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## 4. HYDROMAGNETIC DYNAMO. MÖBIUS GEOMETRY. METHOD OF FORMATION OF ATOMS.

***"Of all the services that can be rendered to science, the introduction of new ideas is the most important."*** *Nobel laureate* ***Joseph John Thomson***

***"It is precisely the ethereal matter of space (masked by the obviously inappropriate term "vacuum") that, according to the conviction of truly knowledgeable scientists, should become the basis for bringing all the forces of nature into a single self-consistent picture."*** [39]

In my author`s monograph "Substance. Atom. Theory of Everything" [43] I proposed a self-consistent concept based on the ontology of the **complementarity principle**. The concept is proposed as a **new platform for generalizations** and covers the issues of the structure of the supporting Cosmic Medium, the **basic element of nature** and the **atomic model** based on it, the method of formation of atoms and the actualization of structural interrelations that hold system formations together as a whole, as well as the fractally-identical transfer of the general universal structural scheme to scaling levels. The monograph uses the methodology of Fractal Synthesis and lays the foundations of Linguistic Physics.

Speaking about the ontology of the complementarity principle, it should be noted that this principle has been known since **ancient times**.

For **quantum mechanics**, it was formulated by Nobel laureate **N. Bohr in 1927** and is its most important principle.

Subsequently, the principle of complementarity was generalized in science, which led to the creation of the **concept of complementarity**, which covers not only physics, but also biology, psychology, cultural studies and, in fact, all areas of knowledge in general.

**B. Mandelbrot's fractal geometry**, discovered **in 1967**, has its roots in the ontology of the principle of complementarity.

The ontology of the complementarity principle also underlies the **holographic principle**, introduced into modern science **in 1993** by theoretical physicist **G. 't Hooft** as a hypothesis about the general property of quantum gravity – a theory that aims to create a quantum description of gravitational interaction and bring theoretical achievements closer to the creation of a general Theory of Everything.

Experience and the accumulation of knowledge show that the comprehensive essence of the complementarity principle implies the existence of its equivalent in everything and is a **universal natural duality**. And the main conclusion is that it is the **original and fundamental principle**, mediating a unified formula, a unified equation and a unified geometry. And if in all reasoning we start from its original essence, then we can get significant simplifications both in chains of logical reasoning and in mathematical calculations.

A more detailed restatement of the theoretical view proposed in the monograph is grouped by me into four main articles in accordance with current topics of theoretical physics, and several articles published earlier are also added to this. In physics, experiment plays a decisive role in the construction of theories. Therefore, in the format of the proposed concept, not only a number of basic questions of theoretical physics are considered, but also the results of existing theoretical proposals and experiments are included, confirming both the correctness of

the chosen starting point of the concept and the conclusions made on its basis, which can be classified as a **fundamental work**.

*"The fundamental nature of the theory is determined by the degree of penetration into the secrets of nature and is determined not by the cumbersomeness of its mathematical apparatus, but by the degree of connection with materialistic philosophy and proximity to the boundaries of the knowable." Kuligin V.A*. [46]

At this point, it is important to emphasize that the existing paradigm of particles still has its place due to the fact that at the stages of cognition, scientific thinking creates a vector of dividing a single spatial structure into separate fragments, peculiar puzzles, which are much easier to learn and describe by the apparatus of algebra separately.

Nevertheless, the fullness of time comes when differentiation has already exhausted itself, the fragments are known and a feeling of a dead end and a state of crisis arises. It is then that the stage of integration and synthesis of already acquired knowledge into the overall picture begins, the picture which is most clearly visible at the current stage of cognition. This picture forms a new fundamental theory, which requires both a new platform of generalizations and new mathematics.

Experimental results applied to the theoretical field of the new concept proposed by me increase the weight of the arguments in favor of the conclusions made, and are also the evidence link that is extremely necessary for the theoretical view to acquire the status of reflecting the reality of natural phenomena. And in this regard, the experiment is the fact that supports and confirms the theory.

"*In physics, it is the experiment that plays the decisive role in constructing a theory*." Academician of the Russian Academy of Natural Sciences G.I. Shipov [60]

For the theoretical presentation I used a **geometric approach**, which, as is known, helps to make quite significant simplifications and often leads to the goal faster than the path laid out by the apparatus of algebra. Also, the geometric approach contributes to visualization and the creation of figurative pictures, which theoretical physics experienced an acute shortage in the period of the creation of quantum mechanics, and is also experiencing also experiences the same deficit at the current stage of development.

The foundation of the geometric approach in the new proposed concept is the **geometric analogue of the principle of complementarity**. As a geometric analogue, the **Mobius strip** or Mobius ring is considered. The basis for this is the correspondence of this geometry and its properties to the ontological content of the principle of complementarity as a universal duality mediating the dynamics and forms of movement, as well as to the pictorial display in ancient symbolism.

The representation of a physical point in space in the form of a Mobius ring and its consideration as a magnetoelectric circuit provides the key to the analysis of the processes of Cosmogenesis, which can bring many theoretical views to a common denominator. In this regard, the universalism of the principle of complementarity as a **natural duality**, presented in the format of Mobius Geometry, can be laid down as the basis for creating the Unified Theory of Everything and, in all likelihood, is the most effective way to achieve this goal.

The author's monograph and articles also note hypothetical assumptions and elements of theoretical proposals in which scientists in the history of science, at the level of guesses or partial

conclusions, touched upon the method of explaining a number of theoretical aspects using the geometry of the Mobius strip.

However, to date, no scientist has considered the properties of Möbius geometry in application to the fundamental and intractable questions of physics so broadly as to obtain their resulting or exhaustive explanation, as well as to link the scaling levels into a unified paradigm on this basis and to show the universality of the interrelations that mediate interactions and determine the forces in them, that is, to create a Unified Theory of Everything. A number of questions of theoretical physics in electrodynamics and quantum mechanics still have no explanation. The proposed geometric format demonstrates how these difficult questions can be resolved.

A more detailed presentation of the questions of physics in the theoretical view I propose in the format of Möbius Geometry is grouped into four articles:
"1. Quantum Medium. Möbius Geometry. Magnetic Monopole."
"2. Quantum Entanglement. The Möbius Geometry. «Yin-Yang» Symbol. Phases of Fibration".
"3. The Basic Element of Nature. Mobius Geometry. Gravity. Model of the Atom".
"4. Hydromagnetic Dynamo. Mobius Geometry. The Method of Formation of the Atom".

To these four articles several articles published earlier are attached:
5. "Experiments of Thomson and Rutherford", ("Time out") [74]
6. "Clifford`s parallels", [72]
7. "Fibration of the Mobius Pattern. Formation of the Atom" [73]

In the work "***1. Quantum Medium. Mobius Geometry. Magnetic Monopole***" the issues of the structure of the supporting Cosmic Medium and its matrix unit – the magnetic monopole are considered, in the work "***2. Quantum Entanglement. Mobius Geometry. The Yin-Yang Symbol. Phases of Fibration***" more attention is paid to the issues of quantum entanglement and bifidation/fibration, in the work "***3. Basic Element of Nature. Mobius Geometry. Gravity. Model of the Atom***" gravity, the basic element of Nature and the model of the atom based on it are considered, and model schemes of atomic elements from the element of hydrogen and its isotopes to the element of fluorine are proposed.

This work covers the issues of the hydromagnetic dynamo as a method of forming atoms in the supporting Cosmic Medium and its bodies.

"The most important lesson that quantum chromodynamics has taught physics [Wilczek was awarded the Nobel Prize for his achievements in this field] is this: «What we perceive as "empty space" is in fact a powerful medium whose activity shapes this world. No less important, progress in other areas of modern physics in every way strengthens and enriches this - the main - lesson. It is this concept of "empty" space as a rich and dynamic medium that now constantly fuels the dreams and ideas of science about how to achieve the unification of the forces of nature." [38]

In the famous British weekly "***New Scientist***", October 8-14, 2022, pp. 34-37, an article by Stuart Clark "***Our Magnetic Universe: The Forgotten Force That Shapes the Cosmos***" was published. [40, [01]], [28]

A remarkable fact of this article and the main topic are the views of the 1970 Nobel laureate H. Alfvén (1908 – 1995) on cosmology, as well as his main ideas, which are currently

being linked by young astrophysicists to the latest discoveries of experimental observational science.

In recent years, astrophysics has accumulated an abundance of such experimental facts and observations that confirm with high reliability Alfvén's cosmological ideas, and in particular about living cosmic plasma.

In the article by Stuart Clark, it is noted that "H. Alfvén pointed out that the overwhelming majority of all matter in the universe is in a state of physical plasma, similar to a kind of gas consisting of magnetic particles. From this, Alfvén suggested that the forces acting on plasma due to magnetism must be at least comparable in their effect to gravity. So overall, according to his arguments, magnetic fields must play an important, and perhaps even dominant, role in the formation of the cosmos." [28]

The concept I proposed based on the FPC is in agreement with the opinion of H. Alfven and his definitions of the filling of outer space and its composition, as well as with the opinion of Nobel laureate F. Wilczek and other scientists who share these views, which already have sufficient confirmation with the help of new research tools.

Based on the three previous articles, when considering the issues of the structure of the etheric Quantum Medium as a physical support environment of outer space, as well as the issues of the Magnetic Monopole, Magnetic Dipole, phases of fibrations in the universal method of generating matter from the inside out, as well as issues of actualizing system-forming interrelations, the following conclusions are progressively proposed:

1. The main driving mechanism mediating the method of universal torsion (UNI-VERCE) is INVERSION (mirror asymmetry), enclosed in the topology of the geometry of the Mobius strip. This inversion mediates the interrelation between complementary components and determines the universal law of the dynamics of their interaction.
2. The supporting **Cosmic Medium** is a **physical medium** and represents the initial state of matter – **the primordial matter** – in the form of a dynamic cellular (matrix) structure of vortex magnetoelectric nodes, closed according to the complementary principle, which mediates the phenomenon of magnetism as such and oscillating self-motion – **spinning**.
3. **Magnetism** is the physical embodiment of the comprehensive principle of complementarity, which determines its universality and generality of manifestation.
4. **The matrix structure** gives the supporting etheric medium the property of granularity and, according to fractal similarity, it is characterized by effects occurring in granular materials.
5. **The magnetic field** of such nodes is not externally manifested as bipolarity, since their polarity has a closure in **one topology**, and is in a monopolar (monopole) state – **two in one**, closed in **antiphase**. The nodes of etheric matter are magnetic monopoles. Such an initial physical state of matter is magnetoelectrically "invisible" or unmanifested. It represents a monopole hidden duality. A **monopole does not mean unipolar**, but has an internal closure of the polarities of magnetism. It represents a **monopole hidden duality**.
6. The **geometric visualization** of such a magnetic monopole is a Mobius strip with a minimum aspect ratio of a plane closed through an inverse turn of 180 degrees.
   The **Mobius Magnetic Monopole (MMM**) contains a natural **antiphase duality**, as well as the **duality of symmetry and mirror asymmetry**, combining them into one whole.
   In essence, this is the original **form of a quantum phenomenon**, which determines discreteness. The InfoGen of the original antiphase duality and the symmetry-asymmetry

duality is transmitted to all subsequent generations in a universal copying method. **Magnetism as a physical embodiment of this duality has the property of transmitting its InfoGen to all subsequent generations.**

7. In the state of closure through inversion and due to the internal **magnetic reconnection**, the etheric monopoles perform continuous and non-stop **oscillations**, which are an act of their internal spinning in the form of Mobius torsion, which is the simultaneous execution of two cyclorotations:
   - rotation of inversion around a conditional internal center along the middle of the Mobius curvature line and
   - cyclorotations of inversion around a conditional external center located inside the Mobius ring.
   This double type of cyclo-turnover is transmitted InfoGenetically to all system formations generated by the etheric Quantum Medium, and is a universal type of torsion UNI-VERSE, as evidenced by the entire cosmos and the names of the Universe in English, as well as Russian. [43]
8. The **Mobius Magnetic Monopole** (MMM) is a spinning **quantum-mechanical unit** that performs continuous and non-stop oscillations and produces sub-micro-**monopole radiation**, as well as the absorption of portions of magneto-plasma as a phase of **quantum breathing.**
   The **Mobius Magnetic Monopole is the original fundamental unit.**
   The **geometric shape, metrics and dynamics** of the MMM cycle rotation contain a relationship with numerical values close to three constants: $\boldsymbol{\varphi = 1.618}$**,** $\boldsymbol{\pi = 3.1415}$ **and** $\boldsymbol{e = 2.718281828459.}$
9. According to the description, such a vortex matrix of the supporting Cosmic Medium will create **turbulence effects** and, accordingly, a hydromagnetic dynamo will be spontaneously generated in it.
10. **Magnetoelectric oscillations** of magnetic etheric monopoles are a reciprocal quantum process of "radiation-absorption", in other words, a process of oscillating **quantum breathing** of the etheric Medium, which is also transmitted InfoGenetically to all the creatures of the environment from small to large as a process of breathing of life and at each level of scaling and in each plane of being has its own way of expression. This breathing of life is performed by both sub-micro-units of the etheric Quantum Medium, and atoms, bioorganisms, stellar-planetary systems, galaxies and the Universe as a whole.
11. The process of quantum breathing of the supporting Medium creates a sub-micro-vibrational background and is that high-vibrational carrier mediating all processes of interactions in the supporting Medium, the transfer of information and the implementation of the background principle.
12. The spinning substrate of the etheric Quantum Medium is an etheric **magneto-plasma** – a kind of **superfluid plasma liquid** from sub-micro-monopole radiations-absorptions, that is, **active living matter**.
13. At ultra-low temperatures of outer space, the etheric magneto-plasma is a special kind of condensed medium, a kind of **mega-quantum** object, in which a variety of collective effects are observed both of the entire object as a whole and of its individual areas interacting as a whole. Such a medium is characterized by the movement of arrays of “text phrases”, and not individual “letter units” of **universal binary coding**.

14. The processes occurring in the superfluid etheric-plasma medium will obey the **laws of hydrodynamics** similar to the processes occurring in water and air environments.
15. According to the laws of hydrodynamics:
    - In a hydrodynamic environment, any arc discharge, whether occurring in technological power plants or in natural conditions, can curl up into an electron vortex.
    - As a result of external influences, a vortex ring can decrease the toroidal velocity and increase the annular velocity, turning either into a vortex disk or a cylindrical vortex (thick or thin). The opposite transformation is also possible. A vortex ring in the form of a Hill vortex can form a vortex funnel in the form of a cone (jet).
    - Individual electron streams can separate from the surface of the vortex, quickly disintegrating into sparks.
    - A vortex ring can deform, passing through small holes, and restore its shape after deformation.
    - Vortex objects can divide spontaneously or under sudden external influence. The surface of an electron vortex can spontaneously delaminate into parallel electron beams.
    - Dynamic interaction is possible between vortex objects – they play leapfrog, dance in a circle, merge together, etc.
    - Vortices can form Karman paths. [42]
16. In accordance with the law of hydrodynamics on the spontaneous division of a vortex object or its division under a sharp external influence, it is proposed to further consider the phases of the process of bifurcation/fibration of a vortex monopole formation closed through an inverse turn, which geometrically represents the original Mobius strip as a special case of **Clifford parallels**.
17. As shown schematically, the result of the first phase of the bifurcation/fibration process is the doubling of the original InfoGenome of the Mobius Magnetic Monopole (MMM) and its polarization, that is, transformation into the Mobius Magnetoelectric Dipole (MMD), which, when doubling the inversion and loop length, has the configurability of the lemniscate-“eight”.
    As a result of such a transformation, the internal polarity acquires an external multi-manifestation in the form of bi-polarity or **dipole**. The dipole state of matter is its magnetoelectrically manifested state, which is called ***baryonic matter***.
18. All manifested matter in the universe has a magnetoelectric dipole structure. Based on this, the **dipole template** is the ***basic element of nature*** on the basis of which atoms are built and then everything else is fractally-holographically. This template is **universal** and is mediated by the ontology of the principle of complementarity.
19. In the process of step-by-step fibration of Magnetic Monopoles, which can be called the process of generating matter from the inside out, the actualization of those structural interrelations that are necessary to maintain the growing system formation in one whole occurs. This is **bipolar gravity** and **quantum entanglement**, which are derivatives of the original **complementary interrelation**, physically manifested as **magnetism**.
20. In the process of growth from the generative element, the "Center-Periphery" interrelation is actualized, which is equally extrapolated to different levels of scaling and to different planes of being.
    All **three** described **interelations**: gravitational, quantum entanglement and center-periphery, represent a functional **Universal Triplet of Interrelations**, equally inherent in

all existential levels: the micro-world of an atom, a biological cell, an organism, stellar-planetary and galactic systems, as well as the Universe as a Whole.

21. **The universal method** of bifurcation/fibration of the Magnetic Mobius Monopole and its transformation into a Magnetic Dipole provides the key to understanding the issue of charge quantization and its multiplicity to the minimum calculated one.
22. **The basic element of nature** in the format of the Mobius Magnetic Dipole visualizes the geometric transformations that constitute the essence of those atomic components that in the current paradigm are called "***proton-electron***" and "***neutron***" and demonstrates their mutual transformations.
23. **The basic element of nature** in the variant of the symmetrical Mobius Magnetic Dipole is the basis of the atomic structure and contains the physics of **opposite charges**, their **sign**, magnitude, the method of their interaction through the gravitational tensor of tension and balancing and the concept of **mass**.
24. **The basic element of nature** gives a visual representation of the natural four-dot, grouped "two by two" in the development of the duality principle, originally contained in the structure of the Magnetic Mobius Monopole.
25. **The basic element of nature** illustrates the **gravitational interrelation**, the principle of its actualization and functioning based on magnetism, as well as its action at all scaling levels.
26. **The basic element of nature** illustrates the process of reducing symmetry, which leads to the formation of a universal "***Center-Periphery***" structure, which is inherent in all scaling levels.
27. **The model of the atom** based on the described basic element of nature with a decrease in its symmetry creates a new visual representation of the planetary model of the atom, atomic quantum mechanics and rhythmodynamics of its functional components, their interrelations, corresponds to **line atomic spectra** and does not contradict the **classical laws** of electrodynamics.
28. **The formation** of the atomic weight and total charge of an atom are quite clearly visualized in the atomic model based on the Mobius Magnetic Dipoles connected in a **topological knot** and forming the “Center-Periphery” scheme.
29. The **atom** is a product of the generation of the etheric Quantum Medium in the process of bifurcation/fibration of the etheric vortex magnetic monopole (monopole macro-region) and that minimal part of a certain type of matter, which preserves the stable nature and properties of this matter, i.e. its **minimal particle**. All other formations classified as particles are quantum formations of the vital activity of the atom in the process of its quantum respiration, metabolism and symbiosis with the ethereal Quantum Medium, as well as the result of processes continuously occurring in the cosmic environment.
30. **The internal mechanics** of the atomic mechanism is based on the functioning of vortex dipole components connected in a topological knot and synchronized by quantum entanglement. The balance of the asymmetric arms of each vortex dipole formation is maintained due to their gravitational interrelation.
31. **The internal atomic rhythmodynamics** is determined by the synchronized spinning of the ring vortex dipoles and their mutual interrelaction. The product of the atom's vital activity is radiation, which is produced by the atom in its regular quantum symbiosis with the etheric Quantum Medium or with various types of impact on the atomic structure.

32. **Dipole atomic formations** can be destroyed, but it is impossible to perform the reverse action on them to connect them back. There is no method in nature for connecting individual «parts» into a stable and consistent atomic system formation (stellar-planetary), as well as forces for this. Any system is generated from the inside out and its growth is carried out in the same way. In the method of generation from the inside, the actualization of those interrelations occurs that are necessary for maintaining the system as a single whole.
33. The **basic element of nature** based on the FPC allows us to consider the physics of the micro- and macro-world in one geometric format and brings the scaling levels to one initial denominator.

In the field of this article, devoted to the phenomenon of hydromagnetic dynamo, I continue the chain of coverage of the issues of theoretical physics, which I have united into a self-consistent concept based on the ontology of the fundamental principle of complementarity (**FPC**) with the application to these issues of its **geometric analogue** – the Mobius strip.

At the very beginning and first of all, I would like to outline the very important results of the research (2008, 2014) [3], [34] for this topic and the conclusions made on their basis, because it is precisely these conclusions that speak in favor of that the version of the hydromagnetic dynamo model proposed by me in the author's monograph and earlier articles is correct. Also, following the entire chain of the concept I proposed, other important conclusions turn out to be correct.

**The model of hydromagnetic dynamo** proposed by me is logically derived by me solely on the basis of geometric transformations of the Möbius strip in a simple paper experiment and without involving any sources covering topics of the format of this geometry.

It is a great success that the conclusions I have made coincide with the study (2008, 2014), which came to my attention much later – during the preparation of the above 4 articles (including this one) in 2024. The 2008 study independently increases the number of arguments confirming my theoretical proposal and not only speaks in its favor, but also directly indicates the correctness of the conclusions I have made.

