GEOMETRIZED VACUUM PHYSICS. PART 11: GRAVITY AND LEVITATION

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ABSTRACT

This article is the tenth part of the scientific project under the general title "Geometrized Vacuum Physics based on the Algebra of Signature " (GVPh&AS) [1,2,3,4,5,6,7,8,9]. In this article, the phenomenon of planetary gravity is considered as a result of a spatial-phase shift between two counter intra-vacuum flows, flowing from top-down and bottom-up. These powerful intra-vacuum flows flow along counter spirals wound on all radial directions departing from the core of stable spherical vacuum formations (in particular, "planets" and "stars"). In this case, the vacuum currents flowing upward along the spiral always slightly lag in magnitude behind the vacuum currents flowing downward along the counter spirals. Therefore, a relatively weak residual accelerating drain carries along all bodies in the direction of the core of the spherical vacuum formation, and is the cause of gravitation. The model representation of gravity as a result of the difference of counter powerful intra-vacuum currents can serve as a theoretical justification for the possibility of using these flows for alternative methods of movement in space. In conclusion, the article considers possible methods of controlling the topology of space and intra-vacuum currents with the aim of using them as a driving force in the levitation mode.

Keywords: gravity, vacuum physics, vacuum theory of gravity, geometrodynamics, vacuum, signature algebra, superluminal speed.

BACKGROUND AND INTRODUCTION

This paper is the eleventh in a series of articles under the general title "Geometrized Vacuum Physics Based on The Algebra of Signature" (GVPh&AS). The previous ten articles are listed in the bibliography [1,2,3,4,5, 6,7,8,9,10].

In the article [10] the metric-dynamic models of naked "planets" and "stars" (more precisely, electrically neutral planetary P_k-"atoms" and P_k-"molecules", i.e. stable spherical $\lambda_{6,7}$-vacuum formations of planetary and stellar scale) were considered. In [10] it was conditionally accepted that in the vicinity of the core of these funnel-shaped regions of $\lambda_{6,7}$-vacuum there are no mini-, milli-, micro-, nano- and picoscopic local curvatures of $\lambda_{m,n}$-vacuum ("particles" or "corpuscles"), see Figures 2*b* and 3 in [10]. However, in reality the cores of naked "planets" and "stars" are surrounded by a huge number of small "corpuscles", see Figure 2*a* in [10]. This article makes another attempt to understand why the outer shells of naked "planets" and "stars" (i.e. planetary P_k-"atoms" and P_k-"molecules") attract small stable $\lambda_{m,n}$-vacuum corpuscular curvatures (i.e. "particles").

Here we mainly consider planetary gravity, using the example of gravitation to the core of a naked "planet" (or "star").

A naked "star", by definition in [10], is a large naked "planet" in which a huge cluster of planetary P_k-"quarks" goes on to enhance gravity to such a level that thermonuclear reactions are ignited in the atomic depths of this astronomical object. In other words, a naked "star" differs from a naked "planet" only in the magnitude of the gravitational interaction.

At the same time, all the model concepts presented in this work also apply to all other stable spherical $\lambda_{m,n}$-vacuum formations included in the hierarchical cosmological model presented in [6], regardless of their scale (see Figure 1 in [6]).

The study of the nature of planetary gravity is a significant task for natural science, since it was with the attempt to describe this amazing phenomenon by Galileo Galilei that modern science began.

Take an object in your hand, for example, a pencil, raise it to eye level and let go. Why does a pencil (or any other object) fall down? Thinkers of all times have sought the answer to this question, but even today gravity (i.e. the attraction of planets and stars to all objects around them) remains one of the most mysterious phenomena in the world around us.

There have been many attempts to explain the phenomenon of mutual attraction of material bodies to each other. Some ancient philosophers were of the opinion that the World is a mixture of vortices of Love and Hate, and that gravity is a natural desire to reunite clots of living matter. There were also more pragmatic thinkers who believed that when bodies approach each other, the resistance of the environment between them simply decreases. Others, on the contrary, believed that the environment closes behind the approaching bodies and exerts excess pressure on them from the outside.

Summarizing the observational experience of ancient philosophers, Aristotle (384 – 322 BC) indicated in his treatise “Physics” that everything around has a combination of four basic qualities (elements): “fire”, “water”, “air” and “earth”. At the same time, those entities in which the qualities “fire” and “air” predominate – strive upward; and entities in which the qualities “water” and “earth” predominate – strive downward (air navigation on hot air balloons is based on this principle).

In addition, Aristotle somewhat changed the vector of thinking regarding gravity by asserting that the speed at which bodies fall to the ground depends on their size and weight. Indeed, this is an observational fact: if, for example, a pencil and a fluff are released from a certain height at the same time, the pencil will reach the surface of the earth much earlier than the fluff.

In Aristotle's cosmology, the center of the Universe is the stationary planet Earth, which is spherical in shape. Around the Earth is distributed water, then air, then fire. Fire extends to the orbit of the Moon, the first celestial body. Above the Moon is the supralunar, Divine world, where bodies consist of ether. In the supralunar sky, there is only uniform, continuous circular motion of celestial bodies. Celestial bodies revolve around the Earth in circular orbits; they are attached to rotating spheres woven from ether. There are spheres of the Moon, Mercury, Venus, the Sun, Mars, Jupiter, Saturn, and the sphere of fixed stars (see Figure 1). Behind the last sphere is the PRIMOR MOVER – GOD, Who Gives motion to the spheres.

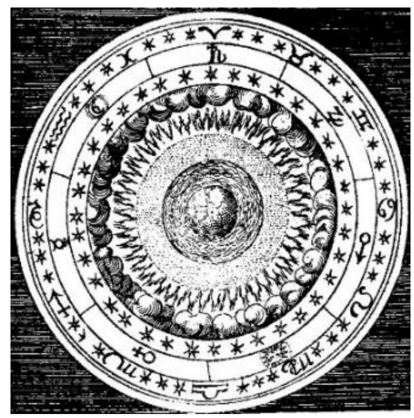


Fig. 1. Aristotle's picture of the world

Aristotle's opinion was taken into account by philosophers for about two millennia, until Nicolaus Copernicus (1473 – 1543) developed a model of the world in which the planets revolve not around the Earth, but around the Sun. Copernicus' model, presented in the treatise "De revolutionibus orbium coelestium" ("On the Revolutions of the Heavenly Spheres"), was less accurate, but significantly simpler than the model of Claudius Ptolemy's "Almagest" (from Arabic الكتاب المجسطي – Great Construction, 127 – 151 AD), which was based on Aristotle's cosmology.

The Catholic Church, headed by the Curia Romana, treated the innovations of the Catholic Copernicus with cautious interest, and was ready to accept them as one of the hypotheses suitable for simplified calculations. However, many clerics considered the teaching of Copernicus to be contrary to the Holy Scripture, since it is said (Joshua 10:12): "Sun, stand still over Gibeon, and you, moon, over the Valley of Aijalon." Martin Luther (1483 – 1546) also criticized Copernicus for distorting the Bible when he proposed a heliocentric planetary system. As a result, the case of the World System acquired a political character.

The situation became even more acute when Galileo Galilei (1564 – 1642) improved the telescope and observed the rotation (or rather phases) of satellites around Jupiter, craters on the Moon and spots on the Sun. Aristotle’s teachings, and with them the “Summas” of Thomas Aquinas (1225 – 1274), were shaken, since it turned out that not all celestial bodies are ideal and not all planets move around the Earth. However, Galileo did not have convincing evidence that the Earth revolves around the Sun, so he was forced to renounce the teachings of Copernicus before the Inquisition in 1633.

The opinion of European intellectuals changed radically only after the publication of Newton's «Philosophiæ Naturalis Principia Mathematica» (Mathematical Principles of Natural Philosophy) in 1687, since according to the law of universal gravitation published in the Principles, the Sun (with a large mass) revolves around a common center of mass with the Earth (with a small mass) in an orbit with a radius significantly smaller than the radius of the Earth's orbit. Now we understand that there is no fundamental difference between the geocentric and heliocentric systems, since everything depends on the convenience

of choosing a point and a frame of reference. In some problems, it is convenient to choose a frame of reference associated with the Sun, and in other problems it is much more economical to associate the frame of reference with the Earth. At the same time, the laws of physics are formulated in such a way that they do not depend on the choice of a frame of reference.
David Reid's note: –"Galileo was aware of the fact that different reference systems would be possible to describe the same phenomenon; he pointed this out in his «Dialogo sopra i due massimi sistemi del mondo». The work is not so much a thesis supporting the Copernican system as refuting several incorrect «proofs» that the supporters of the Ptolemaic system were presenting. The three fictional characters, Salviati, Sagredo and Simplicio, talk a lot about the tides, but about a number of other topics not directly related to astronomy. That is, Galileo was less interested in presenting the Copernican theory in the book than presenting his ideas of scientific reasoning. So while the implied support for the Copernican system in itself angered some in the Church, many others were more angered by the fact that Galileo was pointing out that the Church had not come up with any good scholarly arguments for their position".

In addition, Galileo performed a number of experiments with bodies of different sizes and weights (in particular, he rolled balls down an inclined plane). The result was contrary to Aristotle's assertions. He established that in the case where air resistance can be neglected, all bodies, regardless of their weight and size, fall to the ground according to the same law $s = 4{,}9t^{\,2}$, where *s* is the path of a body's free fall to the ground during a duration *t*.

However, Galileo based his reasoning on the teachings of St. Augustine on the Divine perfection of nature rather than on the results of the experiment. Galileo was convinced that the simplest movements are realized in nature. In particular, he assumed that the increase in the speed of a falling body occurs over time by the same amount. Galileo wrote in his [Discorsi e dimostrazioni matematiche intorno a due nuove scienze,1638]: – "When a stone, brought out of a state of rest and falling from a considerable height, acquires a new and new increase in speed, should I not think that such an increase occurs in the simplest and clearest form for everyone? If we look closely at the matter, we will find that there is no increase simpler than that which always occurs uniformly…". Galileo expressed the uniformity of the increase in speed v(t) of a falling stone through the proportion [11] $v(t_1){:}\,v(t_2) = t_1{:}\,t_2$, or $\frac{v(t_1)}{t_1} = \frac{v(t_2)}{t_2}$ where time *t* is measured from the beginning of the free fall of the body.

*Most likely, Galileo did not throw stones from the Leaning Tower of Pisa, since this experiment is not described in any of his works. His student Vincenzo Viviani wrote about it. Perhaps Galileo saw others doing this in his youth and/or planned to perform such measurements with his students. But another coincidence is striking. Next to the Leaning Tower of Pisa, in the Piazza dei Miracoli (Square of Miracles), stands the Pisa Cathedral of the Blessed Virgin Mary. Under the dome of this basilica there is a huge fresco of Jesus Christ the **Galilean**. From this "Square of Miracles" began modern science, which was created by the Christian universities of Europe.*

Galileo's discoveries were an important addition to the modified Aristotelianism of Albertus Magnus (c.1200 – 1280) and Thomas Aquinas (1225 – 1274), and Galileo's trial by the Inquisition stirred the mind of René Descartes.

René Descartes (1596 – 1650), a younger contemporary of Galileo Galilei, set himself the task of rationalizing physics along the lines of Euclidean geometry. Rationalization meant that physics should proceed from a small number of obvious axioms, on which a sequence of conclusions based on the Aristotle's logic [12].

Descartes and Galileo both accepted the deductive method of the ancient Greeks, but motivated it differently. They accepted that in explaining nature, reason must proceed from general propositions (axioms), but Descartes believed that reason must find general propositions within itself, while Galileo thought that reason could develop them on the basis of experimental observations.
Descartes based his opinion on the fact that our observations are imperfect: our senses are only capable of misleading us, the fog of which can only be dispelled by our reason. Only that which our reason perceives as something absolutely clear and certain can be true. Such clear and certain thoughts for the mind seemed to Descartes to be the idea of G-D (SUPREME REASON) and the idea of one's own existence: «*Cogito ergo sum*» ("I think, therefore I exist") [12].

Galileo, in defense of his beliefs, gave the following argument: "To assert that reason itself contains knowledge of Nature means to believe that G-D First Created the human brain, into which He put this Knowledge, and only then Created the Universe in exact accordance with this human Knowledge. Is this really how the Creation of the World took place? To assert something like this means to place man at the center of the Universe or, at least, to introduce a completely unprovable anthropological principle: only that which man is capable of knowing exists."

Lurianic Kabbalah asserts precisely what Galileo could not agree with. The ancient Jewish tradition contains the Teaching that the MOST HIGH first Created Consciousness (i.e. Ratzon of the level of Keter – the Crown of Desire) – Adam Kadmon de Keter (Eternal Man). Then the MOST HIGH Clothed Him with all the lower levels of the Universe, and Breathed into Him the Spirit of LIFE.

Galileo and Descartes are the origins of two different traditions of interpreting the speculations of the ancient Greeks. Descartes, like Kepler, believed that physics must necessarily and always seek the causes of phenomena. This literally corresponded to Aristotle's understanding of the meaning of physical knowledge. Galileo believed that the goal of physics was not so much a causal explanation as a mathematical (model) description of the phenomena of Nature.

According to Descartes, physics should seek an answer to the question of why phenomena occur; in this he followed Aristotle, while according to Galileo, it is important to know only how they occur.

Descartes did not accept Galileo's teaching on gravity and his law of falling bodies. The very concept of acceleration of bodies was alien to Descartes' kinematics. He saw the cause of change in motion only in the direct contact of bodies: the non-contact effect of one body on another was difficult to recognize as a material cause of change in motion [12].

The recognition of non-contact actions seemed to Descartes a return to occultism and medieval scholasticism, and in this fight against mysticism he was later supported by Huygens and Leibniz. Indeed, in order for body *A* to attract body *B* at a distance, it is necessary for it to know where body B is. How can an inanimate body "recognize"? And recognize through absolute emptiness [12].

If non-contact forces do not exist at all, then interaction cannot be transmitted through emptiness. The denial of non-contact forces thus led Descartes to the denial of emptiness. How did he understand space?

Descartes recognized two fundamental substances: "Extension" and "Consciousness", fundamentally separated from each other. The world of Consciousness is immaterial and non-spatial, it is the world of ideas, with its own logical causality, in which the First Cause is G-D. On the way to finding the final causes, Descartes founded his so-called ontological proof of the Existence of G-D.

Within the framework of Lurianic Kabbalah, THINKING and all levels of Being are inseparable. Constant changes of each local area of Natural extension are the manifested stage of the most complex, multi-level Thought Process of the Single Creative PRINCIPLE of Being. The Thought of G-D is formed into the Word, which is clothed in worlds, but EIN SOF HIMSELF, Baruch (INFINITE, Blessed be He) is outside the created worlds. Baruch Spinoza criticized Descartes for dualism in relation to Thinking and Space. Spinoza, following the Jewish tradition, believed that Thinking and Space are attributes of the SINGLE SUBSTANCE (G-D).

Another natural causality takes place in the world of extensions, for which Descartes created his doctrine of motion and gravity. Descartes proves the very existence of the external physical world, i.e. the world of things, by deducing it from the substance of extension: bodies exist because they have extension. Everything that is extended is material: this was another justification for the Cartesian thesis that space cannot be empty. Then, obviously, it is always and everywhere filled with something. With what? "Subtle matter," answered Descartes. What is it?

By pumping air out of a glass vessel, we achieve less and less density of air in it. But even having pumped out all the air, we will not be able to "pump out" Descartes' subtle matter [20]. Not without reason it was also called the plenum (all-filling). Its presence cannot be eliminated, because it is an attribute of space. It would be better to say: space cannot exist without this subtle matter, although we can neither see nor feel it. It is not subject to our influence, because it does not possess any physical properties except for the properties of extension and movement. Not subject to influence, subtle matter itself has actions: light, heat and gravity.

Weight (gravity), according to Descartes, is a property of the movement of subtle matter (fluids) [20]. According to Descartes, this same subtle-material (fluid) environment carries planets around the Sun, like ships floating in a giant whirlpool of a fluid sea (see Figure 2). The satellites of the planets move thanks to smaller fluid vortices surrounding these planets [12].

Fig. 2. Illustration of Descartes' views on the fascination of planets with a subtle-material (fluid) medium rotating around a star

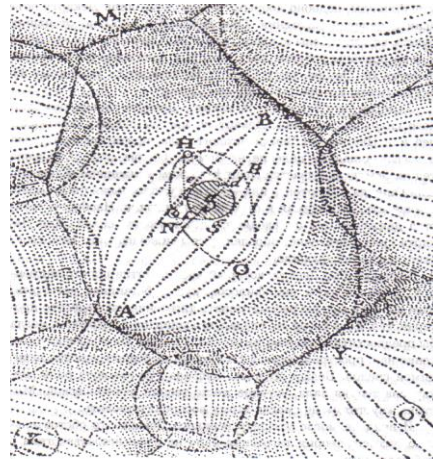


Fig. 3. Vortexes of subtle matter according to Descartes. The Solar System is in the center (Oeuvres de Descartrs, v. IX)

The Cartesian Universe is a gigantic set of vortices of subtle matter (fluids), which G-D has endowed with continuous movement (see Figure 3).

As for gravity, Descartes saw its cause in the pressure gradient exerted by subtle matter ("fluids") on bodies located near the surface of the planet. That is, according to Descartes, bodies fall to the Earth because they are pushed towards It by the smallest invisible particles of subtle matter (fluids). "If Galileo had known this," Descartes once said, "then he would not have needed to construct a groundless theory of the fall of bodies in a vacuum" [12].

The ideas of flows and vortices of fluids created by Descartes dominated physics throughout the 18th and partly in the 19th century. Galileo-Newton's theory of gravitation, which lacked a subtle-material mediator, was taken into account only a century and a half after its creation. In 1740, the Paris Academy awarded a prize for solving the problem of the ebb and flow of the tides to the Cartesian abbot Cavalieri and the Newtonians D. Bernoulli, L. Euler and K. Maclaurin [12].

Newton's theory of gravitation won not because, or not only because, it explained the facts better. With it, a new worldview won, a sequence of speculative principles that rejected any possibility of Otherworldly Influence.

Descartes' fluid views, based on the reunification of the Spiritual and material Principles, fell, giving way to the puritanical stinginess of Newton's geometry of the motion of the luminaries. Even religious awe of the mysticism of "emptiness" could not prevent this. But the path outlined by Thales (Thales' "Water" substrate), Heraclitus (Heraclitus' "Fire" substrate), Aristotle (Aristotle's "Yule" substrate) and continued by Descartes, helps our mind to perceive the incredibly complex interweaving of the illusory fabric of nature as a predicate of extended Being.

Modern science is quite clearly aware that there is not a single reliable experiment that can confirm the existence of fluids, amers, ether, phlogiston, subcont or any other manifestations of subtle materiality – all of them are only auxiliary agents intended to visualize our ideas about the extension of the surrounding Reality. Therefore, one should always remember the warning of Ernst Mach [13]: "We must not consider as the foundations of the real world those intellectual auxiliary means that we use to stage the world on the stage of our thinking."

Almost in parallel with Galileo, Johannes Kepler (1571 – 1630) in Prague for several years carefully studied the fairly accurate long-term observations of Tycho Brahe on the stars and planets. As a result, in 1609, Kepler formulated three laws in his book "New Astronomy": 1) The orbit of the planet Mars is an ellipse, in one of the two focuses of which is the Sun; 2) A straight line segment connecting the planet Mars and the Sun intersects equal areas in equal intervals of time. 3) The square of the period of revolution of the planet Mars around its axis is proportional to the cube of the length of the semi-major axis of its orbit.

Later it turned out that Kepler's laws apply not only to Mars, but also to other observable planets. This achievement of the human mind made a great impression on the supporters of the Copernican model of the Solar System and on Isaac Newton (1642 – 1727), who turned the next page in the study of gravity. Legend has it that an apple that fell on Newton's head gave him the idea that the same force that makes objects fall also holds the Moon in the Earth's orbit. Developing this idea, Newton formulated the law of universal gravitation in the "Mathematical Principles of Natural Philosophy": – "The force with which two bodies are attracted is proportional to the product of their masses and inversely proportional to the square of the distance between them." It turned out that this simple statement generalized the achievements of Copernicus, Galileo and Kepler.

Newton's followers presented an elegant and laconic law of universal gravitation in the form of the following compact formula, which contains practically all of celestial mechanics:

$$F = G\frac{mM}{r^2}, \tag{1}$$

where M is the mass of the Planet; m is the mass of the body falling onto the surface of the Planet; r is the distance between the centers of mass of the gravitating (i.e. attracted) bodies; G is the gravitational constant (G = 6.6720 $\cdot 10^{-11}$ N$\cdot$m^2/kg^2).

In the elegant and laconic formula (1) all three of Newton's laws are latently present. According to the first law, in a frame of reference moving without acceleration (i.e. in an inertial frame of reference), any body maintains a state of rest or rectilinear and uniform motion (*this contradicts the position of Aristotelian physics, which states that a constant effect of force is required to maintain the motion of a body*). Therefore, in post-Newtonian physics, if a body moves with acceleration, it means that a force is acting on it. An object moving along a curved trajectory experiences acceleration, therefore in Newton's celestial mechanics, for example, planets revolving around the Sun are affected by a force called gravity. According to Newton's second law, the greater the inertia of a body (i.e. resistance to change in magnitude or direction of its velocity) - essentially "mass" - the less its acceleration with the same applied force. The third law of reaction states that interacting bodies exert equal but opposite forces on each other. Therefore, in a system of two gravitating bodies, each experiences an acceleration inversely proportional to its mass. A point distant from each of the two gravitating celestial bodies inversely proportional to their mass moves without acceleration and is called the center of mass of the system. If one body is twice as massive as the other, it moves twice as close to the center of mass as its partner.

