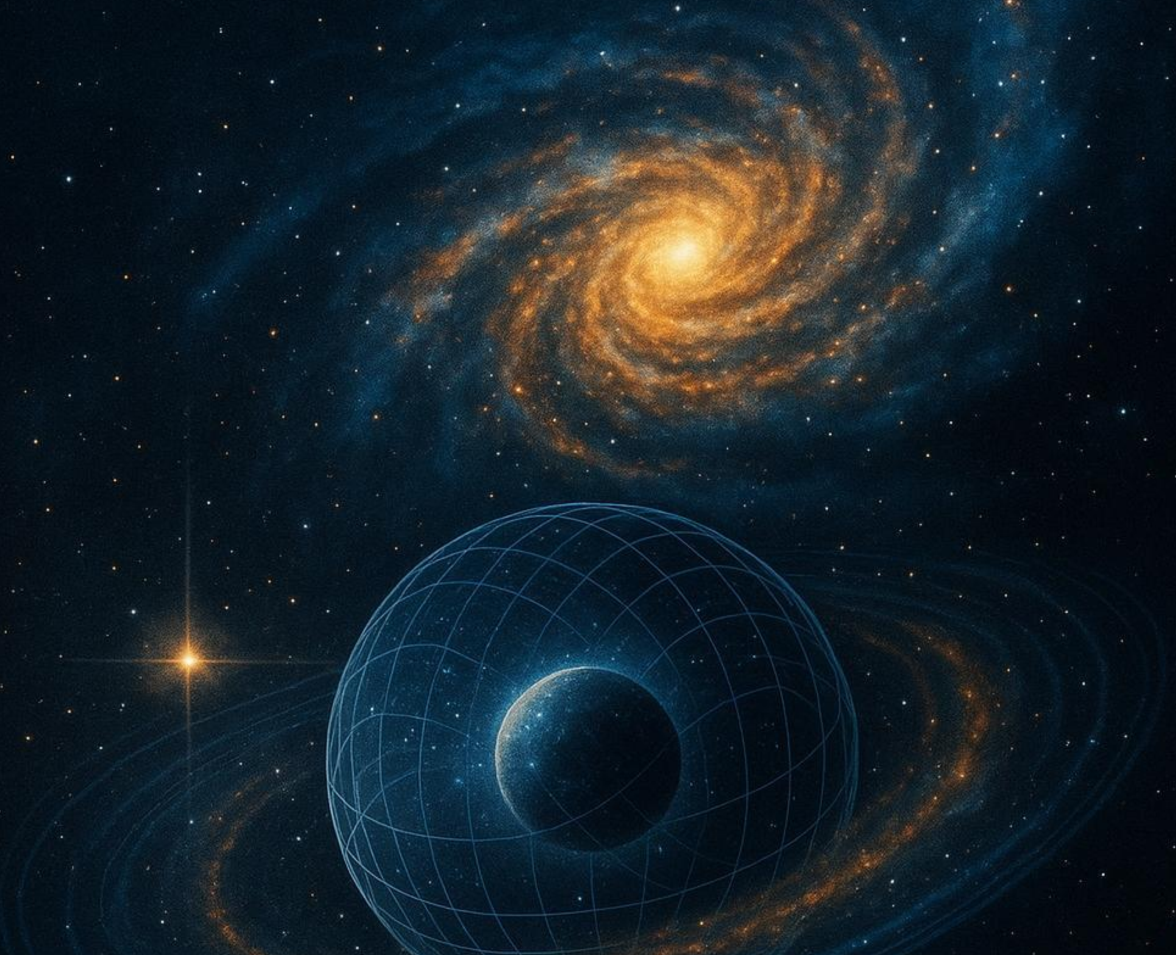
THE NATURE OF MATTER AND ENERGY

IN THE CONDITIONS OF A CYCLICAL UNIVERSE



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Hypothesis by Oleg Khatsaev

“The Nature of Matter and Energy in the Conditions of a Cyclical Universe”

Chapter I. The Optical Effect of Shifting the Observation Point and the Nature of Light Clusters

When observing the night sky, one can notice that some stars twinkle more intensely, others less, and some do not twinkle at all. Upon closer observation, it becomes clear that objects that do not exhibit the twinkling effect are, as a rule, bodies within the Solar System: planets, satellites, comets. This observation contradicts the assertion that the twinkling of celestial objects is caused exclusively by the refraction of their light in the Earth's atmosphere. After all, if the atmosphere distorted the light of all objects equally, we would not be able to observe evenly shining objects through the same atmosphere.

