

## **HYPOTHESIS OF A COSMOLOGICAL MODEL OF THE UNIVERSE WITHOUT GRAVITATION**

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### ***Abstract***

*The paper presents a hypothesis of a Cosmological Model of the Universe without Gravitation as a factor and a reason for the attraction of the material bodies. It is justified a physical Essence availability in the Space and its parameters, defined for the first time at the paper, and their evolution to be accepted as a basis of emergence of the matter and the processes in the Universe.*

### **Introduction**

The present-day physicists and scientists of different field of knowledge are trying hard to achieve the so called “Great unification” of the gravitation with other three fundamental forces of hard interaction in the frames of the Standard Model. Many theories of gravitation have been proposed for this aim. The gravitational waves and dark matter registration have been announced lately. At the present stage, approximately 100 years after the General Theory of Gravitation had been created, which is considered as a final theory of gravitation, there is no explanation of it. Why is it so? Why we seek for gravitational waves and dark matter as a proof of the gravitation existence, that is the bodies attraction? Maybe the analogues with the electromagnetic and mechanical waves mislead us.

Meeting the difficulties, concerning the nature of the gravitation and its relation with other forces and interactions, it should be considered as an option the possibility of gravitation not existence, contrary to our views and scientific theories. At first, such idea seems paradoxical and insolent but the trying to find an answer of several basic questions in this direction,

predisposes in thoughts about such possibility. Generally they are as follows:

- why the contemporary science with its high level theoretical and experimental development, can't unify the gravitational interaction with the three other basic interactions;

- why and how the electrically neutral material bodies attract each other;

- why the gravitational interaction force is on order of  $37$  to  $40$  or approximately  $10^{40}$  times weaker than the rest three interactions;

- why, despite the development of contemporary high-tech measuring equipment and technology, it can't be registered the gravitational waves and the corresponding graviton, which according to the science, is considered as a gravitational energy quantum of spin  $2$ ;

- why the gravitational interaction is an exception from the other three interactions and is only attraction, without repulsion.

The uniting of the possible answers of these and other related questions in a single information massif gives rise to the assumption that gravity, that is the bodies attraction to each other may not actually exist. But then logically comes the question what could be the reason for the bodies trend towards each other, the reality which led to the Newton's law of Universal attraction.

### **Hypothesis**

The seeking for the answer of the posed questions, relating to the gravitation, and many years of persistent efforts for their clarifying, have resulted in and reinforced the idea that what we define and perceive as gravity is not an attraction of the bodies at all, e.g. gravity as a phenomenon is absent, and the attraction effect is due to other factors. The development of the concept has led to the search for the reason of the material bodies tend to each other. The logic leads to the conclusion, that, if the bodies actually do not attract, according to the assumption of the hypothesis, they should be pushed towards each other. Assuming that the admission is well founded, it should also be a reason for their pushing, therefore, there must be some force that pushes them. This force could be due to the pressure, caused by a real physical factor with certain physical parameters, occupying the universal space (Here it should be noted, that the modern science assumes with high degree of credibility, that a small part of the so-called "dark" matter has converted into a substance of the known physical parameters

(bright matter).

Second branch of the point leads to the same conclusion, namely, that the universal space is not empty, and is occupied entirely by dense and continuous reality. Evidence about this and a direct consequence is the genesis and formation of the material entities. It is not logical to believe and accept that the matter and, in particular, the substance come from nothing, from empty space. (Let us recall one of the main issues, concerning contemporary physics, namely - what gives mass of the material particles, according to the hypothesis that this is Higgs - boson or "god particle", which is also increasingly being looked for like the "dark" matter, spending huge funds).

Once we have come to the conclusion through two independent branches of reasoning, that universal space is filled with something real of inherent physical properties, we should name it and reveal its physical parameters. Then this unintelligible reality will emerge from anonymity and be legitimized. The term "Essence" is the most appropriate about the name.

According to the hypothesis, this Essence adopted by us for the objective existence with its physical properties, is a source of pressure, leading to suppression of material bodies toward each other. Prior to clarify the pressure process principles it should be revealed the physical properties and parameters of the Essence.

