Vacuum structures.

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Abstract.

What does charge and mass consist of, why is the charge of a proton with quarks the same as the charge of a positron without quarks? What is their unity and difference? What does an electric field consist of, what does a magnetic field consist of, and why does the dynamics of one field induce another field? What is a gravitational field and how does mass create gravity? What is dark mass and what is dark energy? Why and how does mass appear from energy? How does all this form a single physical vacuum of the material world? Here is an attempt to answer these and similar questions.

1.Introduction

There are amazing properties of mathematics to model and calculate physical properties of matter. They say that the language of Nature is mathematics. Mathematics describes physical experiments, generalizes and predicts physical properties. But there are questions of physics that mathematics has no answers to. Modern physics runs into many problems, facts that go beyond its theoretical concepts. The theoretical models and fundamental concepts themselves are largely contradictory. For example, they said that the Higgs field creates the mass of particles. Formally, this can be understood at the classical level, $m = \nu^2 V$ (frequency is determined by the stiffness coefficient and mass), as oscillations in the volume of the Higgs field (boson energy in the Spontaneous Symmetry Breaking model), which are taken as the basis of the idea. But how the "Higgs field mass" creates the force of gravitational attraction of two masses, they forgot to say. There is no answer. Mathematics answers the question HOW? Physics answers the question WHY? We will look for physical reasons. This is very important. For example, what is a charge, how does mass create gravity, and so on.

Here we will pay attention that mathematical models are created in the Euclidean axiomatics of points ("...having no parts"), lines ("...length without width"), the system of numbers equal by analogy to units. Let's say we are talking about 10 apples, to which 5 apples were added, and we are talking about 15 apples, as equal by analogy to apples, that is, units. But we are not saying that each apple is different from another apple. There are no 15 identical apples (units) in Nature. This means that such an addition operation corresponds to reality only in an approximate form. On the other hand, if we put 3 apples on the table, and then take one apple away, then 2 apples remain. Note that we took away the apple that we put on the table. Everything is real. And this operation of subtracting numbers corresponds to physical reality. As we can see, even simple actions with prime numbers do not always correspond to the properties of Natural events. A set of Euclidean points at one point, is it a point or a set of them? A set of Euclidean lines in one "length without width", is it a line or a set of them? Euclidean axiomatic does not provide answers to such questions. But it is this axiomatic that is our technology of theories in space-time. Earlier we considered another technology of theories of dynamic space-matter, in which the technology of theories in Euclidean axiomatic is a limiting, special case. At the same time, space dynamic in time (in any coordinate system) is a form of matter, the main property of which is movement. In other words, dynamic space-matter is one and the same. And that is why the mathematical properties of space-time correspond to the physical properties of matter. That is why the properties of matter are written by the laws of mathematics.

2. Initial positions.

In order to avoid searching through various sources, we will recall here the basic provisions necessary for further presentation.

How does the technology of theories in Euclidean axiomatic differ from the technology of theories of a single and dynamic space-matter? The answer is in the Euclidean axioms themselves of the system of numbers equal by analogy to units, a point ("...having no parts") and a line ("...length without width"). The question immediately arises, how many straight lines pass through a point outside another line and are parallel to it. They say that there is one straight line, but this is "...length without width", in which there are many. The axioms do not work. Then the uncertainty principle of the line-trajectory of a quantum is introduced. In fact, and according to the Euclidean axioms, many straight lines parallel to the original straight line pass through a point outside a line. In this case, the properties of parallelism are the properties of isotropy of space, Euclidean in this case, when parallel lines can be drawn in any direction. Such technology of Euclidean axiomatic in theories gives excellent results of classical physics. But in quantum theories with the uncertainty principle, we have only extreme or probabilistic fixed properties of matter.

We considered the properties of dynamic space-matter with its own axiomatic (as facts that do not require proof) in which the Euclidean axiomatic, as well as its technology, is a special case. Let us recall.

Isotropic properties of lines parallel $(\|)$to trajectory lines give Euclidean space with zero $(\varphi = 0)$angle of parallelism.

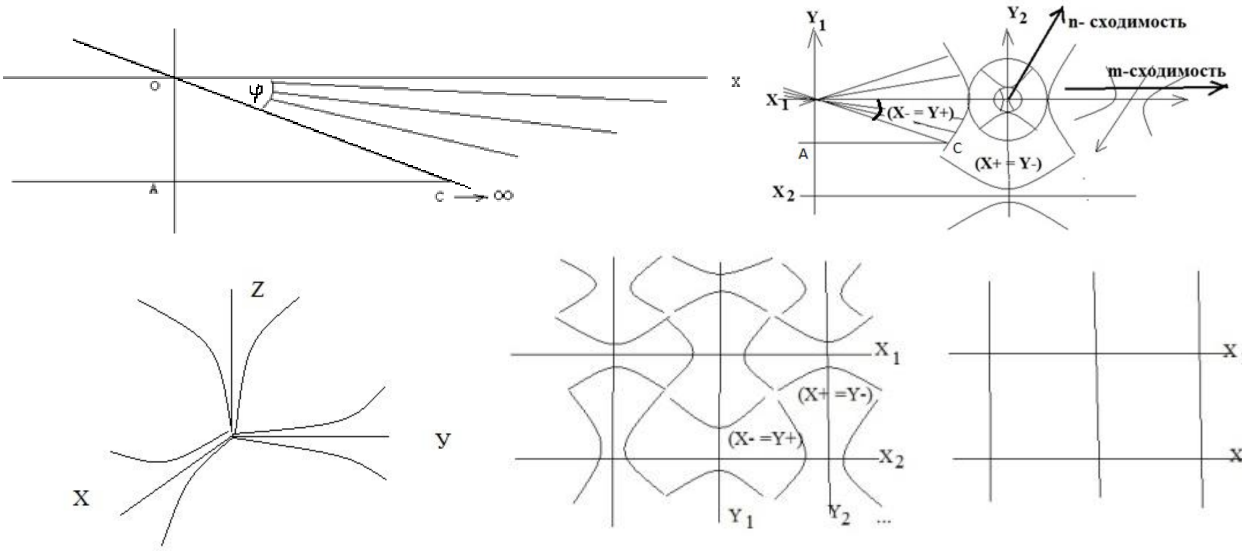


Fig. 1. Dynamic space-matter.

In this case, through the point O, outside the ray $(\text{AC} \to \infty)$, there passes only one straight line (OX)that does not intersect the original straight ray $(\text{AC} \to \infty)$. The fact of reality is that when moving along $(\text{AC} \to \infty)$to infinity, within the dynamic $(\varphi \neq const)$angle of parallelism, there is always a dynamic bundle of straight lines in $(\text{X}-)$a dynamic field, with a non-zero $(\varphi \neq 0)$angle of parallelism, and not intersecting the ray $(\text{AC} \to \infty)$at infinity. We are talking about a set of straight lines passing through the point O, outside the straight line $(\text{AC} \to \infty)$and parallel to the original ray $(\text{AC} \to \infty)$. This is "length without width" in Euclidean axiomatic, with the principle of uncertainty $(\text{X}-)$of the line-trajectory. In the axes (XYZ), as we see, Euclidean space loses its meaning. It simply does not exist.
Such dynamic $(\varphi \neq const)$space-matter has its own geometric facts, like axioms, that do not require proof.

<u>Axioms of dynamic space-matter</u>

1. A non-zero, dynamic angle of parallelism $(\varphi \neq 0) \neq const$of a bundle of parallel lines determines the orthogonal fields of $(\text{X}-) \perp (Y-)$parallel lines - trajectories, as isotropic properties of space-matter.

2. Zero angle of parallelism $(\varphi = 0)$gives "length without width" with zero or non-zero Y_0 - the radius of a sphere-point “having no parts” in Euclidean axiomatic.

3. A pencil of parallel lines with zero angle of parallelism $(\varphi = 0)$, "equally located to all its points", gives a set of straight lines in one "width less" Euclidean straight line.
4. Internal $(X-)$, $(Y-)$and external $(X+)$, $(Y+)$fields of the trajectory lines are non-zero $X_0 \neq 0$ or $(Y_0 \neq 0)$ material sphere-points, form an Indivisible Region of Localization $НОЛ(X\pm)$ or $НОЛ(Y\pm)$ dynamic space-matter.
5. In unified fields $(X+ = Y-)$, $(Y+ = X-)$there are no two identical sphere-points and lines-trajectories of orthogonal lines-trajectories.$(X-) \perp (Y-)$
6. The sequence of Indivisible Localization Regions $(X\pm)$, $(Y\pm)$, $(X\pm)$… along the radius $X_0 \neq 0$ or $Y_0 \neq 0$ sphere-points on one line-trajectory gives n convergence, and on different trajectories m convergence.
7. Each Indivisible Area of Localization of space-matter corresponds to a unit of all its Criteria of Evolution – KE, in a single $(X+ = Y-)$,$(Y+ = X-)$ space-matter on $m-n$ convergences,

$$НОЛ = КЭ(X- = Y+)КЭ(Y- = X+) = 1, \quad НОЛ = КЭ(m)КЭ(n) = 1,$$

in a system of numbers equal by analogy of units.
8. Fixing an angle $(\varphi \neq 0) = const)$or $(\varphi = 0)$a bundle of straight parallel lines, space-matter, immediately gives the 5th postulate of Euclid and the axiom of parallelism.

Any point of fixed lines-trajectories is represented by local basis vectors of Riemannian space: $\boldsymbol{e_i} = \frac{\partial X}{\partial x^i}\boldsymbol{i} + \frac{\partial Y}{\partial x^j}\boldsymbol{j} + \frac{\partial Z}{\partial x^k}\boldsymbol{k}$, $\boldsymbol{e^i} = \frac{\partial x^i}{\partial X}\boldsymbol{i} + \frac{\partial x^j}{\partial Y}\boldsymbol{j} + \frac{\partial x^k}{\partial Z}\boldsymbol{k}$, (Korn, p. 508), with fundamental tensor $\boldsymbol{e_i}(x^n) * \boldsymbol{e_k}(x^n) = \boldsymbol{g_{ik}}(x^n)$, and topology $(x^n = \boldsymbol{XYZ})$in Euclidean space. These basis vectors can always be represented as a velocity space in vector form: $\boldsymbol{e_i} = \boldsymbol{v_i}(x^n)$, $\boldsymbol{e^i} = \boldsymbol{v^i}(x^n)$, with linear components $(x^i = c_x * t)$,$(X = c_x * t)$ space-time, then we have:$\boldsymbol{v_i}(x^n) * \boldsymbol{v_k}(x^n) = (v^2) = \Pi$, the usual potential of space-matter, as a certain acceleration on the length. That is, Riemannian space is a fixed $(\varphi \neq 0 = const)$ state of the geodesic$(x^s = const)$ lines dynamic$(\varphi \neq const)$ space-matter $(x^s \neq const)$. That is, Riemannian space is a fixed $(\varphi \neq 0 = const)$state of a geodesic$(x^s = const)$ lines dynamic $(\varphi \neq const)$ space-matter $(x^s \neq const)$. There is no such mathematics of Riemannian space $\boldsymbol{g_{ik}}(x^s \neq const)$, with a variable geodesic. There is no geometry of the Euclidean non-stationary sphere, no geometry of Lobachevsky space, with variable asymptotes of hyperbolas. A special case of negative curvature $\left(K = -\frac{Y^2}{Y_0} = \frac{(+Y)(-Y)}{Y_0}\right)$(Smirnov v.1, p.186) of Riemannian space is the space of Lobachevsky geometry (Mathematical Encyclopedia v.5, p.439). There are nine distinctive features of Lobachevsky geometry from Euclidean geometry (Fig. 1.2).

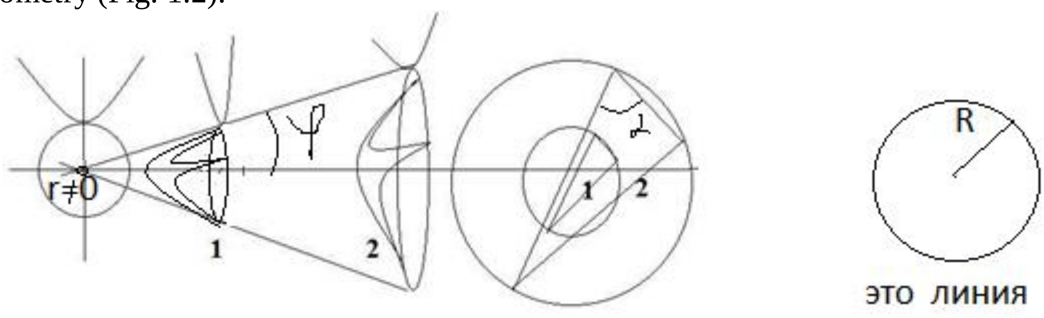


Fig. 1.2 Isotropic dynamics.

One of the features of Lobachevsky geometry is the sum of $(0^0 < \sum \alpha < 180^0)$the angles of a triangle, in contrast to their Euclidean projection $(\sum \alpha = 180^0)$onto a plane. Equal areas $S_1 = S_2$of triangles, in equal angles of parallelism $\varphi_1 = \varphi_2$ of a bundle of parallel straight lines, give projectively similar triangles in the Euclidean plane with equal angles at the vertices. A circle in the Euclidean plane is a line in Lobachevsky geometry. Here, Euclidean "length without width" is the radius of a circle in Lobachevsky geometry. The larger the radius, the longer the "line". Such circles on the surface of the Euclidean sphere are a set of straight lines in the Universe. In our case, the Euclidean sphere is also dynamic. How can we create theories of the "Big Bang" or "cyclic Universe" in such a sphere? The answer is no way. This is about nothing. The zero radius of such a circle $(r = 0)$means that such a circle does not exist, and there are no such lines. This is a conversation about nothing, they simply do not exist. This is about the questions of singularity with their infinite criteria and impossibilities. They do not exist either in mathematics or in Nature. There is no such mathematics of Riemannian space $\boldsymbol{g_{ik}}(x^s \neq const)$, with a variable geodesic. There is no geometry of the Euclidean non-stationary sphere, there is no geometry of the Lobachevski space, with variable asymptotes of hyperbolas. These orthogonal $(X-) \perp (Y-)$lines-trajectories have dynamic spheres inside, non-stationary Euclidean space $(\varphi \neq const)$. And these $(X-) \perp (Y-)$ lines-trajectories have their own fields of a single and $(\varphi \neq const)$dynamic $(X+ = Y-)$, $(Y+ = X-)$space - matter. In the Euclidean grid of axes $(X_i) \perp (Y_i)$, we do not see it, and cannot imagine it. And this is already another $(\varphi \neq const)$technology of mathematical and physical theories, in which the existing technology of Euclidean axiomatics $(\varphi = 0)$ or $(\varphi = const)$Riemannian space is a limiting and special case, respectively. At the same time, all the Criteria of Evolution are formed in a single way in the multidimensional $W^N = K^{+N} T^{-N}$ space of velocities, multidimensional space-time.

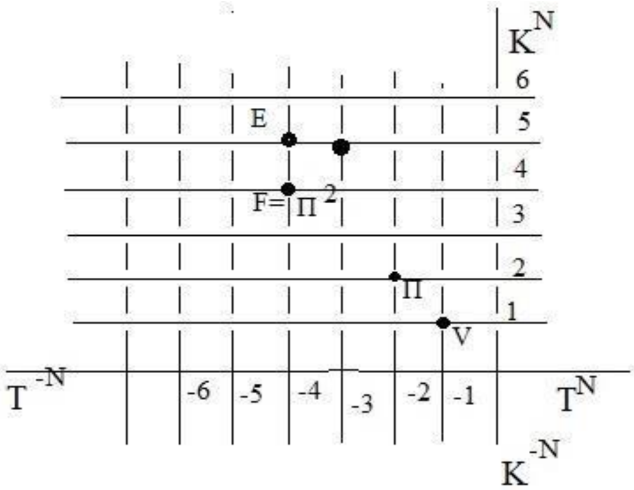


Fig. 2. Criteria of Evolution in space-time.

Here for (N=1), $V= K^{+1} T^{-1}$ is the velocity, $W^2 = \Pi$ is the potential, $\Pi^2 = F$ is the force. Their projections onto the coordinate (K) or time (T) space-time give: charge ΠK= q (Y + =X -) in electro (Y+ =X -) magnetic fields, or mass ΠK=m(X+=Y-) in gravitational (X+=Y-) mass fields, then the density $\left(\rho = \frac{m}{V} = \frac{\Pi K}{K^3} = \frac{1}{T^2} = \nu^2\right)$ is the square of the frequency, energy $E=\Pi^2 K$, momentum $(p=\Pi^2 T)$, action $(\hbar=\Pi^2 KT)$, etc., of a single NOL= (X+=Y-) (Y+ =X -) =1, space-matter.