In this theory, light is considered not as an abstract wave, but as a stream of particles possessing mass and identifiable as light during movement in the field (ether) at certain speeds. The size of a particle is impressively small. Light is what we see when conducting experiments with the smallest particles known to us. Each light particle has its own gravitational field and can interact with other particles — especially under conditions of weightlessness and prolonged rest relative to each other, as occurs inside a beam of light traveling through space for millions or billions of years. If we imagine that we are able to move at the speed of light and observe what is happening inside the beam itself, we would see the following picture.

Leaving a star, the light stream initially cannot be absolutely homogeneous. Even within the limits of one light-second, the intensity of the light emission fluctuates due to processes occurring within the star. This means that inside the beam, already at the initial stage, regions with greater and lesser particle density are formed, which means — regions with different mass.

These differences cause gradual gravitational redistribution of particles: more massive and dense regions become small centers of mass, attracting neighboring particles, forming light clusters, while less dense regions become increasingly rarefied and dim. As a result, as the beam moves away from the source, it transforms — from a relatively uniform light stream into a sequence of condensations alternating with rarefied areas, similar to how a smooth stream of water falling from a height eventually begins to split into droplets.

Thus, the effect of a star's twinkling in the night sky may be caused not by the influence of the atmosphere, but by gravitational processes inside the light stream. These light clusters, when entering the focus of a telescope, create a ripple effect — an image resembling the play of sun glints on water, similar to observing the reflection of a light bulb in shimmering water. However, when using more powerful optics, the pattern becomes obvious: the higher the resolution and magnification of the instrument, the less pronounced the ripple effect is. This indicates that with deeper focus — closer to the light source — we observe the beam at an earlier, not yet distorted segment of its path, when light particles have not yet had time to form dense gravitational clusters.

From this follows an important conclusion: an optical device is capable, in a certain sense, of moving the observation point closer to the light source. We, as observers, do not change our position in space, but focusing on a section of the beam closer to the object allows us to see what is happening there, as if we ourselves were located at that point. All intermediate space — millions of light-years filled with light clusters and gravitational distortions inside the beam itself — actually remains behind the observation point, beyond the optical focus.

This means that through optics, we receive an image from a region where natural light would not have yet arrived — and we do so instantly, at the moment of focusing. Consequently, the image transmitted through an optical device reaches us at a speed significantly exceeding the speed of light in a vacuum.

This statement must be confirmed experimentally using two optical instruments — one with maximum and the other with minimum optical magnification — and one observed object at a great distance. The instruments should analyze the light emission parameters of the object and signal changes (fluctuations, flares, etc.); the instrument equipped with optics should detect changes faster. With the same distance between the instruments and the observed object, due to the shift of the focal point, the first instrument will transmit the image faster, because its focal point was much closer to the object, bypassing part of the path.

This effect cannot be explained by time dilation or spatial deformation, since we observe not the change of the beam itself, but the real transformation of the stream of particles occurring under the influence of internal gravitational interactions. Consequently, the optical shift of the observation point is a physically justified effect, indicating the possibility of perceiving events at the moment of their actual occurrence, despite the remoteness of the object.

We now arrive at a deeper concept: if light is capable of transforming under the influence of gravity, if it exhibits both particle and wave properties, then light is a special form of matter, possessing all the properties of energy, mass, and the tendency toward gravitational interaction and transformation.

This logically leads to the next chapter, where we will examine the nature of light as matter and move on to the discussion of the hypothetical particle — the graviton, as a carrier of energy and a key to understanding the nature of matter, mass, and gravitational interaction in the Universe.

Chapter III. Light as Matter and Energy

Based on the results of the observations described in the previous chapter, it becomes obvious: light is not an abstract wavefront, but a stream of particles possessing a specific structure, interacting with each other and with the external environment. The effect of clusters formed in the beam over billions of years of travel shows that light is not homogeneous or continuous. On the contrary, it has properties characteristic of mass — the tendency to gravitational attraction, structuring, and even aggregation.

From this observation follows the first main thesis of this chapter: light is matter in an energetically excited state. It represents a flow of microparticles possessing mass, and therefore also energy. It is this energy that makes light not only visible but also capable of exerting influence on other physical bodies.

