Why black holes cannot disappear?

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Abstract.

The antigravity force is the corresponding buoyancy force, according to the physical law of buoyancy (Archimedes' principle), but for the dynamic space. As a Universal antigravity force, it causes centrifugal accelerated motion of the galaxies with radial direction to the periphery of the Universe and as a nuclear antigravity force on which the architecture of the nuclei model is based. Also, as a particulate antigravity force, it prevents the further gravitational collapse and destruction of the vacuum bubbles (Higgs bosons) in the core of the neutrons, that build the black holes in the form of grid space matter, consisting of polyhedral cells, like bubbles in a foamed liquid. Therefore, matter has the same fundamental form both during the beginning of the Genesis of primary neutron and during its final gravitational collapse in the cores of the stars.

Keywords: Vacuum bubbles; black holes; antigravity; gravity pressure.

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1. The gravity pressure of the empty space hole

The vacuum bubble[1,2] (empty space hole) is the second deformation of space (local), the sophisticated form of which is perceived by our senses as matter. The grid structure of the cell, that surrounds the vacuum of the bubble, has the properties of an elastic membrane.[3] This membrane stretches the surrounding space with a force F_0 of its formation and balances the opposite attractive force of the space cohesive pressure[4] P_0. This force F_0 is due to the elementary resultants (Fig. 1) that are formed by the component forces[5]

$$F = kL_0 \tag{1}$$

of the electric dipoles of the bubble spherical surface, where L_0 the dipole length.[5] Therefore, force

$$F_0 = 4\pi r^2 P_0 \Rightarrow r = \sqrt{\frac{F_0}{4\pi P_0}} \tag{2}$$

balances the attractive forces, caused by the cohesive pressure P_0 on the spherical surface of bubble and so the dynamic energy of the core vacuum, due to Eq. 2, is

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

where $r = r_x = 3L_{0x}$ (Eq. 3) is the radius of the particle core vacuum at a distance x from the Universe center. The forces developed in the surrounding space create the dynamic field of gravity. This total force F_0 (Eq. 2) is the gravity force of the vacuum bubble.
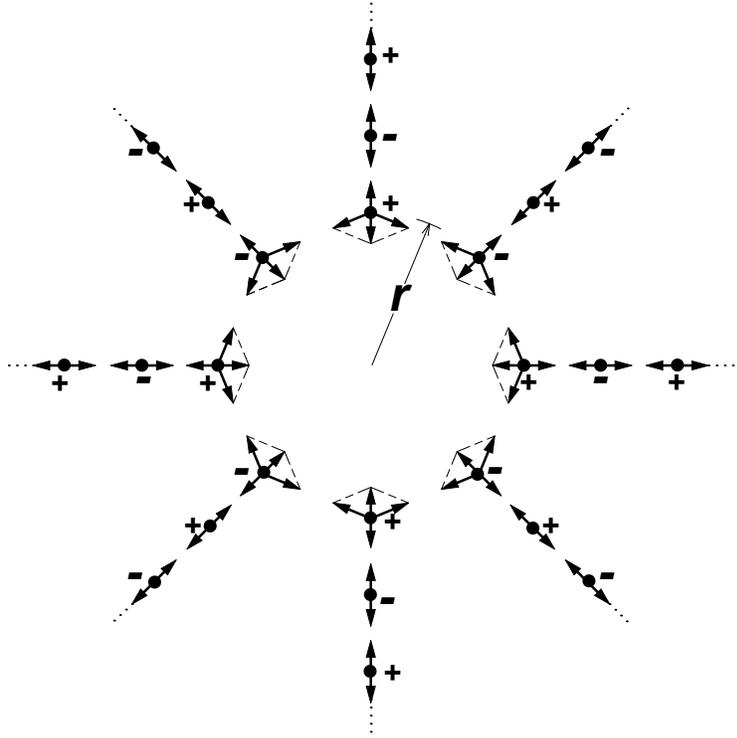
Figure 1. Indicative presentation of the bubble spherical formation ($F_0 = 4\pi r^2 P_0$, where F_0 the gravity force of bubble, P_0 the cohesive pressure of space, $4\pi r^2$ the surface area of bubble and r its radius)

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

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

where P_g the gravity pressure of the empty space hole (vacuum bubble) of a radius r_x at a distance R from the particle. From Eqs 2 and 4 the gravity pressure of the particle at a distance x from the Universe center is calculated as

$$P_g = P_{0x} \frac{r_x^2}{R^2}. \tag{5}$$

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[5] 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).

