Global Journal of Science Frontier Research: A
Physics and Space Science
Volume 20 Issue 6 Version 1.0 Year 2020
Type : Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 2249-4626 & Print ISSN: 0975-5896

Epistemological Dualism between Einstein's Relativity and Quantum Mechanics in the Five-Dimensional Continuum for Universe

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Abstract- The article is an answer to the call of Dr. Stefano Veneroni, the Catholic University of the Sacred Heart explain the relationship between the continuum and discreteness in the epistemological model of the classical theory and explain how can Quantum Mechanics explain the connection between matter, antimatter, and gravitation, while being respectful of the (phoronomic) rules of general relativity? To answer the Dr. Stefano Veneroni questions, I first propose to recognize that Minkowski's space-time, as well as an attempt Einstein in General Relativity Theory to generalize it to the case of accelerated motion, cannot be accepted as the basic model for describing the Universe. As such a basic model, the author sees the Finsler space of projective geometry, which allows combining the coordinate space and the space of impulses into a single continuum. In the article emphasized the role of the theory of global resonance in the birth of particles and the self-organization of matter in the five-dimensional continuum of the Universe.

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GJSFR-A Classification: *FOR Code: 010503p*

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I. Introduction

In his appeal in 2014, Dr. Stefano Veneroni, the Catholic University of the Sacred Heart Department of Philosophy, asked a question: "How can Quantum Mechanics explain the connection between matter, antimatter, and gravitation, while being respectful of the (phoronomic) rules of general relativity? How can we explain the relationship between the" continuum "and" discreteness "in the epistemological model of the" classical "theory?"[1]. Today, in 2020, I offer you an answer. Relativistic invariance, which is based on subjective Spatio-temporal representations, is not consistent with quantum-mechanical non-locality, which is objective. This manifests internal contradiction of a unified quantum-relativistic field theory, leading to insurmountable difficulties in solving the problems of the quantum theory of gravity, unified theories, and the derivation of space and time representations from the physics of the microworld [2].

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II. The Relationship between the "Continuum" and "Discreteness" the Epistemological Model of the "Classical" Theory

Proposed by mathematicians tests for constructing a discrete model of the world: the r-model of Ahmavaar, the geometry of the causal sets of Rafael Sorkin, the quaternion geometry of David Finkelshtein, Penrose's twistor program to provide an alternative description of Minkowski's space which emphasizes the light rays rather than the points of space-time did not find sufficient physical justification. Professor Lee Smolin notes that numerous versions of String Theory are at an impasse, and primarily because they are based on Einstein's STR and GTR, and also based on imaginary frozen time [3]. The term "frozen time" was introduced into physics by Professor Lee Smolin, an American theoretical physicist. He appealed to the scientific community to find a way to unfreeze time - to imagine a time without turning it into space. He's writing: "I have no idea how to do this. I cannot imagine the mathematics that cannot imagine the world, as if it were frozen in eternity". [3] My article "Epistemological optimism of knowledge of the physics of the Universe" has the answer to Lee Smolin's question. [4]. The time represented by two-component numbers and, in particular, complex numbers allows us to describe reality in its dynamics. Based on the mathematical apparatus of modern projective geometry, the article proposes to combine the coordinate space and the space of impulses into a single geometric design, considering them in the framework of the five-dimensional continuum (two coordinates time and three spatial coordinates).

There is an answer to the question Stefano Veneroni. In one particular example of the birth of a particle and an antiparticle in a quantum vacuum (dark matter) in the process of its polarization, one can trace the relationship between a quantum (particle) and a five-dimensional continuum capable of describing irreversible processes. Einstein's universe is a closed universe with constant entropy since, in such a universe; there is particle production no irreversible processes with symmetry breaking in time. Nobel Prize winner I.

Prigogine believes that for description of the birth of matter in Einstein's general relativity is necessary to be considered variations in the density of matter due to the production of particles. For this, the Dr. I. R. Prigogine proposed to add the number of variables included in the standard model (the pressure P, the mass-energy density σ and the radius of the universe R (t)) an additional variable n - the density of the particles and an additional equation, which would tie the Hubble function of radius of the universe R (t) and the birth of particles n. In the case of the universe, consisting of particles of the same type of mass M, when the mass-energy density is simply equal to σ, and the pressure P - vanishes, Prigogine offers a simple equation that takes into account the creation of particles [5]:

$$\alpha H^2 = \frac{1}{R^2}\frac{\partial nR^3}{\partial t} \qquad (1)$$

Where α - kinetic constant equal to zero or positive.

