

## Section 2. Earth sciences

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### THEORY OF THE EXPANDING EARTH ON THE SOLUTION TO THE PROBLEM OF ENERGY AND MATTER SOURCES

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#### Abstract

Mathematical models and estimates of the Earth's size and mass, intended to discredit the theory of a planet growing in both diameter and mass, prove untenable when faced with geological experimental data. However, the main reason why the theory of plate tectonics continues to dominate in geology is the challenge of identifying a mechanism that would enable planetary growth.

The idea of the existence of an ether, the flow of which is pushing matter toward the planet's center, while aimed at addressing the generation of matter and energy at the Earth's core, falls short in several respects. It fails to answer simple questions such as, 'What force attracts ether to the center of celestial bodies?', 'Where is the source of ether?', 'Why has the ether flow not been exhausted after 14 billion years of the Universe's existence?', 'What is the mechanism of ether transformation into baryonic matter with energy release?', 'What energy source sustains the continuous excited state of ether particles?', 'What constitutes ether matter in its unexcited state?' Furthermore, this concept lacks experimental support, as demonstrated by direct measurements of space 'graininess' (quantization) (ESA, 2011).

Proponents of the idea that a fragment of a neutron star exists at the Earth's core should understand that a neutron star is a hypothetical object, which exists in astrophysicists' imagination due to a mathematical model that corresponds to the properties of certain celestial bodies. According to this same model, a separate fragment of neutron matter is unstable, disintegrating explosively within 10 minutes of separation from the main mass.

Nevertheless, the principle of conservation of matter and energy, while experimentally validated through the laws of conservation of energy, momentum, angular momentum, electric charge, etc., is not absolute. This circumstance, combined with astrophysical observational data, points to the existence of sources of energy and matter within the interiors of celestial bodies that are unknown to current science.

**Keywords:** *plate tectonics, expanding Earth theory, cosmic matter accretion, primordial*

hydride Earth theory, paleontological paradox, internal activity of celestial bodies, Earth's magnetic field, vacuum energy, variation in gravitational field intensity, gravitational-meteorological paradox

### Myth or Reality?

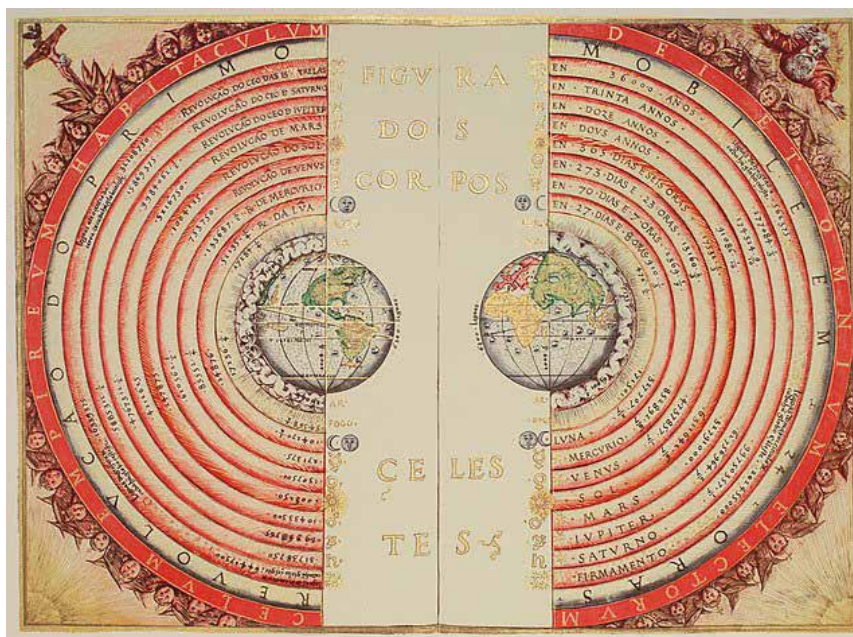
#### Science and Established Truths

Remarkable scientific discoveries over the past two decades have changed scientists' understanding of the Earth's interior. However, due to the inherent conservatism of science, it takes decades for new experimental data to reach a broad audience.

In ancient times, practical knowledge based on everyday activities was highly valued. For example, sailors knew from experience

about the convex shape of the water's surface and the change in the position of the Pole Star as they moved from south to north. The hypothesis of a spherical planet was able to explain the round shadow of the Earth on the Moon's surface. As a result, Eratosthenes (4<sup>th</sup> century BCE) was able to calculate the diameter and surface area of our planet by conducting an experiment to determine the proportions of the shadow cast by objects at noon at different latitudes.

**Figure 1.** Illustration of celestial bodies in the geocentric system. A colored illustration of the Ptolemaic geocentric concept of the universe, presented by Portuguese cosmographer and cartographer Bartolomeu Velho in his work *Cosmography*, published in France in 1568 (National Library of France, Paris). Note the distances of the celestial bodies from the Earth's center (left) and the revolution periods in years (right). The outermost text reads: "The Celestial Empire, the abode of God and all the chosen"



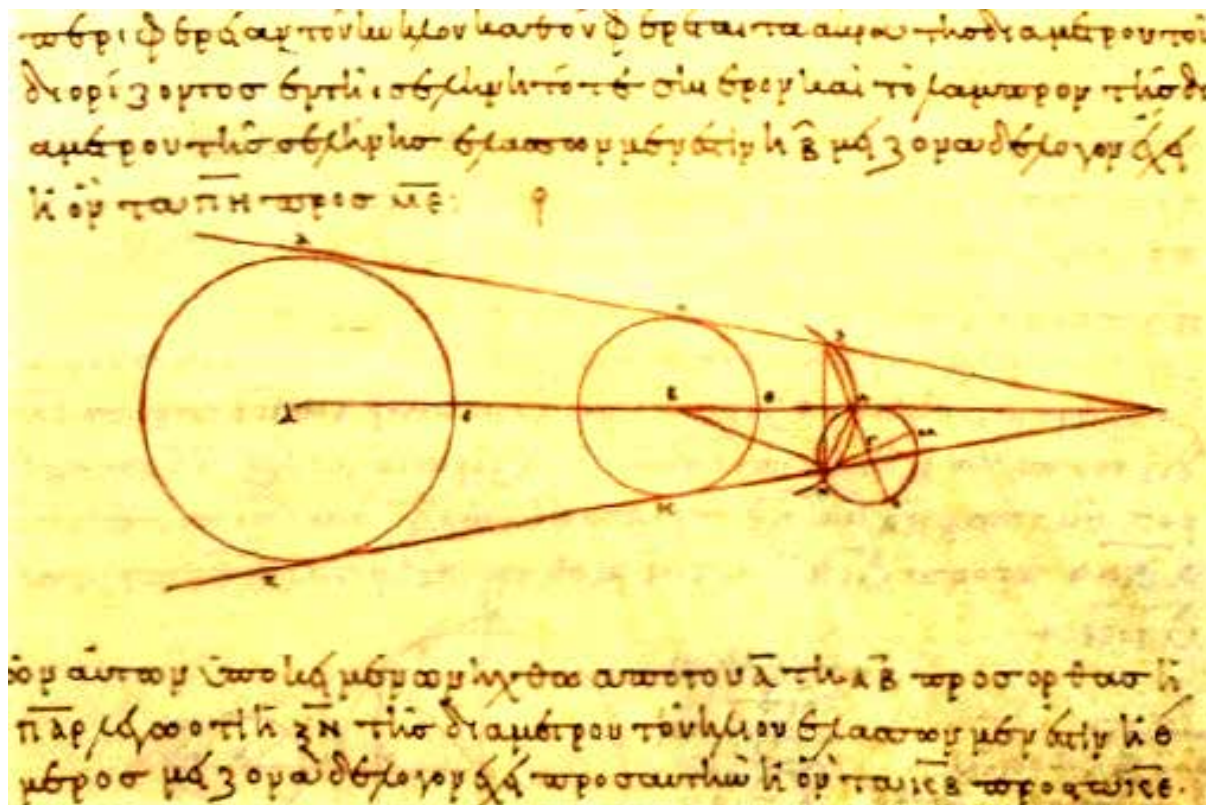
Source: Wikipedia

Other knowledge, such as the rotation of planets around the Sun, was obtained by the philosopher Aristarchus of Samos through mathematical calculations as early as the 3<sup>rd</sup> century BCE, but was far removed from the everyday world and had no practical application (Veselovsky, I.N., 1961).

Aristarchus was an authoritative astronomer of his time, living and working in Alexandria. One of his works, *On the Sizes and*

Distances of the Sun and Moon, was later included in the collection *Minor Astronomers*. Those who wished to devote themselves to astronomy had to study it after completing Euclid's geometry course but before starting Ptolemy's *Almagest*. However, Aristarchus himself was accused of blasphemy during a period of increased religious persecution and was expelled from Alexandria (Veselovsky, I.N., 1961).

**Figure 2.** Illustrations from Aristarchus of Samos's book on the Sizes and Distances of the Sun and Moon. ΓΑ Greek copy from the 10<sup>th</sup> century CE (Vat. gr. 204 fol. 116 recto math 06 NS. 02)



Source: Wikipedia

If we assume that the Earth revolves around the Sun, its trajectory, which is almost circular, has a radius of more than 23,000 Earth radii, i.e., more than 150 million kilometers. Thus, the Earth moves 300 million kilometers over six months in relation to the Sun – a gigantic distance! However, the starry sky appears the same to an observer on Earth. The Earth moves closer to and farther from the stars by 300 million kilometers, but neither the apparent distances between the stars (e.g., the shape of constellations) nor their brightness changes. This means that the distances to the stars must be thousands of times greater, implying that the celestial sphere must have unimaginably large dimensions! (Protasov, V. Yu., 2010).