The definition of gravitational force in the form of the law of universal gravitation (1) made it possible to describe the behavior of celestial bodies in the Solar system with high accuracy, but the reason for the existence of this force remained outside the framework of Newtonian celestial mechanics.

Outside the concepts of Supreme Love and Just Judgment, the phenomena of this World have no explanation. Sir Isaac Newton stated this when he was forced to admit: - "Until now I have explained the phenomena of the heavens and the tides of our seas on the basis of the force of gravity, but I have not indicated the cause of gravity itself... The cause of the properties of the force of gravity I have not yet been able to deduce from the phenomena; and I do not invent hypotheses... It is enough that gravity actually exists and acts according to the laws we have set forth."

In 1749, Georges-Louis Le Sage (1724 – 1803) proposed the following explanation for the phenomenon of attraction between two material bodies. He assumed that space is filled with tiny particles (but these are not Descartes' fluids). These particles have a very long path length in matter and can pass through material bodies, being absorbed by them only partially. These particles were called lesagens. As a result of the absorption of part of the lesagens, their momentum is transferred to the bodies. Since the concentration of lesagens on the outside of the bodies is greater than between them (see Figure 4), the bodies are pushed towards each other by the external pressure of the lesagens. In this case, just as in Newton's law of universal gravitation (1), the attraction of bodies under the action of lesagens is inversely proportional to the square of the distance between these bodies.

Le Sage's hypothesis has received some experimental confirmation, for example, two ships moving on opposite or parallel courses are attracted to each other, since the water pressure on the sides of these ships from the outside is greater than between them.

However, Henri Poincaré (1854 – 1912) subjected Le Sage's hypothesis to devastating criticism. He claimed that if lesagens really existed, the following phenomena should be observed: 1) Moving bodies should slow down in Lesage's gas, due to the resistance to the movement of the oncoming flow of this gas. But such a slowdown is not observed, otherwise all the planets would have fallen into the Sun long ago; 2) When absorbing lesagens, they should transfer their kinetic energy to bodies. In this case, the surface of, for example, the Earth should be uniformly heated to a very high temperature, whereas in reality it is not the crust of our planet that has a high temperature, but its interior.

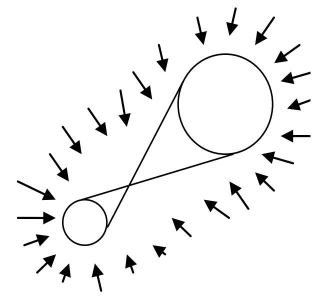


Fig. 4. The flow of lesagens from the outside of the bodies attracts them to each other

Poincaré's criticism noticeably reduced the interest of the scientific community in Le Sage's hypothesis. Moreover, at the turn of the 19th and 20th centuries, particles with the properties of lesagens had not yet been discovered. Modern physics is confident that the entire Universe is permeated with neutrino flows, which has allowed some scientists to return to Le Sage's ideas. The hypothesis that neutrinos can play the role of lesagens may well be applicable to explaining the mutual approach of small bodies. But it is clearly not suitable for explaining the attraction of stars and planets. Neutrinos interact too weakly with matter to be able to explain the retention of planets in the orbit of a star using their flows.

Mathematical approaches based on the principle of Cartesian's "short-range" in the 15^{th} – 18^{th} centuries did not lead to the identification of the nature of a number of observed mechanical phenomena, including gravity. Therefore, scientists from Germany and Austria-Hungary expressed their intention to continue the line of Galileo-Newton and put forward the idea of "action at a distance", according to which inertia and gravity (i.e., gravity between bodies) are explained as the result of myriads of specific acts of mutual relations of all the masses of the Universe with each point of the body under study. Within the framework of such a relational approach, not only gravity is explained, but also all-natural phenomena in general. The relational concept considers space and time not as special entities independent of matter, but as forms of existence of things and without these things themselves non-existent. In the relational concept (from the Latin relatio - relationship), space is the order of mutual arrangement of material objects, and time is the sequence of their changes. The supporters of the relational concept were Leibniz (1646 –1716) and Hegel (1770 –1831).

The development of relational views was continued by Ernst Mach (Mach, Ernst 1838 – 1916). In his work «Die Mechanik in ihrer Entwickelung: historisch-kritisch dargestellt, 1883» Mach suggested that the reason for the existence of inertial reference systems is the presence of distant cosmic masses, i.e. the inertial properties of each physical body are determined by all other physical bodies in the Universe and depend on their location. According to Mach, the removal of all massive bodies ceases to exist space and time. This principle of the relativity of Mach's inertia allows for the instantaneous transfer of action over a distance (i.e. long-range action), which contradicted Einstein's STR and GTR, where the speed of action transfer does not exceed the speed of light in a vacuum. Moreover, in STR and GTR, in empty space, all bodies have inertia, regardless of the presence or absence of other bodies.

The relational concept continues to be developed by a number of modern scientific centers [15, 16]. However, most physicists are skeptical about this line of research, not only because of the complexity of the mathematical problems behind this hypothesis, but also because the transmission of all interactions known to science (including gravitational ones) occurs at a finite speed, not exceeding the speed of light. Relationists have something to object to. But this does not solve the entire complex of difficulties in this concept, and some of the relationists' conclusions do not stand up to experimental verification.
Georg Friedrich Bernhard Riemann (1826 – 1866) in his work "Fragments of Philosophical Content" [17], published in 1876, expressed the following idea: – "I try to explain the acceleration force (i.e. gravity) existing at each point in space, determined in magnitude and direction, by the movement of a certain substance filling all of infinite space, namely, I assume that the direction of its movement coincides with the direction of the acceleration force (free fall), and its speed is proportional to the magnitude of the acceleration force. This substance can be imagined as physical space, the points of which move in geometric space. Based on this assumption, all effects of ponderable bodies on ponderable bodies are transmitted in empty space by

means of the said substance. … The further development of this hypothesis falls into two parts: 1) the study of the laws of motion of the substance, which make it possible to explain the phenomena; 2) the study of the causes that explain the very emergence of this motion.” With this statement, Bernhard Riemann drew attention to the fact that weighty bodies behave in the gravitational field of the planet in exactly the same way as solid objects float in an accelerated flow of water. For example, a large log and a small piece of wood move in a river with the same acceleration, coinciding with the acceleration of the water itself. Like a water flow, Riemann's invisible substance (a kind of ether or Descartes' fluids), directed toward the center of the Earth, carries away everything that it encounters on its way and presses it against the solid surface of the planet.

Riemann's hypothesis finds an echo in the ancient Jewish Kabbalah. In the Zog'ar it is written about gravity: –"Just do not think that it is the shedim (demons) in hell who pull the fabric of space onto themselves."

Riemann's idea, however, has one significant drawback: –"If some subtle substance (i.e. ether or fluids) constantly flows in huge quantities from space to the core of the planet, then where does it end up?" All our physical experience, brought up on the study of exchange processes and conservation laws, rebels against the idea that the depths of stars and planets can be endless reservoirs of subtle substance. In addition, with the constant flow of subtle substance into the depths of a huge number of stars and planets, this substance must eventually disappear from space, which must inevitably manifest itself in the form of some physical consequences.

In modern physics, there are theoretical constructs that develop Riemann's hypothesis. Some researchers believe that the vacuum flowing into the depths of planets flows out into the Anti-Universe or, moving along the so-called "wormhole", ends up in another place in our Universe. The problem, however, is that we do not observe these wormholes. Other scientists believe that the vacuum flowing from space is used to heat the depths of stars and planets and to form material particles, as a result of which the sizes of stars and planets should constantly increase. These ideas have not yet received reliable experimental confirmation, and therefore have not caused any noticeable enthusiasm in broad scientific circles.

There are modern ether theories that are closer to the views of Descartes, for example, in the scalar ether theory [18] the force of gravitational attraction is considered as the Archimedes pull due to the pressure gradient in the liquid compressible ether, which is placed against the background of the solid Lorentz-Poincaré macro-ether [19, 20], which plays the role of a universal inertial frame of reference.

Albert Einstein's model ideas regarding the nature of gravity unexpectedly acquired a completely different logical continuation. Einstein also believed that material bodies in a gravitational field move with acceleration in the same way as the accelerated flow of a river carries all bodies on the surface of the water regardless of their size and mass. But these bodies behave in exactly the same way in a local region of space moving with acceleration. Einstein noted that if a person is in a closed space, for example, in an elevator, then it makes no difference what presses him and all the objects around him to the elevator floor: the gravitational field or the upward movement of the elevator with acceleration. In other words, Einstein assumed that each arbitrarily small region of the gravitational field can be assigned a local accelerated frame of reference (the equivalence principle). If the inertial and gravitational masses of a material body are equal, then its behavior in the accelerated frame of reference turns out to be completely identical to its behavior in the gravitational field.

In fairness, it should be noted that according to Newton's celestial mechanics, Aristotle is right, not Galileo. Indeed, from Newton's second and third laws it follows that with what force F_b a planet with mass M acts on a body with mass m, with the same but opposite force F_P the body acts on the planet

$$F_b = ma_b = G\frac{mM}{r^2}, \quad F_P = Ma_p = G\frac{mM}{r^2}, \quad F_b = -F_P, \tag{2}$$

where a_b is the acceleration of the body, a_p is the acceleration of the planet.
From Eqs. (2) it follows that, according to Newton, the planet and the body move towards each other with accelerations

$$a_b = G\frac{M}{r^2} \quad and \quad a_p = -G\frac{m}{r^2}.$$

This means that bodies with different masses m should approach the planet differently, this corresponds to the teachings of Aristotle and contradicts Einstein's equivalence principle. However, perhaps in this problem, something is wrong with

Newton's laws. That is, small bodies, apparently, do not attract the planet, but are simply carried away by the substrate flowing to its core.

The development of ideas based on the principle of equivalence of inertial and gravitational masses led Einstein to create the general theory of relativity (GTR), within the framework of which gravity is explained by the curvature of the 4-dimensional space-time continuum around massive material bodies. That is, small bodies simply fall into a space-time funnel. In this case, the force of gravitational attraction is interpreted as the force of inertia.

Einstein's four-dimensional space-time views on gravity turned out to be devoid of the shortcomings of Riemann's hypothesis about the confluence of some substance to the center of the planet. Einstein's space-time continuum, curved around a material body, is stationary (i.e. does not depend on time). In this case, there is no need to introduce into consideration some unobservable substance (i.e. ether, which could not be detected in the Michelson-Morley experiments), and there is no need to explain where this substance continuously flows.

Einstein's elegant explanation of the cause of gravity by introducing the concept of curved space-time is amazing in its originality, but at the cost of being completely divorced from reality. The fact is that the space-time continuum is a purely mental (speculative) construction. Humanity does not have a single device that measures real time as a manifestation of our sensation of the duration of Being. We only have frequency standards that emit pulses with a fairly constant period. But this period depends on the interaction of the frequency standard with the surrounding vacuum, which is in one state or another (rest or accelerated motion). In other words, we do not measure the duration of real being in any way, we only synchronize our sensation of duration with the radiation frequency corresponding to the transition between two hyperfine levels of the ground state of the cesium-133 atom [XIII CGPM (1967), Resolution 1].

Uniformly and rectilinearly flowing time (from the past, through the present, into the future) is an invention of artisans and philosophers of the new era to serve utilitarian technologies. Religious time is associated with the Male (Solar) and Female (Lunar) cycles. Timely worship contributes to the loving Union of the Male and Female Principles of the Universe, without which Fertility and Abundance are impossible. Religious time is uneven, for example, in Judaism (and partly in Christianity) the time from sunrise to sunset is divided into 12 parts (4 watches of the day × 3 = 12) and the time from sunset to sunrise is divided into 12 parts (4 watches of the night × 3 = 12). Each of the 12 + 12 = 24 parts (religious hours) is divided into 1080 halakim (religious seconds). There are never identical religious hours and halakim (seconds), because the day is never divided into day and night equally due to the complex rotation of the Earth around the Sun with precession and nutations of its axis due to the influence of the Moon and other planets. In other words, the duration of halakim (religious seconds) is never repeated. Each helek (elementary segment of the duration of Genesis) is unique. 1080 is a number that is divisible without a remainder by all digits from 1 to 9 except 7 (Shabbat).

Religious time

It is also impossible to measure the distance between two points in a curved space. Ordinary rulers consisting of atoms and molecules, in principle, cannot measure distances in the curved extension of existence due to internal physical and chemical bonds. Measuring distances with light rays also encounters insurmountable difficulties. We do not know how to measure the path traveled by a light beam between two points of vacuum (i.e. empty space), since this requires absolutely precise synchronization of clocks at these points, which is practically impossible. The radar method of measuring distance by determining the time between the emission of an electromagnetic signal and the reception of the reflected signal encounters many other technical difficulties, starting with the collapse of the fronts of the emitted pulses, instability of the clock generator, the width of the eikonal of the emitted and reflected signals, and questions of the constancy of the speed of light in a vacuum (today, the absolute basic error in measuring the speed of light in a vacuum is approximately 1 m/s, which does not allow us to assert that the speed of light is an unchanging world constant). In other words, the errors of the modern radar method of determining the distance between two points in space practically do not allow us to recognize: is this space curved or not? That is, the measured value is beyond the sensitivity of our measuring instruments.

Thus, Einstein's curved space-time continuum is a purely mental construct. If we rely on empiricism in our judgments about the surrounding reality, then our ideas (illusions) about the curved 4-dimensional space-time cannot in any way be considered the cause of gravity. Inertial and non-inertial reference systems are a figment of our imagination. Therefore, the inertial forces that arise in non-inertial reference systems are illusory. If the inertial force manifests itself in the real world, it is only because the mathematical model, i.e. the non-inertial reference system, to some extent superficially reflects the physical properties of the real process. For example, the steepness of the right banks of rivers flowing in the northern hemisphere from north to south (Beer's law) is, on the one hand, explained by the Coriolis force and friction according to Einstein's general theory of relativity, and on the other hand, by the usual collision of the flow of water with the rotating Earth running onto it.

Many thinkers have spoken about the illusory nature of space and time. For example, in the philosophy of Immanuel Kant, space and time are a priori forms of sensory contemplation, that is, an internal form brought into the world by an observer. According to his point of view, space and time are not inherent in things themselves, but exist only in the consciousness of the cognizing subject. George Berkeley and Ernst Mach believed that space and time are forms of ordered series of sensations. Karl Pearson believed that space and time do not have a real existence, but are only a subjective way of perceiving things. The encyclopedic thinker Alexander Bogdanov said that space and time are products of organizing and harmonizing human thought.

Much has been said in modern scientific literature about the physical, mathematical and methodological problems of GTR. These problems are partly considered in the Introduction to the article [5]. But the most important thing is that GTR does not explain the nature of gravity. Just as Newton does not answer the question: "How does a material body (in particular, a planet) create around itself a force of attraction for other material bodies?", so Einstein did not answer the question: "How does a material body (in particular, a planet) create around itself a curved space-time continuum?" That is, Einstein's hypothesis about the curvature of space-time around massive bodies made the mathematical model of the phenomenon under study amazing and refined the calculations in a number of problems, but fundamentally nothing changed in relation to the understanding of the nature of gravity.

With all the amazing beauty of the mathematical apparatus of GTR, it surprisingly did not bring anything noticeably new to the technological equipment of human civilization (perhaps this duality was the reason why the Nobel Prize was not awarded for GTR). In addition to refining the shift of Mercury's perihelion, corrections to explaining the delay of a radar echo, corrections to the description of the orbital gyroscopic effect, predicting the existence of gravitational waves and black holes, GTR has not found any other more worthy practical application. For example, it is believed that Einstein's GTR and STR are used in modern global positioning systems (GPS). In fact, these systems take into account an experimentally established correction associated with the fact that the clocks (or rather frequency standards) on board the GPS satellite produce clock pulses with a period decreasing by approximately 38 microseconds per day than similar frequency standards on earth. Another thing is that the reason for this correction is associated with the predictions of the STR and GTR. However, it is practically impossible to calculate this correction with high accuracy, since it is necessary to take into account the change in the speed of movement of GPS satellites and the complex variable influence on them not only of the gravitational field of the Earth, but also of the gravitation from the Sun and the Moon.

If we believe the reference data (the average distance from the Earth to the Moon $r_E \approx 384\ 467$ km, the average distance from the Sun to the Moon $r_S \approx 149\ 984\ 400$ km; the mass of the Earth $M_E \approx 5.9722 \cdot 10^{24}$ kg; the mass of the Sun $M_S \approx 1.9885 \cdot 10^{30}$ kg), then, according to Newton's law of universal gravitation (1), the ratio of the force of attraction of the Moon by the star Sun F_S to the force of attraction of the Moon by planet Earth F_E is approximately equal to $\frac{F_S}{F_E} = \frac{M_S r_E^2}{M_E r_S^2} \approx 6$. That is, according to Newton's celestial mechanics, the Sun should attract the Moon 6 times stronger than the Earth. Why does the Moon remain in the sphere of influence of the Earth and not fly away to the Sun? Something is wrong with our classical ideas. But in any case, not only the Earth, but also the Moon and the Sun should have a noticeable influence on the frequency standards that synchronize the operation of satellite constellations of global positioning systems.

Experts know that the accuracy of navigation systems such as Navstar GPS and GLONASS is increased not by calculating corrections using STR and GTR, but by installing pseudo-satellites on the ground with precise geographic references.

In other words, there is a great imbalance between the beauty of the mathematical apparatus of GTR and the insignificant usefulness of its practical application. It should not be so – a great theory should lead to great technical progress, as was the case, for example, with Newtonian mechanics, Maxwell-Faraday electrodynamics, Boltzmann's molecular-kinetic theory, Bohr-Schrödinger-Heisenberg quantum mechanics, etc. In other words, GTR is the most beautiful theory that humanity has, but at the same time it is the most useless. Apparently, the reason for this is the incompleteness of GTR. But Einstein's GTR contains enormous potential, and when it is revealed through the achievement of the fullness of this direction of human thought, then this will lead to an enormous technical and technological breakthrough, commensurate with the stunning beauty of the mathematics of this theory.

In the author's opinion, achieving the completeness of GTR is associated with four directions of development, which are taken into account in the proposed GVPh&AS:

1) taking into account the metrics of solutions of the GTR equations not with one signature (– + + +) or (+ – – –), but all 16 signatures (32) in [2]

$$\begin{array}{llll} (++++) & (+++-) & (-++-) & (++-+) \\ (---+) & (-+++) & (--++) & (-+-+) \\ (+--+) & (++--) & (+---) & (+-++) \\ (--+-) & (+-+-) & (-+--) & (----); \end{array} \tag{3}$$

2) taking into account not one Λ-term in the Einstein vacuum equation, but an infinite number of Λ_i-terms (see equation (194) in [5] and/or equation (11) in [6])

$$R_{ik} + ½\, g_{ik}\left(\sum_{m=1}^{\infty} \Lambda_m + \sum_{n=1}^{\infty} - \Lambda_n\right) = 0, \tag{4}$$

where $\Lambda_j = 3/r_{aj}^2$ or $-3/r_{aj}^2$, here r_{aj} is the radius of the j-th spherical formation;

3) expansion of the mathematical apparatus from Riemann geometry to the geometry of absolute parallelism, where the curvature of space is compensated by its internal rotations and twists.
4) the mathematics of the modernized GTR becomes so complex that it goes beyond the computational capabilities of a person, therefore the task of training Artificial Intelligence is set.

Another serious problem with GTR is that this theory at its core (with the introduction of the right-hand matter part of the Einstein-Hilbert equation) departed from the fundamental program of complete geometrization of physics. William Clifford in his work "On the space theory of matter" (1870) put forward the hypothesis that matter and all force fields, including gravity, are manifestations of various curvatures and deformations of space-time. By particles of matter Clifford meant local hill-shaped curvatures of 3-dimensional space, which continuously move like solitons. In the 20th century, this line of thought was developed in the Clifford-Klein theory of spaces. In GTR, Einstein associated only the forces of gravity with the curvature of space-time, while the ideas about massive particles and the electromagnetic field remained the same, i.e., as they were formulated by Newton and Maxwell. Numerous attempts to geometrize the right-hand side of the Einstein-Hilbert equation, undertaken by Einstein himself and many of his associates and followers, were unsuccessful. In the end, this came down to a return to the classical physics of the 19th century, but in the curved 4-dimensional Riemann space and to the development of relativistic quantum mechanics.

Currently, the nature of gravity is being attempted to be understood by theorists developing the "string" program. Within the framework of superstring theory, it is possible to describe a quantum object with spin 2, which is considered a mathematical model of the graviton – the carrier of gravitational interaction. But the answer to the question: – "How does this help in understanding the causes of universal gravitation?" – remains hidden behind the veil of mathematical fog of "string" theories.

There are many modifications of Einstein's GTR. The following have been developed: Riemann-Cartan-Schotten torsion geometry, Einstein-Weyl geometry, Weitzenbeck-Vitali-Shipov absolute parallelism geometry [21], Newman-Penrose isotropic tetrad method, Rosen bimetric geometry, complex Riemannian geometry, Finsler geometry, etc. Many alternative theories of gravity have emerged: scalar theories, vector theories, bimetric theories, quasilinear theories, Hellings and Nordvedt theory, Hornsdesky's gravity models, Randall-Sundrum models of gravity, Starobinsky's gravity model, loop quantum gravity model, Gauss-Bonnet gravity model, conformal gravity, nonmetric theories such as Moffat's gravity theory, Logunov's relativistic theory of gravity (RTG), nonmetric theories such as Einstein-Cartan theory, scalar-tensor theories such as Jordan-Brans-Dicke theory, etc. However, none of these theories reveals the nature of gravity, but only introduces additional parameters into GTR with the Λ-term to take into account various effects observed in experiments.