In this equation (1), the value of α and H are positive since we are talking only about the birth (and not destruction) of the particles. In Minkowski's space, where H = 0, the production of particles cannot be (equation Hψ = 0 equation is often called the Wheeler – DeWitt Equation). Furthermore, in Einstein's Universe, the total number nR^3 constant irrespective H values, α = 0.

The quantum vacuum is a global field of oscillators' super-positions with the continuum of frequencies. When the quantum vacuum of the Universe is excited by cosmic radiation or relativistic particles, the resonances accompanying the birth of new particles will occur whenever the frequency of external cosmic radiation and particle coincide. The evolution of dynamical systems (particles) to self-organizing matter depends on the resonances between the degrees of freedom in a quantum vacuum (dark matter). I. Prigogine wrote, "If the systems are independent, then for coherence and self-actualization, there would be simply no place as all dynamic movements would essentially be isomorphic movements of free (non-interacting) particles." [5]. Proved by Poincare, the non-integrable dynamical systems and the theory of resonant trajectories by Kolmogorov-Arnold-Moser allowed Prigogine to conclude that the mechanism of resonance interaction of particles in large-scale Poincare systems (LPS) was "essentially" mandatory (the probabilistic outcome is 1) so the particle (quantum of matter) and the Universe (five-dimensional continuum containing three spatial dimensions and two temporal) are is always interconnected by resonances [5].

III. Space and Time is Phantoms of the Material World

Visually, the three-dimensional space is represented and described according to Kant by Euclidean geometry in Cartesian coordinates. Descartes imagined space as something unchangeable, like an empty box, inside of which occur physical processes. Kant's idea to introduce space based on the specific physical laws. Kant linked the three-dimensional space with the law of decreasing strength is inversely proportional to the square of the distance. He wrote: "The three-dimensionality possible on what substances act on each other in such a way that the force of action is inversely proportional to the square of the distance." The geometric representation of this law is a sphere. If we place the observer in the center of the sphere, the space will appear three-dimensional. The relativity of space means that it depends on the attitude and the mechanical interactions of the bodies among themselves. According to Kant Euclidean space three-dimensional, because the forces of interaction between material bodies (the law Cavendish) and electric charge (Coulomb's law) are inversely proportional to the square of the distance. If body interact according to the directly proportional law F = k · x (Hooke's law), they, according to Kant, describe the time running away from the observer in straight lines into the future. This is the cosmological time of the existence of a phenomenon (object in the Universe) from its birth to its disappearance. In this case, time would not have continuity and should be discrete (the lifetime of the phenomenon). Cosmological antigravity in the standard ΛCDM (Λ- Cold Dark Matter) model is described by linear force depending on the distance:

$$Fe = (c^2 / 3) \cdot \Lambda \cdot R, \qquad (2)$$

Where Λ is Einstein's cosmological constant, and R is the distance [6].

If the deformation arising the elastic spring or in the intergalactic medium (dark energy) would is proportional to the force applied to the body of F = k · r (Guka's law), space-time will represent straight lines that go from the observer to infinity. Obeying this cosmological law time is linear and discrete, this is the so-called Eddington's arrow of time, which describes the real processes of evolution of each object of the Universe individually, for the entire period from its birth to disappearance. Wherein, time is two-dimensional. This noted by Nobel laureate I. P. Prigozhin in his book Time, Chaos, Quantum. He wrote: "We need to go beyond the concept of time as a parameter that describes the movement of individual systems. Inharmonic oscillators (classical and quantum), time is uniquely related to the laws of motion, but in non-integrable systems, time plays a dual role. If stable stationary systems are associated with the concept of determinate cyclic time, then for unstable, developing systems, the concept of probabilistic vector time is applicable." [5]. Prigogine speaks of the arrow of time Eddington, which shows the vector of further development of the system at a new level or its disappearance, which reflects the discreteness of cosmological time. The planets of the solar system are classical oscillators for which cyclic time is measured by the number of revolutions of the planet around its axis and around the sun. The actual, cosmological time of the planet determines the time of its linear evolution from birth to extinction. Using the theory of linear measures of sets, professor of St. Petersburg University I.N. Taganov proved that if the state of physical processes is always measured with finite uncertainty (the Heisenberg uncertainty relation between the coordinates and momentum of a particle and the time and energy of particles in the microworld), then the moments of physical time can be represented only by two-component numbers and, in particular, complex numbers. In the book "Physics of Irreversible Time" I.N. Taganov suggested that the spiral with variable pitch and diameter in pseudo-Euclidean three-dimensional space can serve as a geometric way of complex physical, not the frozen time [7].

