

# **Quantum metaphysics: The hydrogen atom - the heart of the universe !?**

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## **Abstract**

This paper presents an energy interpretation of quantum theory. It is proposed to deal with all the changes and interactions (including gravity) is not as power bodies interaction of charges of particles, fields, and displays the curvature of space-time, as well as the manifestations and consequences of energy processes in a unified cosmos. Measure these processes is the energy of the cosmos, including the "dark matter" and "dark energy", with absolute power equal to Planck's constant. The motion of matter in the universe is seen as the dynamics of the vector field of energy, material and energy "cell" structure which is a proton. Energy is proposed interpretation of the hydrogen atom, in which the motion of matter occurs and thus describes a "drain" and the radiation energy flux vector material-energy field. Planck values are shown in the dimensions of the LT. It is argued that a cosmic "relic" radiation is generated in the atoms existing baryonic matter and has no relation to the mythical "Big Bang". Shows the energy interpretation of the fine structure constant.

Keywords: energy interpretation of quantum mechanics, the energy of the universe, the power of the energy of the cosmos, the Planck size, Planck's constant, the hydrogen atom, the CMB, the fine structure constant.

*"... All of the changes in the existing opportunities exist in reality"*

[Aristotle. Metaphysics. M., 2006 2. XII, 2]

*"I think the essence of Search occupation vain and impossible,...*

*if you look in vain for the substance...it does not mean that we can not be studied their characteristics... "*

Galileo Galilei

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## **1. Introduction**

Dissatisfaction with the quantum theory generated by the fundamental probabilistic nature of our world and the fundamental impossibility of its association with the theory of relativity, as well as its inability, despite the strict and precise mathematical power to solve the problems of space, time and consciousness, led to the change described below is an attempt of a scientific paradigm of modern science. The presence of gravity as a fundamental property of matter and the corresponding universal gravitational field leads to the idea: Is not it just a part of the unified field - the energy that manifests itself in a variety of interactions. Application of new hypotheses in the study of the motion of matter and consciousness, based on the energy principle, lead to the conclusion that the constant, absolute in this world is nothing but energy - measures all changes, movements and interactions of matter and consciousness, that is the cosmos. Can be arbitrarily say that the energy

"solution" in the space of the Cosmos, it is everywhere and always. But the energy - it is not a substance, it can not "leak", "transmitted" by wire, accumulated and stored, etc. Energy - a measure of the movement of the cosmos. The power of this energy can not be infinite, it has a limit, and, most likely, in our opinion, its value is unambiguous.

We offer all the changes and interactions (including gravity) not considered as power bodies interaction of charges of particles, fields, and manifestations of the curvature of space-time, but as manifestations and consequences of energy processes in a unified cosmos.

Not invading built great scientists classical quantum theory, and did not hesitate to her mathematical precision - even more so in the words of Richard Feynman's "do not believe those who say that he understands quantum mechanics", pay attention to the interpretation set out below the energy of the quantum theory, which, in our opinion, is not only the beginning of quantum electrodynamics, but also fundamentally changes the scientific model of modern science. Of course, as Werner Heisenberg said, "the one who says quantum physics must also pronounce and Metaphysics"

Quantum theory arose to describe and explain the physical processes occurring at the level of atoms and elementary particles, in particular, and mainly - to explain the wave-particle duality - as a fundamental property of the world. Quantum microworld described mathematically by a wave function, which allows you to describe the real world only probabilistically. From our point of view, the description and explanation of the motion of matter, including quantum processes and systems should be energy, which will create a single unifying theory of the energy of the cosmos.

*"The cruel necessity, not speculation or desire of novelty, forcing us to change the old classical views" [1, Einstein A, Infeld L. The Evolution of Physics]*

## 2. Energy Universe

"There is a fact, or, if you will, the law that governs all phenomena ... Exceptions to this law does not exist; ... It is absolutely accurate. Its name - to save energy. He argues that there is a quantity called the energy that does not change under any transformations that occur in nature. This is essentially a mathematical principle, stating that there is a numerical value that does not change under any circumstances. This is not a description of the mechanism of the phenomenon or something specific, simply says something strange fact that we can calculate some number and then calmly watch how nature will throw out all their tricks, and then again to calculate this number - and it will remain former "[2]

Let us "count the number" - the energy of our universe, taking it as a homogeneous isotropic closed system, as we are advised Feynman:

The energy of the cosmos in the observable universe is proportional to the volume  $V$ , the matter density  $\rho$ , the square of the speed of light  $c$ ,  $c^2$  energy potential and time  $T=1/H$ , where  $H$  - Hubble constant. Formulas and calculations in the system dimensions  $MLT$  and the International System of Units  $SI$  (in brackets in the dimensions  $LT$ , where  $G=1/4\pi$  and  $1\text{kg}=4\pi G=8,386595 \cdot 10^{-10} \text{ m}^3\text{s}^{-2}$ , and therefore the dimension of energy  $\text{m}^5\text{s}^{-4}$ )

Given the stability metagalaxy the basis of equality in the universe is the force of gravity centrifugal force, given the equivalence of mass and energy,

baryonic matter density in  $\text{kg}$  in  $1\text{m}^3$  of the universe is:

$$\rho_{bm} = \frac{3}{4\pi GT^2} = \frac{3H^2}{4\pi G} = 1,86216776 \cdot 10^{-26} \text{ kg m}^{-3}, \quad (\text{B } LT \quad \rho_{bm} = 3H^2 = \frac{3}{T^2} \text{ m}^3 \text{ s}^{-2} \text{ in } 1 \text{ m}^{-3})$$

the density of the "dark matter":

$$\rho_{dm} = \frac{1}{GT^2} = \frac{H^2}{G} = 7,80023 \cdot 10^{-26} \text{ kg m}^{-3}, \quad (\rho_{dm} = 4\pi H^2 = \frac{4\pi}{T^2})$$

density of "dark energy":

$$\rho_{de} = \frac{4\pi}{5GT^2} = \frac{4\pi H^2}{5G} = 19,604116 \cdot 10^{-26} \text{ kg m}^{-3} \quad (\rho_{de} = \frac{16\pi 2}{5} H^2)$$

total density:

$$\Sigma\rho_m=29,2665\cdot 10^{-26}\text{ kg m}^{-3} \quad (\Sigma\rho_m=H^2(3+4\pi+\frac{16\pi 2}{5}))$$