For example, a number of problems that arose in GTR (especially the violation of the law of conservation of energy) were attempted to be resolved by A. A. Logunov and a group of employees of Moscow State University during the development of the Relativistic Theory of Gravity (RTG) [22, 23, 24]. RTG is based on the representation of gravity as a tensor physical field in Minkowski space. According to the supporters of this direction of research, RTG has the following differences from GTR [24]: gravity is not the result of the curvature of a 4-dimensional Riemannian space, but a force field in the spirit of Faraday-Maxwell, described by a symmetric tensor against the background of a flat Minkowski space, in which, under certain conditions, the laws of conservation of energy-momentum and angular momentum are satisfied. However, the solution of problems in RTG is conditioned by the introduction of additional conditions, for example, in the tensor equations for determining the metric, the mass of the graviton should be taken into account, and gauge conditions associated with the metric of Minkowski space should be used. The authors of RTG claim [22,23,24] that these conditions do not allow the gravitational field to be destroyed even in a small region of space by choosing an appropriate local inertial frame of reference. In addition, RTG requires that the causal cones of local Riemannian spaces remain everywhere inside the causal cones of Minkowski space. Complications did not lead to radical changes, for example, just as in GTR, in RTG matter is understood as all forms of matter (including the electromagnetic field), with the exception of the gravitational field itself. In other words, issues related to the geometrization of matter, electromagnetic, weak and nuclear force fields remained outside the scope of RTG. In addition, the massive graviton used in RTG leads any system to instability, whereas when the graviton mass goes to zero, RTG does not give the correct Newtonian limit [25,26,27,28].

The model ideas about the nature of gravity proposed in this article also rely on a modification of the General Relativity, which is based on the extended third vacuum equation of Einstein with an infinite number of Λ_i-terms (194) in [5]

$$R_{ik} - \frac{1}{2}Rg_{ik} + \Lambda_1 g_{ik} + \Lambda_2 g_{ik} + \Lambda_3 g_{ik} + \ldots + \Lambda_\infty g_{ik} = 0. \quad (5)$$

Attempts to solve this equation in the article [6] led to the creation of a hierarchical cosmological model, within the framework of which an infinite number of stable spherical vacuum formations (called "corpuscles") are located inside a closed Universe, which are nested inside each other like Russian dolls (see Figures 1 and 10 in [6]). However, the radii of the cores of these spherical vacuum formations

$$r_i = \sqrt{\frac{3}{\Lambda_i}} \quad (6)$$

are not arbitrary, but are subject to the discrete hierarchy (44a) in [6]:

$r_1 \sim 10^{39}$ cm is radius commensurate with the radius of the mega-Universe core; (7)
$r_2 \sim 10^{29}$ cm is radius commensurate with the radius of the observable Universe core;
$r_3 \sim 10^{19}$ cm is radius commensurate with the radius of the galactic core;
$r_4 \sim 10^{7}$ cm is radius commensurate with the radius of the core of a planet or star;
$r_5 \sim 10^{-3}$ cm is radius commensurate with the radius of a biological cell;
$r_6 \sim 10^{-13}$ cm is radius commensurate with the radius of an elementary particle core;
$r_7 \sim 10^{-24}$ cm is radius commensurate with the radius of a proto-quark core;
$r_8 \sim 10^{-34}$ cm is radius commensurate with the radius of a plankton core;
$r_9 \sim 10^{-45}$ cm is radius commensurate with the radius of the proto-plankton core;
$r_{10} \sim 10^{-55}$ cm is radius commensurate with the size of the instanton core.

In §4 of the article [6] and in the articles [7,8,9] the level of elementary "particles", "atoms" and "molecules", i.e. stable spherical $\lambda_{-12,-15}$-vacuum formations ("corpuscles") with characteristic sizes of core of the order of $r_6 \sim 10^{-13} - 10^{-9}$ cm from the hierarchy (7) was considered in detail. At the same time, a surprising coincidence of the metric-dynamic models of "particles" with the elements of the Standard Model of elementary particles was shown.

In the article [10], metric-dynamic models of naked "planets" and "stars" were proposed, i.e. stable spherical vacuum formations (macro-"corpuscles") with characteristic sizes of core of the order of $r_4 \sim 10^7 – 10^9$ cm. The concept of naked "planets" and "stars" implies the description of these stable macroscopic $\lambda_{7,9}$-vacuum formations without the presence of small vacuum curvatures (i.e. mini-, micro-, nano- and picoscopic "particles", "atoms" and "molecules") in the vicinity of their core.

In this article, within the framework of the hierarchical cosmological model [6,7,8,9,10], we try to explain why naked "planets" and "stars" attract small "particles" to their cores. That is, another hypothesis is put forward, claiming to explain the nature of planetary gravity within the framework of the Clifford-Einstein-Wheeler program aimed at the complete geometrization of physics.

Here it is not possible to fully reveal the secret of the phenomenon of planetary gravity, i.e. the model concept of universal gravitation proposed below does not answer all: – "Why?", since in the author's opinion, gravity is a much more complex, psychosomatic phenomenon. Nevertheless, we believe that in this article another step has been made towards solving this amazing mystery of Nature.

It should be noted that the model ideas about the nature of gravity developed here are nothing fundamentally new, but the development and unification of the ideas of Galileo Galilei, René Descartes, Isaac Newton, Gottfried Leibniz, Bernhard Riemann and Albert Einstein, who saw further than others because they stood on the shoulders of giants Abraham Avinu, Moshe Rabbeinu (Moses), Pythagoras, Democritus, Plato, Aristotle, Ptolemy, Archimedes, Euclid, Avicenna, Augustine, Thomas Aquinas, Baruch Spinoza, Francis Bacon, ……

MATERIALS AND METHOD

1 Metric-dynamic model of a stationary (i.e. non-rotating) "planet$_3$" (or "star$_3$")

Within the framework of "Geometrized Vacuum Physics based on the Algebra of Signature" (GVPh&AS), developed in [1,2,3,4,5,6,7,8,9,10] and in this article, the phenomenon of gravity takes place at all levels of the hierarchical cosmological model presented in [6]. However, we will begin with the development of a model representation of gravity at the "stellar" - "planetary" level, since planetary gravity has been studied more thoroughly.

Metric-dynamic models of naked P_k-“stars$_3$” and P_k-“planets$_3$” are considered in the article [10], where it was shown that these electrically neutral stable spherical $\lambda_{6,7}$-vacuum formations consist of a set of planetary P_k-“quarks$_3$” of type (66) in [10] with signatures presented in Table 1 in [10].

Based on the model concepts developed in §§ 3 – 7 of the article [10], the following simplified metric-dynamic model* of a stationary (relative to the $\lambda_{6,7}$-vacuum) valence** naked “planet$_3$” (or “star$_3$”***) is adopted in this article.

In the article [10], the following designations were introduced: naked P_k-“planet3” and naked P_k-“star$_3$”, where P means that the naked “planet” is a stable spherical $\lambda_{6,7}$-vacuum formation consisting of planetary Pi-“quarks$_3$”; the index k means the number of Pi-“quarks$_3$” in the P_k-“planet$_3$” or P_k-“star$_3$”; index 3 – means that P_k-“planet$_3$” or P_k-“star$_3$” is a cell in a chain consisting of only three spherical formations from the hierarchy (7), which are nested inside each other like Russian dolls, in particular, the chain consists of: a mega-Universe with a radius $r_1 \sim 10^{39}$ cm, a naked “planet” or naked “star” with a core radius $r_{10} \sim 10^{-55}$ cm, and an instanton with a core radius $r_{10} \sim 10^{-55}$ cm (see § 5 in [10]).

*In this article, such details about the objects under study will not be required, therefore, to simplify the notations, instead of the terms **naked P_k-"planet$_3$"** and **naked P_k-"star$_3$"**, we will use the abbreviated terms **naked "planet"** and/or **naked "star"**.*

**When forming this metric-dynamic model of a naked "planet" (or "star"), we proceeded from the fact that the set of chaotically mixed colored P_k-"quarks$_3$" (i.e. with different signatures) are redistributed in such a way that in the equilibrium state all possible variants of the curvature of the $\lambda_{6,7}$-vacuum are realized with equal probability, this corresponds to the maximum entropy of this stochastic system.*

***Let’s note that by "valence" we mean the simplest metric-dynamic model of a stable or unstable $\lambda_{m,n}$-vacuum formation ("corpuscle"). A valence "corpuscle" is a kind of supporting framework (or skeleton) of a convex or concave or convex-concave $\lambda_{m,n}$-vacuum formation, on which an infinite number of layers, sub-layers, sub-sub-layers, etc. are put on, which are specified by metrics with different signatures (see § 2.6 in [5] and § 1 in [7]).*

****From the point of view of the model concepts developed here, a naked "star" is a very large naked "planet" consisting of a huge number of P_k-"quarks$_3$". The quantity of P_k-«quarks$_3$» in a naked «star» turns into quality at the next stage of consideration, when the cluster of small «corpuscles» around macroscopic naked stable spherical $\lambda_{6,7}$-vacuum formations of planetary scale is investigated. Within the framework of the concepts developed here, a naked «star» qualitatively differs from a naked «planet» only in that the gravity it creates is so great that "nuclear" reactions are ignited in the vicinity of its core (i.e. in the cluster of small «corpuscles» surrounding the core). In connection with the above, the metric-dynamic model of a macroscopic stable spherical $\lambda_{6,7}$-vacuum formation presented below applies to both a naked «planet» and a naked «star». It is worth noting that in ancient times, wandering stars (from the ancient Greek πλάνης – «wanderer») were also called planets.*

Taking into account the comments made above, the following metric-dynamic model of a "star" or "planet" is proposed:

Valence naked "PLANET$_3$" (or "STAR$_3$") (8)

a resting, stable, on average spherical, electrically neutral, convex-concave multilayered curvature of the $\lambda_{6,7}$-vacuum with an average signature

1/2{(+ – – –) + (– + + +)} = (0 0 0 0), (9)

I The outer shell of the valence, resting, naked "planet$_3$" (or "star$_3$")

in the interval [r_4, r_1] (see Figure 5), with an average signature (0 0 0 0)

I $$ds_1^{(+---)2} = \left(1 - \frac{r_{4p1}}{r} + \frac{r^2}{r_1^2}\right) c^2dt^2 - \frac{dr^2}{\left(1 - \frac{r_{4p1}}{r} + \frac{r^2}{r_1^2}\right)} - r^2(d\theta^2 + \sin^2\theta\, d\phi^2), \qquad (10)$$

H $$ds_2^{(+---)2} = \left(1 + \frac{r_{4p2}}{r} - \frac{r^2}{r_1^2}\right) c^2dt^2 - \frac{dr^2}{\left(1 + \frac{r_{4p2}}{r} - \frac{r^2}{r_1^2}\right)} - r^2(d\theta^2 + \sin^2\theta\, d\phi^2), \qquad (11)$$

V $$ds_3^{(+---)2} = \left(1 - \frac{r_{4p3}}{r} - \frac{r^2}{r_1^2}\right) c^2dt^2 - \frac{dr^2}{\left(1 - \frac{r_{4p3}}{r} - \frac{r^2}{r_1^2}\right)} - r^2(d\theta^2 + \sin^2\theta\, d\phi^2), \qquad (12)$$

H′ $$ds_4^{(+---)2} = \left(1 + \frac{r_{4p4}}{r} + \frac{r^2}{r_1^2}\right) c^2dt^2 - \frac{dr^2}{\left(1 + \frac{r_{4p4}}{r} + \frac{r^2}{r_1^2}\right)} - r^2(d\theta^2 + \sin^2\theta\, d\phi^2), \qquad (13)$$

H′ $$ds_5^{(-+++)2} = -\left(1 - \frac{r_{4p5}}{r} + \frac{r^2}{r_1^2}\right) c^2dt^2 + \frac{dr^2}{\left(1 - \frac{r_{4p5}}{r} + \frac{r^2}{r_1^2}\right)} + r^2(d\theta^2 + \sin^2\theta\, d\phi^2), \qquad (14)$$

H $$ds_6^{(-+++)2} = -\left(1 + \frac{r_{4p6}}{r} - \frac{r^2}{r_1^2}\right) c^2dt^2 + \frac{dr^2}{\left(1 + \frac{r_{4p6}}{r} - \frac{r^2}{r_1^2}\right)} + r^2(d\theta^2 + \sin^2\theta\, d\phi^2), \qquad (15)$$

V $$ds_7^{(-+++)2} = -\left(1 - \frac{r_{4p7}}{r} - \frac{r^2}{r_1^2}\right) c^2dt^2 + \frac{dr^2}{\left(1 - \frac{r_{4p7}}{r} - \frac{r^2}{r_1^2}\right)} + r^2(d\theta^2 + \sin^2\theta\, d\phi^2), \qquad (16)$$

I $$ds_8^{(-+++)2} = -\left(1 + \frac{r_{4p8}}{r} + \frac{r^2}{r_1^2}\right) c^2dt^2 + \frac{dr^2}{\left(1 + \frac{r_{4p8}}{r} + \frac{r^2}{r_1^2}\right)} + r^2(d\theta^2 + \sin^2\theta\, d\phi^2); \qquad (17)$$

H The core of a valence, resting, naked "planet$_3$" (or "star$_3$")

in the interval [r_{10}, r_4] (see Figure 5), with an average signature (0 0 0 0)

I $$ds_9^{(+---)2} = \left(1 - \frac{r_{10}}{r} + \frac{r^2}{r_{4p9}^2}\right) c^2dt^2 - \frac{dr^2}{\left(1 - \frac{r_{10}}{r} + \frac{r^2}{r_{4p9}^2}\right)} - r^2(d\theta^2 + \sin^2\theta\, d\phi^2), \qquad (18)$$

H $$ds_{10}^{(+---)2} = \left(1 + \frac{r_{10}}{r} - \frac{r^2}{r_{4p10}^2}\right) c^2dt^2 - \frac{dr^2}{\left(1 + \frac{r_{10}}{r} - \frac{r^2}{r_{4p10}^2}\right)} - r^2(d\theta^2 + \sin^2\theta\, d\phi^2), \qquad (19)$$

V $$ds_{11}^{(+---)2} = \left(1 - \frac{r_{10}}{r} - \frac{r^2}{r_{4p11}^2}\right) c^2dt^2 - \frac{dr^2}{\left(1 - \frac{r_{10}}{r} - \frac{r^2}{r_{4p11}^2}\right)} - r^2(d\theta^2 + \sin^2\theta\, d\phi^2), \qquad (20)$$

H′ $$ds_{12}^{(+---)2} = \left(1 + \frac{r_{10}}{r} + \frac{r^2}{r_{4p12}^2}\right) c^2dt^2 - \frac{dr^2}{\left(1 + \frac{r_{10}}{r} + \frac{r^2}{r_{4p12}^2}\right)} - r^2(d\theta^2 + \sin^2\theta\, d\phi^2), \qquad (21)$$

H′ $$ds_{13}^{(-+++)2} = -\left(1 - \frac{r_{10}}{r} + \frac{r^2}{r_{4p13}^2}\right)c^2dt^2 + \frac{dr^2}{\left(1 - \frac{r_{10}}{r} + \frac{r^2}{r_{4p13}^2}\right)} + r^2(d\theta^2 + \sin^2\theta\, d\phi^2), \quad (22)$$

V $$ds_{14}^{(-+++)2} = -\left(1 + \frac{r_{10}}{r} - \frac{r^2}{r_{4p14}^2}\right)c^2dt^2 + \frac{dr^2}{\left(1 + \frac{r_{10}}{r} - \frac{r^2}{r_{4p14}^2}\right)} + r^2(d\theta^2 + \sin^2\theta\, d\phi^2), \quad (23)$$

H $$ds_{15}^{(-+++)2} = -\left(1 - \frac{r_{10}}{r} - \frac{r^2}{r_{4p15}^2}\right)c^2dt^2 + \frac{dr^2}{\left(1 - \frac{r_{10}}{r} - \frac{r^2}{r_{4p15}^2}\right)} + r^2(d\theta^2 + \sin^2\theta\, d\phi^2), \quad (24)$$

I $$ds_{16}^{(-+++)2} = -\left(1 + \frac{r_{10}}{r} + \frac{r^2}{r_{4p16}^2}\right)c^2dt^2 + \frac{dr^2}{\left(1 + \frac{r_{10}}{r} + \frac{r^2}{r_{4p16}^2}\right)} + r^2(d\theta^2 + \sin^2\theta\, d\phi^2); \quad (25)$$

The substrate of a valence, resting, naked "planet$_3$" (or "star$_3$")

in the interval [0, ∞] with an average signature (0 0 0 0)

i $$ds_{17}^{(+---)2} = c^2dt^2 - dr^2 - r^2(d\theta^2 + \sin^2\theta\, d\phi^2), \quad (26)$$

j $$ds_{18}^{(-+++)2} = -c^2dt^2 + dr^2 + r^2(d\theta^2 + \sin^2\theta\, d\phi^2), \quad (27)$$

where, according to (88) in [10], for the outer shell:

$r_{4p1} \approx r_{4p2} \approx r_{4p3} \approx r_{4p4} \approx r_{4p5} \approx r_{4p6} \approx r_{4p7} \approx r_{4p8} \approx$ ½ $A^{1/3}r_4 \approx$ ½ $A^{1/3}\cdot 10^7$ см = ½ $A^{1/3}\cdot$100 км; (28)

for the cores:

$r_{4p9} \approx r_{4p10} \approx r_{4p11} \approx r_{4p12} \approx r_{4p13} \approx r_{4p14} \approx r_{4p15} \approx r_{4p16} \approx$ ½ $A^{1/3}r_4 \approx$ ½ $A^{1/3}\cdot 10^7$ см = ½ $A^{1/3}\cdot$100 км;

A is the number of naked P_k-“quarks$_3$” that make up the naked “planet$_3$” (or “star$_3$”), see [10]; $ds_i^{(-+++)2}$ and $ds_j^{(+---)2}$ (where *i* = 1,2,3,4,5,6,7,8; *j* = 9,10,11,12,13,14,15,16) are averaged metrics, which are the result of twisting (or averaging) a set of sub-metrics with different signatures (3).

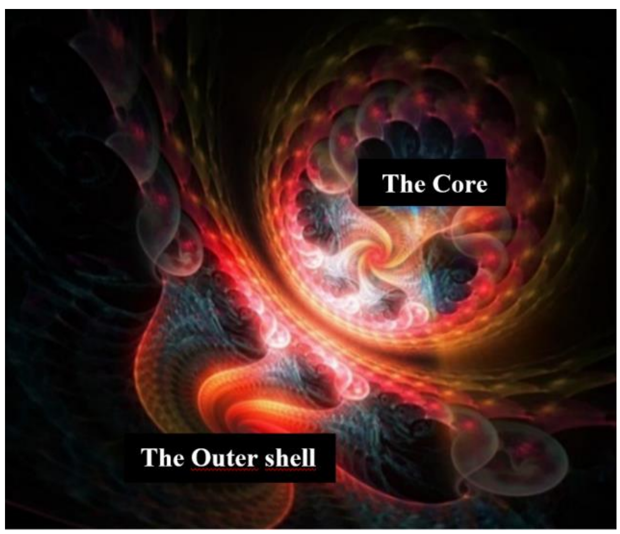


Fig. 5. Illustration of the core and outer shell of a naked "planet" (or "star")

Thus, the metric-dynamic model of the valence naked "planet$_3$" (or "star$_3$") (8) is the result of additive superposition (i.e. averaged intertwining) of a set of planetary naked P_k-"quarks$_3$" of type (66) in [10] with the signatures presented in Table 1 in [10]. In this case, each metric of the form (7) – (22) can be represented as an averaging of 7 sub-metrics with the corresponding signatures (see §2.6 in [5] and §1 in [7]), each sub-metric can be represented as an averaging of another 7 sub-sub-metrics with the corresponding signatures, and so on ad infinitum (see Figure 6). *Let’s note once again that the valence metric-dynamic model is the result of averaging infinite complexity to the simplest (framework) representation.*

Fig. 6. Illustration of the infinite complication of the metric-dynamic model of the outer shell of any stable spherical $\lambda_{m,n}$-vacuum formation (including a “planet” or “star”)

2 Simplified metric-dynamic model of the outer shell of a naked "planet" (or "star")

We will consider the phenomenon of "star$_3$" - "planetary$_3$" (hereinafter, for simplicity of notation, "star" - "planetary") gravity in the interaction of at least two naked celestial "bodies", just as in Newtonian mechanics (see Figure 4).