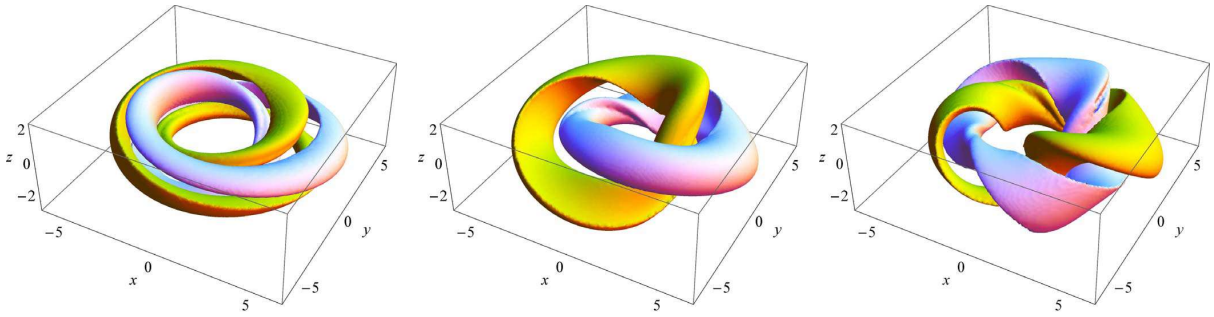
**In August 2008,** the results of the theoretical study "**Dynamo action in Möbius flow**" were published in Physical Review E. [3]

This theoretical proposal concerns the issues of organizing the wrapped configuration of the plasma flow in the stellarator equipment for the purpose of keeping theis flow within the channel.

«We demonstrate that flows of conducting fluid along a Möbius strip and related surfaces are hydromagnetic dynamos, i.e., they can produce an exponentially growing magnetic field from an infinitesimal seed. The critical magnetic Reynolds number in one of our models is as low as about 16. Together with other attractive features, this makes this flow an interesting candidate for a laboratory dynamo experiment. We suggest that a flow of conducting fluid in a channel that envelopes the Möbius strip or a similar surface is a dynamo with a relatively low value of Rm * suitable for a laboratory realization. A shell filled with rotating liquid sodium, as in the Perm dynamo experiment». [3]

**FIG. 3.** _Color online_ Upper panels: snapshots of the isosurfaces of $B2$, where $B$ is 1/3 of its maximum value, for a growing magnetic

field generated by the Möbius flow in _a_ run 1, _b_ run 3, and _c_ run 8 of Table I. Color indicates the general field direction along each
isosurface _magnetic lines are not necessarily confined to the isosurfaces_: red-blue _yellow-green_ colors indicate magnetic field with *Bu*
_0 _*Bu*_0_ _cf. Fig. 1. [3]



The authors of the theoretical study note the fact that in order to make the plasma flow swirling in a toroidal channel, diverters are needed.

«However, it is more difficult to support a swirling flow in the torus. The localized divertors in the Perm experiment produce a rather inhomogeneous swirling flow, after the
braking the average grows slower than V, and the swirling velocity peaks at a smaller value than V». [3]

In the case of creating a flow in the form of a Mobius strip using the geometry of the equipment itself, the disadvantages associated with installations with divertors are eliminated. Based on this, the authors proposed a technical solution that corresponds to their original idea of creating a twisted flow of Mobius configuration due to the geometric shapes of the stellarator equipment. Moreover, the toroidal shell should not be stationary, but **rotating**.

«The dynamo suggested here has several attractive features from the viewpoint of its laboratory implementation. An suitable apparatus for such an experiment could be a rotating
toroidal shell filled with liquid sodium, as in the Perm dynamo experiment 4,7, which is braked to produce an inertial flow of sodium relative to the channel shell. A toroidal channel needs diverters to make the flow swirling. A Möbius flow can be produced using an insert of the corresponding shape e.g., as in **Fig. 1** fitted within the toroidal shell». [3]

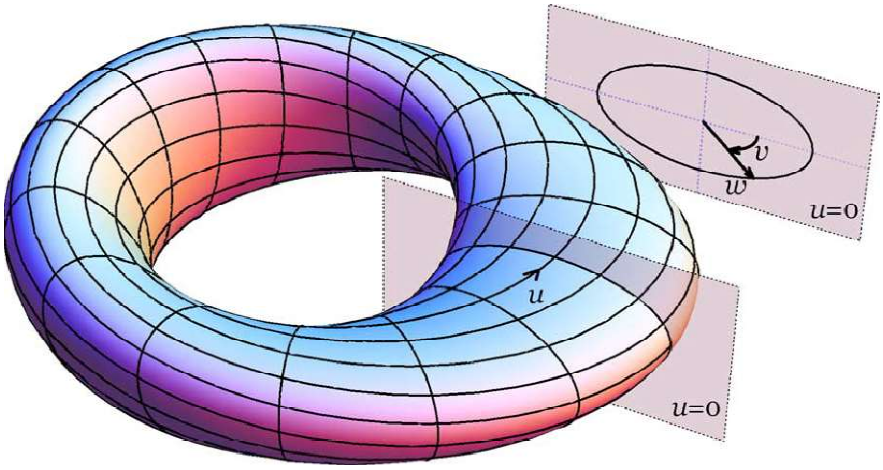


**FIG. 1**. _Color online_ A Möbius channel _$n$=1/2_ with elliptical cross section, as given by Eq. _3_ with $R/b$=4, $a/b$=2. The coordinate lines of $u$ and $v$ are shown solid, the former being the streamlines. The inset shows the cross section, as indicated, with the definitions of $v$ and $w$ illustrated. The surface shown is $w$=1. [3]

The authors of the theoretical proposal emphasize that "the geometry of the flow in our case is transmitted not by divertors or propellers, but by the shape of the channel. It is surprising that this idea has not been explored before." [3]

The most important thing, according to the authors, in the theoretical proposal is the following:

«**In a Möbius flow, the whole channel acts as a diverter**. The swirling flow is established uniformly along the whole channel and willdecay slower because the flow is not impeded by the diverters. Thus, a Möbius flow is likely to become supercritical earlier, and remain so for longer, than a comparable flow in a toroidal channel with diverters. Furthermore, this design could provide an opportunity to optimize the time variation of the flow by applying gradual rather than abrupt, as in the Perm dynamo casebraking. Then the flow velocity relative to the shell can be kept at a level required to prolong the dynamo action further and, hence, to maximize the amplification factor of magnetic field. It is also possible that the elliptical shape of the channel cross section will prevent the development of turbulence». [3]

In fact, this theoretical study, which claims that the flows of conductive fluid along the Mobius strip will be a hydromagnetic dynamo, the **reverse conclusion** will be the following: if the phenomenon of hydromagnetic dynamo is observed in nature, then its occurrence is caused by the movement of flows of conductive ether magnetoplasm along the spatial configuration in the form of a Mobius strip. And this directly indicates the correctness of the fundamental conclusion I made that the fabric of space is structured according to the Mobius pattern, in other words, according to the principle of complementarity, the physical embodiment of which is magnetism and its conductive flows.

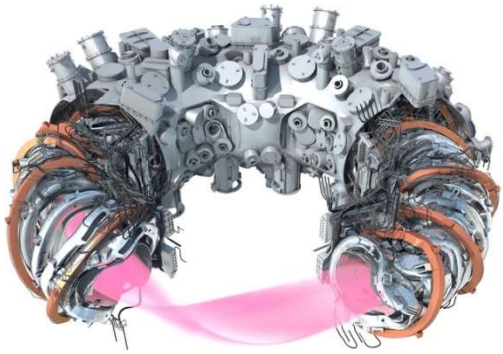
Mobius configuration is inherent in both the smallest sub-micro-unit of the Quantum Medium and the region of space in which such units exhibit a synchronized collective effect and act as one guant **macro-quantum or mega-quantum**, generating a self-exciting hydromagnetic dynamo.

The action of the hydromagnetic dynamo in such a **macro-quantum** (**mega-quantum)** leads to a high-speed doubling of magnetic loops and the generation of cosmic objects: galaxies and star-planetary systems. Such a region of space in the condensed etheric Quantum Medium of space in current views is called a "***black hole***", accumulating the substrate of the etheric medium.

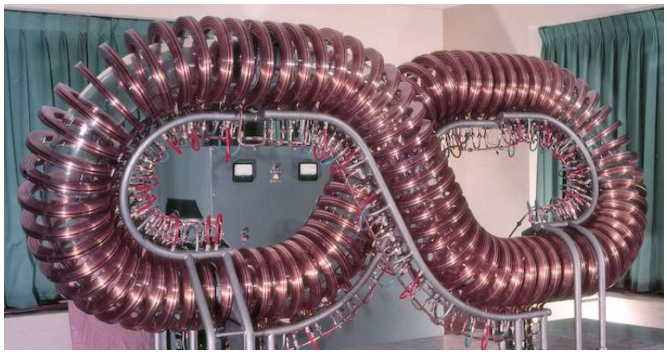
Then the conclusion that the matrix of the etheric Quantum Medium consists of vortex magnetic monopole units – Mobius Magnetic Monopoles (MMM), can be considered a **fundamental conclusion**, since it concerns the structure of cosmic space, in which all energy transformations and geometric transformations occur, and for them the initial structure must contain the potential and properties that generate these transformations. It is from this starting point that my theoretical reasoning began in the work "***1. Quantum Medium. Mobius Geometry. Magnetic Monopole***" and then continued in the works that follow it. Magnetic Mobius Monopoles of the etheric Quantum Medium are precisely those sub-micro-embryos that create collective flows of conductive quantum fluid (magneto-plasma) and generate the effect of a

hydromagnetic dynamo based on the laws of hydrodynamics. And the Quantum Medium of such vortex units is indirectly turbulent, and its units are topological.

The creation of stellarators with the aim of producing the same thermonuclear synthesis that occurs in stellar bodies shows that, by technically implementing this idea, engineering and scientific thought comes to those chemes of technological structures for working with a plasma flow that essentially exist in natural structures and are described by me in the format of Mobius Geometry.



**a)**



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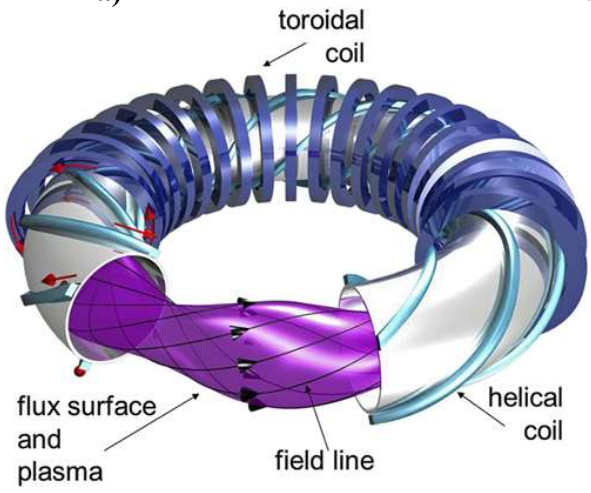
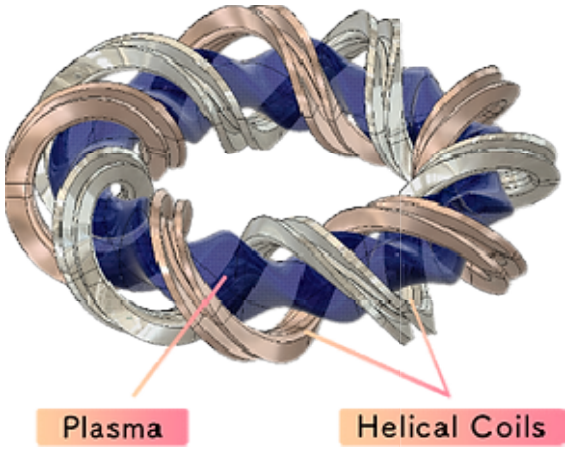



**c)**

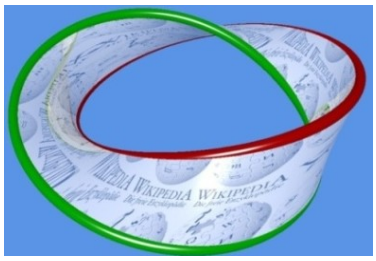



**d)**

As can be seen from the illustrations, stellarators use Mobius tracing of the plasma flow, as well as magnetic coils twisted in the same type of a spiral. Thus, the technological equipment with its forms repeats the natural interrelation of spiral magnetic lines and the sinusoidal direction of the magneto-plasma energy current (electricity) created by them in an electromagnetic phenomenon, in which the spirals of magnetic lines and electric current represent ***Clifford parallels***.

In essence, if we draw fractal-holographic parallels, then DNA is the same dynamo, only biological.

Since today the figurative representation of the configuration of magnetic lines and their interrelation with the direction of electric current has been formed on the basis of the **right-hand rule** in the form that we know from the school physics curriculum, the arsenal of illustrations of the magnetoelectric phenomenon does not assume the presence of drawings based on the geometry of ***Clifford parallels***. In this case, I used the "***Illustration E-M***" – on the right – taken from the DNA picture set and it illustrates electromagnetism.

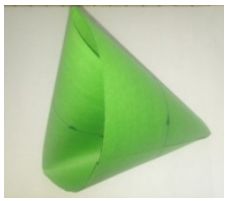
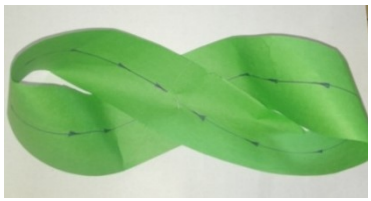




***Clifford parallels.*** ***DNA strands.*** ***«Illustration "E-M"».***

In order to illustrate the hydromagnetic dynamo model I proposed, it is necessary to return to the visualization of the general structural step scheme of the phases of the Magnetic Mobius Monopole (MMP) fibrations, its transformation into the Magnetic Mobius Dipole (MMD) and the actualization of structural interrelactions, which is given below. It is also necessary to analyze the existing basic models of the hydromagnetic dynamo of the Nobel laureate H. Alfven and the scientist Ya. Zeldovich.

TWO PHASES OF FIBRATION.


***1). Monopole*** ***2.) Dipole. Gravity*** ***3).Two dipoles. Quantum entanglement.***

1. **Mobius Magnetic Monopole** (MMM) is a one-sided non-orientable surface. Polarity is internal, not expressed outward as a dipole. Symmetry of two sides of the plane and their mirror-asymmetric connection into one topology.
2. **Mobius Magnetoelectric Dipole** (MMD) is a one-sided orientable surface. The first doubling of the InfoGenome and polarization of the etheric unit of MMM. Polarity is expressed outward through two mirror-asymmetric arms with different chirality. Symmetry of two arms relative to the CBT and their mirror-asymmetric helicity.

**A basic element of nature**. It is an analogue of two interconnected pulsating spheres, "***charges***", the interrelation "***proton-electron***" and "***neutron***" in an atom, "***planet-star***" in cosmology, an analogue of the ***two-brane model*** and other analogies. The ***Gravitational Interrelation*** is actualized as the basis of balanced interaction of two interconnected complementary opposites – mirror-asymmetrical shoulders of the Magnetic Dipole.

The Mobius Magnetic Dipole is the **basis of the atomic structure**.

3. **The Mobius topological knot** of two connected Mobius Magnetic Dipoles. The second doubling of the InfoGenome. Symmetry of two dipoles and their mirror-asymmetrical spinning relative to each other.

The Link Interrelation or **quantum entanglement** is actualized as the basis of the interrelations of dipoles in system formations: atom, stellar-planetary system, galaxy, cell, organism, society, fabric of space.

The issues of fibration phases, as well as the characteristics of the Magnetic Mobius Dipole are considered in detail in the works "***2. Quantum Entanglement. Mobius Geometry. Yin-Yang Symbol. Phases of Fibration***" and "***3. Basic Element of Nature. Mobius Geometry. Model of the Atom***".

The process of filamentary division (bifurcation/fibration) with doubling of magnetic loops in the hydrodynamo effect is the process of **synthesis of atomic elements**.

By definition, the **hydromagnetic dynamo** (HMD) is the effect of **self-generation** of a magnetic field with a certain movement of a conducting fluid, and it is also a mechanism for amplifying or maintaining a stationary (or oscillatory) state of a magnetic field by hydrodynamic movements of a conducting medium. Summarizing a number of conditions necessary for the functioning of the hydromagnetic dynamo (HMD), I emphasized that all these conditions are fulfilled in the descriptive format of the etheric Quantum Medium proposed by me, the matrix nodes of which are magnetoelectric vortex granules in the geometry of the original Mobius strip. This geometry primarily corresponds to the principle of the unity of the complementary principles of cosmogenesis and their antiphase interaction based on magnetism, and also provides those necessary conditions of topological complexity and turbulence that are necessary for the functioning of the HMD, namely:

1. **Liquid medium**.

In the theoretical view I proposed based on the ontology of the principle of complementarity (as well as in a number of modern theories), the Cosmic Ethereal Quantum Medium is described as a granulated quantum liquid with specific properties that allow it to manifest various phases of states (like water) depending on the conditions, and is also constantly in a state of vibration. Such a matrix-granulated and dynamic property of the Medium is provided by **magnetoelectric vortex modes** in the configuration of the Mobius strip, which in their general collective manifestation represent magneto-plasma as a kind of "***quantum liquid***" ("***1. Quantum Medium. Mobius Geometry. Magnetic Monopole***").

2. The turbulent nature of movements and topological properties of flows, respectively, **topological complexity**. As shown, the Mobius geometry of the vortex units of the Quantum Medium provides both the topological properties of flows in the etheric Quantum Medium and their complexity, as well as maintaining a constant vibrational level and turbulence.

3. As shown in the theoretical proposal [3], the motion of a conducting fluid along the surface of a Mobius strip will generate a hydromagnetic dynamo. That is, along with the **topological complexity** associated with motion along cylindrical and toroidal surfaces outlined in earlier works on this topic, motion along a Mobius strip, as shown in [3], belongs to the same category and generates a dynamo effect. The dynamics of a two-cycle revolution of a Mobius vortex granule forms the geometry of an energotor.

4. **Average helicity**.

Helicity as such is inherent in Mobius granules closed by 180 degrees and implementing a universal type of torsion with a high level of vibration.

5. **Non-axisymmetric convective motions**, feedback between the toroidal and poloidal fields of the energy torus.

The screw motions of the inverse "blade" of the vortex formation in the geometry of the Mobius strip form non-axisymmetric convective motions, in which mutually inverse processes occur.

6. **Turbulent motions** should not have mirror symmetry.

The inversion of the Mobius strip creates mirror asymmetry and generates structures in its Image and Likeness, providing asymmetric turbulent motions.

Based on the above, we can conclude that the etheric Quantum Medium, consisting of a matrix of magnetoelectric vortex units that retain their inverse helicity, has a vibrational level and is indirectly turbulent. And if we summarize this analysis, then in the Mobius Pattern all the conditions necessary for the functioning of the natural hydromagnetic dynamo as a kind of reality generator are met.

Considering the phenomenon of hydromagnetic dynamo from the standpoint of already studied requirements for its formation, which are theoretically substantiated and confirmed by research observations, adding the results of the described theoretical study [3] of 2008, as well as connecting with the format of those transformations that the geometry of the Mobius strip demonstrates, I have proposed a **model of hydromagnetic dynamo, which is based on the bifurcation/fibration of magnetic loops (Mobius Magnetic Monopoles).**

As already indicated in previous works, such a mfgnetic loop is a topological unit with closure through inversion, i.e. a Mobius strip. The division of magnetic loops is based on the hydrodynamic property of spontaneous division of vortices or their division under a certain impact on them. In this description, this division is an act of transformation of Mobius Magnetic Monopoles (MMM) into Mobius Magnetic Dipoles (MMD) with the actualization of structural interrelations – **gravitational** and **quantum entanglement** . This leads to the formation of stable structures (atomic, stellar-planetary, galactic), in which gravitationally balanced dipoles are connected by quantum entanglement into a topological knot. More about this in the work "***3. Basic element of nature. Mobius geometry. Model of the atom.***"

This paper offers a more detailed consideration of two states of the ***basic element*** of nature – the **lemniscate-"eight"** and the Möbius **pseudo-ring**, since these two states and their transformations into each other are directly related to the model representation of the hydromagnetic dynamo, as well as to the understanding of the mutually inverse geometric transformations of the atomic components called "***proton-electron***" and "***neutron***".

In the context of this work, I provide an illustration of two states of MMD: lemniscate-shaped in the form of an "eight" and a double pseudo-ring, which visualize, respectively, a "***proton-electron***" and a "***neutron***".

TRANSFORMATION OF A FLAT MÖBIUS LOOP.

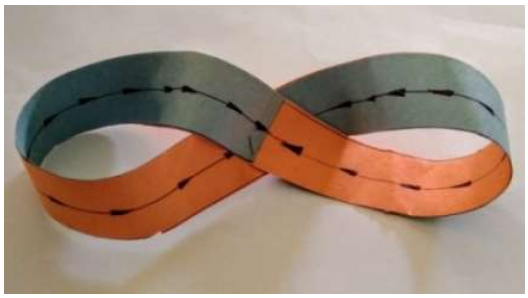


***Figure-eight dipole.***



***Double pseudo ring.***

A double pseudo ring (***neutron***) is obtained as a result of coaxial insertion of the arms of the figure-eight dipole (***proton-electron***).

In the figure-eight state, opposite charges (***proton-electron***) are actualized in the dipole, which is necessary for generating an external magnetic field; in the state of coaxial insertion of the arms – pseudo ring (***neutron***) – the structure acquires a state of neutrality.

These geometric transformations are of great importance for the parallel explanation of many phenomena that have not yet received due treatment in theoretical physics, and also do not have **geometric visualization**. In this context, these two states and their transformations into each other provide a visualization of atomic components.