In physics, there has long been a formula combining mass and energy:

$$E = mc^2$$

If light possesses energy (and this has long been confirmed in both laboratory and astronomical experiments), then, consequently, it must also possess mass. Although extremely small, the mass of a light particle is not zero. This means that light, passing through space, must obey the same laws of gravity as any other form of matter. This is confirmed by how light bends around massive objects (gravitational lensing) — but within the framework of this hypothesis, we propose not just the effect of bending, but the gravitational transformation of the light beam itself over time, accompanied by the formation of clusters and voids.

Moreover, if light is matter, then it does not simply move by inertia but also experiences energy loss during propagation. This manifests itself in redshift, in the fading of signal intensity, and also — potentially — in the mass degradation of the light stream itself, where, over great distances, particles lose the ability to move uniformly and begin to gravitationally interact with each other. This makes the beam not only a carrier of information but also an object of internal transformation — a self-compressing and self-forming stream of matter. If, for example, we take a beam two light-seconds long and block it at the source, then light will continue to reach the final point for two more seconds from the moment of blocking.

If light is matter capable of energetic excitation, we can then propose the second key thesis of this chapter: any radiation is a form of mass loss. An object that emits light loses part of its mass, transferring it in the form of excited particles — photons or similar units of light matter. This is true for both thermal and any other radiation. The energy of radiation that we register is not an abstraction; it is a real outflow of substance in a special phase — the phase of light matter.

From this arises a logical conclusion: any luminous body is subject to energetic and mass loss, and during the absorption of light by a body, on the contrary, an increase in mass should be observed, albeit at the microscopic level. Thus, light ceases to be merely a “carrier of information” in the traditional sense and becomes a physical agent of matter exchange between bodies.

It should also be emphasized that under conditions of strong gravity — for example, near massive objects or inside stars — the behavior of light matter may acquire qualitatively different properties. It is possible that in these conditions, excited light particles may transition into a reactive density phase, and this opens the way to the next stage of consideration — to the phases of heavy and superheavy matter and their ability to undergo thermonuclear transformation, which will be considered in the next chapter.

In conclusion of this chapter, it can be said: light is not just energy; it is matter in the form of a stream, subject to all the laws of gravity and interaction. Optical observation allows us to see not only the external side of this stream but also the involvement of light in global gravitational processes. Passing through the Universe, light loses its original form, turning into a pulsating structure, where clusters and voids alternate as a result of the interaction of elementary masses inside the stream. It is this that makes both the phenomenon of twinkling and the optical shift of the observation point possible.

The next chapter will be devoted to the internal phase states of matter, forming dark matter, reactive layers, and the mechanism of thermonuclear synthesis under conditions of extreme density. We will approach the understanding of the graviton as a fundamental unit of cosmic mass.

Chapter IV. Internal States of Matter and Dark Matter. Reactive Layer and the Mechanism of Thermonuclear Synthesis

Considering light as matter possessing mass and capable of interaction, we inevitably come to a broader concept of matter as a structure capable of existing in various phase states. In this context, both ordinary and dark matter can be viewed as systems subject to transitions between internal phases depending on pressure, density, temperature, and external and internal influences — in particular, gravity.

1. Phase Model: Core and Reactive Layer

Moving from light matter to denser forms, we assume that upon reaching a certain critical density, matter — including hypothetical dark matter — can enter a phase in which thermonuclear synthesis begins. This phase is accompanied by the formation of what is called a reactive layer — a shell around the compressed core, where interaction with the external environment triggers physical and energetic reactions.

The basis of thermonuclear reaction is reaching a temperature and pressure high enough to overcome the Coulomb repulsion between elementary particles. However, in the case of dark matter, we are dealing with a different mechanism: the force that holds it in the compressed phase is not Coulomb interaction, but the internal gravitational attraction of the particles themselves, acting at the microscopic level.

Under the influence of gravitational forces, matter from cosmic space accumulates into enormous massive objects. Deep within these formations, pressure and temperature increase, leading to the collapse of the core and its compression into an extremely dense state of dark matter. Heated to extremely high temperatures, it in turn absorbs and transforms into itself all the matter that triggered its formation and surrounds it. When this sort of cocoon of absorbed matter becomes depleted, external pressure decreases, and the surface of the formed dark matter structure enters a decomposition reaction, releasing an enormous amount of thermal and light energy. When the volume and mass of the reactive layer increase sufficiently, pressure on the surface of the core stabilizes the reaction to a necessary intensity capable of maintaining the optimal volume of the reactive layer.

