FORMATION OF ATOMS BASED ON THE HYDRODYNAMIC PROPERTY OF MAGNETIC LOOP BIFURCATION IN THE PHENOMENON OF HYDROMAGNETIC DYNAMO.

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ABSTRACT.

This paper examines the issues of model representation of the phenomenon of a self-generating hydromagnetic dynamo. Along with the main existing models, a new model is proposed based on the hydrodynamic property of bifurcation/fibration of a magnetic loop and, as a consequence, doubling of its magnetic flux. It is proposed to consider the original magnetic loop in a geometry that has an inverse closure topology. This variant of the geometric representation of a magnetic loop corresponds to the universal principle of natural dualism, which is based on the ontology of the principle of complementarity, the physical embodiment of which is the phenomenon of magnetism.

The paper analyzes two main previous models of a hydromagnetic dynamo proposed by Nobel laureate H. Alfvén and scientist Ya. Zeldovich, and voices those questions that require more specific answers. The paper shows how the proposed new model of a hydromagnetic dynamo answers these questions and reduces both previous models to a common denominator based on natural universalism.

Together with the proposed model of transformation of the magnetic loop through the method of its bifurcation, the conclusion is made that this method of doubling the magnetic flux is a method of forming baryonic matter from ether monopoles, that is, a method of forming atoms.

Along with this, and taking into account the proposed new visualization of magnetic lines, the new model can also contribute to the development of engineering thought in matters of creating stellarator designs, and also changes the view of the internal planetary structure and the processes that occur in the cores of planets and stars.

"***The hydromagnetic dynamo apparently operates in all planets with liquid conducting cores. The main task is to clarify the nature of the movements and build specific dynamo models.***" [4]

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

"***Previously, it was believed that physics describes the universe. Now we know that physics describes only what we can say about the universe.***" *Nobel laureate Niels Bohr.*

The history of the development of the study of the hydromagnetic dynamo phenomenon has its stages and difficulties to overcome, which were mainly initially associated with

conflicting opinions on the very possibility of the spontaneous generation of a hydromagnetic dynamo, as well as with scientific positions regarding the existence of a supporting cosmic medium.

As is already known, the spontaneous generation of a hydromagnetic dynamo primarily requires the presence of a turbulent environment. However, given the facts in the history of the scientific worldview, when science underwent periods of refusal to accept the existence of any cosmic environment at all and theories were built on the basis of its absence, this significantly slowed down the process of developing ideas about the existence of the hydrodynamo phenomenon as such, as well as their theoretical design.

The history of the discovery of the hydromagnetic dynamo phenomenon, 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 motions 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, then the only thing left to explain cosmic magnetism is the phenomenon of electromagnetic induction.

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), considering 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." [39]

In the well-informed popular science publication ***Quanta Magazine***, one of the relatively recent articles (July 2, 2020) 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 ever more distant regions of space, for some inexplicable reason they always 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." [38]

“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 astonishing 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 that universal natural structure that generates and maintains the all-pervading structures of cosmic magnetism.

Scientists have various models on this subject, 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.” [39]

In the self-consistent concept [30] [31] [32] [33] [34] [35], it is proposed to consider the units of the etheric ***Quantum Medium*** – magnetic monopoles (magnetic loops closed through inversion) as sources of magnetism. The concept is based on the presence of a supporting cosmic medium, which I called the etheric ***Quantum Medium***, and represents a matrix spin network of

dynamic vortex nodes – magnetic monopoles – as seed elementals that are potential sources of magnetism and manifest it outwardly in the process of bifurcation with doubling of the magnetic flux, which is the act of formation of baryonic matter (atomic elements).

The process of bifurcation of magnetic loops-monopoles with doubling of the magnetic flux will be a self-generating hydromagnetic dynamo and a way of formation of atoms.

Today, in the scientific worldview, there are a number of theoretical proposals regarding the structure of the supporting cosmic environment, and in particular, the theory of "***loop quantum gravity***" – LQG – suggests considering the supporting cosmic environment as a ***spin network*** of dynamic matrix vortex nodes.

"Notable progress in quantizing the gravitational equations of general relativity was achieved only in the **second half of the 1980s**, thanks to the pioneering work of the Indian-American theorist **Abhay Ashtekar**. His important discovery was called "Ashtekar variables", which allows physics to be turned to a discrete view of space-time on a solid mathematical basis.