3.Selected properties

The main property of matter is movement. Therefore, $(\varphi \neq const)$we correlate the properties of such a dynamic space with the properties of matter. It is one and the same. It is $(X+ = Y-)$,$(Y+ = X-)$ single, discrete with $(X\pm)$and $(Y\pm)$Indivisible Areas of Localization, which we relate to indivisible quanta of space-matter in the form of: proton $(X\pm = p)$, electron $(Y\pm = e)$, neutrinos $(X\pm = \nu_\mu)$ and $(X\pm = \nu_e)$ photons$(Y\pm = \gamma_o)$ $(Y\pm = \gamma)$. From $(m)$the convergence $(X\pm)$of $(Y\pm)$such quanta , their sequence follows in the form:

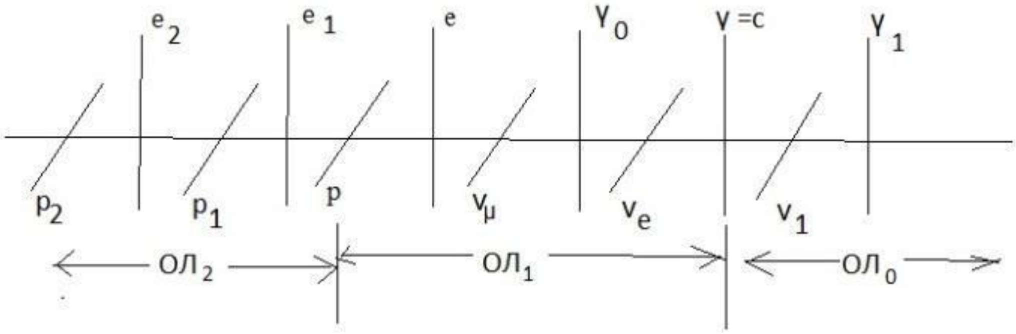


Fig. 3.1 Indivisible quanta of space-matter.

"dark photon" $(Y\pm = \gamma_o)$is introduced for the continuity of a single (X+=Y-) (Y+ =X -) space-matter. Such electro (Y + =X -) magnetic fields have the dynamics of Maxwell's equations:

$$c * rot_Y B(X-) = rot_Y \mathrm{H}(X-) = \varepsilon_1 \frac{\partial E(Y+)}{\partial T} + \lambda E(Y+);$$

$$rot_X E(Y+) = -\mu_1 \frac{\partial \mathrm{H}(X-)}{\partial T} = -\frac{\partial \mathrm{B}(X-)}{\partial T};$$

The dynamics $E(Y+)$of the electric field generates an inductive magnetic $\mathrm{B}(X-)$field, and vice versa. For example, a charged ball in a moving carriage has no magnetic field. But a compass on the platform will show a magnetic field. This is Oersted's experiment, which observed $(X-)$the magnetic field of moving $(Y+)$electrons of a conductor current.

And the same equations of the dynamics of gravitational (X+=Y-) mass fields are derived in a unified way:

$$c * rot_X M(Y-) = rot_X N(Y-) = \varepsilon_2 * \frac{\partial G(\mathrm{X}+)}{\partial T} + \lambda * G(\mathrm{X}+)$$

$$\mathrm{M(Y-)} = \mu_2 * N(Y-); \qquad rot_Y G(\mathrm{X}+) = -\mu_2 * \frac{\partial N(Y-)}{\partial T} = -\frac{\partial M(Y-)}{\partial T};$$

The dynamics of G(X+)the gravitational field generates an inductive mass $M(Y-)$field, and vice versa. Similarly, when (X+)masses (stars) move, mass $(Y-)$fields are generated in induction. Here it is appropriate to dwell on the well-known formula $(E = mc^2)$, which we will dwell on in more detail. A body with a non-zero $(m \neq 0)$mass emits light with energy (L)in the system(x_0, y_0, z_0, ct_0) coordinates, with the law of conservation of energy: $(\mathrm{E}_0 = \mathrm{E}_1 + \mathrm{L})$, before and after radiation. For the same mass, and this is the key point (**the mass $(m \neq 0)$does not change**), in another (x_1, y_1, z_1, ct_1)coordinate system, the law of conservation of energy with $(\gamma = \sqrt{1 - \frac{v^2}{c^2}})$ Lorentz transformations, Einstein wrote in the form $(\mathrm{H}_0 = \mathrm{H}_1 + \mathrm{L}/\gamma)$. Subtracting their difference, Einstein obtained:

$$(\mathrm{H}_0 - \mathrm{E}_0) = (\mathrm{H}_1 - \mathrm{E}_1) + \mathrm{L}(\frac{1}{\gamma} - 1), \text{ or } (\mathrm{H}_0 - \mathrm{E}_0) - (\mathrm{H}_1 - \mathrm{E}_1) = \mathrm{L}(\frac{1}{\gamma} - 1),$$

With separation of the difference in radiation energy. Both inertial coordinate systems are moving, but (x_1, y_1, z_1, ct_1)moves with a speed (v)relative to (x_0, y_0, z_0, ct_0). And it is clear that blue and red light have a difference in energy, which Einstein wrote down in the equation. Einstein wrote the equation itself as the difference in kinetic energies in the first expansion.

$$(\mathrm{K}_0 - \mathrm{K}_1) = \frac{\mathrm{L}}{2}(\frac{v^2}{c^2}..), \qquad \text{or} \qquad \Delta\mathrm{K} = (\frac{\Delta\mathrm{L}}{c^2})\frac{v^2}{2}$$

Here ($\frac{\Delta\mathrm{L}}{c^2} = \Delta m$)the factor, has the properties of the mass of "radiant energy", or: $\Delta\mathrm{L} = \Delta mc^2$. This formula has been interpreted in different ways. The annihilation energy $\mathrm{E} = \mathrm{m}_0 c^2$of the rest mass, or: $\mathrm{m}_0{}^2 = \frac{\mathrm{E}^2}{c^4} - p^2/c^2$, in relativistic dynamics. Here the mass with zero momentum$(p = 0)$, has energy: $\mathrm{E} = \mathrm{m}_0 c^2$, and the zero mass of a photon: $(\mathrm{m}_0 = 0)$, has momentum and energy $\mathrm{E} = \mathrm{p} * \mathrm{c}$. But Einstein derived another law of "radiant energy" $(\Delta\mathrm{L} = \Delta mc^2)$, with mass properties. This is not the energy of a photon, and this is not the energy $(\Delta E = \Delta mc^2)$of the mass defect of the nucleons of the nucleus of an atom. Einstein saw what no one else saw. Like a moving charge, with the induction of the magnetic field of Maxwell's equations, a moving mass (mass$(m \neq 0)$ does not change), induces mass energy $(\Delta\mathrm{L} = \Delta mc^2)$, which Einstein discovered. For example, a charged sphere inside a moving carriage (**the charge $(q \neq 0)$**

does not change) has no magnetic field. But a compass on the platform will show the magnetic field of a sphere in a moving carriage. It was precisely this inductive magnetic field, from moving electrons of a conductor current, that Oersted discovered. Then came Faraday's experiments, the induction of vortex electric fields in an alternating magnetic field, the laws of induction and self-induction, and Maxwell's equations. By analogy with the inductive energy of a magnetic field from a moving charge, Einstein derived a formula for the inductive, "radiant" energy of mass fields, from moving non-zero masses (the **mass ($m \neq 0$) does not change)** , including stars in galaxies. And here Einstein went beyond the Euclidean $(\varphi = 0)$axiomatics of space-time. In the axioms of dynamic space-matter $(\varphi \neq const)$, we are talking about inductive $m(Y-)$mass fields, in complete analogy with Maxwell's equations. This is what Einstein saw, and no one else.

Newton presented the formula, but did not say WHY the force of gravity arises. Writing down the equation of the General Theory of Relativity, Einstein took the gravitational potential of zero mass: $\frac{\mathrm{E}^2}{p^2} = c^2$, in the form of $\frac{\mathrm{L}^2(\mathrm{Y}-)}{p^2} = Gv^2(X+) = \frac{8\pi G}{c^4}\mathrm{T}_{ik}$ the energy-momentum tensor. The false idea of Einstein's General Theory of Relativity is that it is believed that the equation presents a non-zero mass, as a source of curvature of space-time, as a source of gravity. In the equation of Einstein's General Theory of Relativity, as a mathematical truth in dynamic space-matter in full form:

$$R_{ik} - \frac{1}{2}Rg_{ik} - \frac{1}{2}\lambda g_{ik} = \frac{8\pi G}{c^4}\mathrm{T}_{ik}.$$

there is no mass: $(M = 0)$, in its classical understanding. In mathematical truth, this is the difference in relativistic dynamics at two fixed points of Riemannian space, one of which is reduced to the Euclidean sphere, in the external, non-stationary $(\lambda \neq 0)$Euclidean space-time. In physical truth, in the equation of the General Theory of Relativity, Einstein, in the unified Criteria of Evolution, the formula (law) of Newton is "sewn up":

$$E = c^4K, P = c^4T, (c_i^2 - c_k^2 = \Delta c_{ik}^2) = \frac{E^2}{p^2} = (\frac{K^2}{T^2} = c^2), \Delta c_{ik}^2 = Gv^2(X+) \neq 0$$

$$\Delta c_{ik}^2 = \frac{c^4c^4K^2}{c^4c^4T^2} = \frac{G(c^2K_Y = m_1)(c^2K_Y = m_2)}{c^2(c^2T^2 = K^2)} = \frac{Gm_1m_2}{c^2K^2}, \qquad \Delta c_{ik}^2 = \frac{Gm_1m_2}{c^2K^2}, \qquad \Delta c_{ik}^2c^2 = F$$

As we see, in the equation of Einstein's General Theory of Relativity, the gravitational force acts in fields with zero mass. It reads: the difference in mass flows $\Delta c_{ik}^2(Y-)$in the external potential field of gravity $c^2(X+)$, with their Equivalence Principle, gives the force. Let's define how this approach works. For example, for the Sun and the Earth $(M = 2 * 10^{33}g)$and $(m = 5.97 * 10^{27}g)$, we get $(U_1 = \frac{(G=6.67*10^{-8})(M=2*10^{33})}{R=1.496*10^{13}} = 8.917 * 10^{12})$ gravitational potential at a distance from the Earth and $U_2 = \frac{(G=6.67*10^{-8})(m=5.97*10^{27})}{R=6.374*10^8} = 6.25 * 10^{11}$, the potential of the Earth itself. Then $(\Delta U = U_1 - U_2 = 8.917 * 10^{12} - 6.25 * 10^{11} = 8.67 * 10^{12})$, or $(\Delta U = 8.29 * 10^{12})$, we get:

$\Delta U = \frac{8\pi G}{(c^4 = U^2 = F)}(\mathrm{T}_{ik} = \frac{(U^2K)^2}{U^2T^2} = \frac{U^2(UK=m)^2}{U^2T^2} = \frac{Mm}{T^2})$, or $\frac{\Delta U}{\sqrt{2}} = \frac{8\pi G}{F}\frac{Mm}{T^2}$, $F = \frac{8\pi G}{(\Delta U/\sqrt{2})}\frac{Mm}{T^2} = \frac{GMm}{(\Delta U*T^2/\sqrt{2})/8\pi}$ without dark masses. It remains to calculate $\frac{\Delta U*T^2}{8\pi\sqrt{2}} = \frac{8.29*10^{12}*(365.25*24*3600=31557600)^2}{8\pi\sqrt{2}} = 2.3 * 10^{26}$, which corresponds to the square of the distance $(R^2 = 2.24 * 10^{26})$from the Earth to the Sun, or , Newton's law. This approach corresponds to reality. Let's say more, it is from the equation of $F = \frac{GMm}{R^2}$ Einstein 's General Theory of Relativity that the equations of quantum gravity are derived in mathematical truth. In words, we are talking about the dynamics of the quantum gravitational potential Δc_{ik}^2, on the diverging (spiral) wavelength of the quantum. There is their mathematical representation $\Delta c_{ik}^2 = K * G(\mathrm{X}+)$:

Let us denote ($\Delta \mathrm{e}_{лп} = 2\psi \mathrm{e}_k$), $\mathrm{T}_{ik} = \left(\frac{\varepsilon}{\mathrm{P}}\right)_i \Delta \left(\frac{\varepsilon}{\mathrm{P}}\right)_{лп} = \left(\frac{\varepsilon}{\mathrm{P}}\right)_i 2\psi \left(\frac{\varepsilon}{\mathrm{P}}\right)_к = 2\psi \mathrm{T}_{ik}$, as an energy tensor ($\boldsymbol{\mathcal{E}}$) – (P)momentum with a wave function (ψ). From this follows the equation:

$$R_{ik} - \frac{1}{2}R\mathrm{e}_i\Delta\mathrm{e}_{лп} = к\left(\frac{\varepsilon}{P}\right)_i \Delta \left(\frac{\varepsilon}{P}\right)_{лп} \text{ or}$$

$$R_{ik}(X+) = 2\psi\left(\frac{1}{2}R\mathrm{e}_i\mathrm{e}_k(X+) + к\mathrm{T}_{ik}(Y-)\right), \quad \text{and} \quad R_{ik}(X+) = 2\psi\left(\frac{1}{2}Rg_{ik}(X+) + к\mathrm{T}_{ik}(Y-)\right).$$

This is the equation of the quantum Gravitational potential with the dimension $\left[\frac{\mathrm{K}^2}{\mathrm{T}^2}\right]$of the potential $(\Pi = v_Y^2)$and the spin (2ψ). In the brackets of this equation, part of the equation of General Relativity in the form of a potential Π(X+)gravitational field. In field theory (Smirnov, v.2, p.361), the acceleration of mass $(Y-)$trajectories in $(X+)$the gravitational field of a single $(Y-) = (X+)$space-matter is represented by the divergence of the vector field:

$$divR_{ik}(Y-)\left[\frac{K}{T^2}\right] = G(X+)\left[\frac{K}{T^2}\right], \text{ with acceleration } G(X+)\left[\frac{K}{T^2}\right] \text{and}$$

$$G(X+)\left[\frac{K}{T^2}\right] = grad_l\Pi(X+)\left[\frac{K}{T^2}\right] = grad_n\Pi(X+) * \cos\varphi_x\left[\frac{K}{T^2}\right].$$

The relation $G(X+) = grad_l\Pi(X+)$is equivalent to $G_x = \frac{\partial G}{\partial x}$; $G_Y = \frac{\partial G}{\partial y}$; $G_z = \frac{\partial G}{\partial z}$; representation. Here the total differential is $G_x dx + G_Y dy + G_z dz = d\Pi$. It has an integrating factor of the family of surfaces $\Pi(M) = C_{1,2,3\ldots}$, with the point M, orthogonal to the vector lines of the field of mass $(Y-)$trajectories in $(X+)$the gravitational field. Here $e_i(Y-) \perp e_k(X-)$. From this follows the quasipotential field:

$$t_T(G_x dx + G_Y dy + G_z dz) = d\Pi\left[\frac{K^2}{T^2}\right], \qquad \text{And} \qquad G(X+) = \frac{1}{t_T} grad_l\Pi(X+)\left[\frac{K}{T^2}\right].$$

Here $t_T = n$for the quasipotential field. Time $t = nT$, is $n$the number of periods $T$of quantum dynamics. And $n = t_T \neq 0$. From here follow the quasipotential surfaces$\omega = 2\pi/t$ quantum gravitational fields with period $T$and acceleration:

$$G(X+) = \frac{\psi}{t_T} grad_l\Pi(X+)\left[\frac{K}{T^2}\right].$$

$$G(X+)\left[\frac{K}{T^2}\right] = \frac{\psi}{t_T}\left(grad_n(Rg_{ik})(\cos^2\varphi_{x_{MAX}} = G)\left[\frac{K}{T^2}\right] + (grad_l(T_{ik})\right).$$

In models, it looks something like this:

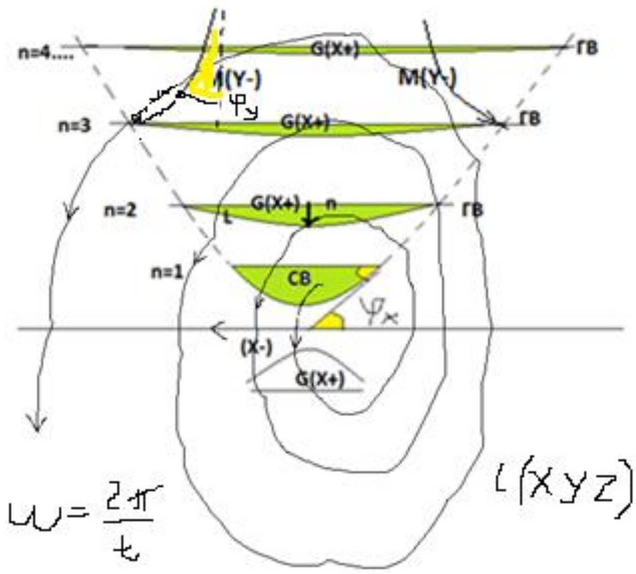


Fig. 3.2 Quantum gravitational fields.

