$ds^2 = r^2 \left(C_1 e^{i\cdot\varepsilon\cdot\ln(r)} + C_2 e^{-i\cdot\varepsilon\cdot\ln(r)} \right)^2 dt^2 - \frac{dr^2}{1-\beta} - r^2 d\Omega_{n-2}^2 \tag{36}$$

here, assuming that $C \equiv (C_1 + C_2)^2$ and $C_1 = C_2$, expression (36) can be reduced to the form:

$$ds^2 = C \cdot r^2 \cdot \cos^2\left(\varepsilon\cdot\ln(r)\right) dt^2 - \frac{dr^2}{1-\beta} - r^2 d\Omega_{n-2}^2 \tag{37}$$

The restrictions imposed on the parameters of the environment α, in this case, are reduced to inequality:

$$1 - \frac{\beta(n-3)}{1-\beta} \leq 0 \rightarrow \frac{n-3}{2} < \alpha < \frac{(n-2)(n-3)}{2} \tag{38}$$

Let's examine the metric (37), taking into account the restrictions on the parameter α and the designations we have introduced, while noting that the point $r = 0$ is outside the scope of the metric definition (37) and the behavior of the metric at this point is indeterminate. For $r > 0$, we have:

$$\cos\left(\varepsilon\ln(r)\right) = 0 \rightarrow r_k = r_0 \cdot e^{\frac{\pi\cdot k}{\varepsilon}}, \text{ where } r_0 = e^{\frac{\pi}{2\varepsilon}} \tag{39}$$

From **Figure 2** we see a rather interesting behavior of the metric (37), where $g_{00}(r) = 0$ in points $r \rightarrow r_k = r_0 \cdot e^{\frac{\pi\cdot k}{\varepsilon}}$, here $k = 0, 1, 2, \cdots, \infty$. Thus, the physical domain for the existence of matter is determined by the condition:

$$r_0 \cdot e^{\frac{\pi(k+1)}{\varepsilon}} = r_k < r < r_{k+1} = r_0 \cdot e^{\frac{\pi(k+1)}{\varepsilon}} \tag{40}$$

The parameter $\varepsilon = \sqrt{\left|\frac{2\alpha - (n-3)}{2\alpha - (n-2)(n-3)}\right|}$ and then, metric (37), will finally be written, taking into account the dimension of the space n, in the following form:

$$ds_n^2 = C \cdot r^2 \cdot \cos^2\left[\sqrt{\left|\frac{2\alpha - (n-3)}{2\alpha - (n-2)(n-3)}\right|} \cdot \ln(r)\right] dt^2 - \frac{dr^2}{1-\beta} - r^2 d\Omega_{n-2}^2 \tag{41}$$

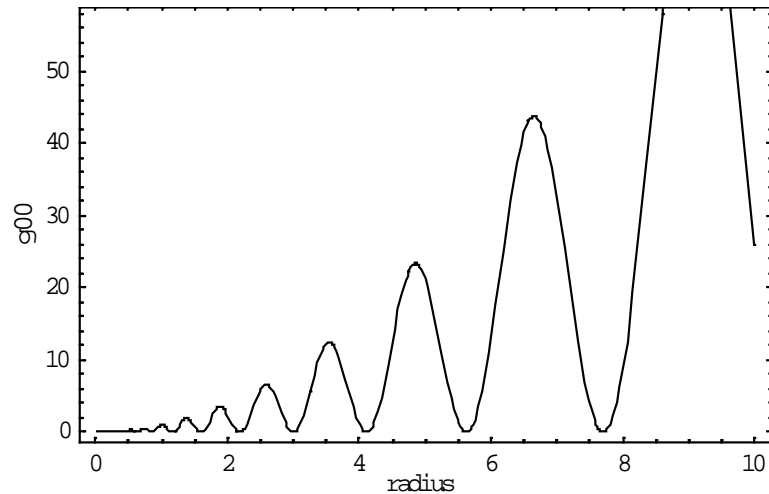**Figure 2.** Behavior of the normalized component $g_{00}(r)$.

In this solution, we obtain that the region of the spatial distribution of matter satisfies condition (40), while the regions of the discrete distribution of matter are connected by jumpers representing concentric singular surfaces with fixed radii r_k i. The area defined as $r \in \,]r_k, r_{k+1}[$ is a separate "physical world". In general, for arbitrary dimension n, it is enclosed between singular spherical hypersurfaces $r = r_k$. For an external observer inside such a region, the time of transition of a particle or body belonging to his world to another world tends to infinity and in this sense, all events inside this region are causally connected. All these worlds are a kind of "layered matryoshka" between the layers of which there are singular hypersurfaces.

At the same time, we get that in the case when the parameters of the medium and the dimension of the space in which this medium is located satisfy condition (38), then we have a model of the Universe in the form of a shell structure resembling an atom.

Based on the results obtained, we can determine the mass of each world enclosed between singular hypersurfaces:

$$M_k^{(n)} = \int_{r_k}^{r_{k+1}} \rho(r)\sqrt{-g}\,dV_n = \alpha \int_{r_k}^{r_{k+1}} r^{-2} \cdot \sqrt{-g}\,dV_n \qquad (42)$$

6. Main Conclusions, Results and Discussion

In this article, we continued to build the concept of "Everything", a system that can look logically consistent and maximally take into account the laws of the Universe already discovered by science and confirmed by experience. The existence of Ether in the worlds of the Universe as the basic matter of the lowest level and the lowest energy state, in our opinion, is one of such laws.