The main result of Ashtekar's discovery should be considered the birth of the so-called "***loop quantum gravity***" – a theory that proposed a new view of the structure of space-time." [40] [41]

In the late 1980s, relying on the results of A. Ashtekar, **Carlo Rovelli and Lee Smolin** studied the rewritten Einstein gravity equations for the microstructure of space. As a result of their calculations, they discovered that the minimum areas and volumes of regions in space cannot be arbitrarily small. The smallest value of the linear size, dictating the limits of reduction of area and volume, turns out to be directly related to the main constants of the universe – the speed of light, the gravitational constant, Planck's constant. [42][43][44]

"In passing, it can be noted that the entire course of construction of the LQG theory, although implicitly, recreates the features of the vortex microstructure of space. The term "loop" in the name of the theory itself refers to the lines of force of the field, which closes in microscopic loops. If we operate not with abstract fields, but with more realistic vortex movements of energy, then microscopic loops of the smallest size turn out to be the very vortex-granules that form the vortex sponge of space.

Thus, at a new stage and from other starting points, the ideas of K. Bernoulli and W. Thomson (Lord Kelvin) are again present here." [46]

When K. Rovelli and L. Smolin outlined the "micro-vortex" physics of the theory, it turned out that this construction under the name "***spin networks***" was developed **in the 1960s** by the British mathematician and physicist **Roger Penrose** [45], who also tried to develop discrete approaches to the physics of space-time, operating with the connections between the quantum characteristics of particles. An important characteristic, according to R. Penrose, should be considered ***spin***, which is related to both the energy and the spatial orientation of the object, which is also true for the description of the physics of granules in a vortex sponge.

"Although the apparatus of ***spin networks*** (the mathematics of graphs whose edges are assigned different spin values) was developed by Penrose for interacting particles, it turned out that after some modifications it can be very successfully deepened to describe the structure of space on smaller scales of the Planck length." [46]

Twenty years after these discoveries and a hundred years after the publication of K. Bjørkens's work on hydrodynamics, an article by **Gianfranco D'Anna** and his colleagues, "***Observing Brownian motion in vibration-fluidized granular matter***", appeared in the August 2003 issue of ***Nature*** magazine. [47]

Their work focused on the study of Brownian motion in a fine-grained material under constant vibration. A material with such a fine-grained structure is called a so-called ***granular fluid***.

It was demonstrated that such finely dispersed structures can have a set of properties that make the medium similar to a gas, a liquid, and a solid at the same time. But an important condition must be met – the granular medium must constantly be in a state of vibration. [48]

In other words, the described set of properties can be inherent in a medium that has a matrix (granular) structure and its structural units must be in a state of dynamic continuous oscillating motion. That is, such a discrete-continuous medium cannot in principle be in a state of equilibrium and in order to maintain its "liquid" state it always requires a constant supply of vibrational energy.

Thus, as the listed theoretical proposals show, in the step-by-step mode of development of scientific thought from R. Descartes, who was the first to propose the matrix structure of the etheric medium, a number of its main characteristics are revealed. It remains only to identify the cause of continuous and unceasing oscillations and to show where the supply of vibrational energy comes from.

In works [30] [31] [32] [33] [34] [35], as well as others [36], I have proposed a more detailed description of the dynamic vortex nodes of the matrix of the supporting space environment, as well as the reasons for their continuous oscillations.

These dynamic nodes are considered as magnetoelectric units and sources of magnetism and are presented in the form of magnetic loops with a topology of inverse closure (mirror asymmetric duality), in other words, in the geometry of the original Mobius strip with one turn. This idea corresponds to the universality of natural complementary duality, the physical embodiment of which is magnetism. Until now, no scientist has proposed to consider a magnetic loop closed inversely.

