

Space and matter YRA-hypothesis

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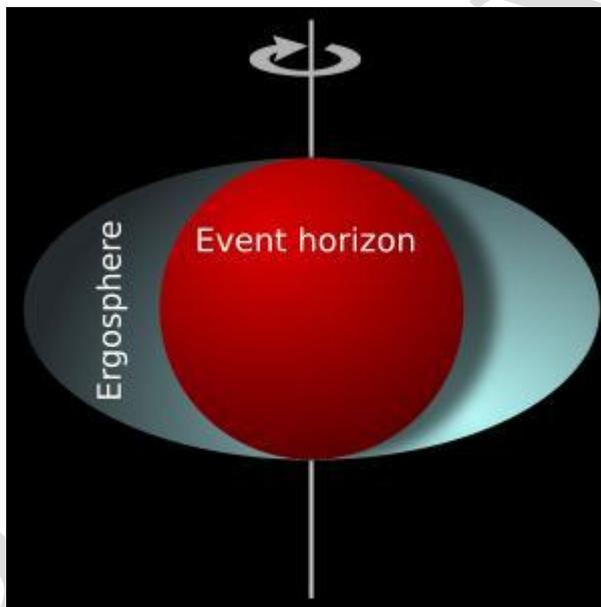
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Abstract

In the present article the author offers the concept of space of the Universe. The author views space, as 3-dimensional, material, discrete, the Euclidean, absolute. The elemental "brick" of space is the pulsing (fluctuated) Planck's black hole (PBH) with its ergo-sphere. This is the first type (type 1) of a matter. This is an invisible matter (substance). This is a dark matter (substance). The second type (type 2) of matter is usual, visible, shone (lighting) matter (substance).

1 Introduction

In article the opinion at structure of space and a Universe matter is stated.



Black hole (from Wikipedia)

The space is considered, as 3-dimensional, material, discrete, the Euclidean, absolute. The elemental unity of space is the space cell, further simply cell. The cell is material. The space is material too. This is the first type (type 1) of a matter. This is an invisible matter. This is a dark matter and dark energy [2]. Everybody knows Einstein's formula $E = mc^2$. The real physical object, Planck's black hole (PBH) is a cell and is the first type (type 1) of a matter. PBH is a pulsing (fluctuated). All PBHs

have one's own ergo-sphere. Usual, visible, shone (lighting) matter is the second type (type 2) of the matter. The elemental unity of a visible, shone (lighting) matter is some material objects. Let us name them ergo-particle. The real physical object which can be the candidate of ergo-particle is a particle, moving with light velocity. For example, a photon, neutrino, etc. It is possible also a superstring[1]. Space can

be imagined visually, as the children's cubes correctly agglomerated. The cube is the representative of a cell. Also the space can be imagined, as 3-dimensional crystalline lattice. The lattice knot is the representative of a cell.

2 Explanatories

It is important for understanding further that each cell has the neighbors, the next cells. As our space is 3-dimensional, the each cell has 6 neighbors ($2 \cdot 3 = 6$). Cell has communications with its neighbors. Each cells has the Planck's size, $P_l \approx 1.616 \times 10^{-35}$ m. PBH as the cell basis, fluctuates with Planck's frequency $P_f \approx 1.855 \times 10^{43} \text{ s}^{-1}$. It is inverse quantity to the Planck's time $P_t \approx 5.391 \times 10^{-44}$ s. It is important that PBH has ergo-sphere. In this ergo-sphere whole our Universe is disposed. More precisely, the Universe is disposed at integrating of all ergo-spheres of our space. Integrating of ergo-spheres for all cells (PBHs) is even more exact as itself space, a stay place, a place of existence for all usual matter of the Universe. Thus, the whole Universe is material. The Universe has space (PBHs with ergo-sphere) as the basis (a flesh, the scene, arena) on which is disposed a visible, lighted, shining, moving matter of our Universe. In a sense the space is a static matter while the usual matter is a dynamical matter. The space matter (type 1) and moving matter (type 2) together are flesh and blood of the Universe.

3 Values and calculations

Everywhere further, speaking about the Universe, we will mean its visible part. We will remember some numerals and we will make some evaluations. These effects let us put to the Table 1.