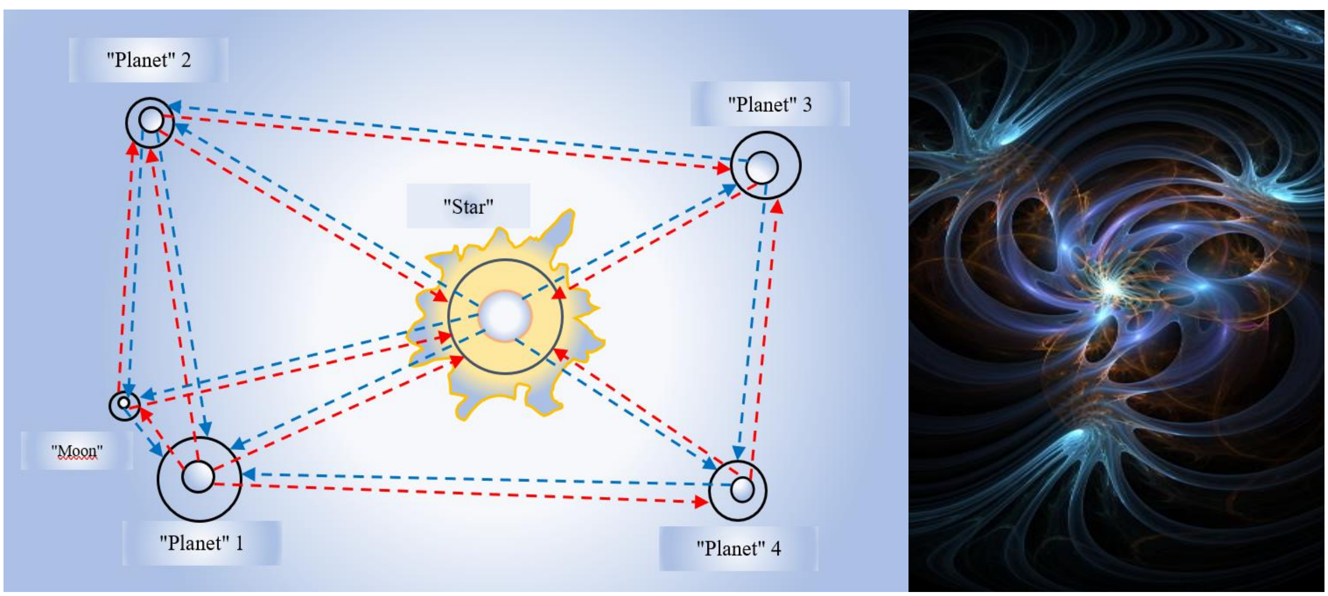


Fig. 7. "Star"-"planetary" system, where subcont-antisubcont exchange processes circulate between the cores of a naked "star" and naked "planets"

In particular, we will consider the gravitational interaction of a naked "planet" and a naked "star". This interaction occurs mainly between the cores of these stable $\lambda_{6,7}$-vacuum formations (see Figure 7), so we will leave within the framework of our consideration only the metric-dynamic models of their outer shells (10) – (16). We will also take into account that the radius of the mega-Universe $r_1 \sim 10^{39}$ cm is greater than the distance between the nuclei of, for example, the Sun and the Earth $r \sim 1.5 \cdot 10^{13}$ cm by approximately 25 orders of magnitude, so we will neglect the terms r^2/r_1^2 in the metrics (10) – (16).

For the above reasons, instead of the set of metrics (10) – (16), for the study of the gravitational interaction of a naked "planet" and a naked "star", we will leave only the following simplified metrics, which determine the metric-dynamic model of the outer shells in the vicinity of the cores of these $\lambda_{6,7}$-vacuum formations of stellar-planetary scale:

The outer shell (29)

of the valence, resting, naked "planet" (or "star")

in the interval $[r_4, r_1]$, with an average signature

$\frac{1}{2}\{(+---) + (-+++)\} = (0\ 0\ 0\ 0)$

$$ds_1^{(+---)2} = ds^{(+a)2} = \left(1 - \frac{r_{4E1}}{r}\right) c^2dt^2 - \frac{dr^2}{\left(1 - \frac{r_{4E1}}{r}\right)} - r^2(d\theta^2 + sin^2\,\theta\, d\phi^2), \tag{30}$$

$$ds_2^{(+---)2} = ds^{(+b)2} = \left(1 + \frac{r_{4E2}}{r}\right) c^2dt^2 - \frac{dr^2}{\left(1 + \frac{r_{4E2}}{r}\right)} - r^2(d\theta^2 + sin^2\,\theta\, d\phi^2), \tag{31}$$

$$ds_3^{(-+++)2} = ds^{(-c)2} = -\left(1 - \frac{r_{4E3}}{r}\right) c^2dt^2 + \frac{dr^2}{\left(1 - \frac{r_{4E3}}{r}\right)} + r^2(d\theta^2 + sin^2\,\theta\, d\phi^2), \tag{32}$$

$$ds_4^{(-+++)2} = ds^{(-d)2} = -\left(1 + \frac{r_{4E4}}{r}\right) c^2dt^2 + \frac{dr^2}{\left(1 + \frac{r_{4E4}}{r}\right)} + r^2(d\theta^2 + sin^2\,\theta\, d\phi^2); \tag{33}$$

The substrate

of a valence, resting, naked "planet" (or "star")

in the interval $[0, \infty]$ with an average signature (0 0 0 0)

$$ds_5^{(+---)2} = c^2dt^2 - dr^2 - r^2(d\theta^2 + sin^2\,\theta\, d\phi^2), \tag{34}$$

$$ds_6^{(-+++)2} = -\,c^2dt^2 + dr^2 + r^2(d\theta^2 + sin^2\,\theta\, d\phi^2). \tag{35}$$

were

$$r_{4E1} = \frac{1}{2}(r_{4p1} + r_{4p3}), \quad r_{4E2} = \frac{1}{2}(r_{4p2} + r_{4p4}),$$
$$r_{4E3} = \frac{1}{2}(r_{4p5} + r_{4p7}), \quad r_{4E4} = \frac{1}{2}(r_{4p6} + r_{4p8}).$$

3 Methods of extracting information from sets of metrics that make up a metric-dynamic model

Methods of extracting averaged information from sets of metrics that make up a metric-dynamic model of type (8) – (28) or (29) – (36) are based on the mathematical apparatus of the Algebra of Signature [1,2,3,4] and are described in detail in the articles [5,6,7,8]. To understand the following, you must first familiarize yourself with all of these articles.

4 Average deformation of the outer shell of a naked "planet" (or "star")

We will determine the deformations of the outer shell of a naked "planet" (or "star") by analogy with the method proposed in §5.1 in [3], as well as in §§ 2.8.1 – 2.8.3 and 3.2.3 – 3.2.4 in [5] and applied, for example, in 2.1.1 – 2.1.2 in [7].

We will average the metrics (30) – (33)

$$ds_{1234}^{(\pm)2} = \frac{1}{4}\left(ds^{(+a)2} + \ ds^{(+b)2} + ds^{(-c)2} + \ ds^{(-d)2}\right) = g_{00}^{(\pm)} c^2dt^2 - g_{11}^{(\pm)} dr^2 - r^2(d\theta^2 + sin^2\,\theta\, d\phi^2) \tag{36}$$

were

$$g_{00}^{(\pm)} = \frac{1}{4}\left(\left(1 - \frac{r_{4E1}}{r}\right) + \left(1 + \frac{r_{4E2}}{r}\right) - \left(1 - \frac{r_{4E3}}{r}\right) - \left(1 + \frac{r_{4E4}}{r}\right)\right) = \frac{(r_{4E2} + r_{4E3}) - (r_{4E1} + r_{4E4})}{4r},$$

$$g_{11}^{(\pm)} = \frac{1}{4}\left(-\frac{1}{\left(1 - \frac{r_{4E1}}{r}\right)} - \frac{1}{\left(1 + \frac{r_{4E2}}{r}\right)} + \frac{1}{\left(1 - \frac{r_{4E3}}{r}\right)} + \frac{1}{\left(1 + \frac{r_{4E4}}{r}\right)}\right).$$

Let's assume that

$$r_{4E1} \approx r_{4E2} \approx r_{4E3} \approx r_{4E4}, \quad \text{and} \quad r_{4E} = \frac{1}{4}(r_{4E1} + r_{4E2} + r_{4E13} + r_{4E4}). \tag{37}$$

Under these conditions, we write down the results of averaging the metrics (30) and (31), as well as (32) and (33), separately

$$ds_{12}^{(+---)2} = \frac{1}{2}\left(ds^{(+a)2} + ds^{(+b)2}\right) = c^2dt^2 - \frac{r^2}{r^2 - r_{4E}^2}dr^2 - r^2d\theta^2 - r^2\sin^2\theta\, d\phi^2, \tag{38}$$

$$ds_{34}^{(-+++)2} = \frac{1}{2}\left(ds^{(-c)2} + ds^{(-d)2}\right) = -c^2dt^2 + \frac{r^2}{r^2 - r_{4E}^2}dr^2 + r^2d\theta^2 + r^2\sin^2\theta\, d\phi^2. \tag{39}$$

The relative elongation of the outer side of the $\lambda_{6,7}$-vacuum (i.e. subcont*) in the vicinity of the core of a naked "planet" (or "star") is determined by Ex. (47) in [3]

$$l_i^{(+---)} = \sqrt{1 + \frac{g_{ii}^{(+---)} - g_{ii0}^{(+---)}}{g_{ii0}^{(+---)}}} - 1, \tag{40}$$

where $g_{ii}^{(+---)}$ are the components of the metric tensor of the average curved section of the outer side of the $\lambda_{6,7}$-vacuum (i.e., the subcont);

$g_{ii0}^{(+---)}$ are the components of the metric tensor of the same section of the outer side of the $\lambda_{6,7}$-vacuum before the curvature (i.e., in the absence of its curvature).

Note: *The concepts of the subcont and antisubcont (i.e., the outer and inner sides of the $\lambda_{m,n}$-vacuum), as well as the subcont-antisubcont currents were introduced in §4 in [3], §2.5 in [5], §1.1 in [4]);*

We substitute into Exs. (40) the components $g_{ii}^{(+---)}$ from the averaged metric (38), and the components $g_{ii}^{(+---)}$ from the original metric for the subcont (34), as a result, for each local section of the outer side of the $\lambda_{6,7}$-vacuum we obtain

$$l_r^{(+---)} = \frac{\Delta r}{r} = \sqrt{\frac{r^2}{r^2 - r_{4E}^2}} - 1, \quad l_\theta^{(+---)} = 0, \quad l_\phi^{(+---)} = 0. \tag{41}$$

The relative elongation of the inner side of the $\lambda_{6,7}$-vacuum (i.e. the antisubcont) in the vicinity of the core of a naked "planet" (or "star") is determined by a similar expression

$$l_i^{(-+++)} = \sqrt{1 + \frac{g_{ii}^{(-+++)} - g_{ii0}^{(-+++)}}{g_{ii0}^{(-+++)}}} - 1, \tag{42}$$

where $g_{ii}^{(-+++)}$ – components of the metric tensor of the curved section of the inner side of the $\lambda_{6,7}$-vacuum (i.e. the antisubcont);

$g_{ii0}^{(-+++)}$ – components of the metric tensor of the same section of the inner side of the $\lambda_{6,7}$-vacuum before curvature (i.e. in the absence of its curvature).

We substitute into Exs. (42) the components $g_{ii}^{(-+++)}$ from the averaged metric (39), and the components $g_{ii0}^{(-+++)}$ from the original metric (35) for the antisubcontact, as a result for each local section of the inner side of the $\lambda_{6,7}$-vacuum we obtain

$$l_r^{(-+++)} = \frac{\Delta r}{r} = \sqrt{\frac{r^2}{r^2 - r_{4E}^2}} - 1, \quad l_\theta^{(-+++)} = 0, \quad l_\phi^{(-+++)} = 0. \qquad (43)$$

Graphs of the radial component of the relative elongation of the subcont (41) $l_i^{(-+++)} = \frac{\Delta r}{r}$ and the antisubcont (43) $l_i^{(-+++)} = \frac{\Delta r}{r}$ in the outer shell of a naked "planet" (or "star") are shown in Figure 8.

Thus, in the outer shell of a naked "planet" (or "star") there is both an average convexity and an average concavity. On average, they almost completely compensate for each other's manifestations, therefore, in the vicinity of the core of a naked "planet" (or "star"), the $\lambda_{6,7}$-vacuum is, on average, flat (i.e., on average, its deformations are practically absent). This is equivalent to an average flat space. Convexity and concavity coexist (i.e., as if they fill each other), but do not annihilate, for the following reasons:

- firstly, the radii of the raqiya* layers of the naked "planet" (or "star") (37) do not completely coincide, i.e., they are equal to each other only approximately ($r_{4E1} \approx r_{4E2} \approx r_{4E3} \approx r_{4E4}$), in other words, convexity and concavity do not exactly coincide with each other;

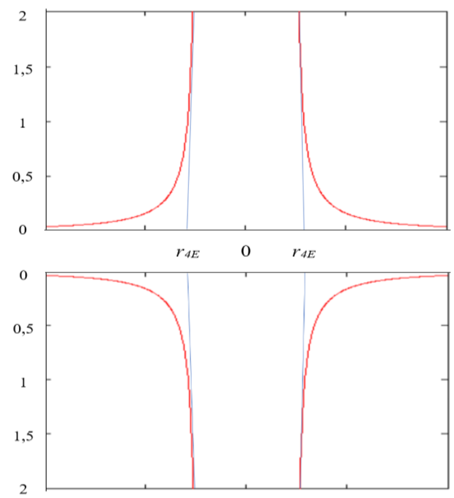


Fig. 8. Graphs of radial components of relative elongation: subcont (41) $l_i^{(-+++)} = \frac{\Delta r}{r}$ (upper), and antisubcont (43) $l_i^{(-+++)} = \frac{\Delta r}{r}$ (lower) in the vicinity of the core of a naked "planet" (or "star")

**The concept of "raqiya" was introduced in 4.11 in [6], raqiya is an extremely complex curved and intertwined region of $\lambda_{m,n}$-vacuum surrounding the core of any stable spherical $\lambda_{m,n}$-vacuum formation (e.g., the core of an elementary "particle", the core of a "planet", the core of a "galaxy", etc.), see Figures 17 and 18 in [5] and Figure 11 in [7].*

- secondly, the cores of the colored planetary P_k-"quarks$_3$" and P_k-"antiquarks$_3$" that make up a naked "planet" (or "star") are in constant chaotic motion (i.e., thermal motion). Moreover, as already noted in §9 in [10], the annihilation of the corresponding P_k-"quarks$_3$" and P_k-"antiquarks$_3$" is possible only with a complete stop of thermal motion, i.e. at temperatures close to absolute zero.

5 Subcont-antisubcont currents in the outer shell of a naked "planet" (or "star")

One bearded sage concluded: there's no motion.
Without a word, another walked before him.
He couldn't answer better
A.S. Pushkin *(Translation by David Reid)*

Similarly to what we have already done, for example, in §2.2 in [7], for the convenience of considering intra-vacuum processes, we introduce conventional names for the transverse layers of the $\lambda_{6,7}$-vacuum, the metric-dynamic state of which is determined by metrics (30) – (33):

$$ds_1^{(+---)2} = ds^{(+a)2} = \left(1 - \frac{r_{4E1}}{r}\right)c^2dt^2 - \frac{dr^2}{\left(1 - \frac{r_{4E1}}{r}\right)} - r^2(d\theta^2 + sin^2\,\theta\, d\phi^2) \qquad a\text{-subcont}, \qquad (44)$$

$$ds_2^{(+---)2} = ds^{(+b)2} = \left(1 + \frac{r_{4E2}}{r}\right)c^2dt^2 - \frac{dr^2}{\left(1 + \frac{r_{4E2}}{r}\right)} - r^2(d\theta^2 + sin^2\,\theta\, d\phi^2) \qquad b\text{-subcont}, \qquad (45)$$

$$ds_3^{(-+++)2} = ds^{(-c)2} = -\left(1 - \frac{r_{4E3}}{r}\right)c^2dt^2 + \frac{dr^2}{\left(1 - \frac{r_{4E3}}{r}\right)} + r^2(d\theta^2 + sin^2\,\theta\, d\phi^2) \qquad c\text{-antisubcont}, \qquad (46)$$

$$ds_4^{(-+++)2} = ds^{(-d)2} = -\left(1 + \frac{r_{4E4}}{r}\right)c^2dt^2 + \frac{dr^2}{\left(1 + \frac{r_{4E4}}{r}\right)} + r^2(d\theta^2 + sin^2\,\theta\, d\phi^2) \qquad d\text{-antisubcont}. \qquad (47)$$

That is, as already noted in §7 in [2], we conventionally represent the metric space described, for example, by the metric $ds^{(+a)2}$ as an elastic-plastic medium (or substantial continuum) and assign it the conventional name a-subcont.

We note once again that we do not know what a substantial continuum (subcont or antisubcont) is, but we resort to the method of analogy with a continuous medium that has elasticity and fluidity, for the convenience of our perception. The same method of analogy with an ideal fluid was used by Maxwell when composing his "Treatise on Electricity and Magnetism" (1873). Even in the report "Are Analogies Real in Nature?" (1856), Maxwell tried to express the idea of all phenomena as different states of an ideal fluid. By physical analogy, Maxwell meant the similarity of the laws of two areas of science, due to which one is an illustration of the other." In particular, Maxwell relied on the analogy between the hydrodynamics of an ideal fluid and electromagnetism. Subsequently, this fluid was forgotten as unnecessary, since the field concept displaced the ideal fluid from the mechanism of perception, due to its greater rationality and brevity. But at the initial stage, the human mind requires a substitute for a more tangible basis than a force field. Objectification of illusion is something that we constantly encounter with the complete geometrization of our ideas about the surrounding reality. This is inevitable due to the peculiarity of our perception of the surrounding reality. As many philosophers have noted, our "I" does not see the surrounding reality directly, but an image of this reality in our consciousness. Other philosophers reasonably believe that we have no immediate opportunity to prove the reality of what we call reality.

Let's recall some basic provisions of the "Geometrized Vacuum Physics Based on the Algebra of Signature " (GVPA) presented in [1,2,3,4,5].

Metrics (30) – (33) (or (44) – (47)) are the result of solving the same Einstein vacuum equation (42) in [5] $R_{ik} = 0$, and describe the metric-dynamic state of the same region of $\lambda_{6,7}$-vacuum. That is, these metrics relate to the studied region of $\lambda_{6,7}$-vacuum with equal probability. Therefore, within the framework of the GVPh&AS developed here [1,2,3,4,5], an assumption is made that the state of the outer shell of the naked "planet" is determined by the result of averaging the metrics (44) – (47)

$$ds^{(ab)2} = \frac{1}{4}\left(ds^{(+a)2} + ds^{(+b)2} + ds^{(-a)2} + ds^{(-b)2}\right). \tag{48}$$

Ex. (42), on the one hand, is of a probabilistic nature. This suggests that it describes the average state of a complexly iridescent (i.e., fluctuating everywhere) region of the $\lambda_{6,7}$-vacuum.

On the other hand, the metric (42) is a quadratic form (which resembles the Pythagorean theorem). This means that the elementary 4-segments of the geodesic lines $ds^{(+a)}$, $ds^{(+b)}$, $ds^{(-a)}$, $ds^{(-b)}$, are mutually perpendicular to each other (see §4 in [3] and the Introduction in [3])

$$ds^{(+a)} \perp ds^{(+b)} \perp ds^{(-a)} \perp ds^{(-b)}. \tag{49}$$

In this case, the averaged quadratic form (42) can be represented as a product of two complex conjugate quaternions (see §10 in [2])

$$ds^{(ab)} = \frac{1}{2}\left(ds^{(+a)} + ids^{(+b)} + jds^{(-a)} + kds^{(-b)}\right), \tag{50}$$
$$ds^{(ab)*} = \frac{1}{2}\left(ds^{(+a)} - ids^{(+b)} - jds^{(-a)} - kds^{(-b)}\right). \tag{51}$$

In the framework of the GVPh&AS [1,2.3.4.5] this is interpreted as the interweaving of geodesic lines $s^{(+a)}$, $s^{(+b)}$, $s^{(-a)}$, $s^{(-b)}$ into 4-helices (i.e., into 4-braids) or into two double helices, or into other more complex nodal configurations (see Figure 9).

Another fundamental hypothesis of the GVPh&AS [1,2.3.4.5] this is interpreted as the interweaving of geodesic lines $s^{(+a)}$, $s^{(+b)}$, $s^{(-a)}$, $s^{(-b)}$, into 4-helices (i.e., into 4-braids [1,2,3,4,5] is associated with a large difference from the interpretation of the zero components of the metric tensor in Einstein's GTR. Within the framework of the GVPh&AS [1,2.3.4.5] this is interpreted as the interweaving of geodesic lines $s^{(+a)}$, $s^{(+b)}$, $s^{(-a)}$, $s^{(-b)}$, into 4-helices (i.e., into 4-braids, the zero components of the metric tensor g_{00} of each of the 4-metrics, in particular (44) – (47), are associated not with a change in the rate of flow of local time (the ephemerality of which was discussed in the Introduction), but with the local velocity of motion of the substantial continuum (*a*-subcont, *b*-subcont, a-antisubcont, or *b*-antisubcont).

Fig. 9. Illustrations of the interweaving of geodesic lines into braids around all radial directions in the vicinity of the core of a naked "planet" (or "star")

At first glance, the ephemerality of the subcont and antisubcont pseudo-environments is no better than the ephemerality of Einstein's local time. However, in a number of problems it is much more convenient to consider that time flows everywhere in a straight line and uniformly (i.e. Newton's time is everywhere, and there is no problem of synchronizing clocks), but at the same time the flow rate in the deformed pseudo-environment is different everywhere.

The heuristic connection between the components of the metric tensor g_{00} and the velocity of the subcont or antisubcont is established based on a comparison of the zero components of metrics of the form (44) – (47) with the kinematic metric of the form (96) in [3] in spherical coordinates

$$\begin{cases} ds^{(+)2} = \left(1-\frac{v_r^2}{c^2}\right)c^2dt^2 + 2v_r drcdt - dr^2 - r^2(d\theta^2 + \sin^2\theta\, d\phi^2) \quad \text{with signature } (+---), & (52) \\ ds^{(-)2} = -\left(1-\frac{v_r^2}{c^2}\right)c^2dt^2 - 2v_r drcdt + dr^2 + r^2(d\theta^2 + \sin^2\theta\, d\phi^2) \quad \text{with signature } (-+++), & (53) \end{cases}$$

where v_r is the velocity of the *i*-th substantial continuum in the radial direction.