This is a fixed in the section, selected direction of the normal $n \perp l$. **The addition of all such quantum fields of a set of quanta $rot_X G(X+)\left[\frac{K}{T^2}\right]$of any mass forms a common potential "hole" of its gravitational field,** where the Einstein equation is already in effect, with the formula (law) of Newton "sewn up" in the equation. In dynamic space-matter, we are talking about the dynamics $rot_X G(X+)\left[\frac{K}{T^2}\right]$of fields on closed $rot_X M(Y-)$trajectories. Here is a line along the quasi-potential surfaces of the Riemannian space, with the normal $n \perp l$. The limiting angle of parallelism of mass $(Y-)$trajectories in $(X+)$the gravitational field gives the gravitational constant ($\cos^2\varphi(X-)_{MAX} = G = 6.67 * 10^{-8}$). Here $t_T = \frac{t}{T} = n$, the order of the quasi-potential surfaces, and $(\cos\varphi(Y-)_{MAX} = \alpha = \frac{1}{137.036})$.

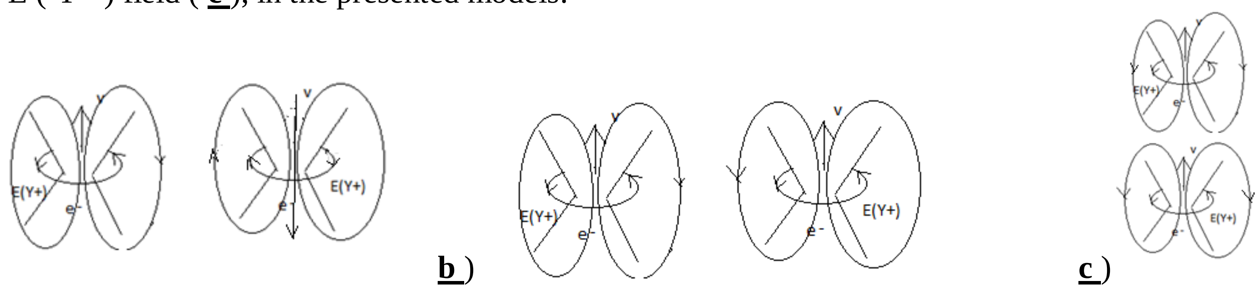
$$G(X+)\left[\frac{K}{T^2}\right] = \frac{\psi * T}{t}\left(G * grad_n Rg_{ik}(X+) + \alpha * grad_n T_{ik}(Y-)\right)\left[\frac{K}{T^2}\right].$$

This is the general equation of quantum gravity (X+ = Y-) of the mass field of accelerations , $\left[\frac{K}{T^2}\right]$and the wave ψfunction, as well as $T$the period of quantum dynamics $\lambda(X+)$, with spin (↓↑), (2ψ). Acceleration fields, as is known, are already force fields.

Based on this, models of the products of proton and electron annihilation are considered in the form:

Fig. 3.3 Models of the products of proton-electron annihilation

in a single space-matter $(X\pm = p^{+}) = (\boldsymbol{Y}-= \gamma_0^{+})(\boldsymbol{X}+= \nu_e^{-})(\boldsymbol{Y}-= \gamma_0^{+})$of proton and electron $(Y\pm = e^{-}) = (\boldsymbol{X}- = \nu_e^{-})(Y+ = \gamma^{+})(\boldsymbol{X}- = \nu_e^{-})$. In the simplest model of the hydrogen atom, there are no exchange photons in the electro (Y + =X -) magnetic interaction of the orbital electron and the proton of the nucleus, including any atom. The electron $(Y\pm = e^{-})$emits an exchange $(Y-= \gamma^{+})$photon, but the proton cannot emit an exchange $(Y-= \gamma^{+})$photon. The proton in the nucleus of the atom does not emit an exchange photon. And another question, why do the orbital electrons of the atom not repel each other in interaction, if they are attracted in interaction with the protons of the nucleus. There is an obvious contradiction here. In the presented models there are no such problems and contradictions. Two free electrons will repel (**a**), be on equipotential orbits of the atom (**b**) or follow each other in a uniform electric E (Y +) field (**c**), in the presented models:



a) **b**) **c**)

Fig.3. 4. Different states of electrons.

Under certain conditions, the electrons of a conductor, in the presence of an electric field in it, can follow each other and even “stick together like magnets.”

An electron emits and absorbs a photon: $(e \leftrightarrow \gamma)$. Their speeds are related by the relation: The speeds of a photon $(v_e = \alpha * c)$and a superluminal photon $(v_\gamma \leftrightarrow \alpha * v_{\gamma_2})$are connected in exactly the same way $(\gamma \leftrightarrow \gamma_2)$. They are connected by red lines in Fig. 3. How is this possible? Let us present the electron model in more detail.

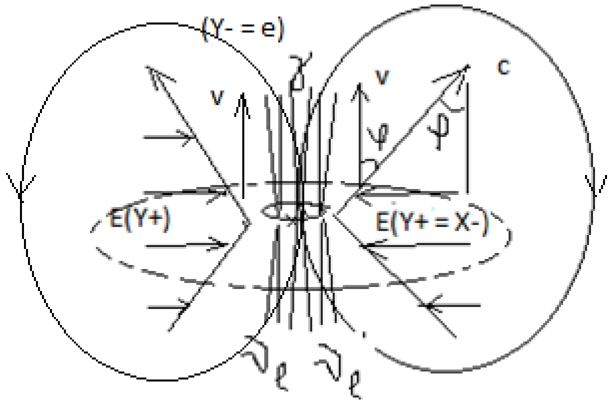


Fig.3.5. Electron model.

The electron has the shape of a torus, with $(\gamma$a photon inside. Indivisible electrons are repelled by external $E(Y+)$fields of electric charges. There is a Coulomb law of such interaction:

$$F = \frac{q^2}{r^2} = \frac{p}{t}, \qquad p = \frac{\hbar}{r}, \qquad t = \frac{r}{v}, \qquad F = \frac{q^2}{r^2} = \frac{\hbar(v=\alpha c)}{r^2},$$

$$\alpha = \frac{q^2}{\hbar c} = \frac{(4.8056*10^{-10})^2}{3.1647*10^{-17}} = 0.00728 \approx \frac{1}{137}, \text{ or: } \quad (v = \alpha c), \text{ where: } \quad \alpha = \frac{v}{c} = \cos(\varphi_Y)$$

The fine structure constant $(\alpha)$of the electric $(Y+ = e)$field of a charge is the cosine of the angle of parallelism of the electron $\cos(\varphi_Y)$mass trajectories $(Y- = e)$. We understand that the dynamics of the electric $(Y+ = e)$field generates a vortex in the induction$B(X-)$ magnetic field, according to Maxwell's equations: $c * rot_Y B(X -) \equiv \varepsilon_1 \frac{\partial E(Y+)}{\partial T}$. And the spin properties of an electron in $B(X-)$a magnetic field are quite obvious here. An electron emits and absorbs a photon. But the main thing is that the space of velocities of mass trajectories of an electron has inside the electron, with a near-zero angle of parallelism $(\varphi \approx 0)$, the maximum speed of a photon (virtual photon). That is, the speed of light $(v_e = \alpha * c)$inside an electron emitting a photon. We are talking about virtual photons of each electron, including in the presented models. These are the facts.

In a dynamic$(Y-)$ space-matter, we write down the emission or absorption by the electron $(Y- = e) \leftrightarrow (Y- = \gamma)$photon. And exactly the same, the space of velocities $(Y- = \gamma)$of mass trajectories of a photon, has inside the photon, with a near-zero $(\varphi \approx 0)$angle of parallelism, the maximum speed of a superluminal $(v = 137 * c)$photon. In other words, if a photon exists, then in fact, inside the photon there is a superluminal space of velocities, and an ordinary photon $(Y\pm = \gamma = c)$ can emit or absorb a superluminal $(Y \pm = \gamma_2)$photon. According to the usual formulas of Einstein's Special Theory of Relativity, for a photon $(Y\pm = \gamma)$, the speed of a superluminal photon $(Y \pm = \gamma_2)$, will have the same speed of light:

$$w = \frac{u+v}{1+\frac{uv}{c^2}}, \qquad v = \frac{c+137*c}{1+\frac{137*c*c}{c^2}} = \frac{c(1+137)}{(1+137)} = c.$$

Superluminal photons can be detected by recording the increase in momentum$(E = p * (1 + \alpha) * c)$ ordinary $(Y\pm = \gamma)$photons of any energy that absorb superluminal $(Y \pm = \gamma_2)$photons from the quanta $(p_4/e_4)$of the galactic core. Here we proceed from the fact that in the spectrum (Fig. 3) of indivisible quanta of space-matter, the quanta $(Y\pm = e_2)$of the star's core emit $(Y\pm= e)$ordinary electrons, which in turn emit $(Y\pm = \gamma)$photons. The principle of exchange interaction does not work here. The question then is what is actually happening (not in the "exchange the ball" models). For the experimental data $m(p) = 938{,}28 MeV, G = 6{,}67 * 10^{-8}. m_e = 0{,}511\ MeV,\ (m_{\nu_\mu} = 0{,}27\ MeV)$, and the simplest transformations, we obtained the calculated data:

$$(X -) = cos^2\varphi_X = (\sqrt{G})^2 = G, \qquad \left(\frac{Y=K_Y}{K}\right)(Y -) = cos\ \varphi_Y = \alpha = \frac{1}{137{,}036}$$

$$m = \frac{F=\Pi^2}{Y''} = \left[\frac{\Pi^2 T^2}{Y} = \frac{\Pi}{(Y/K^2)}\right] = \frac{\Pi Y = m_Y}{\left(\frac{Y^2}{K^2}=\frac{G}{2}\right)}, \qquad \text{where} \qquad 2m_Y = Gm_X\ ,$$

$$m = \frac{F=\Pi^2}{X''} = \left[\frac{\Pi^2 T^2}{X} = \frac{\Pi}{(X/K^2)}\right] = \frac{\Pi X = m_X}{\left(\frac{X^2}{K^2}=\frac{\alpha^2}{2}\right)}, \qquad \text{where} \qquad 2m_X = \alpha^2\ m_Y$$

$$(\alpha^2/\sqrt{2}) * \Pi K * (\alpha^2/\sqrt{2}) = \alpha^2 * m(e)/2 = m(\nu_e) = 1{,}36 * 10^{-5} MeV \qquad \text{or} \qquad \alpha^2\ m_Y/2 = m_X$$

$$\sqrt{G/2} * \Pi K * \sqrt{G/2} = G * \frac{m(p)}{2} = m(\gamma_0) = 3{,}13 * 10^{-5} MeV \qquad \text{or} \qquad Gm_X/2 = m_Y$$

$$m(\gamma) = \frac{Gm(\nu_\mu)}{2} = 9{,}1 * 10^{-9} MeV.$$

On the other hand, for the proton wavelength $\lambda_p = 2{,}1 * 10^{-14}$см, its frequency $(\nu_{\gamma_0^+}) = \frac{c}{\lambda_p} = 1{,}4286 * 10^{24}$Гц, is formed by the frequency $(\gamma_0^+)$of quanta, with mass $2(m_{\gamma_0^+})c^2 = G\hbar(\nu_{\gamma_0^+}).1\text{г} = 5{,}62 * 10^{26} MeV$, or

$$(m_{\gamma_0^+}) = \frac{G\hbar(\nu_{\gamma_0^+}).}{2c^2} = \frac{6{,}67*10^{-8}*1{,}0545*10^{-27}*1{,}4286*10^{24}}{2*9*10^{20}} = 5{,}58 * 10^{-32}\text{г} = 3{,}13 * 10^{-5} MeV$$

Similarly, for an electron $\lambda_e = 3{,}86 * 10^{-11}$см, its frequency $(\nu_{\nu_e^-}) = \frac{c}{\lambda_e} = 7{,}77 * 10^{20}$Гцis formed by the frequency $(\nu_e^-)$of quanta, with mass $2(m_{\nu_e^-})c^2 = \alpha^2\hbar(\nu_{(\nu_e^-)}$, where is $\alpha(Y-) = \frac{1}{137{,}036}$a constant, we obtain:

$$(m_{\nu_e^-}) = \frac{\alpha^2\hbar(\nu_{(\nu_e^-)})}{2c^2} = \frac{1*1{,}0545*10^{-27}*7{,}77*10^{20}}{(137{,}036^2)*2*9*10^{20}} = 2{,}424 * 10^{-32}\text{г} = 1{,}36 * 10^{-5}MeV,$$

for the neutrino mass. Such coincidences cannot be accidental. Let's look further. $(Y- = e^-)$Mass field dynamics Electron generates its electric $(Y+ = e^-)$field with electromagnetic $(Y+ = X-)$dynamics, as already charge field. Exactly such dynamics of fields of proton, with the specified mass fields. Separating electromagnetic $(Y+ = X-)$fields from mass fields $(Y- = X+)$we obtain their charges:

$$(X+)(X+) = (Y-)\text{and } \frac{(X+)(X+)}{(Y-)} = 1 = (Y+)(Y-);\ (Y+= X-) = \frac{(X+)(X+)}{(Y-)}, \text{ or:}$$

$$\frac{(\boldsymbol{X}+=\nu_e^-/2)(\sqrt{\boldsymbol{2}}*\boldsymbol{G})(\boldsymbol{X}+=\nu_e^-/2)}{(Y-=\gamma^+)} = q_e(Y+)$$

$$q_e = \frac{(m(\nu_e)/2)(\sqrt{\boldsymbol{2}}*\boldsymbol{G})(m(\nu_e)/2)}{m(\gamma)} = \frac{(1.36*10^{-5})^2*\sqrt{2}*6{,}67*10^{-8}}{4*9{,}07*10^{-9}} = 4{,}8*10^{-10}\text{СГСЕ}$$

$$(Y+)(Y+) = (X-)\text{and } \frac{(Y+)(Y+)}{(X-)} = 1 = (X+)(X-);\ (Y+= X-) = \frac{(Y-)(Y-)}{(X+)}, \text{ or:}$$

$$\frac{(\boldsymbol{Y}-=\gamma_0^+)(\boldsymbol{\alpha^2})(\boldsymbol{Y}-=\gamma_0^+)}{(\boldsymbol{X}+=\nu_e^-)} = q_p(Y+= X-),$$

$$q_p = \frac{(m(\gamma_0^+)/2)(\alpha^2/2)(m(\gamma_0^+)/2)}{m(\nu_e^-)} = \frac{(3{,}13*10^{-5}/2)^2}{2*137{,}036^2*1.36*10^{-5}} = 4{,}8*10^{-10}\text{СГСЕ}$$

Such coincidences also cannot be accidental. Such circumstances give grounds to speak about other models and other (non-exchange) principles of interaction.

It is appropriate to note here that from the relations: $m_Y = \frac{Gm_X}{2}$, $m_X = \frac{\propto^2 m_Y}{2}$, their transformations follow in the form: $m_Y = \frac{G\left(\frac{\propto^2 m_Y}{2}\right)}{2}$, or $(z = G \propto^2/4) = 8.88 * 10^{-13})$. In exactly the same way we obtain $m_X = \frac{\propto^2\left(\frac{Gm_X}{2}\right)}{2}$, or $(z = G \propto^2/4) = 8.88 * 10^{-13})$. The full calculation of the mass spectrum in $ОЛ_j$, and $ОЛ_i$levels of physical vacuum, has the same result in both calculations $(zp = \nu_1)$, $(ze = \gamma_1)$and so on. And already from these circumstances, follow the answers to the questions of what the magnetic field of the proton and the electric field of the electron consists of. For the proton $(X\pm= p^+) = (Y-= \gamma_0^+)(X+= \nu_e^-)(Y-= \gamma_0^+)$, where we have quanta $(Y\pm= \gamma_0^+) = (X- = \nu_1^+)(Y+= \gamma_2^{-+})(X- = \nu_1^+)$, its p(X -) field is formed by the fields $(X-) = 2(Y+= \gamma_0^+)$of quanta, which in their $(Y+ = \gamma_0^+)$field contain $(X- = \nu_1^+)$quanta, in a single $(Y+ = X-)$space-matter. In other words, the magnetic field p(X -) of the proton forms the vortex (according to the equations) trajectories $(X- = \nu_1^+)$of quanta. The proton here has the shape of a torus. Similarly, for the electron.