Table 1

	Quantity	Value	Unit
1	Planck length, P_l	1.616×10^{-35}	m
2	Planck area, P_a	2.612×10^{-70}	m^2
3	Planck volume, P_v	4.222×10^{-105}	m^3
4	Radius of Universe, R_U (13,7 billion light years)	$1.296 \times 10^{+28}$	m
5	Radius of Universe, R_U	$8.020 \times 10^{+60}$	P_1
6	Volume of Universe, V_U	$2.177 \times 10^{+84}$	m^3

7	Volume of Universe, V_U	$2.160 \times 10^{+183}$	P_1^3
8	Planck mass, P_m (mass of PBH!)	2.177×10^{-08}	kg
9	Planck mass energy equivalent in eV (mass of PBH), P_E	$1.221 \times 10^{+28}$	eV
10	Mass of visible, shone (lighting) matter of the Universe (matter type 2), M_{U2}	$\approx 1.0 \times 10^{+56}$	kg
11	Mass of visible, shone (lighting) matter of the Universe energy equivalent (matter type 2), E_{U2}	$5.610 \times 10^{+82}$	eV
12	Mass of space matter of Universe (mass of all PBH of Universe) (matter type 1), M_{U1} , Dark matter.	$4.702 \times 10^{+175}$	kg
13	Mass of space matter of Universe (mass of all PBH of Universe) energy equivalent (matter type 1), E_{U1} , Dark energy.	$2.638 \times 10^{+211}$	eV

4 Preliminary inference

In YRA-hypothesis the discrete space structure of the Universe is presented, its elements (cells) are defined. Real, material, physical carriers (bearers) of cells of space are named. These are fluctuated PBHs with one's ergo-sphere. The place and a role of space of the Universe are defined. The mass and energy of a space matter of the Universe from the data presented in article really are enormous. It, according to the author of article, also is a dark matter and dark energy in the Universe [2]. The space is absolute universal system of axes. The space is not visible, is not perceived. We do not feel it, we do not notice it. It exists as though in itself. It in any way does not interfere with us in our life. It does not interfere with our movement. It is as though massless, weightless. But it surpasses in mass and in energy all matter known to us in the Universe in not the mental sizes. It as though is not present, but it is present at each point (cell) of our space. The space has resulted from a Big Bang. During that epoch, an epoch of enormous energies, the Nature obeying its own laws has created a flesh of space from an available material. This suitable material were fluctuating PBH with ergo-sphere, and fastening "solution" were gravitational force.

5 Interaction

Let's consider the possible scenario of interaction of material space and a visible, shone, moving matter. The ergo-particles as elementary simple fundamental particles as mentioned above is the "bricks" of a visible, lighted, shining, moving matter, a matter of type 2. The "bricks" of the space of the matter type 1 are the space cells. Whole space and all its cells are pulsing, fluctuating material objects. Each cell is the real, material object, fluctuating Planck's black hole (PBH) with its ergo-sphere. It is mentally possible for itself to present ticking of clock "tik-tak", "tik-tak". Similarly and the space cells (PBHs with ergo-sphere) are pulsing, fluctuating "tik-tak", "tik-tak". Whole space fluctuated. Each of all $V_{U1} \approx 2.16 \times 10^{+183}$ space cells (PBHs) are a synchronously pulsing, fluctuating. These are natural hours. The cycle of a fluctuation "tik-tak" can be viewed as two phases, a phase "tik" and a phase "tak". The author considers that the neighbor cells of space fluctuate (pulse) in opposite phases. In the phase "tik" in a cell from the neighbor cells (which are in a phase "tak") the simple fundamental particles (ergo-particle) moved (shifted). The ergo-particle is an elementary "bricks" of a visible, lighted, shining, moving substance, a matter of type 2. In the phase "tack" these ergo-particle leave a cell and move (shift) into the next neighbor cells. Being in a space cell, ergo-particles interact among themselves. This interaction also is discrete, quantum. We remember that a cell of space is PBH's inner surface (space) of ergo-sphere. In the elementary case of interaction of two ergo-particles there is an exchange of energies and impulses between them. As our space model 3-dimensional probably there is a maximum number SEPs, which simultaneously can be present on one PBH's ergo-sphere equal to 6. This interaction is carried out on inner surface (space) of ergo-sphere. Ergo-particle is converted around PBH in its own ergo-sphere. It is represented that this interaction occurs for certain quantity of cycles of a pulsation, fluctuation, "tik-tak", for certain quantity of turns on inner surface (space) of ergo-sphere around PBH. This "time" ergo-particle spends on ergo-sphere and rotates around PBH. As it is represented to the author of article, ergo-particle having own energy ($E = \hbar\nu$) do not spend it for moving (travel) from one cell on another. For moving (shifting) they gain energy from PBH's ergo-sphere. The pulsing space itself moves ergo-particle from one PBH to another PBH, according to one's own impulse.