For example, when comparing the zero components g_{00} of the metric tensors from metrics (44) and (52), we obtain the heuristic identity

$$1-\frac{r_{4E1}}{r} \equiv 1-\frac{v_r^2}{c^2}, \quad \text{или} \quad \frac{r_{4E1}}{r} \equiv \frac{v_r^2}{c^2}, \tag{54}$$

in this case, the metric (44) can be represented as

$$ds^{(+a)2} = \left(1-\frac{v_{ra}^2}{c^2}\right)c^2dt^2 - \frac{dr^2}{\left(1-\frac{v_{ra}^2}{c^2}\right)} - r^2(d\theta^2 + \sin^2\theta\, d\phi^2) \quad \text{- for the } a\text{-subcont}, \tag{55}$$

where the components of the velocity vector of the *a*-subcont in the outer shell of the naked "planet"

$$v_{ra} = \sqrt{\frac{c^2 r_{4E1}}{r}}, \quad v_{\theta a} = 0\,, \quad v_{\phi a} = 0. \tag{56}$$

The velocity of the substantial continuum (subcont) with components (56) reflects the general property of the $\lambda_{m,n}$-vacuum. Regardless of whether $r_i = r_{4E1}$ is the radius of the core of a naked "planet", or the radius of the core of an "electron" ($r_i = r_6$, see §2.2 in [7]), or the radius of the core of a naked "galaxy" ($r_i = r_3$), etc., expressions of type (56) remain unchanged. Only the size of the necks of spherical cores of different diameters changes.

Comparing the zero components from metrics (44) and (45) with the zero component from metric (52), as well as the zero components from metrics (46) and (47) with the zero component from metric (53), we obtain the components of the velocity vectors

$$1-\frac{r_{4E1}}{r} \equiv 1-\frac{v_{ra}^2}{c^2} \quad \text{or} \quad \frac{r_{4E1}}{r} \equiv \frac{v_{ra}^2}{c^2}, \quad \text{while} \quad v_{ra}=\sqrt{\frac{c^2 r_{4E1}}{r}}, \ v_{\theta a}=0, \ v_{\phi a}=0 \quad \text{for } a\text{-subcont}, \tag{57}$$

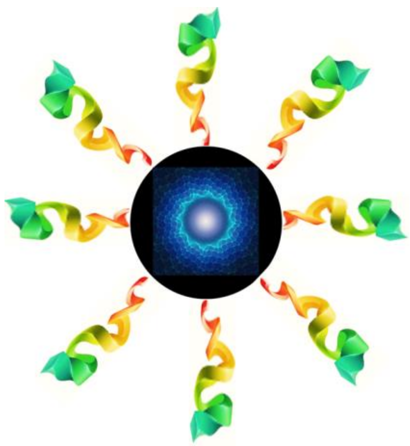
$$1+\frac{r_{4E2}}{r} \equiv 1-\frac{v_{rb}^2}{c^2} \quad \text{or} \quad -\frac{r_{4E2}}{r} \equiv \frac{v_{rb}^2}{c^2}, \quad \text{while} \quad -iv_{rb}=\sqrt{\frac{c^2 r_{4E2}}{r}}, \ v_{\theta b}=0, \ v_{\phi b}=0 \quad \text{for } b\text{-subcont}, \tag{58}$$

$$-1+\frac{r_{4E3}}{r} \equiv -1+\frac{v_{ra}^2}{c^2} \quad \text{or} \quad \frac{r_{4E3}}{r} \equiv \frac{v_{ra}^2}{c^2}, \quad \text{while} \quad v_{rc}=\sqrt{\frac{c^2 r_{4E3}}{r}}, \ v_{\theta c}=0, \ v_{\phi c}=0 \quad \text{for } c\text{-antisubcont}, \tag{59}$$

$$-1-\frac{r_{4E4}}{r} \equiv -1+\frac{v_{ra}^2}{c^2} \quad \text{or} \quad -\frac{r_{4E4}}{r} \equiv \frac{v_{ra}^2}{c^2}, \quad \text{while} \quad -jv_{rd}=\sqrt{\frac{c^2 r_{4E4}}{r}}, \ v_{\theta d}=0, \ v_{\phi d}=0 \quad \text{for } d\text{-antisubcont}, \tag{60}$$

where $j=\sqrt{-1}$ is the imaginary unit, but it is perpendicular to the imaginary unit i, i.e. their scalar product is zero ($i\,j$) = 0.

This means that in a simplified two-sided consideration (see §5 in [3]), in the outer shell of a naked "planet" (or "star") in each radial direction there are four subcont-antisubcont currents, flown into radial 4-braids (i.e. 4-sided spirals wound in all radial directions) (see Figure 10).



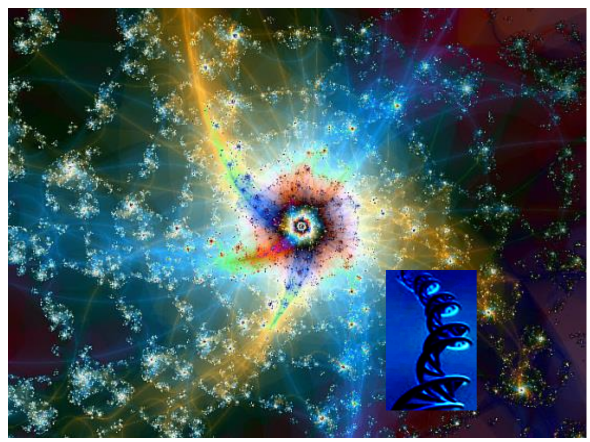


Fig. 10. Illustration of 4-sided radial spirals (4-braids) along which subcont-antisubcont currents flow in and out to/from the core of the naked "planet" (or "star")

In this case, the a-subcont currents flow in from space along all the first faces of the radial spirals (see Figures 9 and 10) to the first spherical layer of raqiya with a radius of r_{4E1}, surrounding the core of the naked "planet" (or "star"). There they turn around and flow out from the second spherical layer of raqiya of the "planet" with a radius of r_{4E2}into space in the form of b-subcont currents along all the second faces of the radial spirals. Similarly, the c-antisubcont currents flow in from space along all the third faces of the radial spirals to the third spherical layer of raqiya with a radius of r_{4E1}. There they unfold and flow away from the fourth spherical layer of the raqiya "planet" with a radius of r_{4E4} into space in the form of d-antisubcont currents along all fourth faces of the radial spirals.

Similarly, to (73) – (74) in [7], each such radial 4-braid can be described by an averaged quaternion

$$v_r^{(abcd)}=\frac{1}{4}(v_{ra}+iv_{ra}+jv_{ra}+kv_{ra}). \tag{61}$$

According to heuristic Exs. (57) – (60), in the region of the raqiya surrounding the core of the naked "planet" (or "star") (i.e., at $r \approx r_{4E}$), the velocities of the subcont-antisubcont currents $v_{ra}, v_{rb,} v_{rc}, v_{rd}$ are close to the speed of light c. However, due to the fact that these subcont-antisubcont currents move towards each other, they almost completely compensate each other's manifestations. Therefore, in the region of the core of the naked "planet" (or "star"), no powerful subcont-antisubcont outflow or drain is observed. However, due to the fact that the radii of the different layers of raqiya r_{4E1}, r_{4E2}, r_{4E3}, r_{4E4}, differ somewhat from each other (i.e. $r_{4E1} > r_{4E2} > r_{4E3} > r_{4E4}$), in the vicinity of the core of the naked "planet" (or "star") there is a residual radial fluence of $\lambda_{6,7}$-vacuum to the core of the naked "planet" (or "star") with an average velocity

$$\left|v_r^{(abcd)}\right| = \sqrt{\frac{1}{4}(v_{ra}^2 + v_{rb}^2 + v_{rc}^2 + v_{rd}^2)} = \frac{c}{2}\sqrt{\frac{r_{4E1}-r_{4E2}+r_{4E3}-r_{4E4}}{r}} = \frac{c}{2}\sqrt{\frac{(r_{4E1}+r_{4E3})-(r_{4E2}+r_{4E4})}{r}} = \frac{c}{\sqrt{2}}\sqrt{\frac{r_{4E13}-r_{4E24}}{r}}, \quad (62)$$

where $r_{4E13} = \frac{1}{2}(r_{4E1} + r_{4E3}),\quad r_{4E24} = \frac{1}{2}(r_{4E2} + r_{4E4}),$ (63)

$\left|v_r^{(abcd)}\right|$ is the module of quaternion (62), here the Exs. (57) – (60) for v_{rk}^2 are taken into account.

From Ex. (62) it follows that if the radii of the various spherical shells of raqiya surrounding the core of a naked "planet" (or "star") were the same (i.e. $r_{n1} = r_{n2} = r_{n3} = r_{n4}$), then the average velocity of the $\lambda_{6,7}$-vacuum drain $v_r^{(abcd)}$ would be equal to zero. In this case, there would be no average confluence of $\lambda_{6,7}$-vacuum to the core of the naked "planet" (or "star"). Consequently, there would be no entrainment of all the small "corpuscles" and the bodies consisting of them to the core of the naked "planet" (or "star").

Thus, the mechanism of "planetary" (or "stellar") gravity is due to the fact that the inflowing and outflowing subcont-antisubcont currents are not only twisted into 4-braids around all radial directions, but also these spirals are spatially and phase-shifted relative to each other by the difference in the radii of the shells of the raqiya $\Delta r = r_{4E13} - r_{4E24}$ (see Figure 11*a*).

This solves the problem of the Bernhard Riemann gravity model mentioned in the Introduction. In the model under consideration, there is no need to explain where the substance constantly flowing to the planet's core is collected. On average, as much *a*-subcont and *c*-antisubcont flows from all sides along spirals to their spherical shells of raqiya, the same amount of *b*-subcont and *d*-antisubcont flows away in all directions along reverse spirals from their spherical shells of raqiya of the "planet" (or "star").

Here it is appropriate to mention one fact from funny mathematics. If the length of a circle with a radius r is increased by one, then the following equality can be written $2\pi r_1 = 2\pi r + 1$ *(where* r_1 *is the radius of the larger circle, see Figure 11b). From which it follows that* $\Delta r = r_1 - r = \frac{1}{2\pi} \approx 0.16$*. This result does not depend on the radius (or length) of the original circle r. For example, if we add 1 m to the length of the Earth's equator* $2\pi r_э = 40\,000\,000$ *m, then the size of the gap between the two circles is* $\Delta r = r_1 - r_э \approx 16$ *cm.*

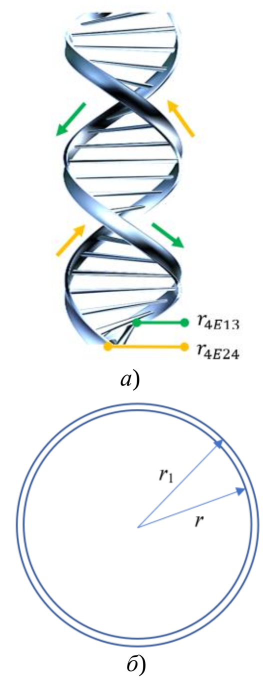


Fig. 11. Illustration of the spatial-phase shift of the counter spirals relative to each other

6 Acceleration of subcont-antisubcont currents in the outer shell of a naked "planet" (or "star")

The components of the acceleration vector of subcont and antisubcont currents in the outer shell of a resting naked "planet" (or "star") are given by an expression of the form (116) in [4] or (54) in [7]

$$a_n^{(k)} = -\frac{c^2}{\sqrt{1-\frac{v_{rk}^2}{c^2}}}\frac{\partial \ln\sqrt{g_{00}^{(k)}}}{\partial x^n}, \qquad \text{where } k = +a, +b, -c, -d; \quad n = r, \theta, \phi. \quad (64)$$

We write out the zero components of the metric tensor from the metrics (44) – (47)

$$g_{00}^{(+a)} = \left(1 - \frac{r_{4E1}}{r}\right),\quad g_{00}^{(+b)} = \left(1 + \frac{r_{4E2}}{r}\right),\quad g_{00}^{(-c)} = -\left(1 - \frac{r_{4E3}}{r}\right),\quad g_{00}^{(+d)} = -\left(1 + \frac{r_{4E4}}{r}\right). \quad (65)$$

Let's substitute these zero components into Ex. (64). As a result, taking into account relations (57) – (60), we obtain the following components of the acceleration vector of two subcont and two antisubcont currents in the outer shell of a resting naked "planet" (or "star"):

– components of the acceleration vector of the *a*-subcont

$$a_r^{(+a)} = -\frac{c^2}{\sqrt{1-\frac{r_{4E1}^2}{r^2}}} \frac{\partial \ln \sqrt{\left(1-\frac{r_{4E1}}{r}\right)}}{\partial r_*} = -\frac{c^2 r_{4E1}}{2r^2\sqrt{\left(1-\frac{r_{4E1}}{r}\right)}}, \quad a_\theta^{(-a)} = 0, \quad a_\phi^{(-a)} = 0, \tag{66}$$

where $\frac{\partial}{\partial r_*} = g^{11(+a)}\frac{\partial}{\partial r} = \left(1-\frac{r_{4E1}}{r}\right)\frac{\partial}{\partial r}$;

– components of the acceleration vector of the *b*-subcont

$$a_r^{(+b)} = -\frac{c^2}{\sqrt{1+\frac{r_{4E2}^2}{r^2}}} \frac{\partial \ln \sqrt{\left(1+\frac{r_{4E2}}{r}\right)}}{\partial r_*} = \frac{c^2 r_{4E2}}{2r^2\sqrt{\left(1+\frac{r_{4E2}}{r}\right)}}, \quad a_\theta^{(+b)} = 0, \quad a_\phi^{(+b)} = 0, \tag{67}$$

where $\frac{\partial}{\partial r_*} = g^{11(+b)}\frac{\partial}{\partial r} = \left(1+\frac{r_{4E2}}{r}\right)\frac{\partial}{\partial r}$;

– components of the acceleration vector of the *c*-antisubcont

$$a_r^{(-c)} = -\frac{c^2}{\sqrt{1-\frac{r_{4E3}^2}{r^2}}} \frac{\partial \ln \sqrt{-\left(1-\frac{r_{4E3}}{r}\right)}}{\partial r_*} = -\frac{ic^2 r_{4E3}}{2r^2\sqrt{\left(1-\frac{r_{4E3}}{r}\right)}}, \quad a_\theta^{(-c)} = 0, \quad a_\phi^{(-c)} = 0, \tag{68}$$

where $\frac{\partial}{\partial r_*} = g^{11(-c)}\frac{\partial}{\partial r} = -\left(1-\frac{r_{4E3}}{r}\right)\frac{\partial}{\partial r}$;

– components of the acceleration vector of the *d*-antisubcont

$$a_r^{(+d)} = -\frac{c^2}{\sqrt{\left(1+\frac{r_{4E4}^2}{r^2}\right)}} \frac{\partial \ln \sqrt{-\left(1+\frac{r_{4E4}}{r}\right)}}{\partial r_*} = \frac{jc^2 r_{4E4}}{2r^2\sqrt{\left(1+\frac{r_{4E4}}{r}\right)}}, \quad a_\theta^{(+d)} = 0, \quad a_\phi^{(+d)} = 0, \tag{69}$$

where $\frac{\partial}{\partial r_*} = g^{11(-d)}\frac{\partial}{\partial r} = -\left(1+\frac{r_{4E4}}{r}\right)\frac{\partial}{\partial r}$.

The accelerations of the *a*-subcont (66) and *b*-subcont (67), as well as the accelerations of the *c*-antisubcont (68) and *d*-antisubcont (69) are directed towards each other. At the same time, they form two intertwined counter and spatially-phase shifted spirals

$$a_r^{(ad)} = a_r^{(+a)} + ia_r^{(-c)} = -\frac{c^2 r_{4E1}}{2r^2\sqrt{\left(1-\frac{r_{4E1}}{r}\right)}} - i\frac{c^2 r_{4E3}}{2r^2\sqrt{\left(1-\frac{r_{4E3}}{r}\right)}}, \tag{70}$$

$$a_r^{(bc)} = a_r^{(+b)} - ja_r^{(-d)} = \frac{c^2 r_{4E2}}{2r^2\sqrt{\left(1+\frac{r_{4E2}}{r}\right)}} + j\frac{c^2 r_{4E4}}{2r^2\sqrt{\left(1+\frac{r_{4E4}}{r}\right)}}. \tag{71}$$

Similarly, to (79) and (80) in [7], the acceleration of a 4-braid wound on each radial direction in the vicinity of the core of a naked "planet" (or "star") is given by an averaged quaternion with the stignature {– + – +}

$$a_r^{(abcd)} = \frac{1}{4}\left(a_r^{(+a)} + ia_r^{(+b)} + ja_r^{(-c)} + ka_r^{(-d)}\right) = \frac{1}{4}\left(-\frac{c^2 r_{4E1}}{2r^2\sqrt{\left(1-\frac{r_{4E1}}{r}\right)}} + i\frac{c^2 r_{4E2}}{2r^2\sqrt{\left(1+\frac{r_{4E2}}{r}\right)}} - j\frac{c^2 r_{4E3}}{2r^2\sqrt{\left(1-\frac{r_{4E3}}{r}\right)}} + k\frac{c^2 r_{4E4}}{2r^2\sqrt{\left(1+\frac{r_{4E4}}{r}\right)}}\right), \tag{72}$$

or $a_r^{(abcd)} = \frac{1}{4}\frac{c^2}{2r^2}\left(-\frac{r_{4E1}}{\sqrt{\left(1-\frac{r_{4E1}}{r}\right)}} + i\frac{r_{4E2}}{\sqrt{\left(1+\frac{r_{4E2}}{r}\right)}} - j\frac{r_{4E3}}{\sqrt{\left(1-\frac{r_{4E3}}{r}\right)}} + k\frac{r_{4E4}}{\sqrt{\left(1+\frac{r_{4E4}}{r}\right)}}\right).$ (73)

The modulus of this quaternion

$$\left|a_r^{(abcd)}\right| = \sqrt{\frac{1}{16}\left(a_r^{(+a)2} + a_r^{(+b)2} + a_r^{(-c)2} + a_r^{(-d)2}\right)} = \frac{c^2}{8r^2}\sqrt{\frac{-r_{4E1}^2}{1-\frac{r_{4E1}}{r}} + \frac{r_{4E2}^2}{1-\frac{r_{4E2}}{r}} + \frac{-r_{4E3}^2}{1-\frac{r_{4E3}}{r}} + \frac{r_{4E4}^2}{1-\frac{r_{4E4}}{r}}}. \quad (74)$$

At a large distance from the core of a naked “planet” (or “star”), i.e. in the case when r_{4E1}, r_{4E2}, r_{4E3}, $r_{4E4} << r$, Ex. (74) takes on a simplified form

$$\left|a_r^{(abcd)}\right| = \frac{c^2\sqrt{(r_{4E2}^2+r_{4E4}^2)-(r_{4E1}^2+r_{4E3}^2)}}{8r^2} = \frac{c^2\sqrt{r_{4EZ24}^2-r_{4Z13}^2}}{2r^2}, \quad (75)$$

where $r_{4Z24}^2 = \frac{1}{16}(r_{4E2}^2 + r_{4E4}^2)$ and $r_{4Z13}^2 = \frac{1}{16}(r_{4E1}^2 + r_{4E3}^2)$. (76)

From the law of universal gravitation (1) and Newton's second law $F = mg$ (where g is the acceleration of gravity) it follows
$g = \frac{GM}{r^2}$. (77)
Let's compare the acceleration (76) with the acceleration (77),

$$g = \frac{GM}{r^2} \cong \frac{c^2\sqrt{(r_{4E2}^2+r_{4E4}^2)-(r_{4E1}^2+r_{4E3}^2)}}{8r^2} = \frac{c^2\sqrt{r_{4Z24}^2-r_{4Z13}^2}}{2r^2}, \quad (78)$$

as a result, we obtain the heuristic identity

$$r_{4Z1234}^2 = r_{4Z24}^2 - r_{4Z13}^2 \cong \left(\frac{2GM_p}{c^2}\right)^2. \quad (79)$$

For example, if the mass of the planet Earth $M_P = M_{\oplus} \approx 5.97 \cdot 10^{24}$ kg, then according to (79) for our planet

$$r_{4E1234} = \sqrt{r_{4Z24}^2 - r_{4Z13}^2} \cong \frac{2GM_{\oplus}}{c^2} \approx \frac{2\cdot 6.67\cdot 10^{-11}\cdot 5{,}97\cdot 10^{24}}{(2.99\cdot 10^8)^2} \approx 8.9\cdot 10^{-3}\text{m} \approx 0.9 \text{ cm}. \quad (80)$$

In this case, if our assumptions are correct, then the star Sun with a mass $M_P = M_{\odot} = 1.99\cdot 10^{30}$ kg

$$r_{4S1234} = \sqrt{r_{4Z24}^2 - r_{4Z13}^2} \cong \frac{2GM_{\odot}}{c^2} \approx 2.97\cdot 10^3\text{m} \approx 3 \text{ km}. \quad (81)$$

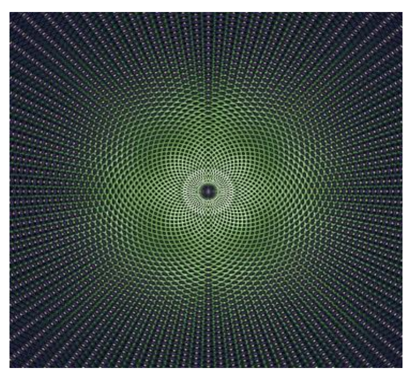


Fig. 12. Illustration of the interwoven subcont-antisubcont fabric

Thus, within the framework of the theory proposed here, a small, by planetary standards, spatial-phase shift between the counter spirals (see Figure 11), wound in all radial directions in the vicinity of the core of the naked “planet” (or “star”), leads to an average relatively weak flow of the intertwined subcont-antisubcont fabric (i.e., the fabric of the $\lambda_{6,7}$-vacuum, see Figures. 9, 10 and 12) to the center of this stable spherical $\lambda_{6,7}$-vacuum formation.