A physical fact is the charge isopotential of a proton $p(X-= Y+)e$and an electron in a hydrogen atom with a mass ratio $(p/e \approx 1836)$. By analogy, we speak of the charge isopotential $\nu_\mu(X-= Y+)\gamma_0$, and $\nu_e(X-= Y+)\gamma$, of subatoms, with a mass ratio $(\nu_\mu/\gamma_0 \approx 8642)$and, $(\nu_e/\gamma \approx 1500)$respectively. In this case, subatoms $(\nu_\mu/\gamma_0)$are held by the gravitational field of planets, and sub atoms $(\nu_e/\gamma)$are held by the gravitational field of stars. This follows from calculations of atomic structures (p/e), sub atoms of planets $(p_1/e_1)(p/e)(\nu_\mu/\gamma_0)$, stars $(p_2/e_2)(p_1/e_1)(p/e)(\nu_\mu/\gamma_0)(\nu_e/\gamma)$, for: $e_1 = 2\nu_\mu/\alpha^2 = 10{,}2GeV)$,

$e_2 = 2p/\alpha^2 = 35{,}2TeV)$, $НОЛ = e_1 * 3{,}13 * \gamma_0 = 1$, and $НОЛ = e_2 * 3{,}13 * \gamma = 1$. And also, for $p_1 = \frac{2e}{G} = 15{,}3TeV$, and $p_1(X-= Y+)e_1$ "heavy atoms" inside the stars themselves. If quanta $(m_X = p_1^-) = \frac{2(m_Y=e^-)}{G} = (15{,}3\ TeV)$and exist $(m_Y = e_2^-) = \frac{2(m_X=m_p)}{\alpha^2} = (35{,}24\ TeV)$, then similar to the generation of (p_1/n_1)uranium $p^+ \approx n$nuclei by quanta of the Earth's core , $(2\alpha p_1^- = 238p^+ = {}^{238}_{92}U)$, with subsequent decay into a spectrum of atoms, quanta $p_2^- = \frac{2e_1^-}{G} = 3{,}06 * 10^5TeV$, and (p_2/n_2), $(p_2 \approx n_2)$of the Sun's (star's) core, generate nuclei of "stellar uranium", $(2\alpha p_2^- = 290p_1^+ = {}^{290}U^*)$, with their exothermic decay into a spectrum of "stellar" atoms (p_1^+/e_1^-)in the solid surface of the star (Sun) without interactions with ordinary (p^+/e^-)hydrogen atoms and a spectrum of atoms. The mass of the quanta of the planetary core is calculated in exactly the same way:

$$(m_X \;= p_1^-) = \frac{2(m_Y=e^-)}{G} = \frac{2(0.511\ MeV)}{6.67*10^{-8}} = 15{,}3\ TeV$$

Moreover, there are surprising ratios of their masses:

$$\text{НОЛ} = M(e_2 = 3{,}524\ \text{E}7\ )(k = 3.13)M(\gamma = 9{,}07\ \text{E} - 9\ ) = 1$$

$$\text{НОЛ} = M(e_4 = 1{,}15\ \text{E}16\ )(k = 3.13)M(\gamma_2 = 2{,}78\ \text{E} - 17\ ) = 1$$

Here we are talking about Indivisible Areas of Localization of dynamic space-matter. And this means that the core of a star, as well as stars, are in the energy level of physical vacuum at the level of ordinary (γ)photons emitted by them. Then, exactly the same way, the core of galaxies, as well as galaxies themselves, are in the energy level of physical vacuum at the level of superluminal (γ_2)photons emitted by them.

Based on these calculations, the dynamic space-matter of the photon has exactly the same model, but with different parameters of superluminal speeds.

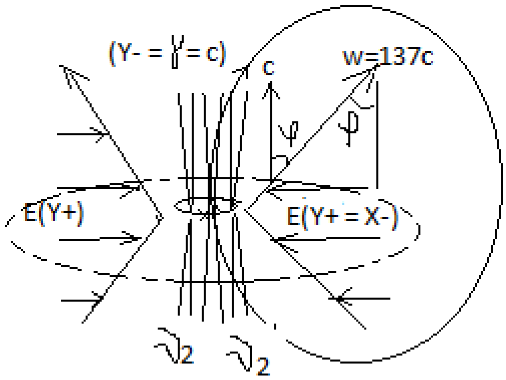


Fig. 3.6. Dynamic space-matter of photon

And exactly the same way, the space of velocities of mass trajectories of a photon has inside the photon, with a near-zero angle of parallelism, the ultimate velocity of a superluminal $(v_2 = 137 * \text{c})$photon. The velocity of a photon (c)is the projection of the velocity $(v_2 = 137\text{c} = \gamma_2)$. In other words, inside the photon we have a superluminal velocity of a photon $(v_2 = 137\text{c})$. The important thing is that the usual$(Y\pm = \ \gamma = c)$ a photon can emit and absorb a superluminal photon $(Y \pm = \gamma_2)$just as an ordinary electron can $(Y\pm = \ e)$emit an ordinary photon $(Y\pm = \ \gamma)$. And the source of ordinary photons are stars. And the source of superluminal photons is the "heavy" (e_2)electrons of the galaxy's core. Superluminal photons can be detected by recording an increase in momentum:$(E = p * (1 + \alpha) * \text{c}\ )$ ordinary $(Y\pm = \ \gamma)$photons of any energy that absorb superluminal $(Y \pm = \gamma_2)$photons from the quanta $(p_4/e_4)$of the galactic core.

Speaking about other models of non-exchange character and principles of interaction, we can speak about the structural form of charged (Y- = p^+/n) and neutral (Y- =2n) quanta of Strong Interaction of the nucleus in their single $(Y\pm = X\mp)$space-matter. They are connected and emit a quantum of interaction $(2\alpha * \text{p}\ \approx 2 * \left(\frac{1}{137}\right) * 938{,}28 \approx 13{,}7MeV)$, with the specific binding energy $(\text{E}_{\text{уд}} \approx 6{,}9\text{MeV})$of the nucleons of the nucleus. For the maximum specific binding energy $(\text{E}_{\text{уд}} \approx 8{,}5\text{MeV})$, the emitted quantum of the Strong Interaction binding in the nucleus is $(\text{E} \approx 17\text{MeV})$. It was discovered in the experiment as a fact. Such charged (Y- = p^+/n) and neutral (Y- =2n) quanta of the Strong Interaction of the nucleus have levels and shells in the nucleus, as the cause of the formation of levels and shells of the electrons of the atom.

From the axioms of such a dynamic $(\varphi \neq const)$space-matter, as geometric facts that do not require proof, $(m - n)$convergence, are formed by Indivisible Areas of Localization of both indivisible $(X\pm)$and $(Y\pm)$quanta of dynamic space-matter. Indivisible quanta $(X\pm = p)$, $(Y\pm= e)$, $(X \pm = \nu_\mu)$, $(Y \pm = \gamma_o)$, $(X\pm = \nu_e)$, $(Y\pm = \ \gamma)$, form OL $_1$ – the first Area of their Localization. In exactly the same way, OL $_2$, OL $_3$ – Areas of Localization of indivisible quanta are formed.

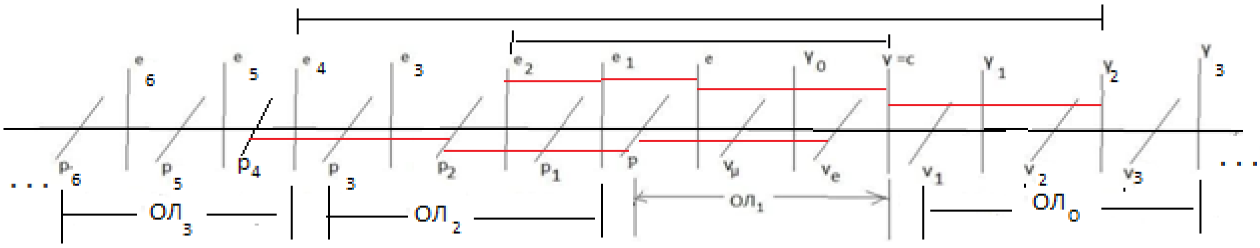


Fig. 4 Quantum coordinate system

Let us highlight the facts necessary here. An electron emits and absorbs a photon: $(e \leftrightarrow \gamma)$. Their velocities are related by the relation: . The velocities of a photon $(v_e = \alpha * c)$and a superluminal photon $(v_\gamma \leftrightarrow \alpha * v_{\gamma_2})$are related in exactly the same way $(\gamma \leftrightarrow \gamma_2)$. They are connected by the red lines in Fig. 4. Sequences of emission and absorption of indivisible (stable) quanta, in such a quantum coordinate system:

$$\dots (p_8^+ \to p_6^-), (p_6^- \to p_4^+), (p_4^+ \to p_2^-), (p_2^- \to p^+),..$$

with the corresponding nucleus of the atom: $(p^+/e^-)$the matter of an ordinary atom, $(p_2^-/e_2^+)$the antimatter of the nucleus of a "stellar atom", $(p_4^+/e_4^-)$the matter of a galaxy's nucleus, $(p_6^-/e_6^+)$the antimatter of a quasar's nucleus and " $(p_8^+/e_8^-)$the matter of a "quasar galaxy's nucleus". Further, we proceed from the fact that the quantum $(e_{*1}^-)$of the matter $(Y- = p_1^-/n_1^- = e_{*1}^-)$of the planet's nucleus emits a quantum

$$(e_{*1}^+ = 2 * \alpha * (p_1^- = 1{,}532E7\ MeV)) = 223591MeV, \quad \text{or:} \frac{223591}{p=938{,}28} = e_*^+ = 238{,}3 * p$$

mass of the uranium nucleus, the quantum of "antimatter" $M(e_*^+) = M(238{,}3 * p) = {}^{238}_{92}U$, the uranium nucleus. Such "antimatter" $(e_*^+ = {}^{238}_{92}U = Y-)$is unstable and disintegrates exothermically into a spectrum of atoms in the core of planets. Such calculations are consistent with the observed facts.

In the superluminal level of $w_i(\alpha^{-N}(\gamma = c))$the physical vacuum, such (p_2^-/e_2^+)stars do not manifest themselves. Further, we are talking about the substance $(p_3^+ \to p_1^-)$of the core of $(Y- = p_3^+/n_3^0 = e_{*3}^+)$the "black spheres", around which, in their gravitational field, globular clusters of stars are formed. Similarly, further, we are talking about the radiation of matter of antimatter and vice versa: $(p_6^+ \to p_5^-)$, $(p_5^- \to p_3^+)$, $(p_3^+ \to p_1^-)$, $(p_1^- \to v_\mu^+)$. The general sequence of them is as follows: $p_8^+, p_7^+, p_6^-, p_5^-, p_4^+, p_3^+, p_2^-, p_1^-, p^+, v_\mu^+, v_e^-$ .... Further: НОЛ $= M(e_4 = 1{,}15\ \text{E}16)(k = 3.13)M(\gamma_2 = 2{,}78\ \text{E} - 17) = 1$. These quanta of the galaxy core are surrounded by quanta $(p_4/e_4)$of the star core $v_i(\gamma_2 = \alpha^{-1}\text{c}) = 137 * \text{c}$emitted separately, and are the cause of their formation. Such galaxy cores, in the equations of quantum gravity, have spiral arms of mass trajectories, already: (p_2/e_2), in superluminal space of velocities. Below the energy of light photons $(v_{\gamma_2} = 137 * \text{c})$in the physical vacuum, galaxies do not manifest themselves. Outside galaxies, we are talking about quanta of the core of mega stars $(Y- = p_5^-/n_5^- = e_{*5}^-)$. They generate many quanta $(e_{*5}^- = 2 * \alpha * p_5^- = e_{*4}^+ = 290p_4^+)$of the galaxy core. Similarly, further.

The important thing is that an ordinary photon $(Y\pm = \gamma)$can emit and absorb a superluminal photon $(Y \pm = \gamma_2)$in exactly the same way as an electron $(Y\pm = e)$emits an ordinary photon $(Y\pm = \gamma)$. The source of ordinary photons are stars. And the source of superluminal photons is the "heavy" electrons of the galaxy's core.

$$\text{НОЛ} = M(e_2 = 3{,}524\ \text{E}7)(k = 3.13)M(\gamma = 9{,}07\ \text{E} - 9) = 1$$
$$\text{НОЛ} = M(e_4 = 1{,}15\ \text{E}16)(k = 3.13)M(\gamma_2 = 2{,}78\ \text{E} - 17) = 1$$

Moreover, for a photon $(Y\pm = \gamma)$, the speed of a superluminal photon $(Y \pm = \gamma_2)$will have the same speed of light: $w = \frac{c+137*c}{1+\frac{137*c*c}{c^2}} = \frac{c(1+137)}{(1+137)} = c$. These connections are shown in Fig. 4. In essence, we are talking about the "immersion" of quanta of the core of stars and galaxies, in the corresponding levels of the physical vacuum. As we see, the quanta of the core of galaxies are "immersed" in the superluminal space of velocities. The task is to search for such photons in the direction of the galactic core as a source of superluminal photons $(Y \pm = \gamma_2)$. For example, an orbital hydrogen electron emits a photon when it moves from one orbit to another. Understood. So, the emitted photons, from the same orbits of hydrogen electrons in the direction of the galactic core, and in the direction perpendicular from the galactic core, can have the following: $E = p * c * (1 + \alpha)$, energy difference. The decisive word here will be said by trial experiments. The same decisive word will be given by trial experiments to detect quasipotential , quantum gravitational acceleration fields.

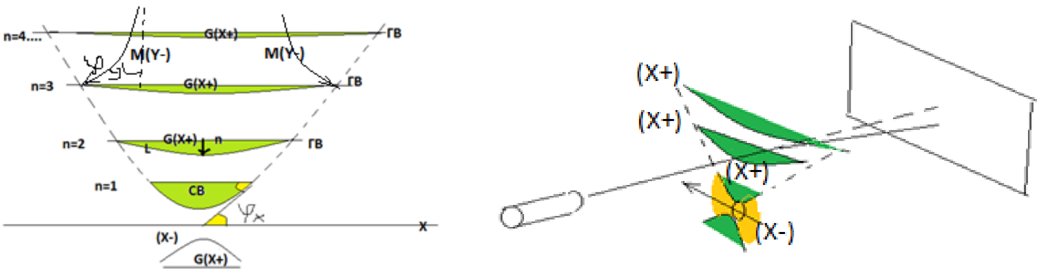


Fig. 5 Quantum gravitational fields

The essence of the experiment is to pass a laser photon through quantum gravitational fields of accelerations, for example: $(X\pm = p)$- a proton, $(X\pm = {}_2^4\alpha)$- a particle, a helium nucleus. These are the levels of mass G (X + = Y -) trajectories of electron (Y - = e $^-$) orbits of an atom.

4.In the depths of the physical vacuum

Like the Cartesian, any other coordinate system in the Euclidean axiomatic, it is already possible to represent the quantum coordinate system on $(m)$and (n)convergence of space-matter, the points of which are indivisible quanta, in full form.

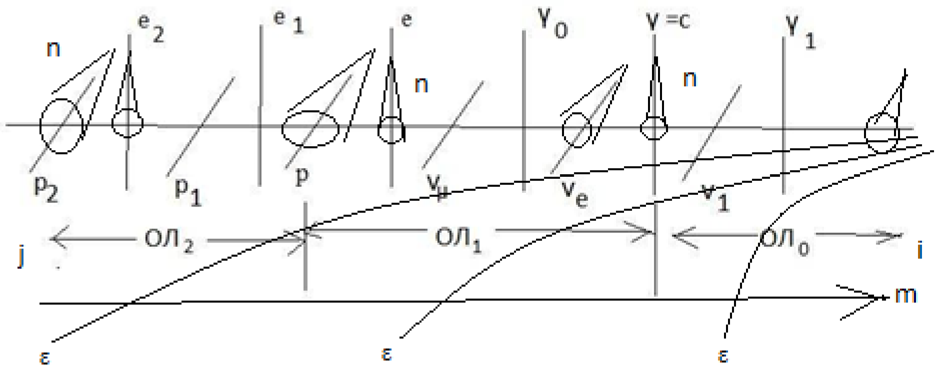


Fig.6 Quantum coordinate system

Already in such a quantum coordinate system, we can consider the properties of the space-matter of the Universe, visible and invisible for photons and neutrinos $(ОЛ_1)$of the level. We are talking about the visible expansion, fixed $(Y\pm = \gamma = c)$by photons $(ОЛ_1)$of the level of indivisible quanta of space-matter $(p,\ e, \nu_\mu, \ \gamma_{0,}\ \nu_e, \gamma)$in the quantum coordinate system. Now we will represent the indivisible quanta of space-matter in the form of $ОЛ_{ji}(m)$their (m)convergence.

$$ОЛ_j \dots ОЛ_3 \dots (p_3\ e_3\ p_2\, e_2\, p_1\, e_1\ = ОЛ_2)(p, e, \nu_\mu,\ \gamma_{0,}\ \nu_e, \gamma = ОЛ_1)(\nu_1\gamma_1\ \nu_2\gamma_2\ \nu_3\gamma_3\ = ОЛ_0) \dots ОЛ_{-1}ОЛ_{-2} \dots ОЛ_i$$

In this case, the speed of the electron $(ОЛ_1)$of level: $(w = \left(\alpha = \frac{1}{137}\right) * c$, or $(w = \alpha^{(N=1)} * c$.