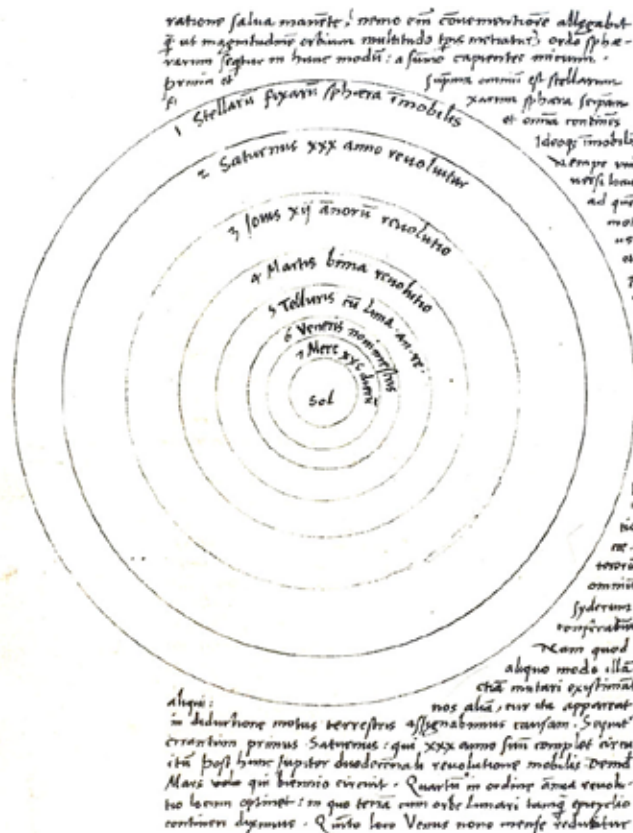
Aristarchus himself realized this, writing in his book: “The volume of the sphere of fixed stars is as many times larger than the volume of the sphere with the radius Earth-Sun as the volume of the latter is larger than the volume of the Earth,” meaning that, ac-

ording to Aristarchus, the distance to the stars was  $(23.455)^2$  times greater than  $R$ , or over 3.5 trillion kilometers. In reality, the distance from the Sun to the nearest star is about 11 times greater. Instead of a compact and cozy world centered on the Earth and enclosed within a relatively small celestial sphere, Aristarchus painted an abyss. And this abyss terrified everyone (Protasov, V. Yu., 2010).

Simple ideas are easier to understand and are preserved for millennia. One such idea is that Aristarchus of Samos's teachings are absurd since there is practically no room for the celestial sphere. Where, then, do the souls of people go after death?

The crystalline sphere still appears in Nicolaus Copernicus's book *On the Revolutions of the Celestial Spheres* 1.700 years after Aristarchus. In his heliocentric system, the planets were still compactly arranged and moved in circular orbits, introducing even greater errors in calculations than the geocentric system.

**Figure 3.** The celestial spheres in Nicolaus Copernicus’s manuscript: 1) Stationary sphere of fixed stars; 2) Saturn. 30-year revolution; 3) Jupiter. 12-year revolution; 4) Mars. 2-year revolution; 5) Earth. Annual revolution with the Moon in orbit; 6) Venus. 9-month revolution; 7) Mercury. 80-day revolution; 8) The Sun is at the center of the system



Source: Wikipedia

**Continental Drift or Expanding Earth?**

The Expanding Earth hypothesis, which Charles Darwin arrived at in the 1830s while studying the coast of South America, and the

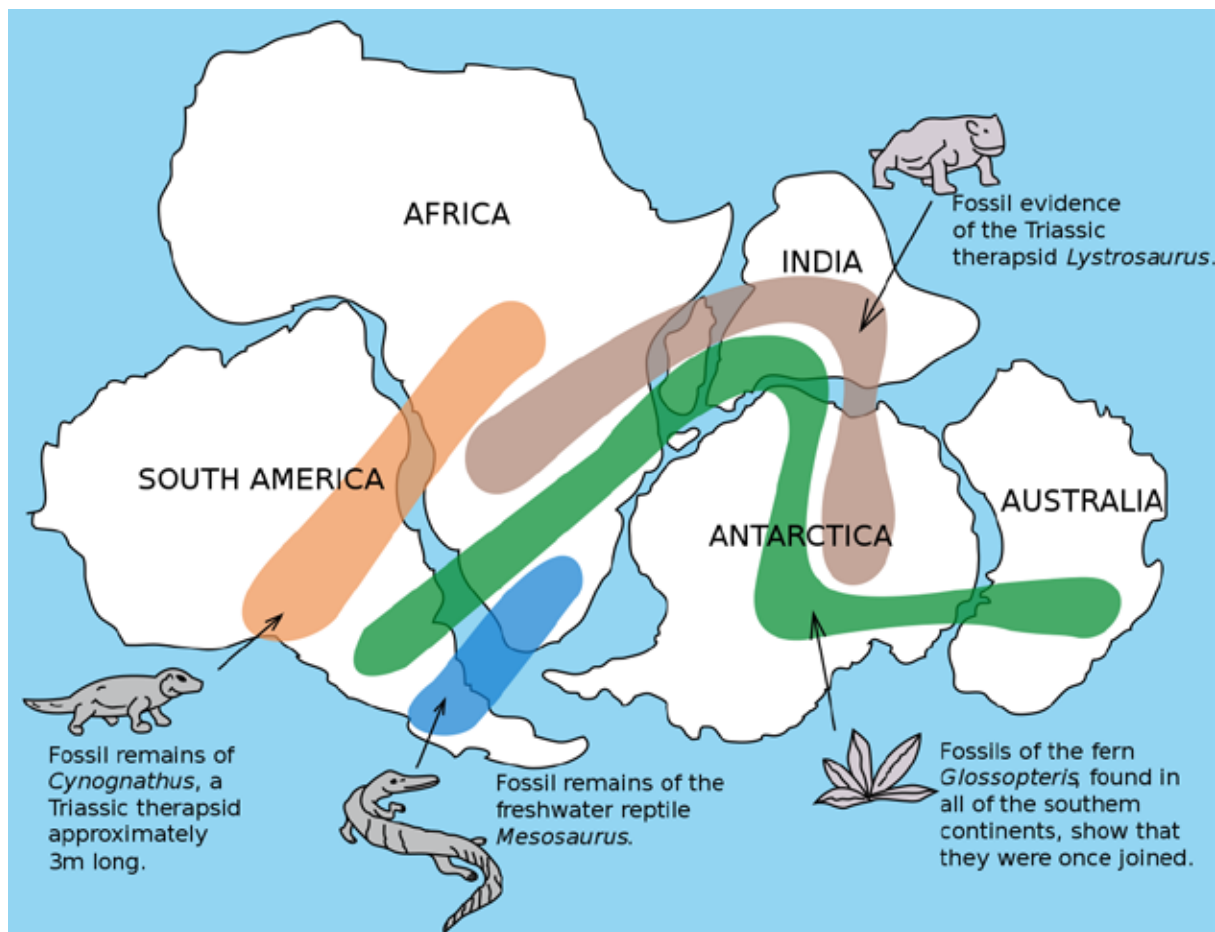
Continental Drift hypothesis, formulated and proposed in 1912 by Alfred Wegener, both fell outside the dominant scientific worldview of their times.

**Figure 4.** The HMS Beagle surveys the coast of South America. While on this expedition, Darwin proposed the theory of an expanding Earth and the extinction of less evolved life forms. A watercolor by ship’s artist Conrad Martens in Tierra del Fuego



Source: Wikipedia

**Figure 5.** The location of certain fossil plants and animals on present-day continents, far apart from each other, would form specific patterns (shown by colored bands) if the continents were rejoined



Source: United States Geological Survey (USGS)

Both hypotheses were based on the striking similarity of coastlines and geological data, including identical structures and compositions of sedimentary rocks, and the presence of flora and fauna from the geological past on opposite continents, now separated by vast ocean distances.

### Plate Tectonics

Initially, the primary obstacle to the acceptance of these hypotheses was the lack of an explanation for the source of energy and matter needed to implement these grand planetary processes.

However, the discovery of mid-ocean ridges and strip-like magnetic anomalies on the ocean floor (indicating irregular reversals of Earth's magnetic field) elevated the hypothesis of continental drift to a widely accepted theory. This new science became known as the theory of plate tectonics.

However, several unresolved issues with this theory persist for example:

At the same time, there are a number of unresolved problems of this theory, such as:

1) To explain the universal similarity in the structure and composition of sedimentary rocks, as well as the similarity of flora and fauna from past geological eras along the edges of opposite continents, one must assume that in the Earth's geological past, there was a recurring process of disassembly and reassembly of supercontinents in different regions of the globe, opening and closing entire oceans (Blinov, V.F., 2010; Carey, S.W., 1991).