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3. The Reactive Layer as an Optical and Thermal Phenomenon

If a star or its analog consists of a core and a reactive layer, then it is the layer that is responsible for observable emissions — electromagnetic bursts, heat, and light, which are visible because the reactive layer is located outside the zone of light absorption. The internal structure (the core) may not only be invisible, but also remain stable as long as the reactive layer is not exhausted. The exhaustion of the core's reserves will lead to insufficient generation of the reactive layer to stabilize the decomposition process, resulting in weakened pressure on the core, which will lead to an “opened soda bottle” effect and the birth of a red giant.

In this understanding, a star is not a single burning body, but a phase system, existing at a certain stage of its existence.

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4. The Graviton as an Aggregate of Dark Matter

Continuing to develop the hypothesis, we introduce the concept of the graviton — not in the sense of the theoretical quantum particle of gravity, but as an aggregate of dark matter, capable of accumulating mass, compressing, and entering the phase of thermonuclear synthesis. In this condition, the graviton becomes a source of energy — a local core capable of forming a reactive layer and transforming surrounding matter.

By graviton, we will refer to matter whose density and gravitational properties allow it to absorb light, making visual study impossible. A graviton can exist at different stages of development. We will consider three assumed stages:

• First-phase graviton (forming a reactive layer around itself);

• Second-phase graviton (formed as a result of the collapse of the first-phase graviton and being the matter of black holes);

• Primary graviton with the maximum possible density (other intermediate phases may also exist).

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5. Transition to Black Hole — Not Destruction, but Continuation of the Compression Cycle

According to this model, black holes are gravitons of the second and subsequent phases, having transitioned into a state in which the reactive layer disappears, thermonuclear reaction ends, and only the invisible core remains, continuing to absorb matter. However, from the standpoint of phase theory, this is not the end, but one of the possible stages.

Besides the primary phase — which we will examine in the following sections — it is likely that other intermediate phases of the graviton exist, although under current conditions we cannot identify them.

In the next chapter, we will attempt to explain the nature of the first-phase graviton, using the example of our Sun.

Chapter V. The Nature of the Sun. Sunspots as Overheated Zones and the Manifestation of the Graviton's Interaction with the Reactive Layer

After examining the internal structure of matter and the mechanism of thermonuclear synthesis in dark matter and gravitons, it is logical to turn to the closest and most studied object — our Sun. We know much about it, but there are several observable phenomena that are not only not definitively explained, but also contradict common representations. Among them is the nature of sunspots.

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1. The Sun as a Phase Structure

From the perspective of the previously described hypothesis, the Sun is not simply a sphere of hydrogen in which thermonuclear reactions take place. It is an object with a phase structure: a dense core possessing active mass, and a reactive layer, where the main energy transformations occur. The reactive layer is the zone in which matter enters the phase of thermonuclear synthesis and emits radiation. This process is not constant or uniform — its properties depend on the condition of the core and the external pressure exerted on it.

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2. Sunspots as Overheated Zones

It is commonly believed that sunspots are regions of lower temperature, caused by disruption of circulation or the emergence of magnetic field lines. However, within the framework of the proposed model, such interpretation leads to logical contradictions.

First, the temperature of the photosphere is about 5500°C. In order for a spot to appear darker, its temperature must be significantly lower. But to cool such a vast fragment of the Sun’s surface, there must be external cooling conditions or a mechanism of heat removal — which do not exist. Moreover, spots appear, grow, and disappear with enormous mass and energy, leaving no trace of cooling — which contradicts the law of conservation of energy.

We propose the opposite: sunspots are overheated zones, where thermonuclear activity reaches such a level that the photosphere burns out, evaporates, or breaks through, under the extreme influence of fragments rising from the dense core.

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3. The Mass of Sunspots as Evidence

The largest recorded group of sunspots, observed in October 2014, had an area comparable to 66 Earths and an estimated mass of approximately 35 quintillion tons.

It is physically impossible for such a colossal region to cool significantly, locally, in a short time without a mechanism of energy removal.

If we assume that a sunspot is a zone where a fragment of a first-phase graviton surfaced — which burned through and overheated the photosphere above it — then many characteristics of dark spots become more logical.