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) $P_{0x} = P_{0p}x^2/R_0^2$.[6]

(ii) Local deformation (gravity pressure) $P_g = P_{0x}r_x^2/R^2$ (Eq. 5).

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_x).

Hence, the Universal deformation creates the opposite local deformation, according to the fundamental principle of antithesis[4] (opposition).

2. Gravitational attraction force between two particles

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 $P_{0x} = P_g$. However, at a distance R from the particle the cohesive pressure of space is

$$P = P_{0x} - P_g, \tag{6}$$

namely it decreases by the measure of the corresponding gravity pressure P_g, which prevails at the above position.
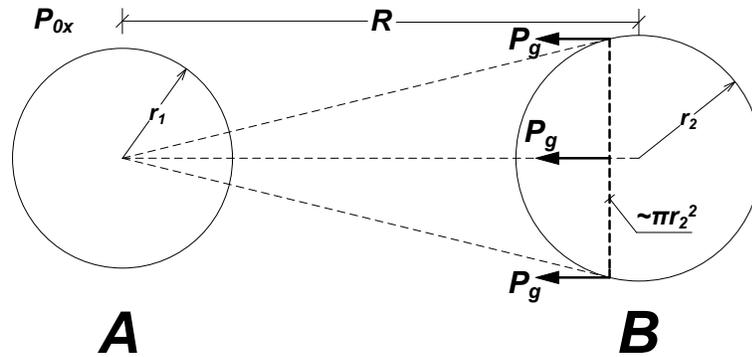
Figure 2. The gravitational attraction force of the particle A on the particle B is due to the gravity pressure $P_g = P_{0x}r_1^2/R^2$ (Eq. 5) where P_{0x} is the cohesive pressure of space

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. 2). The gravity pressure P_g (Eq. 5) of particle A is not transmitted through the core vacuum of particle B, since there are not electric charges and dipoles[5] into that. 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 $P_g = P_{0x} r_1^2 / R^2$ (Eq. 5), so

$$F_g = \pi r_2^2 P_g \Rightarrow F_g = \pi P_{0x} \frac{r_1^2 r_2^2}{R^2}. \tag{7}$$

This Eq. 7 expresses the Law of gravitation.

Substituting the $r_1^2 = F_{01}/4\pi P_{0x}$ and $r_2^2 = F_{02}/4\pi P_{0x}$ (Eq. 2) in Eq. 7, we have

$$F_g = \frac{1}{16\pi P_{0x}} \cdot \frac{F_{01} F_{02}}{R^2}. \tag{8}$$

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

Comparing the Law of gravitation (Eq. 8) with Newton's Law

$$F_g = G \frac{m_1 m_2}{R^2} \tag{9}$$

the following reciprocal concepts

$$G \sim \frac{1}{16\pi P_{0x}}, \tag{10}$$

$$m_1 \sim F_{01} \tag{11}$$

and

$$m_2 \sim F_{02} \tag{12}$$

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.

The dynamic energy of the particle is $E = P_0 V = F_0 L_0$ (Eq. 3) and for $E = mC_0^2$ the gravitational mass is

$$m = \frac{F_0 L_0}{C_0^2}, \tag{13}$$

that it coincides with the inertial mass.

It is noted, that the mass-energy equivalence $(E = mC_0^2)$ is calculated from the accumulated force[7] at the dynamic autonomous motion formation[8] 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 $E = mC_0^2$.