The following conclusions can be drawn from these transformations:

1. The Mobius Dipole in the **lemniscate** configuration with mirror-asymmetric arms of different chirality is the ***basic element of nature*** and the basis for the chemical element PROTIUM (hydrogen) – one "**proton**" and one "***electron***". The basic element of nature becomes an atomic element when the symmetry between the arms decreases and the "Center-Periphery" scheme is formed. ("***3. Basic Element of Nature. Mobius Geometry. Gravity. Model of the Atom***").

2. The Mobius Dipole in the configuration of a **double pseudo ring** is the basis for the "NEUTRON" state, when the "***proton***" and "***electron***" dipole arms are coaxially nested into each other and the structure acquires **internal polarity**, but already in the doubled version and outwardly such an element is neutral. As a stable element, the "neutron" exists only as part of an atom. Outside the atom, its lifetime is about 15 minutes and it again decomposes into a two-loop state of the lemniscate-"eight" or, in the language of the current paradigm of physics, decays into "proton-electron".

3. These transformations are important for creating a visualization when considering the issues of hydromagnetic dynamo, beta decay, and others in which calculations using algebraic formulas include the states "proton-electron" and "neutron". In the application of the Mobius Geometry format to the issues under discussion, these states should be considered as components geometrically transformable into each other. This is the basis of radioactive transformations.

When considering issues related to the hydromagnetic dynamo, these reciprocal transformations provide a visualization of the process of magnetic flux generation itself. The hydromagnetic dynamo model I have proposed is based on these transformations, which are based on the original magnetic loop in the geometry of the Mobius strip with one inverse turn.

The model I proposed, on the one hand, complements the existing models of the hydromagnetic dynamo of H. Alfven and Ya. Zeldovich with the necessary elements, and on the other hand, shows the real mechanism of the formation of atomic elements in stellar and planetary bodies, as well as the generation of entire galaxies.

**In 1950, Hannes Alfvén** published an article of historical importance, "***A Discussion of the Origin of the Magnetic Fields of the Earth and the Sun***" [25], in which he first described his model of the generation of the cosmic dynamo, which, along with Zeldovich's "eight" of 1971, still serves as the basis for most modern models.

An illustration of H. Alfvén's model is below.

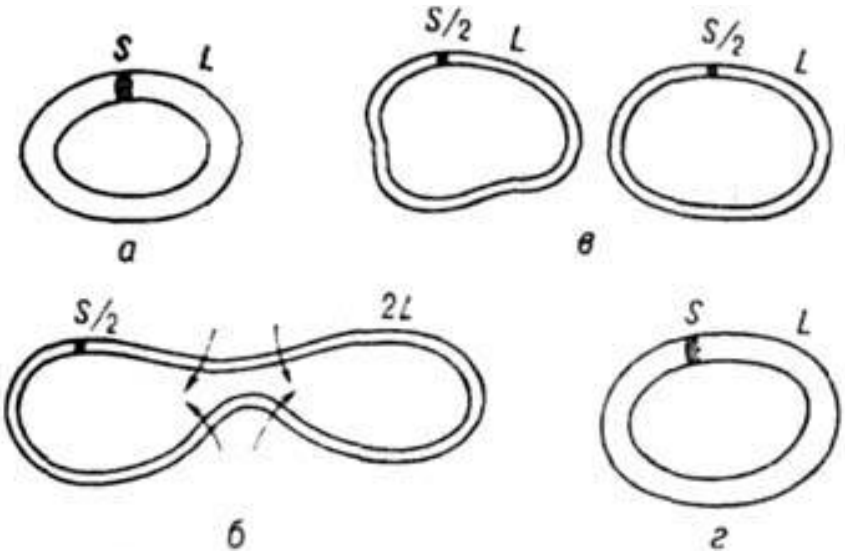



**Fig. 1**. ***Illustration of the operating principle of a slow dynamo in the model of H. Alfven.*** [25], [11].

"According to the model of H. Alfven, the initial loop of the magnetic field (length L, cross-sectional area S) is stretched twice. Then, along one of the diameters, two oppositely directed sections of the field come together and the loop is divided into two under the action of magnetic diffusion. After superimposing the two resulting loops by shifting, a doubled loop is obtained with a diameter equal to the initial one and a magnetic flux through the cross-section of the loop twice as large as the original (due to doubling the number of lines of force). Then the procedure is repeated. Strict examples of a slow dynamo are solutions of the equations of a hydromagnetic dynamo for screw motion along cylindrical surfaces, for a system of several spheres rotating around their axes, or toroidal vortices immersed in a medium with finite conductivity." [11]

“Kinematic dynamos have been classified by the behavior of the field growth rate at high magnetic Reynolds numbers, dividing them into slow and fast [10,12,13]. A clear illustration of a slow dynamo is the model of X. Alfvén [10,14], in which the initial closed tube of magnetic lines is stretched twice, splits into two tubes after approaching along one of the diameters and the action of magnetic ohmic diffusion at the point of approach, and then the tubes are added together without turning into one with a doubled magnetic flux. The field growth in this model depends decisively on magnetic diffusion and stops when the latter becomes vanishingly small.” [7]

The fast kinematic dynamo was one of the important ideas of **Ya. Zeldovich in 1971**. This idea offered a solution to the nature of the generation of powerful magnetic fields in astrophysics and is known under the names: "***Zel'dovich figure eight***", "rope dynamo" or "***stretch-twist-fold mechanism***". **In 1983**, the most famous book by Ya. Zeldovich and his students on magnetic fields in astrophysics was published. [9], [41, [o11]]

**In 1998,** the book "***Topological Methods in Hydrodynamics***" by the outstanding mathematician V. Arnold, known for his achievements and radical views on scientific affairs, and his student B. Khesin was published. [14], [41, [o12]]

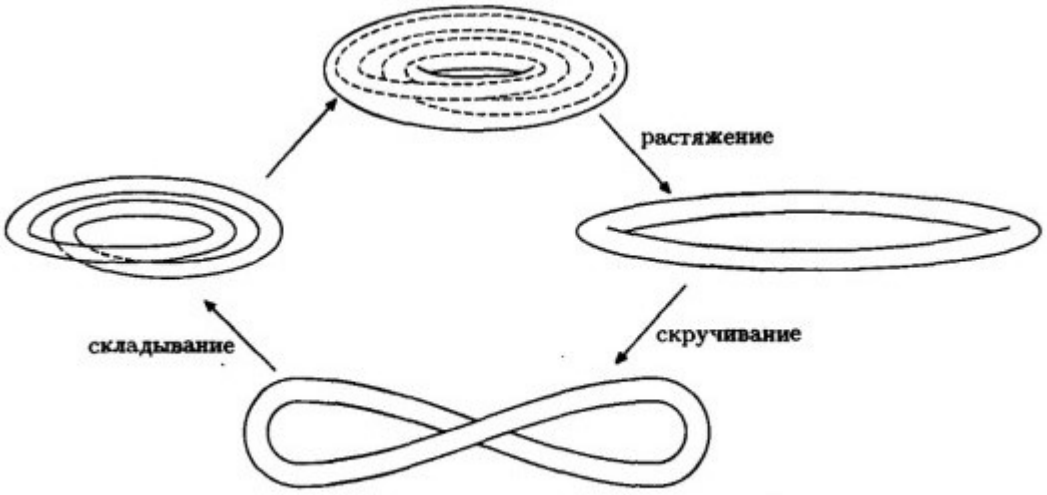
A separate chapter of this book is devoted to the analysis of the problems of fast kinematic dynamo in astrophysics.

"The model of a fast dynamo, the growth rate of which does not depend on small magnetic diffusion, is the well-known figure eight, proposed by one of the authors [10, 13, 15]. Thus, from a mathematical point of view, the existence of a hydromagnetic dynamo is proven." [7].

"The magnetic field amplification is formed by twisting and doubling the loops: the movements of the medium give the lines of the initial toroidal magnetic field the shape of a figure eight, then combine the loops of the figure eight and stretch the resulting torus to its initial dimensions. After this, the process is repeated. Each time the number of loops is doubled, the magnetic field is doubled" [10].

"A fast dynamo can operate in a turbulent environment typical of space conditions. At the same time, turbulent motions entangle magnetic field lines, reducing their characteristic scale.

To amplify and maintain large-scale magnetic fields, turbulent motions must not have mirror symmetry. Violation of mirror symmetry means the predominance of vortices of the same sign (right-handed or left-handed), i.e. the presence of average helicity. Such turbulence is not typical for laboratory experiments, but it naturally occurs in space conditions due to the rotation of inhomogeneous celestial bodies. As theoretical studies have shown, mirror-asymmetric random movements are capable of generating a large-scale magnetic field." [10]




Веревочное динамо: механизм растяжения-скручивания-складывания

***The Zeldovich dynamo diagram in the book by V. Arnold and B. Khesin***. [41, [o12]]

**In 1977, Hannes Alfven** proposed his own picture of the evolution of magnetic lines, consonant with the model of Ya. Zeldovich (Alfven H. Rev. Geophys. 15 271, 1977). [22]

As can be seen from the models of H. Alfven and B. Zeldovich, the main difference in their geometry is the method of forming the doubled magnetic loop itself in the form of an "eight", and then the formation of two magnetic loops, the addition of which doubles the growing magnetic flux.

Let us consider the elements of the Alfven and Zeldovich models in more detail. Despite the presence of similar elements, the Alfven and Zeldovich models have different algorithms for the process of amplifying (doublings) the magnetic flux. When analyzing both models, the following can be said.

**Analysis of the H. Alfven model.**

According to the slow dynamo model of H. Alfvén (**Fig. 2**), the magnetic loop below stretches and bends so that its two distant sections approach each other, a reconnection occurs, the loop splits into two, i.e. a bifurcation occurs, and after this they overlap each other so that the magnetic flux doubles.

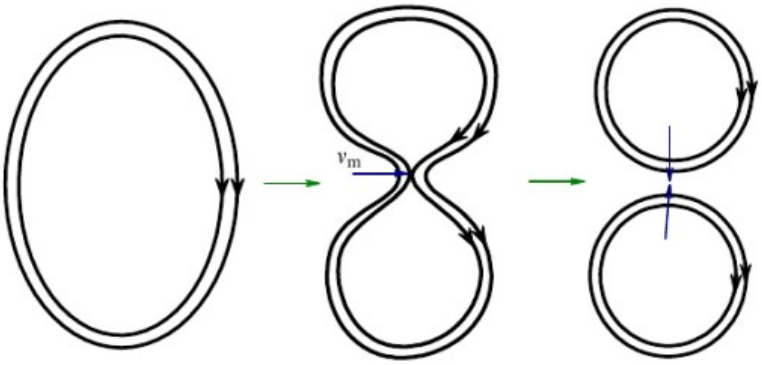
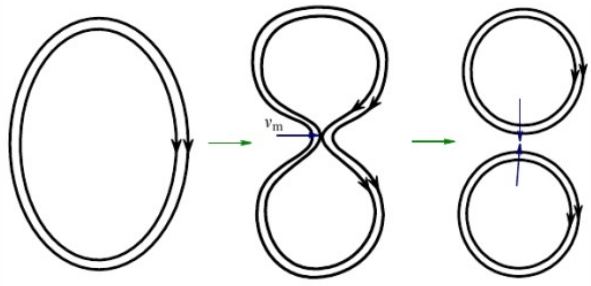
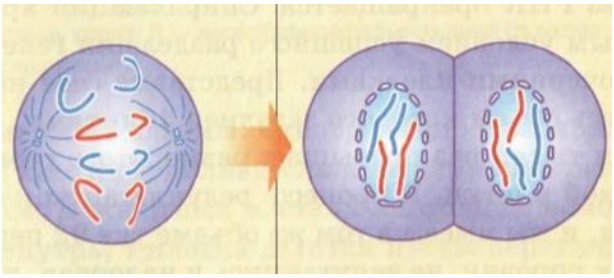



**Figure 2.** Alfven process: the magnetic loop stretches, flattens, and breaks under the effect of magnetic diffusion. The resulting loops overlap. The magnetic flux is doubled, but the process governed by weak diffusion is slow. [34]

In this doubling scheme, it is necessary to explain that even if the original loop is divided into two by diffusion, then by what means do these two loops, obtained after the break (division) of the original, add up? Also, the question arises about by what measuring instruments the original magnetic loop is stretched exactly twice. Then, by what means are two equal-sized loops obtained as a result of the break, equal in diameter to each other, and also equal to the diameter of the original magnetic loop, and when they are subsequently superimposed, they absolutely precisely correspond to each other? These are the main questions according to the Alfven model.

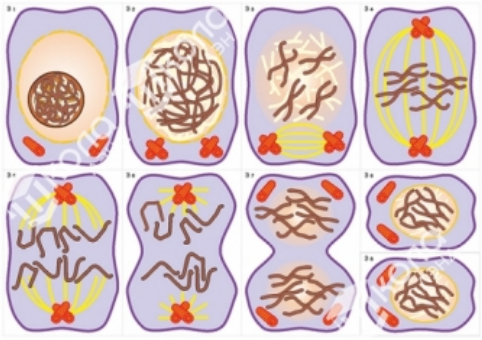
If we draw an analogy with another plane of being on the basis of If on the basis of the holographic principle and the general universalism of the FPC, in particular with the process of cellular reproduction, then in the Alfven model an analogy with a part of the algorithm of division of a living cell is clearly visible. This process of division is a projection into the plane of biology of the Universal principle of self-copying through bifurcation/fibration with the receipt of an identical copy.

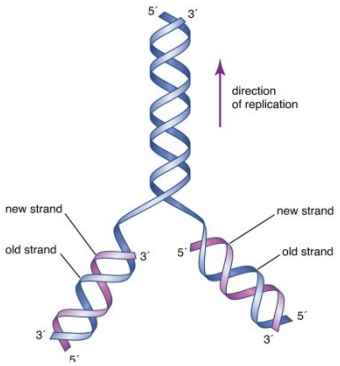


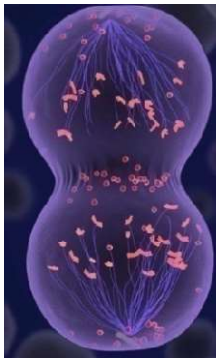



But in order to divide a cell and obtain an identical copy, it is necessary to perform information fibration/bifurcation of its InfoGenome, that is, it is necessary to perform bifurcation of the DNA strands, which ultimately gives doubling – two cells. Moreover, both cells are equal

in size to the original one. It is this result during cell division that is important in understanding how, during division of the original magnetic loop, the magnetic flux does not decrease by half, but increases by two.





Part of this universal algorithm of bifurcation/fibration is reflected in the model of H. Alfven by flattening the original, but already doubled loop in the middle, then breaking it into two equal loops, the size of which also requires additional explanation.

I repeat that in the algorithm of the scheme of the hydrodynamo model of H. Alfven, the two obtained rings are superimposed, but how to make them equal, combine and superimpose one on top of the other – this question remains without a detailed explanation.

**Analysis of the Zeldovich model (Fig. 1).**

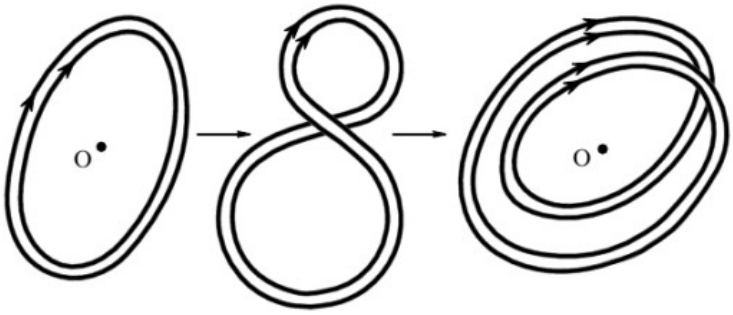





**Figure 1**. Zeldovich figure-eight magnetic loop stretched, turned over,
And folded onto itself with the doubled magnetic flux. Magnetic diffusion
Is needed to smooth the magnetic field in the place where the loop was twisted. [34]

According to the model scheme of the fast dynamo of Ya. Zeldovich, the initial loop is stretched twice, then the magnetic loop line is twisted with the formation of the "eight" configuration and then it is folded in half.

As it can be seen, in the scheme of doubling the magnetic flux of Ya. Zeldovich there is the formation of the lemniscate-shaped "eight" configuration with the crossing of the curvature line and then its transformation into a double ring.

However, obtaining the very act of twisting into a "***figure eight***" requires explanations in Zeldovich scheme, i.e. it is necessary to justify as a result of what transformation and what measuring instrument the initial magnetic loop is stretched exactly twice, then the crossed "eight" configuration appears and then due to what its property it is folded in half, as a result of which the magnetic flux is doubled, and the diameter of the doubled magnetic loop should be

equal to the diameter of the original loop. These are the main questions according to the Zeldovich model.

As shown, what is common in both schemes, despite their differences, is the process of bifurcation followed by doubling, which is essentially a universal process of generating matter from within and is demonstrated in parallel using the example of cell division during the bifurcation of DNA strands, resulting in the doubling of the original cell.

It should also be noted that in both models (**Fig. 1** and **Fig. 2**), the initial magnetic loop, as can be seen from the illustration, is a toroidal loop with a length ***L*** and a cross-section ***S,*** and both models are talking about the **diameters** of the loops, that is, they are initially represented as **circles-donuts**.

Also, both models indicate that the initial loop undergoes expansion-stretching.
But then the question remains for both model schemes – what is the reason and what is the method of this loop expansion and why exactly **twice**, and not more or less?

Despite the difference in the algorithms for doubling the magnetic flux in the schemes, the end result is common in the models – after superposition (addition) of the two resulting loops, a doubled loop is obtained with a diameter equal to the diameter of the original loop, and a magnetic flux through the cross-section of the loop twice as large as the original (due to doubling the number of lines of force).

If you think about the final result of the transformations in both models, a rather rational thought arises – after all, Nature does not have measuring instruments to stretch the original magnetic loop like a rubber band exactly to double its diameter and then end up with two identical folded loops whose diameter is equal to the diameter of the original one. How does Nature achieve such incredible precision without having hands, rulers and other instruments to press the "stop" button when expanding to double the length, and then create two rings that exactly match in size, equal to the size of the original loop? What is the secret of its ability to so accurately and quickly find a solution and come to the intended goal – to double the magnetic flux?

Along with the given illustration of the models of H. Alven and Ya. Zeldovich, I have proposed a diagram from the author's monograph, which, in my opinion, reveals the main secret of nature – bifurcation/bidivision/fibration, which leads to the formation of a doubled magnetic loop in the form of an "eight", its subsequent folding in half and indicates a way to explain the origin of the hydromagnetic dynamo itself, supplementing both models with missing elements.

Answers to questions about existing models and visualization of the process are given by Mobius Geometry. As already indicated, the original magnetic loop is represented in the form of a Mobius ring (MMM) with one inverse turn – this is the **first.**

Its doubled expansion is obtained by the universal method of bifurcation/bidivision/fibration along the line of the Mobius curvature, that is, the magnetic loop is stratified filamentarily in accordance with the laws of hydrodynamics and, according to such a geometric transformation, it automatically becomes twice as long – this is the **second**.

With this method of filamentary bifurcation/stratification, along with doubling the length of the loop, the inversion is doubled, due to which the loop acquires a twisted configuration of the lemniscate-"eight" – this is the **third**.

Further, the magnetic loop can be folded coaxially, and the length of the doubled loop, folded in half, will correspond one to one to the length of the original magnetic loop – this is the **fourth**.

The group of illustrations in **Fig. (3)** below illustrate the scheme I proposed. With the bifurcation method, both at the stage of doubling the length of the ring and at the stage of inserting the two resulting loops into each other, the dimensions completely match without the use of measuring instruments.

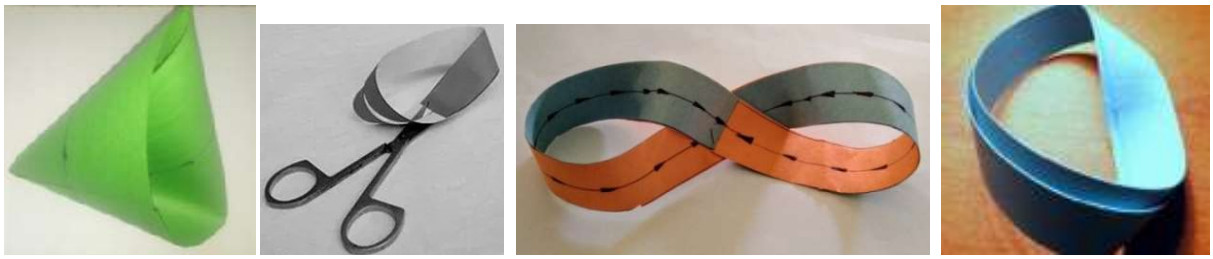


***Fig. 3 Mobius Monopole. 1st phase of fibration. Two-loop Mobius Dipole in two states – lemniscate-eight and double pseudo-ring***.

Due to such a process of generation from within – bifurcation/fibration – and the formation of a double pseudo-ring, the magnetic flux doubles.

As shown, the doubling of the magnetic flux and the observance of all dimensions is naturally ensured by the properties of Mobius Geometry. With further bifurcation-fibration, the flux doubles again, i.e. increases four times compared to the original.