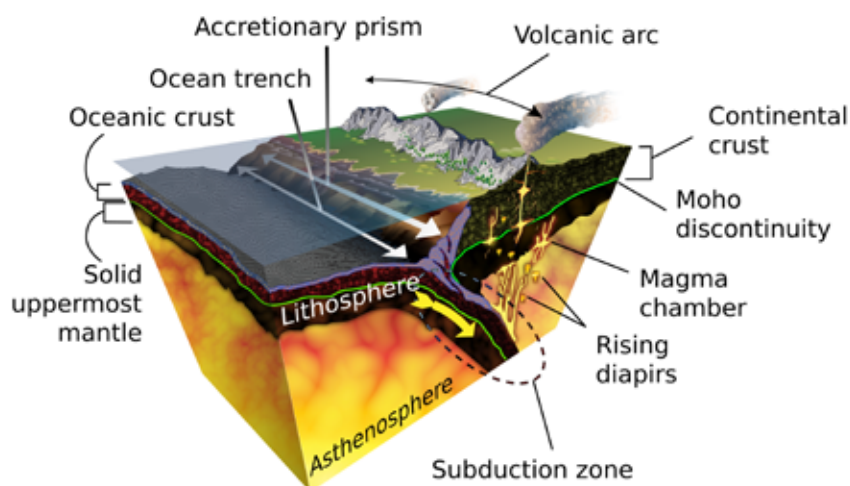
2) Processes of cracking in oceanic and continental plates are observed on the Earth's crust's surface and have been well-studied, as have the measured rates of Earth's surface expansion due to spreading, (Blinov, V.F., 2010; Carey, S.W., 1991);

**Figure 6.** *Formation of continents within the framework of plate tectonics. As the supercontinent Gondwana broke apart (approximately 175 million years ago), modern continents emerged. However, to explain, for example, the unified range of titanosaurs across present-day China and Argentina, the reassembly of another supercontinent on the opposite side of the globe would be required*



Source: Wikipedia

**Figure 7.** *Outdated conceptions of a subduction zone. Studies have shown that the accretionary prism of a continental slope is actually composed of island arc or continental deposits, rather than sedimentary and hard oceanic rocks as suggested by the subduction hypothesis. Additionally, the higher density of the asthenosphere material should push the less dense solid oceanic crust to the surface, preventing it from sinking into the Earth's mantle*



Source: Wikipedia

3) The expansion of the ocean floor over the past 250 million years has accelerated. (Blinov, V.F., 2010);

4) There is no empirical confirmation of the existence of the subduction process – where oceanic lithospheric plates submerge beneath continental plates – because:

- the mantle has a layered structure (Pushcharovsky, Yu.M., Pushcharovsky, D.Yu., 2010), a property indicating the absence of mantle material circulation and the absence of a mechanism capable of driving the drift of lithospheric plates;

- the density of the mantle is higher than that of the oceanic crust, and thus the idea of subduction contradicts the physical phenomenon known as “Archimedes’ principle” (Blinov, V.F., 2003; Koronovsky, N.V., 2001; Burundukov, A.S., Drozdov, A.L.);
- drilling of continental slopes near trenches revealed that they are composed of series of island arc or continental deposits, whereas subduction zones (where oceanic crust is supposedly sinking under continental crust) should contain accretionary prisms formed by the scraping off of soft sedi-

ments and irregularities in hard rocks that inevitably occur when one plate slides beneath another (Blinov, V.F., 2003; Koronovsky, N.V., 2001; Burundukov, A.S., Drozdov, A.L., 2015);

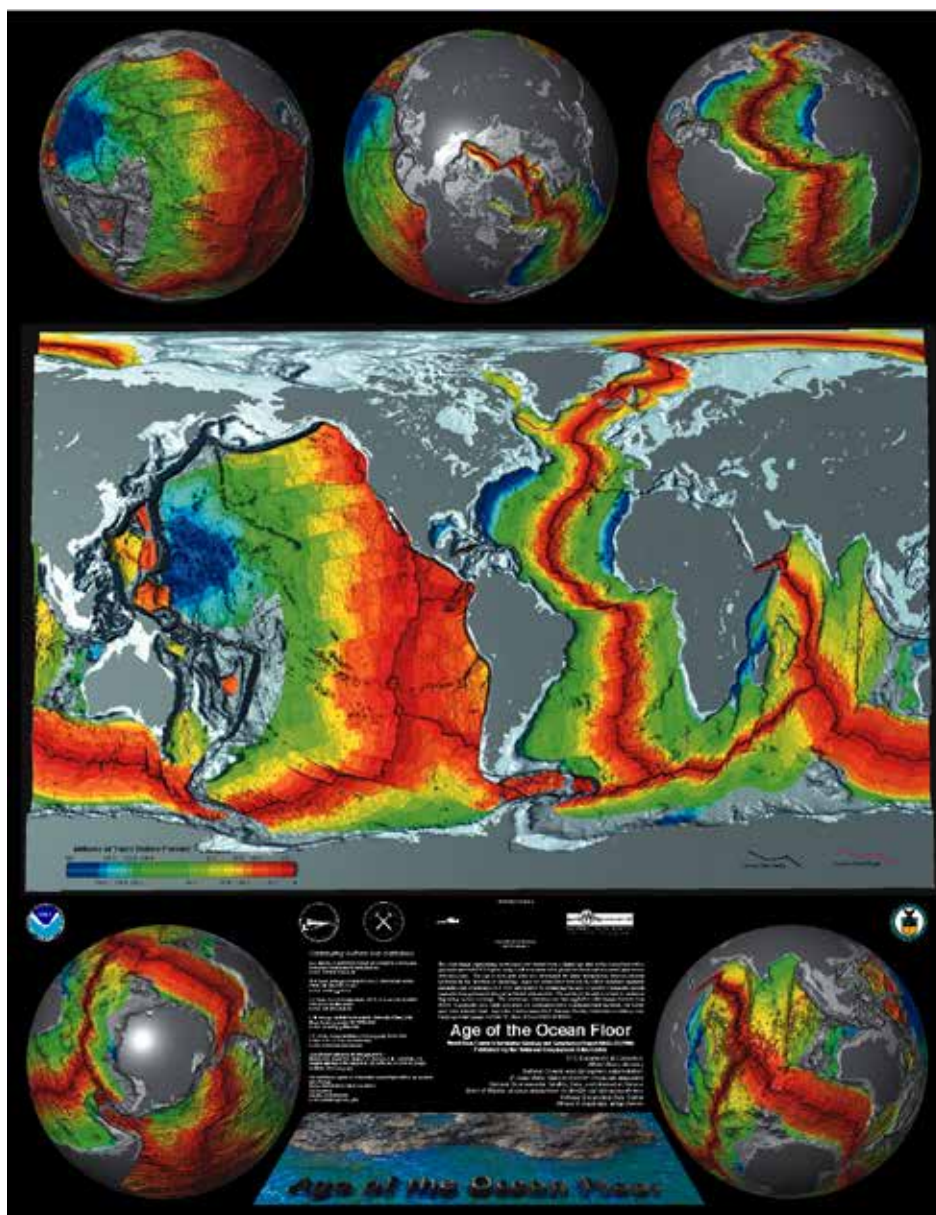
- there is a lack of experimental data regarding subduction rates, such as the speed at which the distance between the shoreline and nearby islands in the ocean decreases. (Blinov, V.F., 2003; Koronovsky, N.V., 2001; Burundukov, A.S., Drozdov, A.L., 2015).

5) There is a multitude of other experimental data that refutes the hypothesis of the existence of subduction zones.

### Expanding Earth Theory

There are several works by geologists and biologists who have proposed various hypotheses to explain the mechanism behind the increase in the Earth's volume (Blinov, V.F., 2003; Burundukov, A.S., Drozdov, A.L., 2015; Carey, S.W., 1991; Larin, V.N., 2005).

**Figure 8.** Deep ocean ridges on the globe and the age of the bedrock of the oceanic crust. Red indicates the youngest seafloor sections. Older ones are shown in yellow and green. The oldest are marked in blue



Source: NOAA

The answer lies in an interdisciplinary area of knowledge, leading to a shift in the scientific paradigm, which not only affects our understanding of the processes occurring within our planet but also necessitates the revision of some fundamental scientific concepts.

To properly address the issue, let us consider two possible scenarios for the Earth's size increase:

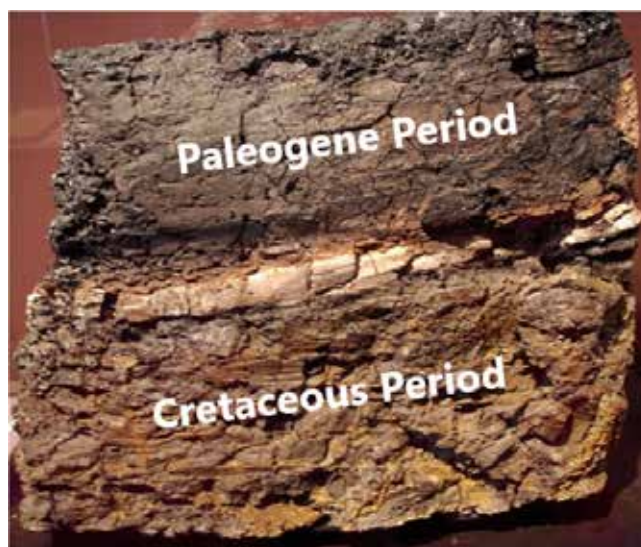
1) accretion of material from space, (Burundukov, A.S., Drozdov, A.L., 2015);

2) expansion of the Earth's metal hydride core due to the emission of dissolved hydrogen (Larin, V.N., 2005).

#### **Accretion of Material from Space**

The accretion of material from space suggests that cosmic material settling on the Earth's surface from space could be a mechanism capable of increasing the planet's volume along with its mass.

**Figure 9.** A fragment of a sedimentary rock section, showing a thin light layer of argillite (containing 1.000 times more iridium than the upper and lower layers). The sharp increase in iridium concentration in this layer indicates a sudden increase in the amount of cosmic material within it. Many overlook that Cretaceous deposits continue just above the iridium anomaly



Source: Wikipedia

Cosmic material falling onto the planet's surface consists of water-insoluble solid dust particles and meteorites:

1) cometary dust: a mixture of crystalline and amorphous silicates, refractory organic materials, and a small amount of oxides;

2) meteorites and asteroid dust: various rocks (mainly chondrites), minerals, and metals;

3) interstellar dust: composed of larger refractory minerals that condensed from matter left after star formation.

Today, about 100 tons of cosmic dust and meteorites fall on our planet daily. (Zook, H.A., 2001) But if this amount is multiplied by 365 days, and then by the entire existence of our planet (4.5 billion years), the total amount of fallen material would account for

an insignificant fraction of 1% of its current mass.

According to supporters of the expanding Earth theory, the acceleration due to gravity on the planet's surface has doubled (Burundukov, A.S., Drozdov, A.L., 2015) over the past 150 million years, implying an increase in the Earth's radius by 1,950 km, requiring an average sediment accumulation rate of about 13 mm/year (including today). For comparison, the soil formation process (which does not increase the Earth's mass) is roughly 10,000 times slower than the rate required for the hypothetical cosmic sediment accumulation (Gennadiev, A.N., Gerasimova, M.I., Patsukevich, Z.V., 1987).