Figure 1: Spiral of time

The Argentine philosopher and physicist Professor Mario Bunge introduced the complex time T_e into electron theory:

$$T_e = (t + i\tau) \quad (3)$$

Where t is the electron's existence time in a given orbit in an atom, and τ is a constant cyclic time equal to the electron spin period [8].

Minkowski's flat space, as well as an attempt to generalize it to the case of accelerated motions, i.e., Einstein's GRT space-time, cannot be accepted as basic geometric models for describing the not frozen dynamic evolving world in which we live. Based on the mathematical apparatus of modern projective geometry, scientists come to new, more general conservation laws inherent in the physics of open systems [9]. Moreover, in the five-dimensional continuum, a synchronous interdependence of the change in the state of the body is provided when describing its motion in the momentum representation with a description of its motion in the coordinate representation. First of all, this is the theoretical justification of a space having bundles Xm (Xn) for the geometrization of dynamical systems. The basis of the representation of a layered space is: the base is a n-dimensional differentiable manifold Xn (base-coordinate space), and the layer is a m-dimensional manifold (layer is a momentum space). The return of the system to its initial state is crucial in the formation of the concept of "base". It allows you to describe the behavior of the system (classical and quantum oscillators) by symmetric, invariant equations Einstein's GRT. This state of the system corresponds to the concept of a time horizon during which we can predict its development path. The system's transition to a qualitatively new level, during which the system becomes non-integrable, irreversible processes prevail in it, and time loses the invariance property and its behavior is probabilistic, the vector character corresponds to the concept of "layer" [4].

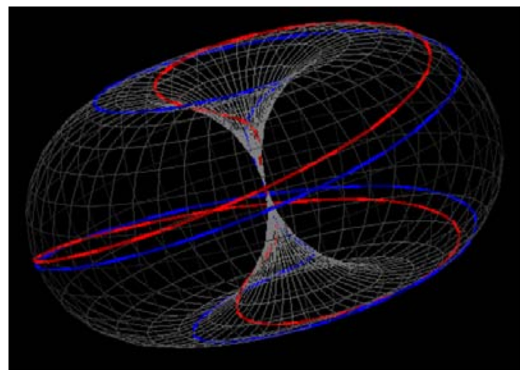

Figure 2: The geometrization of dynamical systems. Representation of a layered space is the base and the layer in the five-dimensional continuum (two temporal coordinates and three spatial coordinates)

If we recall the existence of a layered space consisting of a base and a layer, we can assume that the four-dimensional Minkowski – Einstein world describes precisely and only the "base" where symmetric and invariant equations reign and the system is in a stationary integrable state. The limitedness of the General Theory of Relativity does not give scientists the right to drive physical reality into the Procrustean bed of Einstein's invariant, symmetric solutions. The imaginary part of the complex time — cyclic time — corresponds to this state [2]. The five-dimensional continuum proposed in the article, which includes two temporal coordinates and three spatial coordinates, absorbed all the advantages of the Kaluza five-dimensional world over the flat four-dimensional Minkowski continuum, revealed the connection of the macrocosm, including temporal representations, with microcosm, charge and mass of elementary particles, with the presence of the space environment (dark energy and dark matter), with the existence of vector, and scalar fields [4]. His predecessor can be considered Eddington's Five-Dimensional Continuum (Paranoid), which includes, in addition to the four-dimensional continuum of Minkowski the fifth time coordinate [10]. The Eddington's Paranoid is the object under study environment (the entire universe is composed of elementary particles). It contains, in addition to the four dimensions of the continuum Minkovsky (x1, x2, x3, t), the fifth - time t0. "The E-frame provides a fifth direction perpendicular to the axes x1, x2, x3, t; and the position vector can be extended t0:

$$X = E15\, ix1 + E25\, ix2 + E35\, ix3 + E45\, t + E05\, t0, \quad (4)$$

Where according to the real conditions, t0 should be real" [10]

