Hubble's Law and Antigravity Higgs Boson and Gravity

Michael Tzoumpas

Mechanical and Electrical Engineer
National Technical University of Athens
Irinis 2, 15234 Athens, Greece

E-mail: m.tzoumpas@gmail.com

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Abstract. The theory of dynamic space has been conceived and written by Professor Physicist Naoum Gosdas, inspired from the principle of antithesis (opposition), because of which all natural phenomena are created. These phenomena are derived from the unique absolute dynamic space, which is structured with the fundamental elements, namely the dimension or distance or length, the elementary electric charges (units) and the forces, according to the principle of antithesis. However, due to the finite dimensions of the Universe and the opposition between existence (the Universe) and nonexistence (non space), a spherical deformity of the space occurred, which has created the equality of the peripheral and radial cohesive forces (Universal symmetry) and the Universal antigravity force, whereby the Hubble's Law is proved. The breaking of the above Universal symmetry, close to the Universe center, causes the Genesis of the primary form of matter, the first grand Cosmic event of Universe. The gravitational mass of the particle is defined as a stretching of the dynamic space by the core vacuum (Higgs boson) of the particle.

Keywords: Principle of antithesis; dynamic space; curvature of dynamic space; cubic cell; empty space hole; particle core vacuum; black holes; Universal symmetry; antigravity force; force density; mass density; cohesive pressure; entropy; Cosmic background radiation; gravity pressure; corrected Law of gravitation.

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1. Introduction

The theory of dynamic space[1] refers first to the structure of the isotropic space, based on the electrical and dynamic antithesis (opposition) of positive and negative elementary units. This antithesis emerges as the unique principle of the Cosmos structure, in which all natural phenomena are observed as pairs of opposites.

If the isotropic space were infinite, then the attractive and repulsive forces of space elementary units would be at balance, in the form of a cubic grid of infinite dimensions as a sole existence.[2]

The physical space (the Universe), though, is not infinite. It has been created by the spherical deformity of the isotropic space, as its first deformation. At space limits, the vacuum (non units-non space) attracts the space-existence, because of the opposition (principle of antithesis) between existence and nonexistence.

By the above first deformation of space, the Universal symmetry of the peripheral and radial cohesive forces occurred, which caused the $P_0 \approx 10^{151}\text{N/m}^2$ (Eq. 60) huge cohesive pressure[3,4] in our region and the Universal antigravity force, as the first force of Nature, which is complemented by the nuclear antigravity force[5] and the particulate antigravity one. Consequently, the Universal antigravity force causes the centrifugal accelerated motion of matter with radial direction to the periphery of Universe (Hubble's Law), while the nuclear antigravity force does not allow the nucleons to approach and the particulate antigravity force prevents the further gravitational collapse of black holes.[2]

The breaking of the above Universal symmetry close to the Universe center causes the first grand Cosmic event (the Genesis of matter), with the creation of the primordial neutron[3,4] as a second (local) space deformation (hole-bubble of empty space). This bubble of neutron is the cause of the gravity pressure $P_g = P_{0x}x^2/R^2$ (Eq. 66) at a distance R, as the new form of pressure[6] within the gravitational field of the particle that replaces part of the cohesive pressure P_0. So, the gravitational attraction force appears between two particles as the second force of Nature.

Moreover, the famous Higgs boson that was detected at CERN, is the remaining core vacuum (bubble) during the collision of the oppositely moving protons in the accelerator, since it is plausible that a destruction of protons cortex[6,16] takes place. Therefore, the Higgs field[2] is identical with the dynamic space, where the primary form of matter begins close to the Universe center with the creation of empty space bubbles and ends with the destruction of these bubbles at the periphery of Universe.

Additionally, the black holes look like the bubbles in a foamed liquid,[4] consisting of neutron core vacuums, the Higgs bosons. Therefore, Matter has the same fundamental form (bubbles) both during the beginning of the Genesis of primary neutron and during its final gravitational collapse in the cores of the stars.

2. First Deformation of Space - Antigravity

2.1. The principle of antithesis

The theory of dynamic space[1] is based on the principle of antithesis (opposition), because of which all natural phenomena are created. So, the structure of geometric space (as an abstract concept of Geometry) begins with the dimensioning (separation) of point P and with the Genesis of the two ends of the line segment AB. The point P can be considered as a potential pair of opposite (separated) points, which create the one-dimensional line

segment AB. This dimensioning or opposition is called linear antithesis and establishes the dimension or distance or length L between the points A and B as a factor of analogy (Fig. 1a).

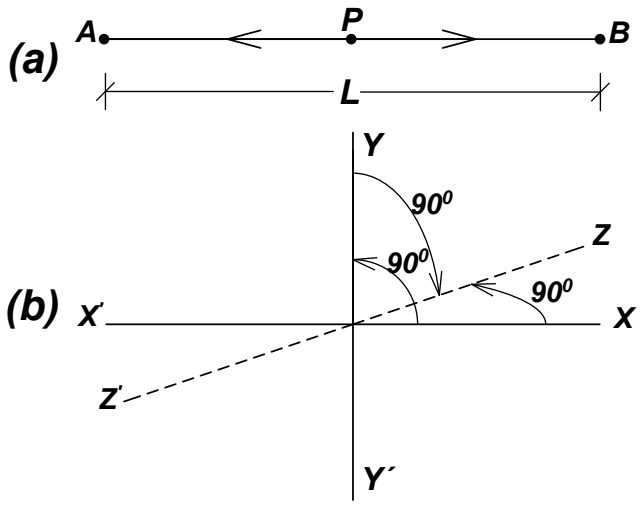

Figure 1. The geometric space is structured with the linear (a) and the spatial or right (b) antithesis .

The structure of geometric space[7] is completed with the opposition (antithesis) of the line. If this line is rotated at a maximum angle of 90^0, then the two opposite (in direction) lines that are created have a maximum divergence of 90^0. Therefore, the two vertical lines are considered as opposites in direction and this verticality is called spatial or right antithesis (Fig. 1b). Hence, the two opposition types of the geometric space are the linear antithesis and the spatial or right antithesis.

The above separation of the neutral point P into two points A and B (Fig. 1a), on which there exist (Fig. 2a) two electrically opposite elementary units (in short: units), gives us the between them electrical attraction force[2]

$$F = kL, \tag{1}$$

proportional to the distance L, where k is a constant ratio. This fact that contradicts the Coulomb's Law,[8] is happening because force must be proportional to the distance L, due to the linear antithesis, given that here at the foundations of Nature (region of units) this dimension L is a factor of analogy. Note that, these electrical units are defined as the ultimate structural entity of Nature and bear the elementary positive or negative electric charge $q = 1,6 \cdot 10^{-25}$Cb,[9] without gravitational or inertial mass.

This dimension or distance or length L calculated as $L = L_0 = 0,558 \cdot 10^{-54}$m (Eq. 62), is the quantum length the dipole of antithesis in our region (Fig. 2a). So, the first structural element of the physical space is the electric dipole of the units.

With two successive spatial or right antithesis of the electric dipole, the elementary orthogonal axes system occurred (Fig. 2b). With the repetition of this spatial or right

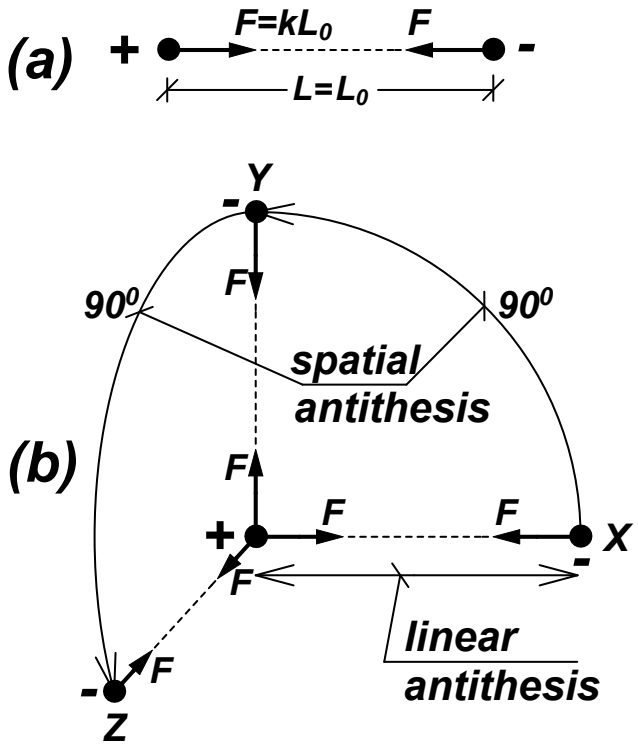

Figure 2. (a) The elementary electric dipole (linear antithesis $L_0 \approx 10^{-54}$m) and (b) the elementary orthogonal axes system XYZ of isotropic space (spatial or right antithesis).

antithesis the space is structured as a grid of cubic cells, first as an infinite dimensional isotropic space (Fig. 3).

2.2. Cubic cell as space quantum - Spherical deformation of dynamic space - Cohesive pressure and dynamic energy of Universe

The isotropic space is structured by the positive and negative units. The units are located at the vertices of the cubic cells according to the model of bipolar compounds of NaCl. The cubic cell is the elementary volume or the quantum of space, structured by the electric dipoles (Fig. 3).

The attraction forces exercised by the electric dipoles create cohesive pressure on the seats of the cells. These forces are neutralized mutually between adjacent units, with result the creation of the isotropic space at the form of a cubic grid of infinite dimensions as a sole existence.