The question of why the energy in the process of bifurcation of the original loop doubles, and does not decrease by half, lies in the same plane as the question of why, when a cell divides and the identical copiy is obtained, the resulting cells do not decrease by half.

The plane of beingness in which the answer lies is the presence of a feeding supporting Quantum Medium and the implementation of transformation mechanisms in the etheric magneto-plasma, namely, quantum breathing, quantum metabolism, as well as the quantum symbiosis of all objects with it. Without recognizing the existence of the supporting Cosmic Medium, practically all the main questions of physics remain suspended in the "emptiness of the physical vacuum" and without clarity in explanations, require mathematical manipulations, artificial inclusions and complications, as well as excessive postulation.

Thus, all processes associated with the hydromagnetic dynamo and the increase in magnetic flux must be considered as processes that occur in the living, nourishing, supporting etheric Quantum Medium – this is the first thing. And secondly, the analogy with the division of a biological cell is very important. The new copied cell does not turn out to be half the size of the one that generated it, but is identical to it. The same thing happens at the quantum level during the division of the magnetic loop – the process of bifurcation/doubling occurs according to the universal mechanism, wherever and however it is performed.

The next point that should be noted concerns the fact that since both models of H. Alfven and Ya. Zeldovich deal with loop diameters, it must be assumed that the variant of the Möbius closure of a magnetic loop through inversion was not considered in these models. Both models considered the variant of a magnetic loop in the configuration of a torus-doughnut, to which the term "diameter" is applicable.

In the variant of the application of Möbius Geometry to this issue, we cannot talk about loop diameters, since the shape of the Möbius ring is not a circle. In the case of the Möbius ring, we can only talk about the **length of the ring**.

Now it should be noted that during the bifurcation/fibration of the magnetic loop and the increase in magnetic flux, the resulting loops from fission remain topologically connected and,

depending on the conditions in the fission algorithms, atomic elements are generated based on the algorithmic combination of the states of the MMD – "**neutron**" and "**proton-electron**".

In the biography of Ya. Zeldovich there is a remarkable fact, which should also be cited by analogy with the "Dirac belt" mentioned in the previous work, since both facts indicate that the magnetic loop and all its subsequent transformations should be considered precisely in the version of the Möbius configuration, which is the geometry of the magnetic loop.

"According to a legend, which Ya. Zeldovich never disputed, he first demonstrated his scheme during a discussion at a conference in Krakow in 1971, using a trouser belt, which he borrowed from one of the conference participants, as a model of a magnetic loop."

That is, Ya Zeldovich demonstrated his famous "eight" in the model of a hydromagnetic dynamo by twisting a trouser belt, which is exactly what visualizes the Mobius strip with two turns. This version of the Mobius strip illustrates the basic element of nature, described in the work "***3. Basic Element of Nature. Mobius Geometry. Gravity. Model of the Atom.***"

And "Zeldovich's eight" is a stage of transformation of a magnetic loop with its addition to a neutron, which in the effect of the hydromagnetic dynamo is obtained as the transformation of a magnetic monopole into a magnetic dipole with a doubling of the magnetic flux. According to the descriptions given above, such a folded loop "***neutron***" decomposes into "***proton***" and "***electron***".

P. Dirac used almost the same image of a twisted belt to demonstrate the spin of an electron. Being an engineer, he was the first to notice that the strange feature of the spin becomes a completely natural geometric consequence if the electron spin is represented as a twisted trouser belt, in other words, as a Mobius strip with two inverces.

From these two examples, we can extract the fact that two scientists in different years, working in different areas of theoretical physics, used a **doubly twisted Mobius ring** to explain, at first glance, different phenomena: P. Dirac – to explain the electron spin, and Ya. Zeldovich – to explain the process of doubling the magnetic loop in his model of a hydromagnetic dynamo.

At first glance, these are different aspects. But only at first glance. "***Zel'dovich's eight***" as a doubled magnetic loop appears in the field of physics that studies the hydromagnetic dynamo. But the hydromagnetic dynamo is a way of forming atoms based on the fibration of the Magnetic Monopole with the formation of a **basic dipole element** – Mobius Magnetic Dipole (MMD).

This same basic dipole element, but as a **bi-spinor**, is described in the relativistic equation of P. Dirac using the tool of algebra. The bi-spinor discussed there and Zeldovich's eight are the same basic dipole element. Therefore, in both examples with a trouser belt, we are talking about the same aspect – how and on what basis atoms are formed. Only Zeldovich talks about a hydromagnetic dynamo and doubling of the magnetic loop, which is the method for obtaining atoms, while Dirac wrote down the formula for the basic element – the bi-spinor, on the basis of which atoms are constructed.

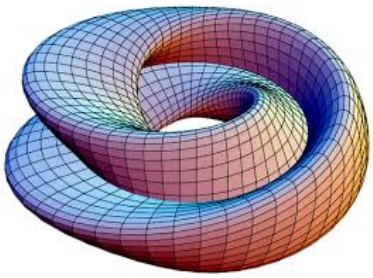
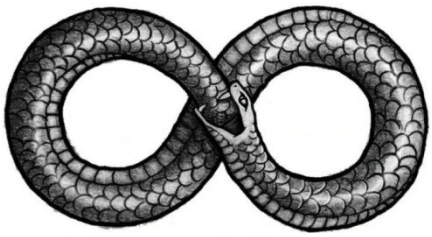
Both of these aspects belong to one essential unit – this is the Magnetic Mobius Dipole Double-Inversion Loop, which is obtained in the hydromagnetic dynamo phenomenon when the MMM bifurcation/fibration occurs with the doubling of its InfoGenome. The geometrical "***eight***" of Ya. Zeldovich in the hydromagnetic dynamo phenomenon is an algebraic ***bi-spinor*** in the relativistic equation of P. Dirac together with the ***spin***, which should be considered as the mutual spin of the two components of the ***basic dipole element***. Being described in different aspects, the ***basic element*** based on the Mobius geometry reduces these aspects to a single essential process, a single figurative representation and leads to a single denominator of the physics of the hydromagnetic dynamo phenomenon as a way of forming atoms.

The question of the magnetic hydrodynamo model based on the process of fibrations as a bifurcation of the Magnetic Monopole can also be connected to the fulfillment of the universal principle, which is noted in the physics of nonlinear systems, namely:

"If a certain system is brought to a state of excitation, then the excitation energy, having passed a complex path throughout the system, will necessarily return to the point of initial excitation. This is the so-called effect of return of excitation energy, the FPU – **Fermi-Pasta-Ulam** effect (the Fermi-Pasta-Ulam-Tsingou paradox). Stimulated emission is strictly coherent (related, preserves the memory of the initial development phase) with the forced emission, which leads to a doubling of the initial excitation impulse. Hence the purpose of all forms of matter – to amplify the initial excitation energy of the living process twice." [35]

In the application of MG to the issue of hydrodynamo based on magnetic loop division (MMM), it should be noted that such a magnetoelectric circuit can be related to a dynamic nonlinear system in which, as a result of magnetic reconnections, the system is brought to a state of excitation, as a result of which both the excitation pulse is doubled, and the process of fibrations on this basis, and then the magnetic flux is doubled with the transformations of magnetic loops.

Möbius configurability illustrates the fact that a nonlinear system, justified by the presence of a mirror-asymmetric inversion, which is a universal substantial bookmark, is in a state of constant oscillatory (vibrational) excitation, starting its path from the “head” and ending with the “tail”, which the “head” constantly grabs, as was depicted by the ancients using the figurative symbolism of the “uroboros” – a snake biting its own tail. Through the image of such a snake from ancient times to the present day, the essence of the universe's geometry, expressed by pictorial symbolism, reaches us.


Thus, the **fundamental conclusion** will be as follows: the original magnetoelectric Mobius structure, as well as the structures generated by it by the method of copying through bifission/bifurcation, will be in the mode of continuous self-oscillatory process of self-excitation and self-generation as renewal.

As shown above, the state of the Mobius Magnetic Dipole (MMD) – a double neutral Mobius pseudo-ring – geometrically visualizes the state of "***neutron***", and the lemniscate-"eight" geometrically visualizes the state of "***proton-electron***". It follows that each atom is an algorithmic combination of these two states of MMD, geometrically transformed into each other.

The process of hydromagnetic dynamo, for example, on the sun will be most associated with the transformation of these states with the formation of hydrogen, its isotopes and helium and most likely to a lesser extent associated with the remaining elements, for the formation of which the conditions of planetary bodies are more suitable. Heavier atomic elements, along with lighter ones, are formed in the domain layers of planetary bodies, where certain temperature and pressure conditions are created for the processes of division of magnetic loops, in order to form a set of atomic elements representing a periodic system through bifurcation/fibration, which speaks in favor of the fact that the process of division of magnetic loops in the hydromagnetic dynamo method is algorithmized by domains and each atomic element is an individual formula for the bifurcation process.

This process is ensured by a combination of factors in the superconducting liquid plasma layered regions of the internal structure of the planetary body, where a high-speed magneto-plasma quantum generator operates and, in the conditions of a "blast furnace", smelts from the pumped-in ether magneto-plasma, clamped in the crust of the planet, those alloys that come out at the places of their birth. Thus, it becomes clear that in the planetary core there is a quantum furnace, a kind of quantum "blast furnace" in which the etheric maneto-plasma is pumped in and the process of molding all the atomic elements of the periodic system from it, like from quantum plasticine, takes place.

The generation process is associated with a strong tension of the gravitational tensor during the generation of mass inside the Earth and the transformation of magneto-plasma into atomic elements.

In current views, the planetary core is represented as a solid metallic body. I believe that such a view has been formed due to the still insufficient understanding of the importance of the presence of the etheric cosmic Quantum Medium, as such, and its role, as well as how the formation of cosmic bodies occurs in it. According to the concept I proposed and the method of formation of space objects described in it, the planetary core is a superconducting liquid magneto-plasma medium in a special compressed state, which imitates high-density solidity due to the extremely high tension of the gravitational tensor.

Since the logic of my descriptive paradigm and the applied geometry of space give exactly this result, I fully agree with the opinion of Ya. Zeldovich's student A.A. Ruzmaikin in his work "Physics of Space. Hydromagnetic Dynamo". [10]

"Thus, the hydromagnetic dynamo apparently operates in all planets with liquid conducting cores. The main task is to clarify the nature of the movements and construct specific dynamo models." [10]

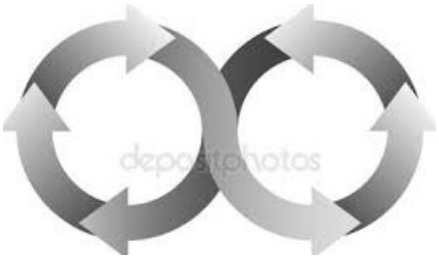
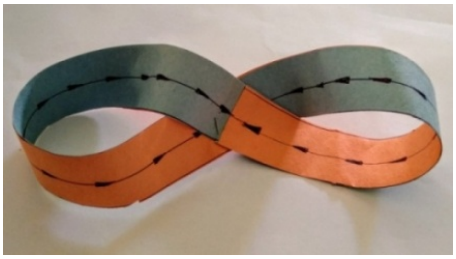
The dynamo model version I have proposed may bring the missing clarity to this issue, which will resonate with other related issues that at first glance seem unrelated.

As a consequence of the proposed new model of the hydromagnetic dynamo, I will risk proposing a new visualization of the magnetic lines of the Earth's magnetic field, which forms a new perspective on the already established views on the structure of the Earth's core and the processes occurring there.

No theoretician in the history of science has yet designated the nature of a magnetic loop as having an inverse closure or proposed a visualization of magnetic lines corresponding to such an assumption. In this regard, I propose to consider a new visualization of magnetic lines in the format of an application of Mobius Geometry or, in other words, based on the comprehensiveness of the Fundamental Principle of Complementarity (FPC). Magnetism is a physical embodiment of the FPC, which means that the magnetic phenomenon initially contains

a complementary principle. It is from here that the comprehensiveness of magnetism takes its understanding as the basis of all natural phenomena, and on this basis it is possible to form pictures of the representation of the properties of magnetism.

I have proposed a different visualization of the Earth's magnetic lines, firstly, due to the fact that our planet is considered a magnetic dipole, and secondly, on this basis the lines of its magnetic field are shown in the MG format, where in the dipole version they are proposed to be considered crossed along the center of the planetary sphere.

In this variant, magnetic lines demonstrate certain **convective movements** from the CBT (Center of Tension and Balancing) of the Earth to its surface (periphery) and back. Similar applications can be made to both the planet and the stellar-planetary system, as well as to the star itself.

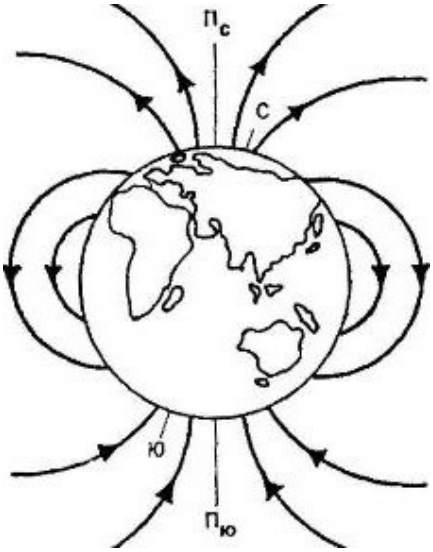



***Fig. (1)***

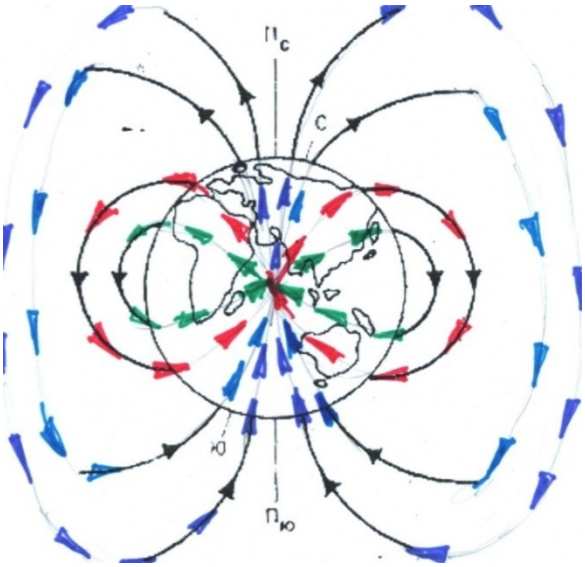



***Fig. (2)***

***The Earth's magnetic lines in the accepted representation Fig.(1) and the same lines in the proposed dipole visualization Fig.(2).***

Crossing of magnetic lines in the center – **Fig. (2)** – corresponds to the Universal Mobius Magnetic Dipole construction and gives an understanding of the fact that in the very center of the planet (by analogy with the center-nucleus of the atom and the center-nucleus of the star in the stellar-planetary system), there is a gravitational tensor, through which the transformation of the ether magneto-plasma and the **synthesis of matter** takes place, as described in the work "***3. Basic Element of Nature. Mobius Geometry. Gravity. Model of the Atom***", that is, the synthesis of all elements of the Periodic Table of Chemical Elements.

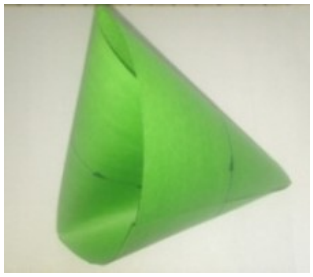
The planet is a kind of blast furnace and domain furnace, squeezed by dense basalt layers of the crust, in which, with the help of the hydromagnetic dynamo mechanism, matters with different quantum formulas are synthesized and smelted from the ether.

These domain areas are located in layers and each domain layer functions in it`s own blast furnace mode. The formation of each period of chemical elements is associated with the temperature and pressure conditions, as well as with the simultaneous two-cycle revolution of the planetary body of the Earth around its axis and around the Sun, as well as its dipole interrelation with the Sun.

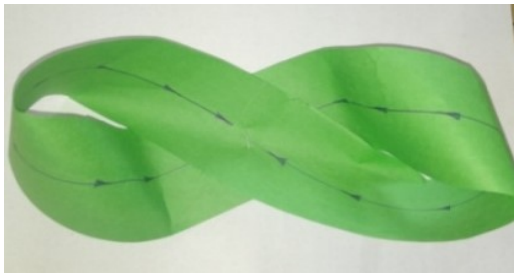
The planet feeds itself from its internal plasma generator source and simultaneously receives power from an external source – a star – which is a necessary condition for the existence of an object in space, namely, power from two sources: internal and external. Each planet is in the same dipole interrelation with the core-star of the stellar-planetary system, as the peripheral arm of the atomic dipole (electron) with the core. These interrelations are fractally identical based on the universal basic element of nature and the holographic principle.

There the corresponding illustration below from the work "***3. Basic Element of Nature. Geometry of Mobius. Gravity. Model of the Atom.***"

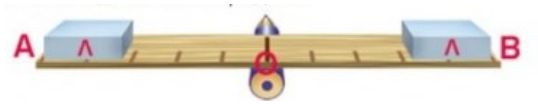
1. BIFURCATION/FIBRATION OF THE MONOPOLE.

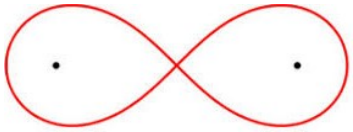

Mobius Monopole.


FIBRATION.


Symmetrical Mobius Dipole.

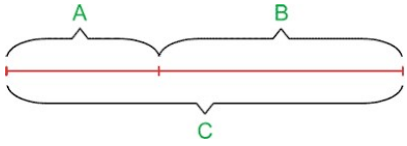
2. SYMMETRY OF DIPOLE ARMS.



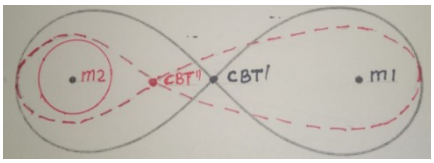
3. REDUCING SYMMETRY ACCORDING TO THE PRINCIPLE OF THE "GOLDEN RATIO" AND BALANCING DUE TO CBT DISPLACEMENT.






**Lever balance with movable axis.**



**"Proton (m2)–electron (m1)" dipole coupling.**

CBT 1 – Center of Balancing and Tension with symmetry between the arms;
CBT 2 – Center of Balancing and Tension with decreasing symmetry between the arms.

This universal dipole scheme can be considered in application to the formation of both atomic structure and stellar-planetary, as well as to other planes of being that are not considered here. This scheme allows us to understand the principle of action of the gravitational interrelaction and the gravitational tensor, through which the process of generating the mass of matter is carried out. When oppositely directed magnetic flows approach each other in the area of their crossing, a **reconnection of magnetic lines occurs**, generating magneto-plasma quanta, and the transformation of plasma magnetic energy **into thermal and kinetic energy** is carried out.

**The phenomenon of reconnection** when plasma flows approach each other is currently being studied in laboratory, space and astrophysical plasma. [4], [5]

Also of interest are the experimental results on the study of processes in plasma and in particular the issues of reconnection, which have been obtained over the past few years. [65]-[68]

Thus, returning to the internal structure of the planetary body, we can say that the effect that is recorded by seismic and other instruments as a very solid body, interpreted today as a solid metallic core, is a property of super-powerful gravitational tension, which is created by a powerful magnetic tensor and the process of hydrodynamic generation in the core - the bifurcation of magnetic loops of the etheric magnetoplasm with a doubling of the magnetic flux.

As can be seen from the illustration of magnetic lines proposed above in **Fig. (2)**, the dipole crossing of magnetic lines and their inverse flip along the center of the Earth's sphere change current ideas.

According to such visualization, the direction of movement of the magneto-plasma flow inside the Earth's sphere is indicated in the illustration **(D)** below according to the "right hand" rule. In accordance with the selected direction of magnetic lines (from south to north), in the left dipole arm the movement of the plasma flow will **unscrew**, and in the right dipole arm – **screw**. That is, in the inner space of dipole magnetic loops and inside the conditional magnetic circuit in the form closed to a **horn-torus**, the movement of the internally generated "liquid" plasma flows will be carried out along the **Mobius trajectory** and **counterclockwise**. These lines are indicated in the illustration **Fig. D** by purple dash-dotted lines inside planetary sphere.

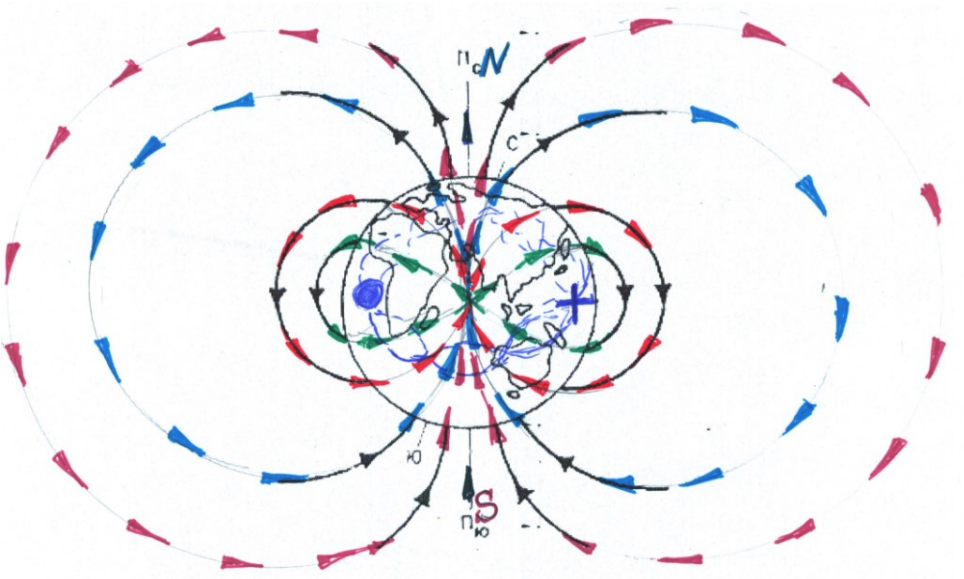



**Fig. D**

**Fig. D** ***Direction of magnetic lines and direction of internal plasma motion.*** The «***plus***» sign in right loop indicates **screwing in**, the «***dot***» sign in left loop indicates **unscrewing**.