Einstein's gravitational field in the space of five dimensions is exactly and completely equivalent to ordinary gravity plus the Maxwell electrodynamics equations and one more scalar field. The fifth component of the particle velocity has the physical meaning of the ratio of the electric charge q to the mass m of the particle. The fifth equation of the geodesic line means a constant q / m ratio for the current state of the planets in the solar system (current time horizon). It is even true that the momentum of particles in the fifth coordinate is an electric charge [11]. Spatial and temporal diversity of different dimensions different properties introduced into these discrete transformations P-space conversion, the conversion time T, and C charge conjugation. The 5-dimensional manifold instead of the square of the 4-dimensional interval $\partial s^2 = g_{\alpha\beta}\, \partial x^a \partial x^\beta$ should take $dl^2 = GAB\, \partial x^A\, \partial x^B$, where the indices A and B have the meanings: 0,1,2,3,5. GAB values are components of the five-dimensional metric tensor. They form a square matrix having a generally 15 independent components:

$$GAB = \begin{matrix} G00 & G01 & G02 & G03 & G05 \\ G10 & G11 & G12 & G13 & G15 \\ G20 & G21 & G22 & G23 & G25 \\ G30 & G31 & G32 & G33 & G35 \\ G50 & G51 & G52 & G53 & G55 \end{matrix} \quad (4)$$

In the curved R iemannian space-time, operating with the components of the five-dimensional metric tensor, one can obtain ten components of the metric tensor of the Einstein's general theory of relativity, four components of electromagnetic vector potential $\bar{\mathbf{A}}$ of the Maxwell theory, and one component which theoretically can describe any new scalar field [11]. The new scalar field may belong to a hypothetical particle of dark matter the protophobic X boson, which, like the Higgs boson, creates the scalar field responsible for the fifth interaction between dark matter and ordinary (baryonic) matter. Dr. Jonathan Feng from the University of California, Irvine, in a press release in 2017 said: "For decades, we've known of four fundamental forces: gravitation, electromagnetism, and the strong and weak nuclear forces. Discovery of a possible fifth force would completely change our understanding of the universe, with consequences for the unification of fifth force and dark matter. The protophobic X boson of dark matter makes it possible to explain a number of experiments in which the anomalous magnetic moment of the muon is observed and is associated with the fifth interaction". According to the head of the group Jonathan Feng, if in the future experiments the fifth force is confirmed, this will completely change our view of the Universe [12]. Unlike the "geometric" concept of A. Einstein's gravity, autor in his article adheres to the "field" concept of gravity, which allows one to describe gravitational interactions of bodies similarly to electric and magnetic interactions. In this case, gravitational fields should have properties similar to, but not identical to, the properties of electromagnetic fields. The "field" concept of gravity does not contradict other experimentally grounded approaches in describing the phenomenon of gravitation and inertia, in particular, for example model the Universe involving a quantum vacuum (dark matter). The equation of gravity $G\mu\nu = 8\pi G T\mu\nu$, obtained by Einstein within the framework of the general theory of relativity, relates the curvature of the space $G\mu\nu$ to the energy-momentum tensor $T\mu\nu$ and the Newtonian gravitational constant G, due to the spatial in homogeneity of the Universe as a whole relate to its individual parts. Einstein's predictions regarding the type and the speed of gravitational waves in the new cosmology need to be clarified. A more complete equation of the field, taking into account the polarization medium of quantum vacuum (dark matter), was presented in 1998 by professor of the Institute of Mathematics of the Russian Academy of Sciences V. Dyatlov [13]. The new equations include the density of matter and its speed as independent variables, their closure is possible only with the use of continuum mechanics. The equivalence principle predicts the same acceleration for bodies of different composition in the same gravitational field and allows us to consider gravity as a geometric property of space-time, which leads to the interpretation of gravity from the perspective of the General Theory of Relativity [6]. In the general theory of relativity (GR), Einstein proposed a new interpretation of acceleration. Acceleration, which Newton explained in terms of gravitational and inertial interaction, is considered in GR as the result of curved space-time. In Einstein's gravitational theory, the curvature of space-time (Gravity funnel Fig. 3) determines the existence of matter-energy. The equations of Einstein's general theory of relativity are usually written in such a form that the left side is expressed through the space-time curvature tensor and has a purely geometric nature, and the energy-momentum tensor of matter and fields of various natures is on the right side:

$$R\mu\nu - \frac{1}{2} g\mu\nu = \frac{8\pi G}{c^4} T\mu\nu \quad (5)$$

Where $R\mu\nu$ is the Ricci tensor; $g\mu\nu$ is the event space metric tensor; $T\mu\nu$ is the energy-momentum tensor of matter.

Einstein himself was unsatisfied with such a separation of geometry and matter in equations. Indeed, the form of the mathematical tensor was the result of subtle geometric considerations, while the stress tensor, which defines the "source" of space-time curvature, is described in terms of macroscopic concepts of pressure and energy density. Einstein compared his equations with a building, one wing of which is built of precious marble, and the other is made of cheap wood [14]. Newton's law of gravity mathematically confirms long-term observations of the planets of the solar system. With its help, the positions of the planets for many years are calculated, but no one calculates the position of the Sun relative to the planets since the Sun is always in the center of the heliocentric coordinates. The world for this law is the planets of the solar system. For other objects of the solar system, the applicability of this law is not a fact. If we try to calculate the force of attraction not between the Sun and the Earth, but between the Earth and the Sun, it will not be clear how the Earth, whose mass is small relative to the Sun, can attract the Sun to itself. Earth in orbit is held by the gravitational force of the Sun and centrifugal force, but there is no centrifugal force of the Sun relative to the Earth. Therefore, if the Earth begins to attract the Sun to itself, then this will lead to a collision of the Sun with the Earth. From the above, it can be concluded that the size of the gravitational funnel created around rotating the Earth by vortices of excited quantum medium (dark matter) does not reach the Sun, and the Earth falls into the region of the gravitational funnel of the Sun. Indeed, it has been experimentally established that the radius of the Earth's gravitational funnel is approximately 900,000 km, and the distance from the Earth to the Sun is 150,000,000 km. [15] In the solar system, the effects of gravity of the sun and gravity of the planets are delineated! Planetary gravity funnels have finite dimensions and do not overlap with each other (Figure 3).

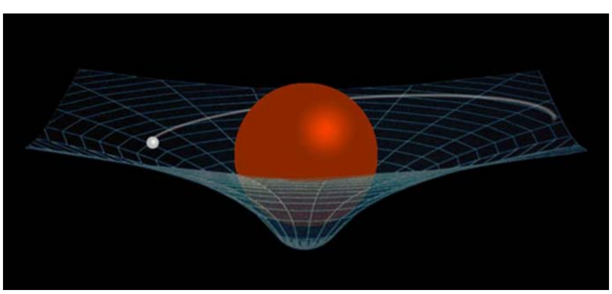

Figure 3: Gravity funnel

It should be noted that the geometry, on which Newtonian mechanics is based is Euclidean geometry, these are Cartesian rectangular coordinates. Professor Gennady Shipov proposed in the monograph: "The Theory of Physical Vacuum. Theory, experiments, and technology" of mechanics that additionally take into account rotational effects [15]. He managed to connect the Cartesian coordinate system with the six angular coordinates of Euler and get the eleven-dimensional Weizenberg geometry. It turned out that, within the framework of such a geometry it was possible to explain a series of experiments in which the law of conservation of energy is violated. The excitation of quantum vacuum (dark matter), caused by the accelerated motion of bodies or their rotation, leads in open systems to the violation of the symmetries, conservation laws, and prohibitions caused by them. I suggest into account this fact in classical and quantum mechanics, in theories of quantum electrodynamics (QED) and quantum chromodynamics (QCD).