However, the physical space (the Universe) is not infinite. At the limits of Universe and beyond, where the vacuum (non units-nonexistence) "extends", the external units of space are attracted only by the underlying zone of units.

At the limits of Universe, wherein the space-existence is separated from the vacuum-nonexistence, the maximum opposition (the principle of antithesis) applies

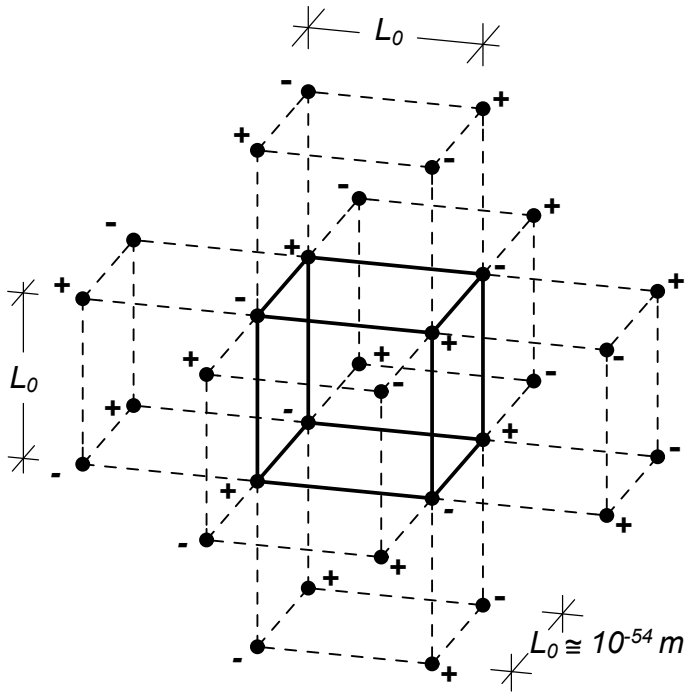

Figure 3. The cubic cell as an elementary volume-quantum of isotropic space, which has the form of an infinite dimensional cubic grid as a sole existence.

between existence and nonexistence, with result the mutual attraction from the vacuum-nonexistence to the space-existence. The vacuum-nonexistence attracts the existence of the units (Fig. 4).

Finally, because of this mutual attraction between nonexistence of vacuum and existence of space, a spherical deformity of space occurred, under the influence of surface tension, such as the surface tension on a mercury drop. Thus, the isotropic space from a unique existence of infinite dimensions is transformed into a spherical deformation of dynamic space, of finite dimensions (the Universe). The cohesive forces that are developed from this first Universal deformation always are directed to the space-existence. It is obvious that this spherical deformity of space has distorted the cubic cells. So, the dipoles lengthen more, away from the center to the Universe periphery, resulting to develop stronger cohesive forces. This is because the force $F = kL_0$ (Eq. 1) of the electric dipole (Fig. 2) is proportional to the distance L_0 between the units. In our region the force F of the electric dipole is measured at the amazing value $F = F_x = 0,242{\cdot}10^{43}$N (Eq. 64) and is, of course, the cause of the space cohesiveness. Therefore, the cohesive pressure P_0, developed by forces of the electric dipoles, is altered and increases from the center to the Universe periphery the same way as the distance L_0 of the units increases.

The result of this first deformation of the Universal space is the development of the cohesive pressure $P_0 = 0,7777 \cdot 10^{151}\text{N/m}^2$ (Eq. 60) in our region. Thus, the

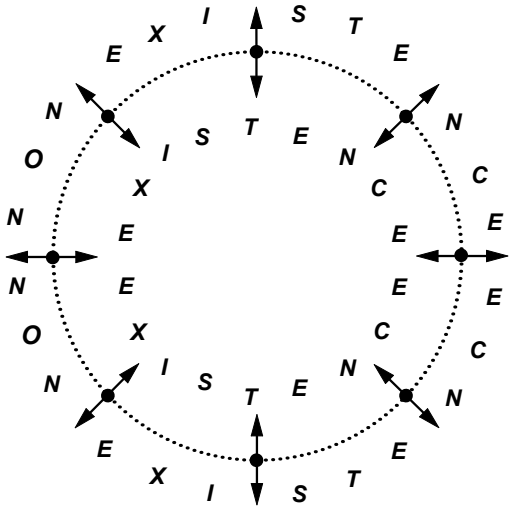

Figure 4. At the limits of Universe, the nonexistence of vacuum attracts the existence of units.

dynamic space is a vast storehouse of energy, in which the fundamental cause of the force is the electric one between positive and negative units. This vast energy comes from the dynamic energy E_0 of the spherical deformation of Universal space, that is $E_0 = P_0V_0 = P_0 4\pi {R_0}^3/3$, where $R_0 \approx 10^{26}$m the constant radius[9] of Universe and $P_0 \approx 10^{151}\mathrm{N/m^2}$, therefore $E_0 \approx 10^{230}$ Joule.

This huge Cosmic energy adequately covers the energy and material needs of the Universe and so, the search for so-called dark matter and energy[10] is no longer required.

2.3. Dynamics of Universe

Using the mechanical analog of a maximum circle of Universe section and by studying the dynamics of the elastic stretched circular membrane, the $P_{0x} = P_{0p}x^2/R_0^2$ (Eq. 29) cohesive pressure of a region at a distance x from the Universe center with a constant radius R_0, where P_{0p} the constant cohesive pressure at the Universe periphery, is calculated as follows:[7]

The elementary external force F (Fig. 5), as a part of the total external force, is applied onto the node A of the dipoles and is balanced by the radial force F_r (transferred to the next underlying radial edge) and by the peripheral force F_p (consisting of two peripheral components f), so that

$$F = F_p + F_r. \tag{2}$$

It is noted that, the curvature‡ on the dynamic space of Universe is defined as

$$K_x = \frac{L_{0x}}{x} = \omega_x, \tag{3}$$

‡ In Mathematics the curvature is defined as an abstract geometric concept $K = 1/R$. Here, the numerator is replaced with the actual unit of Nature, namely the dipole length L_{0x}.

where L_{0x} is the elementary length of the electric dipole and ω_x is the central angle by which the edge L_{0x} is observed at a distance x from the Universe center.

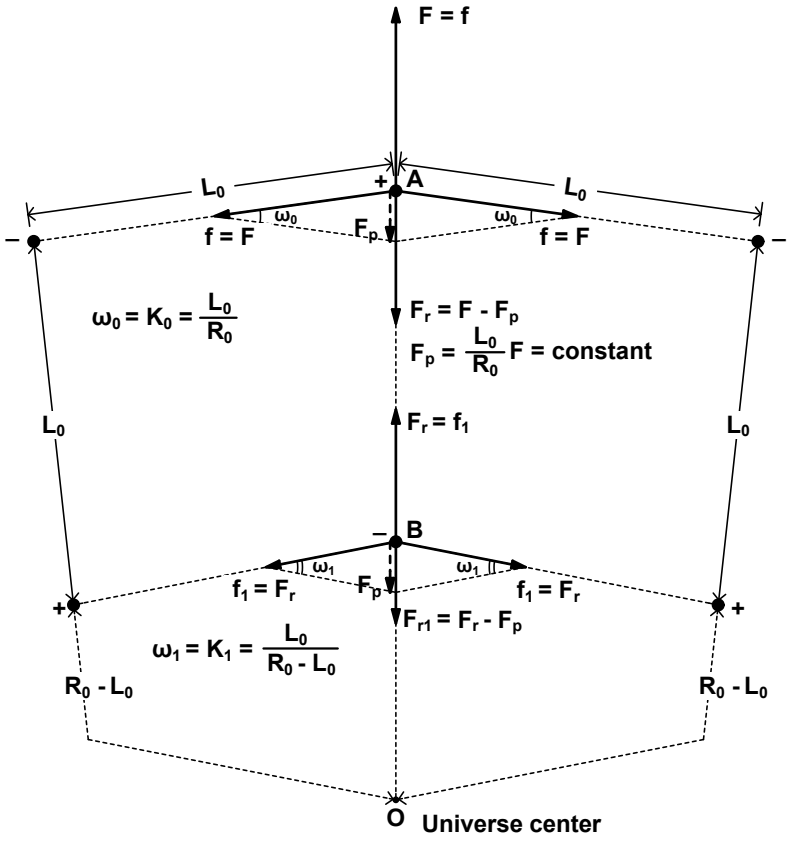

Figure 5. The elementary external force F (at the periphery of Universe) is balanced by the radial force F_r (transferred to the next underlying radial edge) and by the peripheral constant force F_p, which consists of two peripheral components $f = F$, because of the curvature $K_0 = L_0/R_0 = \omega_0$.

In the Universe periphery of a radius R_0 it will be

$$F_p = K_0 F, \tag{4}$$

namely the peripheral force F_p is proportional to the external force F and to the curvature (Eq. 3)

$$K_0 = \frac{L_0}{R_0} = \omega_0, \tag{5}$$

which is the cause of the lateral deviation of the forces. Therefore, the Eq. (4), due to Eq. (5), becomes

$$F_p = K_0 F \Rightarrow F_p = \frac{L_0}{R_0} F. \tag{6}$$

The peripheral components f, due to (Eq. 5), are

$$f = \frac{F_p}{2 sin \omega_0/2} = \frac{F_p/2}{\omega_0/2} = \frac{F_p}{\omega_0} = \frac{F_p}{K_0} \Rightarrow f = \frac{R_0}{L_0} F_p \tag{7}$$

and due to Eq. (6)

$$f = F. \tag{8}$$

This equality of peripheral components f with the external radial attractive force F is obvious. Throughout the Universe there is an equality of peripheral and radial forces (Universal symmetry), corresponding to the elastic changes of lengths $\Delta l = 2\pi\Delta x$ of concentric peripheries that are proportional to distance x from the Universe center ($l = 2\pi x$).