The energy density of the Universe, as a measure of its movement during  $T$ , is equal to:

1. baryonic matter

$$\rho_{ebm}=\frac{3H^2c^2}{4\pi G} \quad (\rho_{ebm}=3H^2c^2) \quad \Omega=0,0596831 \quad \rho_{ebm}=\rho_{Gbm}+\rho_{Sbm}=\frac{3}{4\pi}\rho_{edm}=\frac{3}{16\pi}\Sigma\rho_e$$

2. "dark matter"

$$\rho_{edm}=\frac{H^2c^2}{G} \quad (\rho_{edm}=4\pi H^2c^2) \quad \Omega=0,2500000 \quad \rho_{edm}=\frac{1}{4}\Sigma\rho_e=\frac{4\pi}{3}\rho_{ebm}$$

3. gravitational actual "baryonic matter"

$$\rho_{Gbm}=\frac{9H^2c^2}{20\pi G} \quad (\rho_{Gbm}=9H^2c^2/5) \quad \Omega=0,035809862 \quad \rho_{Gbm}=3/5\rho_{ebm}$$

4. gravitational "dark matter"

$$\rho_{Gde}=\frac{4\pi H^2c^2}{5G} \quad (\rho_{Gde}=\frac{16\pi 2}{5}H^2c^2) \quad \Omega=0,62831853 \quad \rho_{Gde}=\frac{16\pi 2}{15}\rho_{ebm}$$

5. The rotation (spin) baryonic matter

$$\rho_{Sbm}=\frac{3H^2c^2}{10\pi G} \quad (\rho_{Sbm}=\frac{6}{5}H^2c^2) \quad \Omega=0,02387324 \quad \rho_{Sbm}=2/5\rho_{ebm}$$

6. The energy density of neutrinos, cosmic microwave background radiation, and other accepted

$$\rho_{nr}\sim 0,9261\% \text{ OT } \rho_{edm} \sim 0,002315268\Sigma\rho_e = \quad \Omega=0,002315268$$

The total energy density of the universe is

$$\Sigma\rho_e=4\rho_{edm}=4\frac{H^2c^2}{G}=28,0439\cdot 10^{-9}\text{ kg m}^{-1}\text{s}^{-2}$$

Equivalent to the energy density of the mass in kg per  $1\text{m}^{-3}$  is

$$\Sigma\rho=31,203\cdot 10^{-26}\text{ kg } 1\text{ m}^{-3} (SI)$$

(Power density in  $LT$ :

$$\Sigma\rho_e=4\rho_{edm}=16\pi H^2c^2=\frac{16\pi c^2}{T^2}=2,351768\cdot 10^{-17}\text{ m}^3\text{ s}^{-2}\text{ m}^2\text{ s}^{-2}=\text{m}^5\text{ s}^{-4} \quad \text{in } 1\text{ m}^3)$$

(Equivalent to the mass density in the  $LT$

$$\Sigma\rho=261,63656\cdot 10^{-36}\text{ m}^3\text{ s}^{-2} \text{ in } 1\text{m}^3)$$

The energy of the universe in the volume of  $1\text{m}^3$  in  $1\text{s}$ , that is, the power of the universe in the SI, is equal to:

$$\tau=\rho_e T=4\frac{H^2c^2T}{G}=4\frac{Hc^2}{G}=4\frac{c^2}{TG}=1,229085\cdot 10^{10}\text{ kg m}^{-1}\text{s}^{-1} \quad (1)$$

$$(\tau=\rho_e T=16\pi Hc^2=16\pi c^2/T=10,307837\text{ m}^5\text{s}^{-4} \quad \text{in } 1\text{m}^3 \text{ in } 1\text{s})$$

### 3. Planck values and Planck's constant.

Max Planck in the report made by 18 May 1899 at a meeting of the Academy of Sciences in Berlin, said: "... we are able to establish a unit of length, mass, time and temperature, which would not depend on the choice of any objects or substances, and certainly would maintain its value for all times and all cultures, including alien and inhuman ..." [3, p.232] - said in connection with the Planck units built on the basis of fundamental constants  $G$ ,  $c$ ,  $h$ .

And in our case, it should be possible, for example, Max Planck, from dimensional considerations and spherical flow and radiation matter, determine Planck units on the basis of the dimensions of  $LT$ , in which there were only two fundamental constants: the absolute value of the energy of the cosmos  $\tau=10,307837m^5s^{-4} 1m^{-3}$  in 1s and energy potential of the Cosmos  $\varphi=c^2=8,98755179 \cdot 10^{16}m^2 s^{-2}$ . Indeed, in the dimensions  $LT$  Planck units are:

$$t_P = \frac{\tau}{8\pi^2 c^5} = 5,391 \cdot 10^{-44} s$$

$$l_P = \frac{\tau}{8\pi^2 c^4} = 1,61618 \cdot 10^{-35} m$$

$$m_P = \frac{\tau}{2\pi c^2} = 0,182535 \cdot 10^{-16} m^3 s^{-2}$$

$$E_P = m_P c^2 = \frac{\tau}{2\pi} = 1,640543 m^5 s^{-4}$$

(The transition rate between  $LT$  and  $MLT$  systems is  $4\pi G=8,3865947 \cdot 10^{-10} m^3 kg^{-1} s^{-2}$ )

Under certain higher energy density and the corresponding energy potential, spherical runoff matter and geometry of the cosmos for the Planck time  $t_P$  uniquely and must quantized matter-energy:

$$\tau t_P = 4 \frac{Hc^2}{G} \cdot \frac{\tau}{8\pi^2 c^5} = \frac{\tau^2}{8\pi^2 c^5} = 6,626 \cdot 10^{-34} kgm^2 s^{-2} \cdot s (J \cdot s) = h - \text{Planck's constant!} \quad (2)$$

and  $\tau = h/t_P!$  ( $h_{LT} = 55,563158 \cdot 10^{-44} m^5 s^{-4} \cdot s$ ) -

"... *Quantum of action plays a fundamental role in physics*" (Planck)

The physical meaning of Planck's constant - the energy generated in the cosmos, in a unit volume of  $1 m^3$  per unit time Planck  $t_P$ , that is, the absolute power of the energy of the cosmos in Planck units.