The closure of the magnetic loop into one topology through the turn leads to the effect of reconnections and, accordingly, the release of energy portions, and also according to the effect of **the return of excitation energy** – the Fermi-Pasta-Ulam-(Tsingu) paradox – this process has the character of a continuous and non-stop oscillating movement, which, coming to a conditional certain starting point, is repeated again and again. In the repeating process of reconnections**, the effect of the release-absorption of quanta occurs.** This effect can be called the ***oscillating breath of the supporting medium.*** And the cosmic environment itself, due to the presence of such quantum breath, can be named the ***etheric Quantum Medium*** in the form of a kind of ***quantum liquid*** – **magneto-plasma** – in which all objects are formed from the matrix vortex units as seed elements. [30] [31] [32] [33] [34] [35]

Similar ideas in describing the supporting cosmic ьувшгь as consisting of magnetic units with quantum activity were put forward by predecessors and contemporaries – Nobel laureates H. Alfvén, who called the cosmic filling of **magnetic particles** "***living plasma***" [20] [21] [22], and F. Wilczek, who pointed to the presence of a ***primary ingredient*** that is constantly filled with ***quantum activity and from which everything else is formed*** [29].

The above-mentioned works show that the matrix units of the etheric Quantum Medium – magnetic loops with inverse closure – are ***magnetic monopoles*** that undergo transformation into ***magnetic dipoles***, which are the basis of baryonic matter. Such a transformation with the formation of atomic elements is the phenomenon of the hydromagnetic dynamo.

Due to the proposed geometry and dynamics of the activity of such magnetic units that make up the fabric of space, the supporting cosmic Medium will be indirectly turbulent and all

conditions for the spontaneous generation of a hydromagnetic dynamo will be met in it. These conditions are: a liquid medium, a turbulent nature of motions that do not have mirror symmetry, topological properties of flows, respectively topological complexity, as well as average helicity and non-axisymmetric convective motions. All these conditions are provided by the matrix structure of the etheric medium and are mediated by the framework properties of its primary ingredients – magnetic monopole units, topologically closed through inversion. [31] [34]

In addition to what is described in the proposed concept, as well as in addition to other theoretical proposals and as evidence for the ideas and hypotheses put forward, new research tools ultimately lead to increasingly clear ideas about the comprehensiveness of magnetism that permeates the entire cosmos, respectively about the physical nature of the supporting cosmic environment and its structure and, as a consequence, about the phenomenon of a self-generating hydromagnetic dynamo. [17] [18] [19]

In the history of science, two main models of the hydromagnetic dynamo are known – this is the model of the Nobel laureate H. Alfven and the model of the scientist Ya. Zeldovich.

In 1950, Hannes Alfvén published a paper of historic importance, "***A Discussion of the Origin of the Magnetic Fields of the Earth and the Sun***" [1], 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 and theories.

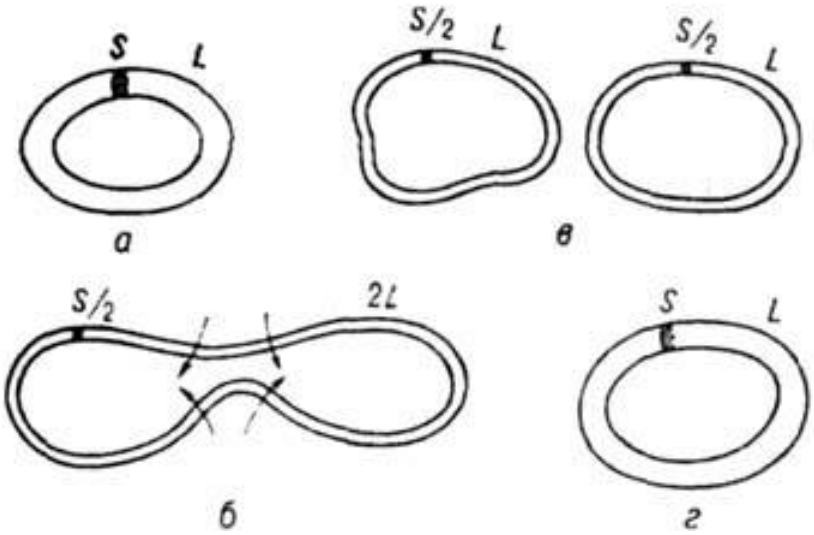


Fig. 1**.** ***Illustration of the operating principle of a slow dynamo in the Alfven model.*** [1] [5].