The radial force $F_r = f_1 = F - F_p$ (Eq. 2), due to Eq. (6) and Eq. (8), becomes

$$F_r = f_1 = F - \frac{L_0}{R_0}F = (1 - \frac{L_0}{R_0})F \Rightarrow F_r = f_1 = \frac{R_0/L_0 - 1}{R_0/L_0}F. \tag{9}$$

This is transferred to the next underlying radial edge (onto the node B), so that the peripheral force will be $F_{p1} = K_1 F_r$ (Eq. 4), where the curvature K_1, due to Eq. (3) and for $L_{0x} \approx L_0$ and $x = R_0 - L_0$, becomes

$$K_1 = \frac{L_0}{R_0 - L_0} = \frac{1}{R_0/L_0 - 1} \Rightarrow F_{p1} = \frac{F_r}{R_0/L_0 - 1}. \tag{10}$$

Substituting in Eq. (10) the Eq. (9) and due to Eq. (6), we find

$$F_{p1} = \frac{L_0}{R_0}F \Rightarrow F_{p1} = F_p. \tag{11}$$

Consequently, the peripheral force F_p is transported constant throughout the Universe. However, the components of F_p are reduced towards the Universe center and are equal to the corresponding radial force. Thus, the increase of the Universe curvature is the cause that reduces the respective peripheral components f of the resultant constant force F_p (Eq. 6).

The radial force F_{r1} will be $F_{r1} = f_2 = F_r - F_p$ (Fig. 5) and substituting therein Eq. (6) and Eq. (9), we find

$$F_{r1} = f_2 = \frac{R_0/L_0 - 1}{R_0/L_0}F - \frac{L_0}{R_0}F = \frac{R_0/L_0 - 1}{R_0/L_0} \cdot \frac{L_0/R_0}{L_0/R_0}F - \frac{L_0}{R_0}F \tag{12}$$

$$\Rightarrow F_{r1} = F - 2\frac{L_0}{R_0}F \tag{13}$$

and due to Eq. (6), we have

$$F_{r1} = f_2 = F - 2F_p \Rightarrow F_{r1} = f_2 = F - (\frac{R_0}{L_0} - \frac{R_0 - 2L_0}{L_0})F_p. \tag{14}$$

Also, the next underlying radial force is $F_{r2} = f_3 = F_{r1} - F_p$ (Eq. 2) and substituting therein $F_{r1} = F - 2F_p$ Eq. (14), we find

$$F_{r2} = f_3 = F - 3F_p \Rightarrow F_{r2} = f_3 = F - (\frac{R_0}{L_0} - \frac{R_0 - 3L_0}{L_0})F_p. \tag{15}$$

At the distance x from the Universe center, $R_0 - 3L_0$ (Eq. 15) is identical to x and the corresponding radial force $F_{r2} = f_3$ is identical to $F_{rx} = f_{x+1}$, namely the above Eq. (15) becomes

$$F_{rx} = f_{x+1} = F - (\frac{R_0}{L_0} - \frac{x}{L_0})F_p. \tag{16}$$

Therefore due to Eq. (6), we find

$$F_{rx} = f_{x+1} = F - (\frac{R_0}{L_0} - \frac{x}{L_0})\frac{L_0}{R_0}F \Rightarrow F_{rx} = f_{x+1} = \frac{x}{R_0}F. \tag{17}$$

In the spherical three-dimensional space, the cell seats are oriented as tangents to the Universe peripheries and as verticals to its radii (Fig. 6).

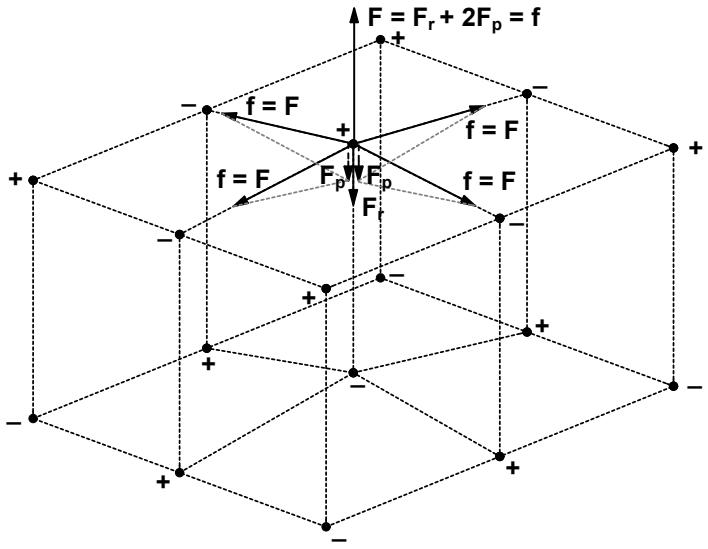

Figure 6. The elementary external force F (to the elastic membrane of the Universe periphery) is balanced by the radial force F_r (transferred to the next underlying radial edge) and by two peripheral forces F_p, which consist of two pairs of peripheral components (where every $f = F$).

Therefore, at the limits of Universe, the peripheral force consists of two pairs of peripheral components (where every equals f) at the tangent level of the periphery and is deducted twice ($2F_p$) from the external force F, so as to give an equality with the corresponding radial force F_r, namely it is[7]

$$F_r = F - 2F_p \tag{18}$$

and due to Eq. (6) and Eq. (8) we have

$$F_r = f_1 = F - 2\frac{L_0}{R_0}F = (1 - 2\frac{L_0}{R_0})F \Rightarrow F_r = f_1 = \frac{R_0/L_0 - 2}{R_0/L_0}F. \tag{19}$$

The next underlying peripheral force is $F_{p1} = K_1F_r$ (Eq. 4), where K_1 (Eq. 3) is

$$K_1 = \frac{L_0}{R_0 - L_0} \Rightarrow K_1 = \frac{1}{R_0/L_0 - 1} \tag{20}$$

and due to Eq. (19) and Eq. (20) the $F_{p1} = K_1F_r$ becomes

$$F_{p1} = K_1F_r \Rightarrow F_{p1} = \frac{R_0/L_0 - 2}{R_0/L_0 - 1} \cdot \frac{1}{R_0/L_0}F. \tag{21}$$

At the next peripheral zone it is $F_{r1} = f_2 = F_r - 2F_{p1}$ (Eq. 18) and due to Eq. (19) and Eq. (21), we have

$$F_{r1} = f_2 = \frac{R_0/L_0 - 2}{R_0/L_0} F - 2\frac{R_0/L_0 - 2}{R_0/L_0 - 1} \cdot \frac{1}{R_0/L_0} F \tag{22}$$

and so

$$F_{r1} = f_2 = \frac{R_0/L_0 - 2}{R_0/L_0 - 1} \cdot \frac{R_0/L_0 - 3}{R_0/L_0} F. \tag{23}$$

The same way, we find at the next peripheral zone

$$F_{r2} = f_3 = \frac{R_0/L_0 - 3}{R_0/L_0 - 1} \cdot \frac{R_0/L_0 - 4}{R_0/L_0} F. \tag{24}$$

At the peripheral zone at a distance x from the Universe center, the formulas $R_0/L_0 - 3 = (R_0 - 3L_0)/L_0$ and $R_0/L_0 - 4 = (R_0 - 4L_0)/L_0$ of Eq. (24) are identical to x/L_0 and to $(x-1)/L_0$ respectively and the corresponding radial force $F_{r2} = f_3$ is identical to $F_{rx} = f_{x+1}$, namely the above Eq. (24) becomes

$$F_{rx} = f_{x+1} = \frac{x/L_0}{R_0/L_0 - 1} \cdot \frac{(x-1)/L_0}{R_0/L_0} F. \tag{25}$$

In Eq. (25), it is obvious to do the replacement of $(x-1)/L_0$ and $R_0/L_0 - 1$ with x/L_0 and R_0/L_0 respectively, whereby the Eq. (25) becomes

$$F_{rx} = f_{x+1} = F\frac{x^2/L_0^2}{R_0^2/L_0^2} \Rightarrow F_{rx} = f_{x+1} = F\frac{x^2}{R_0^2}. \tag{26}$$

So, with Eq. (26) the established equal radial and peripheral forces of the lattice dynamic space (Universal symmetry) are proportional to the square of the distance x from the Universe center. These radial and peripheral forces, that stretch the cell edges, stretch the cell seats too, which occupy the elementary surface area L_{0x}^2 (Eq. 62). Therefore, the radial and peripheral forces are identical with cohesive pressure P_{0x} at a distance x from the Universe center, namely it is

$$F_{rx} = f_{x+1} \sim P_{0x}. \tag{27}$$

The same happens at the Universe limits, where the external force F stretches the external peripheral cell-seat of an elementary surface area L_{0p}^2 (of the elastic membrane). So, this external force F is identical with the cohesive pressure P_{0p} at the Universe periphery, namely it is

$$F \sim P_{0p}. \tag{28}$$

Substituting the identical of Eq. (27) and Eq. (28) in Eq. (26) the cohesive pressure of a region at a distance x from the Universe center becomes

$$P_{0x} = P_{0p}\frac{x^2}{R_0^2}. \tag{29}$$

2.4. The space force and mass densities

The spherical deformation of space creates its dynamics,[3,4] based on the force F and the dimension or distance or length L_0. The force density of space is $d_f = F/V$, where $F = 0,242 \cdot 10^{43}$N (Eq. 64) is the force of the electric dipole in our region and $V = L_0^3$ the volume of the cubic cell with edge $L_0 = 0,558 \cdot 10^{-54}$m (Eq. 62) in our region, namely it is

$$d_f = 1,393 \cdot 10^{205} N/m^3. \tag{30}$$

This force density of space was calculated far off the matter.