(where  $G=6,67384 \cdot 10^{-11} m^3 kg^{-1} s^{-2}$ , last measurement 2014 -  $G=6,67191 \cdot 10^{-11} J s$ , velocity of light  $c=2,99792458 \cdot 10^8 m s^{-1}$  ( $c^2=8,987551787 \cdot 10^{16} m^2 s^{-2}$ ), Hubble constant, varying in time, WMAP mission is  $H_{0W}=71,00 (km/s)Mpc=2,3007 \cdot 10^{-18} s^{-1}$ ,  $T_W=13,75$  billion years  $=0,43392 \cdot 10^{18} s$ , and according to recent reports of the mission «Planck» - Hubble constant  $H_{0P}=67,80 (km/s)Mpc = 2,197 \cdot 10^{-18} s^{-1}$ ,  $T_P=13,82$  billion years  $=0,436126 \cdot 10^{18} s$ ,  $t_P=5,39106 \cdot 10^{-44} s$  - Planck time. With precise experimental value of Planck's constant  $h=6,62606957 \cdot 10^{-34} J \cdot s$ , solving the inverse problem, we define  $H=hG/4c^2 t_P=2,2816878 \cdot 10^{-18} s^{-1}$  (70,4109 (km/s)Mpc) and correspondingly  $T=0,438272 \cdot 10^{18} s$ ,  $H^2=5,2061 \cdot 10^{-36} s^{-2}$ ,  $T^2=0,19208237 \cdot 10^{36} s^2$ )

Note that in the  $MLT$   $\tau/2\pi=EP=m_P c^2=1,95615 \cdot 10^9 kgm^2 s^{-2} (J)$  - Planck energy.

Einstein wrote: "... *except for the atomic structure of matter, there is a kind of atomistic structure of power-driven universal constant introduced by Planck*" [4, s.1234]

It is surprising that even the Max Planck could not refuse from Maxwell's electrodynamics in favor of "light quanta" Albert Einstein: "*We assume that all the phenomena occurring in a vacuum, correspond exactly to the Maxwell equations and have no relation to the constant h*" [3, s.282]

From the energy point of view, the Heisenberg uncertainty relation for position and momentum and energy and time, expressed by the formula:

$$\Delta x \Delta p_x \geq \hbar = h/(2\pi) ,$$

$$\Delta E \Delta t \geq \hbar ,$$

relations are showing that the minimum possible in the nature of the work-energy can not be less than the Planck constant, what is easy to see both sides of the dividing ratio per unit time.

Constant energy flux density and geometry of our world is such that the absolute power of the Cosmos is

$$\tau = 1,229085 \cdot 10^{10} \text{ kg m}^{-2}\text{s}^{-3} (\text{J s}^{-1}) = \hbar / t_p .$$

It is interesting that in the dimensions  $LT$  dimension of power is  $\text{m}^5\text{s}^{-5}$ , and the numerical value of the power of the Cosmos without « $4\pi$ » miraculously coincides with  $c^5 = 2,4216 \cdot 10^{42} \text{ m}^5\text{s}^{-5}$  - currently a large number. Apparently,  $4\pi$  is present in all formulas of energy and power because the energy and power of "excited" and spread in all directions in the volume of the sphere at an angle of  $4\pi$  sr. No Space in some specific primary sources of energy. Power being constant, proceeds from each "node structure of the Cosmos", it is everywhere, here and now. We note that in the natural system of absolute dimensions  $LT$ , in which the gravitational constant  $G = 1/4\pi$ , a  $1\text{kg} = 8,38554 \cdot 10^{-10} \text{ m}^3\text{s}^{-2}$ , in volume observed space with a radius  $R = cT$ , surprisingly degree the speed of light  $c$  are:

1.  $c^1 = 2,99792458 \cdot 10^8 \text{ ms}^{-1}$  - perturbation velocity structure of the Cosmos,
2.  $c^2 = 8,98755 \cdot 10^{16} \text{ m}^2\text{s}^{-2}$  - energy potential of Cosmos,
3.  $c^3 = 26,94400 \cdot 10^{24} \text{ m}^3\text{s}^{-3}$  - constant mass flow of the universe in the second, the value of education of mass per second:  $m = M 8,38554/T 4\pi 10^{10} = 26,9407 \cdot 10^{24} \text{ m}^3\text{s}^{-3}$
4.  $c^4 = 80,776087 \cdot 10^{32} \text{ m}^4\text{s}^{-4}$  - the gravitational force of the Universe  $F = M^2/R^2 = 80,756 \cdot 10^{32} \text{ m}^4\text{s}^{-4}$
5.  $c^5 = 242,1628 \cdot 10^{40} \text{ m}^5\text{s}^{-5} = \text{const}$  - power energy of our universe. (We note parenthetically that the reduced Planck's constant - "elementary quantum of action" in the dimension  $LT$  surprisingly exactly equal to:  $\hbar = c^5 4\pi t_p^2 / 8,38554 \cdot 10^{-10} \text{ m}^3\text{s}^{-2} = 1,054 784 \times 10^{-34} \text{ J s}$ )
6.  $c^6 = 725,9858 \cdot 10^{48} \text{ m}^6\text{s}^{-6} = \text{const}$  - rate of change of power? Acceleration power?