If cosmic material accretion had been intense, the entire surface of our planet would primarily consist of cosmic material, with all



the resulting consequences for the biosphere (plant and animal life).

Some researchers explain the absence of cosmic material traces in the sediments on continental surfaces and ocean floors by processes of weathering, erosion, chemical, and mechanical impacts followed by washing this material into the oceans and absorption into the Earth's interior at subduction zones.

If we assume that, alongside the abundant deposition of cosmic dust on Earth, there were atmospheric precipitation and various natural impacts, why did these factors selectively fragment and wash away only cosmic dust and meteorites but did not affect

the iridium layer, soil, or fragments of Earth's rocks?

For example, the Hell Creek Formation's sedimentary rocks formed over 1.3 million years between the late Cretaceous and early Paleocene (Maastrichtian epoch). The most recent deposits are estimated to be 66.043 million years old. The formation is primarily known for the large number of dinosaur fossils found there. Its depth is about 2.5 km (not the expected 858 km according to the cosmic accretion hypothesis). Naturally, these sedimentary rocks are not composed of cosmic dust and meteorites. (Lamanna, M.C. et al., 2014; Husson, D., et al., 2011).

**Figure 10.** Hell Creek Fauna



Source: Wikipedia

Considering these facts, it is easy to conclude that the hypothesis of cosmic material deposition on Earth's surface cannot explain the increase in the planet's size and mass.

### Expansion of the Earth's Metal Hydride Core

This theory was born from the discovery by geologist, Doctor of Geological and Mineralogical Sciences Vladimir Nikolaevich Larin of the effect of melting at room temperatures, as well as the expansion of metal hydrides during hydrogen release. (Larin, V.N., 2005)

However, applying this effect as a cause for the planet's size increase encounters several unresolved contradictions with paleontological data. The well-known *Tyrannosaurus rex* (T. rex) is well-studied, as initially incomplete and then complete skeletons were found.

The well-known *Tyrannosaurus rex* (T. rex) is well-studied because initially, several incomplete skeletons were discovered, followed later by the discovery of complete skeletons.

The weight of T. rex, according to various estimates, ranges from 7.8 to 9.9 tons (Erickson, G.M., et al., 2004; Farlow, J.O. et al, 1995; Seebacher, F., 2001; Farlow, J.O. et al., 1995), exceeding the average weight of Indian elephants, which is between 3 and 5 tons (Shoshani, J.; Eisenberg, J. F., 1982; Pillai, N.G., 1941; Furaha ten Velde, P., 1997).

Why is the comparison made with Indian elephants and not with the larger African elephants? Indian elephants are smaller than African elephants and, therefore, have practical value: they can carry or push-pull additional loads.

However, even Indian elephants, moving on four legs, cannot run or jump (and even sleep standing, although they can lie down and wallow in mud, sand, or water, then get up)(Hutchinson, J. R. at al., 2006). T. rex, on the other hand, hunted, moving on two hind legs, ran, and was fast enough to catch its prey (Hone, D., 2017; Sellers, W.I., and Manning, P.L., 2007; Hutchinson, J. R, Garcia M., 2002; Hutchinson, J. R., 2004).

**Figure 11.** *Reconstruction of Tyrannosaurus (CM 9380)  
at the Carnegie Museum of Natural History*



*Source: Wikipedia*

The methods that successfully calculate the weight of modern megafauna based on the thickness of their supporting bones under current gravitational conditions, when applied to *T. rex* (Anderson, J.F., Hall-Martin A., Russell D.A., 1985), predict approximately half the mass compared to what is determined by volumetric models (McNeill, A.R., 1985). This suggests that the leg bones of *T. rex* would have fractured under its own weight in today's gravitational force on Earth.

There is also a geophysical reason for the inconsistency of Larin's theory.

It is generally accepted that the Earth's core is metallic, which, in turn, is the source of the Earth's magnetic field. To justify his theory, Larin only needed to replace the iron-nickel core concept with the idea of a metal hydride core and prove that hydrogen is continuously and ubiquitously emitted from the Earth's interior to the surface and atmosphere.

V. N. Larin's doctrine of the originally hydride Earth is a theory, not a hypothesis, as it is a structured and substantiated system of views, judgments, and propositions that adequately explains facts, analyzes processes, predicts, and regulates their development, and has experimental confirmation:

1) the volume of material indeed increases during hydrogen emission from the crystal lattice of metal hydrides;

2) gas emissions (hydrogen, carbon dioxide, hydrogen sulfide, methane, etc.) and water from the Earth's interior to the surface are observed;

3) the possibility of synthesizing inorganic hydrocarbons in the Earth's crust is confirmed (Deep Carbon Observatory, 2019; Kutcherov, V.G., 2013).

Meanwhile, the generally accepted concept of an iron-nickel core arose from the understanding that the density of surface-accessible rocks on Earth is insufficient to justify existing gravity and that the metallic core could serve as the generator of our planet's magnetic field.

However, the impressive edifice of the dominant worldview collapses like a house of cards upon careful analysis of geophysical research results from the past two decades.

This issue is further explored in sections 3.7 "The Geometry of Earth's Magnetic Field Lines," 3.8 "The Non-Dipole Nature of Earth's Magnetic Field," 3.9 "The Geoid", and 3.10 "Variation in the Earth's Gravitational Field Intensity."

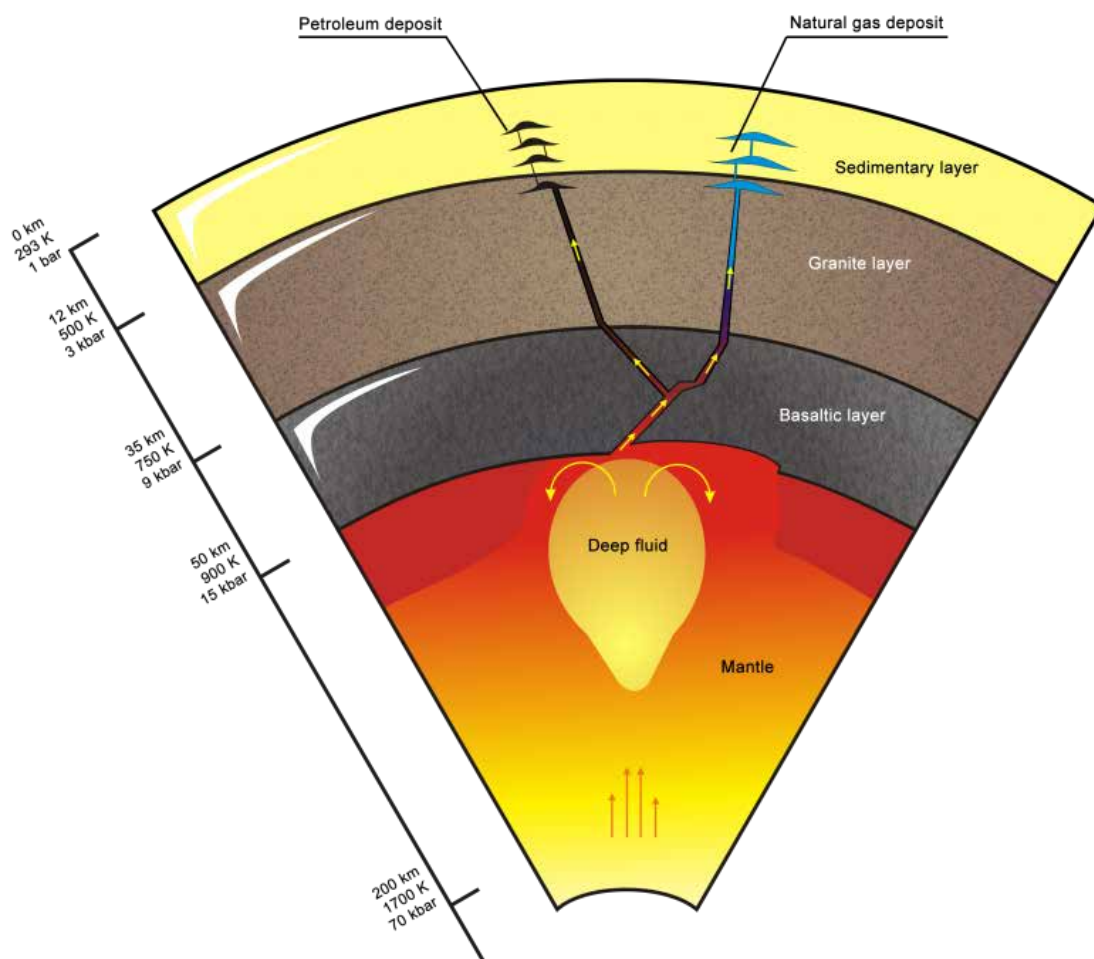
In this article, we will not discuss other hypotheses proposed to explain the mechanism of the Earth's size increase, as they either fall outside the scope of the scientific method or contradict experimental data.

As we can see, the fundamental truth regarding the expanding Earth theory is the

following statement: “The expanding Earth theory is absurd, as its hypothetical implementation violates the principle of conser-

vation of matter and energy. This theory belongs to the realm of magical arts!”

**Figure 12.** *The scheme of hydrocarbon genesis and oil field formation*



Source: V.G. Kucherov

### A New Paradigm

#### Vacuum Energy as a Source of Matter-Energy in the Earth's Core

The results of research within the framework of the Standard Model of elementary particles and quantum field theory are gradually bringing fundamental science out of a crisis that has lasted for a century. The problem lies in the disregard for the violation of the conservation of matter-energy when evaluating quantum mechanical processes.

Experimental data indicate the reality of an enormous vacuum energy density (Weinberg, S., 1989), which, for unknown reasons, does not interact with material bodies within the space of the Universe. However, quantum mechanical tunneling effects allow this

energy to penetrate into the Universe in the form of weak thermal radiation (mistakenly called relic radiation) as well as through the spontaneous emission of electron-positron pairs by the vacuum (CERN, 2013).