Einstein's Theory of Relativity and quantum relativistic dynamics allow superluminal speeds in space-time.

$$\overline{W_Y} = \frac{c+Nc}{1+c*Nc/c^2} = c, \qquad \overline{W_Y} = \frac{a_{11}Nc+c}{a_{22}+Nc/c} = \text{c, For } a_{11} = a_{22} = 1.$$

Here $(\uparrow a_{11} \downarrow)(\downarrow a_{22} \uparrow) = 1$cosines of the angles of parallelism in the form: $\cos(\varphi_X) * \cos(\varphi_Y) = 1$. Then the speeds of subphotons $(\gamma_i\,)$of the physical vacuum are equal to: $(w_i = \alpha^{(-N=-1,-2\dots)} * c)$superluminal speeds in $(ОЛ_i)$the levels of the physical vacuum. Similarly, the space of speeds in $(ОЛ_j)$the levels in the form: $(w_j = \alpha^{(+N=1,2,3\dots)} * c)$, subject to the limiting$(w_j * w_i = \alpha^{+N}c * \alpha^{+N}c = П = c^2)$ potentials in Einstein's postulates for $(ОЛ_1)$the level. In the same potentials, the mass spectrum of indivisible quanta of the entire quantum coordinate system is calculated $ОЛ_{ji}(m)$at (m)convergence, similar to the calculations of the masses of $m(X+= Y -) = ПК$, $(ОЛ_1)$level. $m_Y = Gm_X/2,\ m_X = \propto^2 m_Y/2$.Full calculation of the mass spectrum in $ОЛ_j$, and $ОЛ_i$levels of physical vacuum, has the form:

Table 1.

	Quanta of the nucleus	$2\alpha * p_j = N * p_{j-1}$	N	(X±) = p ^+_J (M eV)	(Y±) = e $_J$ (M eV)
				$p^+_{27} = 2e_{26} / G$	$e_{27} = 2\, p_{25} / \alpha^2$

OL +1 1				p^{+}_{27} =2.7 E111 M eV	e_{27} = 1.48 9 E108 MeV
	○ Exaquasar	$2\alpha * p_{26}^{-} = 290 p_{25}^{+}$	14	$p^{-}_{26} = 2e_{25} / G$ p^{-}_{26} = 7.9 E107 MeV	$e_{26} = 2 p_{24} / \alpha^2$ e_{26} = 9.1 E103 MeV
		$2\alpha * p_{25}^{-} = 238 p_{24}^{+}$		$p^{-}_{25} = 2e_{24} / G$ p^{-}_{25} = 3.96 E103 MeV	$e_{25} = 2 p_{23} / \alpha^2$ e_{25} = 2.6 E100 MeV
OL +1 0	Superquasar . ● Galact . 1st kind	$2\alpha * p_{24}^{+} = 25 p_{23}^{-}$	13	$p^{+}_{24} = 2e_{23} / G$ p^{+}_{24} = 2.4 E99 MeV	$e_{24} = 2 p_{22} / \alpha^2$ e_{24} = 1.32 E96 MeV
	black spheres	$2\alpha * p_{23}^{+} = 290 p_{22}^{-}$		$p^{+}_{23} = 2e_{22} / G$ p^{+}_{23} = 7.0 1 E95 M eV	$e_{23} = 2 p_{21} / \alpha^2$ e_{23} =8.1 E91 M eV
	○ superquasar 1st kind	$2\alpha * p_{22}^{-} = 238 p_{21}^{+}$	12	$p^{-}_{22} = 2e_{21} / G$ p^{-}_{22} = 3.5 E91 MeV	$e_{22} = 2 p_{20} / \alpha^2$ e_{22} =2.3 4 E88 M eV
OL + 8		$2\alpha * p_{21}^{-} = 25 p_{20}^{+}$		$p^{-}_{21} = 2e_{20} / G$ p^{-}_{21} = 2 , 16 E87 M eV	$e_{21} = 2 p_{19} / \alpha^2$ e_{21} = 1 , 17 E84 M eV
	●● Superquasar Galact . Type 2	$2\alpha * p_{20}^{+} = 290 p_{19}^{-}$	11	$p^{+}_{20} = 2e_{19} / G$ p^{+}_{20} = 6 , 2 26 E83 M eV	$e_{20} = 2 p_{18} / \alpha^2$ e_{20} = 7 , 2 E79 M eV
	black spheres	$2\alpha * p_{19}^{+} = 238 p_{18}^{-}$		$p^{+}_{19} = 2e_{18} / G$ p^{+}_{19} = 3 , 13 E79 M eV	$e_{19} = 2 p_{17} / \alpha^2$ e_{19} = 2 , 08 E76 M eV
OL + 7	○○ superquasars 2 genera	$2\alpha * p_{18}^{-} = 25 p_{17}^{+}$	10	$p^{-}_{18} = 2e_{17} / G$ p^{-}_{18} = 1 , 9 E75 M eV	$e_{18} = 2 p_{16} / \alpha^2$ e_{18} = 1 , 04 E72 M eV
		$2\alpha * p_{17}^{-} = 290 p_{16}^{+}$		$p^{-}_{17} = 2e_{16} / G$ p^{-}_{17} = 5 , 5 3 E71 M eV	$e_{17} = 2 p_{15} / \alpha^2$ e_{17} = 6 , 38 E 6 7 MeV
	● megastar galaxies	$2\alpha * p_{16}^{+} = 238 p_{15}^{-}$	9	$p^{+}_{16} = 2e_{15} / G$ p^{+}_{16} = 2 , 7 8 E 6 7 MeV	$e_{16} = 2 p_{14} / \alpha^2$ e_{16} = 1.8 4 E 6 4 MeV
OL + 6	black spheres	$2\alpha * p_{15}^{+} = 25 p_{14}^{-}$		$p^{+}_{15} = 2e_{14} / G$ p^{+}_{15} = 1 ,7 E 6 3 MeV	$e_{15} = 2 p_{13} / \alpha^2$ e_{15} = 9.26 E 59 MeV
	○ megastars	$2\alpha * p_{14}^{-} = 291 p_{13}^{+}$	8	$p^{-}_{14} = 2e_{13} / G$ p^{-}_{14} = 4.91 E 59 MeV	$e_{14} = 2 p_{12} / \alpha^2$ e_{14} = 5.67 E 55 MeV
	Superplanets	$2\alpha * p_{13}^{-} = 238 p_{12}^{+}$		$p^{-}_{13} = 2e_{12} / G$ p^{-}_{13} = 2.46 E 55 MeV	$e_{13} = 2 p_{11} / \alpha^2$ e_{13} = 1.64 E 52 MeV
OL + 5	● quasar galaxies of the 1st type	$2\alpha * p_{12}^{+} = 25 p_{11}^{-}$	7	$p^{+}_{12} = 2e_{11} / G$ p^{+}_{12} = 1 , 51 E 51 MeV	$e_{12} = 2 p_{10} / \alpha^2$ e_{12} = 8 , 2 2 E 47 MeV
	black spheres	$2\alpha * p_{11}^{+} = 290 p_{10}^{-}$		$p^{+}_{11} = 2e_{10} / G$ p^{+}_{11} = 4 , 36 E 47 MeV	$e_{11} = 2 p_{9} / \alpha^2$ e_{11} = 5 , 03 E 43 MeV
	○ quasars 1st kind	$2\alpha * p_{10}^{-} = 238 p_{9}^{+}$	6	$p^{-}_{10} = 2e_{9} / G$ p^{-}_{10} = 2, 19 E 43 MeV	$e_{10} = 2 p_{8} / \alpha^2$ e_{10} =1, 45 E 40 MeV
OL + 4		$2\alpha * p_{9}^{-} = 25 p_{8}^{+}$		$p^{-}_{9} = 2e_{8} / G$ p^{-}_{9} =1.3 4 E 39 MeV	$e_{9} = 2 p_{7} / \alpha^2$ e_{9} = 7.3 E 35 MeV
	●● quasar galaxies of type 2	$2\alpha * p_{8}^{+} = 290 p_{7}^{-}$	5	$p^{+}_{8} = 2e_{7} / G$ p^{+}_{8} = 3.8 7 E 35 MeV	$e_{8} = 2 p_{6} / \alpha^2$ e_{8} = 4.47 E 31 MeV
	black spheres	$2\alpha * p_{7}^{+} = 238 p_{6}^{-}$		$p^{+}_{7} = 2e_{6} / G$ p^{+}_{7} = 1.94 E 31 MeV	$e_{7} = 2 p_{5} / \alpha^2$ e_{7} =1.3 E2 8 MeV
OL + 3	○ ○ quasars 2 genera	$2\alpha * p_{6}^{-} = 25 p_{5}^{+}$	4	$p^{-}_{6} = 2e_{5} / G$ p^{-}_{6} = 1.19 E2 7 MeV	$e^{+}_{6} = 2 p_{4} / \alpha^2$ e^{+}_{6} = 6.48 E 23 MeV
	Intergalactic black spheres	$2\alpha * p_{5}^{-} = 290 p_{4}^{+}$		$p^{-}_{5} = 2e_{4} / G$ p^{-}_{5} = 3.4 47 E 23 MeV	$e_{5} = 2 p_{3} / \alpha^2$ e_{5} = 3.97 E1 9 MeV
	● star Galactics	$2\alpha * p_{4}^{+} = 238 p_{3}^{-}$	3	$p^{+}_{4} = 2e_{3} / G$ p^{+}_{4} = 1.7 E1 9 M eV	$e^{-}_{4} = 2 p_{2} / \alpha^2$ e^{-}_{4} = 1.15E+1 6 M eV
OL + 2	Galactic black spheres	$2\alpha * p_{3}^{+} = 25 p_{2}^{-}$		$p^{+}_{3} = 2e_{2} / G$ p^{+}_{3} = 1.057 E 15 MeV	e3 = $2 p_{1} / \alpha^2$ e_{3} = 5.7 55 E 11 MeV
	○ Stars	$2\alpha * p_{2}^{-} = 290 p_{1}^{+}$	2	$p^{-}_{2} = 2e_{1} / G$ p^{-}_{2} = 3.0 5 E 11 MeV	e2 = $2 p / \alpha^2$ e2 = 3,524 E7 M eV
	Planets	$2\alpha * p_{1}^{-} = 238 p^{+}$		$p^{-}_{1} = 2e / G$ p^{-}_{1} = 1 , 532 E7 M eV	$e_{1} = 2 v_{\mu} / \alpha^2$ e_{1} = 10 178 M eV

OL_{+1}	level	$2\alpha * p^+ = 25\nu_\mu^-$	1	$p^+ = 2\gamma_0/G$ $p^+ = 938.28$ MeV	$e^- = 2\nu_e/\alpha^2$ $e^- = 0.511$ MeV
		$2\alpha * \nu_\mu^+ = 292\nu_e^-$		$\nu_\mu = \alpha^2 e_1/2$ $\nu_\mu = 0.27\ 1$ MeV	$\gamma_0 = G p/2$ $\gamma_0 = 3.13*10^{-5}$ MeV
			0	$\nu_e = \alpha^2 e/2$ $\nu_e = 1.36* 10^{-5}$ MeV	$\gamma = G \nu_\mu/2$ $\gamma^+ = 9.07*10^{-9} MeV$
OL_0	Physical vacuum level			$\nu_1 = \alpha^2 \gamma_0/2$ $\nu_1 = 8.3*10^{-10}$ M eV	$\gamma_1 = G \nu_e/2$ $\gamma_1 = 4.5* 10^{-13}$ MeV
			-1	$\nu_1 = \alpha^2 \gamma/2$ $\nu_2 = 2.4* 10^{-13}$ MeV	$\gamma_2 = G \nu_1/2$ $\gamma_2 = 2.78* 10^{-17}$ MeV
				$\nu_3 = \alpha^2 \gamma_1/2$ $\nu_3 = 1.2* 10^{-17}$ MeV	$\gamma_3 = G \nu_2/2$ $\gamma_3 = 8.05* 10^{-21}$ MeV
OL_{-1}	Physical vacuum level		-2	$\nu_4 = \alpha^2 \gamma_2/2$ $\nu_4 = 7.4 * 10^{-22}$ MeV	$\gamma_4 = G \nu_3/2$ $\gamma_4 = 4.03* 10^{-25}$ MeV
				$\nu_5 = \alpha^2 \gamma_3/2$ $\nu_5 = 2.14* 10^{-25}$ MeV	$\gamma_5 = G \nu_4/2$ $\gamma_5 = 2.47* 10^{-29}$ MeV
			-3	$\nu_6 = \alpha^2 \gamma_4/2$ $\nu_6 = 1.07* 10^{-29}$ MeV	$\gamma_6 = G \nu_5/2$ $\gamma_6 = 7.13* 10^{-33}$ MeV
OL_{-2}	Physical vacuum level			$\nu_7 = \alpha^2 \gamma_5/2$ $\nu_7 = 6,57 *10^{-34}$ MeV	$\gamma_7 = G \nu_6/2$ $\gamma_7 = 3.58 * 10^{-37}$ MeV
			-1	$\nu_8 = \alpha^2 \gamma_6/2$ $\nu_8 = 1.897 *10^{-37}$ MeV	$\gamma_8 = G \nu_7/2$ $\gamma_8 = 2.2 * 10^{-41}$ MeV
				$\nu_9 = \alpha^2 \gamma_7/2$ $\nu_9 = 9.5 *10^{-42}$ MeV	$\gamma_9 = G \nu_8/2$ $\gamma_9 = 6,33 * 10^{-45}$ MeV
OL_{-3}	Physical vacuum level		-2	$\nu_{10} = \alpha^2 \gamma_8/2$ $\nu_{10} = 5,8 *10^{-46}$ MeV	$\gamma_{10} = G \nu_9/2$ $\gamma_{10} = 3,2 * 10^{-49}$ MeV
				$\nu_{11} = \alpha^2 \gamma_9/2$ $\nu_{11} = 1.685 *10^{-49}$ MeV	$\gamma_{11} = G \nu_{10}/2$ $\gamma_{11} = 1.9* 10^{-53}$ MeV
			-3	$\nu_{12} = \alpha^2 \gamma_{10}/2$ $\nu_{12} = 8.46* 10^{-54}$ MeV	$\gamma_{12} = G \nu_{11}/2$ $\gamma_{12} = 5,62 * 10^{-57}$ MeV
	Physical vacuum OL_{-4} levels			$\nu_{13} = \alpha^2 \gamma_{11}/2$ $\nu_{13} = 5.2 *10^{-58}$ MeV	$\gamma_{13} = G \nu_{12}/2$ $\gamma_{13} = 2,8 * 10^{-61}$ MeV
			-4	$\nu_{14} = \alpha^2 \gamma_{13}/2$ $\nu_{14} = 1.5 * 10^{-61}$ MeV	$\gamma_{14} = G \nu_{13}/2$ $\gamma_{14} = 1.7* 10^{-65}$ MeV
				$\nu_{15} = \alpha^2 \gamma_{10}/2$ $\nu_{15} = 7.5* 10^{-66}$ MeV	$\gamma_{15} = G \nu_{14}/2$ $\gamma_{15} = 5* 10^{-69}$ MeV
	Physical vacuum OL_{-5} levels		-1	$\nu_{16} = \alpha^2 \gamma_{14}/2$ $\nu_{16} = 4.6 * 10^{-70}$ MeV	$\gamma_{16} = G \nu_{15}/2$ $\gamma_{16} = 2.5 * 10^{-73}$ MeV
				$\nu_{17} = \alpha^2 \gamma_{15}/2$ $\nu_{17} = 1.33 * 10^{-73}$ MeV	$\gamma_{17} = G \nu_{16}/2$ $\gamma_{17} = 1.5* 10^{-77}$ MeV
			-2	$\nu_{18} = \alpha^2 \gamma_{16}/2$ $\nu_{18} = 6.7 * 10^{-78}$ MeV	$\gamma_{18} = G \nu_{17}/2$ $\gamma_{18} = 4.4^3 *10 -^{81}$ MeV
	Physical vacuum OL_{-6} levels			$\nu_{19} = \alpha^2 \gamma_{17}/2$ $\nu_{19} = 4.1 * 10^{-82}$ MeV	$\gamma_{19} = G \nu_{18}/2$ $\gamma_{19} = 2.2 * 10^{-85}$ MeV
			-3	$\nu_{20} = \alpha^2 \gamma_{18}/2$ $\nu_{20} = 1.18 * 10^{-85}$ MeV	$\gamma_{20} = G \nu_{19}/2$ $\gamma_{20} = 1.36* 10^{-89}$ MeV
				$\nu_{21} = \alpha^2 \gamma_{19}/2$ $\nu_{21} = 5.9*10^{-90}$ M eV	$\gamma_{21} = G \nu_{20}/2$ $\gamma_{21} = 3.94 * 10^{-93}$ MeV
	Physical vacuum OL_{-7} levels		-4	$\nu_{22} = \alpha^2 \gamma_{20}/2$ $\nu_{22} = 3.6 *10^{-94}$ MeV	$\gamma_{22} = G \nu_{21}/2$ $\gamma_{22} = 1.975 *10^{-97}$ M eV
				$\nu_{23} = \alpha^2 \gamma_{21}/2$ $\nu_{23} = 1.05 * 10^{-97}$ MeV	$\gamma_{23} = G \nu_{22}/2$ $\gamma_{23} = 1,2 * 10^{-101}$ MeV
			-4	$\nu_{24} = \alpha^2 \gamma_{22}/2$	$\gamma_{24} = G \nu_{23}/2$

				ν 24 =. 5.26 * 10 - 102 MeV	γ 24 = 3.494 *10 - 105 M eV

$$НОЛ = w_j(e_{26}) * w_i(\gamma_{24}) = (\alpha^{13} w_e) * (\alpha^{-13} w_e) = w_e^2 = \Pi_e = 1$$

НОЛ=9,1 E103 *(3,14=L/d) *3.494*10^{-105}=1.