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4. Rotation and Equatorial Displacement

The Sun rotates, and this rotation affects the behavior of matter in the reactive layer and fragments detached from the core. During rotation, dense formations begin to shift toward the equator due to the action of centrifugal forces. This explains why the largest spots most often form in the equatorial region of the Sun.

During active processes occurring on the surface of the solar core, fragments detached from it rise toward the surface, carried by reactive flows. Small fragments dissolve in the reactive layer on the way to the surface, while larger ones, displaced by centrifugal force toward the equator, rise to the surface of the reactive layer, where they are held by powerful ascending currents. Before spots become visible, electromagnetic disturbances appear above the rise area; then the photosphere layer above and around the spot burns out — and the spot becomes visible.

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5. Optical Observation and the Overheating Hypothesis

Optical observations from Earth and satellites show that in the zones of sunspots, oscillations, pulsations, and flashes are often observed in the ultraviolet and X-ray ranges. This confirms high activity, not “coldness”.

We are simply observing an overheated fragment — like a piece of a dissolving aspirin tablet, separated and pushed to the surface by rising streams of gas.

Thus, the Sun is not a static furnace, but a phase structure operating according to the graviton model: dense core, thermonuclear reactive layer, and outer shell. Sunspots are not cooling defects, but consequences of overheating, resulting from the ejection of a first-phase graviton. Therefore, the processes occurring on the surface and in the depths of our star acquire a new and far more rational meaning.

Chapter VI. Black Holes as the Highest Stages of Gravitational Compression and Matter Density

Continuing the logic of previous chapters, we now approach objects traditionally considered the most mysterious in the Universe — black holes. But in the context of this hypothesis, their existence becomes not mystical, but a natural continuation — the second stage of the graviton, or the next step in the lifecycle of dense matter.

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1. The Graviton of the Second Phase

If the graviton of the first phase is a dense structure in the centers of stars or galaxies, then the black hole is the graviton of the second phase, meaning a graviton that has reached such a level of compression that:

With further accumulation of mass (through absorption or collision), internal pressure stops thermonuclear reactions;

The reactive layer collapses onto the graviton of the first phase, triggering a powerful explosion;

As a consequence, the core undergoes collapse into the state of the second-phase graviton, or black hole.

As a result, a black hole is born with a core of the second-phase graviton, which, after absorbing the products of the explosion, becomes invisible.

Key properties of the graviton of the second phase:

• Gravity becomes so strong that even the outer layer, interacting with cosmic space, experiences pressure preventing decomposition and thermonuclear reactions.

• Visual observation becomes possible only in cases of capture and absorption of cosmic matter, as the event horizon becomes visible.

• This may appear like a supernova explosion, and on larger scales — like the birth of a galaxy.

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2. Violation of the Principle of the Finite Speed

When studying the event horizon, we encounter a paradox.

If light cannot escape a black hole, then the rate at which similar-mass particles are absorbed is higher than the speed of light.

This does not mean that a black hole drags in any matter at such a speed, because massive objects cannot accelerate up to light speed due to kinetic energy limitations. But as matter approaches the event horizon, heating and acceleration break it down into a state in which nothing prevents further acceleration.

This suggests the possibility of exceeding the speed of light under certain conditions — not as a violation of physics, but as an indication that matter in extreme phases is not obliged to obey the limitations of known physical states.

In other words, light is the manifestation of energy in one specific state, not the ultimate speed limit. It is possible that the density phase achieved by a black hole absorbs energy faster than energy can move in other states.

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3. The Optical Paradox

In earlier chapters, we considered the possibility of optically shifting the point of observation closer to a light source. But when observing black holes, optics becomes powerless. We cannot see anything, even with increased magnification.

Why?

Because in the case of a black hole, there is no reflected or refracted signal.

It is not a matter of distance, but a matter of phase: the matter is in a state in which light cannot manifest itself.

Optics works only where light exists as matter.

Inside a black hole, light exists as potential energy, locked in a gravitational field.

Thus, a black hole is not only an absorber of matter, but also of energy. It becomes an absolute optical shadow, while retaining full presence of mass — and its core may remain liquid or gaseous.

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4. Physical Opacity and the Gravitonic Core

It is proposed that a second-phase graviton (black hole) does not contain emptiness, but matter of extremely high density.

This aggregate possesses mass and gravity, acting on the surrounding space.

Everything we perceive as a “hole” is not an absence of matter, but simply a volume where light cannot manifest — rather than disappear.