Table Bartini RO it would look as follows:

	T <sup>3</sup>	T <sup>2</sup>	T <sup>1</sup>	T <sup>0</sup>	T <sup>-1</sup>	T <sup>-2</sup>	T <sup>-3</sup>	T <sup>-4</sup>	T <sup>-5</sup>	T <sup>-6</sup>
L <sup>6</sup>								<b>m<sup>6</sup>s<sup>-4</sup></b> Speed of operation	<b>m<sup>6</sup>s<sup>-5</sup></b> transmission rate energy	<b>c<sup>6</sup>=725,985</b> <b>x10<sup>48</sup></b> <b>m<sup>6</sup>s<sup>-6</sup></b> transmission rate capacities energy
L <sup>5</sup>						<b>m<sup>5</sup>s<sup>-2</sup></b> moment of inertia	<b>m<sup>5</sup>s<sup>-3</sup></b> Planck constant <b>h</b> Action	<b>m<sup>5</sup>s<sup>-4</sup></b> Energy	<b>c<sup>5</sup>=242,1628</b> <b>x10<sup>40</sup></b> <b>m<sup>5</sup>s<sup>-5</sup></b> power energy Cosmos	
L <sup>4</sup>							<b>m<sup>4</sup>s<sup>-3</sup></b> pulse	<b>c<sup>4</sup>=80,77608</b> <b>x10<sup>32</sup></b> <b>m<sup>4</sup>s<sup>-4</sup></b> power gravitational Cosmos		
L <sup>3</sup>				<b>m<sup>3</sup></b> volume spatial		<b>m<sup>3</sup>s<sup>-2</sup></b> Weight Qty Electricity and Magnetism	<b>c<sup>3</sup>=26,944</b> <b>x10<sup>24</sup></b> <b>m<sup>3</sup>s<sup>-3</sup></b> The mass of a second current weight mass flow rate		<b>m<sup>3</sup>s<sup>-5</sup></b> surface power	
L <sup>2</sup>				<b>m<sup>2</sup></b> surface		<b>c<sup>2</sup>=8,98755</b> <b>x10<sup>16</sup></b> <b>m<sup>2</sup>s<sup>-2</sup></b> energy potential of the Cosmos	<b>m<sup>2</sup>s<sup>-3</sup></b> Field strength, gradient, viscosity	<b>m<sup>2</sup>s<sup>-4</sup></b> pressure density	<b>m<sup>2</sup>s<sup>-5</sup></b> pressure change	
L <sup>1</sup>				<b>m<sup>1</sup></b> length capacity self-induction	<b>c<sup>1</sup>=2,99792458</b> <b>x10<sup>8</sup></b> <b>m<sup>1</sup>s<sup>-1</sup></b> the speed of propagation of perturbations	<b>m<sup>1</sup>s<sup>-2</sup></b> acceleration				
L <sup>0</sup>	<b>s<sup>3</sup></b> volume time	<b>s<sup>2</sup></b> surface time	<b>s<sup>1</sup></b> period	<b>s<sup>0</sup></b> dimensionless constants <b>α = 7,297 x10<sup>-3</sup></b> <b>=1/137036</b> <b>π=3,14159</b>	<b>s<sup>-1</sup></b> the oscillation frequency of the structure of the Cosmos	<b>s<sup>-2</sup></b> mass density				
L <sup>-1</sup>			<b>s<sup>1</sup>m<sup>-1</sup></b> conductivity							
L <sup>-2</sup>		<b>s<sup>2</sup>m<sup>-2</sup></b> magnetic permeability								

... wonder how our world appears in all its beauty, unity and relationship ...

*"I am sincerely convinced of its truth and contemplate its beauty with enthusiasm and gusto, not daring to trust himself" [I. Kepler]*

#### 4. Atom hydrogen.

We ask the question: "Where is the energy generated in the universe with such a power?"

Where are the indefatigable and ever-beating heart of our world?

This, of course, the hydrogen atom - the dynamic material energy-information structural unit of the cosmos in which all the processes taking place in our world.

Energy interpretation of the hydrogen atom (in the article discusses only the ground state of the hydrogen atom) is that the proton-nucleus is the center flow of matter, and the electron, forming electron shell around the nucleus, the proton is the "supplier" of energy for the "existence" of the proton, which is a dynamic material and energy "node-cell structure" of the Cosmos.

The motion of matter occurs and thus describes and measures the "drain" and the radiation energy flux vector material-energy field.

According to the formula Gauss (link triple integral for the volume of a surface integral over the surface bounding this volume), the convergence of mass-energy in a spherical volume  $V$  with a

radius  $R$ , determine the mass-energy of the flow of tension as the energy field through a closed surface with the radius  $r$  of the sphere  $S$ , in which the energy and intensity  $\mathbf{a}$ :

$$\iint \mathbf{a} \cdot d\mathbf{S} = \iiint \operatorname{div} \mathbf{a} \, dV = \iiint 4\pi\rho_e \tau \, dV \quad (3)$$

$$(\text{when } \operatorname{div} \mathbf{a} = \operatorname{div} \operatorname{grad} \varphi = \Delta \varphi = 4\pi\rho)$$