This is the answer of Mobius Geometry to a question that has no answer yet in the scientific community – why does planet Earth rotate **counter-clockwise** every day? During this rotation, the process of generating chemical elements from the ether in the earth's blast furnace is carried out.

The inverse reversal of the magnetic loop, on which the phenomenon of magnetism is based and essentially founded, creates in the dipole magnetic structure with two inversions the generation of plasma mass and then the generation of atoms. This generation of mass through the division of magnetic loops and the doubling of the magnetic flux in the macroquantum of a planetary body or star is called the phenomenon of hydromagnetic dynamo.

Dipole visualization of magnetic lines gives an understanding that the center of the planet is not a solid metal core, as is believed in the current approach to the structure of the Earth, but in the center of the planet a hydromagnetic dynamo functions and the process of transformation of the ether magneto-plasma in the phase of its materialization and transformation into baryonic matter is underway.

I have analyzed a number of publications in the field of the internal structure of the earth over the past 5 years [47]-[58]. The results of the experiments and conclusions indicate that in theoretical views today, the concept of the internal structure of the Earth continues to remain, according to which the center of the planetary body is a solid metal core. In official sources, new proposals are not yet visible. Accordingly, all interpretations of published observations and theoretical conclusions based on them are considered within the framework of these established views.

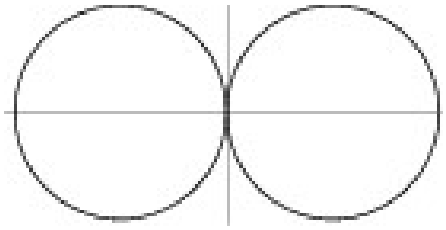
The approach based on Mobius Geometry offers a revision of previous theoretical views, using the universality of both the "Center-Periphery" scheme and the universal method of transition of the etheric state of matter into baryonic matter through the bifurcation of magnetic loops with doubling of the magnetic flux, and offers to look at the internal structure of the planet from the position of the location in its core of the epicenter of the plasma quantum generator, the functioning of which in the conditions of the planetary body creates the illusion of a dense metal core.

The formation and location of such a metal core in the center of the Earth's body, as well as its functional purpose, are too difficult to explain. In addition, the new visualization of magnetic lines provides an impetus to explain with greater clarity the process of rotation of the planet around its axis and the rotation of the entire stellar-planetary system as a whole.

Here it is necessary to once again focus attention on the fact that in the magnetoelectric phenomenon both magnetic lines and energy flow lines have a Mobius spiralization and the dipole magnetic loop wraps the plasma flow into the configuration of the Mobius strip, which achieves the retention of the plasma flow in the inner space of the planet.

When designing stellarators, engineering thought comes to the same method of plasma retention as is implemented in Nature.

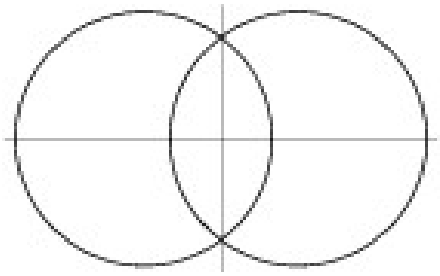
In the proposed approach based on the Mobius geometry, emphasis is placed on the geometry of the cavity inside which the plasma flow being wrapped moves – this is a **horn torus** or even a **spindle torus**, since its section is similar to the geometry of the ancient symbol "***Vesica piscis***".



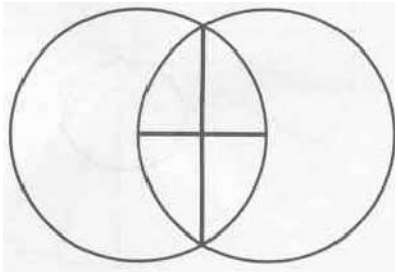
***Section of horn torus.***



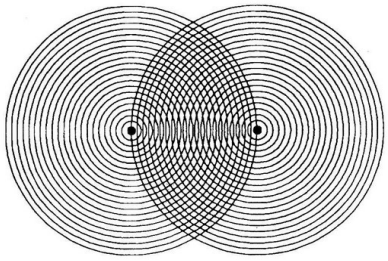
***Dipole magnetic loop.***



***Section of spindle torus.***



***Vesica piscis.*** [78]



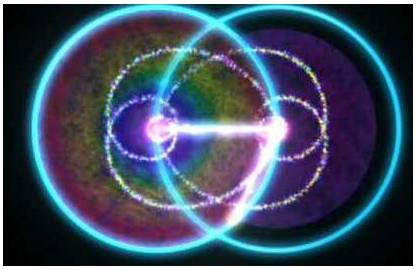
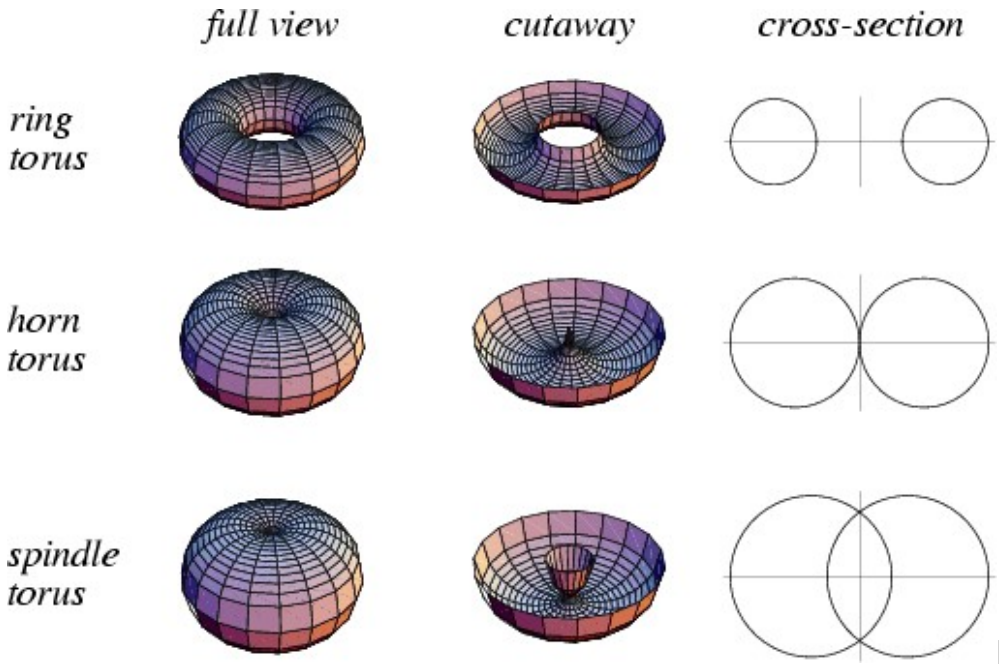


**Fig. G** [79]

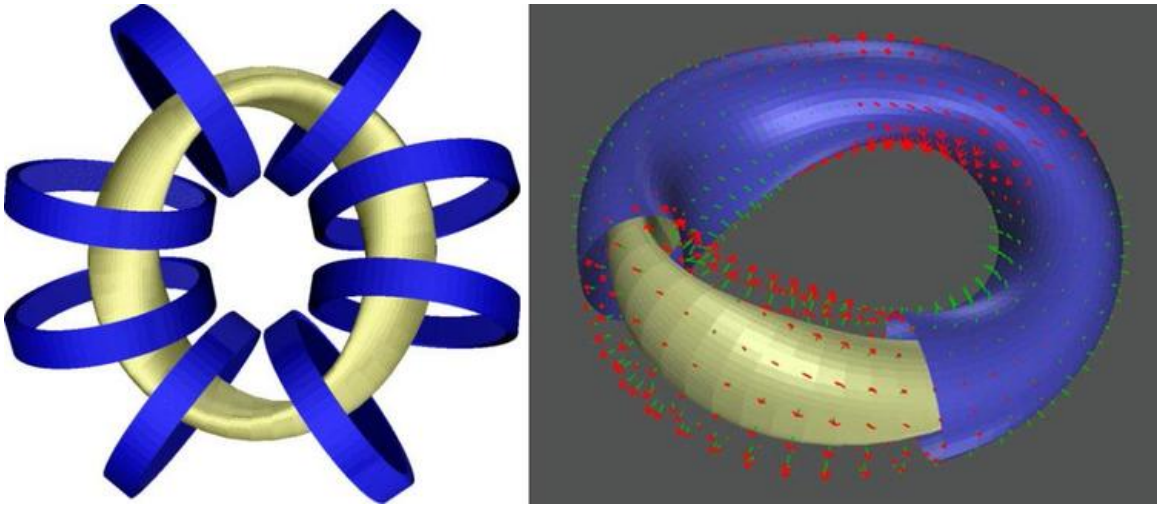
**[79] –** Animation to **Fig.G** https://www.youtube.com/watch?app=desktop&v=jXsKh1p6vIg

Torus cuts are presented on the website of the famous mathematician Stephen Wolfram. [70]




[70]

As already noted above, the wrapping of the plasma flow into the Mobius spiralization is currently achieved on stellarators using permanent ring magnets for the purpose of magnetically holding the plasma flow inside the equipment, made in the form of a torus. In practice, the technical solution for creating thermonuclear fusion repeats nothing other than the natural design.



**(C)**

A simple set of circular electromagnets, shown on left **Fig C**. The shaping magnetic field is produced by an array of permanent magnets. Each magnet creates a dipole field, which is represented by an arrow. The total magnetic field created is designed for optimal plasma confinement. *Image courtesy of P. Helander, M. Drevlak, M. Zarnstorff, and S. C. Cowley, Phys. Rev. Lett. 124, 095001 (2020).* [62]

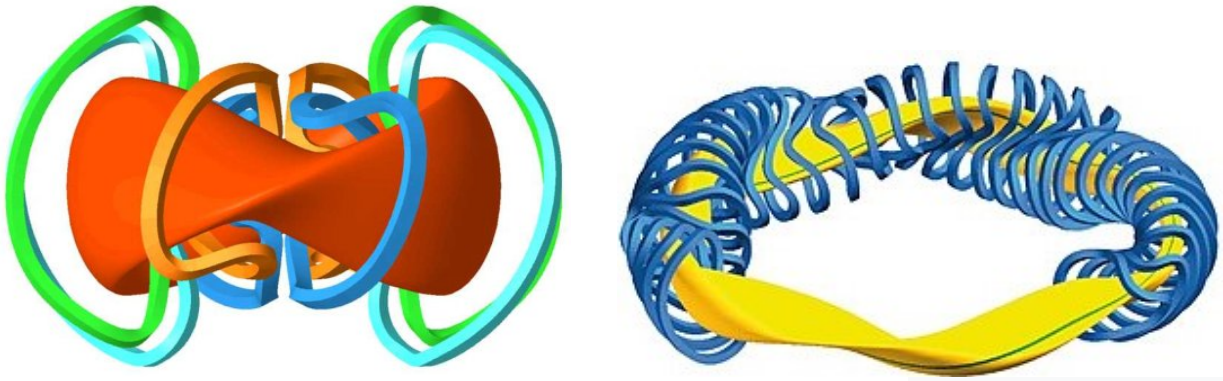


***Image Courtesy of*** *Aries Program UC San Diego* [61]**. [Wikipedia].** ***Stellarator schema*** *– coil system (blue), plasma (yellow), a magnetic field line (green) on the plasma surface*.

As described above, along with the already practiced use of ring magnets for wrapping and holding plasma, there is an interesting proposal [3] that proposes creating a flow wrapped in a Mobius shape using an insert of the corresponding Mobius shape installed inside the toroidal shell of the equipment. In this case, the Mobius geometry of the plasma flow will be organized not by divertors or propellers, but by the shape of the channel itself. That is, the entire channel will act as a divertor and the swirled flow will be established uniformly throughout the channel.

It is also necessary to add the fact that despite the fact that illustrations of processes in stellarators with undeniable clarity demonstrate the spiralization of the plasma flow according to the Mobius geometry, almost all articles about stellarators and on the original sites do not talk about practical applications of the Mobius geometry to technical design or theoretical developments. This is evidenced by the fact that today developers do not include aspects of this geometry in their projects, although in practice they are steadily moving in this direction.

Stellarators as types of reactors are designed to carry out a controlled thermonuclear fusion reaction. The origin of the name stellarator from the Latin "stella" – "star" – indicates the fact that the very idea of a stellarator is an attempt to obtain processes similar to those that occur inside stars.

"The Simons Foundation is pleased to announce the establishment of the Simons Collaboration on Hidden Symmetries and Fusion Energy, directed by Amitava Bhattacharjee of Princeton University.

*"I would like nuclear fusion to become a practical power source. It would provide an inexhaustible supply of energy, without pollution or global warming." Stephen Hawking (1942–2018)*

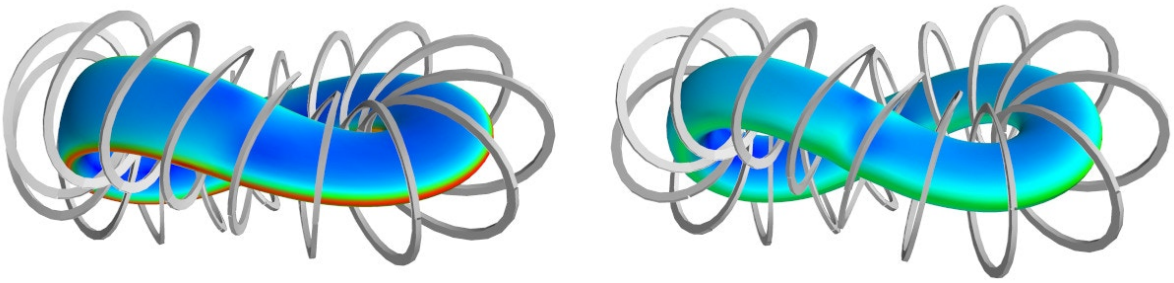
The most compelling transformational use of magnetically confined, high-temperature plasma is to realize sustained fusion energy. Despite impressive progress, net energy production has not yet been achieved. The *tokamak*, which is the leading magnetic confinement concept in the world today, has the topology of a torus and continuous symmetry with respect to the toroidal angle, giving it good confinement properties.

In the *stellarator*, which is the leading alternative to the tokamak, the confining magnetic field is mostly produced by external current-carrying coils. In contrast to the tokamak, stellarators *rely* on symmetry breaking to realize the magnetic field needed to confine particles.

Over the last few decades, a new concept has emerged in the design of stellarators, giving rise to a renaissance—the remarkable discovery that it is possible to design 3-D magnetic confinement devices with *hidden symmetries* that can have the same virtues as tokamaks while overcoming some of the inherent drawbacks of the latter.

An example of a hidden symmetry, known as 'quasi-symmetry,' is that the magnitude *B* of the magnetic vector field B has a negligible coordinate dependence (in a special curvilinear coordinate system) even though B does not. The primary purpose of this collaboration is to create and exploit an effective mathematical and computational framework for the design of stellarators with hidden symmetries.

The challenge of finding 3-D optimum magnetic fields with hidden symmetries encompasses mathematical and computational problems of great subtlety, straddling optimization theory, plasma physics, dynamical systems and the analysis of partial differential equations. This collaboration has, therefore, assembled a multidisciplinary team of world experts in these disciplines, reflecting the breadth and importance of our challenge. Synthesizing the understanding developed through our research, our goals include a modern stellarator optimization code that can exploit the full power of petascale and exascale computers, and a few optimal designs of next-generation stellarator experiments.



***Above**: Two stellarator configurations with coils that produce confining magnetic fields. The color shows the curvature of a magnetic surface filled ergodically by field lines. One configuration has higher torsion (right), and the other has higher ellipticity (left), but both have the same magnetic field-line pitch on the axis.*" [63]

As can be seen from the illustration, in order to create a technoGenic equivalent of exactly this synthesis that occurs in the bodies of stars, it is necessary to create conditions for the hydrodynamic process of fibration, in which the generation and transformation of states of dipole atomic elements occurs either directly from the ether magneto-plasma, or using the fibration of the basic element of nature, enclosed in the formula of hydrogen, its isotopes or helium.

But the most important thing in creating devices in which an attempt is made to repeat the process of synthesis in stars or the planetary body of the planet under the conditions of a natural hydromagnetic dynamo is to imagine this process with sufficient clarity, as well as to understand whether it is technically possible to implement it and how it can be controlled, or whether it is possible to create only some modification of it under the conditions of technically manufactured equipment.

The new visualization of magnetic lines gives impetus to explain with greater clarity the process of rotation of the planet around its axis and the rotation of the entire stellar-planetary system as a whole. Also, the new visualization of magnetic lines, along with the explanation of the internal structure of the planetary body and its two-cycle torsion, will obviously be able to eliminate the division into several types of fields: **magnetic, electric, gravitational, inertial**. This will make it possible to significantly simplify the explanatory paradigm.

According to the new visualization, the magnetoelectric field remains the main one as two mutually perpendicular vectors. The gravitational field is a consequence of magnetism and geometric spatial transformations of the original magnetic loop in the process of matter growth from the inside out. And the inertial field is a complement to the 3 fields in the previous explanatory approach as a counteraction to the action according to Newton's law. [59]

If we move on to an even greater simplification, then magneto-electricity is essentially one phenomenon and a single manifestation of universal magnetism, which in the current paradigm is divided into magnetic and electric components. If we talk about this phenomenon as a single one, then magnetic spinning with crossing and reconnection of magnetic lines creates the allocation and directed movement of magneto-plasma, which in the current explanatory paradigm is called "electricity".

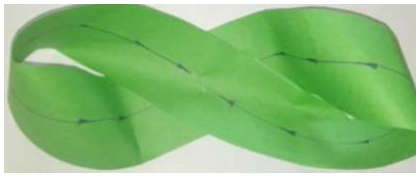
In the model of hydromagnetic dynamo proposed by me, we are talking about two geometric states of the MMDipole and their mutual transformations into each other, namely, the state "***neutron***" is transformed into the state "***proton-electron***" and back. Below are examples of

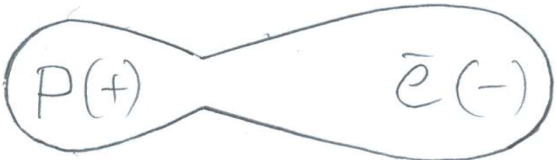
fibrations during the production of hydrogen, its isotopes and the helium atom. From the illustration it is clear how these transformations are realized.

More detailed materials on the models of atomic elements of the first two periods of the Periodic Table based on Mobius Magnetic Dipoles are presented in the work "***3. Basic Element of Nature. Mobius Geometry. Gravity. Model of the Atom***".

**SYMBOLS ON THE SCHEMES OF ATOMIC ELEMENTS.**

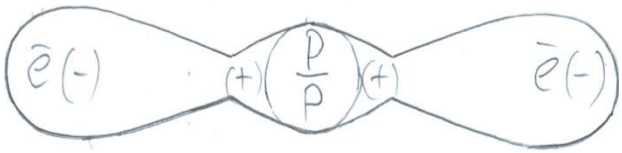
**1. MOBIUS DIPOLE** (proton-electron).






2. **LINK CONNECTION OF TWO MOBIUS DIPOLES.**





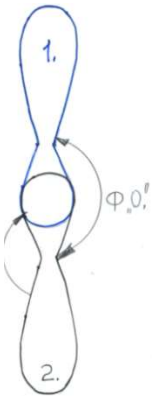

**4. N – NEUTRON.**

**H (HYDROGEN) 1=A=Z(P)+ N=1+0; P=1, N=0**
**PROTIUM, `H = 1P + 1e ;**
**DEUTERIUM, ``H = 1P + 1N + 1e**
**TRITIUM, ```H = 1P + 2N + 1e**



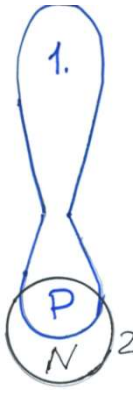

PROTIUM.






FIBRATION.