However, the force density of space is also calculated from the gravitational force $F_0 = 27,043 \cdot 10^{43}$N (Eq. 61) of the neutron, with radius $r = 1,6639 \cdot 10^{-54}$m (Eq. 59) of its core vacuum and of its volume $V = 4\pi r^3/3$. That is $d_f = F_0/V$ and $d_f = 1,393 \cdot 10^{205}$N/m^3 such as the force density of space far off the matter. Therefore, the force far off or onto the matter is the same. In the deformations of space (matter and motion) the force changes its direction and becomes evident in human senses.

Also, the force density of space is $d_f = F/V = kL_0/L_0^3 = k/L_0^2$ and for the cohesive pressure of space $P_0 = F/L_0^2 = kL_0/L_0^2 = k/L_0$, it is

$$d_f = \frac{P_0}{L_0}. \tag{31}$$

In above $F_{rx} = f_{x+1} = Fx^2/R_0^2$ (Eq. 26), the $F_{rx} = f_{x+1} = kL_{0x}$ (Eq. 1) is the force of electric dipole in a region, F the maximum external force (constant) of the electric dipole on the Universe periphery of constant radius R_0 (Fig. 6) and x is the distance of a region from the Universe center. So, it is $kL_{0x} = Fx^2/R_0^2$, namely

$$L_{0x} = F\frac{x^2}{kR_0^2}. \tag{32}$$

Therefore, the cohesive pressure $P_0 = P_{0x}$ (Eq. 29) and the quantum length $L_0 = L_{0x}$ (Eq. 32) of the electric dipole vary depending on the square of the distance x from Universe center and so the force density of space d_f (Eq. 31) is independent of x and remains as a Universal constant.

The mass density of space is $d_m = m/V$, where $m = E/C_0^2 = FL_0/C_0^2$ and C_0 is the light speed, then $d_m = FL_0/C_0^2V$ and for $d_f = F/V$, it is

$$d_m = d_f\frac{L_0}{C_0^2}. \tag{33}$$

It is noted, that the mass-energy equivalence ($E = mC_0^2$) is calculated from the accumulated force[11] at the dynamic autonomous motion formation of the E/M wave.§

§ $F_f^2 = F_0^2 + F_s^2$, where for the E/M wave applies $F_0 = 0$, therefore $F_f = F_s$, namely the final force F_f of the formation is equal to the accumulated force F_s, where $F_f = E/L_0$ represents the energy of the E/M wave and $F_s = pC_0/L_0$ represents its momentum. Substituting in the above $F_f = F_s$ we have $E/L_0 = pC_0/L_0$, where $p = mC_0$ is the momentum of the formation, so $E = mC_0^2$.

Substituting in Eq. (33) the values $C_0 = 3 \cdot 10^8$m/sec, d_f =1,393·10^{205}N/m^3 (Eq. 30) and $L_0 = 0,558 \cdot 10^{-54}$m (Eq. 62), the mass density of space is calculated as

$$d_m = 0,864 \cdot 10^{134} Kg/m^3. \tag{34}$$

The dipole length $L_0 = L_{0x}$ (Eq. 32) is proportional to x^2, while the speed of light $C_0 = C_{0x}$ is proportional to x (see below Eq. 36). Therefore, the ratio L_0/C_0^2 of Eq. (33) is independent of x and, consequently, the mass density of space d_m is independent of the distance x from the Universe center. Accordingly, the mass density of space d_m is a Universal constant.

Awe is caused by the enormous values (Eq. 30 and Eq. 34) of space force and mass densities (Universal constants), as well as by the fixed values in the "emptiness of matter"and in the condensed matter at the particles scale.

2.5. The speed of light

We replace $d_f = P_0/L_0$ (Eq. 31) into $d_m = d_f L_0/C_0^2$ (Eq. 33), then we have $d_m = P_0/C_0^2$, hence

$$C_0 = \sqrt{\frac{P_0}{d_m}}. \tag{35}$$

So, the light speed is determined as the transmission speed of the disturbance into the tense elastic-dynamic space, where P_0 the space cohesive pressure and d_m the Universal constant mass density of space.

In addition, the E/M wave‖ is a dynamic autonomous motion formation of accumulated evident forces.[11,12]

Dividing the members of $P_{0x} = P_{0p}x^2/R_0^2$ (Eq. 29) with d_m and because it is $P_{0x}/d_m = C_{0x}^2$ and $P_{0p}/d_m = C_{0p}^2$, we have

$$C_{0x} = \frac{C_{0p}}{R_0} x, \tag{36}$$

where C_{0x} is the light speed in a region at a distance x from the Universe center of constant radius R_0 and C_{0p} the constant light speed at periphery of Universe. Consequently, the light speed is not a Universal constant, since as a local constant it depends on the distance x from the Universe center.

2.6. Universal antigravity force as the first force of Nature

The change of cohesive pressure $P_{0x} = P_{0p}x^2/R_0^2$ (Eq. 29) causes a potential difference of pressure ΔP (Fig. 7), onto the volume V of a particle core vacuum,¶ with result the creation of buoyancy conditions on the bodies.

‖ In the E/M wave the whole huge cohesive pressure P_0 of space is installed as a pressure difference $\Delta P = (P_0 + P_0/2) - (P_0 - P_0/2) = P_0$ and causes a change of volume ΔV at the proximal elastic space of the E/M wave, creating dynamic energy $\Delta V \cdot P_0/2$, that converts to kinetic energy $mC_0^2/2$ of the E/M wave. So, $\Delta V \cdot P_0/2$=$mC_0^2/2$ and for $d_m = m/\Delta V$, it is $C_0^2 = P_0/d_m \Rightarrow$C$_0 = (P_0/d_m)^{1/2}$.

¶ see subsection 3.1

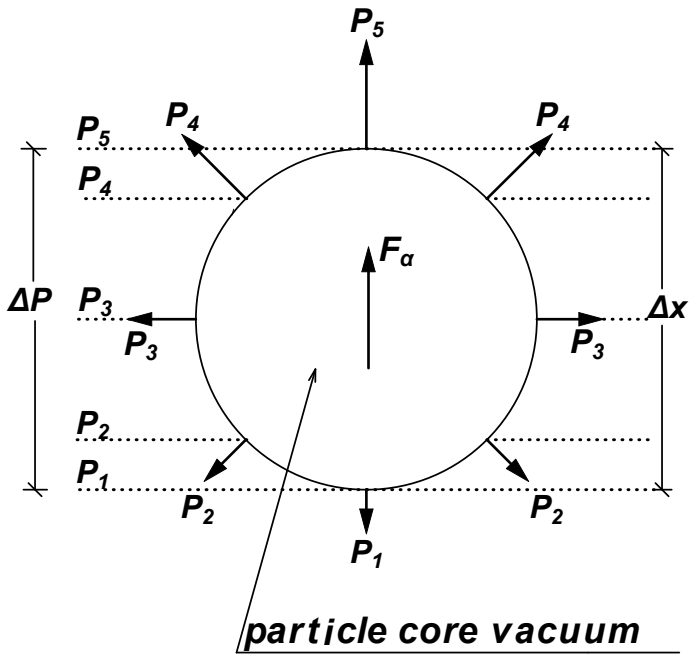

Figure 7. The buoyancy in the dynamic space creates the Universal antigravity force F_a, which causes the accelerated "expansion" of Universe and has a direction towards the greater cohesive pressure P_5 and to the periphery of Universe ($P_1 < P_2 < P_3 < P_4 < P_5$, $F_a = V\Delta P/\Delta x$, $\Delta P = P_5 - P_1$, V is the volume of bubble vacuum and Δx is the diameter of bubble vacuum).

The above buoyancy creates the Universal antigravity force F_a, as the first force of Nature. Therefore, the matter acquires centrifugal accelerated motion with radial direction to the periphery of Universe.

The Universal antigravity force, which is exerted on the submerged body into the dynamic space of Universe, is calculated in this subsection. The cohesive pressures (Fig. 8) P_{0x1} and P_{0x2} (Eq. 29) are $P_{0x1} = P_{0p}x_1^2/R_0^2$ and $P_{0x2} = P_{0p}x_2^2/R_0^2$. Therefore, the forces F_1 and F_2 are

$$F_1 = SP_{0x1} \Rightarrow F_1 = SP_{0p}\frac{x_1^2}{R_0^2} \tag{37}$$

and

$$F_2 = SP_{0x2} \Rightarrow F_2 = SP_{0p}\frac{x_2^2}{R_0^2}, \tag{38}$$

since the cohesive pressure attracts the bubbles of empty space of the body particles.

The resultant of forces F_1 and F_2 (Eq. 37 and Eq. 38) is

$$F_a = F_2 - F_1 = (x_2^2 - x_1^2)S\frac{P_{0p}}{R_0^2} = (x_2 + x_1)(x_2 - x_1)S\frac{P_{0p}}{R_0^2} \tag{39}$$

and is directed to the Universe periphery and putting in Eq. (39) $x_2 + x_1 \approx 2x$,

$x_2 - x_1 = \Delta x$ and $V = S\Delta x$, the Universal antigravity force

$$F_a = 2xV\frac{P_{0p}}{R_0^2} \tag{40}$$

is calculated. Of course, the volume $V = S\Delta x$ equals to the sum of the volumes of the vacuum bubbles of the body particles (particles core vacuums).