3. Particulate antigravity force and black holes

The change of cohesive pressure[6] $P_{0x} = P_{0p}x^2/R_0^2$ causes a potential difference of pressure ΔP, onto the volume V of a particle core vacuum, with result the creation of buoyancy conditions on the bodies.[9]

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 is complemented by the nuclear antigravity force[10] and the particulate antigravity force, which will be explained below.
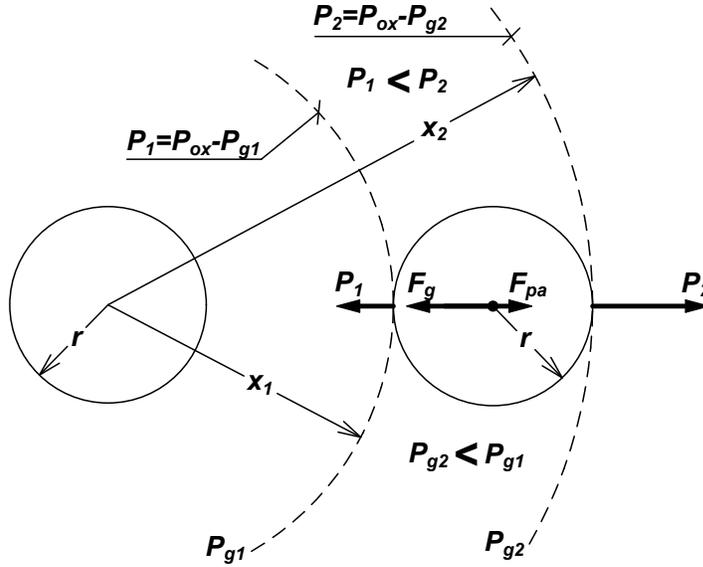
Figure 3. The inequality of gravity pressures $P_{g2} < P_{g1}$ of the left particle implies the inequality of cohesive pressures $P_1 < P_2$ in its proximal area, causing repulsive force onto the right particle of antigravity F_{pa} opposite to the gravitational attraction force F_g

The residual cohesive pressure P of space in the area close to the particle is $P = P_{0x} - P_g$ (Eq. 6), 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. 5) 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

$$P_{g2} < P_{g1}, \tag{14}$$

the residual cohesive pressures are

$$P_1 = P_{0x} - P_{g1} \tag{15}$$

and

$$P_2 = P_{0x} - P_{g2} \tag{16}$$

and for

$$P_{g2} < P_{g1}, \tag{17}$$

it is

$$P_1 < P_2, \tag{18}$$

namely a difference of cohesive pressure

$$\Delta P = P_2 - P_1 \tag{19}$$

is created (Fig. 3). 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 particles, since each one is forming its own pressure of gravity, created against the cohesive pressure of space.

Additionally, the residual cohesive pressure P at a distance $R = x$ from the particle that is $P = P_{0x} - P_g$ (Eq. 6) and for $P_g = P_{0x} r^2/x^2$ (Eq. 5), it is

$$P = P_{0x} - P_{0x} \frac{r^2}{x^2}. \tag{20}$$

So, its derivative of x is

$$\frac{\Delta P}{\Delta x} = 2 P_{0x} \frac{r^2}{x^3} \tag{21}$$

as the pressure gradient of particulate antigravity, while the corresponding Universal pressure gradient[9] is

$$\frac{\Delta P}{\Delta x} = 2x \frac{P_{0p}}{R_0^2}. \tag{22}$$

It is reminded that x in the Universal pressure gradient (Eq. 22) is the distance from the center of Universe (of radius R_0), while x in the particulate antigravity pressure gradient (Eq. 21) 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. (21) 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. 3) and due to (Eq. 21) is equal to

$$F_{pa} = \frac{\Delta P}{\Delta x} V \Rightarrow F_{pa} = 2 P_{0x} \frac{r^2}{x^3} \cdot \frac{4}{3} \pi r^3 \Rightarrow F_{pa} = \frac{8\pi r^5 P_{0x}}{3x^3}. \tag{23}$$