These newly discovered realities are key to solving the issues of fulfilling the conservation of matter-energy principle at the microscopic level and the problem of generating matter-energy at the center of our planet.

#### Quantum Field Theory

It is not widely known that the idea of creating quantum field theory was debunked more than ten years ago (ESA, 2011; Smolin, L.; 2006, Susskind, L.; 2015, Zinaliev, M., 2017). Grand theoretical and experi-

mental research spanning about fifty years concluded:

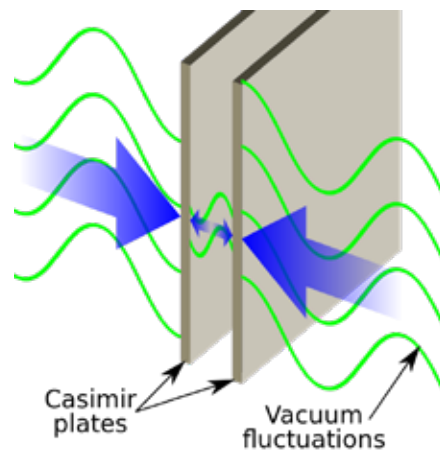
1) with the realization that the fundamental principles of quantum field theory are flawed, leading to various insurmountable theoretical contradictions and depriving numerical simulations of certainty;

2) that the hypothesis of the possibility of quantizing the space of the Universe

was experimentally disproven in 2011 during a cosmic mission aimed at detecting the “graininess” (degree of quantization) of space, revealing that space granularity does not manifest down to a scale of 10–48 meters, which is 10<sup>14</sup> times smaller than the Planck length. (ESA, 2011; Smolin, L., 2006; Susskind, L., 2015; Zinaliev, M., 2017).

**Figure 13.** Casimir forces on parallel grounded neutral metal plates.

Vacuum energy contains contributions from all wavelengths except those excluded by the distance between the plates. As the plates move closer, more wavelengths are excluded, and vacuum energy decreases. A decrease in energy means a force must act on the plates, doing work as they move closer together



Source: Wikipedia

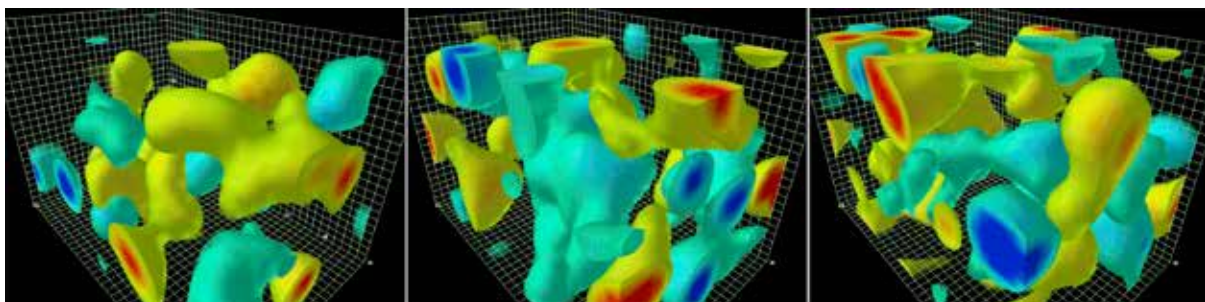
At the same time, quantum mechanical phenomena such as spontaneous emission, the Casimir effect, the Lamb shift, and vacuum polarization (spontaneous generation and annihilation of electron-positron pairs in a vacuum) point to the reality that the vacuum energy density is about 120 orders of magnitude higher than the vacuum energy measured using macroscopic instruments. (Weinberg, S., 1989)

This colossal energy density is comparable to the energy density of the Big Bang singularity.

### Quantum Mechanics

It is known that all elementary particles are perpetual motion machines of the first kind (drawing energy from nowhere) – they are in a continuous process of energy fluctuation (Ponomarev, L.I., 1989).

**Figure 14.** Illustration of the typical four-dimensional structure of gluon field fluctuations



Source: Wikipedia

In 1913, Niels Bohr became the founder of quantum mechanics by formulating the first laws of this new science.

The first postulate – about stationary states: “In an atom, there are orbits where the electron does not emit energy while revolving (this assertion contradicts the behavior of electrically charged particles in conductors)” (Ponomarev, L. I., 1989).

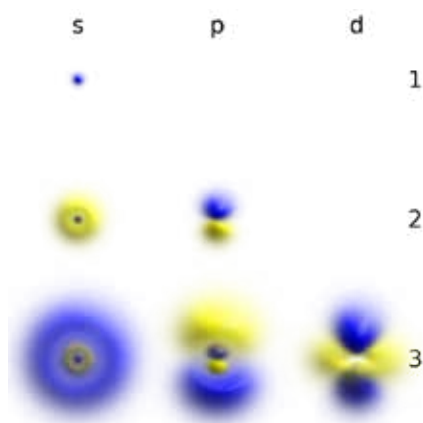
The second postulate – about quantum jumps: “Radiation occurs only when an electron jumps from one stationary orbit to another” (Ponomarev, L. I., 1989).

Modern formulations of these laws consist exclusively of quantum mechanical terms, and the idea of electron rotation has been replaced by a description of the mathematical probability of its location at a certain point in space (quantum fluctuations). However, the essence of these laws has not changed since Niels Bohr’s time (Ponomarev, L. I., 1989).

It is essential to understand that the magnetic field is generated both by the electron and by the atom, whose magnetic properties are determined by the magnetic moments of the electrons within them (Ponomarev, L. I., 1989).

If anyone doubts that a magnetic field exerts force, recommend that they repeatedly open and close the door of a cabinet with a latch using a permanent magnet, which requires no energy input, and then recall the existence of industrial magnets capable of lifting hundreds of kilograms of iron objects, albeit with the expenditure of electrical energy.

*Figure 15. Electron atomic orbitals at different energy levels. The more opaque areas are where the electron is most likely to be found at any given moment*



Source: Wikipedia

Now, if we know that a certain system generates a force field, what is the source of the energy that produces it?

The answer to this question is forbidden by the informal humorous principle of quantum mechanics: “Shut up and calculate!” (Smolin, L., 2006; Susskind, L., 2015). By default, the violation of the conservation of energy principle is enshrined in the first law of quantum physics.

### Dark Energy and Dark Matter

How are the concepts of dark energy and dark matter related to the principle of conservation of matter-energy?

In essence, when researchers encounter the influx of energy from nowhere (a perpetual motion machine of the first kind) on a cosmic scale, particularly with the accelerated expansion of the Universe, they refer to this phenomenon as “dark energy” (Verkhovanov, O. V., 2020).

If a natural phenomenon associated with excess gravity is discovered, along with the amount of matter necessary for this being absent, then the solution to this kind of problem is the presence of dark matter (Verkhovanov, O. V., 2020).

In the last two decades, dark matter has been attributed with yet another ability – to decay into electron-positron pairs (vacuum polarization) (CERN, 2013).

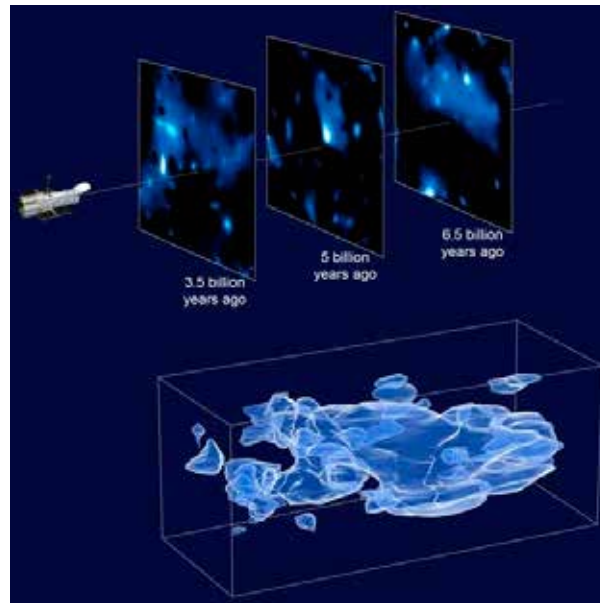
Attempts to detect elementary particles of dark matter, as predicted by some theorists, have been unsuccessful (Verkhovanov, O. V., 2020). Therefore, it is unclear what scheme or components this “something” decays into, leading to the observed real physical phenomenon of vacuum polarization.

In modern science, a contradictory situation has arisen where the hypotheses of dark energy and dark matter, on the one hand, emerge from astrophysical observations, and on the other hand, the astrophysical observations themselves serve as proof of the reality of these two entities!

However, using conclusions as evidence for a hypothesis is a logical error. This error is known as “affirming the consequent”.

All of these accumulating facts illustrate how the principle of energy conservation is violated at the level of the large-scale structure of the universe.

**Figure 16.** *Dark matter map from 2007, compiled by the Cosmic Evolution Survey using the Hubble telescope*



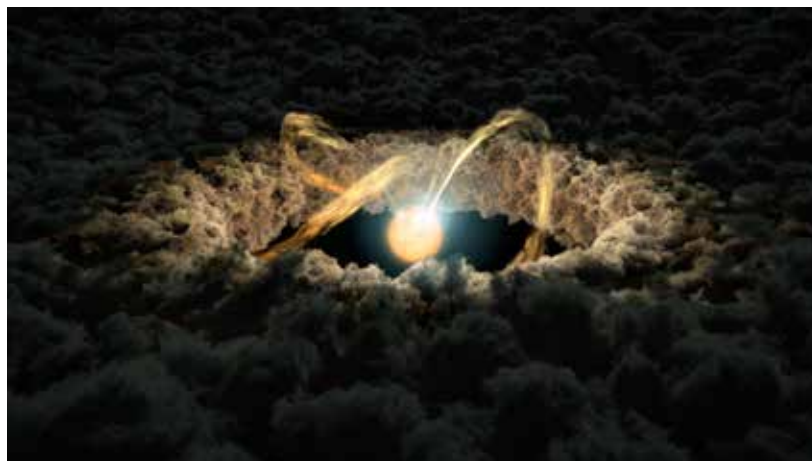
*Source: NASA*

### **The Problem of Celestial Body Formation from Gas-Dust Clouds**

It is generally accepted that the process of the formation of celestial bodies in the solar system occurred through the formation of an accretion disk, the collapse of the protostellar

nebula into a central star, and the formation of planetesimals. A planetesimal is a celestial body orbiting a protostar, formed by the gradual accumulation of smaller bodies composed of particles from the protoplanetary disk.