It is logical to assume, that the likely physical parameters of the Essence are the known primary physical parameters - density, temperature, energy and their derivatives. To determine the values of these parameters, it is appropriate to adopt as a base some fundamental values. For example, for the Essence density determination, which should relate with the pressure, it is suitable, as a fundamental value, the Newton's gravitational constant to be used  $\text{cm}^3/\text{g}\cdot\text{s}^2$ , (In cgs units, centimeters cubed per gram per second squared). Physically, it is known as a specific volume in thermodynamics – the volume per unit mass of the Essence. The specific volume is the reciprocal of the density, which is a prerequisite for the determination of the density of the Essence. As is known, the value of the gravitational constant, determined experimentally for the first time by Cavendish [1] is  $6,67 \cdot 10^{-8}$ , ie in this volume expressed in cubic centimeters [ $\text{cm}^3$ ], Essence of 1 g should fit. Therefore, in a cubic centimeter [ $\text{cm}^3$ ] **X** grams of the Essence should fit. As a result,  $\mathbf{X} = 1/6,67 \cdot 10^{-8} = 10^8/6,67 = 1,49 \cdot 10^7$  g, i.e. in a cubic centimeter of the space, the Essence of the order of  $10^7$  grams fits. The resulting value of the supposed Essence's density is the seemingly unusually

high, but it is considerably lower, practically negligible, compared to the density of the substance, from which everything material is built, including ourselves, which is of the order of  $10^{12} - 10^{14} \text{ g/cm}^3$ . In other words, the substance is from 100000 to 10 000 000 (one hundred thousand to ten million) times more dense than the Essence, from which it originates and where it is "immersed", distributed, dispersed, everywhere in the universal space, or concentrated in galaxies, suns, planets, molecules, atoms, elementary particles.

At so specified value of the Essence density, it follows that every point and area of it experiences and performs pressure at the same time from and on the adjacent points and zones and through them on the whole Essence. This results in compensated and approximately balanced pressure at any point of the universal space. The whole universal space is filled homogeneously (tightly), isomorphic (no separate points) and isotropic (no separate directions) by the Essence, with defined value of the the density and temperature, probably close to absolute zero, i.e. around  $3^0 \text{ K}$ . In the field theory this state is defined as a scalar field, scalar or tensor of rank zero, without preferential points and directions [2]. This state precisely forms and in a much higher degree physically meets the definition of a continuum, adopted artificially for etc. space-time continuum, composed of two very different non-physical categories.

Anthropic principle, widely used in science, provides evidence that the Essence state and condition is not stationary, and its parameters should be changed in time. Probably, the reaching a limit value of the Essence density (and possibly of the temperature) leads to a state at which spontaneously (cumulatively, explosively) a synthesis occurs or separation from the Essence of condensed entities of higher density, compared to the initial one in the Essence environment. Much more likely, it is a process of generation and formation from the Essence of the primary entities in the entire universal space, in the entire the Universe or in its separate areas, but not the alleged "big bang" with its vaguely attributed parameters and singularity. Hypothesis presented here also implies and suggests that in the Essence evolution there was an event of the characteristics of the "Big Bang", because science objectively dates the age of its consequences, but not explosion of that supposedly "fireball" with those fantastic parameters - temperature of  $1,5^{12} \text{ K}$ , density of  $10^{94} \text{ g/cm}^3$  and duration of  $10^{-43} \text{ s}$ , but a "burst" or perhaps a continuous process of condensation of the known material formations from the objectively existing Essence, without any