But in the Earth's atmosphere, it is possible to detect particles with energy $p_2 = 305$ E15 eVor e $_2$ = 3.524 E 13 eV, at least.

Fragmentation of the physical vacuum.

The fact of the birth of an electron-positron pair by a high-energy photon is interesting. This is a fact. In this case, one can imagine a model of the dynamics of space-matter of this process.

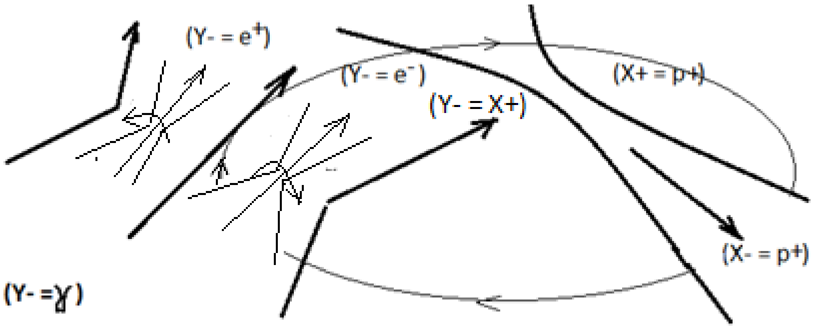


Fig. 7 birth of an electron-positron pair

Thus, a high-energy $(Y- = \gamma)$photon gives birth to an electron $(e^- e^+)$positron pair in the field $(X+ = p^+)$of the Strong Interaction $(X\pm = p^+)$of the proton nucleus. The energy of such a photon. As is known, should be equal to $(E = 2 * 0{,}511\ MeV)$. In the unified Criteria of Evolution, any quantum density $(\rho = \nu^2)$is represented by the symmetry of two quanta with the frequency $(\nu = \frac{E}{\hbar})$and energy $(E = \hbar\nu)$of an electron and a positron, in this case. In exactly the same way, we speak about the generation of quanta of the (p_1/n_1)uranium $(p^+ \approx n)$nucleus by the quanta of the Earth's core, $(2\alpha p_1^- = (Y -) = 238p^+ = {}^{238}_{92}U)$, with subsequent decay into a spectrum of atoms. From the considered properties of the physical vacuum, we say that from the "bottom of the physical vacuum" of infinitely large densities $(\rho_i(X-) \to \infty)$of the dynamic space-matter of the Universe:

$$(X \pm)_{ji} = p_j \begin{pmatrix} R_j(X-) \to \infty \\ \rho_j(X-) \to 0 \end{pmatrix} \nu_i \begin{pmatrix} r_i(X-) \to 0 \\ \rho_i(X-) \to \infty \end{pmatrix} = 1,$$

$$(Y \pm)_{ji} = e_j \begin{pmatrix} r_j(Y-) \to 0 \\ \rho_j(Y-) \to \infty \end{pmatrix} \gamma_i \begin{pmatrix} R_i(Y-) \to \infty \\ \rho_i(Y-) \to 0 \end{pmatrix} = 1,$$

"drop out" quanta $(X \pm)_i$of intermediate densities $(0 < \rho_i(X -) < \infty)$, right up to large-scale quanta $(X \pm)_j$of dynamic space-matter. We are talking about quanta of the quasar core $(X\pm = p_6)$, quanta $(X\pm = p_5)$of intergalactic "black spheres", quanta $(X\pm = p_4)$of the core of galaxies, quanta of $(X\pm = p_3)$ galactic "black spheres", quanta $(X\pm = p_2)$of the core of stars generated by the physical vacuum of infinitely high densities $(\rho_i(X-) \to \infty)$. And such large-scale quanta emit and generate other quanta of the space-matter of the Universe.

Already as a consequence of such circumstances, we can say that $(p_1/n_1)$the quanta of the core of the planets, including the Earth, generate quanta $(2\alpha p_1^- = 238p^+ = {}^{238}_{92}U)$uranium nuclei, $(p^+ \approx n)$, with subsequent decay into a spectrum of atoms in exothermic decay reactions.

Thus, the physical vacuum between objects of the Universe is a multi-level space of speeds, in which the photon has its own speed. The photon cannot penetrate into the superluminal space of speeds, and it cannot slow down. And we are talking about the fact that a clot of energy of mass $(Y -)$trajectories can fragment in the physical vacuum of the Universe into indivisible quanta of space-matter, with a certain mass, with the well-known $(E = mc^2)$Einstein formula.

In classical relativistic dynamics , $R^2 - c^2t^2 = \frac{c^4}{b^2} = \bar{R}^2 - c^2\bar{t}^2$space-time itself experiences acceleration: $b^2(R \uparrow)^2 - b^2c^2(t \uparrow)^2 = (c^4 = F)$. In the unified Criteria, $\left(b = \frac{K}{T^2}\right)(R = K) = \frac{K^2}{T^2} = \Pi$ we speak of the potential in the velocity space $(\frac{K}{T} = \overrightarrow{e})$of a vector space in any $\vec{e}(x^n)$coordinate system where $\Pi = g_{ik}(x^n)$the fundamental tensor of the Riemannian space. Then in the general case we have:

$$\Pi_1^2 - \Pi_2^2 = (\Pi_1(X+) - \Pi_2(Y-))(\Pi_1(X-) + \Pi_2 * (Y+)) = (\Delta\Pi_1(X+= Y-)) \downarrow (\Delta\Pi_2(X-= Y+)) \uparrow= F$$

This force on the entire radius $(R = K)$of the visible sphere of the unified $(X\pm= Y\mp)$space-matter of the Universe, gives (dark) energy $(U = FK)$of the dynamics of the Universe, in gravitational $(X+= Y-)$mass and in electromagnetic $(Y+ = X -)$ fields. Therefore, this is the energy of the relativistic dynamics of the Universe.

$$(\Pi_1^2 - \Pi_2^2)K = (\Pi_1 - \Pi_2)K(\Pi_1 + \Pi_2) = (\Delta\Pi_1)(X+= Y-) \downarrow K(\Delta\Pi_2)(X-= Y+) \uparrow= FK = U$$

What is its nature? On the radius $(R = K)$of the dynamic sphere of the Universe there is a simultaneous dynamics of a single $(X\pm= Y\mp)$space-matter. Considering the dynamics of potentials in gravitational mass $(X+= Y-)$fields, as is already known, $(\Pi_1 - \Pi_2) = g_{ik}(1) - g_{ik}(2) \neq 0$we are talking about the equation of "gravity" $R_{ik} - \frac{1}{2}Rg_{ik} - \frac{1}{2}\lambda g_{ik} = kT_{ik}$General Theory of Relativity, in any system$g_{ik}(x^m \neq const)$ coordinates, and at different levels of singularity $ОЛ_j$, $ОЛ_i$ physical vacuum of the entire Universe. In this case: $\left(R_{ik} - \frac{1}{2}Rg_{ik} = \Delta\Pi_1 = kT_{ik} + \frac{1}{2}\lambda g_{ik}\right)(X+= Y-)$, in addition to the curvature of space-matter caused by the (kT_{ik})energy-momentum tensor, we also talk about the dynamics of the physical vacuum: $\frac{1}{2}\lambda(g_{ik} = 4\pi a^2 * \rho)$, where from $(a(t) \to \infty)$and $(\rho = \frac{1}{(T\to\infty)^2} \equiv H^2)$, НОЛ $= (T_i \to \infty)(t_i \to 0) = 1$, the Universe disappears in time $(t_i \to 0)$, at infinite radii $(a(t) \to \infty)$, with the Hubble parameter $(H = \frac{\dot{a}}{a})$of the inflationary $(a = cT * ch\frac{ct}{cT})$model. We are talking about a sphere ($x^m = \mathrm{X, Y, Z, ct} \neq const$)non-stationary Euclidean space-time, in the form:

$$(x^m = \mathrm{X, Y, Z, ct}) * \{\left(ch\frac{X(X+=Y-)}{Y_0=R_0(X-)}\right)(\mathrm{X}+= \mathrm{Y} -) * \cos\varphi_{\mathrm{X}}(\mathrm{X}- = \mathrm{Y}+) = 1\}\ .$$

The gradient of such $(\Delta\Pi_1)$a potential, it is also known, gives the equations of quantum gravity with inductive $M(Y-)$(hidden) mass fields in the gravitational field. We are talking about $(\Delta\Pi_1{\sim}T_{ik}) \downarrow (X+= Y-)$the energy-momentum $T_{ik} = \left(\frac{E=\Pi^2K}{p=\Pi^2T}\right)_i\left(\frac{E=\Pi^2K}{p=\Pi^2T}\right)_k = \frac{K^2}{T^2} \equiv (\Pi)$, gravitational $(X+= Y-)$mass fields of the entire Universe, with a decrease in the density of mass $(Y-)$trajectories in the Planck scales.

$$\Pi K = \frac{(K_i\to\infty)^3}{(T_i\to\infty)^2} = \left(\frac{1}{(T_i\to\infty)^2} = (\rho_i \to 0)\downarrow\right)\left({K_i}^3 = V_i \uparrow\right)(X+= Y-)\ = (\rho_i \downarrow V_i \uparrow)(X+= Y-),$$

$$(R_j) * (R_i = 1{,}616 * 10^{-33} sm) = 1, \qquad (R_j) = 6{,}2 * 10^{32} sm \qquad (\rho_i(Y-) \to 0).$$

In quantum gravity, we talk about the dynamics of quanta: $e(Y-)_j \to \gamma(Y-)_i$in $ОЛ_j$, and $ОЛ_i$ levels of the physical vacuum on $(m)$the convergence of the entire Universe. In the unified Criteria of the Evolution of space-matter, the density $(\rho = \frac{ПК}{К^3} = \frac{1}{Т^2} = \nu^2)$, gives $\mathrm{c} = \frac{r(Y-)_J\to0}{T(Y-)_J\to0}$near-zero parameters of the instantaneous "Explosion" of an infinitely large $(\rho(Y-)_J = \frac{1}{T(Y-)_J{}^2} \to \infty)$density of dynamic masses in $(Y+ = X-)_J$field of the Universe. At infinitely small $(T(Y-)_J \to 0)$periods of dynamics, in dynamic space-matter: НОЛ $= (T(Y-)_J \to 0) * (t(Y+= X-)_J \to \infty) = 1$, in $(X-)_J$the field of the Universe, an infinite number of events occur, $(t(Y+= X-)_J \to \infty)$in "compressed time", at the level ν_i/γ_i quanta and with the beginning of $\left(T(Y -)_J = 1\right) * \left(t(Y+= X -)_J = 1\right) = 1$time counting $\left(t(X -)_J = 1\right)$).

From the axioms НОЛ = КЭ$(m = j) *$ КЭ$(n = i) = 1$, or $(\rho(Y+= X-)_J \to 0)(\rho(X-)_i \to \infty) = 1$, of the single space-matter of the initial Universe, quanta $(\rho(X-= Y+)_i \to \infty)$are born immediately. And already in such $(\rho(X+= Y-)_i \to 0)$physical vacuum, quanta $(\gamma(Y-)_i = (\rho(Y-)_i \to 0)$with near-zero mass density are initially born. And we are talking about the radius of the sphere of non-stationary Euclidean expanding space, $R(X-)_J \to \infty$, at (m)convergence, and $r(X-)_i \to 0$, at(n) convergence, that is superluminal speeds: $(w_i = \alpha^{(-N=-1,-2...)} * c)$, in $(0Л_i)$the levels of the physical vacuum. In the axioms of dynamic space-matter НОЛ $=$ КЭ$(m = j) *$ КЭ$(n = i) = 1$, there are Indivisible Regions of Localization: $(X \pm)_{ji} = p_j(X^n)v_i(X^n)$and $(Y \pm)_{ji} = e_j(Y^n)\gamma_i(Y^n)$states of quanta, with mutually orthogonal $(X^n) \perp (Y^n)$coordinate systems. This means that if there are $(Y- = e_j)$, then there are always $(Y- = \gamma_i)$ quanta. Similarly, $(X- = p_j)$, $(X- = v_i)$quanta. From this follows the quadratic form of the dynamics of the energy of quanta: $(\Delta E^2 = \hbar^2 \Delta(\rho = v^2)$.

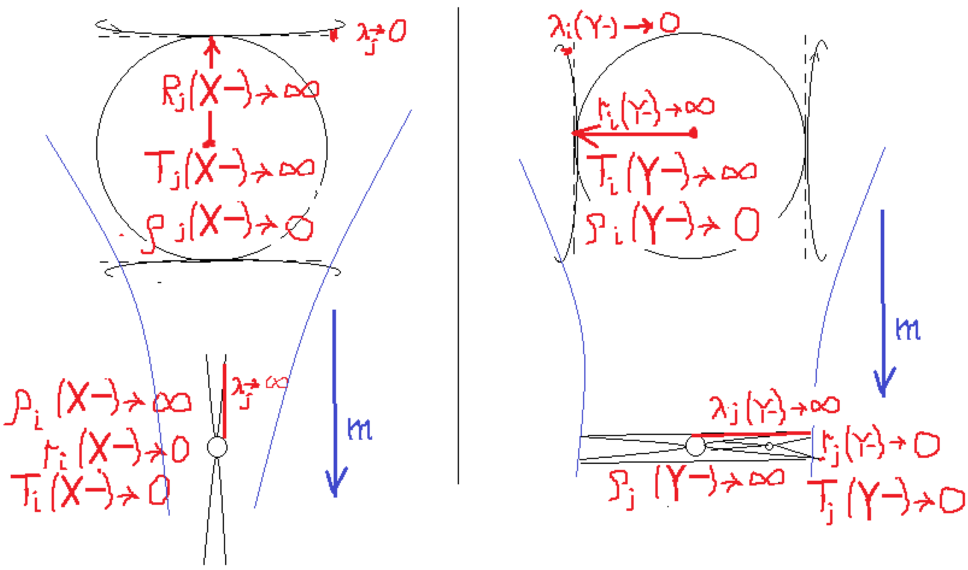


Fig.8 to the dynamics of space-matter of the Universe

The larger the radius of the dynamic sphere, $(r \to R)$the smaller the curvature $(\lambda_\infty \to \lambda_0)$of space-matter and vice versa, in accordance with the properties НОЛ $= (r\lambda_\infty) = (R\lambda_0) = 1$of space-matter itself. Here: $\lambda(X-) = (r \to R)tg\,\varphi(X-)$and $\lambda(Y-) = (r \to R)tg\,\varphi(Y-)$, respectively. Exactly so, the ratios of densities НОЛ $= (\rho_\infty\lambda_\infty) = (\rho_0\lambda_0) = 1$, with constant field potentials. And exactly such properties (T)- the period of the dynamics of quanta and (t)- their relative time of events, НОЛ $= (T_0 t_\infty) = (t_0 T_\infty) = 1$. At infinitely large radii, the Universe disappears in time.(t_0) and the density of space-matter is reduced to zero (ρ_0), in all cases. The opposite picture in hyperbolic properties occurs in the depths of the physical vacuum of the Universe. Such a state of dynamic space-matter is represented by quanta:

$$(X \pm)_{ji} = p_j\begin{pmatrix} R_j(X-) \to \infty \\ \rho_j(X-) \to 0 \end{pmatrix} v_i \begin{pmatrix} r_i(X-) \to 0 \\ \rho_i(X-) \to \infty \end{pmatrix} = 1, \quad (Y \pm)_{ji} = e_j\begin{pmatrix} r_j(Y-) \to 0 \\ \rho_j(Y-) \to \infty \end{pmatrix} \gamma_i \begin{pmatrix} R_i(Y-) \to \infty \\ \rho_i(Y-) \to 0 \end{pmatrix} = 1$$

Properties of dynamic spheres $(r \to R)$in velocity space:

$(W_j(X-) = \alpha^N c \to 0)(v_i(X-) = \alpha^{-N} * c \to \infty) = 1$: the following relations take place:

НОЛ $= \left(R_j(X-) \to \infty)(\lambda_j(X-) \to 0\right) = 1$, НОЛ $= (r_i(X-) \to 0)(\lambda_i(X-) \to \infty) = 1$,

and $\left(W_j(Y-) = \alpha^N c \to 0\right)(v_i(Y-) = \alpha^{-N} * c \to \infty) = 1$

НОЛ $= (R_i(Y-) \to \infty)(\lambda_i(Y-) \to 0) = 1$, НОЛ $= \left(r_j(Y-) \to 0)(\lambda_j(Y-) \to \infty\right) = 1$.