**Figure 17.** *Artist's depiction of a protoplanetary disk*



*Source: NASA/JPL–Caltech*

Numerical modeling has shown that both the initiation of accretion disk formation and the birth of planetesimals require a seed in the form of a celestial body (Verkhovanyov, O. V., 2020).

The asteroid belt and the Oort cloud have existed for about 4 billion years, and yet, for some reason, the numerous celestial bodies have not coalesced into a single object.

The absurdity of the situation is obvious: for the Sun and planets to form, an accretion process is necessary, involving a protoplanetary disk and planetesimals, but to initiate this process, small planets are required.

Theorists have slipped out of this situation with a serious face: the dominant viewpoint now is that dark matter serves as the seed for the protosun and planets of the solar system! (Verkhovanov, O. V., 2020).

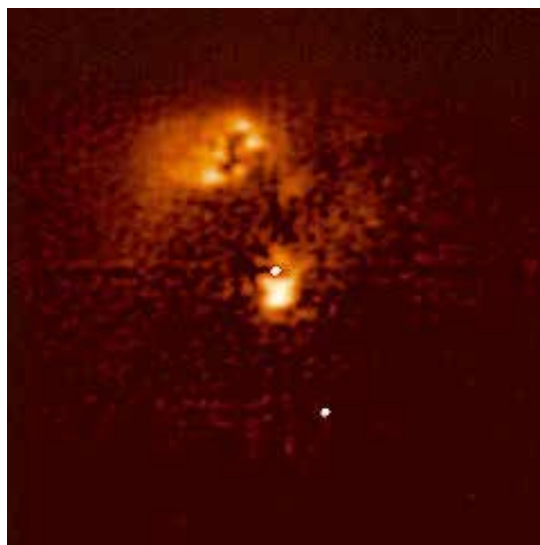
### Quasars

In the distant cosmos, there are various exotic celestial bodies. Among them, quasars hold a special place as a class of astronomical objects that are among the brightest (in absolute terms) in the visible Universe (Wikipedia, 2024).

It is commonly accepted that quasars represent the active nuclei of galaxies in their early stages of development, where a supermassive black hole absorbs surrounding matter, forming an accretion disk. A quasar is a source of extremely powerful radiation (sometimes tens or hundreds of times greater than the combined power of all the stars in galaxies like ours) and exhibits, in addition to the cosmological redshift, a gravitational redshift predicted by A. Einstein in the general theory of relativity (Wikipedia, 2024).

The official explanation of the nature of quasars is nullified by the unusual object HE0450–2958. This object is called a “naked quasar” or “homeless quasar” because no host galaxy has been detected (Wikipedia, 2024).

**Figure 18.** *Quasar HE0450–2958, image by HST. The quasar is located near the center of the image; no apparent host galaxy is visible. At the top of the image is a highly disturbed star-forming galaxy. Next to the quasar is a gas clump that appears to be ionized by the quasar’s radiation. The point object in the lower right corner is a foreground star that accidentally entered the field of view*



*Source: ESA/Hubble Images and Videos*

Astrophysicists attempted to attribute the energy of this celestial object to processes associated with nearby galaxies. They are not deterred by the vast cosmic distances between galaxies or by the fact that the supermassive black hole (SMBH) in our galaxy, situated amid stars, gas, and dust, bears little resemblance to a quasar! (ESA, 2005).

As we see from observational astrophysical data, there are colossal energy sources in deep space whose nature is infinitely far from

the unconditional and universal observance of the conservation of matter-energy principle.

### Comets

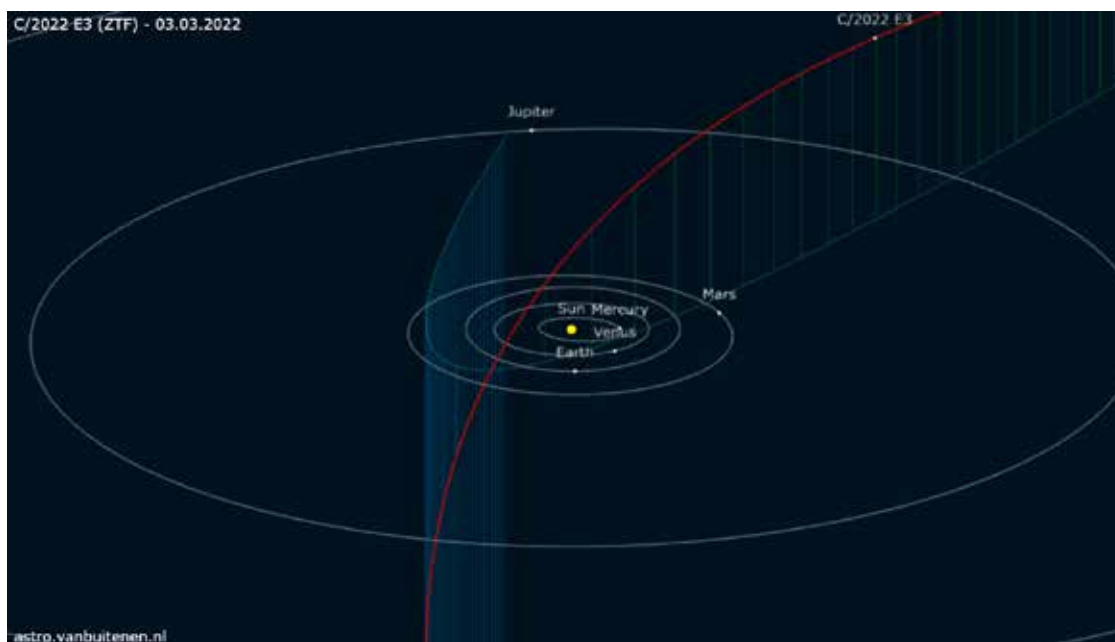
On February 1, 2023, comet C/2022 E3 (ZTF) was especially visible in the sky. It is no different from other comets, whose sizes range from about 1 km to 45 km (Guido, E., 2022).

Comet C/2022 was discovered by astronomers Bryce Bolin and Frank Masci using the Zwicky Transient Facility (ZTF) survey

on March 2, 2022. At the time of its discovery, the comet had an apparent magnitude of

17.3m and was about 4.3 AU from the Sun. (Guido, E., 2022).

**Figure 19.** Position of comet C/2022 E3 (ZTF) on March 3, 2022



Source: Gideon van Buitenen

The distance at which the comet was discovered exceeds the distance from the Sun to the astronomical snow line, which ranges between 2.7–3.1 AU (Wikipedia, 2023).

Let's recall that the snow line in astronomy and planetology is the distance from a star at which the temperature becomes low enough for simple volatile compounds (such as water, ammonia, methane, molecular nitrogen, and chlorine) to transition into a solid state (Wikipedia, 2023).

Depending on the theoretical model applied, various temperature values are used to define these conditions. For example, in the case of water, at temperatures of 140–170 K and under the current luminosity of the Sun, the water snow line corresponds to a distance of 2.7–3.1 AU, approximately midway between the current orbits of Mars and Jupiter, within the asteroid belt. Following this are the snow lines for carbon dioxide, methane, and, finally, carbon monoxide. The carbon monoxide snow line is located roughly at Neptune's orbit (Wikipedia, 2023).

It is worth noting that in astronomy and planetology, the snow line is the distance from a star at which the temperature becomes low enough for simple volatile compounds (such

as water, ammonia, methane, molecular nitrogen, and chlorine) to condense into solid ice.

However, there is a significant detail: the diameter of comet C/2022 E3 (ZTF) is about 1 km (Guido, E., 2022), and it can only be detected at such a distance using the most powerful telescopes from Earth's orbit.

What Bolin and Masci observed was the coma, a gas-dust cloud surrounding the comet. Through a telescope, this cloud appears as a round spot with blurry edges, resembling a galaxy. However, unlike galaxies, cometary comas move against the backdrop of stationary stars.

On March 3, 2023, the iTelescope observatory (H06) captured ten 60-second sequential images, confirming cometary activity. The angular size was 6" (six arcseconds), which corresponds to a body size one and a half times the diameter of Earth (Guido, E., 2022).

This raises a natural question: "How can comets, arriving from beyond the Solar System, form a coma of planetary size?" After all, a comet's gravitational force is weak. To sustain a coma of this size, it must be continuously replenished with gas and dust, as the coma's material constantly dissipates into space!



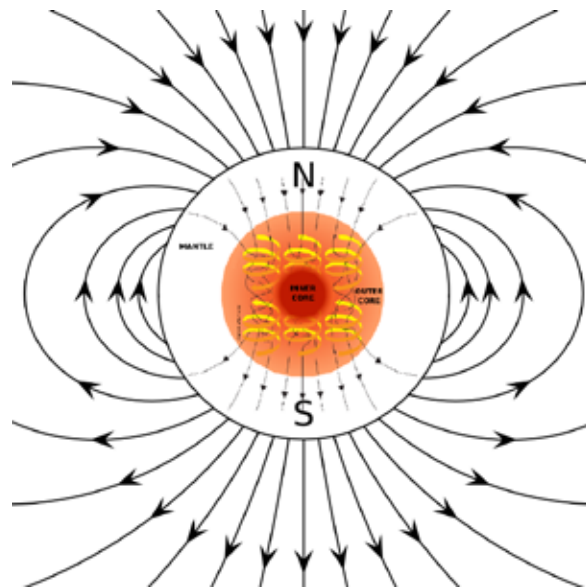
As we can see, the ability of comets to form a massive coma beyond the snow line suggests a violation of the conservation of energy-matter within the core of comets.

our planet. However, if we examine all possible hypotheses for the formation of planetary magnetic fields, we find an insurmountable flaw in the very idea of generating a magnetic field in this way.