Thus, black holes are not the opposite of matter, but its logical continuation.

This is a stage toward which any matter may evolve, if it accumulates enough mass and compresses to extreme density.

It is a phase in which matter ceases to be visible, but continues to exist as a carrier of gravity and mass.

In the next chapter, we will examine the cyclic nature of the Universe and the role played by the graviton in this process.

Chapter VII. The Cycle: The Return of the Universe to the Primary Graviton and the New Big Bang

As described earlier in this hypothesis, the entire Universe originated from the explosive expansion of the Primary Graviton — an object of ultimate density, in which matter existed in one, maximally compressed state.

We have examined the processes of dispersion and condensation of matter, described the formation of first- and second-phase gravitons (including black holes), and shown that density can increase due to gravitational interaction.

It is now time to consider the final stage of this cycle — the return of all matter of the Universe back into the Primary Graviton, and the conditions under which a new Big Bang may occur.

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1. The Universe is not infinitely expanding, but has its cycles

Modern cosmology often operates with the idea of infinite expansion.

However, if we accept the hypothesis that dark matter and gravitons are carriers of density and matter phases, then it becomes clear:

👉 Gravitational interaction never disappears.

Nothing in the Universe can continue endlessly from the perspective of physics.

Eventually, the kinetic energy of expansion will weaken, and expansion will slow down until it stops completely.

This moment — the balance between expansion and gravity — will mark the beginning of the reverse phase, when gravity becomes the dominant driver.

Matter, once thrown outward by the Big Bang, will begin its journey back to the center.

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2. The Uniqueness of the Primary Graviton

All these processes must have a cause, and according to this hypothesis, that cause is the Primary Graviton.

It is assumed that the Primary Graviton represents ultimate density, where no molecular or atomic structure exists, and matter is represented only as pure energy held by gravity.

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3. Matter Falling into the Primary Graviton

As stars, galaxies, and black holes move closer to the central black hole of the Primary Graviton, gravitational attraction strengthens.

Objects participating in this motion inevitably fall into the gravitational fields of other black holes moving in the same direction.

Eventually, only black holes — gravitons of the second phase — remain, moving toward the common center to become the fuel for the new Big Bang.

This stage will resemble absolute silence before a storm, although in reality, it is the most intense process in the cyclical Universe.

A silent and absolutely invisible process — the merging of black holes into one giant structure, which will become the Primary Graviton, implies the phase transition of all universal matter into a state of pure energy.

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4. The Mechanism of the New Big Bang

At the moment when the Primary Graviton absorbs all matter, breaking it down into pure energy, the central black hole becomes an energy field that no longer interacts with anything except itself.

⚡ Losing an external factor of interaction, the energy object changes polarity —

from compression to repulsion, which leads to expansion, once again filling cosmic space.

During expansion, the separation of a single whole object into many gives rise to self-polarity in each of them (like when a magnet is broken into pieces and each fragment becomes polarized).

This becomes the trigger for a new cycle of interaction, fusion, and growth of mass.

But the most important thing — the cycle continues.

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5. Possibility of Other Universes

This model is not limited to our Universe only.

If we allow that each phase — compression and expansion — occurs within its spatial limits, then it is quite possible that:

• Other Universes exist beyond our own,

• Each has its own Primary Graviton,

• Each lives in its own cycle: expansion → compression → new explosion.

Thus, the Multiverse is not parallel reality (as in fiction), but a natural consequence of gravitational cyclicity, where each Universe is a pulsating organism, living by its own laws, but subject to the common logic of matter, energy, and gravity.

Conclusion

Despite our massive knowledge base, humanity is still at the very beginning of understanding the world. There are things we cannot comprehend due to insufficient awareness of the structure of the Universe. The lack of information leads our reasoning down false paths, significantly lengthening our journey toward understanding.

Try, as an example, to imagine the edge of space — and the mind will guide you from one barrier to another, because it cannot imagine what “nothing” looks like. As a result, we are not thinking about how it is arranged, but simply shifting the imaginary boundary farther and farther, unable to describe what exactly we are looking for.

In the search for answers, we must rely on unshakable laws:

“Everything has a cause” — just as unshakable in philosophy

as “Energy cannot be destroyed” — in physics.

Our Universe exists within these laws.

And when it seems that something violates them, it only means one thing —

👉 We do not yet have enough knowledge.