Is there absolute peace? And if it exists, what material object or physical entity is it attached to? If it does not exist, then, recognizing this, we necessarily come to the idea of "eternal movement", indestructible, and then the opposite question arises—what is the carrier of this eternal and indestructible movement? And is

the spin of a particle a manifestation of its internal dynamics, the nature of which is still unknown to us? The answer to the question that there is no dedicated frame of reference is not as obvious as it may seem at first glance. However, if we go beyond our usual ideas about understanding physical reality, then everything will not be so obvious. For example, suppose there is a two-dimensional world in the form of an expanding spherical surface. Then each point on its surface is the center of expansion, and among the reference systems selected at each point of the sphere, there is no dedicated reference system on the surface of the expanding sphere. But if we consider this expanding surface as embedded in three-dimensional space, then there is such a highlighted point, and this is the center of this sphere, which does not belong to the sphere itself, but defines it, and then the frame of reference associated with this center is a highlighted frame of reference. The radial expansion of the surface of a sphere for a three-dimensional observer, for a 2D observer on its surface looks like the scattering of points of the sphere from each other, such as the Hubble expansion. We want to understand what principles and physical entities form the physical reality that we observe?

Let us consider the problem of the expanding sphere from the point of view of the Newtonian approach. Suppose we have a ball with a radius r and the density of matter in it equal ρ, so that the total energy of a particle with a mass m on the surface of this ball is equal E, and the mass of this ball is equal M. Then we can write that:

$$m\frac{V^2}{2} - \gamma\frac{Mm}{r} = E \rightarrow \left(\frac{dr}{dt}\right)^2 - \frac{8}{3}\pi\rho\gamma \cdot r^2 = \frac{2E}{m} = \varepsilon$$

$$\rightarrow \frac{dr}{dt} = \pm\sqrt{\varepsilon + \frac{8}{3}\pi\rho\gamma \cdot r^2} \tag{43}$$

From where after a simple integration at $\varepsilon \geq 0$ we can write, that:

$$\int\frac{dr}{\sqrt{a^2 + r^2}} = \sqrt{\frac{8}{3}\pi\rho\gamma} \pm dt ,$$

$$a^2 = \frac{3\varepsilon}{8\pi\rho\gamma} \rightarrow r + \sqrt{a^2 + r^2} = Const \cdot Exp\left[\pm t \cdot \sqrt{\frac{8}{3}\pi\rho\gamma}\right] \tag{44}$$

And finally we have, that:

$$r(t) = \frac{1}{2}f(t) - \frac{a^2}{2f(t)} \rightarrow \text{where } f(t) = Const \cdot Exp\left[\pm t \cdot \sqrt{\frac{8}{3}\pi\rho\gamma}\right] \tag{45}$$

1) We have shown how, as a result of the destruction of Borromeo's "rings" in B-WH, a type 1 ether was born in a bubble of O_{SP}-space, 70% of which as Dark energy became the basis for the construction of the "building" of the Universe: a) a double Rim and a Field attached to it; b) 3 Spheres The Primary Relict (the prototype of the future 3 worlds—Higher, Middle and Lower).

2) Another part (30%) of type 1 ether, having undergone a number of transformations ("clot", "seeds of Creation", Big Bang), turned into a substance "3",

"2", "1"—the future three subtypes of Type 2 Ether. The gradual inclusion of the transformation mechanism allowed the creation of 6 types of Dark Matter from three different subtypes of this ether, which, in turn, served as the basis for the creation of "atoms"–"bricks" of baryonic matter of the Upper, Middle and Lower worlds.

3) The principle of constructing the Field of the Universe from the Ether of infinite "0" strings and the role of 3 Relict spheres in restoring order in the Chaos of the ether substance formed after the Big Bang is shown. The idea of the relative immobility of the 3 Spheres of the Relict with the existence of the dynamics of transitions within its layers is proved.

4) The transcendental properties of Ether particles of the 1st type are determined and the reasons that necessitated the formation of Ether of the 2nd type containing the self-unfolding code of matter in the phased Creation of the worlds of the Universe under construction are considered.

5) The mechanism of energy transformation is revealed, which allowed the Ether of the 2nd type to transform into Universal cosmic Dark Matter. It assumes compliance with 2 main conditions: a) "places" (taking into account the energy background of various spheres of the Relict ("0"), ("+"), ("−") and the "leadership" of one of the 3 Ether particles at the "assembly point" of the triad; b) compliance with the process of transformation of energies as an interaction of 3 Principles.

6) The way of transformation of invisible Dark matter into visible materiality (baryonic matter) of the Universe is shown: the path from the Ether of the 2nd type to the "atoms"–"bricks" of the Upper, Middle and Lower worlds.

7) The method of distribution of ether in the Field of the Universe is revealed: The Ether of the 1st type, regardless of the scale, is always isotropic; The isotropy of the Ether of the 2nd type in some parts of the Universe is replaced by anisotropy, obeying the cosmological principle in its classical sense.

8) On the example of a specially constructed Scheme, the decisive role of quantum transitions is demonstrated not only in the formation of Ethers of the 1st and 2nd types, but in general as a way of creating the Universe.

9) The assumption is made about the increasing volumes of the emission of type 2 Ether in the process of B-WH operation as the main reason for the accelerated expansion of the space of our Universe.

10) It is shown that the speed of light in an arbitrary inertial reference frame is a constant value and is a consequence of the covariance principle.

11) A multidimensional cosmological model with an isothermal temperature distribution of matter in it, is constructed, which is characterized by a discrete distribution of matter, being a kind of large-scale analog of the distribution of matter in an atom. At the same time, there are transitions between these discrete distributions of matter similar to Black-White holes.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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