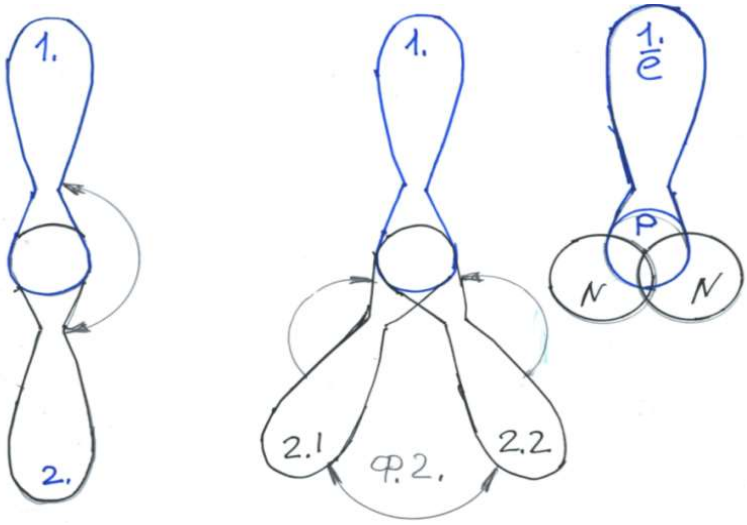




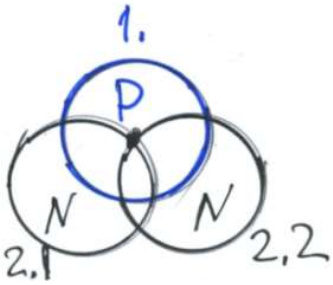

FUSION INTO NEUTRON, DEUTERIUM.

As illustrated, the formation of the Deuterium isotope occurs in the second phase of fibration, when two bound dipoles in the proton-electron state are obtained. Obviously, such a state cannot be realized magnetoelectrically, and in this case one of the bound dipoles is

transformed into the "neutron" state, and the second remains in the unfolded "proton-electron" state.




**TRITIUM, ```H = 1P + 2N + 1e**




**TRITIUM NUCLEI.**

The formation of the isotope Tritium occurs in the process of fibration of one of the two Dipoles after the second phase of fibration. In this case, two of the three dipoles form two "***neutrons***", and one remains in the "***proton-electron***" state.

All fibration processes are determined by certain conditions under which the process of bifurcation is launched and maintained to a certain level.

From these examples it is clear that the geometric transformations of the original Magnetic Mobius Monopole (MMM) in the process of its bifurcation with doubling determine the formulas of the resulting chemical elements, the quantization of charges and their multiplicity to the minimum charge, internally "folded" in the structure of the Magnetic Monopole. Its actualization and InfoGenetic copying in the process of successive fibrations gives the charge number "Z" in the sum of the obtained Dipoles in the "***proton-electron***" state.

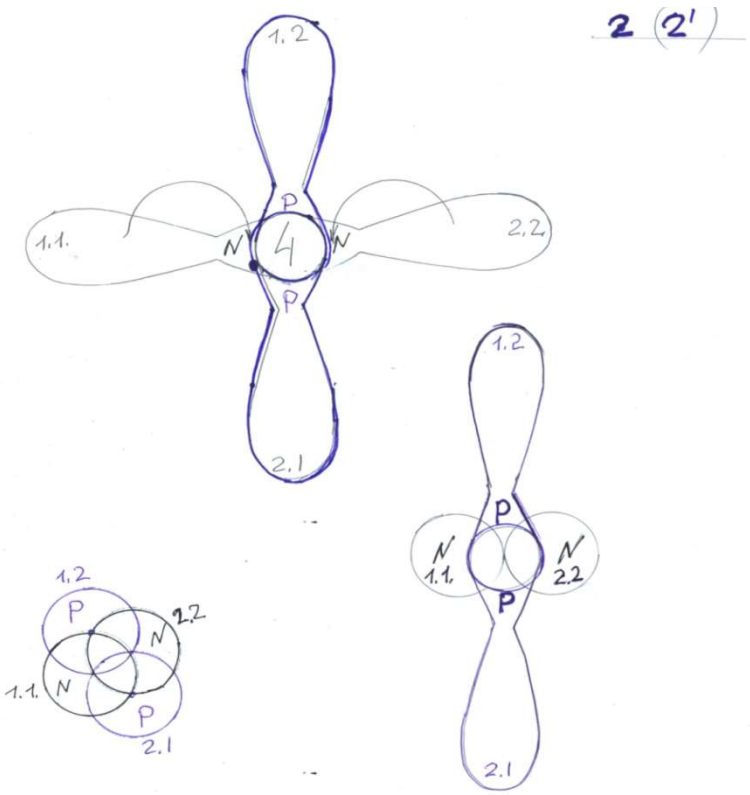
The formation of Helium is the third phase of fibration of two Dipoles, of which two remain in the "***proton-electron***" state, and two in the "***neutron***" state.

**He (HELIUM),** 4=A=Z(P)+ N=2+2; P=2, N=2



>>>>>>>>






| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| H | | | | | | | H 1,0079 1 $1s^1$ Водород | He 4,0026 2 $1s^2$ Гелий |
| Li 6,94 3 $2s^1$ Литий | Be 9,012 4 $2s^2$ Бериллий | B 10,811 5 $2s^2 2p^1$ Бор | C 12,011 6 $2s^2 2p^2$ Углерод | N 14,0067 7 $2s^2 2p^3$ Азот | O 15,999 8 $2s^2 2p^4$ Кислород | F 18,998 9 $2s^2 2p^5$ Фтор | Ne 20,179 10 $2s^2 2p^6$ Неон | |

As shown in the examples of illustrating the elements of Hydrogen, its isotopes and Helium, in the format of Mobius Geometry there is only the geometry of transformations and universal transformation. This simplifies many theoretical issues and gives a clear figurative representation.

As it is visualized using transformations based on Mobius geometry, the atomic structure of MMDipoles is a **quantum-mechanical mechanism** for the transformation of etheric magneto-plasma. This mechanism also has the property of retaining the transformed and circulating quanta of magneto-plasma inside the atomic structure, creating its filling.

Returning to the theoretical study of 2008 "***Dynamo action in Möbius flow***" [3] with the recommendation to use it for laboratory experiments, it should be noted that it is directly related to both the practical aspect of stellarator models and the principles of creating wrapping plasma flows, and to the theoretical aspect concerning the application of Möbius geometry to issues of hydrodynamo, and therefore directly to issues of internal planetary structure and processes occurring in the bodies of stars, since in both cases the designated hydrodynamic processes function in these space objects.

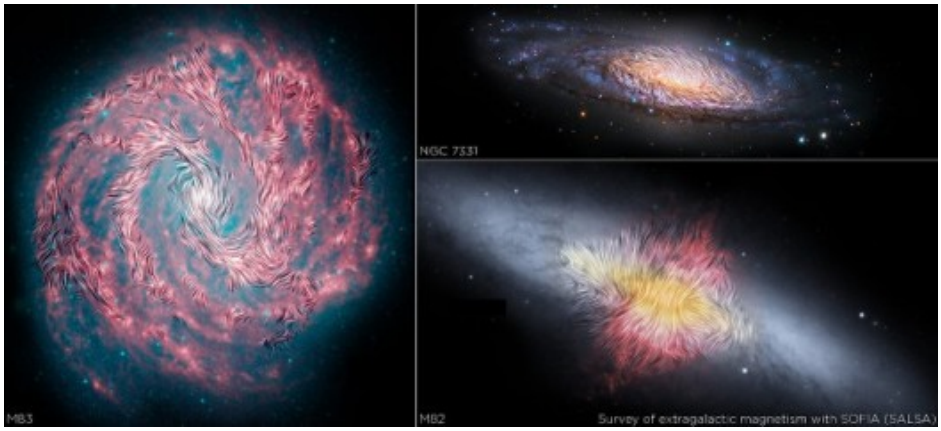
And if we transfer theoretical proposals [3] not only to laboratory experiments and technogenic devices, but also to the cosmic scale, then we can once again emphasize that if hydromagnetic dynamos function in outer space, then the conclusion is drawn that the flows of

the conducting liquid of the ether magneto-plasma move along the spatial geometric configuration of the Clifford parallels or, in other words, along the Mobius strip, and can create an exponentially growing magnetic field from an infinitely small etheric embryonic material, forming the entire diversity of cosmic systems.

Among the latest scientific news there are reports of new interesting discoveries in the field of all-pervading cosmic magnetism. In particular, an article about the new results of the already known to us SOFIA project was recently published in the Stanford University News. [30]

Astrophysicist Enrique Lopez-Rodriguez reports on the results of these studies and explains the extraordinary new results of the project:

"In a new study published in “The Astrophysical Journal” [29], several Stanford astrophysicists studied the infrared signals from just such material – magnetically ordered particles present in the cold, dense clouds of star-forming regions. Comparing this light with another type of light, coming from cosmic ray electrons, which are marked by magnetic fields in warmer, more diffuse material, showed surprising differences in the measured magnetic fields of the galaxies.




The spiral arms have chaotically tangled magnetic fields due to the activity of star formation and molecular clouds, indicating high levels of turbulence. Potentially, this is where magnetic fields could be enhanced.

In contrast, the regions between the arms of spiral galaxies, as well as in the medium above and below the galactic disk, these regions have well-ordered magnetic fields.

In general, it should be recognized that we do not yet know what role magnetic fields play in the evolution of galaxies. But the infrared observations obtained today tell us that magnetic fields are directly related to the regions of star formation, and this is the key to the formation of galaxies. We do not yet know exactly how these things relate to each other. But we assume that there may be some kind of feedback loop between them." [30]

Such a final conclusion suggests that scientists who receive new experimental data do not yet have a suitable theory for understanding, correctly processing and interpreting them.

Nevertheless, I quote from an earlier work, and in particular Zeldovich Ya.B. and Ruzmaikin A.A.: "Observations convince us of the magnetic nature of solar activity. The only natural cause of field variability is the hydrodynamic motion of plasma, primarily rotation and convection.

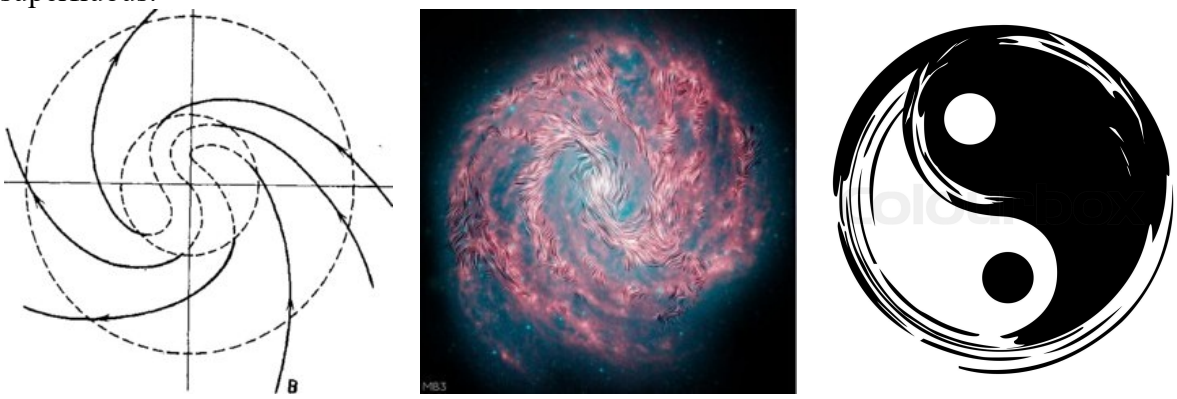
Therefore, the main mechanism of solar (and stellar) activity can be considered the hydromagnetic dynamo.

The flow of solar plasma is a combination of large-scale motion (differential rotation, meridional circulation) with stochastic (turbulent convection).

Against the background of strong turbulence, the cellular pattern of granulation and supergranulation observed on the Sun looks like a surprising, synergetic phenomenon.

In the question of the generation of non-axisymmetric, dependent magnetic fields, differential rotation is considered, which twists such a field into a two-arm spiral (Fig. 8). Thus, even consideration of the average magnetic field shows that the theory of the hydromagnetic dynamo gives meaningful applied results." [7]

For comparison with the given illustration (**Fig. 8** from [7]), I have placed in one line the ancient "Yin-Yang" symbol, in the pictorial symbolism of which the dynamics and nature of the formation of a magnetic dynamo, mediated by the principle of complementarity, are quite convincingly included, as well as the magnetic field of the galaxy from [29], obtained in the research of the SALSA (Survey of extragalactric magnetism with the Stratospheric Observatory for Infrared Astronomy) project, which is the successor of the SOFIA project, terminated in 2022, and compares the magnetic fields of various media in deep space. Comments may be superfluous.




From the left to the right: ***Double-armed spiral of the magnetic field Fig. 8*** *from [7]*. ***Magnetic field of the galaxy [29]. "Yin-Yang" symbol.***

The history of the discovery of the hydromagnetic dynamo, as well as the history of the question of the comprehensiveness of the phenomenon of magnetism itself, includes the following facts.

"The idea that plasma movements can lead to an increase in the magnetic field was put forward **in 1919** by the English physicist **J. Larmor**, who was also engaged in the issues of explaining cosmic magnetism and made some assumptions. Joseph Larmor realized that if we do not involve some unknown fundamental interactions (and such attempts were certainly made, but were not crowned with success), then only the phenomenon of electromagnetic induction remains to explain cosmic magnetism.

This was a time of rapid development of the automobile industry, so the concept proposed by Larmor was named after one of the parts of a car engine. This is how the idea of a dynamo arose. But the scientific implementation of D. Larmor's idea turned out to be quite complex.

**E. Fermi (1949)**, pondering data on the distribution of cosmic rays, came to the conclusion that our Milky Way galaxy is a giant magnet, and later such magnetic fields were discovered by radio astronomy methods in a number of spiral galaxies." [33]

In the well-informed popular science publication "***Quanta Magazine***" one of the relatively recent articles devoted to the still unsolved mysteries of space began with the following words:

"Every time astronomers invent a new way to search for magnetic fields in increasingly distant regions of space, for some inexplicable reason they inevitably find them.

These force fields surround the Earth, the Sun, and all galaxies. Twenty years ago, astronomers began to detect magnetism that permeates entire clusters of galaxies, including the giant intergalactic spaces between clusters.

Invisible magnetic field lines permeate space everywhere." [32]

"If we accept the truly amazing phenomenon of cosmic magnetism, which permeates the space of the universe on all scales, simply as a fact of nature, then the most striking thing in the above quotation will be the words about the "inexplicable causes" of this phenomenon, since the situation in modern physics is still such that scientists simply do not know, and therefore cannot clearly explain, the structure of that universal natural structure that generates and maintains the all-pervading structures of cosmic magnetism.

Scientists have various models on this account, but the explanations there differ significantly, and it has not yet been possible to convincingly prove which of the models is closest to the truth." [33]

And also: "***In all cases, the dynamo is considered the most probable source of magnetism at some stages of the evolution of the terrestrial planets***." [2]

The proposed concept based on Mobius Geometry suggests considering the structure of the supporting cosmic Medium as a matrix of magnetic monopole etheric units in the configuration of a contracted Mobius strip with one inverse turn. Based on this, the hydromagnetic dynamo in the area of space of the etheric Quantum Medium, which according to current views can be called a "***black hole***" and considered as a formed monopole mega-quantum, is a ***collective effect*** of high-speed division of magnetic loops (bifurcation/fibration of Magnetic Mobius Monopoles), with the formation of atomic structures, stellar-planetary and galactic systems according to the CosmoGenesis algorithm.

***"The hot bodies of space are born in the cold of space from the FIRE of the genetic center of the Universe."*** [80]

Currently, collective macro-effects are studied in the physics of **condensed matter** at low temperatures. Since such a temperature regime is close to the temperature regime of the space of the supporting Cosmic Medium, therefore, from the experiments carried out, it is possible to extract analogies, with the help of which it becomes possible to explain what is happening in the regions of outer space. In particular, using effects observed in condensed matter, attempts are being made to detect a magnetic "***Dirac monopole***" or a region of the medium that behaves like a magnetic monopole. These questions and a series of experiments are discussed in the paper "***1. Quantum Medium. Mobius Geometry. Magnetic Monopole***".

One of the emphasis in pointed work is on the fact that magnetic **unipolarity** as such does not exist in nature, since magnetism is a **natural duality**. Magnetism is a physical embodiment of the Principle of Complementarity and this is its **fundamentality**.

It is necessary to concentrate thought not on the search for a unipolar monopole, but on the search for duality, in which magnetism has a closure of polarities into one topology and is a

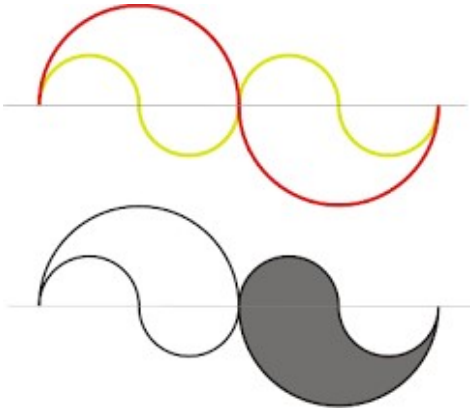
***monopole formation of "two in one***". It is the closure into one topology through one turn that gives the initial state of the absence of an external magnetic field, expressed in the form of dipole, which can be called the state of monopole duality. The ***etheric substance*** is in this state. Its transition to the state of dipole duality gives rise to **baryon matter**, its **mass** together with **gravitational interrelation**. These aspects are covered in the work. "***3. Basic Element of Nature. Mobius Geometry. Gravity. Model of the Atom***".

In the works "***1. Quantum Medium. Mobius Geometry. Magnetic Monopole" and "2. Quantum Entanglement. Geometry of Mobius. Symbol "Yin-Yang". Phases of Fibration***" attention is paid to the structure of the etheric Quantum Medium and the interrelation of its matrix of monopole units closed through the Mobius inversion with the issues of the complementary principle of the Two Beginnings of Cosmogenesis, reflected in philosophical views through the geometry of the symbol "Yin-Yang", as well as the universalism of this symbol and its identity with the Geometry of Mobius.

It is shown that this symbol is a planar two-dimensional display of the three-dimensionality and dynamics of the vortex movements of the Mobius Pattern, which, according to its structural geometry, is a geometric analogue of the Fundamental Principle of Complementarity – **FPC**.





The Yin-Yang symbol as a representation of **universal duality** has its individual "decoding" at each scaling level and in each plane of being. In each aspect it has its individual form-expression. The graphics of the Yin-Yang symbol are a universal geometric representation of the **original natural duality** that is contained in the FPC.

Since this natural duality as the original InfoGen is transmitted in the copying method through bifurcation/fibration during the generation of matter from the inside out, then each phase of the bifurcation process forms the **next stage of duality**, which, like the previous one, can be displayed by the Yin-Yang symbol. Thus and as it should be understood, doubling by the bifurcation method prolongs the principle of duality (FPC), changing its function, but not changing its essence **according to holographic principle**. Only the degree of fractally identical build-up changes, which takes its individual form each time.

A recent experiment [31] demonstrated the fact that the Yin-Yang symbol is nothing more than strictly scientific information, which, within the framework of the experiment, showed the visualization of quantum entanglement of two photons.

**In August 2023**, the results of one of the latest experiments on quantum entanglement of photons, conducted by a group of researchers from the University of Ottawa and the Sapienza University of Rome, were published in the journal *NATURE PHOTONICS*. [31]

The experiment demonstrated a new technique of biphoton holography, which allows visualization of the wave function of two entangled photons in real time. The researchers turned to an interferometric method based on the interaction of waves. This technique, inspired by digital holography, allows you to create three-dimensional images of objects based on the light they emit. The authors applied it to the case of two entangled photons.

Reconstruction of a two-photon state consists of superimposing it on a known quantum state and then analyzing the spatial distribution of positions where the two photons arrive simultaneously. The image of the simultaneous arrival of two photons is known as a coincidence image. By comparing these two states, information about the unknown state can be extracted.

The proposed reconstruction method allows for more efficient (three orders of magnitude faster) and more reliable (average accuracy of 87%) characterization of states in arbitrary spatial mode bases compared to previously performed experiments. Multiphoton digital holography can pave the way for efficient and accurate computational visualization of ghosts and processing of high-dimensional quantum information.

Biphoton holography is emerging as an innovative proposal in the field of quantum visualization. This breakthrough, which combines holographic methods with quantum mechanics, promises to open the way to new applications in the fields of visualization and metrology.

Along with other illustrations, the paper presents a holographic reconstruction of a two-photon state and a reconstructed image.

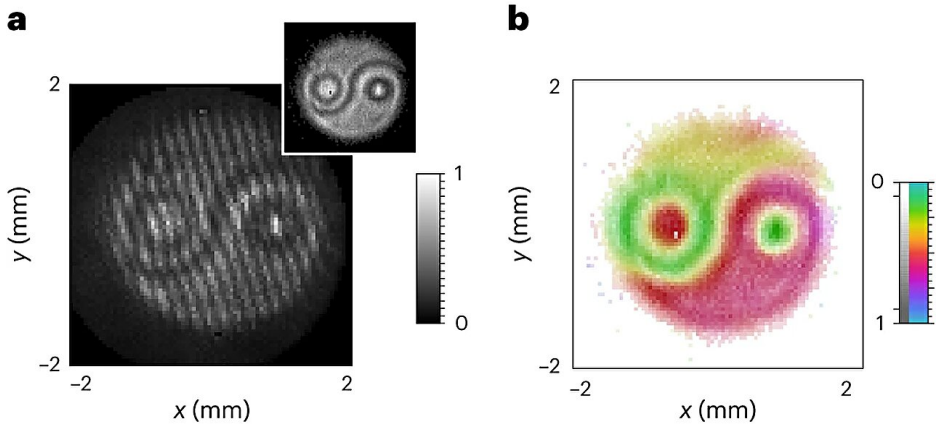



***Fig. 6: Image reconstruction***. [31]

**a**, Coincidence image of interference between a reference SPDC state and a state obtained by a pump beam with the shape of a Ying and Yang symbol (shown in the inset). The inset scale is the same as in the main plot.
**b**, Reconstructed amplitude and phase structure of the image imprinted on the unknown pump. [31]

The matching image in the form of the ancient symbol "Yin-Yang" leads to the following logical conclusion that the ancient symbol "Yin-Yang" is an exact quantum cast and an exact geometric equivalent of spatial structures.