"According to the Alfven model, the initial loop of the magnetic field (length L, cross-sectional area S) is stretched to double its original length. Then, along one of the diameters, two oppositely directed sections of the field come together and the loop is divided into two by 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 field lines). Then the procedure is repeated. Strict examples of a slow dynamo are solutions of the hydromagnetic dynamo equations 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." [5]

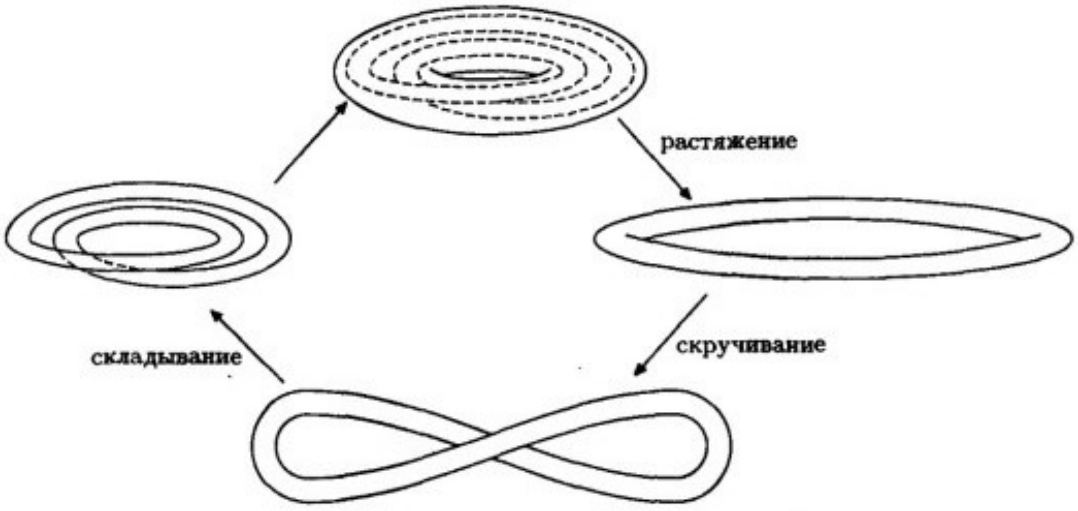
“Kinematic dynamos have been classified by the behavior of the field growth rate at high magnetic Reynolds numbers, dividing them into slow and fast [10,12,13]. A clear illustration of a slow dynamo is the model of X. Alfvén [10,14], in which the initial closed tube of magnetic lines is stretched twice, 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 growth of the field in this model depends decisively on magnetic diffusion and stops when the latter becomes vanishingly small.” [6]

A fast kinematic dynamo was one of the important ideas of Ya. Zeldovich in 1971. This idea proposed 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.

"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 the initial dimensions. After this, the process is repeated. Each doubling of the number of loops leads to a twofold amplification of the magnetic field" [4].

"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. As theoretical studies have shown, mirror-asymmetric random movements are capable of generating a large-scale magnetic field.” [4]



Веревочное динамо: механизм растяжения-скручивания-складывания

The Zeldovich dynamo diagram in the book by V. Arnold and B. Khesin. [9]

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). [10]

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" (with or without crossing), and then the formation of two magnetic loops, the addition of which doubles the growth of the magnetic flux.

Let's 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 amplification (doubling) of the magnetic flux. When analyzing both models, the following can be said.

Analysis of the H. Alfven model.