6 Velocity of light

All phenomena on Planck's gauge (scale) are discrete, quantum. Here on Planck's gauge (scale) ergo-particle constantly are in a motion, move (shift) from a cell to a neighbor cell, with one's surface (inner space) of PBH's ergo-sphere to another. This moving (shifting) occurs for one Planck length unity distance (one Pl) of one cycle (one "tik-tak", one Planck time unit Pt). It accurately is velocity of light. Nothing but of velocity of light is present here. It is unique velocity of the Nature. Here in what universality of velocity of light consists. With this velocity of light are moving (shifting) each of the all ergo-particle (elementary simple fundamental particles). The space and moving matter are in constant interaction, in a close interlacing among themselves. All in the Nature is interconnected. The nature is material in all displays and on all scales. Here on Planck gauge (scale) the Nature has together agglomerated elemental, material, discrete or as speak, quantum concepts of space, time, a motion and action (interactions ergo-particle with space matter and with each other). Only the particles moved with velocity of light can be the candidate on ergo-particle.

7 Structurization

Elementary structural unit of the 1-st type of matter is the cell. The real physical object pulsing, fluctuated Planck's a black hole (PBH) with ergo-sphere corresponds to this cell. The elemental structural unity of the 2-nd type of matter (substance) is the simple fundamental particle (ergo-particle), moving with velocity of light. Ergo-particle it is a certain material essence. Real candidates in ergo-particle are fundamental particles, moving with velocity of light. It is for example the photon, neutrino etc. The indispensable condition for real candidates for ergo-particle is a motion with velocity of light. Therefore electron is not candidate for ergo-particle. Ergo-particle uniting in structures of the higher order generated together with fundamental interactions all variety of our world, our Universe. The association of ergo-particle into structures results from fundamental interactions. Any structure is the system with its own inner elements. Distinctive signs of system it is collective (own) velocity, the center of inertia and a number of others. Finally any system consists of some set ergo-particle. System it not simply set of elements entering into it, this is a new quality. All mechanics is based on the system

approach. We will remember A. Einstein's expressing dependence of energy of a physical object from its mass the formula:

$$E = mc^2 \quad (1)$$

Here m – mass of object, c - velocity of light.

For object being at rest (the hypothetical!) the energy of rest is defined similarly:

$$E_0 = m_0c^2 \quad (2)$$

Here m_0 - mass of object being in rest, E_0 - energy of rest of object, c - a velocity of light.

There is a dependence of mass on speed of object:

$$m = \frac{m_0}{\sqrt{1-\left(\frac{v}{c}\right)^2}}, \quad (3)$$

Here, m_0 - mass of object being in rest, m - mass of a moving object, v - velocity of moving object.

Substituting value m from the formula (3) in the formula (1) we will receive:

$$E = mc^2 = \frac{m_0c^2}{\sqrt{1-\left(\frac{v}{c}\right)^2}}, \quad (4)$$

For small values of v , it is possible to present expression (4) in a kind:

$$E \approx m_0c^2 + \frac{m_0v^2}{2} \quad (5)$$

The first composed is energy of rest object. All objects consist from ergo-particle, moving with a velocity of light. Here a direct explanation of presence of this energy of object. The second item in the formula (5) is kinetic energy of object. But the object is structure and therefore it is system. And the system has own velocity and the inertia center. Here this velocity of object as its center of inertia is the absolute velocity of the object concerning space, not concerning of other object. It is a principle note! Owing to the above, it is clear that object as the system (structure) cannot move with a velocity of light. If $v \rightarrow c$ then for a large value of velocity (v) any object as the structure ceases to exist. It breaks up to making parts and in a limit to ergo-particle.

8 Gravitation

The Newtonian law of gravitation allows calculate force of gravitational interaction between two objects:

$$F = G \frac{m_1m_2}{r^2} \quad (6)$$

There is $G = 6.67 \times 10^{-11} \text{ N} \times \text{m}^2 \times \text{kg}^{-2}$, is the Newtonian constant of gravitation, m_1 and m_2 - masses of co-operating objects, r – distance, between objects (the inertia centers).