As you know, the laws of symmetry play an important role in establishing the laws of Nature (laws of motion and conservation). It is believed that the laws of Nature do not change with uniform and rectilinear movement. This statement is called the "principle of relativity." Albert Einstein made an attempt to extend this principle to any, including accelerated types of movement. However, Einstein was not able to achieve the desired result. Academician V.A. Fok drew attention to this circumstance [16]. An impeccable, from a mathematical point of view, solution of the problem of extending the principle of relativity to accelerated movements dictates the need to combine the coordinate space $R^4(x)$ and the momentum space $R^4(p)$ in a single mathematical construction for open systems that take into account the effect of quantum vacuum (dark matter). The indicated spaces are dual (mutually complementary) to each other, although they belong to two different classes of measurements. Here we use the following notation $x = (t, \mathbf{r})$, where $\mathbf{r}$ is a three coordinate vector; $p = (E, p)$, and p is the three pulse vector in the system of units $c = 1$, $h=1$.

For a geometric space, which in reality could satisfy the principle of relativity for any movements, the action integral should remain invariant with respect to translation in the space of momenta. Dr. V. G. Zhotikov, V.G.in his monograph "Introduction to Finsler geometry and its generalization (for physicists)" proves that the structure of the necessary space, combining both of the above spaces, should be endowed with the properties of projective geometric space [9].

IV. Conclusion

In light of the foregoing, the question I can be posed as to what constitutes the cosmic fabric of space-time in Einstein's general theory of relativity. Let us recall the famous report of Minkowski made on September 21, 1908, at the 80th meeting of German naturalists in Cologne: "Gracious gentlemen! The view on space and time that I intend to develop before you has arisen on an experimental physical basis. This is their strength. From now on, space in itself and time in itself must turn into fiction, and only a certain kind of combination of both should remain independent" [17]. How true were these predictions of Minkowski? In fact, at the beginning of the 20th century, as a mathematical model of space-time SRT, Einstein declared a geometric space of a special kind. It received the name "Minkowski space." In the mid-20th century, the Russian mathematician, academician L. Keldysh, proposed to consider the object M^4 to be the "point" of Minkowski's space. Each such "point" is given the name "elementary event." Each elementary event must correspond to a certain 3D spatial point taken at some particular moment in time. The essence of the theorem of L. Keldysh has applied to the hypothesis of G. Minkowski was as follows: "3D (spatial point) and 1D (point on the time axis) pulper objects can be openly displayed in a compact dimension of 4D. However, the result of the displayed will be a superposition of individual images, and not at all a single 4D object" [18] .

The above contradicts the ability to record and solve the equation of motion of particles and the field equation in 4D form. Each scientific concept has a limit of applicability, and any system of scientific concepts is internally contradictory. The geometry, as a theory of invariants of one or another group of transformations, the space-time of the special theory of relativity (Minkowski flat space) is a four-dimensional real affine space with a metric of a specific singularity. In other words, the STR is the theory of the invariance of the laws of physics in isolated stationary systems, concerning to uniform movements. If we keep in mind the symmetries that would determine uniform rectilinear motions, then we can divide Feynman's point of view: "Symmetry concerning to uniform rectilinear motions leads to the special principle of relativity." In other words, this principle takes place only in the case of rectilinear uniform motion of reference systems. In the case when the movement is accelerated, including when it comes down to uniform rotation, the special principle of relativity ceases to be fair. Einstein's attempts in the general theory of relativity to extend the principle of relativity for any kind of motion of matter turned out to be unsuccessful. The use of GTR by physicists to describe non-invariant, irreversible processes leads to gross errors, in some cases fraught with catastrophe. It was noted experimentally that when the limiting speed of rotation of the rotors of electric motors and turbines is reached, spontaneous acceleration of the disks occurs in a several cases and, moving vertically along the axis of rotation they break from the supports and fly out of the device. A similar accident occurred on August 17, 2009, at the Sayano-Shushenskaya hydroelectric power station. The turbine of the second hydroelectric unit suddenly began to rotate at a hypersonic speed, which led to the destruction of the fixing bolts, the destruction of the room, and the death of 75 people.The excitation of quantum vacuum (dark matter), caused by the accelerated motion of bodies or their rotation, leads in open systems to the violation of the symmetries, conservation laws, and prohibitions in the standard ΛCDM (Λ- Cold Dark Matter) model. This fact must concern into account in classical and quantum mechanics. Each symmetry in the SM corresponds to its own conservation law (the famous Noether's theorem and its subsequent generalizations). For example, symmetries with respect to time shifts (that is, the fact that the laws of physics are the same at every moment) correspond to the law of conservation of energy, symmetries relative to shifts in space correspond to the law of conservation of momentum, and symmetries about rotations in it (all directions in space are equal) - the law of conservation of angular momentum. Conservation laws can also be interpreted as prohibitions: symmetries prohibit changes in the energy, momentum, and angular momentum of a closed system during its evolution. The participation of quantum vacuum (dark matter) in all interactions causes a rejection of the paradigm of the evolution of a closed system it requires a review of all conservation laws and symmetries. J. Wheeler wrote on this subject, "An object that is central to the whole classical general theory of relativity, "four-dimensional space-time geometry" simply does not exist if we go beyond the framework of the classical approximation. This argument shows that the concept of space-time and time are not primary concepts in the structure of Einstein's physical theory. There is no space-time, there is no time; there is nothing before, nothing after. The question is, what happens at the next moment, asking in GRT is meaningless."[19]. Stephen Hawking proposed introducing the imaginary time $\tau = ict$ into the metric of general relativity. If in the Euclidean space the metric has the form $\partial s^2 = \partial x^2 + \partial y^2 + \partial z^2$, then in general relativity the metric has the form $\partial s^2 = c^2\partial t^2 - (\partial x^2 + \partial y^2 + \partial z^2)$ and for imaginary time $c^2\partial t^2$ goes over to $-d^2\tau$. In this case, the differences between time and space in the interval ∂s^2 of the GR metric disappear [20]. This is frozen time. In the standard model, A.Fridmana universe on a large scale can be considered homogeneous and isotropic. Then the metric takes the simple form:

$$\partial s^2 = c^2\partial t^2 - R^2(t)\partial l^2 \quad (6)$$

Where ∂l^2 is a spatial element, which may correspond to the zero curvature, either positive or negative curvature (spherical or hyperboloid);

R (t) is the radius of the universe, corresponding to the limiting distance achievable for astronomical observations.

The standard model establishes the relationship between the radius of the universe R (t) and the curvature of space on the one hand and an average density of mass - energy, which is denoted σ, and the pressure P.

Instead of R (t) is often administered to the Hubble function:

$$H = \frac{1}{R}\frac{\partial R}{\partial t} \tag{7}$$

The relationship between P and density σ is determined by the Einstein's equation of state.

Therefore, in the standard model, there are only two independent variables: density function σ and the Hubble H. To define them, you need two equations, which give Einstein's GRT [6]. One of the equations binds Hubble function H with a density of σ; the second equation expresses the adiabatic space evolution of the universe. Adiabatic means that between the environment and the elementary volume in Einstein's General Relativity Theory no heat exchange:

$$\partial Q = 0 \tag{8}$$

In Einstein's General Relativity Theory, irreversible processes are absent, the entropy of the universe remains constant. Herewith, the true cosmic time, included in Newton's Second Law, disappeared from consideration [5]. In the standard cosmological model ΛCDM total energy of the universe is assumed to be zero. It can, therefore, be assumed that H = 0. Therefore, considering the wave function of the universe, from the Schrodinger equation:

$$H\Psi = iH\frac{\partial \Psi}{\partial t} \tag{9}$$

It follows that$\partial \Psi / \partial t = 0$; the wave function does not depend on the time (equation $H\Psi = 0$ equation is often called the Wheeler – DeWitt Equation). This is a paradox. The cosmological time is excluded from consideration in the flat Minkowski space [4].

Why the authors of recent astrophysical discoveries constantly indicate the presence of the cosmic fabric of space-time in the Universe [21, 22]. Today it can be firmly stated that the cosmic fabric of space-time Einstein is made of the same material as the clothes on the naked king in the fairy tale of Danish writer Andersen's "The Naked King." But why do all astrophysicists feel its presence? Indeed, the cosmic space of the Universe is 95% filled with dark matter, which does not emit electromagnetic radiation and does not interact with it directly. This property complicates and possibly even makes direct observation of dark matter impossible. But astrophysicists feel its presence and influence on all processes occurring in the Cosmos with ordinary (baryonic) matter, which in the Universe is about 5%. That is why the cosmic fabric of space-time has taken root in science.

Acknowledgements

The author thanks for discussions to the professors I.N. Taganov, V. G. Zhotikov, G.I. Shipov

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