It is assumed that there are strong currents of the *a*-subcont and *c*-antisubcont, which flow in along spirals with high velocities and accelerations from all radial directions to the core of the naked "planet" (or "star"), and there are two currents of the *b*-subcont and *d*-antisubcont, which flow out along opposite spirals with the same high (or rather with slightly lower due to the spatial-phase shift) velocities and accelerations from all radial directions from the core of the naked "planet" (or "star"). This small difference between the strong incoming and outgoing currents of the subcont and antisubcont is, in our opinion, the reason for the weak effect of the confluence of the $\lambda_{6,7}$-vacuum fabric to the core of the naked "planet" (or "star"). This weak accelerated confluence of subcont-antisubcont fabric entrains all small (compared to a “planet” or “star”) stable spherical $\lambda_{m,n}$-vacuum formations (pico-, nano-, micro- and mini- “corpuscles”) and is the cause of inter-“planetary” and inter-“stellar” gravity.

7 Vacuum balance. "Stellar"-"planetary" interaction

In the previous paragraph, a hypothesis was put forward that the cause of planetary gravity is a relatively weak accelerated confluence of subcont-antisubcont fabric (or $\lambda_{6,7}$-vacuum fabric, see Figure 12 in [17]) to the core of a naked "planet" (or "star"). At first glance, this hypothesis is no different from Bernhard Riemann's idea of a confluence of some substance, which is presented in [17] and mentioned in the Introduction. That is, the question remains: – Where does the huge amount of flowing subcont-antisubcont fabric fit?

To answer this question, let us consider the following simplified model of the interaction of a naked "planet-1" (in particular, the Earth) and a naked "star" the Sun. At the same time, we believe that similar processes occur between all other naked “planets” and the naked “star” of the Solar System (see Figures 7, 10, 13).

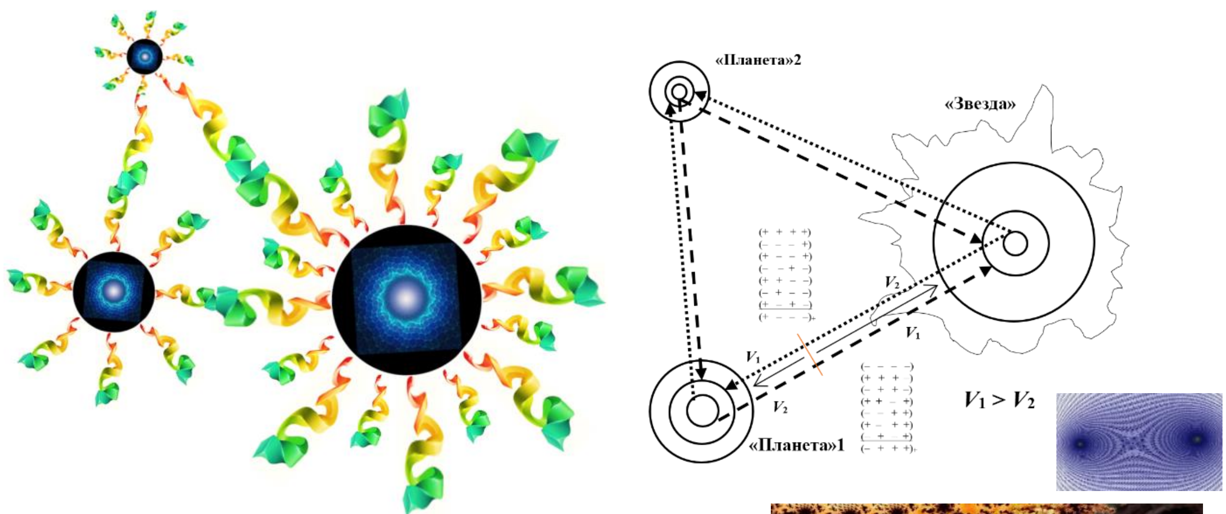


Fig. 13. Illustration of the exchange of “planets” and “star” by subcont-antisubcont currents, flowing along different sides of a 4-sided spiral wound on all radial directions extending from their cores

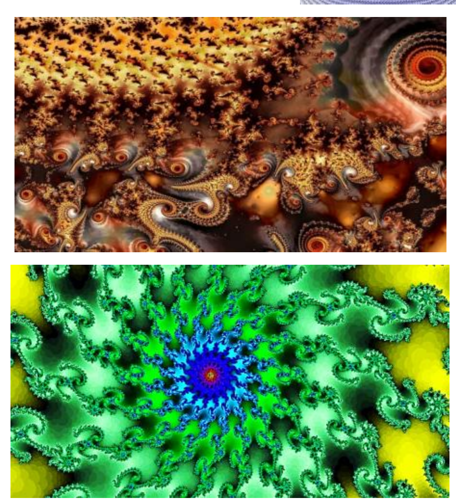


Fig. 14. Illustrations of complex turbulent processes involving subcont-antisubcont currents in the region of the raqiya surrounding the core of the "star" (or "planet")

It was shown above that from the core of a naked “planet” (in particular, “planet-1” Earth) along double spirals wound in all radial directions, the currents of the *b*-subcont and *d*-antisubcont flow out, slowing down (i.e. winding in the radial direction with less intensity and a larger spiral pitch, see Figure 13).

Further, as the distance from the core of the naked “planet-1” increases and the approach to the core of the naked “star” (or another “planet-2”) increases, the currents of the *b*-subcont and *d*-antisubcont accelerate (i.e. wind in the radial direction with greater intensity and a decreasing spiral pitch, see Figure 13). Then, in the region of the raqiya of the naked “star” (or other “planet-2”), these currents participate in a complex turbulent process (see Figure 14 and Figure 17 in [5]), turn around to other sides of the same 4-sided spiral (see Figure 15) and with a delay (see Figure 11*a*) and a gradual slowdown in twisting, flow away from the core of the naked “star” (or other “planet-2”) in the form of *a*-subcont and c-antisubcont currents, back to the core of the original naked “planet-1” (see Figure 13).

Further, as moves away from the core of the naked “star” (or “planet-2”) and approaches the core of the original naked “planet-1”, the *a*-subcont and *c*-antisubcont currents accelerate (i.e., they wind in a radial direction with greater intensity and a decreasing spiral pitch). Then, in the region of the raqiya of the naked “planet-1”, these currents participate in a complex turbulent process, unfolding to other sides of the same 4-sided spiral (see Figures 14 and 15), and with a delay (see Figure 11) and a gradual slowdown in the twisting of this spiral, they flow away from the core of the naked “planet-1” in the form of b-subcont and d-antisubcont currents back to the core of the naked “star” (or another “planet-2”), where this entire process is repeated.

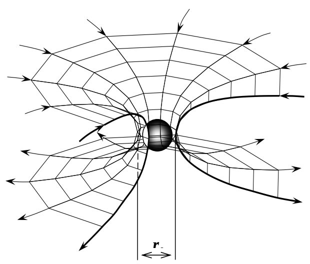


Fig. 15. Illustrations of the unfolding of subcont-antisubcont currents as a result of complex turbulent processes in the region of the raqiya surrounding the core of the “star” (or “planet”)

Thus, between the core of a naked "planet" (for example, the Earth) and the core of a naked "star" (for example, the Sun), or between the cores of any two naked "planets", subcont-antisubcont currents constantly circulate. At the same time, the amount of circulating subcont and antisubcont remains practically unchanged. As much subcont and antisubcont flows into the raqiya of any stable spherical $\lambda_{m,n}$-vacuum formation (for example, a naked "planet" or "star"), the same amount of subcont and antisubcont flows out of the same raqiya. This is similar to the water cycle in nature.

At the same time, for all $\lambda_{m,n}$-vacuum "corpuscles" (in particular, naked "planets" and "stars"), the outflowing subcont-antisubcont currents always lag behind (i.e., are slightly spatially-phase shifted into the depth of the cancer) in relation to the inflowing subcont-antisubcont currents (see Figure 11). This, in our opinion, as shown in the previous paragraphs, is the reason for the weak effect of gravitational attraction to any spherical $\lambda_{m,n}$-vacuum "corpuscle" (in particular, to a naked "planet" or to a naked "star").

The presence of a spatial-phase shift between the inflowing and outflowing subcont-antisubcont currents in the vicinity of the core of any spherical $\lambda_{m,n}$-vacuum "corpuscle" is not a violation of the general vacuum balance (i.e. the initial symmetry), since this shift is, on average, completely coordinated by the opposite spatial-phase shifts of the same currents, but in the environments of other stable spherical $\lambda_{m,n}$-vacuum formations ("corpuscles") (see Figures 7 and 13).

Maintaining the full vacuum balance (in this case, the full average compensation of spatial-phase shifts) remains the main initial principle of the theory (GVPh&AC) developed here, since what appeared from Nothing must, on average, remain nothing.

8 Gravity of elementary "particles"

Gravitational attraction is inherent in all stable spherical $\lambda_{m,n}$-vacuum formations ("corpuscles") included in the hierarchical cosmological model presented in [6], regardless of their scale.

For example, the metric-dynamic models of the outer shells of the "electron" (2) – (5) in [7] and the "positron" (12) – (15) in [7] should initially be written as

The outer shell of a free valence "electron"
in the interval [r_2, r_6] (see Figure 1 in [7])

I $$ds_1^{(+---)2} = \left(1 - \frac{r_{6X1}}{r} + \frac{r^2}{r_2^2}\right) c^2dt^2 - \frac{dr^2}{\left(1 - \frac{r_{6X1}}{r} + \frac{r^2}{r_2^2}\right)} - r^2(d\theta^2 + sin^2\,\theta\, d\phi^2), \tag{82}$$

H $$ds_2^{(+---)2} = \left(1 + \frac{r_{6X2}}{r} - \frac{r^2}{r_2^2}\right) c^2dt^2 - \frac{dr^2}{\left(1 + \frac{r_{6X2}}{r} - \frac{r^2}{r_2^2}\right)} - r^2(d\theta^2 + sin^2\,\theta\, d\phi^2), \tag{83}$$

V $$ds_3^{(+---)2} = \left(1 - \frac{r_{6X3}}{r} - \frac{r^2}{r_2^2}\right) c^2dt^2 - \frac{dr^2}{\left(1 - \frac{r_{6X3}}{r} - \frac{r^2}{r_2^2}\right)} - r^2(d\theta^2 + sin^2\,\theta\, d\phi^2), \tag{84}$$

H′ $$ds_4^{(+---)2} = \left(1 + \frac{r_{6X4}}{r} + \frac{r^2}{r_2^2}\right) c^2dt^2 - \frac{dr^2}{\left(1 + \frac{r_{6X4}}{r} + \frac{r^2}{r_2^2}\right)} - r^2(d\theta^2 + sin^2\,\theta\, d\phi^2), \tag{85}$$

where $r_{6X1} \approx r_{6X2} \approx r_{6X3} \approx r_{6X4}$ are the radii of the spherical layers of raqiya surrounding the core of the “electron”. (86)

The outer shell of the free valence “positron”
in the interval [r2, r6] (negative of Figure 1 in [7])

I $$ds_1^{(-+++)2} = -\left(1 + \frac{r_{6Y1}}{r} - \frac{r^2}{r_2^2}\right) c^2dt^2 + \frac{dr^2}{-\left(1 - \frac{r_{6Y1}}{r} + \frac{r^2}{r_2^2}\right)} + r^2(d\theta^2 + sin^2\,\theta\, d\phi^2), \tag{87}$$

H $$ds_2^{(-+++)2} = -\left(1 - \frac{r_{6Y2}}{r} + \frac{r^2}{r_2^2}\right) c^2dt^2 + \frac{dr^2}{-\left(1 + \frac{r_{6Y2}}{r} - \frac{r^2}{r_2^2}\right)} + r^2(d\theta^2 + sin^2\,\theta\, d\phi^2), \tag{88}$$

V $$ds_3^{(-+++)2} = -\left(1 + \frac{r_{6Y3}}{r} + \frac{r^2}{r_2^2}\right) c^2dt^2 + \frac{dr^2}{-\left(1 - \frac{r_{6Y3}}{r} - \frac{r^2}{r_2^2}\right)} + r^2(d\theta^2 + sin^2\,\theta\, d\phi^2), \tag{89}$$

H′ $$ds_4^{(-+++)2} = -\left(1 - \frac{r_{6Y4}}{r} - \frac{r^2}{r_2^2}\right) c^2dt^2 + \frac{dr^2}{-\left(1 + \frac{r_{6Y4}}{r} + \frac{r^2}{r_2^2}\right)} + r^2(d\theta^2 + sin^2\,\theta\, d\phi^2), \tag{90}$$

where $r_{6Y1} \approx r_{6Y2} \approx r_{6Y3} \approx r_{6Y4}$ are the radii of the spherical layers of raqiya surrounding the core of the “positron”. (91)

In this case, when considering the interaction of the "electron" - "positron", or "electron" and "electron" in §10 in [7], we would also find their gravitational attraction (similar to the "planetary" - "planetary" attraction or "starry" - "planetary" attraction). But this interaction is negligible compared to the electrical interaction. It is believed that, for example, the force of gravitational attraction of like-charged elementary particles is approximately forty orders of magnitude weaker than the force of their electrical repulsion. Therefore, the gravitational interaction of elementary "particles" was not considered in [7].

Thus, within the framework of the GVPh&AS, the relatively weak gravitational interaction between stable spherical □m,n-vacuum formations is universal in nature. The GVPh&AS confirms that Newton's formula (1) is deservedly called the "Law of Universal Gravitation". But the gravitational interaction is so weak that it manifests itself noticeably for us only starting from the "stellar" - "planetary" scale, due to the fact that naked "planets" and "stars" are electrically neutral.

Looking ahead, we note that, apparently, such stable spherical $\lambda_{m,n}$-vacuum formations as naked "galaxies" and naked neutron "stars" are electrically charged, since in the region of these objects the velocities of subcont-antisubcont currents reach the speed of light, and this is typical for charged "particles" (for example, "electrons" and "positrons", see §10 in [7]).

9 Deeper levels of consideration

The most simplified (averaged) metric-dynamic models of valence stable spherical $\lambda_{6,7}$-vacuum formations were considered above. In this case, within the framework of the considered models, between two astronomical objects (in particular, between a naked "planet" and a naked "star"), four pairwise counter-current subcont-antisubcont currents with accelerations (66) – (69) circulate, which flow along four sides of a 4-sided spiral (see Figures 10 and 13).

As has been noted more than once, within the framework of the GVPh&AS (see §9 in [2] and §2.6 in [5]), at a deeper level of consideration, each metric (44) – (47) can be represented as a sum (or averaging) of 7 + 1 = 8 metrics with the corresponding signatures:

a-subcont (44)	*c*-antisubcont (46)	*b*-subcont (45)	*d*-antisubcont (47)
(+ + + +)	(– – – –)	(+ + + +)	(– – – –)
(– – – +)	(+ + + –)	(– – – +)	(+ + + –)
(+ – – +)	(– + + –)	(+ – – +)	(– + + –)
(– – + –)	(+ + – +)	(– – + –)	(+ + – +)
(+ + – –)	(– – + +)	(+ + – –)	(– – + +)
(– + – –)	(+ – + +)	(– + – –)	(+ – + +)
(+ – + –)	(– + – +)	(+ – + –)	(– + – +)
$(+ – – –)_+$	$(– + + +)_+$	$(+ – – –)_+$	$(– + + +)_+$

Fig. 16. Illustration of a braid consisting of many colored threads (analogous to a braid of spiral sub-currents and sub-sub-currents)

In the framework of GVPh&AS this means that each current and anti-current of the 4-sided subcont-antisubcont helix (see Figures 10 and 13) can be represented as an interweaving of 7 + 1 = 8 sub-currents. In this case, the 4-sided helix takes the form of a braid consisting of 8 × 4 = 32 threads (or sub-currents) (see Figures 16 and 17).

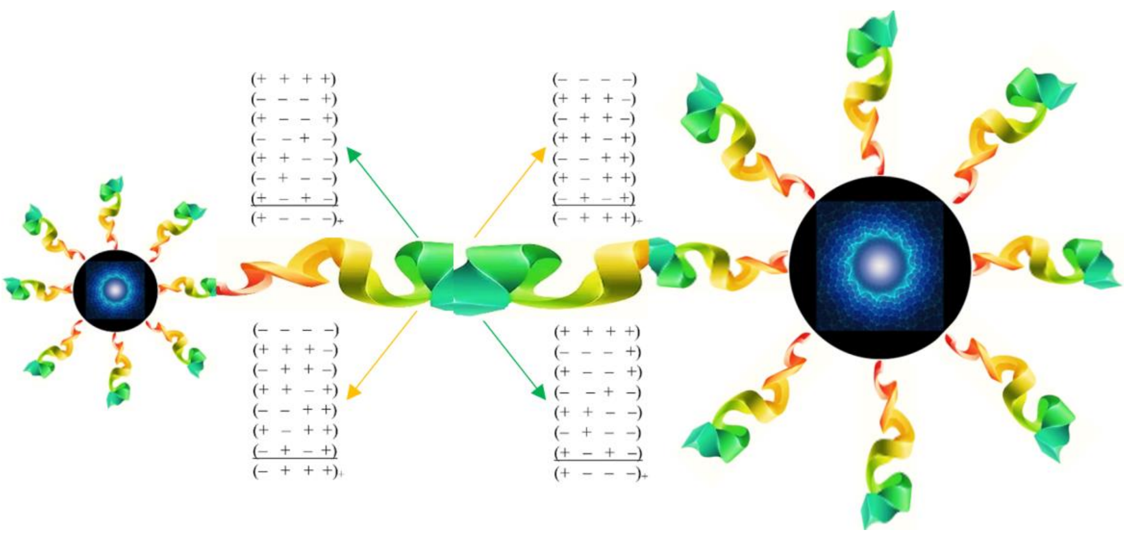


Fig. 17. Illustration of the circulation of four pairwise counter-current spiral subcont-antisubcont currents between a naked "planet" and a naked "star", each of which consists of 7 + 1 = 8 colored spiral sub-currents

Each spiral sub-current consists of another 7 + 1 = 8 spiral sub-sub-currents, and this can continue indefinitely, depending on the acuity of perception and the need to immerse oneself in the longitudinal and transverse depths of the $\lambda_{m,n}$-vacuum.

10 Rotation of the outer shell of a mobile "planet" moving around a "star"

10.1 *Vertical ether wind (i.e. subcont-antisubcont drain)*

In the previous paragraphs, model concepts of static (i.e. motionless) stable spherical $\lambda_{6,7}$-vacuum formations ("corpuscles") of a stellar-planetary scale were considered. However, in reality, naked "planets" rotate when moving around a "star" (see Figures 18 and 19).

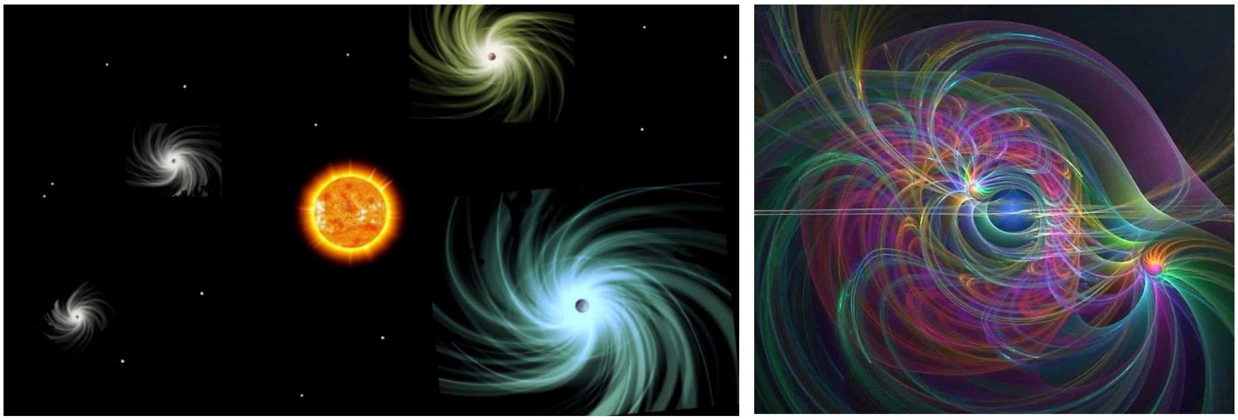


Fig. 18. Naked "planets" rotate when moving around the "star", while the averaged outer shells of naked "planets" resemble vortices flowing to their cores

Rotating electrically neutral stable spherical $\lambda_{6,7}$-vacuum formations (i.e. neutral rotating "corpuscles") require a separate extensive study. Here we will only refine the averaging metric-dynamic model of the outer shell of a moving and rotating "planet" (98) – (109) in [10], which consists of a family of Kerr metric solutions of the Einstein vacuum equation without the Λ-term, in Boyer-Lindquist coordinates:

Averaged outer shell of a rotating
electrically neutral naked valence "planet" (92)
moving around a "star" with velocity V_E
with total (or averaged) signature
½ {(+ – – –) + (– + + +)} = (0 0 0 0)

I $$ds_1^{(+a1)2} = \left(1-\frac{r_{4E1}r}{\rho}\right)c^2dt^2 - \frac{\rho dr^2}{r^2-r_{4E1}r+a^2} - \rho d\theta^2 - \left(r^2+a^2+\frac{r_{4E1}ra^2}{\rho}sin^2\theta\right)sin^2\theta\, d\phi^2 + \frac{2r_{4E1}ra}{\rho}sin^2\theta\, d\phi cdt, \quad (93)$$

H $$ds_2^{(+a2)2} = \left(1-\frac{r_{4E2}r}{\rho}\right)c^2dt^2 - \frac{\rho dr^2}{r^2-r_{4E2}r+a^2} - \rho d\theta^2 - \left(r^2+a^2+\frac{r_{4E2}ra^2}{\rho}sin^2\theta\right)sin^2\theta\, d\phi^2 - \frac{2r_{4E2}ra}{\rho}sin^2\theta\, d\phi cdt, \quad (94)$$