The selected states of the physical vacuum set the modality of the properties of matter, for example, a proton, electron and antimatter, respectively. Quanta of space-matter have the properties of emitting and absorbing. An electron $(Y \pm = e)$emits and absorbs $(Y \pm = \gamma)$a photon. Therefore, we can say that $(Y \pm = e_j)$quanta of higher density of mass $\rho(Y-)$fields successively emit quanta $(Y \pm = e_{j-2})$of lower density, and then $(Y \pm = \gamma)$quanta emit $(Y \pm = \gamma_{i-2} \ldots . \gamma_{i-22})$quanta into the full depth of the physical vacuum, with a near-zero density. Conversely, quanta $(X \pm = p)$of higher density of mass $\rho(X-)$fields are absorbed successively by quanta $(X \pm = p_{j+2})$of lower density. In this case, the conditions are formed: $\rho_j(X-) \to \infty$, and $R_j(X-) \to \infty$, a new cycle of the dynamics of the Universe. Different densities $(\rho_\infty)$and (ρ_0)in different $(Y- = X+)_j$and $(X- = Y+)$fields, give a difference in densities $(\Delta(\rho = v^2) \neq 0)$. It is this ($\Delta\rho = \frac{\Delta E^2}{\hbar^2}$)difference in densities that is the cause of the emission and (or) absorption of energy of space-matter quanta. We are talking about quantum (non-vanishing) dynamics

$$(R_j(X-) \to \infty) \to (R_i(X-) \to 0)\text{And}(R_i(Y-) \to \infty) \to (R_j(Y-) \to 0)$$

space-matter, in a quantum $(m-n)$coordinate system. The argument of such dynamics is the "dark energy" of the expansion $(R_i(Y-) \to \infty)$of space-matter. Such dynamics of accelerations:

$$(b = \rho R),\ (\rho_j(X-) \to 0)(R_j(X-) \to \infty) = \text{НОЛ},\ \text{And}(\rho_i(Y-) \to 0)(R_i(Y-) \to \infty) = \text{НОЛ}$$

quanta of dynamic space-matter, is determined and has the property of the uncertainty principle. In other words, in these $(X\pm)_{ji}$and $(Y\pm)_{ji}$levels $R_j(X-)$of $R_i(Y-)$physical vacuum, the properties of any point are the properties of the space-matter of the entire Universe. This is the space of velocities in which all the Criteria of Evolution of matter are formed. Let's call them the Background Criteria of Evolution of charge and mass $(X-)_j$trajectories $(Y-)_i$, with their quantum dynamics. And already on this background $(\rho_j(X-) \to 0)$, $(\rho_i(Y-) \to 0)$that is: $(\rho \equiv \nu^2)$, the dynamics of the Dominant, any Criteria of Evolution, in the multidimensional space of velocities, goes towards increasing frequencies $(\uparrow \rho \equiv \uparrow \nu^2)$, as well as densities of quanta of dynamic space-matter at their (m)convergence.

On the other hand, such properties give quantum entanglement of the entire dynamic space-matter of the Universe as a whole. We are talking about the simultaneous and opposite dynamics of any Evolution Criteria on infinite $R_j(X-)$radii $R_i(Y-)$of spheres-points in each level of $(m-n)$convergence of the physical vacuum. To understand, this is similar to a tablecloth on a table, where " let's say, two objects A and B $i\psi = \sqrt{(+\psi\ (-\psi\ )}$lie " at any distances. If you "pull the tablecloth" (the background quantum of space-matter), then objects A and B with opposite properties (say, the wave function of convergence quanta (m)) will change simultaneously at any distances. In this case, object A does not interact with object B. And this happens at all $(m-n)$levels of spheres-points of the space-matter of the entire Universe.

In the overall picture, we have the dynamics of (m)convergence quanta $(\uparrow \nu^2)$in one sphere-point, but already $(n)$the convergence $(\downarrow \nu^2)$of spheres-points of the entire Universe, with the indicated quantum entanglement and the uncertainty principle at each $(m-n)$level of the physical vacuum. And such dynamics are accompanied by radiations ("explosions") of quanta $(Y\pm = e_j)$ ... $(Y\pm = \gamma_{i-2} \ldots . \gamma_{i-22})$, into the full depth of the physical vacuum, with the subsequent generation of structural forms similar to the generation nuclei $(Y\pm = e_+^*) = 238p^+$, with their decay into a spectrum of atoms. And this happens everywhere. We are talking about the superluminal space of velocities $(w_i = \alpha^{(-N=-1,-2\ldots)} * c)$, $\gamma_i(Y-)$photons $(\text{ОЛ}_i)$of the level, with their period of dynamics $\text{c} = \frac{\lambda(Y-)_{i\to\infty}}{T(Y-)_{i\to\infty}}$, $T(Y-)_i \to \infty$. This means that at infinite radii $R(X-)_J \to \infty$, "at the bottom" of the physical vacuum, at each of its points $r(X-)_i \to 0$, at (n)convergences, the Universe "disappears" in time: $t = (n \to 0) * T(Y-)_i = 0$. "At the bottom" of the physical vacuum, in (ОЛ_i)levels, we cannot record events with a photon $\gamma_i(Y-)$with a period of dynamics $T(Y-)_i \to \infty$. In this case, any density: $(\rho(Y-)_J = \frac{1}{T(Y-)_J{}^2} \to \infty)$dynamic masses, "falls" into the depths of $(\rho(Y-)_i \to 0)$the physical vacuum $(\text{ОЛ}_i)$of levels, at (n)convergence at each point of the space-matter of the entire $(R(X-)_J \to \infty)$Universe. The masses themselves $e(Y-)_J = (X+ = p_j)(X+ = p_j)$have the structural form of "black spheres" with "jets" $e(Y-)_J \to \gamma_i(Y-)$of decays. And each time there is a generation $2\alpha(X+ = p_j) = e(Y-)_{J-1}$quanta in mass trajectories. This creates the effect of an "expanding Universe" with the effect of the primary $(T(Y-)_J \to 0)$"Big Bang". In this case, the speed of light,$\gamma(Y-)$ photon (ОЛ_1)level, remains unchanged at any level of physical vacuum:
$\text{c} = \frac{\lambda(Y-)_{i\to\infty}}{T(Y-)_{i\to\infty}} = \text{c} = \frac{\lambda(Y-)_{j\to 0}}{T(Y-)_{j\to 0}} = \text{c} = \frac{\lambda(X-)_{i\to 0}}{T(X-)_{i\to 0}}$. For$\gamma(Y-)$ photons (ОЛ_1)level, "falling" to near-zero mass densities $(\rho(Y-)_i = \frac{1}{T(Y-)_i{}^2} \to 0)$, with acceleration $G(\text{X}+)\left[\frac{\text{К}}{\text{Т}^2}\right] = \upsilon * \text{H}\left[\frac{\text{К}}{\text{Т}^2}\right]$, where(H) fixed Hubble constant: $\text{H} = \frac{\upsilon}{R}$. Wavelength$\gamma(Y-)$ photons increases, when "falling into near-zero density" at the limiting radii $(R(X-)_J \to \infty)$of the Universe, in the extreme depth of the physical $(r(X-)_i \to 0)$vacuum. These "relic $\gamma(Y-)$photons" $(\text{ОЛ}_1)$of the level (red in the figure) are seen in experiments. Further we talk about superluminal $\gamma_i(Y-)$photons.

The mathematical truth is that at the infinite radii of the entire space-matter of the Universe

($R_j(X-) \to \infty$) with its mass ($\lambda_i(Y-) \to \infty$) trajectories, the density of matter ($\rho_j(X-) \to 0$), ($\rho_i(Y-) \to 0$), tends to zero. At any point of the sphere $R_j(X-) \to \infty$of the Universe, the non-locality (simultaneity) of the dynamics of the set of points chosen in symmetries is valid at the level $(X-=Y+)_j$of energies of the electromagnetic field of the physical vacuum. The proper time of dynamics (t) is reduced to zero in the axioms NOL=($t_i(Y+) \longrightarrow 0$)($T_i(Y-) \longrightarrow \infty$)=1, dynamic space-matter, as well as dynamics($b = (R_j(X-) \to \infty)(\rho_j(X-) \to 0) = const$) acceleration of ($b = (\lambda_i(Y-) \to \infty)(\rho_i(Y-) \to 0) = const$)mass trajectories. In other words, the mathematical truth is the disappearance of the mass density of dynamic space-matter at infinities, and the Universe disappears in time $t_i(Y+ = X-) \longrightarrow 0$, with constant acceleration ($b = const$) of all space-matter. On the other hand, ($r_i(X-) \to 0$) takes place ($\rho_i(X-) \to \infty$) and the beginning ($\lambda_j(Y-) \to 0$), ($\rho_j(Y-) \to \infty$), of such (the "Explosion"), "instantaneous" $T_j(Y-) \to 0$period of the dynamics of the Universe. In this case, we have:

1. The energy of radiation and (or) absorption $\Delta E^2 = \hbar^2 \Delta\rho$of quanta of space-matter, in the form known to us: $E = mc^2$, or $E = \hbar\nu$, where $m = \nu^2 V$, and so on, but already on $0Л_{ji}(m-n)$the spectrum of the quantum coordinate system of space-matter of the entire Universe. We are talking about radiation ($\rho_\infty(Y- = e_j) \to \rho_0(Y- = \gamma_i)$mass and ($\rho_\infty(X- = p_j) \to \rho_0(X- = \nu_i)$charge fields.
2. We always have a vortex: $rot_Y B(X-)$both $rot_Y M(Y-)$the dynamics of quanta ($X\pm$)and ($Y\pm$)in a single space – matter ($X-=Y+$), ($Y-=X+$).
3. The dynamics ($\Delta\rho$)of densities themselves occur due to the "step (quantum) failure" of densities (ρ_∞), into the "endless void ($\rho_\infty \to \rho_0$). "
4. Combination of densities: $\rho(X-)\rho(Y-) = 1$, this is the Indivisible Region of Localization of a single and dynamic space – matter ($X-=Y+$), ($Y-=X+$). Quantum dynamics $\rho(X-)$of the field ($X\pm$), always generates $\rho(X+ = Y-)$a field, and the quantum dynamics $\rho(Y-)$of the field ($Y\pm$), always generates $\rho(Y+ = X-)$a field.
5. $\rho(Y-)$The emission and absorption $\rho(X-)$of densities ($\rho_\infty \to \rho_0$)occurs simultaneously with their quantum dynamics $\rho(Y-) \to \rho(Y+ = X-)$and $\rho(X-) \to \rho(X+ = Y-)$. This is a multi-stage and multi-level process in the quantum $0Л_{ji}(m-n)$coordinate system.
6. It is necessary to take into account, in this case, the scale of $(r = 10^{-33} sm)(R = 10^{33} sm) = 1$ such dynamics of each such a $(R\lambda = 1)$quantum $(r\lambda = 1)$of their $0Л_{ji}(m-n)$spectrum. This is the wavelength $(Y\pm)$of quanta. $(\lambda_i(Y-) = 10^{33} sm)(\lambda_i(Y+ = X-) = 10^{-33} sm) = 1$ dynamic space-matter in the physical vacuum of the Universe

The quantum dynamics of the space-matter of the Universe in the quantum coordinate system, during the expansion of the Universe is caused by the primary "failure" of densities $\rho_j(Y- = e_j)$ to near-zero mass ↓ ($\rho_i(Y- = \gamma_i) \approx 0$)densities of the physical vacuum. In the axioms of dynamic space-matter:

5.Intergalactic spacecraft without fuel engines.

https://vixra.org/abs/2302.0022

The physical reality is the different space of the velocities of the Sun and the Earth. Without any fuel engines, the Earth flies in the space of the physical vacuum at a speed of $30 км/с$, and the Sun at a speed of the order of $265 км/с$. We are talking about the main property of space-matter - movement. The mass flow $(Y-)_A$ of the apparatus is created by the fields of Strong and Gravitational Interaction of energy quanta $(X\pm = p_1)$, $(X\pm = p_2)$, $ОЛ_2$ the level of indivisible quanta of the space-matter of the physical vacuum, interconnected by the same $(X+)$ fields on the trajectories $(X-)$ of the module, without an external energy source.

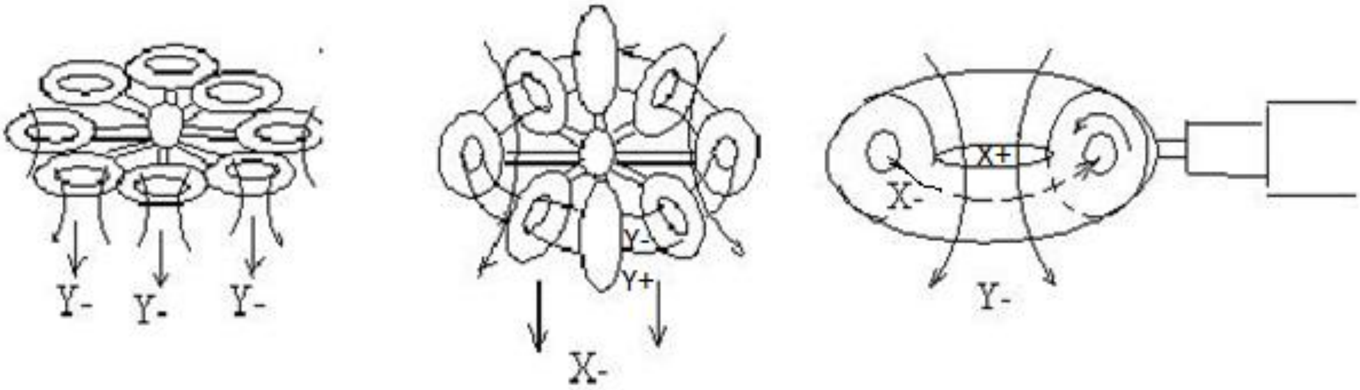


Fig.9. Intergalactic spacecraft without fuel engines.