Taking into account the fractal-holographic structure of the World Order and the fact that since ancient times in philosophical views the symbol "Yin-Yang" was a schematic representation of the two Principles of Cosmogenesis, it can be considered that as a result of the experiment, its authors for the first time received experimental proof that the pictorial geometry of the symbol "Yin-Yang" in its essence belongs to the category of strictly scientific information.

This symbol represents a **universal template** that can be fractally identically transferred to different planes of being as a basic complementary interrelation. Based on this, the above triptych of illustrations – the Yin-Yang symbol, the magnetic field of the galaxy and the two-arm magnetic flux – demonstrates identities.

And also, what is of particular importance and globality, is the result of the experiment in displaying quantum entangled photons through the Yin-Yang geometry, which, as shown above, is a two-dimensional analogue of the three-dimensionality of the Mobius strip, confirms the fact that the structure of the spatial fabric is structured by the geometric universalism of the Mobius vortex formations, which lays this universal template as the initial InfoGene in the generation of all objects at all stages of the evolution of CosmoGenesis.

Nobel laureate H. Alfvén pointed out that the overwhelming majority of all matter in the universe is in the state of **physical plasma**, and therefore he attached great importance to issues related to physical cosmic plasma and magnetohydrodynamics, which in the current period of development of cosmology, with the receipt of new observational results using SOFIA (Stratospheric Observatory for Infrared Astronomy) and SALSA (Survey of extragalactric magnetism with the Stratospheric Observatory for Infrared Astronomy), have already entered the mainstream of science not only as a recognition of the significance of physical plasma and magnetohydrodynamics in cosmology, but also as a confirmation of Alfvén's idea of filamentary (stringy, thread-like) and cellular structures of space (which is clearly confirmed by astronomical observations). [29], [30], [40, [01]]

In the recent period, astrophysics has accumulated an abundance of such experimental facts and observations that confirm with high reliability Alfven's cosmological ideas and, in particular, about **living cosmic plasma**.

At the beginning of his scientific career, when H. Alfvén was just beginning to formulate his ideas about living cosmic plasma and tried to promote them through publications, he received words of support from the American physicist **A.H. Compton**, who at that time had already become a Nobel Prize laureate in physics **in 1927** and was one of the main authorities in the field of cosmic radiation. [23], [33]

It should be noted that during the period when H. Alfvén expressed his ideas and tried to publish them, they were considered heretical and he mostly received refusals to publish his articles. But H. Alfvén, who is now called the father of magnetohydrodynamics and the founder of the new scientific field of "magnetohydrodynamics", as well as the author of truly innovative

ideas about the nature of cosmic magnetism and a pioneer of plasma physics, developed his ideas with sufficient persistence.

**In 1977**, one of the chapters for the book-collection by H. Alfvén "***Cosmology, History and Theology***" was called "***Cosmology: Myth or Science?***" [71, [10]].

**In 1984**, in a heavily revised form, H. Alfvén's article with the same title was published in the "***Journal of Astrophysics and Astronomy***" [40, [o3]].

It is worth quoting from this article by H. Alfvén:

"Scientific progress depends on the development of new instruments. The transition from Ptolemaic to Copernican cosmology was largely due to the advent of telescopes. Similarly, modern space exploration has so radically changed the possibilities of science in studying our large-scale environment that a thorough rethinking of the entire physics of the cosmos is now underway.

In earlier times, information was available to us from less than one-third of an octave (the visual part of the spectrum and some radio frequencies).

The new spectral regions include X-ray and gamma-ray astronomy, and most of the new phenomena discovered in these regions are clearly related to plasma effects. This means that the fundamental importance of magnetohydrodynamics and plasma physics is now becoming increasingly obvious.

Moreover, we have now learned to generalize the results of plasma research from one small scale to regions of much larger size.

Taken together, all this leads or has already led to such a revision of our concept of cosmic plasma, which in many respects **allows us to speak of a complete paradigm shift**." [40, [o3]]

And the geometry of Mobius as a geometric analogue of the FPC is that ***Ariadne's thread*** in the cognition of the structure of the World Order, as well as a thread that ties together theoretical achievements on a single universal basis.

Based on the recurring trends in science regarding the announcement of new ideas, it is clearly evident that the authors of new ideas are initially considered crazy, and subsequently become Nobel laureates. Despite these difficulties that arise at the beginning of a new path, I add the topics of my articles, including in them those new ideas that I presented first of all as a priori knowledge in the author's monograph [43], and then developed in subsequent articles.

The ideas I have proposed have already passed the "fantasy" phase, and are perhaps in the "is she crazy?" phase. True, I have not yet encountered a Nobel laureate, as happened in the life of H. Alfvén in 1934, but many Nobel laureates with their hypothetically expressed ideas are present in the field of my articles not by chance, but rather logically, since the self-consistency of the concept I have proposed allows these ideas to be revealed based **on the application of geometry** to them, which is the basis of natural phenomena – physics.

And in this regard, it should be emphasized that the ideas themselves remain important if they successfully explain what was previously unexplained and if they reduce what was previously irreducible to a unified denominator. At the same time, whether to consider the author crazy or not, only Time will give the answer.

It is also necessary to emphasize the fact that with the advent of new ideas, existing academic knowledge often cannot meet the task of theoretical analysis of the proposed new theoretical aspects or operating principles of experimental setups created empirically and including new operating principles. Therefore, it naturally turns out that in a number of cases, the

academic knowledge that exists today cannot fulfill the task of analyzing the new that is coming. Nevertheless, sooner or later this new thing receives its recognition.

As a result of this 4th work, the following should be added to the conclusions given at the very beginning and formed on the basis of the 3 previous articles:

34. **The method of formation of atoms**, stellar-planetary and galactic systems is the phenomenon of hydromagnetic dynamo, which is based on the hydrodynamic property of spontaneous division of vortex generative elements of the etheric Quantum Medium.
    Magnetic Monopoles (MMM) belonging to the generative zone of the Quantum Medium, which is the area of etheric space in accordance with the understanding of the general biology of the Universe as a whole ORGANISM, should be considered generative embryonic elements.
    Such generative zones are associated in the current paradigm with the concept of "black holes", in which the process of accumulation of the etheric substrate and the formation of the embryo of a cosmic object occurs according to the CosmoGenesis algorithm. Such a generative zone is a macro-quantum that acts as a single whole.
35. **Hydromagnetic dynamo** is a process of high-speed bifurcation of MMMonopoles and their transformation into MMDipoles with doubling of the magnetic flux. This process is an act of MMM polarization, in which the magnetic field manifests itself outward in the form of dipole (bi-polarity) with the actualization of the gravitational interrelation and mass, that is, the transformation of **etheric matter into baryonic matter**.
36. In the phenomenon of a hydromagnetic dynamo, mutually inverse transformations of two states of MMM occur, which are accompanied by convection and a number of phenomena depending on the scaling level.
37. In the application of Mobius geometry to the hydromagnetic dynamo model, the existing basic model schemes of Alfven and Zeldovich are supplemented with missing elements, and a new visualization of the magnetic lines of a planetary body appears, which provides a number of explanations regarding the direction of rotation of the planet and its internal structure. And this is also applicable to space objects in which a hydromagnetic dynamo functions.
38. According to the application of Mobius geometry to the question of the internal structure of a planetary body, it is proposed to consider the inner core as a ***quantum generator*** operating in the mode of a powerful gravitational tensor, simulating a solid metallic body, but not being one.
39. The universal natural structure that generates and maintains the all-pervasive structures of cosmic magnetism is the structural topology of the closure of the magnetic loop through an inverse turn, which is the physical embodiment of the principle of complementarity as the basis of CosmoGenesis, which mediates continuous non-stop oscillations, the dynamics of universal torsion and generation by the method of self-copying through the process of bifurcation with doubling of the magnetic flux.
40. The supporting Quantum Cosmic Medium is heterogeneous and has hot spot areas in which a hydromagnetic dynamo functions, as well as low-temperature areas of the condensed state of the environment, in which phase topological transitions also occur due to geometric transformations.
41. The very structure of the supporting cosmic Medium, the collective effects in it and the current laws of hydrodynamics mediate those reciprocal transformations that, obeying the

law of conservation of energy and others, lead to a process of constant renewal due to the non-stop regeneration of both sub-micro-quantum units of the Medium (MMM) and objects in it according to the algorithm of development of CosmoGenesis.

42. As the results of logical reasoning with the application of experimental data and data of theoretical proposals using computer modeling show, the Mobius geometry allows us to consider the physics of the micro- and macro-worlds in **one geometric format** and at the same time allows us to **extrapolate general universal schemes** to questions of biology, chemistry and consciousness.
43. The format of Mobius Geometry leads to the elimination of the crisis in theoretical questions of physics, which arose due to the loss of figurative pictures of representation with the simultaneous rapid development of the mathematical apparatus of algebra, which ultimately led to a bias in theories and a weak philosophy. As a result, virtual mathematical pictures of the world are dominated by models divorced from reality.
44. The format of Mobius Geometry is a real ontological basis for the physical and mathematical unification of biology and physics, as well as consciousness and matter, into a unified system, since it clearly illustrates their unity and interrelation, reflecting aspects of the principle of complementarity in all areas of application. Considering that consciousness operates with words and images, the said connection requires the involvement of **linguistic physics**, which, along with mathematical physics, reveals the structures of the world order through the **formula of the word**. On the basis of such an ontology, by combining physics with geometry, with the formalism of algebra and the formula of the word, it is possible to achieve the goal of creating a **unified Theory of Everything**.
45. The foundation of the structure of the World Order is based on a single and absolute principle – the principle of complementarity, which implies the existence of its equivalent in everything as an **initial universal template**. This same principle lies in the foundation of the science that studies the world order. This principle generates a **unified methodology** for the analysis and synthesis of any systems and natural phenomena. In each system, regardless of the dimension, there is a main link, the properties of which are determined by the principle of complementarity. Having substantiated the geometric analogy of this basic link, giving this link a dimension and taking it as a starting point, it is possible to develop the entire system as a whole.
46. The combination of Mobius Geometry as an instrument of the mathematical apparatus with the principle of complementarity as a fundamental aspect of all sciences creates the necessary physical and philosophical base, and also adds the missing imagery that is necessary to bring many aspects of the micro- and macro-worlds, already worked out in various theories, to a common denominator, which gives grounds to consider Mobius Geometry as a mathematical basis for creating a generalizing Theory of Everything.
47. In the author's monograph "Substance. Atom. The Theory of Everything" and subsequent articles, the aspect of Mobius Geometry is connected with the multidisciplinary aspect of the principle of complementarity, which can be considered the original and mediating all the regularities and phenomena observed in Nature. The principle of complementarity mediates the unified equation, proportion and geometry, as well as the universal type of torsion **UNI-VERSE**.

Based on the formulated conclusions, it can be concluded that a **monistic concept** has been proposed. The proposal of a monistic concept has a direct connection with the geometrization of physics and the construction of a unified field theory.

"The essence of geometrization is that any physical experiment is reduced to measuring length, time and angle." G. I. Shipov

Therefore, to build a physical theory and geometrization, a starting physical entity must be chosen that has a framework of physical parameters that form geometry, dynamics of motion in time and properties.

In the proposed monistic concept the observed effects or phenomena of the micro-, macro- and mega-worlds are explained from the position of the original principle of complementarity and its universal template, expressed geometrically by the Mobius strip. Thus, the concept is laid out from **one fundamental entity** that has a pronounced geometry and dynamics of movement based on magnetism, which is the physical embodiment of the principle of complementarity.

Based on the Mobius strip, a unit of the etheric matrix is considered and a monistic description of a particle of matter is given as a derivative of the etheric elemental. A particle of matter is formed from an etheric magnetic ring – a **magnetic monopole**. In the fibration method, the magnetic monopole is geometrically transformed and forms a **basic element of nature** for the formation of matter – a **magnetic dipole**. Mutually inverse geometric transformations of the states of the magnetic dipole determine the structure of the atom as a **minimal particle** of matter.

All characteristics of such a particle are obtained as derivatives of the geometric parameters of the magnetic monopole, which in this respect is the framework basis. The actualization of system-forming interrelations, the interrelations themselves and the forces acting on their basis are equally inherent in both the structure of the micro-world and the macro-world, which constitutes their **universalism**. All established characteristics of the particle (mass, charge, spin, angular momentum, magnetic moment) are obtained as derivatives of the geometric characteristics of the framework basis.

The **monistic description** determines simplicity and efficiency, there is no need to coordinate or invent anything additionally, since all physical parameters, originating from one and single universal framework base and being its derivatives, are coordinated with each other and synchronized automatically. This is one of the most important understandings in the representation of all objects of the Universe, interconnected fractally-holographically or, in other words, created according to one universal template or Image and Likeness.

"The geometrization of physics is possible with the consistent use of geometric concepts. The construction of a monistic concept of the physics of the microworld (in the form of geometrization of physics) seems to me to be an exceptionally promising direction of research. It is aimed at deepening the understanding of the geometry of space-time, and not at adjusting it by inventing new exotic hypotheses with their subsequent experimental verification." Yu. A. Rylov, Senior researcher of the Institute for Problems in Mechanics Russian Academy of Sciences. [81]

"***The fundamental nature of a theory is determined by the degree of penetration into the secrets of nature and is determined not by the bulkiness of its mathematical apparatus, but by the degree of connection with materialistic philosophy and proximity to the boundaries of the knowable." Kuligin V.A.*** [46]

From personal correspondence with Academician of the Russian Academy of Natural Sciences G.I. Shipov, author of “The Theory of Physical Vacuum”:

"I read your publication "Image of an Atom". It is wonderful when the presentation of the material is conducted by a person with imaginative thinking, as you are.

For many years I have been observing the stagnation of physical thought in theoretical physics, which has led to the flourishing of mathematical physics (this is not bad), but is accompanied by marking time due to the lack of imaginative thinking. What you do in your works using Mobius geometry has a beneficial effect on the minds of theorists who know a lot formally, but do not realize the essential things that formal calculations bring with them." ***Academician of the Russian Academy of Natural Sciences Shipov G.I. (*** **Wednesday, April 3, 2024 at 11:45:56 AM EDT, Gennady Shipov** <warpdrive09@gmail.com>)

"I read your article "Fibration of the Mobius Energy Pattern and Hopf Fibration" on the trinitas.ru website, which surprised and pleased me very much. In other words, it resonates with my thoughts. I am a theoretical physicist and I am engaged in the unification of physical theories in the spirit of Einstein's Unified Theory."
**September 15, 2021**.

"Your versatile creative abilities and strong intuition are amazing. I and a group of my followers are preparing the second international conference "Physical Vacuum – the paradigm of the 21st century". I have an offer to you to speak at this conference. The conference is scheduled for November 2021. In addition, we are starting seminars on this topic. The seminars will be held in Moscow City in the Empire Tower on the 52-nd floor. I invite you to speak at our seminar."
**September 16, 2021**.

"There are two ways of knowing Reality – inductive (from the particular to the general) and deductive (from the general to the particular). Modern Western physics uses mainly the inductive method, relying on a private scientific experiment and generalizing already developed and generally accepted physical theories. The deductive method is used by people with advanced Consciousness. They are given the opportunity to receive Knowledge through a communication channel from the Data Bank, which is a set of Laws by which the Universe exists and develops. It seems that you have just such a channel.
**September 23, 2021.**

"... personally, I like your views on the Mobius geometry, which is associated, as we know, with the spins (3D) and spinors (4D) of particles, with a clear entanglement of wave functions shown on the Mobius strips."
**October 21, 2021**

"Now about the Mobius geometry. This geometry is used in my work and in the work of other theorists and mathematicians. In physics, this geometry assumes the existence of a spinor frame of reference, which was first introduced in physics by Paul Dirac in 1928. Mathematicians know all this well, but physicists are silent about it. Why? Because it leads to a revision (obviously to a generalization) of the foundations of modern physics. In theoretical physics, this is the most difficult and highly skilled work. Part of your work is related to these issues. It is up to you to decide what to emphasize in your report. "
**October 25, 2021.**

"I received your articles and read them with great interest.

I believe that you have found the right way to generalize the theory of Physical Vacuum.

Your analogies and examples of the Clifford-Mobius-Hopf bundle have deep connections to modern physics. I especially liked the unification of symmetry-asymmetry on the image of the Mobius strip (monopole) and its generalizations. "

**May 15, 2023.**

"I am sending you my report at the conference on December 9, 2023 "**Fundamentals of Physics and Mathematics**" https://www.youtube.com/watch?v=FlqvQ258Fro&t=167s

60 people participated in the conference. Of these, about 30 in person and 30 in absentia. There were participants from other countries. As for the Mobius geometry, it is this that underlies the theory of Physical Vacuum. Mobius geometry requires a separate and rather serious conversation. Not all geometers know it, not to mention physicists."

**March 8, 2024**

**Fri, Mar 8 at 7:49 PM (2024)**

***Dear Gennady Ivanovich!***

Yes, Mobius Geometry is, let's say, an unplowed field, which must be walked through with a plow and more than once even after the Pioneer.

I believe that you have already read my work "Mobius Geometry on the Podium of Science", which outlines and describes the tendency of its penetration into science, as well as the peculiarity of the modern stage, when MG is pushing into all areas and storming brains.

It is very important, firstly, to be in the emerging flow of the new and, secondly, to be ahead, and not to drag along at the tail.

I believe that MG is a fundamental element that will most likely put all the unformed PUZZLES together.

And if not all geometers know it, and especially physicists, then those who have already "felt" it and understand its place and significance for explaining natural phenomena and creating new perspectives on its basis – the flag in hand.

You hold your flag in the wind and this is important!

I wave mine and pass on the "Morse code of MG" to those who can read it.

Your words are the main gift!»

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REFERENCES.


1. Steve Childress, «Dynamo theory and GFD», 16 June 2008

2. D. Russell Humphreys «Planetary Magnetic Dynamo Theories: A Century of Failure» Creation Research Society, 2013

3. Anvar Shukurov, Rodion Stepanov, and Dmitry Sokoloff, «Dynamo action in Möbius flow», Phys. Rev. E 78, 025301(R) Published 1 August 2008 https://journals.aps.org/pre/abstract/10.1103/PhysRevE.78.025301

4. Simon Bolaños, Andrey Sladkov, Roch Smets, Sophia N. Chen, Alain Grisollet, Evgeny Filippov, Jose-Luis Henares, Viorel Nastasa, Sergey Pikuz, Raphël Riquier, Maria Safronova, Alexandre Severin, Mikhail Starodubtsev & Julien Fuchs «Laboratory evidence of magnetic reconnection hampered in obliquely interacting flux tubes», *Nature Communications* **volume 13**, Published: 28 October 2022. https://www.nature.com/articles/s41467-022-33813-9?fromPaywallRec=false

5. Abraham Chien, Lan Gao, Shu Zhang, Hantao Ji, Eric G. Blackman, William Daughton, Adam Stanier, Ari Le, Fan Guo, Russ Follett, Hui Chen, Gennady Fiksel, Gabriel Bleotu, Robert C. Cauble, Sophia N. Chen, Alice Fazzini, Kirk Flippo, Omar French, Dustin H. Froula, Julien Fuchs, Shinsuke Fujioka, Kenneth Hill, Sallee Klein, Carolyn Kuranz, …Ryunosuke Takizawa «Non-thermal electron acceleration from magnetically driven reconnection in a laboratory plasma», *Nature Physics* **volume 19**, pages254–262 (2023). Published: 16 January 2023. https://www.nature.com/articles/s41567-022-01839-x?fromPaywallRec=false

6. K. Hori, A. Nilsson & S. M. Tobias, «Waves in planetary dynamos». Volume 7, article number 5. Published: 26 December 2022 https://link.springer.com/article/10.1007/s41614-022-00104-1

7. Зельдович Я.Б., Рузмайкин А.А. «Гидромагнитное динамо как источник планетарного и солнечного магнетизма», «Успехи физических наук», том 152, выпуск 2, июнь 1987 г. https://ufn.ru/ru/articles/1987/6/c/

8. Зедьдович Я.Б., «Электромагнитное взаимодействие при нарушении чётности». Избранные труды, Кн.2, 1985 год, стр. 79-82. http://elib.biblioatom.ru/text/zeldovich_izbannye-trudy_t2_1985/go,82/

9. Zeldovich Ya., Ruzmaikin A., Sokoloff D. «Magnetic Fields in Astrophysics», Gordon and Breach, New York, 1983.
На русском языке: Зельдович Я. Б., Рузмайкин А. А., Соколов Д. Д. Магнитные поля в астрофизике. — М. — Ижевск: Ин-т хаотической динамики, 2006

10. Рузмайкин А.А. «Физика космоса. Гидромагнитное динамо», 1986 г.
http://www.astronet.ru/db/msg/1191490

11. Рузмайкин А.А. «Гидромагнитное динамо»,
http://femto.com.ua/articles/part_1/0774.html

12. Пономаренко Ю.Б. «К теории гидромагнитного динамо», Москва, ПМТФ, №6, 1973 г.