V $$ds_3^{(+b1)2} = \left(1+\frac{r_{4E3}r}{\rho}\right)c^2dt^2 - \frac{\rho dr^2}{r^2+r_{4E3}r+a^2} - \rho d\theta^2 - \left(r^2+a^2-\frac{r_{4E3}ra^2}{\rho}sin^2\theta\right)sin^2\theta\, d\phi^2 + \frac{2r_{4E3}ra}{\rho}sin^2\theta\, d\phi cdt, \quad (95)$$

H′ $$ds_4^{(+b2)2} = \left(1+\frac{r_{4E4}r}{\rho}\right)c^2dt^2 - \frac{\rho dr^2}{r^2+r_{4E4}r+a^2} - \rho d\theta^2 - \left(r^2+a^2-\frac{r_{4E4}ra^2}{\rho}sin^2\theta\right)sin^2\theta\, d\phi^2 - \frac{2r_{4E4}ra}{\rho}sin^2\theta\, d\phi cdt; \quad (96)$$

H′ $$ds_5^{(-c1)2} = -\left(1-\frac{r_{4E5}r}{\rho}\right)c^2dt^2 + \frac{\rho dr^2}{r^2-r_{4E5}r+a^2} + \rho d\theta^2 + \left(r^2+a^2+\frac{r_{4E5}ra^2}{\rho}sin^2\theta\right)sin^2\theta\, d\phi^2 - \frac{2r_{4E5}ra}{\rho}sin^2\theta\, d\phi cdt, \quad (97)$$

V $$ds_6^{(-c2)2} = -\left(1-\frac{r_{4E6}r}{\rho}\right)c^2dt^2 + \frac{\rho dr^2}{r^2-r_{4E6}r+a^2} + \rho d\theta^2 + \left(r^2+a^2+\frac{r_{4E6}ra^2}{\rho}sin^2\theta\right)sin^2\theta\, d\phi^2 + \frac{2r_{4E6}ra}{\rho}sin^2\theta\, d\phi cdt, \quad (98)$$

H $$ds_7^{(-d1)2} = -\left(1+\frac{r_{4E7}r}{\rho}\right)c^2dt^2 + \frac{\rho dr^2}{r^2+r_{4E7}r+a^2} + \rho d\theta^2 + \left(r^2+a^2-\frac{r_{4E7}ra^2}{\rho}sin^2\theta\right)sin^2\theta\, d\phi^2 - \frac{2r_{4E7}ra}{\rho}sin^2\theta\, d\phi cdt, \quad (99)$$

I $$ds_8^{(-d2)2} = -\left(1+\frac{r_{4E8}r}{\rho}\right)c^2dt^2 + \frac{\rho dr^2}{r^2+r_{4E8}r+a^2} + \rho d\theta^2 + \left(r^2+a^2-\frac{r_{4E8}ra^2}{\rho}sin^2\theta\right)sin^2\theta\, d\phi^2 + \frac{2r_{4E8}ra}{\rho}sin^2\theta\, d\phi cdt; \quad (100)$$

The substrate

rotating naked valence "planet"
with common signature

$$\tfrac{1}{2}\{(+---)+(-+++)\}=(0\ 0\ 0\ 0)$$

i $$ds_9^{(+)2}=c^2dt^2-\frac{\rho dr^2}{r^2+a^2}-\rho d\theta^2-(r^2+a^2)\sin^2\theta\, d\phi^2, \quad (101)$$

j $$ds_{10}^{(-)2}=-c^2dt^2+\frac{\rho dr^2}{r^2+a^2}+\rho d\theta^2+(r^2+a^2)\sin^2\theta\, d\phi^2. \quad (102)$$

where $\rho=r^2+a^2\cos^2\theta$; (103)

$a=\frac{r_{4E}V_E}{2c}$ – ellipticity parameter;

$r_{4E}\approx r_{4E1}\approx r_{4E2}\approx r_{4E3}\approx r_{4E4}\approx r_{4E5}\approx r_{4E6}\approx r_{4E7}\approx r_{4E8}$ is radius of the core of the "planet". (104)

For example, for the "planet" Earth: $V_E\approx 30.5$ km/s is velocity of the naked "planet" Earth; $r_{4E}\approx 1320$ km is radius of the core of the naked "planet" Earth (see the last column in Table 3 in [10]).

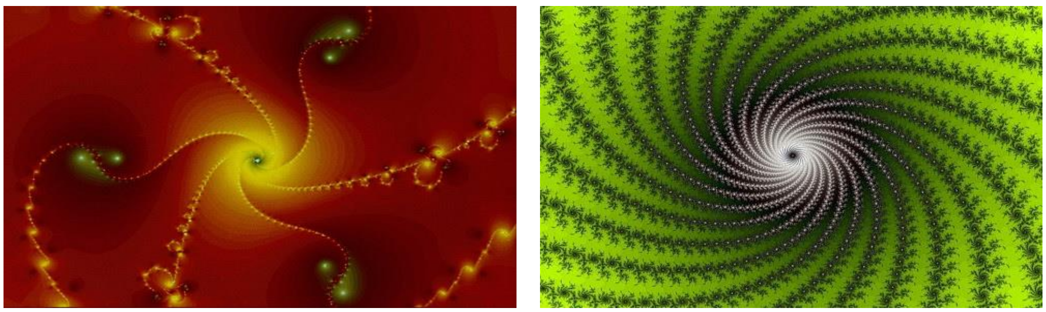
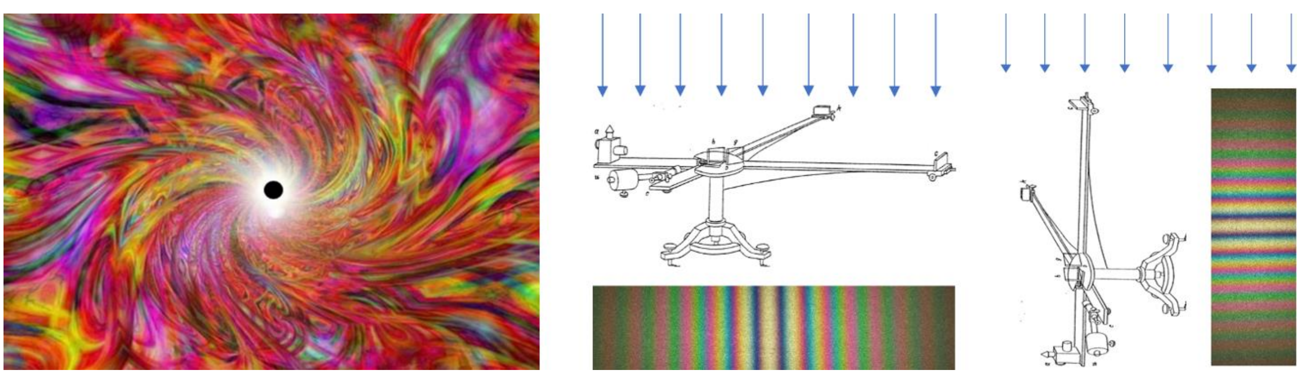


Fig. 19. Fractal illustrations of vortex subcont-antisubcont currents in the outer shell of a moving "planet" (or "star"). Near the surface of the planet, these currents flow into its interior almost vertically

A two-sided $\lambda_{-12,-15}$-vacuum rotating around moving electrically charged elementary "particles" (in particular, an "electron" and a "positron") was considered in the article [8].

If we adhere to the metric-dynamic model of a rotating naked "planet" proposed above, then the negative results of the Michelson-Morley experiment (see Figure 20 *b,c*) are easily explained. The naked "planet" moves around the "star" like a vortex moving in a circle (see Figure 18, 19 and 20 *a*). But when the average subcont-antisubcont vortex approaches the solid surface of the planet (consisting of many small "corpuscles"), it flows into its depths almost vertically (see Figure 18, 19 and 20). This is the reason for the almost constant vertical gravity and the nakedly perceptible magnetic field.



a) *b*) *c*)

Fig. 20. Illustration of the reason for the absence of ether wind in the horizontal plane and the presence of ether wind in the vertical plane when setting up the Michelson experiment

The averaged subcont-antisubcont vortex flows from all sides to the core of the naked "planet" along the branches of the large spiral; at the same time, near the solid spherical surface of this astronomical object (i.e., at the boundary of the result of a dense accumulation of many small "corpuscles"), the subcont-antisubcont currents flow almost vertically (see Figure 20*a*). At the same time, the averaged subcont-antisubcont current penetrates the Michelson interferometer of 1881 (see Figure 20b) almost vertically (from top to bottom). Therefore, when this interferometer rotates around its axis in the horizontal plane, the interference fringes remain unchanged, since in all horizontal directions the vertical subcont-antisubcont drain is practically unchanged.

Repeating the Michelson experiment, but with the interferometer placed perpendicular to the Earth's surface, clearly shows that when this setup is rotated in a vertical plane, the interference fringes are clearly shifted, since the angle between the vertically flowing subcont-antisubcont flow and the arms of the interferometer changes (see Figure 20*c* and 21).

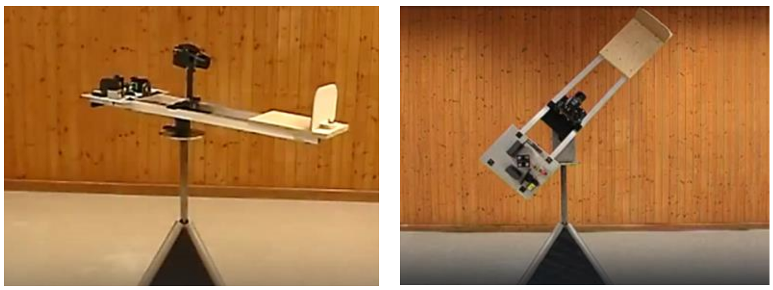


Fig. 21. Repetition of Michelson's experiment in the vertical plane by the German experimenter Von Martin Grusenick, https://rutube.ru/video/76054fc57d61121b37cb171121fd5fb9/?r=a

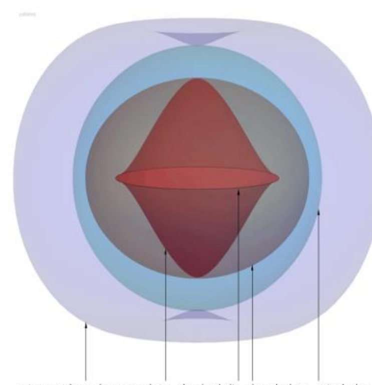
In other words, according to the hypothesis developed here, there is no horizontal ether wind (i.e., horizontal subcont-antisubcont laminar flow) that Michelson and Morley expected to find. At the earth's surface there is only a vertical ether wind (i.e., averaged vertical flow of the subcont-antisubcont), the influence of which is clearly evident in the Michelson-Morley experiment in the vertical plane, repeated by the German experimenter Von Martin Grusenick (see Figure 21).

10.2 Uncompensated averaged ergosphere of a naked "star" (or "planet")

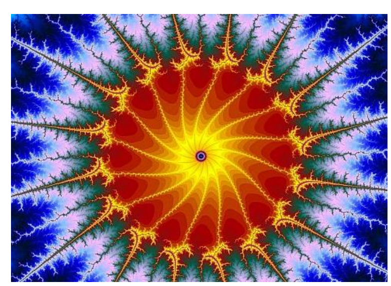
Within the framework of the developed metric-dynamic model, due to the inequality of the radii of the raqiya layers (104) $r_{4E} \approx r_{4E1} \approx r_{4E2} \approx r_{4E3} \approx r_{4E4} \approx r_{4E5} \approx r_{4E6} \approx r_{4E7}$, the rotations of these layers (which are described by the Kerr metrics (93) – (100)) do not completely compensate for each other's manifestations, therefore, within the framework of the model under consideration, in the region of the core of a rotating naked "star" (or "planet") there should be an averaged ergosphere (see Figure 22), where an extremely complex intertwined rotation of subcont-antisubcont currents occurs.

The study of the average ergosphere of a naked "star" (or "planet") requires a separate, extensive paper. Here we will only note the following.

Modern physics believes that the main source of energy emitted by stars is thermonuclear reactions, i.e. the synthesis of various isotopes of helium and tritium atoms from hydrogen and deuterium atoms. GVPh&AS does not exclude the possibility of such reactions occurring during the fusion of small "corpuscles" in the atomic layers of stars (or planet). But within the framework of the concepts developed here, thermonuclear fusion of heavier "atoms" is the source of only a part (about 60 – 70 %, according to V.A. Lebedev) of the internal energy of stars. The remaining 40 – 30 % of heat and light emitted by stars, within the framework of GVPh&AS, are associated



a)



b)

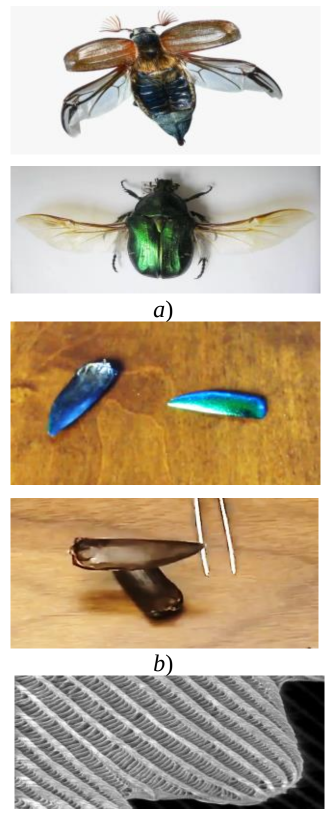
Fig. 22. *a*) The location of the horizons, ergospheres and the ring singularity of Kerr space-time in Kerr-Schild Cartesian coordinates [29] *b*) Fractal illustration of the ergosphere

with the extremely complex rotation and interweaving of subcont-antisubcont currents in the averaged (uncompensated) circumnuclear ergosphere (see Figures 16 and 22).

11 Control of interplanetary subcont-antisubcont currents (levitation)

In the articles [1,2,3,4,5,6,7,8,9,10] we have already noted more than once that the subcont (i.e. the outer side of the $\lambda_{m,n}$-vacuum, with the signature (+ – – –)) and the antisubcont (or the inner side of the $\lambda_{m,n}$-vacuum, with the opposite signature (– + + +)) are conditionally endowed with the properties of continuous elastic-plastic media for the convenience of perceiving complex intra-vacuum processes.

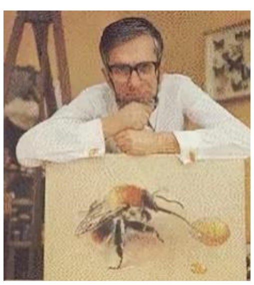
Within the framework of the mathematical apparatus of Riemannian geometry, subcont -antisubcont currents can be individually deprived of the signs of substantiality by transitioning to an accompanying frame of reference. Only when we look at intra-vacuum processes as if from the outside, they have meaning and the right to exist not only in the imagination, but also in our consciousness, because even if they do not exist, their manifestations are.



a) *b*) *c*)

Fig. 23. The Grebennikov effect

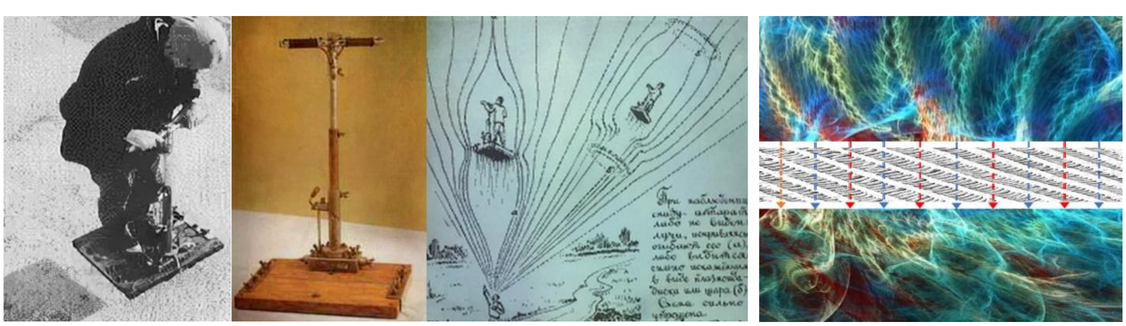
If the illusory (mental) constructions of subcont and antisubcont allow the development of advanced zero (i.e. vacuum) technologies, then they can acquire elements of objectivity. For example, ideas about powerful interplanetary subcont-antisubcont currents, which are intertwined into braids (see Figure 9, 19, 17), can form the basis for the development of alternative methods of movement in space.



Viktor Grebennikov

Russian entomologist Viktor Grebennikov (1927–2001), studying beetles with a large body and small wings (see Figure 23*a*), came to the conclusion that they cannot fly. He began to twist the chitinous coverings (elytra) of these insects on his desk with tweezers. Suddenly, one wing hovered over the other (see the book "My World" [30]). Later, the effect of hovering chitinous elytra was repeated by many researchers, see (see Figure 23b) Explanatory video). Grebennikov examined the coverings and wings of insects under a microscope and saw their cavity structure (see Figure 22c).

As a result of further study of this phenomenon and cavity structures, V. Grebennikov managed to build a flying platform (gravitaplane) (see Figure 24 *a*,*b*), on which he made a flight on the night of March 17 – 18, 1990 (see Figure 24 *c*). This event is described in Grebennikov's book "My World" [30] and in the magazine «Техника молодежи» ("Technology for Youth") No. 4, 1993.



a) *b*) *c*) *d*)

Fig. 24. Grebennikov's flying platform (gravitaplane). Photographs *a*,*b* and drawing *c* are taken from the book by V. Grebennikov "My World" [30]

In the framework of GVPh&AS, the effect of cavity structures, which facilitates the flights of heavy insects, some types of birds and devices such as Grebennikov's gravitaplane, is associated with the fact that materials with a cavity structure (for example, insect coverings and bird feathers) are capable of changing the topological structure of subcont-antisubcont currents flowing through them (see Figure 24*d*).

We assume that cavity structures are capable of locally untangling descending subcont-antisubcont braids and knots (see Figure 24*d*), and tying their braids and knots in a different configuration in which ascending flows prevail. The study of the effect of Grebennikov's cavity structures using the mathematical apparatus of Riemannian geometry and the Algebra of Signature can allow the development of alternative methods of movement in space based on the use of powerful intra-vacuum flows (see Figure 25). By controlling subcont-antisubcont currents in a local region of space using cavity structures, it is possible to create thrust in any given direction, for example, in the direction opposite to gravity.

Fig. 25. Illustration of stellar-planetary subcont-antisubcont currents

Apparently, the sages of antiquity knew the secrets of levitation. The Tanakh (Bible) says that the prophet Elijah was taken to heaven in a fiery chariot (2 Kings 2:1–11); the axe floated up to the surface of the prophet Elisha (2 Kings 6:1–6); Christ ascended to heaven before the eyes of his disciples (Luke 24:45–51). The Midrashim relate that the biblical character Balaam could fly and taught this to five kings of Midian (Evi, Rekem, Tzur, Hur, and Reba) during the war with Israel. Another example from Jewish legends: when the rabbis of Europe wanted to impose herem on the Arizal because he made a halachic decision based on Kabbalah, Rabbi Chaim Vilat (the closest student of the Arizal) moved from Safed to Europe to prevent this ruling of the rabbinical court. Similar legends exist among many peoples, for example, Sai Baba, according to eyewitnesses, repeatedly demonstrated the ability to hover above the ground for a long time; the monks of Shaolin were able to overcome gravity, etc.

12 Control of the topology of a local section of interplanetary space

In the previous chapter, we considered model concepts in which complexly intertwined intra-vacuum subcont-antisubcont currents circulate between a "star" and its "planets", as well as between "planets" and their natural "satellites" (see Figures 13, 18, 25), which, according to the views of GVPh&AS, are the external cause of stellar-planetary gravity. Now we will be interested in the possibility of using these powerful interplanetary and interstellar intra-vacuum currents for movement in space.

Let’s recall once again that at a deeper level of consideration, each layer (i.e. metric space with the corresponding signature) of any local region of cosmic space (more precisely, $\lambda_{m,n}$-vacuum) is the result of complex nodal interweavings of 8 × 4 = 32 types of subcont-antisubcont intra-vacuum sub-currents.

$$
\begin{array}{cccc}
a\text{-субконт} & b\text{-субконт} & c\text{-антисубконт} & d\text{-антисубконт} \\
(+\ +\ +\ +) & (-\ -\ -\ -) & (+\ +\ +\ +) & (-\ -\ -\ -) \\
(-\ -\ -\ +) & (+\ +\ +\ -) & (-\ -\ -\ +) & (+\ +\ +\ -) \\
(+\ -\ -\ +) & (-\ +\ +\ -) & (+\ -\ -\ +) & (-\ +\ +\ -) \\
(-\ -\ +\ -) & (+\ +\ -\ +) & (-\ -\ +\ -) & (+\ +\ -\ +) \\
(+\ +\ -\ -) & (-\ -\ +\ +) & (+\ +\ -\ -) & (-\ -\ +\ +) \\
(-\ +\ -\ -) & (+\ -\ +\ +) & (-\ +\ -\ -) & (+\ -\ +\ +) \\
(-\ +\ +\ +) & (+\ -\ -\ -) & (-\ +\ +\ +) & (+\ -\ -\ -) \\
\underline{(+\ -\ +\ -)} & \underline{(-\ +\ -\ +)} & \underline{(+\ -\ +\ -)} & \underline{(-\ +\ -\ +)} \\
(0\ 0\ 0\ 0)_+ & (0\ 0\ 0\ 0)_+ & (0\ 0\ 0\ 0)_- & (0\ 0\ 0\ 0)_-
\end{array}
\qquad (105)
$$

Fig. 26. Illustration of subcont-antisubcont currents and sub-currents twisted into spirals and topological knots

In this case, the averaged 4-dimensional topological configuration of each local region of space is determined by the amplitude and phase relationships between these 32 types of subcont-antisubcont currents and subcurrents, twisted into spirals and tied into topological nodes (see Figure 15, 24*d*, 26).