### The Geometry of Earth's Magnetic Field Lines

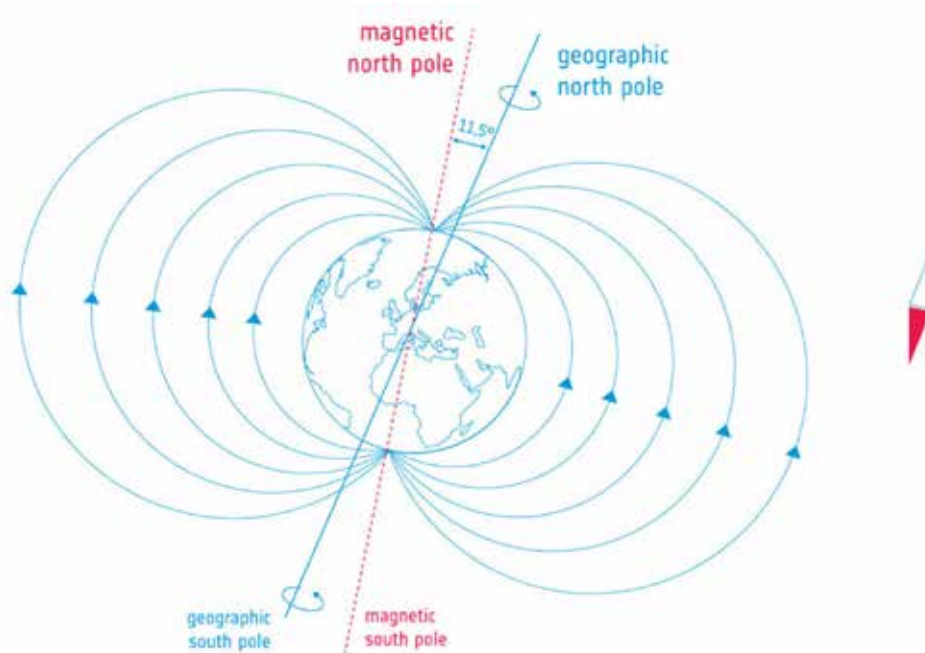
It is widely accepted that Earth's magnetic field is generated in the outer liquid core of

**Figure 20.** Common model of magnetic field generation in the liquid core



Source: Wikipedia

**Figure 21.** Geometry of Earth's magnetic field lines according to the European Space Agency.

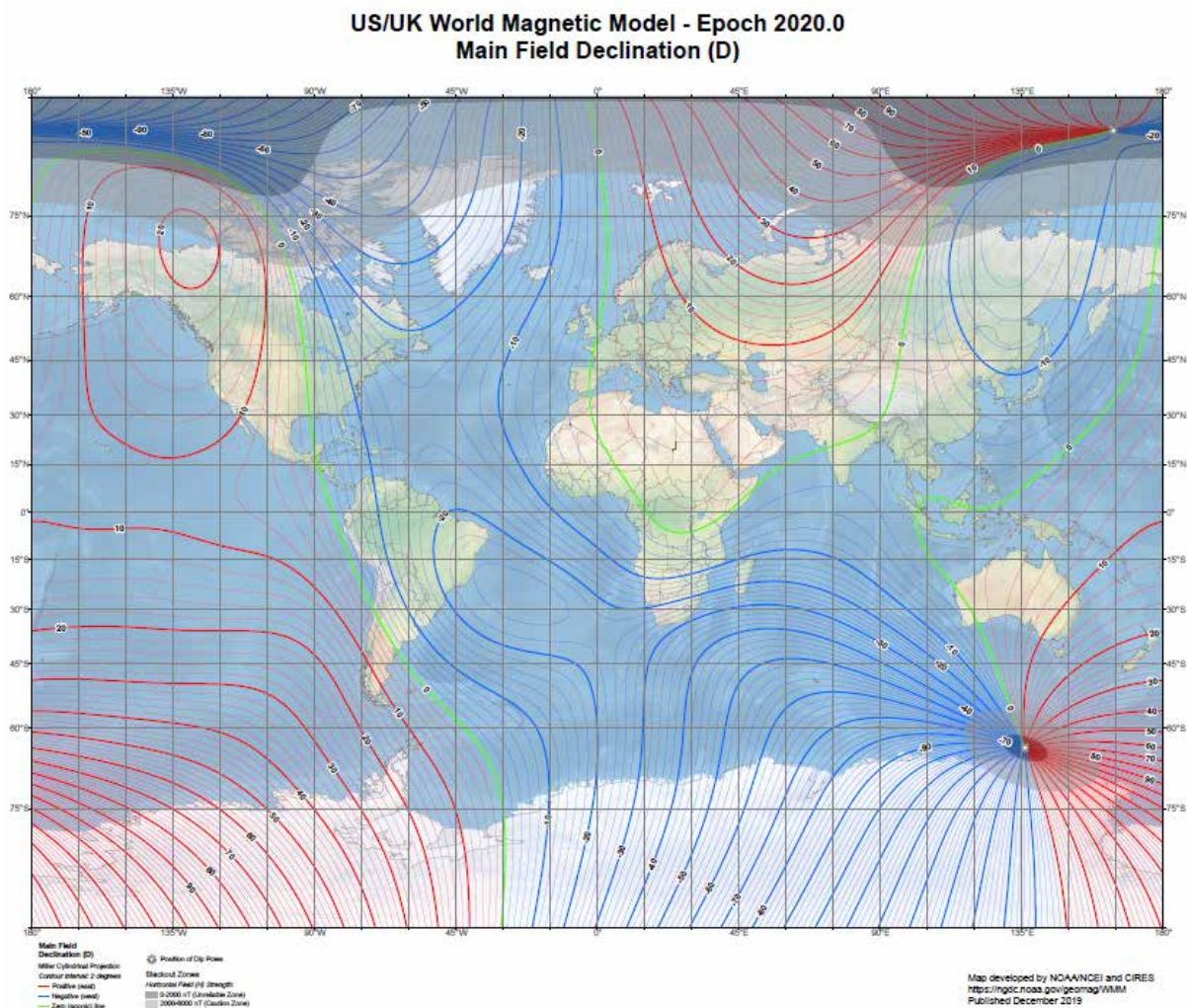


Source: ESA

To grasp the futility of attempting to explain Earth’s magnetic field formation within the framework of this 250-year-old geophysical paradigm, it is enough to compare:

- the common scheme for generating a magnetic field in a liquid core (see Fig. 20), which allows for the placement of magnetic field line exits and entries on Earth’s surface outside the magnetic poles (Pourovskii, L.V. et al., 2017; Wikipedia, 2023);
- the geometry of Earth’s magnetic field lines (see Fig. 21), where the exits and entries of the magnetic field lines are located at the points of the South and North magnetic poles (ESA, 2016);
- the actual geometry of Earth’s magnetic field lines (see Fig. 22), where the exits of the magnetic field lines are at the South Pole and the entries at the North Pole. Additionally, besides the main magnetic poles, there are Global Magnetic Anomalies with a similar nature and comparable intensity (NCEI, 2023).

**Figure 22.** Map of the actual geometry of Earth’s magnetic field lines (2019)



Source: NGA and DGC

The inconsistency of the dominant scientific worldview regarding the global magnetic field is confirmed by the contradiction between the results of the refined model of our planet’s core, which indicates that the solid core – one of the elements of the geo-

dynamo mechanism– in the Earth’s centre formed no earlier than 1 billion years ago (NCEI, 2023), and radiometrically measured geological data on the oldest rocks on the planet’s surface, which suggest the existence of a global magnetic field for as

long as 4.2 billion years (Tarduno, J. et al., 2015).

### The Non-dipolar Nature of Earth's Magnetic Field

Earth's magnetic field consists of magnetic monopoles (see Fig. 22). This conclusion is based on the following observations:

1) the magnetic field lines of both the magnetic poles and the WMA (World Magnetic Anomalies) originate from specific points (southern poles) and converge at other points (northern poles) (NCEI, 2023);

2) the positioning of magnetic poles and WMAs does not depend on the structure of the Earth's crust, and their intensity does not correlate with the magnetic properties of the lithosphere and mantle rocks (Pechersky, D.M., 1985);

3) the intensity of the magnetic poles and WMAs decreases with altitude (with increased distance of magnetic measurements from the Earth's surface) only slightly, and they extend vertically towards the planet's center, indicating a deep location for the sources of these anomalies (Pechersky, D.M., 1985);

4) a drift has been observed both in the North Pole toward Siberia and in the overall "westward drift" of the WMAs, i.e., a shift of the WMA isolines to the west, suggesting variability in the properties of its source located at the Earth's center; (Pechersky, D.M., 1985);

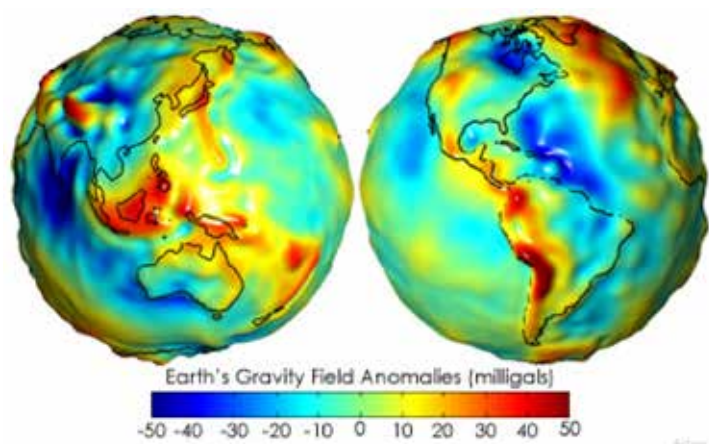
5) the cumulative amplitude of secular variations in the direction of the geomagnetic field consistently increases as it approaches the epicenters of positive WMAs over the past 0–10 thousand years; this dependence "weakens" for the earlier interval of 10–100 thousand years ago and disappears entirely in the interval of 0.1–0.7 million years ago (Pechersky, D.M., 1985).