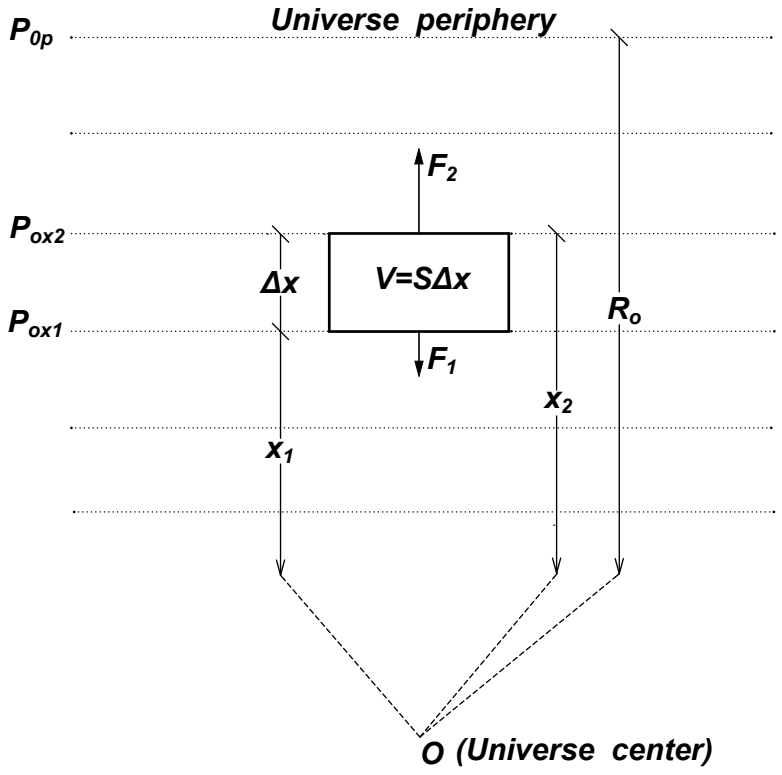

Figure 8. The volume $V = S\Delta x$ is identical to the sum of the volumes of the vacuum bubbles of the body particles.

Also, from Eq. (40) it is $F_a = 2xS\Delta x \cdot P_{0p}/R_0^2$ and $F_a/S\Delta x = 2xP_{0p}/R_0^2$, so for $F_a/S = \Delta P$ then the pressure gradient of the Universal antigravity is

$$\frac{\Delta P}{\Delta x} = 2x\frac{P_{0p}}{R_0^2}. \tag{41}$$

The equation $F_a/S = \Delta P$ can be written $F_a/S\Delta x = \Delta P/\Delta x$ and for $V = S\Delta x$ the Universal antigravity force becomes

$$F_a = \frac{\Delta P}{\Delta x}V. \tag{42}$$

The Universal antigravity force is very weak, as it is exerted on the small volume of the particle core vacuum (vacuum bubble) by a very small difference ΔP of cohesive pressure. However, the results of the antigravity force, although they evolve at a slow pace, are grand in the Universe. It is also noted, that our galaxy is moving towards the periphery of Universe at the inconceivable speed calculated[13] as $u = 0,6 \cdot 3 \cdot 10^8$m/sec

($u = 180.000$km/sec), where $u_a = u/C_0 = 0,6$ the constant timeless speed,[14] with which the Cosmic journey of galaxies takes place, at the centrifugal motion of antigravity.

2.7. "Expansion" of Universe and Hubble's Law - Upgrade of entropy - Cosmic background radiation

The first force of Nature (the Universal antigravity) has been described, because of which the particles and the galaxies consisting of them obey on an accelerated centrifugal motion. Therefore, what Hubble had observed is not due to the "expansion" of the Universe as a result of the "Big Bang", but it is the relative motion of galaxies A and B (Fig. 9). As galaxies A and B move centrifugally from the Universe center O towards the periphery, at speeds u_1 and u_2 respectively ($u_1 < u_2$), the distance AB between them increase, since their components $u\acute{}_1$ and $u\acute{}_2$ are unequal ($u\acute{}_1 < u\acute{}_2$).

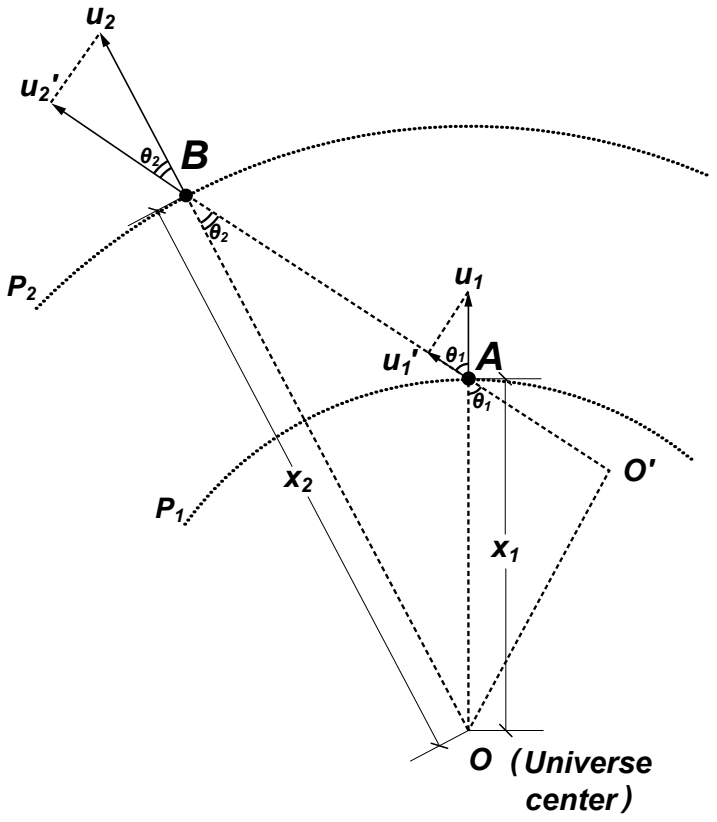

Figure 9. The relative motion of galaxies as "expansion" of Universe, where A is our own galaxy, B is the galaxy observed by Hubble, P_1 is the cohesive pressure in our region, P_2 is the cohesive pressure in region of galaxy B and x_1, x_2 are the distances of galaxies A and B from the Universe center O.

The radius of the particle core vacuum (Fig. 7) is $r_x = 3L_{0x}$ (Eq. 53), where $L_{0x} = Fx^2/kR_0^2$ (Eq. 32) is the quantum length of dipole and hence it is

$$r_x = \frac{3F}{kR_0^2}x^2 \Rightarrow r = ax^2, \tag{43}$$

namely it is proportional to the square of distance x from the Universe center, wherein $a = 3F/kR_0^2$. If $V = 4\pi r^3/3$ is the spherical volume of the bubble, then, due to Eq. (43), we have

$$V = \frac{4}{3}\pi a^3 x^6. \tag{44}$$

Substituting the Eq. (44) into the antigravity force $F = F_a = 2xVP_{0p}/R_0^2$ (Eq. 40) we find

$$F = F_a = \frac{8\pi a^3 P_{0p}}{3R_0^2}x^7. \tag{45}$$

Hence, the Work, accomplished until position x, is

$$W = \int_0^x F dx = \int_0^x \frac{8\pi a^3 P_{0p}}{3R_0^2}x^7 dx \Rightarrow W = \frac{\pi a^3 P_{0p}}{3R_0^2}x^8. \tag{46}$$

This Work is converted into kinetic energy $E_k = mu^2/2$, where $m = Vd_m$, d_m is the constant mass density of space and u is the centrifugal speed of a galaxy (Fig. 9). Thus, $E_k = Vd_m u^2/2$ and substituting therein Eq. (44) we find

$$E_k = \frac{2\pi a^3 d_m u^2 x^6}{3}. \tag{47}$$

Therefore, because $E_k = W$, it is calculated $2\pi a^3 d_m u^2 x^6/3 = \pi a^3 P_{0p} x^8/3R_0^2$, i.e.

$$u = \frac{x}{R_0}\sqrt{\frac{P_{0p}}{2d_m}} \Rightarrow b = \frac{1}{R_0}\sqrt{\frac{P_{0p}}{2d_m}} \Rightarrow u = bx. \tag{48}$$

The centrifugal speed u_1 (Eq. 48) of galaxy A is $u_1 = bx_1$ and of galaxy B is $u_2 = bx_2$. So, the galaxy B moving away with relative speed $u_r = u_2' - u_1'$, namely $u_r = u_2 cos\theta_2 - u_1 cos\theta_1$ and $u_r = bx_2 cos\theta_2 - bx_1 cos\theta_1$, so by substituting $u_r = b(O'B) - b(O'A) = b(AB)$, due to Eq. (48), we have

$$u_r = b(AB) = \frac{1}{R_0}\sqrt{\frac{P_{0p}}{2d_m}}(AB) \Rightarrow u = H(AB). \tag{49}$$

The Eq. (49) is identical with the empirical Hubbles formula, that he concluded by observing the shift of the spectral lines towards the red in the galaxies spectrum. Consequently,

$$H = \frac{1}{R_0}\sqrt{\frac{P_{0p}}{2d_m}} \tag{50}$$

is the Universal Hubble's constant. Using the approximate values $P_{0p} \approx 10^{151}\text{N/m}^2$ (Eq. 60), $R_0 \approx 10^{26}\text{m}$,[9] $d_m \approx 10^{134}\text{Kg/m}^3$ (Eq. 34) and substituting in Eq. (50), we verify the size class of the Hubble's constant

$$H \approx 10^{-18} sec^{-1}. \tag{51}$$

At the end of the Cosmic journey, the particles of the galaxies will disappear, as defined by the antithesis principle (that is the Genesis of matter in the area close to the Universe center and the disappearance of matter at the Universe periphery). This disappearance of matter is contrary to the prevailing principle of conservation of matter

and energy, which has now been replaced by the most valid principle of conservation of forces, representing matter and energy. From the Theory of Dynamic Space, however, matter was defined differently, as a deformation of space,[+] while energy is the ability of displacement of force and, along with the extent, are the structural elements of space.