singularities, but with precise values of its parameters [3]. These formed primary formations were substantially of greater density than that of the Essence. Their form is surely spherical because of the same pressure in all directions, maintained by the Essence. The availability of these formations creates anomalies, distorts the homogeneity of the scalar field and the symmetry of the Essence pressure around them. This results in occurrence of an area of "shadow" around each formation, leading to shielding of the pressure of the surrounding Essence and as a consequence its imbalance in these areas. There is a prerequisite for a different pressure than the average pressure of the Essence primary scalar field and its gradient, i.e. the pressure of the Essence towards the formation acquires a value higher than the fixed one and also direction. Mathematically this can be expressed by the pressure vectors or tensors of the first rank. The value of the pressure's vector in any point of the formation shielding area, at any moment of time should be directly proportional to its mass (M) as a product of its density ( $\rho$ ) and its volume (V), which physically sets its "shadow" or shield potential (real analogue of the hypothetical gravitational potential) and inversely proportional to the distance (r) to it  $P = M/r$ . The direction of the pressure vector is to the center of the formation. Symbolically, thus described physical model and its mathematical equivalent in vector form can be represented by the expression:

$$(1) \quad \mathbf{P}(\mathbf{r}, t) = \frac{M}{r^2} \cdot \mathbf{r}$$

where:

- $\mathbf{P}(\mathbf{r}, t)$  - the Essence pressure vector at a point of radius vector  $\mathbf{r}$  in Descartes coordinate system with beginning at the center of the formation, at time  $t$  ;
- $\mathbf{r}$ -vector having a direction toward the center of the formation and the absolute value of  $r$ , which is equal to the distance to the formation

The vector values are presented by means of bold symbols. Respectively,  $r$  is in the second degree in the denominator of (1). For ease of presentation, the factor  $4\pi$  is not entered in the denominator.

If a formation "B" is located in the "shadow" potential of the "A" formation, due to the pressure gradient, the formation "B" will be pushed

to the formation “A” and acquire an acceleration. Naturally, the formation "B" also has shielding potential and causes vectors of pressure, so the formation “A” and formation “B” will be pushed towards each other without ever being attracted by some mysterious force, defined as gravity. The force  $F$ , by which the two material bodies are driven by the pressure of the Essence to each other should be equal to the scalar product of the vectors of the pressure to the two bodies, or:

$$(2) \quad F = P_1 \cdot P_2 \cdot \cos \varphi, \text{ where } \varphi \text{ is the angle between } P_1 \text{ and } P_2.$$

The development of (2) through  $P_1$  and  $P_2$  according to (1), leads unambiguously to known classical formula of Newton about the force of attraction of two material bodies in the Universal space.

In the general case, if there are more than two formations, and due to the overlap of their screening zone, a resultant force is formed as a result of the Essence pressure. The total pressure vector of the Essence must be equal to the sum of the vectors of the Essence pressure to the available formations.

$$(3) \quad \mathbf{P}(\mathbf{r}, t) = \sum_{i=1}^n \mathbf{P}_i(\mathbf{r}, t)$$

For the marginal case of universal space with the presence of multiple physical formations, it can be formulated the following summary: the Essence pressure at any point of the universal space forms a vector, which is equal to the sum of the vectors of all formations available in the space.

As a result of the action of shady potentials and formed Essence pressure vectors, the movement of each formation is of a direction and a trajectory, determined by all other physical bodies in the universe. The influence of the nearest physical bodies is most expressed, as a result of an inverse proportionality dependence of the pressure vector magnitude from the distance. Since all physical objects in the universe are in constant motion and at regular periodicity to each other, the Essence pressure summary vector at any point and any time is fixed. As a result, each formation has an exactly defined direction, a trajectory and periodicity of the movement. Only the Essence is stationary.

## Cosmological model of the universe without gravity

Initial condition of the universe (or its separate areas) should be a scalar field with defined above parameters - density, internal pressure and temperature without any formations. Reaching a limit „critical” value of the density (and possibly the temperature) leads to spontaneous (explosive) synthesizing of formations by compacting large amount of Essence in defined volumes, resulting in a reduced average density of the Essence and hence, its internal pressure drop.