In order to use various averaged components of interplanetary and/or interstellar intra-vacuum currents for the purpose of moving in space, it is necessary to learn to control the averaged 4-topology of local sections of $\lambda_{-12,-15}$-vacuum.

We consider, as an example, the possibility of overcoming the gravitational field of the "planet". Let's assume that in the local region of the outer shell of the "planet" it was possible to change the topology of space. To do this, we select from the numerators of the rankings (105) a row with signatures (– – + –) and (+ + – +) and express them through the 14 remaining signatures

$$
\begin{array}{ll}
(+\ +\ +\ +) & (-\ -\ -\ -) \\
(-\ -\ -\ +) & (+\ +\ +\ -) \\
(+\ -\ -\ +) & (-\ +\ +\ -) \\
(+\ +\ -\ -) & (-\ -\ +\ +) \\
(-\ +\ -\ -) & (+\ -\ +\ +) \\
(+\ -\ -\ -) & (-\ +\ +\ +) \\
\underline{(+\ -\ +\ -)} & \underline{(-\ +\ -\ +)} \\
(-\ -\ +\ -)_{+} & (+\ +\ -\ +)_{+}
\end{array}
\qquad (106)
$$

In this case, within the framework of a two-sided consideration, the average length of the considered section of the $\lambda_{-12,-15}$-vacuum is described by a quartet of metrics:

$$ds_1^{(--+-)2} = -\left(1-\frac{r_{4E1}}{r}\right)c^2dt^2 - \frac{dr^2}{\left(1-\frac{r_{4E1}}{r}\right)} + r^2(d\theta^2 + sin^2\,\theta\, d\phi^2), \quad \text{with signature } (-\ -\ +\ -) \qquad (107)$$

$$ds_2^{(--+-)2} = -\left(1+\frac{r_{4E2}}{r}\right)c^2dt^2 - \frac{dr^2}{\left(1+\frac{r_{4E2}}{r}\right)} + r^2(d\theta^2 + sin^2\,\theta\, d\phi^2), \quad \text{with signature } (-\ -\ +\ -) \qquad (108)$$

$$ds_3^{(++-+)2} = \left(1-\frac{r_{4E3}}{r}\right)c^2dt^2 + \frac{dr^2}{\left(1-\frac{r_{4E3}}{r}\right)} - r^2(d\theta^2 + sin^2\,\theta\, d\phi^2), \quad \text{with signature } (+\ +\ -\ +) \qquad (109)$$

$$ds_4^{(++-+)2} = \left(1+\frac{r_{4E4}}{r}\right)c^2dt^2 + \frac{dr^2}{\left(1+\frac{r_{4E4}}{r}\right)} - r^2(d\theta^2 + sin^2\,\theta\, d\phi^2), \quad \text{with signature } (+\ +\ -\ +). \qquad (110)$$

In this situation, the accelerations will reverse, that is, those that were accelerations of outgoing currents will become accelerations of incoming currents, and vice versa

$$-\left|a_r^{(abcd)}\right| = \frac{c^2}{8r^2}\sqrt{\frac{r^2_{4E1}}{1-\frac{r_{4E1}}{r}} + \frac{-r^2_{4E2}}{1-\frac{r_{4E2}}{r}} + \frac{r^2_{4E3}}{1-\frac{r_{4E3}}{r}} + \frac{-r^2_{4E1}}{1-\frac{r_{4E3}}{r}}}\,. \qquad (111)$$

At a large distance from the core of the naked "planet" (or "star"), i.e. in the case when r_{4E1}, r_{4E2}, r_{4E3}, $r_{4E4} << r$, Ex. (111) takes a simplified form

$$-\left|a_r^{(abcd)}\right| = \frac{c^2\sqrt{(r^2_{4E1}+r^2_{4E3})-(r^2_{4E2}+r^2_{4E4})}}{8r^2}\,. \qquad (112)$$

This acceleration is directed in the opposite direction, i.e. away from the core of the naked "planet".

Thus, within the framework of the GVPh&AS, we come to the conclusion that in order to use averaged interplanetary and/or interstellar intra-vacuum currents (see Figure 13,18, 25) for the purpose of moving in space, it is necessary to learn to change the topological properties of the space-time continuum surrounding us.

Mathematicians solve the problem of changing the topology of space without difficulty. As an example, we will proceed from a ring-shaped surface described by a quadratic form [31]:

$g_{00}x_0^2 + g_{11}x_1^2 - g_{22}\,x_2^2 - g_{33}x_3^2 = 0$ with signature (+ + – –). (113)

Let’s direct the component of the metric tensor g_{33} to zero in the metric (113), for example; this ring-shaped surface gradually transforms first into a cone

$$g_{00}\,x_0^2 + g_{11}x_1^2 - g_{22}\,x_2^2 = 0, \qquad (114)$$

and with a further change in g_{33} into the negative region, the initial extension transforms into an oval 4-extension (see Figure 27), described by the Ex. [31]:

$$g_{00}\,x_0^2 + g_{11}\,x_1^2 - g_{22}\,x_2^2 + g_{33}\,x_3^2 = 0 \qquad (115)$$

with signature (+ + – +).

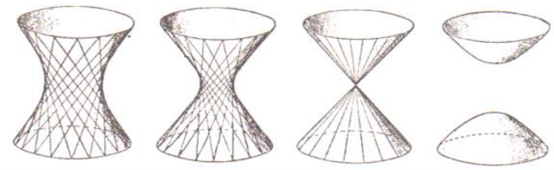

а) б) в) г)

Fig. 27. Transition from annular 4-extension to oval 4-extension [31]

In order to obtain a ring-shaped extension of a different type ("color") from a ring-shaped extension, two components of the metric tensor must be changed at once. As an example, we consider changes in a ring-shaped extension with metric (113) and signature (+ + – –). In this case, its transformation is carried out by simultaneously tending to zero two components of the metric tensor g_{11} and g_{33}. At the moment when both of these components reach zero ($g_{11} = 0$ and $g_{33} = 0$), metric (113) is transformed into the equation of a double pair

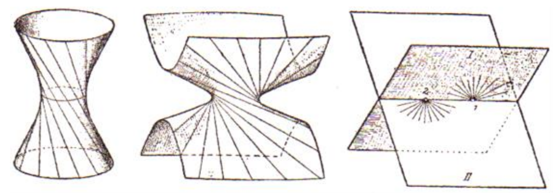

а) б) в)

Fig. 28. Transition from a ring-shaped surface to a ring-shaped surface of another type (“color”) [31]

$$g_{00}\,x_0^2 - g_{22}\,x_2^2 = 0, \qquad (116)$$

describing a two-dimensional surface (see Figure 28).

With continuous continuation of changes in g_{11} and g_{33} into their negative ranges of values, a ring-shaped extension is again obtained

$g_{00}\,x_0^2 - g_{11}x_1^2 - g_{22}\,x_2^2 + g_{33}\,x_3^2 = 0$ with a different signature (+ – – +). (117)

The considered example suggests that the topology of space can be changed by changing the sign of the component of the metric tensor gij, but this is not enough. Signature algebra shows that in order to change the topological properties of a local section of vacuum extension, it is necessary to reconstruct its entire internal structure.

Recall that the topology of the $\lambda_{-12,-15}$-vacuum extension, the external side of which is determined by the metric with the signature (+ – – –) (subcont), and the internal side by the metric with the signature (– + + +) (antisubcont), is the result of a superposition of 7 + 7 = 14 "colored" extensions with signatures (3)

(118)

(+ + + +)	(– – – –)
(– – – +)	(+ + + –)
(+ – – +)	(– + + –)
(– – + –)	(+ + – +)
(+ + – –)	(– – + +)
(– + – –)	(+ – + +)
(+ – + –)	(– + – +)
$(+ – – –)_+$	$(– + + +)_+$

In order to change the configuration of a local section of the $\lambda_{-12,-15}$-vacuum so that the topology of its outer side is defined, for example, by the signature (– – + –), and the topology of its inner side by the antipodal signature (+ + – +), it is necessary to completely change the metric-dynamic structure of this section of the $\lambda_{-12,-15}$-vacuum. That is, to make its “color” topological atlas rebuild, for example, as follows:

$$
\begin{array}{cc}
(+\ +\ +\ +) & (-\ -\ -\ -) \\
(-\ -\ -\ +) & (+\ +\ +\ -) \\
(+\ -\ -\ +) & (-\ +\ +\ -) \\
(+\ +\ -\ -) & (-\ -\ +\ +) \\
(-\ +\ -\ -) & (+\ -\ +\ +) \\
(+\ -\ -\ -) & (-\ +\ +\ +) \\
\underline{(+\ -\ +\ -)} & \underline{(-\ +\ -\ +)} \\
(-\ -\ +\ -)_{+} & (+\ +\ -\ +)_{+}
\end{array}
\qquad (119)
$$

As an example, let's write the left ranking from (119) in expanded form:

$$
\begin{aligned}
&(\ g_{00}^{(\text{к})} x_0^2 + g_{11}^{(\text{к})} x_1^2 + g_{22}^{(\text{к})} x_2^2 + g_{33}^{(\text{к})} x_3^2) \ + \\
+ &(-g_{00}^{(\text{о})} x_0^2 - g_{11}^{(\text{о})} x_1^2 - g_{22}^{(\text{о})} x_2^2 + g_{33}^{(\text{о})} x_3^2) \ + \\
+ &(\ g_{00}^{(\text{ж})} x_0^2 - g_{11}^{(\text{ж})} x_1^2 - g_{22}^{(\text{ж})} x_2^2 + g_{33}^{(\text{ж})} x_3^2) + \\
+ &(\ g_{00}^{(\text{г})} x_0^2 + g_{11}^{(\text{г})} x_1^2 - g_{22}^{(\text{г})} x_2^2 - g_{33}^{(\text{г})} x_3^2) \ + \\
+ &(-g_{00}^{(\text{с})} x_0^2 + g_{11}^{(\text{с})} x_1^2 - g_{22}^{(\text{с})} x_2^2 - g_{33}^{(\text{с})} x_3^2) \ + \\
+ &(\ g_{00}^{(\text{б})} x_0^2 - g_{11}^{(\text{б})} x_1^2 - g_{22}^{(\text{б})} x_2^2 - g_{33}^{(\text{б})} x_3^2) \ + \\
+ &(\ g_{00}^{(\text{ф})} x_0^2 - g_{11}^{(\text{ф})} x_1^2 + g_{22}^{(\text{ф})} x_2^2 - g_{33}^{(\text{ф})} x_3^2) = \\
&\text{---} \\
= &(-g_{00}^{(\text{з})} x_0^2 - g_{11}^{(\text{з})} x_1^2 + g_{22}^{(\text{з})} x_2^2 - g_{33}^{(\text{з})} x_3^2).
\end{aligned}
\qquad (120)
$$

From the ranking (120) it is evident that in order to transform the topology of the "colorless" vacuum with the signatures of its two sides (+ – – –) and (– + + +) into a "colored" topological state with mutually opposite signatures (– – + –) and (+ + – +) it is necessary to change the sign of not one or two components of the metric tensor $g_{ij}^{(m)}$, but several of these quantities included in the corresponding column of the ranking (120), this requires significantly greater energy expenditure.

It remains to find out how the topology of the $\lambda_{-12,-15}$-vacuum can be changed? This question can be answered by geometrized vacuum kinematics and vacuum electrodynamics, presented in §7.3 in [4] and §§ 4 and 5 in [4]. Strong accelerated intra-vacuum currents, with their certain configuration and exceeding certain critical values, are capable of reconstructing the topological structure of a local section of the $\lambda_{-12,-15}$-vacuum and even leading to its “rupture”.

CONCLUSION

This eleventh part of the "Geometrized Vacuum Physics (GVP) based on Signature Algebra (SA)" (GVPh&SA) [1,2,3,4,5, 6,7,8,9,10] is devoted to the study of stellar-planetary gravity and levitation based on the metric-dynamic model of a naked "planet" (or "star").

According to the author, this article succeeded in combining the ideas of Bernhard Riemann and Albert Einstein in relation to clarifying the nature of gravity. Riemann suggested that a confluence of some substance drags all bodies to the center of the planet (or star), but he could not explain where the huge amount of this substance is placed, which stays at the core of planets and stars for many millennia. Einstein applied the amazingly beautiful mathematical apparatus of 4-dimensional Riemannian geometry to explain planetary (or stellar) gravity. In Einstein's GTR, gravity is the result of bodies being drawn into a stationary space-time funnel by inertial forces created by massive bodies. But, according to many philosophers, the space-time continuum is a purely mental construct that only allows us to copy extended reality in our consciousness. As already noted in the introduction, humanity does not have devices for measuring the duration of existence (i.e. real time); there are only frequency standards that produce a fairly stable sequence of pulses. Therefore, Einstein's inertial forces are ephemeral.

In this paper, all possible solutions of the Einstein vacuum equation without the Λ-term are used to form a metric-dynamic model of an electrically neutral stable spherical $\lambda_{6,7}$-vacuum formation of planetary (or stellar) scale. In this case, the effect of planetary gravity is explained by the fact that in all radial directions along the four sides of the 4-sided spiral (see Figure 10 and 13), two subcont-antisubcont currents flow toward the core of the naked "planet" and two subcont-antisubcont currents flow away from the core. The spatial-phase shift between these two powerful counter spiral currents (see Figure 11) leads to a residual phenomenon of an averaged confluence of the intertwined subcont-antisubcont fabric in the direction of the core of the naked "planet" (or "star").

Despite the fact that in the proposed model there is a confluence of subcont-antisubcont fabric to the core of the naked "planet" (or "star"), similar to the confluence of Riemann's substance, the vacuum balance in the GVPh&AC is not disturbed, since as much subcont-antisubcont flows from space to the core of the naked "planet" (or "star"), the same amount of subcont-antisubcont flows away from it into space along counter spirals (see explanatory Figures 7, 9, 10, 11a, 13, 17).

The confluence of the averaged subcont-antisubcont tissue into the depths of the planets (or stars) is also compensated, since what flows away from some naked "planets" (or "stars") and flows to other naked "planets" (or "stars"), there unfolds and returns to the first "planets" (or "stars") (see Figures 7, 15, 29). As a result of such continuous circulation of intertwined subcont-antisubcont currents (see Figures 13, 17), celestial bodies are attracted to each other, and these same subcont-antisubcont currents carry along with them all the small stable $\lambda_{m,n}$-vacuum formations ("corpuscles") into the depths of the "planets" (or "stars") (see Figures 6, 7, 9, 14, 18, 19).

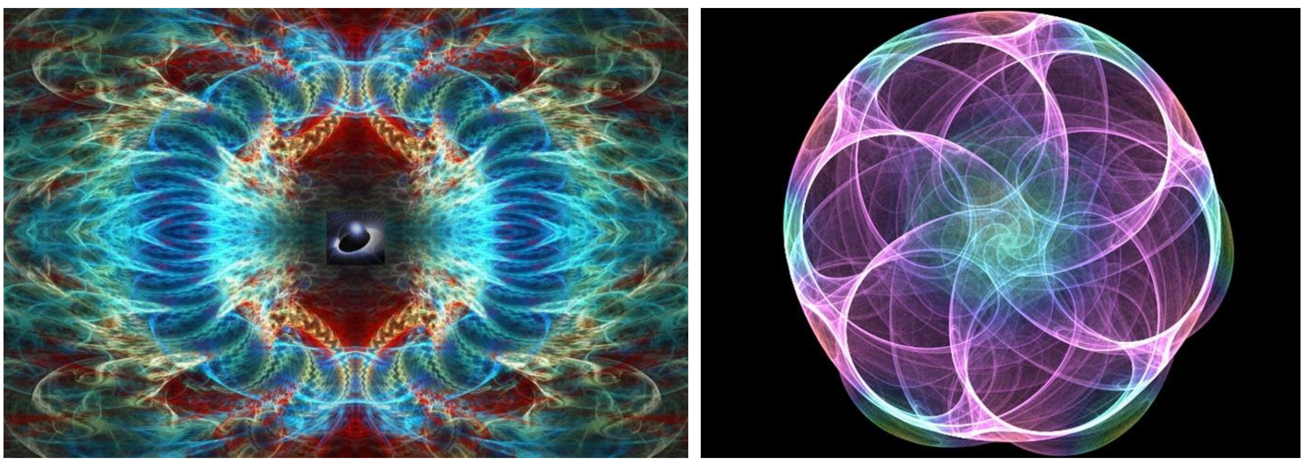


Fig. 29. Illustration of the circulation of intertwined subcont-antisubcont currents

Thus, in the proposed model of gravity, on average, the vacuum balance is not disturbed, and in such a complexly balanced interplanetary and interstellar circulation of the average "nothing" lies the secret of universal gravitation.

Within the framework of the proposed GVPh&AS concept, a naked "planet" (or "star") is a transparent $\lambda_{6,7}$-vacuum formation. On average, subcont-antisubcont $\lambda_{6,7}$-vacuum currents flow to the core of this formation, which carry away various "corpuscles" (including "atoms" and "molecules") from the nearest space (see Figure 14). As a result, a "corpuscular" ("atomic"-"molecular") medium is formed around the transparent core of the naked "planet", which is usually called the crust and mantle of the planet. Let's recall that a naked "star" is a very large naked "planet", in which a huge number of planetary P_k-"quarks" create gravity, which leads to thermonuclear reactions igniting in the "atomistic" depths of the star.

To summarize, in simple terms, we will note once again that the metric-dynamic model of gravity presented here assumes that a fabric woven from many powerful descending and ascending subcont-antisubcont spiral currents descends on each of us (see Figures 9, 12). The reason for this phenomenon is the spatial-phase shift between the descending and ascending subcont-antisubcont currents (see Figure 11). As a result, a weak averaged flow of the subcont-antisubcont fabric carries with it many small "corpuscles" to the core of the naked "planet" (or "star") and forms, on average, a spherical "atomistic" shell.

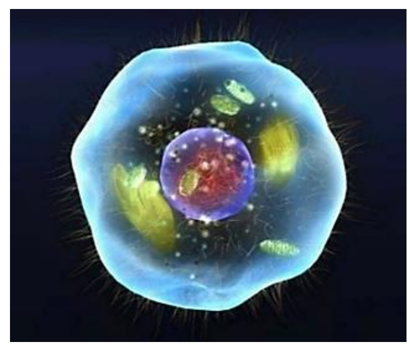
The sizes of the atomistic shells of naked "planets" and "stars" are the result of the balance between the subcont-antisubcont currents flowing to their cores and flowing away from their cores. This is similar to animals, whose sizes depend on their metabolism (i.e. on how much the animal consumes and excretes).

A similar gravitational effect occurs not only in the vicinity of the nuclei of all naked "planets" and "stars", but also in the environment of the cores of all stable spherical $\lambda_{m,n}$-vacuum formations of various scales that are part of the hierarchical cosmological model [6], see, for example, the refined metric-dynamic models of the "electron" and "positron" (82) – (91).

Thus, inter-corpuscular gravitation is of a universal (Universal) nature. But gravitational attraction is approximately 40 orders of magnitude weaker than electrical interaction (see [7]), therefore, when considering metric-dynamic models of "corpuscles" of pico-, nano- and microscopic scales in [6] – [8], their gravitational interaction was not taken into account.

The advantage of the proposed gravity model over all previous attempts to explain this phenomenon is that the GVPh&AS provides for the possibility of the existence of not only descending, but also ascending subcont-antisubcont currents. In this case, descending and ascending subcont-antisubcont flows can be used to develop alternative methods of movement in space. The subcont-antisubcont model of gravity prepares the theoretical basis for the creation of flying devices (such as Grebennikov's gravitaplane, see Figure 24), based on the use of interplanetary and interstellar intra-vacuum flows, by means of artificially changing the topological configuration of a local section of extended existence.

At the same time, the model constructions of GVPh&AS do not explain the cause of planetary gravity, just as neither Newton's celestial mechanics nor Einstein's general theory of relativity explain it. All model concepts of gravity mentioned in the Introduction, including GVPh&AS, only describe this phenomenon.



When revealing deeper causes, gravity can be considered as a psychosomatic phenomenon. It was already mentioned in the Conclusion of the article [10] that Planets and Stars are in many ways similar to the organelles of living biological cells. Within the framework of this analogy, Planets and Stars suck in the nutritious subcont-antisubcont mixture (i.e. arterial lymph with nutrients) and expel the spent subcont-antisubcont mixture (i.e. venous lymph with waste). At the same time, what is liquid waste for some Planets and Stars is nutritious moisture for other Planets and Stars, and vice versa. That is, subcont-antisubcont interplanetary and interstellar circulation provides exchange processes within a single Cellular Organism – the Star-Planetary living system.

For example, the souls of people manifest themselves in the dense layers of the atmosphere of Planet Earth, as a clean fresh breath, and then move away from the Earth filled with bitter experience and a sense of guilt or a sense of duty fulfilled and bright joy.

Each Planet and Star has its own character, therefore those subtle shades of sub-cont-anti-subcont currents that emanate from their depths transfer the influences of this character to the subtle aspects of other Celestial Bodies and their inhabitants. Astrology was the forerunner and stimulus for the development of astronomy and all science in general, in particular Newton's celestial mechanics. Now we return to the study of the influence of Planets and Stars on the nature of interstellar and interplanetary relations, but on a new qualitative level. The Wheel of Denial-Denial makes another turn.

ACKNOWLEDGEMENTS

I sincerely thank Gavriel Davidov, David Reid, Tatyana Levy, Eliezer Rahman, David Kogan, Gennady Ivanovich Shipov, Evgeny Alekseevich Gubarev, Carlos J. Rojas, Alexander Maslov, Alexander Bolotov and Alexander Bindiman, Nikolay Agapov for their assistance.

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