In reality, the dynamic space is the elastic mosaic Being. The Being's deformations, matter and motion, as formations of forces,[15] flow and move under the action of antigravity force, too. Therefore, there is shift of the space deformations, shift of matter and motion.

During the accelerated centrifugal motion of the dynamic formations (matter and motion) towards the periphery of Universe, there happens a continuous increase of entropy. Therefore, we assume that the Universe ends to thermal death.

However, we will give also an etymological interpretation for entropy. The word comes from the Greek verb $\varepsilon\nu\tau\rho\acute{\varepsilon}\pi\omega$ ($\varepsilon\nu + \tau\rho\acute{\varepsilon}\pi\omega$), meaning to restrict. Thus, entropy means the restriction of the energy action at direction and extent. Therefore, for stronger restriction, an increase of entropy happens. So, the definition of the energy, as the ability of the force displacement, can be for the entropy the restriction of the force displacement at direction. Following this restriction of force displacement, forms of lower quality energy are generated, namely of increased entropy.

At the periphery of Universe, the dynamics of particle structure and of motion (as well as of autonomous motion of E/M waves)[12] will be retrieved to the space as incorruptible forces, while the core vacuum of particle will be given away to the vacuum (non units-nonexistence). By this retrieval of the dynamics of particle structure and motion to the space, the cohesive pressure of space is restored.

Therefore, since at the periphery of the Universe the dynamic formation of particles return to the dynamic space and the vacuums of their cores in the vacuum-nonexistence, the entropy of the Universe is upgraded to zero entropy (and of better energy quality) of the cohesive forces of space. Hence, the entropy of Universe remains constant, since it is upgraded at its periphery. Actually, with the dissolution of the space deformations, the oriented forces (high entropy) are restored into the form of space cohesive forces (zero entropy).

In the process of degradation of the moving particle, the degradation of motion formation comes first.[4,15] Therefore, the particles are decelerated prior to their degradation, with result the charged particles to create E/M waves towards the periphery of Universe, where they are finally degraded. However, collisions of the charged particles take place onto the elastic membrane at the periphery of Universe (Fig. 6). The above membrane is pulsing, resulting acceleration of a residue of the charged particle towards the interior of Universe, causing a weak radiation. This is the Cosmic background radiation, which has been detected by Arno Penzias and Robert Wilson.

The Cosmic background radiation is constant, since the charged particles arrive at

[+] see subsection 3.1

the periphery of Universe at the same centrifugal speed and are degraded by the same mechanism.

3. Second Deformation of Space - Gravity

3.1. The breaking of Universal symmetry causes the Genesis of the primary neutron - The gravitational force of the vacuum bubble

Throughout the Universe there is equality (Universal symmetry) of peripheral and radial forces. This equality does not apply in the area close to the Universe center (breaking of Universal symmetry), where the curvature of space (Eq. 3) is great. So, both the inequality of the lateral pressures P_l (they are significantly greater than the radial pressures P_{r1} and P_{r2}) and the inequality $P_{r1} < P_{r2}$ of the radial pressures, due to the Eq. (29), are created (Fig. 10). The result is the distortion of the cell, which evolves into the formation of a vacuum bubble. This is the beginning of the Genesis of the particle-neutron, the primary form of matter, which is the first Cosmic event of Universe as an opposite phenomenon.

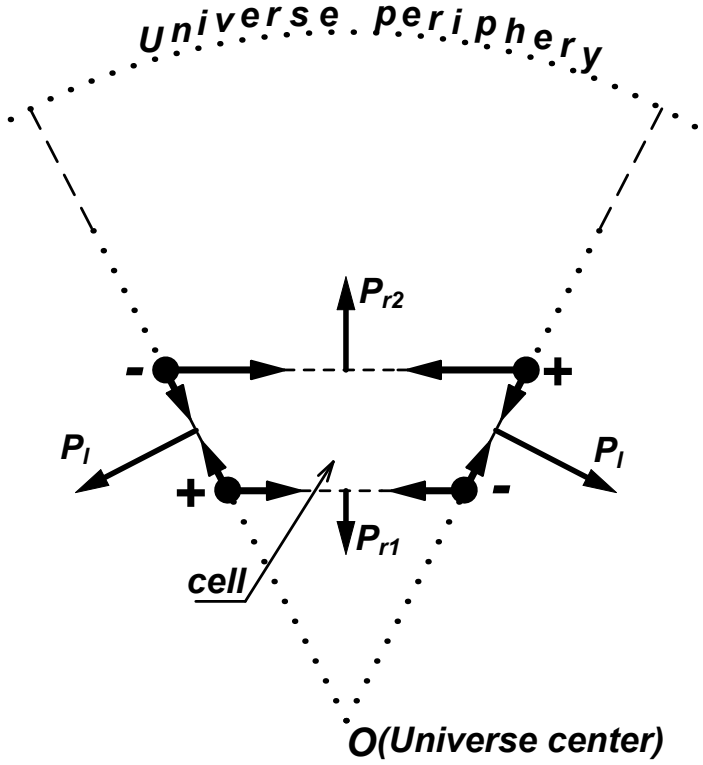

Figure 10. The breaking of Universal symmetry close to the Universe center evolves into the formation of a vacuum bubble ($P_{r1} < P_{r2} < P_l$, where P_{r1}, P_{r2} are the radial pressures and P_l the lateral pressures).

This creates a spherical formation of empty space (without units). This spherical formation is the result of the antithesis between the nonexistence of the cohesive forces

of empty space (non space) and the existence of the cohesive forces of the surrounding dynamic space. This phenomenon is the reverse of the spherical deformation of the Universal space. The attractive pressure by the bubble formation is balanced by the cohesive pressure of space (Fig. 11).

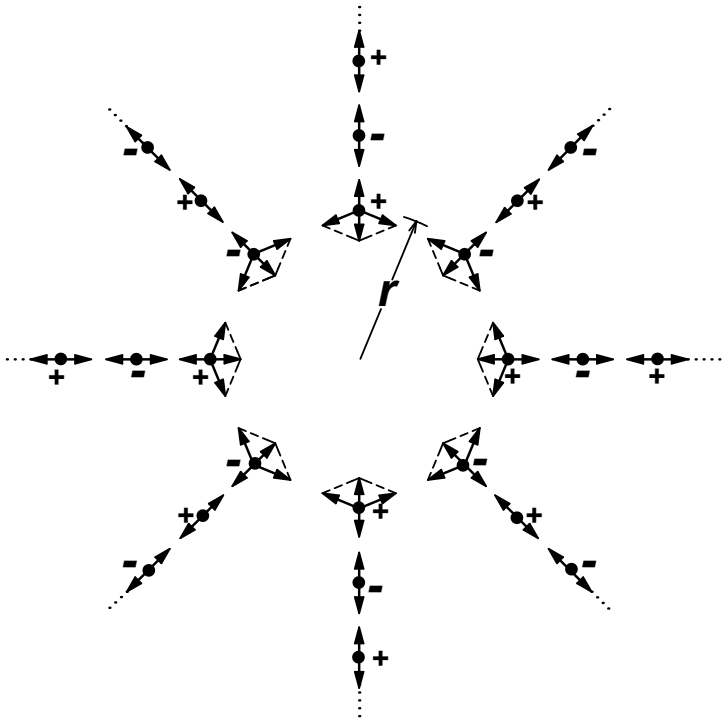

Figure 11. Indicative presentation of the bubble spherical formation ($F_0 = 4\pi r^2 P_0$, where F_0 the force of bubble, P_0 the cohesive pressure of space, $4\pi r^2$ the surface area of bubble and r its radius).

This vacuum bubble is the second deformation of space (local), the sophisticated form of which is perceived by our senses as Matter.[16] The grid structure of the cell, that surrounds the vacuum of the bubble, has the properties of an elastic membrane. This membrane stretches the surrounding space with force F_0 of its formation and balances the opposite attractive force of the space cohesive pressure P_0. This force F_0 is due to the elementary resultants (Fig. 11) that are formed by the component forces $F = kL_0$ (Eq. 1) of the electric dipoles of the bubble spherical surface. Therefore, force F_0 balances the attractive forces, caused by the cohesive pressure P_0 on the spherical surface of bubble. The forces developed in the surrounding space create the dynamic field of gravity. This total force F_0 (Eq. 52) is the gravitational force of the vacuum bubble.

It is also noted, that the Genesis of the bubble vacuum is created as a reaction to the first space deformation (the Universal spherical deformity), due to the breaking of Universal symmetry in the area close to the Universe center. As the space-Universe (existence) is surrounded by the non space (nonexistence), similarly, the space-Universe (existence) surrounds the bubble vacuum (nonexistence).