It is evident that the exotic nature of the magnetic poles and world magnetic anomalies does not fit within the hypothesis of a magnetic field generated in the Earth's liquid outer core. It calls for a change in the geophysical paradigm regarding the object at the Earth's center, whose diameter is at least three orders of magnitude smaller than the inner solid core of the Earth and which forms a magnetic field geometry unexplained by traditional perspectives.

### The Geoid

Earth's shape closely resembles an oblate spheroid. More precise measurements of our planet's shape have led to the conclusion that its surface is slightly deformed on a planetary scale, forming a geoid (Earth Observatory, 2004). These deformations are minor, with an amplitude of about 100 meters. On the planetary scale, these anomalies are almost imperceptible.

**Figure 23.** *The geoid with exaggerated distortions and color corresponding to gravitational anomalies (the same weight measured on the same spring scale will be heavier in the «red areas» and lighter in the «blue areas»)*



Source: NASA.

For example, the sea level of the Pacific Ocean near the Panama Canal is about 12

centimeters higher than that of the Atlantic Ocean. However, water does not flow through

the Panama Canal from the Pacific Ocean to the Atlantic, as this part of the transport artery is fed by rivers located on the Isthmus of Panama, whose levels are significantly higher than those of both oceans.

But there is a scientific consensus that Earth's interior has undergone gravitational differentiation (material is evenly distributed according to its physical and chemical properties), and that the process of isostasy exists, implying that the buoyant force of Earth's mantle is equal to the weight of the continental crust.

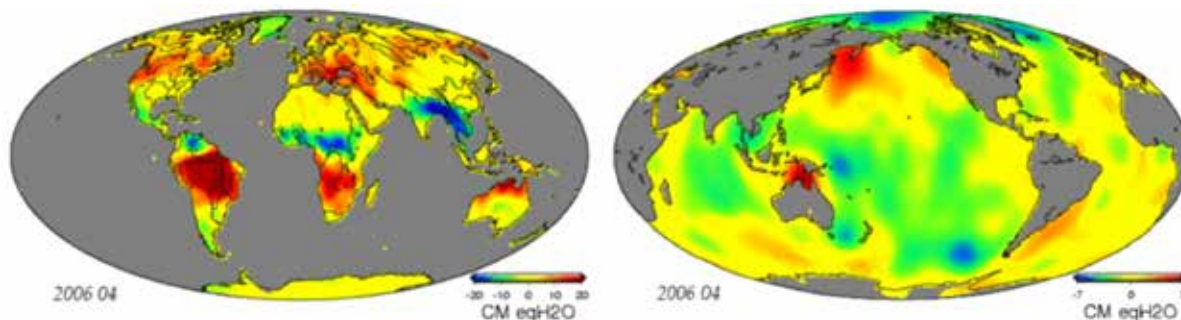
This raises a very natural question: «What energy powers the forces that hold Earth's shape in a constant deformed state?»

### Variation in Gravitational Field Intensity

Among the natural phenomena that are difficult to believe in, the most important is the variation in gravitational field intensity on the geoid's surface (Wikipedia, 2024).

What does this mean? The point is that Earth's gravitational field is not constant.

**Figure 24.** Variation in gravitational field intensity on the geoid's surface



Source: Wikipedia

Moreover, the process of changing the gravitational field intensity can occur within the first dozen hours in different areas of Earth's surface.

What kind of energy could drive the rocks of the Earth's interior at such speed that, by altering gravity, it could synchronously move billions of tons of water on the planet's surface *and underground*? After all, the natural process of rock differentiation during the planet's formation and over the subsequent 4 billion years of its existence inevitably leads to the material in the Earth's interior having the minimal level of internal mechanical stress in the present epoch. As a result, any local volume of rock has the smallest possible pressure gradient on its external side.

From the perspective of the dominant scientific worldview, phenomena of this kind cannot be explained by processes within our planet, as the immense heat generated inside the Earth at its formation has continuously dissipated, facilitating the physical and chemical differentiation of its interior. In the present epoch, the fluidity of Earth's rock material becomes noticeable only on geological timescales (thousands to millions of

years), even under the influence of external factors. Furthermore, observations indicate that tidal forces are not related to variations in the gravitational field of the geoid, as there is no correlation between them.

Meanwhile, a distinctive feature of this phenomenon is the inverse correlation between gravity and atmospheric pressure, which contradicts the laws of physics and is termed the Gravitational-Meteorological Paradox. Specifically:

- 1) in areas of low atmospheric pressure, spacecraft detect increased gravitational field intensity;
- 2) in areas of high atmospheric pressure, spacecraft detect decreased gravitational field intensity;
- 3) the geoid – the average value of gravitational field variation – corresponds to normal atmospheric pressure (Zinaliev, M., 2017).

The most widespread yet erroneous views on the factors shaping atmospheric conditions are based on the idea that vertical air circulation is the cause of atmospheric pressure changes. According to these views, warm air rises and creates a low-pressure zone, while cold air descends, creating a high-pressure

zone. Thus, air currents circulate across the globe. These currents are considered responsible for weather patterns such as hurricanes, tornadoes, and thunderstorms.

As a counterargument, it is sufficient to recall that Earth's atmosphere has year-round zones of high and low pressure that persist regardless of the succession of days and nights or even seasons. For example, one of these – the Azores High – is located in the middle of the Atlantic Ocean near the equator. During the era of sailed navigation, crews caught in this zone would perish from thirst and hunger, as high-pressure zones are characterized by calm weather, no rainfall, and no fish in the water.

An even more striking example is the summer heat and drought periods on the Peloponnese (Greece) and the Apennine Peninsula (Italy). According to conventional views, the hotter air over the peninsula should be displaced by cooler air over the surrounding seas. This convection would supposedly create a low-pressure zone over Greece and Italy, leading to cloud formation and precipitation. Yet, this does not occur, sometimes for as long as two months!

During this season, temperatures rise so high that vegetation rich in essential oils can spontaneously ignite. Forest fires should further enhance the upward movement of hot air over land and the inflow of moist, cool air from the surrounding seas. Fine ash particles rising into the atmosphere should act as centers of moisture condensation in the upper layers, inevitably leading to immediate cloud formation and rainfall. But this is not observed during the drought season, which can last up to two months! The hypothesis of atmospheric circulation as a cloud formation mechanism is nothing more than an urban myth.

The real factor determining atmospheric pressure is the variation in gravitational strength. A decrease in gravitational intensity leads to a drop in atmospheric pressure in a given area of the Earth, resulting in cloud formation and precipitation (Zinaliev, M., 2017).

Conversely, a decrease in atmospheric pressure, cloud formation, and precipitation cannot coincide with an increase in gravitational force over that segment of the surface. Higher gravity would lead to an increase in atmospheric thickness and thus the

pressure of the atmospheric column, which, in turn, would alter the atmospheric conditions – promptly resulting in clear, precipitation-free weather.

However, the GRACE space mission, dedicated to studying Earth's gravitational field over several decades, has observed the gravitational-meteorological paradox – over zones of low atmospheric pressure, for example, during the winter rainy season over the Amazon, a zone of increased gravity forms (Zinaliev, M., 2017).

This contradiction can be resolved by assuming that the source of gravitational field variation on the planet is the same unknown object that generates the Earth's magnetic field (see section 3.8. Non-dipolar Nature of Earth's Magnetic Field) (Zinaliev, M., 2017).

The GRACE space mission records an additional gravitational influence arising from the rise in oceanic and subterranean water levels, as well as an increase in atmospheric density due to cloud formation. This influence is 100 times more intense than that of the source at Earth's center, as the distance from the spacecraft to the excess water masses on the planet's surface is ten times smaller than its distance from the source of gravitational field variation at the planet's center (Zinaliev, M., 2017).

## Conclusions

The variety, quality, and scientific value of the above-listed studies, along with many others not mentioned in this article, combined with the reluctance of scientific and educational authorities to incorporate these insights into school and popular science programs, point to serious issues within scientific, educational, and outreach fields. This obstruction, present worldwide without regard for national boundaries, is euphemistically called «scientific conservatism».

Isn't it strange that, for example, the primary properties of our planet's gravitational and magnetic fields are labeled as anomalies, while the theories unable to account for them are called the dominant scientific worldview?

Experimental data from geology, space missions, and observational astronomy, particularly from the past two decades, suggest a different nature of the interiors of celestial bodies with internal activity, different from

the conventional view. Specifically, they indicate the presence of an unknown energy-matter source at the center of both our planet and other celestial bodies. The intensity of such a source varies from barely detectable, as in comets with minimal gas and dust production, to the tremendous power of quasars.

Considering the inability to explain the configuration of the planetary magnetic field, as well as the phenomena of the «geoid» and the “planetary gravitational field intensity variation” through properties of Earth’s outer liquid core, it is easy to conclude about:

1) the futility of the idea that the Earth’s core is metallic;

2) the existence of a source of the Earth’s magnetic and gravitational properties that has a diameter at least three orders of magnitude smaller than that of the supposed solid inner core and that is unknown to modern science.

The collective experimental data from the past two decades point to physical vacuum as the source that provides the internal activity of those celestial bodies in whose depths processes occur in violation of the principle of conservation of energy and matter.

The study of the interior of comets near Earth’s orbit will not only finally resolve the

issue of the growth of the Earth with the increase in its mass, but will also open a new chapter in the history of humanity’s scientific and technological progress.

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