The universal Newtonian law of gravitation operates under the relation to all material objects. But objects consist from ergo-particle, and ergo-particle is the 2-nd type of matter. Here all is fine! But what state of affairs in case of the 1-st type of matter, the space matter? It is a space of cells as a material essence. It is pulsing, fluctuating PBHs with ergo-spheres. How is state of affairs here? How there is gravitation proves oneself here? Let's look at Table 2.

Table 2

	Quantity	Value	Unit
1	Newtonian constant of gravitation, G	6.67384×10^{-11}	$\text{N} \times \text{m}^2 \times \text{kg}^{-2}$
2	Planck mass, P_m (mass PBH!)	2.177×10^{-08}	kg
3	Planck mass energy equivalent P_E	$1.221 \times 10^{+28}$	eV
4	Mass of the Sun	$1.989 \times 10^{+31}$	kg
5	Mass of the Earth	$5.974 \times 10^{+24}$	kg
6	Volume of the Sun	$1.412 \times 10^{+27}$	m^3
7	Volume of the Earth	$1.083 \times 10^{+21}$	m^3
8	“Cell’s” mass of the Sun	$7.281 \times 10^{+123}$	kg
9	“Cell’s” mass of the Earth	$5.585 \times 10^{+117}$	kg
10	Planck force : $P_F = \frac{P_m \times c}{P_t}$	$1.21027 \times 10^{+44}$	N
11	Gravity force between 2 neighbor cells of space (between 2 PBH) $P_G = G \frac{P_m^2}{P_l^2}$	$1.21034 \times 10^{+44}$	N
12	Gravity force between the Sun and the Earth masses	$3.543 \times 10^{+22}$	N
13	Gravity force between the Sun and the Earth cells’ masses	$1.206 \times 10^{+209}$	N
14	The Schwarzschild sphere of PBH as area, P_a	8.206×10^{-70}	m^2
15	Specific pressure of Planck force of the area of the Schwarzschild sphere of PBH,	$1.475 \times 10^{+113}$	N/m^2

	$U_{Fa} = P_F/P_a$		
16	Planck mass energy equivalent P_E in J	$1.956 \times 10^{+09}$	J
17	The Schwarzschild sphere of PBH as volume, P_V	2.210×10^{-105}	m^3
18	Specific energy of Planck energy of the volume of the Schwarzschild sphere of PBH, $U_{Ev} = P_E/P_v$	$8.850 \times 10^{+113}$	$J/m^3 (= N/m^2)$

The “cell’s” mass of the Sun is a mass of cells of space in volume occupied with the Sun. The “cell’s” mass of the Earth is a mass of cells of space in volume occupied with the Earth. From the table 3, row 13 see that force of gravitation between "cellular" mass of the Sun and the Earth is very great, very much greater the force of usual masses of the Sun and the Earth. Probably the gravitation for two types of matter proves oneself differently.

The Newtonian law of gravitation (6) for the Planck system unity ($P_m=1$, $P_f=1$) and Planck scale show the constant of gravity is numerically equal force of gravitation between two neighbors PBH (P_G). Force of gravitation directly is connected with internal (inner) energy of PBH. As a result the energy of PBH is origin (source) of the gravitational constant. The chain of equalities takes place:

$$\frac{U_{Ev}}{2 \times N} = U_{Fa} = P_F = P_G = G \quad (7)$$

There is N – dimension of space. Deduction: specific energy of Planck energy of PBH carried on one degree of freedom for PBH gives the constant of gravitation.

From (7) it follows that

$$2 \times N \times G = U_{Ev}. \quad (8)$$

There is in case of 3-dimensional space ($2 \times 3 = 6$) we get

$$U_{Ev} = 6 \times U_{Fa}. \quad (9)$$

See Table 2 rows 15, 18. Below the relation streams from the above-mentioned text for gravity constant:

$$G = \frac{P_l}{P_m} \times c^2 \quad (10)$$

It may be write as following formula

$$G = \frac{P_l^3}{P_m \times P_t^2} \quad (11)$$

Dependence of gravity constant G from the energy of PBH Planck energy P_E , Planck mass P_m , Planck length P_l , is visible in the following formula

$$G = P_E \times \frac{P_l}{P_m^2} \quad (12)$$

9 Problems

The author sees following problems:

- a) Problem the PBH and a black hole in general. The problem of energy of pulsing (fluctuated) PBH. Energy balance of system PBH and its ergo-sphere. Energy balance of space of Universe. Questions of interaction among neighbors (next) ergo-spheres. The theory explaining to the physicist of these phenomena is necessary.
- b) Theory of ergo-particle, simple fundamental particles. The energy questions of interaction ergo-particle into ergo-sphere. The moving (shifting) ergo-particle between the ergo-spheres of PBH. Real candidates of ergo-particle.
- c) One more question, is a question of gravitation. What is place it occupies in two type matter (substance) system? How gravitation in relation to two types of matter (substance) proves? Fundamental force of gravitational interaction operating during a Big Bang epoch had connected (glued, "stuck together") spacing cells in a uniform flesh of space. How it occurred?
- d) The theory explaining the mechanism of formation of structures of higher order from structures of the lower order is necessary. It is interesting as oneself PBHs and fundamental forces as they co-operate. What is the structure of first order and higher and how it was doing. Electron is it not the ergo-particle, it is structure of two or more ergo-particle. If it so, how does the process of its structurization go? It concerns of other fundamental particles.
- e) The problem of stability of space is a stability of Planck black holes (PBH). 13.7 billion years has passed after a Big Bang. What did the stability of PBH be in the past and is now? What we must wait in future? And what will be with space if at least one cells of space cease to function and become "defective"? Does "defective" cells (PBH) exist, where, how and what have to do to restore them?

- f) It would be desirable to have the answer and of a question “When and how there was a division of a matter into two types?” All know that happened in Big Bang epoch.
- g) Whether is there continued a formation of a flesh of space now or space formation was completed at epoch of a Big Bang? Whether is going now a process of rolling up of a flesh of space? Energy problem of interaction among of ergo-particles on ergo-sphere.
- h) Though in the abstract the author postulates model of 3-dimensional space, but it has been made on purpose. Actually the question of space dimension is open. What real dimension of our space? If dimension of our space is more 3 then why we "see" only 3 measurements? Even if the space 3-dimensional, whether is it actually integrating of 3 measured spaces two closely inter-tangled and related among themselves which is in opposite phases, "tik"- cells of space and "tak"-cells of space?

10 The conclusion

In the article the hypothesis, idea of a structure of space have been offered and considered, the site of a dark matter and black energy is specified. Black holes, Planck black holes (PBH) surround us everywhere, creating a space flesh. Definitions of two types of a matter (substance) have been given. The matter, substance of the first type, is a spatial matter. The elemental structural unity of this type of a matter is pulsing, fluctuated the Planck black hole (PBH) with ergo-sphere. From this type of a matter our space is created. The matter of the second type is our usual substance. Whole our Universe (without space matter) consists of it. This is a visible, lighting, shining, moving matter. It is that we know. It is that everywhere round us, in us and ourselves. It is whole our world, that we know. This substance constantly is in a motion. We always saw this substance, therefore it terms light. The matter of space we do not see. It is a dark matter. It is much more, than a shining, light substance. It is not comparable quantities for our consciousness. Within the limits of the given hypothesis ones problems obtain the permit, others are put on the agenda. Likely and should be. Only an expert and experiment can prove or deny any idea or hypothesis. True is practice measure. In end, the author telescopes one more guess that is possible in a cycle of a pulsation (fluctuation) of space is not only phases "tik" and "tak", but also the intermediate phases when on all space instantaneous transit gravitational waves. And a usual

substance, in the form of ergo-particle, having gained from ergo-sphere's space this "gravitational" information reacts to it and there is a gravitational interaction. In article the question on fundamental interactions nuclear, electromagnetic, gravitation is not investigated at all. It is clear that it is the major questions of the Nature on which it is necessary to answer. In article new vision of structure of the Universe taking into account space and the mechanism of interaction of two types of a matter is only offered. It is necessary to find out still how taking into account this understanding, to explain fundamental interactions. Direct check of positions and YRA-hypothesis conclusions at a modern level of development of a science and technics of experiment is represented inconvenient and even impossible. Over indirect check of consequences of the given hypothesis it is necessary to think. On it, perhaps, it is necessary to stop.

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