Therefore, matter as a bubble-vacuum (nonexistence) in the Universe (existence) is conceptually the opposite of Universe. The principle of antithesis appears as the opposition between Universe and Matter. The principle of antithesis, that created the spherical deformation of Universe, continues to create the particles within it as reverse models of Universe, that is, creates Matter as small reverse Universes.

3.2. Finding of the cell edge L_0, the space cohesive pressure P_0, the force F of electric dipole, the gravity force F_0 of the neutron and radius r of its core vacuum

The gravity force F_0 of the particle-neutron (Fig. 11) balances the attractive forces of the space cohesive pressure P_0. Therefore, it is

$$F_0 = P_0 4\pi r^2 \tag{52}$$

and so the dynamic energy of the particle-neutron, due to the Eq. (52), is

$$E = P_0 V = \frac{P_0 4\pi r^3}{3} = \frac{(P_0 4\pi r^2) r}{3} = \frac{F_0 r}{3} = F_0 L_0 \Rightarrow r = 3L_0, \tag{53}$$

where r is the radius of the core vacuum of neutron.

The neutron energy is $E_n = m_n C_0^2$ and the neutron mass $m_n = 1,675 \cdot 10^{-27}$Kg, where $C_0 = 3 \cdot 10^8$m/sec, so $E_n = 1,5 \cdot 10^{-10}$Joule.[17] If this value $E = E_n$ is introduced in $E = P_0 4\pi r^3/3$ (Eq. 53), then

$$\frac{P_0 4\pi r^3}{3} = 1,5 \cdot 10^{-10}. \tag{54}$$

The gravitational attraction between two particles* with radii r_1 and r_2 at a distance R, is $F_g = \pi P_0 r_1^2 r_2^2 / R^2$ and for the radius of neutron $r_1 = r_2 = r$, the Eq. (68) becomes

$$F_g = \pi P_0 \frac{r^4}{R^2}. \tag{55}$$

From Newton's Law

$$F_g = G\frac{m_1 m_2}{R^2} \tag{56}$$

and for the mass of neutron $m_1 = m_2 = m_n$, it is

$$F_g = G\frac{m_n^2}{R^2}. \tag{57}$$

From Eq. (55) and Eq. (57) it results $\pi P_0 r^4 = G m_n^2$. Therefore, setting the values $m_n = 1,675 \cdot 10^{-27}$Kg[17] and $G = 6,672 \cdot 10^{-11}$Nm^2/Kg^2,[17] it is

$$\pi P_0 r^4 = 18,719 \cdot 10^{-65}. \tag{58}$$

Finally, from Eq. (54) and Eq. (58) the radius

$$r = r_x = 1,6639 \cdot 10^{-54} m \tag{59}$$

of the neutron core vacuum and the cohesive pressure of space

$$P_0 = P_{0x} = 0,7777 \cdot 10^{151} N/m^2 \tag{60}$$

* see Eq. (68) in subsection 3.4

in our region are calculated.

The gravity force $F_0 = 4\pi r^2 P_0$ (Eq. 52), with which the neutron stretches the dynamic space $[F_0 = 4\pi r^2 P_0 = 4\pi(1,6639 \cdot 10^{-54})^2 \cdot 0,7777 \cdot 10^{151}\text{N}]$, is

$$F_0 = F_{0x} = 27,043 \cdot 10^{43} N. \tag{61}$$

The quantum dipole length (cell edge) $L_0 = E/F_0$ (Eq. 53) of the cubic cell, where $E = E_n = 1,5 \cdot 10^{-10}$Joule ($L_0 = E_n/F_0 = 1,5 \cdot 10^{-10}/27,043 \cdot 10^{43}$m), is

$$L_0 = L_{0x} = 0,558 \cdot 10^{-54} m. \tag{62}$$

The dipole constant k is calculated from $P_0 = F/L_0^2$, where $F = kL_0$ (Eq. 1), so $P_0 = kL_0/L_0^2$ and $k = P_0 L_0 = 0,7777 \cdot 10^{151} \cdot 0.558 \cdot 10^{-54}$N/m, therefore

$$k = 0,434 \cdot 10^{97} N/m. \tag{63}$$

So, the force (Eq. 1) of the electric dipole ($F = kL_0 = 0,434 \cdot 10^{97} \cdot 0,558 \cdot 10^{-54}$N) is

$$F = F_x = 0,242 \cdot 10^{43} N. \tag{64}$$

Note that index x is to determine the distance of our region from the center of Universe.

3.3. The gravity pressure of the empty space hole

The gravitational force $F_0 = 4\pi r^2 P_{0x}$ (Eq. 52) of the vacuum bubble (core of particle) is transmitted unaltered, as a stretching of the elastic-dynamic space on a spherical surface of radius R. That is

$$F_0 = 4\pi R^2 P_g, \tag{65}$$

where P_g the gravity pressure of the empty space hole (vacuum bubble) of a radius r at a distance R from the particle. From Eq. (52) and Eq. (65) the gravity pressure of the particle is calculated as

$$P_g = P_{0x} \frac{r^2}{R^2}. \tag{66}$$

Note that the change of the cohesive pressure P_{0x} is negligible due to the vast expanse of Universe and we can consider it to be constant ($P_{0x} = P_0$).

The gravity pressure P_g is the new form of pressure within the gravitational field of the particle. It causes thickening of the space units and reduction of the space cohesive pressure, due to $F = kL_0$ (Eq. 1). Therefore, the gravity pressure P_g replaces part of the cohesive pressure P_{0x}. It converts the cohesive forces of space into gravity forces, due to the presence of the space hole (local deformation). The fact that the gravity pressure P_g (Eq. 66) of a particle is proportional to the cohesive pressure P_{0x} (Eq. 29) of the Universe regions is the cause that affects the dynamics of motion[10] of distant galaxies. The result of this effect is the chaotic and unexplained motion of galactic systems.

In $P_g = P_{0x} r^2/R^2$ (Eq. 66) for $R = r$, namely on the surface of the vacuum bubble (neutron core), it is $P_g = P_{0x}$ and because $P_{0x} = F_0/4\pi r^2$ (Eq. 52), the radius r of the

neutron core depends on the cohesive pressure P_{0x} of the region. Therefore, close to the Universe center, where a very stable and consistently low cohesive pressure exists, one single kind of particle is born (the neutron).

It is also noted, that the two deformations of space are, respectively, proportional (x^2) and inversely proportional ($1/R^2$) to their distances:

(i) Universal deformation (cohesive pressure) $P_{0x} = P_{0p}x^2/R_0^2$ (Eq. 29).

(ii) Local deformation (gravity pressure) $P_g = P_{0x}r^2/R^2$ (Eq. 66).

Therefore, it is concluded that the cohesive pressure P_{0x} is proportional to the square of the distance x from the center of the Universal deformation (Universe center), while the gravity pressure P_g is inversely proportional to the square of the distance R from the center of the local deformation (empty space hole of radius r).

Hence, the Universal deformation creates the opposite local deformation, according to the fundamental principle of antithesis.

3.4. Gravitational attraction force between two particles - Gravitational and inertial mass

On the spherical surface of the vacuum bubble (core of particle), the cohesive pressure P_{0x} has been completely substituted by the gravity pressure P_g, namely it is $P_{0x} = P_g$. At a distance R from the particle the cohesive pressure is

$$P = P_{0x} - P_g, \tag{67}$$

namely it decreases by the measure of the corresponding gravity pressure P_g, which prevails at the above position.

At a distance R from particle A with core vacuum of radius r_1, let a second particle B with a radius r_2 be found (Fig. 12). The gravity pressure $P_g = P_{0x}r_1^2/R^2$ (Eq. 66) of particle A is not transmitted through the core vacuum of particle B, since there are not electric charges and dipoles into that.

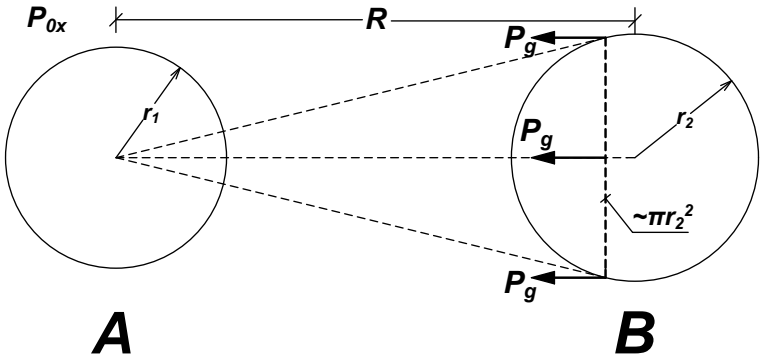

Figure 12. The gravitational attraction force of the particle A on the particle B is due to the gravity pressure $P_g = P_{0x}r_1^2/R^2$ where P_{0x} is the cohesive pressure of space.

Thus, the whole gravity pressure P_g appears as an attraction pressure on the surface of the largest circle of the particle core vacuum B (of approximate area $\sim \pi r_2^2$). Hence, the mutual gravitational attraction force F_g between the particles A and B is equal to the product of surface $\sim \pi r_2^2$ times the gravity pressure P_g (Eq. 66), so

$$F_g = \pi r_2^2 P_g \Rightarrow F_g = \pi P_{0x} \frac{r_1^2 r_2^2}{R^2}. \tag{68}$$

This Eq. (68) expresses the Law of gravitation.

Since $F_{01} = 4\pi r_1^2 P_{0x}$ and $F_{02} = 4\pi r_2^2 P_{0x}$ (Eq. 52), then $r_1^2 = F_{01}/4\pi P_{0x}$ and $r_2^2 = F_{02}/4\pi P_{0x}$ and substituting in Eq. (68), it is

$$F_g = \frac{1}{16\pi P_{0x}} \cdot \frac{F_{01} F_{02}}{R^2}. \tag{69}$$

This is the Law of gravitation as a function of the gravity forces F_{01} and F_{02} of particles A and B.