It is noted, that the gravitational attraction force $F_g = \pi P_{0x} r_1^2 r_2^2 / R^2$ (Eq. 7) between these two neutrons for $r_1 = r_2 = r$ and for $R = x$ is

$$F_g = \pi P_{0x} \frac{r^4}{x^2}. \tag{24}$$

The resultant force of the attractive F_g (Eq. 24) and repulsive F_{pa} (Eq. 23) is

$$F = F_g - F_{pa} = \pi P_{0x} \frac{r^4}{x^2} - \frac{8}{3} \pi P_{0x} \frac{r^5}{x^3} \tag{25}$$

and therefore, the corrected Law of gravitation is

$$F = (1 - \frac{8r}{3x}) \pi P_{0x} \frac{r^4}{x^2}. \tag{26}$$

Respectively, the corrected Newton's Law of gravitation is

$$F = (1 - \frac{8r}{3x}) G \frac{m^2}{x^2}. \tag{27}$$

If

$$k = 1 - \frac{8r}{3x} \tag{28}$$

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

$$k < 0. \tag{29}$$

A negative reduction factor of gravity means resultant $F < 0$ (Eq. 26). Therefore, the neutrons at the distance $x = 2r$ (i.e. "in contact") are repelled, because the particulate antigravity force prevails.

For

$$k = 1 - \frac{8r}{3x} = 0 \Rightarrow x = \frac{8r}{3} \tag{30}$$

and the resultant is $F = 0$ (Eq. 26). Thus, for

$$2r < x < \frac{8r}{3} \tag{31}$$

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

$$\frac{8r}{3} < x \tag{32}$$

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 dipole 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.

4. Higgs boson

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.[1,2] 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[11] 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.

5. References

[1] N.I.Gosdas, *The Unified Theory of Dynamic Space*, Greek Edition (Trohalia, Athens, 1999).
[2] M.Tzoumpas, *Hubble's Law and antigravity - Higgs boson and gravity*, http://viXra.org/abs/1710.0082 [Quantum Gravity and String Theory].
[3] M.Tzoumpas, *Hubble's Law and antigravity - Higgs boson and gravity*, http://viXra.org/abs/1710.0082 (subsection 3.1) [Quantum Gravity and String Theory].
[4] M.Tzoumpas, *Hubble's Law and antigravity - Higgs boson and gravity*, http://viXra.org/abs/1710.0082 (subsection 2.2) [Quantum Gravity and String Theory].
[5] M.Tzoumpas, *Hubble's Law and antigravity - Higgs boson and gravity*, http://viXra.org/abs/1710.0082 (subsection 2.1.) [Quantum Gravity and String Theory].
[6] M.Tzoumpas, *Hubble's Law and antigravity - Higgs boson and gravity*, http://viXra.org/abs/1710.0082 (subsection 2.3, Eq.29) [Quantum Gravity and String Theory].
[7] M.Tzoumpas, *Time as motion phenomenon - Physics Laws do not apply to inertial systems*, http://viXra.org/abs/1802.0372 (section 4) [Relativity and Cosmology].
[8] M.Tzoumpas, *Unified E/M waves theory*, http://viXra.org/abs/1905.0079 [Quantum Gravity and String Theory].
[9] M.Tzoumpas, *Hubble's Law and antigravity - Higgs boson and gravity*, http://viXra.org/abs/1710.0082 (subsection 2.6) [Quantum Gravity and String Theory].
[10] M.Tzoumpas, *Universe expansion - Black holes - Nuclear forces*, http://viXra.org/abs/1903.0248 (sections 4) [Relativity and Cosmology].
[11] M.Tzoumpas, *Hubble's Law and antigravity - Higgs boson and gravity*, http://viXra.org/abs/1710.0082 (subsection 3.2, Eq.61) [Quantum Gravity and String Theory].