Consistently including the space of velocities, the apparatus $(Y-)_A$, $(X-)_A$ in the level of the singularity of the physical vacuum, the apparatus goes along the radial trajectory from the level of the singularity of the physical vacuum of the quantum $(X\pm)$ of the space-matter of the planet, $(Y\pm)$ the space-matter of the star , $(X\pm)$ the space-matter of the galaxy, $(Y\pm)$ the space-matter of the cluster of galaxies, to other clusters and galaxies in field of the Universe, with reverse inclusions when returning to the planet of one's own or another galaxy. Thus, to create mass fields $(Y-=\gamma_i)_A$, space of velocities, it is necessary to use fields $(Y-)_A=(X+=p_j)+(X+=p_j)$ of "heavy" quanta as "working substance" closed on $(X-)$ the trajectory of the "ring" of the device, in the conditions of $\text{НОЛ}=(e_j)(k)(\gamma_i)=1$, Indivisible Area of Localization. These are the conditions in the quantum coordinate system when the quantum (e_j) does not manifest itself below the energy level (γ_i) of physical vacuum quanta. These levels correspond to:

$\text{НОЛ}=M(e_1)(k=3.13)m(\gamma_0)=1$	$\text{НОЛ}=\sqrt{G}M(p_1)(k=1.8)\sqrt{G}m(\nu_\mu)=1$
$\text{НОЛ}=M(e_2)(k=3.13)m(\gamma)=1$	$\text{НОЛ}=\sqrt{G}M(p_2)(k=1.7)\sqrt{G}m(\nu_e)=1$
$\text{НОЛ}=M(e_3)(k=3.86)m(\gamma_1)=1$	$\text{НОЛ}=\sqrt{G}M(p_3)(k=17)\sqrt{G}m(\nu_1)=1$
$\text{НОЛ}=M(e_4)(k=3.13)m(\gamma_2)=1$	$\text{НОЛ}=\sqrt{G}M(p_4)(k=1.8)\sqrt{G}m(\nu_2)=1$
$\text{НОЛ}=M(e_5)(k=3.15)m(\gamma_3)=1$	$\text{НОЛ}=\sqrt{G}M(p_5)(k=1.8)\sqrt{G}m(\nu_3)=1$
$\text{НОЛ}=M(e_6)(k=3.9)m(\gamma_4)=1$	$\text{НОЛ}=\sqrt{G}M(p_6)(k=18.9)\sqrt{G}m(\nu_4)=1$
....	………………………………………..
$\text{НОЛ}=M(e_{26})(k=3.14)m(\gamma_{24})=1$	$\text{НОЛ}=\sqrt{G}M(p_{25})(k=1.8)\sqrt{G}m(\nu_{23})=1$

We are talking about the quantum coordinate system $\text{ОЛ}_{ji}(m-n)$ in the space-matter of the Universe, in each ОЛ_jor ОЛ_i level there are three $(X-=Y+)$ charge and two $(X-=Y+)$ mass isopotential. And in this quantum coordinate system, "heavy" (p_j/e_j) quanta are represented, each of which has its own "depth" of energy levels $(\nu_1/\gamma_i)$of physical vacuum quanta. Let's represent them as models of such $R_{ji}(m)$ Indivisible Regions of space – matter of the Universe.

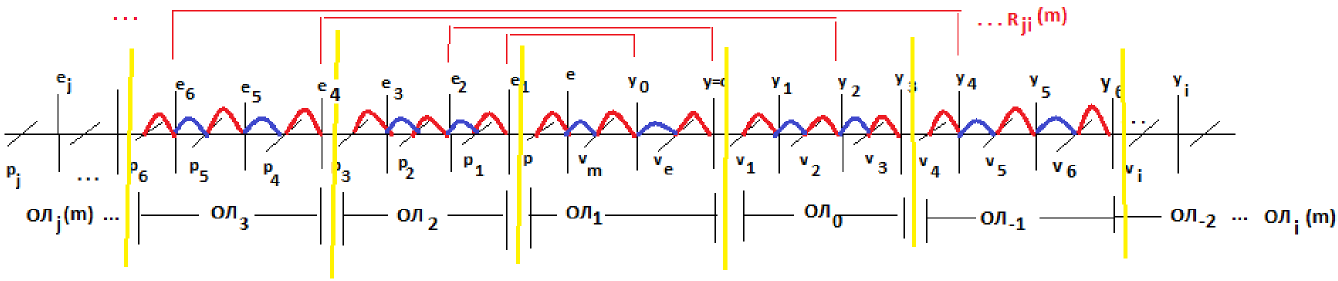


Fig.10.2. spectrum of indivisible quanta

This is a certain sphere in the space-matter, in the center of which are “heavy” (p_j/e_j) quanta, which determine the “bottom”, and “up” along the radius, to the level (ν_i/γ_i) of physical vacuum quanta space-matter of the Universe, for any similar object inside this sphere. These are spheres around a planet, a star, a galaxy, a quasar…. On the example of quants:

$$НОЛ(X\pm=p_1^+)=(\boldsymbol{Y}-=e^+)(X+=\nu_\mu^-)(\boldsymbol{Y}-=e^+)=\frac{2m_e}{G}=15{,}3\ TeV\ ,$$

$$НОЛ(Y\pm=e_2^-)=(\boldsymbol{X}-=p^-)(Y+=e^+)(\boldsymbol{X}-=p^-)=\frac{2m_p}{\alpha^2}=35{,}24\ TeV\ ,$$

we are talking about the synthesis of matter $(X\pm=p_1^+)$, on colliding beams $(e^+e^+\to p_1^+)$ of positrons with virtual quanta (ν_μ^-), and $(Y\pm=e_2^-)$ on colliding beams $(p^-p^-\to e_2^-)$ of antiprotons of positrons with virtual quanta (e^+), similar to an electron $(e^-=\nu_e^-\gamma^+\nu_e^-)$. We can also talk about the sequential synthesis of "heavy" (p_j/e_j) quanta, namely, substances $(X\pm=p_j^+)$, for $(Y-)_A$, $(X-)_A$ apparatus, in individual processes.

$(\ldots\leftarrow p_6^+\leftarrow e_5^+\leftarrow p_3^+\leftarrow e_2^+\leftarrow p^+)$ and $(\ldots\leftarrow p_7^+\leftarrow e_6^+\leftarrow p_4^+\leftarrow e_3^+\leftarrow p_1^+\leftarrow e^+)$synthesis. It is essential that the electron (e^-) emits and absorbs the photon (γ^+) , but it cannot emit and absorb the “dark” photon (γ_0). This "dark" photon is emitted and absorbed by the "heavy" electron $(e_1)\to(\gamma_0\ )$. Similarly, the "heavy" proton $(p_1)\to(\nu_\mu\ )$ emits and absorbs the muon neutrino. These are invisible quanta, not interacting, and non-contact with quanta (p^+/e^-) of the atoms of the periodic table. We can neither see nor fix them. But these invisible quanta (blue color in the indicated sequences) have charge isopotentials and can form Structural Forms not visible to us, similar to ordinary (p^+/e^-) atoms. These are: structures $(\nu_\mu\ /\gamma_0)$,(p_1/e_1)… This is how we gradually master the potentials of the core of planets, the core of stars, the core of galaxies and the core of quasars. But for the $(Y-)_A$ apparatus, we can form only contact quanta (p_4^+) of the galactic nuclei and quanta $(p_6^+)$of the substance of the quasar nucleus. And the apparatus itself $(Y-)_A$, sequentially "plunges" into the physical vacuum, as: $НОЛ=(e_4\ )(k)(\ \gamma_2\ )=1$,
$НОЛ=(e_6\ )(k)(\ \gamma_4\ )=1$, and superluminal $(\gamma_2\ =137*c\ )$, и $(\gamma_4\ =137^2*c\ )$velocity spaces.This is how we gradually master the potentials of the nucleus of planets, the nucleus of stars, the nucleus of galaxies and the nucleus of quasars. At the same time, the device itself $(Y-)_A$, sequentially "plunges" into the physical vacuum, as:
$НОЛ=(e_2\ )(k)(\gamma\ )=1$, $НОЛ=(e_4\ )(k)(\ \gamma_2\ )=1$, $НОЛ=(e_6\ )(k)(\ \gamma_4\ )=1$ …, light (γ=c) and superluminal
$(\gamma_2\ =137*c\ )$, $(\gamma_4\ =137^2*c\ )$ velocity space. These are quite admissible in the Special $\overline{W_Y}=\frac{c+Nc}{1+c*Nc/c^2}=c,$ and in the Quantum $\overline{W_Y}=\frac{a_{11}Nc+c}{a_{22}+Nc/c}=$ c, Theories of Relativity in Euclidean $a_{ii}=\cos(\varphi=0)$, $a_{11}=a_{22}=1$, angles of parallelism. The $(Y-)_A$ apparatus itself moves in the specified sphere of the space-matter of the Universe, in different levels of physical vacuum. It is worth noting that the volume of space-matter of a star is “immersed” in the space of velocities $(\gamma=c\ )$, the volume of galaxies is “immersed” in the space of velocities $(\gamma_2\ =137*c\ )$, the volume of quasars is “immersed” in space $(\gamma_4\ =137^2*c\ )$ are already superluminal speeds. The apparatus represented by $(Y-)_A$ moves in the specified sphere, in the space of velocities $(\gamma_2\ =137*c\ )$ of the galaxy nucleus, or $(\gamma_4\ =137^2*c\ )$ of the quasar nucleus. The question is, how does the crew feel in the central capsule of the apparatus, in the superluminal space of speeds? Just like the Earth, being in the sphere of the space-matter of the star, the Sun, does not feel 265 km / s of the speed of the Sun (read apparatus) in the space-matter of the Galaxy. Capsule with crew, covered with material and fields $(Y-)_A$ of the vehicle. The capsule moves to another $(ОЛ)_j$ level. In the indicated spheres $R_{ji}(m)$ of Indivisible Regions, spheres of space - matter, speeds $p_je_j(m)$ quanta $w_j(p_je_j)*v_i(\nu_i\gamma_i)=c^2$, because $w_j=\alpha^{+N}*c)(v_i=\alpha^{-N}*c)=c^2$. And these speeds (N=j=1,2,3…), $w_j(p_je_j)=(\alpha=\frac{1}{137})^{+N}*c\to0$, in the very center $(Y-\ )_A$ apparatus. Such properties of space-matter.

Now let's consider the real physical properties of the quantum $(Y-=\frac{p^+}{n})$ of the Strong Interaction of the ordinary nucleus $ОЛ_1(p,e,\nu_\mu^-,\nu_e^-,\gamma)$ of the physical vacuum level. Its mass (Y-) trajectories are formed by gravity (X+ =Y-)

mass fields of two protons (X+ =p)(X+ =p)=(Y-), in atomic mass units: $(Y-=\frac{\alpha*p^{+}}{931,5\ MeV}=\frac{938,28\ MeV}{137,036*931,5\ MeV}=0,0073aem)$, for a proton with mass: $m(p)=1aum+\frac{\alpha p}{931,5\ MeV}aum=1,0073\ aum$. At the same time, we understand that and energy $E(1aum)=mc^{2}=1.6604*10^{-27}*(2,997924*10^{8})^{2}*(1Дж=6.2422*10^{18}eV)=931.5MeV$

$1aem=\frac{m(^{12}_{6}C)}{12}=1.6604*10^{-27}kg$. We are talking about inductive mass (Y-), in the equation $rot_{y}G(X+)=-\frac{\partial M(Y-)}{\partial T}$ of dynamics. This is exactly how the mass $(Y-)_{A}$ apparatus trajectories are formed, by "heavy" quanta $(Y-=Np_{j}^{+})_{A}$, on (X-) trajectories of a closed ring, in different levels of the physical vacuum, in the superluminal velocity space. (X-) trajectories of a closed ring, in fact, a vortex field of dynamic equations: $rot_{Y}G(X+)=-\frac{\partial M(Y-)}{\partial T}$, similar to induction $rot_{X}E(Y+)=-\frac{\partial B(X-)}{\partial T}$, of the magnetic field of the coil. There are several such (X-) “coil turns” in $(Y-)_{A}$ apparatus to increase the density $\rho(Y-)=\frac{\partial M(Y-)}{\partial T}\left[\frac{1}{T^{2}}=\frac{m=K^{3}/T^{2}}{V=K^{3}}\right]$ mass $(Y-)_{A}$ vehicle trajectories. Thus, it is necessary to create full periods of quanta $(Y-=\gamma_{i})_{A}$, the space of velocities by the fields $(Y-)_{A}=(X+=p_{j})+(X+=p_{j})$ of "heavy" quanta as a "working substance", closed on the trajectory (X-) of the "ring" of the apparatus with Indivisible Localization Area НОЛ $=(e_{j})k(\gamma_{i})=1$. From the ratios for quanta, $T_{J}(X-=p_{J})\to\infty$, $\lambda_{J}(X-=p_{J})\to\infty$, the greater the quantum mass $(X-=p_{J})$ formed $(p_{j}=2(e_{j-1})/G)$ by quanta (e_{j-1}), the greater $\lambda_{J}(X-=p_{J})$, the greater the diameter of the “ring” D of the device. For ratios

$(E=\Pi^{2}K_{X})(X-)(E=\Pi^{2}K_{Y})(X+)=НОЛ(X\pm=p_{J})$, there are ratios

$\uparrow E(X-)\downarrow E(X+)=НОЛ(X\pm=p_{J})$, or $\uparrow K_{X}(X-)K_{Y}\downarrow(X+)=НОЛ(X\pm=p_{J})$, as well as for masses

$\uparrow(m=\Pi K_{X})(X-)(m=\Pi K_{Y})\downarrow(X+)=НОЛ(X\pm=p_{J})$. The entire mass is concentrated in the field $(X-=p_{J})$ formed by the electric fields $(X-=p_{J})=(Y+=e_{J-1})(Y+=e_{J-1})$ of mass $(Y-=e_{J-1})$ trajectories, in the form $m(X-=p_{j})=2m(Y-=e_{j-1})/G)$ of mass fields. It means that in the created quanta

$НОЛ=\lambda(Y+=e_{J-1})\lambda(Y-=e_{J-1})=1$ it is enough to know the wavelength $\lambda(Y+=e_{J-1})=\frac{1}{\lambda(Y-=e_{J-1})}$, to calculate the order of the quanta $N(e_{J})$ that form the trajectory of the "working substance" quanta $(X-=p_{j})$.

For example, if for you need a "ring" of diameter, $D=\frac{2\lambda(X-=p_{J})}{(\pi\approx3)}$, $D=10м$, then

$\lambda(X-=p_{J})=15м=\lambda(Y+=e_{J-1})$. That is, there is a quantum $\lambda(Y-=e_{J-1})=\frac{1}{\lambda(Y+=e_{J-1})}=6,67*10^{-3}см$ length . This corresponds to the relations $\lambda(Y-=e_{J-1})=6,67*10^{-3}см=2\pi*\alpha^{N}(\lambda_{e}=3.3*10^{-8}см)$, whence

$\alpha^{N}=2*10^{-5}$, for $(J-1)$ gives $N=\log_{\alpha}2*10^{-5}=\frac{\ln(2*10^{-5})}{\ln(\alpha=1/137)}=\frac{-10,82}{-4,92}=2.2\approx2$. Then $(N_{j}=3)$ corresponds to the order of quanta $(\alpha^{3}*c)=W(e_{4})$ of the working substance $(X-=p_{4}^{+})$, in a "ring" with a diameter of 10m. Such "rings" give an intergalactic apparatus. The speed of an intergalactic apparatus with such a "working substance" $(X-=p_{4}^{+})$, at the singularity level $НОЛ=m(e_{4})*m(\gamma_{2})=1$, is $V(Y-=\gamma_{2})=\alpha^{-1}*c\approx137*c$. For Earth time of 10 years, you can fly $(r=10лет*\alpha^{-1}*c)км$ or $(r=10*365,25*24*3600*137*3*10^{5}=1,3*10^{16}км=8,8*10^{7}a.e=425,8пк$. That is, our galaxy (30 kpc), the device will fly by in about 705 years. For the crew of such a vehicle, the proper time is $T=\alpha(705лет)=5,14$лет, the singularity (γ_{2}) level time. The greater the mass of the quantum (p_{j}), the greater the length of its "wave" $\lambda(X-=p_{j})$. For $(N_{J}=4)$ quasar nucleus matter $(X-=p_{6}^{+})$ quanta, have $(N_{J-1}=3)$. Then from the relation $2\pi*\alpha^{N}(\lambda_{e})=\lambda(Y-=e_{J-1=3})=6,28*(1/137)^{3}*3.3*10^{-9}см=8,14*10^{-15}см$, and we calculate

$$\lambda(Y+=e_{J-1=5})=\frac{1}{\lambda(Y-=e_{J-1})}=\frac{1}{8{,}14*10^{-15}\,см}=1{,}23*10^{14}\,см=\lambda(X-=p_6^+)$$. This is $1{,}2*10^{14}\,см \approx 10^9\,км = 8{,}2\ \ a.e.$ the diameter of the nucleus $(X-=p_6^+)$ of an extragalactic quasar with nucleus quanta. The "working substance" of such quanta $НОЛ = m(e_4)*m(\gamma_2)=1$ is given by flights already outside the galaxies in the Universe. For 10 years of Earth time, you can fly in the Universe, $(r=10лет*(V(\gamma_4)=\alpha^{-2}*c)=1{,}78*10^{18}\,км$ or 183 500 light years. For own time $t=\alpha^2(10лет)$ in the device or 4 hours 40 minutes. This is the time for $(Y-=\gamma_4)$ quanta, in the intergalactic level of the singularity of the physical vacuum.

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