The physical meaning of this equation - it is the law of conservation of energy for the process of motion of matter as spherical drain-source vector energy field to "oscillate" nodes structure of the cosmos. Integrating with respect to volume and time for the sphere  $c$  unit volume of  $1 \text{ m}^3$  per  $1 \text{ s}$ , the overall energy flow in the universe, seeing it as a sphere with uniformly distributed energy density

$$\sum \rho_e = 4\rho_{edm} = 4 \frac{H^2 c^2}{G} = 28,0439 \cdot 10^{-9} \text{ kg m}^{-1} \text{ s}^{-2} \text{ and a power } \tau = 1,229085 \cdot 10^{10} \text{ kg m}^{-2} \text{ s}^{-3}, \text{ we have:}$$

$$\mathbf{a} \cdot S = 4\pi\rho_e \tau = 4331,42 \text{ m}^3 \text{ s}^{-2}$$

$$(\text{in } LT \ \mathbf{a} \cdot S = 4\pi\rho_e \tau = 4\pi \cdot 2,351768 \cdot 10^{-17} \cdot 10,307837 = 3,0462945 \cdot 10^{-15} \text{ m}^3 \text{ s}^{-2})$$

where  $\mathbf{a} = \Delta\varphi/r = (\varphi_1 - \varphi_2)/r$  -tension "flow" of energy, the scope of the volume  $V=1 \text{ m}^3$ ,  $\rho_e$  -energy density,  $\tau = \rho_e T = 1,229085 \cdot 10^{10} \text{ kg m}^{-1} \text{ s}^{-1}$ ,  $\operatorname{div} \mathbf{a} = \operatorname{div} \operatorname{grad} \varphi = \Delta \varphi = 4\pi\rho$ )

When konvergenti- "condensation" of "clusters" "dark matter" in the proton "consumed" the flow of energy with an energy density equal to

$$\sum \rho_e = (\rho_{ebm} \Omega = 0,0596831 + \rho_{Gde} \Omega = 0,62831853 + \rho_{Gbm} \Omega = 0,035809862 - \rho_{Sbm} \Omega = 0,02387324/2 - \rho_{nr} \Omega = 0,002315268) = 0,735748 \sum \rho_e,$$

therefore, the value of the energy flow to the proton is

$$\mathbf{a} \cdot S = 4\pi\rho_e \tau = 4331,42 \text{ m}^3 \text{ s}^{-2} \cdot 0,735748 = 3186,8 \text{ m}^3 \text{ s}^{-2} = H_E$$

$$(\text{in } LT \ \mathbf{a} \cdot S = 4\pi\rho_e \tau = 3,0462945 \cdot 10^{-15} \text{ m}^3 \text{ s}^{-2} \cdot 0,735748 = 2,2413 \cdot 10^{-15} \text{ m}^3 \text{ s}^{-2} = H_E)$$

With a constant flow of energy  $\mathbf{a} \cdot S = \text{const.}$  for the proton, electron, Bohr sphere and other areas can be written:

$$\mathbf{a}_p \cdot S_p = \mathbf{a}_e \cdot S_e = \mathbf{a}_I \cdot S_I = \mathbf{a}_n \cdot S_n = 3186,8 \text{ m}^3 \text{ s}^{-2},$$

and, accordingly, the ratio of the energy potential on the "surface" areas of the proton, electron, and inversely proportional to the Bohr radius:

$$\Delta\varphi_p / \Delta\varphi_e = r_e / r_p, \text{ или } \Delta\varphi_p r_p = \Delta\varphi_e r_e$$

indicating that the implementation of universal relation with the drain and source:

$$\Delta\varphi_n r_n = \Delta\varphi_e r_e = \Delta\varphi_p r_p = \Delta\varphi_I r_I = 253,6 \text{ m}^3 \text{ s}^{-2} = \text{const}$$

$$\text{at } \mathbf{a} = \Delta\varphi/r \quad H_E = \mathbf{a} \cdot S = \Delta\varphi 4\pi r = 3186,8 \text{ m}^3 \text{ s}^{-2} = \text{const},$$

$$\text{whence } \Delta\varphi = \mathbf{a} \cdot S / 4\pi r$$

In the light of the stated energy paradigm motion of matter to the proton (material and energy flow), "ensure" energy electrons that are part of this stream, like "rays" of the flow in order to form on the sphere of the first orbit  $r_I$  potential  $\Delta\varphi_I$ . Electrons if I may say so, "materialize" in the field of Bohr as "clusters" of matter, creating the potential on the surface  $\Delta\varphi_e = c^2$  and thus providing a potential difference of the energy on the Bohr orbit  $\Delta\varphi_I$  and energy flow in the  $1 \text{ s}$ , equal

$H_E = \mathbf{a}_I \cdot S_I = \Delta\varphi_I 4\pi r_I = 3186,8 \text{ m}^3 \text{ s}^{-2} = \text{const.}$  Natural to assume that the process goes as low as possible with the clotted energy that we have identified above, namely  $h = 6,626 \cdot 10^{-34} \text{ J} \cdot \text{s}$ .

The motion of matter to the proton (material and energy flow) occurs when there is a difference of energy potential, which is equal to the Bohr orbit:

$$\varphi_1 - \varphi_2 = \Delta\varphi_1 = \frac{m_p c^2 h}{\alpha r_1 t_p} = \frac{E_p \tau}{\alpha r_1} = 4,78454 \cdot 10^{12} \text{ m}^2 \text{ s}^{-2} = v_e^2 \quad (4)$$

We see that the energy potential in the field of Bohr (in classical mechanics - the square of the velocity of the electron) is determined solely by the proton energy  $E_p$  and the power of the Cosmos  $\tau$ . Thus, the electron in the hydrogen atom does not have its own entity.

where  $m_p = 1,67262178 \times 10^{-27}$  kg – mass of the proton, the proton energy  $E_p = m_p c^2$ ,  $r_1 = 0,52918 \times 10^{-10}$  m — the first Bohr radius of the electron orbit,  $\alpha = 7,2973525 \cdot 10^{-3} = 1/137,03599\dots$  - the fine structure constant.

$v_e = 2,18769126 \cdot 10^6 \text{ m}^1 \text{ s}^{-1}$  - velocity of the electron on the first orbit,  $v_e^2 = 4,78599305 \cdot 10^{12} \text{ m}^2 \text{ s}^{-2}$ .  $c = 2,99792458 \cdot 10^8 \text{ m}^1 \text{ s}^{-1}$   
 $c^2 = 8,987551787 \cdot 10^{16} \text{ m}^2 \text{ s}^{-2}$ .