These formations of density, significantly higher than the Essence average density, represent the lowest levels of the substance structuring, that build all other known entities of the matter. That should be the "bright matter" of the Universe, and the primary Essence from which it originates should be the "dark" matter. The substance entities are submerged in the Essence and are closely covered by it. Two questions arise. The first question: in the process of "condensation" what part of the Essence is compacted and converted into substance. Contemporary science assumes that a small fraction of Essence has become a substance, from 4% to 10%, and the average density of the substance in the Universe is from  $10^{-29}$  to  $10^{-31}$  g/cm<sup>3</sup>, and the value of  $10^{-28}$  is determined as "critical" density. Second question: at what spatial scales the action took place, i.e. the size of the primary formations - the range of particles' size of  $10^{-13}$  -  $10^{-14}$  cm, or the range of quark of  $10^{-17}$  cm, Planck length, or J. A. Wheeler's geon of  $10^{-33}$  cm, Compton's length of  $10^{-54}$  cm, or lower level. Let us disregard the sizes of the primary formations and assume, that they are around an average-statistical value. Any arising formation creates around itself "shady" or shielding areas for the pressure, because of the considerably higher density than that of the Essence, covering them. The impaired wholeness of the Essence continuum, results in asymmetry of the pressure on the formations, the consequence of which is the movement of formations in the Essence environment. The movement of any entity is a function of the complex influence of three factors: the Essence pressure asymmetry, the dispersion of the formation sizes and screen zones overlapping. According to the mechanics, two main types of movement are known - rotation and translation. Logically, the rotational movement should cause electrification of the formations as a result of the constant friction with the Essence. This may be the genesis of the one of the three main types of interactions - electromagnetic

The second type of movement - translation, according to this hypothesis,

is not due to gravity, but because of the pushing of the formations to one another. There are two consequences:

- quantitative accumulation and formation of structures and configurations of increasingly higher level - from elementary particles, atoms, molecules and chain structures of atoms and molecules, organic compounds, planets, suns, galaxies;
- well-defined orbits and trajectories of the formations movement, due to their complex mutual influence through shield areas and modulated pressure of the Essence.

The presented above concepts regarding the levels of structuring and movement of physical formations give grounds of acceptance the universal pressure of the Essence as a major factor, instead of attraction of bodies or gravity.

This hypothesis of the Universe model allows logically to explain all observed physical and astronomical phenomena and processes. There are two fundamental questions to answer. The first one - are the processes in the Universe single without repeat or cyclical? The second one – do they cover all Universal space simultaneously or its separate zones shifted in time. Their clarification is under investigation

## References

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## ХИПОТЕЗА ЗА КОСМОЛОГИЧЕН МОДЕЛ НА ВСЕМИРА БЕЗ ГРАВИТАЦИЯ

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### Резюме

Статията представя хипотеза за космологичен модел на Всемира в отсъствието на гравитация като причина за притеглянето на материалните тела. Поставени са пет фундаментални въпроса,



свързани с гравитацията, на които съвременната наука не предлага удовлетворителни отговори и на тази база е потърсена причина или фактор, играещ ролята на гравитация. За такъв е определен факторът налягане, създаван от основополагаща физическа същност, изпълваща всемирното пространство и формираща скаларно поле или тензор от нулев ранг. За първи път са определени някои от основните физически свойства и параметри на тази същност, в частност плътността, чията стойност, изчислена на базата на гравитационната постоянна на Нютон –  $G$ , е получена от порядъка на  $1,5 \cdot 10^7 \text{ g/cm}^3$ . Хипотезата допуска, че от тази същност чрез кондензация се формират материалните образувания, елементарните частици с плътност от порядъка на  $10^{12} - 10^{14} \text{ g/cm}^3$ , които нарушават хомогенността на скаларното поле на същността, създавайки зони на сянка около себе си и съответно асиметрия в налягането на същността. Нарушената асиметрия в налягането е определена като причина за изтласкването на телата едно към друго, а не предполагаемото гравитационно взаимодействие, нямащо физическа предпоставка и основа. На базата на хипотезата е предложен космологичен модел на Всемира без гравитация. Предложените хипотеза и модел не противоречат на предшестващи теории и математически описания на наблюдаваните процеси и взаимодействия във Всемира. Напротив потвърждават ги, изключвайки всякакви сингулярности и неопределености в тях и ги допълват с физически обосновани доводи за образуването, движението и наелектризирането на материалните образувания и формираните на тяхна база тела.