Comparing the Law of gravitation (Eq. 69) with Newton's Law (Eq. 56) the following reciprocal concepts $m_1 \sim F_{01}$, $m_2 \sim F_{02}$ and $G \sim 1/16\pi P_{0x}$ are resulting. So, the masses of particles correspond to the gravity forces of particles. They are the gravity forces of particles, with which the space is stretched.

Consequently, the gravitational mass is the expression of the particle gravity force, which stretches the space, while the inertial mass is its property of reacting to any change of its movement. This property of inertial mass is analyzed in detail.[18]

The dynamic energy of the particle is $E = P_0 V$ (Eq. 53) and $E = F_0 L_0 = m C_0^2$. So, the gravitational mass is

$$m = \frac{F_0 L_0}{C_0^2} \tag{70}$$

and it coincides with the inertial mass.

3.5. Particulate antigravity force and black holes

The Universal antigravity force is complemented by the nuclear antigravity force[19] and the particulate antigravity force, which will be explained below (Fig. 13).

The residual cohesive pressure P of space in the area close to the particle is $P = P_{0x} - P_g$ (Eq. 67), where P_{0x} is the cohesive pressure of space far from the gravitational field of the particle, $P_g = P_{0x} r^2/R^2$ (Eq. 66) is the gravity pressure of the particle, r is its radius of core vacuum and R is the distance from the particle. At the distances $R = x_1$ and $R = x_2$ from the particle (where $x_1 < x_2$ resulting $P_{g2} < P_{g1}$) the residual cohesive pressures are $P_1 = P_{0x} - P_{g1}$ and $P_2 = P_{0x} - P_{g2}$ and for $P_{g2} < P_{g1}$ it is $P_1 < P_2$, namely a difference of cohesive pressure $\Delta P = P_2 - P_1$ is created (Fig. 13). This difference of space cohesive pressure creates conditions of buoyancy on a second particle, which is found immersed in the proximal area of the first particle and it acts with the repulsive force F_{pa} of antigravity opposite to the gravitational attraction force F_g. This repulsive force is the particulate antigravity force and is mutual for the two

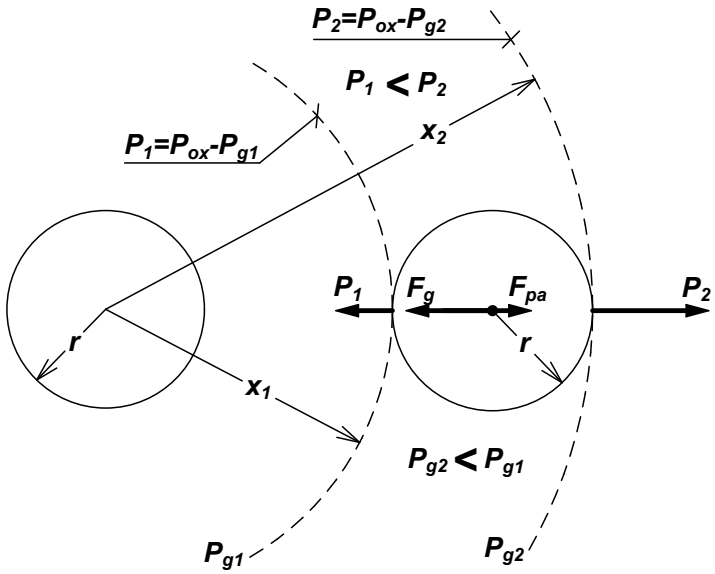

Figure 13. The inequality of gravity pressures $P_{g2} < P_{g1}$ of the left particle implies the inequality of cohesive pressures $P_1 < P_2$ in its proximal area, causing repulsive force onto the right particle of antigravity F_{pa} opposite to the gravitational attraction force F_g.

particles, since each one is forming its own pressure of gravity, created against the cohesive pressure of space.

The residual cohesive pressure P (Eq. 67) at a distance $R = x$ from the particle is $P = P_{0x} - P_g$ and for $P_g = P_{0x}r^2/x^2$ (Eq. 66) is $P = P_{0x} - P_{0x}r^2/x^2$. So its derivative of x is

$$\frac{\Delta P}{\Delta x} = 2P_{0x}\frac{r^2}{x^3} \tag{71}$$

as the pressure gradient of particulate antigravity, while the corresponding Universal pressure gradient is $\Delta P/\Delta x = 2xP_{0p}/R_0^2$ (Eq. 41).

It is reminded that x in the Universal pressure gradient (Eq. 41) is the distance from the center of Universe (of radius R_0), while x in the particulate antigravity pressure gradient (Eq. 71) is the distance from the particle (of radius r), P_{0x} is the space cohesive pressure of a region and P_{0p} the cohesive pressure of space at the periphery of Universe. From Eq. (71) it is concluded that the particulate pressure gradient decreases inversely to the cube of distance x from the particle and therefore it is very strong in small distances and declines rapidly as the distance increases. The fact that the particulate antigravity force decreases so rapidly with the distance from the particle, attributes to this phenomenon a theoretical significance concerning the structure of the black holes as a form of grid space matter, consisting of polyhedral cells, like bubbles in a foamed liquid.

The particulate pressure gradient causes repulsive force of antigravity on a same particle (neutron) of bubble volume $V = 4\pi r^3/3$ (Fig. 13) and due to (Eq. 71) is equal

to (see the identical Eq. 42)

$$F_{pa} = \frac{\Delta P}{\Delta x} V \Rightarrow F_{pa} = 2P_{0x}\frac{r^2}{x^3} \cdot \frac{4}{3}\pi r^3 \Rightarrow F_{pa} = \frac{8\pi r^5 P_{0x}}{3x^3}. \tag{72}$$

It is noted, that the gravitational attraction force $F_g = \pi P_{0x} r_1^2 r_2^2 / R^2$ (Eq. 68) between these two neutrons for $r_1 = r_2 = r$ and for $R = x$ is

$$F_g = \pi P_{0x} \frac{r^4}{x^2}. \tag{73}$$

The resultant force of the attractive F_g (Eq. 73) and repulsive F_{pa} (Eq. 72) is

$$F = F_g - F_{pa} = \pi P_{0x}\frac{r^4}{x^2} - \frac{8}{3}\pi P_{0x}\frac{r^5}{x^3} \tag{74}$$

and therefore, the corrected Law of gravitation is[3,4]

$$F = (1 - \frac{8r}{3x})\pi P_{0x}\frac{r^4}{x^2}. \tag{75}$$

Respectively, the corrected Newton's Law of gravitation is

$$F = (1 - \frac{8r}{3x})G\frac{m^2}{x^2}. \tag{76}$$

If

$$k = 1 - \frac{8r}{3x} \tag{77}$$

is the reduction factor of gravity, then for $x = 2r$ (the minimum distance between two identical particles-neutrons), we find $k < 0$.

A negative reduction factor of gravity means resultant $F < 0$ (Eq. 75). Therefore, the neutrons at the distance $x = 2r$ (i.e. "in contact") are repelled, because the particulate antigravity force prevails.

For

$$k = 1 - \frac{8r}{3x} = 0 \Rightarrow x = \frac{8r}{3} \tag{78}$$

and the resultant is $F = 0$ (Eq. 75). Thus, for

$$2r < x < \frac{8r}{3} \tag{79}$$

the particulate antigravity force prevails and the neutrons are repelled, while for

$$\frac{8r}{3} < x \tag{80}$$

the force of gravity prevails and they are attracted.

These conditions apply in black holes, which are constructed from the core vacuum (vacuum bubble) of neutrons. Hence, it is proved that the dimension or distance or length $L = L_{0x}$ has the role of the first structural element of space, as a physical entity that cannot become zero and that it also contributes in the conservation of matter, even if this matter has the form of a black hole.

Consequently, the particulate antigravity force prevents the further gravitational collapse and destruction of these bubbles. So, the black holes are sustainable matter forms of the dynamic space that cannot disappear.

3.6. Higgs boson

In the experiment at CERN for the detection of the Higgs boson, where the particles are accelerated at the vicinity of light speed C_0, during the collisions of the oppositely moving protons in the accelerator it is plausible that a destruction of their cortex[16] takes place and their remaining core vacuum (bubbles) are detected as Higgs bosons. Therefore, the Higgs field is identical with the dynamic space, where the primary form of matter begins close to the Universe center (breaking of Universal symmetry) with the creation of empty space bubbles and ends with the destruction of these bubbles at the Universe periphery. Consequently, at the CERN experiment, a breaking of Universal symmetry has been caused, resulting that core vacuums (Higgs bosons) have been created. Accordingly, in this experiment the structure of dynamic space (Higgs field) is interpreted.

Hence, the "theory of Higgs boson doomsday", where a quantum fluctuation creates a vacuum bubble that expands through space and wipes out the Universe cannot be a reality. On the contrary, there are only bubbles of empty space in the cores of particles (the Higgs bosons), which have radius $r = r_x = 1,6639 \cdot 10^{-54}$m (Eq. 59) in our region as the smaller measured order of Nature magnitude (hierarchy problem).

Additionally, the black holes look like the bubbles in a foamed liquid, consisting of core vacuums, the Higgs bosons. Therefore, Matter has the same fundamental form (bubbles) both during the beginning of the Genesis of primary neutron and during its final gravitational collapse in the cores of the stars.

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