Energy drain (through the surface of a sphere with the Bohr radius) to the proton in a hydrogen atom is given by:

$$\alpha \cdot S = \frac{\Delta\varphi_1}{r_1} 4\pi r_1^2 = \Delta\varphi_1 4\pi r_1 = v_e^2 4\pi r_1 = \frac{m_p c^2 h}{\alpha r_1 t_p} 4\pi r_1 = 4\pi \frac{m_p c^2 h}{\alpha t_p} = \frac{4\pi E_p \tau}{\alpha} = 3181,8 \text{ m}^3 \text{ s}^{-2} = H_E \quad (5)$$

Knowing the current data on the hydrogen atom, it is possible to specify the value of the energy flow to the proton as:  $H_E = 3182,6 \text{ m}^3 \text{ s}^{-2}$  (difference of 0.025%)

It is known that the energy potential of the baryonic matter of the Universe  $\varphi_{ebm} = c^2$ , then

The energy potential of "dark matter"  $\varphi_{edm} = \frac{4\pi c^2}{3} = 4,1887902 c^2$ ,

The energy potential of "dark energy"  $\varphi_{ede} = \frac{16\pi^2 c^2}{15} = 10,527578 c^2$ ,

We must assume that the quality of material and energy "phase transitions" in Space occur "at the crossroads" difference between the energy potentials, namely:

from 0 to  $\Delta\varphi_{ebm} = c^2$  - phase transition "field-baryonic matter" when there is the formation and movement of baryonic matter, this is an area of gravitational and electromagnetic interactions,

from  $\Delta\varphi_{ebm} = c^2$  to  $\Delta\varphi_{edm} = \frac{4\pi c^2}{3}$  - phase transition of baryonic matter in the "dark matter" and vice versa, is the area of the electroweak interaction,

from  $\Delta\varphi_{edm} = \frac{4\pi c^2}{3}$  to  $\Delta\varphi_{ede} = \frac{16\pi^2 c^2}{15}$  - an area of strong interactions of quarks and the gluon field.

For example, for the difference between the energy potential  $\Delta\varphi_{ebm} = c^2$  with a constant stream of spherical energy proton equal  $H_E = 3181,8 \text{ m}^3 \text{ s}^{-2} = \text{const}$ .

$$\alpha_e \cdot S_e = H_E$$

$$\Delta\varphi_{ebm} / r_e 4\pi r_e^2 = H_E = 3181,8 \text{ m}^3 \text{ s}^{-2},$$

where the radius of this "bunch" baryonic matter is

$$r_e = 3181,8 / 4\pi \cdot c^2 = 2,8172255 \cdot 10^{-15} \text{ m}$$

On the other hand, the "clot" baryonic matter in modern physics is called "electron" classical radius (or radius Lorenz, or the length of the Thomson scattering), certain of the electromagnetic considerations on the assumption that the entire mass of the electron is electromagnetic in nature, that is, electron mass equivalent to the energy produced by the electric field, and in the representation of the electron - an area equal to

$$r_0 = \frac{1}{4\pi\epsilon_0} \cdot \frac{e^2}{m_0 c^2} = 2,8179403267 \cdot 10^{-15} \text{ m}, \text{ (CODATA - 2010)}$$

where  $e$  and  $m_0$  - electric charge and mass of the electron,  $c$  - the speed of light,  $\epsilon_0$  - dielectric constant.



When the difference in potential energy

$$\Delta\varphi_p = \varphi_{edm} - \varphi_{ebm} = \frac{4\pi c^2}{3} \cdot c^2 = \left(\frac{4\pi}{3} - 1\right)c^2 = (4,1887902 - 1)c^2 = 3,1887902 \cdot c^2 \quad \text{m}^2\text{s}^{-2}$$

radius of the "bunch" "dark matter" is

$$r_p = H_E / 4\pi \Delta\varphi_p = 3181,8 / 4\pi \cdot 3,1887902 \cdot c^2 = 0,8834779 \cdot 10^{-15} \text{m}$$

The resulting value nearly coincides with the radius of the proton, the experimental charge rms radius measured by conventional atomic hydrogen is  $r_p = 0,8768 \cdot 10^{-15} \text{m}$  (CODATA – 2006). Recent measurements give  $r_p = 0,8775 \cdot 10^{-15} \text{m}$  (CODATA – 2010).

According to the "old" classical quantum mechanics, the kinetic energy of the electron in the 1s equal  $E_e = m_e \Delta\varphi_e = m_e v_e^2 = 4,3597439 \times 10^{-18} \text{kgm}^2\text{s}^{-2}$ ,

at a speed  $v_e = 2,18769126 \cdot 10^6 \text{ms}^{-1}$  and radius  $r_l = 5,2917720859 \cdot 10^{-11} \text{m}$ .

Electron on the first orbit makes one revolution around the nucleus during  $t_e = 2\pi r_l / v_e = 15,1982986 \cdot 10^{-17} \text{s}$

For the 1s electron orbiting the nucleus:  $N = 1/t_e = 6,57968386 \cdot 10^{15} \text{s}^{-1}$  (revolutions per 1s).

In one revolution around the proton electron "generates" energy  $E_l = 4,3597439 \cdot 10^{-18} \text{kg m}^2 \cdot \text{s}^{-2} / 6,57968386 \cdot 10^{15} \text{s}^{-1} = 6,62606896 \times 10^{-34} \text{J} \cdot \text{s} = h$ , equal to Planck's constant.