13. Кадомцев Б.Б. «Перезамыкание магнитных силовых линий», Успехи Физических Наук, том 151, выпуск 1, январь 1987 г.

14. Vladimir I. Arnold, Boris A. Khesin. «Topological Methods in Hydrodynamics». Springer-Verlag New York, 1998.
Русский перевод: Арнольд В. И., Хесин Б. А. «Топологические методы в гидродинамике». – М.: МЦНМО, 2007

15. Parker, Eugene N., «Hydromagnetic Dynamo Models». **Published:** Astrophysical Journal, vol. 122, p.293, **Pub Date:** September 1955 **DOI:** 10.1086/146087
https://ui.adsabs.harvard.edu/abs/1955ApJ...122..293P/abstract

16. Reshetnyak M. Yu., «Tuning of the mean-field geodynamo model», Published: 13 July 2017, Volume 53, pages 581–587, (2017)
https://link.springer.com/article/10.1134/S1069351317030090?fromPaywallRec=true

17. H. Weyl, «Elektron und Gravitation, Zeitschrift fur Physik», 56, 330-352, 1929.
Русский перевод: Электрон и гравитация (1929). В сборнике Герман Вейль. Математика. Теоретическая физика. Избранные труды. «Наука» 1985

18. H. Weyl, «The Theory of Groups and Quantum Mechanics», pp. 263-4 and preface, Dover, NewYork.

19. E. Schroedinger (1930), «Uber die Kraftfreie Bewegung in der Relativistischen Quantenmechanik», Sitzungb. Preuss. Akad. Wiss. Phys.-Math. Kl. 24: 418.

20. R. Penrose, «The Road to Reality, A Complete Guide to the Laws of the Universe», 2004.
Русский перевод: Пенроуз Р. «Путь к реальности, или законы, управляющие Вселенной. Полный путеводитель». Ижевск изд. 2007

21. Enrico Fermi. On The Origin Of The Cosmic Radiation. Physical Review Volume 75, Number 8, April 15, 1949, pp 1169-1174

22. Hannes Alfvén. Electric currents in cosmic plasmas. Reviews of Geophysics, Volume 15, Issue 3 (August 1977) p. 271-284

23. Hannes Alfvén, Memoirs of a Dissident Scientist. American Scientist, Volume 76, No 3, May–June 1988, pp. 249–251.

24. H. Alfven, R. D. Richtmyer, and E. Teller. On the Origin of Cosmic Rays. Phys. Rev. 75, 892. March 1949, pp 892-893

25. H. Alfvén, Discussion of the Origin of the Terrestrial and Solar Magnetic Fields. Tellus, Volume 2, No 2, May 1950, pp 74-82

26. ChiuMan Ho, Robert J. Scherrer «Anapole dark matter», Physics Letter B, Volume 722, Issues 4–5, 24 May 2013, Pages 341-346
https://www.sciencedirect.com/science/article/pii/S0370269313003286?via%3Dihub

27. Frank Wilczek. "The Lightness of Being: Mass, Ether, and the Unification of Forces». Basic Books. 2008

28. «Our Magnetic Universe: The forgotten force that sculpts the cosmos». By Stuart Clark. New Scientist, October 8-14, 2022. Pp. 34-37

29. Alejandro S. Borlaff, Enrique Lopez-Rodriguez et al. Extragalactic Magnetism with SOFIA (SALSA Legacy Program). First Results on the Magnetic Field Orientation of Galaxies. The Astrophysical Journal, Volume 952, Number 1 (2023 July)

30. Revealing the invisible: detecting variations in extragalactic magnetic fields. By Lori Ann White. Stanford News, July 13, 2023

31. Danilo Zia, Nazanin Dehghan, Alessio D'Errico, Fabio Sciarrino & Ebrahim Karimi, «Interferometric imaging of amplitude and phase of spatial biphoton states», *NATURE*, published August 14, 2023.
https://www.nature.com/articles/s41566-023-01272-3

32. «The Hidden Magnetic Universe Begins to Come Into View», by Natalie Wolchover. Quanta Magazine, July 2, 2020

33. «От Ферми до Альвена и Зельдовича»,
https://kiwibyrd.org/2022/10/10/22ha2/
**[1]** The Hidden Magnetic Universe Begins to Come Into View, by Natalie Wolchover. Quanta Magazine, July 2, 2020
**[3]** Enrico Fermi. On The Origin Of The Cosmic Radiation. Physical Review Volume 75, Number 8, April 15, 1949, pp 1169-1174

**[4]** Hannes Alfvén. Electric currents in cosmic plasmas. Reviews of Geophysics, Volume 15, Issue 3 (August 1977) p. 271-284
**[5]** Hannes Alfvén, Memoirs of a Dissident Scientist. American Scientist, Volume 76, No 3, May–June 1988, pp. 249–251.
**[6]** H. Alfven, R. D. Richtmyer, and E. Teller. On the Origin of Cosmic Rays. Phys. Rev. 75, 892. March 1949, pp 892-893
**[7]** H. Alfvén, Discussion of the Origin of the Terrestrial and Solar Magnetic Fields. Tellus, Volume 2, No 2, May 1950, pp 74-82
**[8]** Zeldovich Ya., Ruzmaikin A., Sokoloff D. Magnetic Fields in Astrophysics. — Gordon and Breach, New York, 1983. Особенности советско-российской научной бюрократии таковы, что на родном русском языке эту весьма известную в мире книгу удалось выпустить лишь 20 с лишним лет спустя: Зельдович Я. Б., Рузмайкин А. А., Соколов Д. Д. Магнитные поля в астрофизике. — М. — Ижевск: Ин-т хаотической динамики, 2006.
**[9]** С. А. Молчанов, А. А. Рузмайкин, Д. Д. Соколов. Кинематическое динамо в случайном потоке. Успехи Физических Наук 1985 Апрель Том 145. вып. 4. Стр 593-628
**[10]** Hannes Alfven, Cosmology: Myth Or Science? (In Yourgrau, Wolfgang and Breck, Allen duPont (Editors) Cosmology, history, and theology. 1977 Plenum Press, New York)

34. D. D. Sokoloff, R. A. Stepanov, P. G. Frick «Dynamos: from an astrophysical model to laboratory experiments», DOI: 10.3367/UFNe.0184.201403g.0313, Physics ± Uspekhi 57 (3) 292 ± 311 (2014) #2014, Uspekhi Fizicheskikh Nauk, Russian Academy of Sciences.

35. Петров Н.В**.,** Свет есть духовная форма живой Вселенной, а звук – это голос Света // «Академия Тринитаризма», М., Эл № 77-6567, публ.25960, 21.12.2019 http://www.trinitas.ru/rus/doc/0016/001g/00164218.htm

36. S. A. Henneberg, G. G. Plunk «Compact stellarator-tokamak hybrid», Published 4 June 2024, *PHYSICAL REVIEW RESEARCH* 6, L022052 (2024)

37. «Гидродинамика пустого пространства», 11 января 2024 г., https://kiwibyrd.org/2024/01/11/24h12/

38. «Свет небесный, Материя земная и табу на Эфир», 19 марта 2023 г. https://kiwibyrd.org/2023/03/19/23h33/

39. «Вихревые кристаллы и дискретная структура», 12 апреля 2023 г. https://kniganews.org/2023/04/12/vortex-crystal/

40. «Мифология Big Bang и космология Альвена», https://kiwibyrd.org/2023/10/25/23ha2/
**[o1]** Our Magnetic Universe: The forgotten force that sculpts the cosmos. By Stuart Clark. New Scientist, October 8-14, 2022. Pp. 34-37

**[o2]** Hannes Alfvén. Cosmology: Myth Or Science? Chapter I in Cosmology, history, and theology, ( Eds. W Yourgrau and A Breck). Plenum Press, New York, 1977, pp 1-14
**[o3]** Hannes Alfvén. Cosmology: Myth or Science? (For the Golden Jubilee of the Indian Academy of Sciences, representing a culture which has investigated cosmology for four millennia). Journal of Astrophysics and Astronomy, vol 5, March 1984, pp 79–98
**[o4]** Alfvén, H. 1981, Cosmic Plasma, D. Reidel, Dordrecht, Chapter VI ; Alfvén, H. 1982, Phys. Scripta, 2, 10 ; Alfvén, H. 1983, Geophys. Res. Lett., 10, 487
**[o5]** Revealing the invisible: detecting variations in extragalactic magnetic fields. By Lori Ann White. Stanford News, July 13, 2023
**[o6]** Alejandro S. Borlaff, Enrique Lopez-Rodriguez et al. Extragalactic Magnetism with SOFIA (SALSA Legacy Program). First Results on the Magnetic Field Orientation of Galaxies. The Astrophysical Journal, Volume 952, Number 1 (2023 July)
**[o7]** Juan M. Maldacena. Eternal Black Holes in AdS. Journal of High Energy Physics. 2003 (4): 021. arXiv:hep-th/0106112

41. «Двоеточие ПСА, Хопф и Восьмёрка Зельдовича», https://kiwibyrd.org/2022/11/18/22hb2/
**[o1]** Арнольд В. И. Экспериментальная математика. М.: ФАЗИС, 2005. См. также: В. И. Арнольд, О преподавании математики, УМН, 1998, том 53, выпуск 1 (319), стр. 229–234
**[o11]** Zeldovich Ya., Ruzmaikin A., Sokoloff D. Magnetic Fields in Astrophysics. — Gordon and Breach, New York, 1983. На русском языке: Зельдович Я. Б., Рузмайкин А. А., Соколов Д. Д. Магнитные поля в астрофизике. — М. — Ижевск: Ин-т хаотической динамики, 2006
**[o12]** Vladimir I. Arnold, Boris A. Khesin. «Topological Methods in Hydrodynamics». Springer-Verlag New York, 1998. Русский перевод: Арнольд В. И., Хесин Б. А. «Топологические методы в гидродинамике». – М.: МЦНМО, 2007

42. В. Яковлев, «Обобщённая модель шаровой молнии», доклад на 32 МНТК, 7 апреля 2024 года, https://www.youtube.com/watch?v=Yookx3A2mps

43. Antoniya Ilyinskaya (Kulak L.A.) «Substance. Atom. The Theory of Everything», monograph, Altaspera Publishing & Literary Agency, Toronto, Canada, January 2020 https://www.lulu.com/en/en/shop/antoniya-ilyinskaya/substance-atom-theory-of-everything/paperback/product-124rw8wr.html?page=1&pageSize=4

44. Antoniya Ilyinskaya (Kulak L.A.) «Möbius Typology and Theory of Everything», New Physics, Altaspera Publishing & Literary Agency, Toronto, Canada, January 2020 https://www.lulu.com/en/en/shop/antoniya-ilyinskaya/mobius-typology-and-theory-of-everything/paperback/product-d8d9pq.html

45. Шипов Г.И. «Теория физического вакуума», Москва, «Наука», 1997 г.

46. Кулигин В.А. «Материалистическая теория познания научной истины», (учебник для физиков), май 2018.

47. Dali Kong, Keke Zhang & Gerald Schubert
«Using Jupiter's gravitational field to probe the Jovian convective dynamo»
Published: 23 March 2016
*Scientific Reports* **volume 6**, Article number: 23497 (2016)
https://www.nature.com/articles/srep23497

48. Andrey Sheyko, Christopher C. Finlay & Andrew Jackson
«Magnetic reversals from planetary dynamo waves».
Published: 07 November 2016, *Nature* **volume 539**, pages551–554 (2016)
https://www.nature.com/articles/nature19842

49. Christopher J. Davies & Catherine G. Constable
«Rapid geomagnetic changes inferred from Earth observations and numerical simulations».
Published: 06 July 2020,
*Nature Communications* **volume 11**, Article number: 3371 (2020)
https://www.nature.com/articles/s41467-020-16888-0?fromPaywallRec=false

50. Yi Yang & Xiaodong Song
«Multidecadal variation of the Earth's inner-core rotation».
Published: 23 January 2023, *Nature Geoscience* **volume 16**, pages182–187 (2023)
https://www.nature.com/articles/s41561-022-01112-z?fromPaywallRec=false

51. Thanh-Son Pham & Hrvoje Tkalčić
«Up-to-fivefold reverberating waves through the Earth's center and distinctly anisotropic innermost inner core». Published: 21 February 2023
*Nature Communications* **volume 14**, Article number: 754 (2023)
https://www.nature.com/articles/s41467-023-36074-2?fromPaywallRec=false

52. Thuany Costa de Lima, Thanh-Son Pham, Xiaolong Ma & Hrvoje Tkalčić
«An estimate of absolute shear-wave speed in the Earth's inner core».
Published: 29 July 2023
https://www.nature.com/articles/s41467-023-40307-9

53. Jonathan E. Mound & Christopher J. Davies
«Longitudinal structure of Earth's magnetic field controlled by lower mantle heat flow».
Published: 16 March 2023, *Nature Geoscience* **volume 16**, pages380–385 (2023)
https://www.nature.com/articles/s41561-023-01148-9?fromPaywallRec=false

54. Yachong An, Hao Ding, Zhifeng Chen, Wenbin Shen & Weiping Jiang
«Inner core static tilt inferred from intradecadal oscillation in the Earth's rotation».
Published: 08 December 2023
*Nature Communications* **volume 14**, Article number: 8130 (2023)
https://www.nature.com/articles/s41467-023-43894-9?fromPaywallRec=true

55. Filipe Terra-Nova & Hagay Amit

«Regionally-triggered geomagnetic reversals».
Published: 26 April 2024
*Scientific Reports* **volume 14**, Article number: 9639 (2024)
https://www.nature.com/articles/s41598-024-59849-z?fromPaywallRec=true

56. Wei Wang, John E. Vidale, Guanning Pang, Keith D. Koper & Ruoyan Wang
«Inner core backtracking by seismic waveform change reversals».
Published: 12 June 2024
*Nature* **volume 631**, pages340–343 (2024)
https://www.nature.com/articles/s41586-024-07536-4?fromPaywallRec=true

57. Mostafa Kiani Shahvandi, Surendra Adhikari, Mathieu Dumberry,
Sadegh Modiri, Robert Heinkelmann, Harald Schuh, Siddhartha Mishra & Benedikt Soja
«Contributions of core, mantle and climatological processes to Earth's polar motion».
Published: 12 July 2024
*Nature Geoscience* **volume 17**, pages705–710 (2024)
https://www.nature.com/articles/s41561-024-01478-2?fromPaywallRec=false

58. Hen Brett, Jeroen Tromp & Arwen Deuss
«Tilted transverse isotropy in Earth's inner core».
Published: 27 September 2024, *Nature Geoscience* (2024)
https://www.nature.com/articles/s41561-024-01539-6?fromPaywallRec=false

59. Смирнов А.Н. "Об инерционном поле" (ИПФО, ноябрь 2006)
http://www.niimestprom.ru/?id=853

60. Г.И. Шипов, «Объяснение движения инерцоида Толчина в неголономной механике» // «Академия Тринитаризма», М., Эл № 77-6567, публ.29196, 30.10.2024
https://www.trinitas.ru/rus/doc/0231/008b/02311179.htm

61. Spherical Stellarator - Simple Idea. Promising Cheaper Stable Fusion.
https://www.ialtenergy.com/spherical-stellarator.html

62. P. Helander, M. Drevlak, M. Zarnstorff, and S. C. Cowley
«Stellarators with Permanent Magnets»
Phys. Rev. Lett. 124, 095001 – Published 5 March 2020
https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.124.095001

63. «Foundation Announces Simons Collaboration on Hidden Symmetries and Fusion Energy», July 24, 2018
https://www.simonsfoundation.org/2018/07/24/foundation-announces-simons-collaboration-on-hidden-symmetries-and-fusion-energy/

64. S. A. Henneberg, G. G. Plunk, «Compact stellarator-tokamak hybrid»,
Published 4 June 2024, *PHYSICAL REVIEW RESEARCH* 6, L022052 (2024)

65. Yi-Hsin Liu, Paul Cassak, Xiaocan Li, Michael Hesse, Shan-Chang Lin & Kevin Genestreti «First-principles theory of the rate of magnetic reconnection in magnetospheric and solar plasmas»
*Communications Physics* **volume 5**, Article number: 97 (2022)
Published: 28 April 2022
https://www.nature.com/articles/s42005-022-00854-x?fromPaywallRec=false

66. Rongsheng Wang, Shimou Wang, Quanming Lu, Xinmin Li, San Lu & Walter Gonzalez «Direct observation of turbulent magnetic reconnection in the solar wind»
Published: 10 November 2022
*Nature Astronomy* **volume 7**, pages18–28 (2023)
https://www.nature.com/articles/s41550-022-01818-5?fromPaywallRec=false

67. S. D. Bale, J. F. Drake, M. D. McManus,M. I. Desai, S. T. Badman, D. E. Larson, M. Swisdak, T. S. Horbury, N. E. Raouafi, T. Phan, M. Velli, D. J. McComas, C. M. S. Cohen, D. Mitchell, O. Panasenco & J. C. Kasper
«Interchange reconnection as the source of the fast solar wind within coronal holes»
Published: 07 June 2023
*Nature* **volume 618**, pages252–256 (2023)
https://www.nature.com/articles/s41586-023-05955-3?fromPaywallRec=false

68. Chuanpeng Hou, Jiansen He, Die Duan, Ziqi Wu, Yajie Chen, Daniel Verscharen, Alexis P. Rouillard, Huichao Li, Liping Yang & Stuart D. Bale
«The origin of interplanetary switchbacks in reconnection at chromospheric network boundaries»
Published: 02 September 2024, *Nature Astronomy* (2024)
https://www.nature.com/articles/s41550-024-02321-9?fromPaywallRec=false

69. L. D. Pichakhchi, Theory of the Hydromagnetic Dynamo, Soviet Physics JETP volume 23, number 3, September, 1966.
Пичахчи Л.Д., «Теория гидромагнитного динамо», Институт теплофизики СО АН СССР, Советский Физический Журнал том 23, номер 3, Сентябрь 1966 года

70. Steven Wolfram, https://mathworld.wolfram.com/Torus.html

71. Кулак Л.А., «Геометрия Мёбиуса на подиуме науки» // «Академия Тринитаризма», М., Эл № 77-6567, публ.28839, 18.02.2024
https://www.trinitas.ru/rus/doc/0016/001h/00165521.htm

72. Kulak L.A., «Clifford parallels. Gravitation. Atom», // «Академия Тринитаризма», М., Эл № 77-6567, публ.28464, 13.05.2023
http://www.trinitas.ru/rus/doc/0016/001h/00165322.htm

72. Kulak L.A. «Hopf fibration and möbius energy pattern fibration. Energy dynamics of an atom based on Möbius Dipole. Physics issues in applications of the new atomic model», (Л.А. Кулак, «Фибрация Хопфа и фибрация мёбиусного энергопаттерна. Энергодинамика атома на основе мёбиусной дипольности. Вопросы физики в

приложениях новой атомарной модели» // «Академия Тринитаризма», М., Эл № 77-6567, публ.27501, 28.12.2021)
http://www.trinitas.ru/rus/doc/0016/001h/00164875.htm

73. Kulak L.A., Time out // «Академия Тринитаризма», М., Эл № 77-6567, публ.28434, 18.04.2023, http://www.trinitas.ru/rus/doc/0016/001h/00165301.htm

74. Antonio F. Rañada «A topological theory of the electromagnetic field», Published: August 1989, Volume 18, Pages 97-106,
https://link.springer.com/article/10.1007/BF00401864

75. F. Ranada and A. Tiemblo. "A Topological Structure in the Set of Classical Free Radiation Electromagnetic Fields". arXiv:1407.8145v1 [physics.class-ph] 29 Jul 2014.
https://arxiv.org/abs/1407.8145

76. William T. M. Irvine & Dirk Bouwmeester, «Linked and knotted beams of light», Volume 18, Pages 97-106. Published: 31 August 2008.
https://www.nature.com/articles/nphys1056

77. Друнвало Мелхиседек, «Древняя тайна Цветка Жизни», том 1, «София», 2004 г.

78. Vesica Pisces (Sacred Geometry by ieoie)
https://www.youtube.com/watch?app=desktop&v=jXsKh1p6vIg

79. Петров Н.В. Живая растущая планета Земля // «Академия Тринитаризма», М., Эл № 77-6567, публ.25374, 20.04.2019
http://www.trinitas.ru/rus/doc/0016/001g/00164018.htm

80. Петров Н.В. Живая растущая планета Земля // «Академия Тринитаризма», М., Эл № 77-6567, публ.25374, 20.04.2019
http://www.trinitas.ru/rus/doc/0016/001g/00164018.htm

81. Ю. А. Рылов, «Геометризация физики. Зачем она нужна?», 29.02.2012
https://ipmnet.ru/~rylov/20120229.htm

82. Ю. А. Рылов, «Геометризация физики – ключ к построению фундаментальной физической теории микромира и мега мира».
https://ipmnet.ru/~rylov/20110105.htm

83. Кулак Л.А., «Теория всего на основе мёбиусной типологии» // «Академия Тринитаризма», М., Эл № 77-6567, публ.26933, 25.01.2021
https://www.trinitas.ru/rus/doc/0016/001h/00164609.htm