*«The main event point in Rutherford's atomic model was that it clearly showed that the stability of atoms can not be explained on the basis of classical physics and quantum postulate that - this is the only possible way ...» [N. Bor. 5, p. 210]*

*"... I have come to the conclusion that the structure of the cluster of electrons in the Rutherford atom is controlled by the quantum of action - the Planck constant" [N. Bor. 5, p. 210]*

*"The question of why all the electrons of an atom in the ground state are not in the innermost shell, already in the early works Bohr stood out as having fundamental importance ..." [6, W. Pauli]*

Quantum mechanics is needed to explain the theory of the atom, when it became clear that classical physics can not explain the fact that, according to the electrodynamics of moving with an acceleration of the electron around the nucleus, radiating energy in the form of electromagnetic waves, does not fall into the nucleus. Niels Bohr, the titanic efforts, abandoning the concepts of classical physics and electrodynamics contradicting succeeded, with the help of his intuitive postulates briefly appease inquisitive scientists, but a formal mathematical structure of the wave function of the Schrödinger and Heisenberg's uncertainty relation to the present time is completely detached from material reality and hidden the physical nature of the atom. The problem lies in the fact that it is necessary to abandon the reconciliation irreconcilable - classical motion of the electron continuity with discrete quanta. Modern physics Boito put the question bluntly: that the fundamental - elementary particles or quantum of energy? And in general, if there are elementary particles?

In the paradigm of the stated energy theory, the above results require the following interpretation: in the hydrogen atom as an energy sink required for the "existence" of a proton, "going" from space, electrons - these "energy vortexes" materializing, move to the proton and "oscillate" dwelling on the first orbit and other stationary orbits - around the core areas that we perceive (it can be said as "oscillations") as the motion of a particle on the electron orbits around the nucleus. Electrons - "materializing energy vortexes" "stop" on the first Bohr orbit sphere, creating a difference in potential energy  $\Delta\varphi_l = v_e^2$ , because the proton-nucleus, so to speak, "saturated" sufficient energy so that energy potential at the surface of a proton is  $\left(\frac{4\pi}{3} - 1\right)c^2 = 3,1887902 \cdot c^2 \text{m}^2\text{s}^{-2}$ , is achieved at a constant energy flow equal  $H_E = 3181,8 \text{m}^3\text{s}^{-2}$ . It is necessary to state that strictly "stationary" states of the atom can not be, we can only speak of the states corresponding to a certain energy performance. Proton - "bunch" of dark matter, and the electron - "supplier" of matter-energy proton as "node-cell" structure of the cosmos. The "strength" of the strong interaction, creating confinement - none other than the deterministic concentrating flow of matter-energy proton, where the massless gluon clouds and almost massless quarks produced material proton. We must assume that quarks can exist only under conditions that are created inside the proton at the corresponding

energy density. Protons and electrons are absolutely identical and therefore indistinguishable from other protons and electrons, respectively, that is identical, because the image each time only "now" and only on the Planck time. We must assume that inside the proton played the main drama of nature - the birth of space and time and superunification all interactions. Atom - the fundamental energy-material information system structure of the cosmos, the "heart" of our world, in which the global process of constant transition and concentration ("condensation") baryonic matter and "dark matter" and back in time at the Planck energy supply "dark energy".

Thus the motion of matter in the atom is completely determined by the energy density, energy potential and the geometry of the "structure" of the Cosmos.

## 5. Cosmic Microwave Background (CMB) radiation of the hydrogen atom

The work done in the effluent matter to the proton, ie, "movement" of the electron from the potential 0 and  $c^2$  equal to the kinetic energy of the electron  $E_k = m_e c^2 / 2 = 4,09355 \cdot 10^{-14}$  J.

If there is flow, then the radiation must occur. Indeed: in the universe of 1 nucleon-nucleus of the hydrogen atom - a proton falls  $10^9$  photons. 1 photon energy peak of the CMB with a frequency  $\nu = 160,4$  GHz  $= 1,604 \cdot 10^{11}$  s<sup>-1</sup>

$\epsilon_{max} = h\nu = 6,62606957 \cdot 10^{-34} \cdot 1,604 \cdot 10^{11}$  s<sup>-1</sup>  $= 1,06282 \cdot 10^{-22}$  kgm<sup>2</sup>s<sup>-2</sup>. The number of photons in 1 m<sup>3</sup> estimated at 400 - 412 photons (in 1 m<sup>3</sup> - 400 - 412  $\cdot 10^6$  photons) whose energy is equal to

$\epsilon_r = 1,06282 \cdot 10^{-22}$  kgm<sup>2</sup>s<sup>-2</sup>  $\cdot 400 \cdot 10^6 = 4,25128 \cdot 10^{-14}$  J.

Take for estimating the average energy of 65% of the maximum  $\epsilon_{max} \cdot 0,65 \sim \epsilon = 6,9 \cdot 10^{-24}$  kgm<sup>2</sup>s<sup>-2</sup>.

When the density of matter in the Universe  $\rho_c \sim 1,0005 \cdot 10^{-26}$  kgm<sup>-3</sup>, that is  $\sim 6$  (0.597) nucleons in 1 m<sup>3</sup>, the energy density of the radiation photons in "ripple" of matter will be

$6,9 \cdot 10^{-24} \cdot 6 \cdot 10^9 = 4,12 \cdot 10^{-14}$  J/m<sup>3</sup>, that is practically equal to the experimental density of relic radiation equal to  $\epsilon_r = 4,005 \cdot 10^{-14}$  J/m<sup>3</sup> (0,25 eV/sm<sup>3</sup>).

Interestingly, the experimentally defined energy density of the CMB  $\epsilon_r = 4,005 \cdot 10^{-14}$  J/m<sup>3</sup> (0,25 eV/sm<sup>3</sup>) is the ionization energy of the hydrogen atom  $2,17793 \times 10^{-18}$  J, divided by the square of the fine structure constant:

$$\epsilon_r = \epsilon_i / \alpha^2 \quad \epsilon_i = m_e \Delta \phi_e / 2 = m_e v_e^2 / 2$$

From energy considerations, it must be concluded that the so-called "relict" radiation - is "today" radiation periodically "pulsing" energy "oscillating" hydrogen and helium atoms (more precisely 6 nucleons in 1 m<sup>3</sup>) of which is almost the entire material universe. The energy required for the "cosmic microwave background radiation" is generated in the hydrogen atom.

After experimenting DMR (Differential Microwave Radiometer) on American satellite COBE (Cosmic Background Explorer, 1989-1993) and the other must be concluded that the isotropic cosmic background radiation (with the anisotropy of the whole  $\sim 10^{-5} T$ ) not a local phenomenon, it goes everywhere. CMB isotropy clearly points to the non-locality of this phenomenon. But somehow, in our opinion, made a controversial uncontested conclusion that the CMB clearly external, that is, the local radiation from the initial stage of the birth of the universe. From this we deduce inflationary cosmological model of the «Big Bang» with an initial singularity with the initial conditions. We believe in the infinite universe any initial conditions can not be and so-called "primary" fluctuations should be always and everywhere - they are embedded in the energy information - a geometric nature of our world. From our point of view, everything can be explained by the cosmological model of energy "oscillating" universe without primary singularities.

It is necessary to postulate that the mode of existence of the cosmos - a periodic dynamic energy and material information "flicker" - "ripple" from the Planck frequency, ie, the process of "education" visible baryonic matter and its reconversion into the energy of the cosmos, in which the emitted and absorbed CMB photons in the spectrum close to blackbody radiation. Cosmic microwave background radiation is not related to the mythical «Big Bang». Cosmic microwave background radiation - radiation is generated in the process of education-existence of matter. When the eternal existence of the universe cause-source "relic" radiation may be only light atoms existing baryonic matter.

If the CMB comes from everywhere, it comes from each "cell" of the universe, each volume of the cosmos, that is, the global characteristics of the universe generated by each cell of the

universe. Then we have to assume that instead of "Big Bang" happens during the Planck many "small explosion", during which there is a periodic "birth and disappearance" of our world and Grand Unification-Separation of all interactions. Colorful description «Big Bang» - this description of "small explosion" that occur for every Planck time.

## 6. Fine-structure constant

*"When I die, shall count the first thing to ask the devil - what is the meaning of the fine structure constant?" (Wolfgang Pauli)*

Richard Feynman called the fine structure constant *"one of the greatest damned mysteries of physics: a magic number that comes to us without any understanding of his person"*

*Let's try to make a contribution and to the understanding of the physical meaning of the fine structure constant. According to classical physics, the fine structure constant  $\alpha$  - is the ratio of the velocity of the electron on the first orbit of the hydrogen atom to the speed of light:*

$$\alpha = v_1/c = \frac{1}{137,03599...} = 7,2973525 \cdot 10^{-3}.$$

Accordingly, the ratio of the squares of the velocities as the ratio of energy potentials

$$v_1^2/c^2 = \Delta\varphi_1/\Delta\varphi_0 = \alpha^2.$$

These relations can be written for all the energy levels of the hydrogen atom:

$$v_n^2/c^2 = \Delta\varphi_n/\Delta\varphi_0 = r_e/r_n = (\alpha/n)^2$$

Then, of course, the area ratio of the electron to the scope of the area of a sphere with the Bohr radius  $S_e/S_l = \alpha^4$  and the ratio of the corresponding volume of  $V_e/V_l = \alpha^6$ .

The last element is a chemical element №137 - «Feynmanium», because the potential of the electron cloud in the first orbit in this case would be the best possible, equal  $\Delta\varphi_0 = c^2$  and correspondingly the maximum velocity of the electron.

The ratio of the energy density in the electron to the energy density in the proton is

$$\rho_e/\rho_p = \alpha^2 \Delta\varphi_e/\Delta\varphi_p, \quad (6)$$

where  $\Delta\varphi_e = c^2$  and  $\Delta\varphi_p = 3,188855 \cdot c^2$  - energy potentials on the surfaces of the electron and proton, respectively.

For Bohr orbit

$$\Delta\varphi_1/\Delta\varphi_p = \alpha^2/3,188855.$$

Consequently, at constant energy flow in the drain or source material change in the density of the baryon energy per unit time is  $\alpha^2$ , which indicates that the physical meaning of the fine structure - energy.

On the other hand, from the formula (5), is the fine structure constant

$$\alpha = \frac{4\pi E_p \tau}{aS} \quad (7)$$

(where  $E_p = m_p c^2$  - energy proton)

It is interesting to note that the mass-energy of the Higgs boson multiplied by the fine-structure constant is almost exactly equal to the mass-energy of the proton. If so, then the mass-energy of the Higgs boson must be equal to:  $m_p/\alpha = 0,938272 \text{ GeV}/7,2973525 \times 10^{-3} = 128,577 \text{ GeV}$ , and the energy density of the CMB  $\epsilon_r$ , what stated above, is the ionization energy of the hydrogen atom  $\epsilon_i$ , divided by the square of the fine structure constant:  $\epsilon_r = \epsilon_i/\alpha^2$ .

## 7. Conclusion

Energy interpretation of quantum theory presented in this paper is, in our opinion, the right to review and comment. It is our deep conviction that only the energy principle in the description of the motion of matter can lead to a unifying theory. To date, it is believed that "dark matter" and "dark energy" is outside of the real material world and, accordingly, is a physical science. But our research outlined in this article, talking about the need for "legalization" of dark matter and dark energy, and the corresponding expansion of physics, because the only way to explain and unify the

movement of matter in the microcosm and macrocosm, describing him as a determined energy process, determine the energy characteristics of a single Cosmos.

In conclusion, the proposed "paradigm shift" and go to the Copenhagen interpretation of quantum mechanics based on the postulates of Bohr and Schrödinger wave function, while maintaining a universal mathematical apparatus to Energodynamic model describing the motion of matter in the atom.

According to Niels Bohr, said in 1961 in Moscow, at the Institute for Physical Problems, the first reaction of Einstein on the Bohr model of the atom was: "...if it's all right here - the end of physics", to which the answer Niels Bohr: "After all, if Einstein was right, then everything would be collapsed."

Only at the time have time to answer the question: "Is the crazy theories to be true?"

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