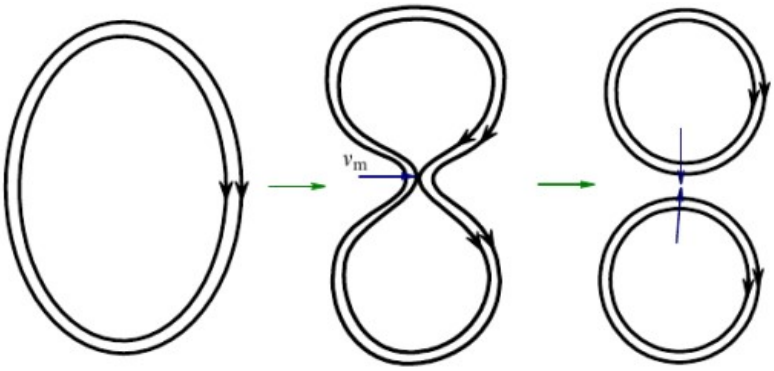
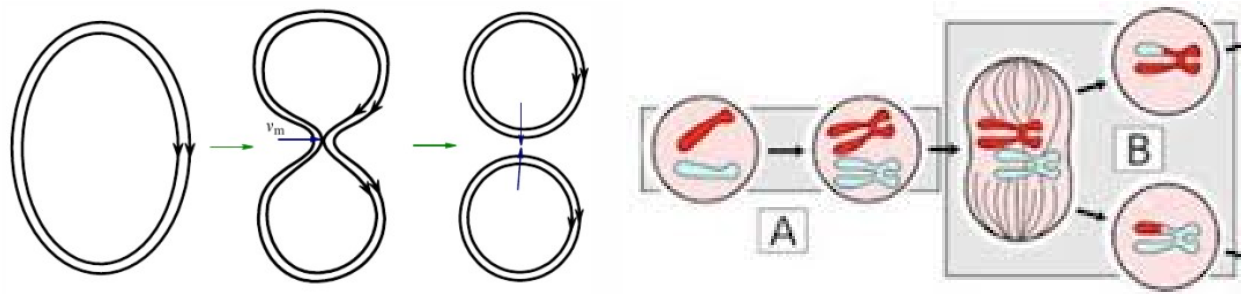


Figure 2. Alfven process: the magnetic loop stretches, flattens, and breaks under the effect of magnetic diffusion. The resulting loops overlap. The magnetic flux is doubled, but the process governed by weak diffusion is slow. [11]

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

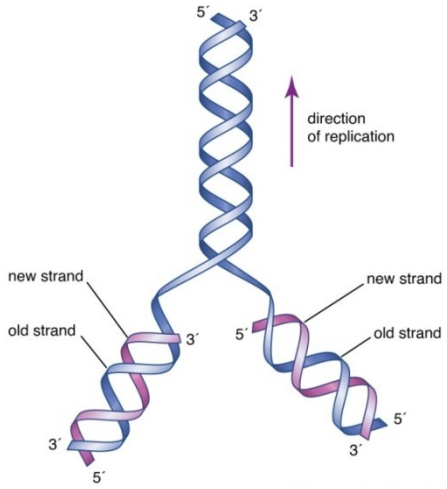
In this doubling scheme, an explanation is required of what measuring instruments stretch the original magnetic loop exactly twice and two equal loops obtained as a result of the rupture, equal in diameter to each other, and also equal to the diameter of the original magnetic loop, and when they are subsequently superimposed, they absolutely precisely correspond to each other? These are the main questions in the Alfven model.

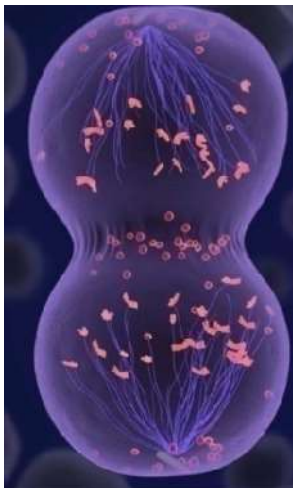
If, on the basis of the general universalism of the Fundamental Principle of Complementarity, we draw an analogy with another plane of being, in particular with the process of cellular reproduction, then in the Alfven model we can clearly see an analogy with a part of the algorithm for dividing a living cell. It should be noted that the cellular process of dividing is a projection into the plane of biology of the Universal method of self-copying through bifurcation/fibration with the production of an identical copy.



The universality of the method of bifurcation is based on the fractal-holographic structure of the world order. Based on this, the same general scheme of self-copying will also take place in the processes of the quantum world during the bifurcation of the magnetic loop.

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 a bifurcation of complementary DNA strands, which as a result of the replication process 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 increases exactly twofold.

The universality of the method of bifurcation is based on the fractal-holographic structure of the world order. Observed Reality is a reflection of what is happening in Quantum Reality. That points to the fact that the inverse problem of understanding Quantum Reality through Observed Reality is solvable and feasible through the observation of similar processes in other planes of being.

Based on this, the same general scheme of self-copying will also take place in the processes of the quantum world during the division of the magnetic loop. And the legitimacy of drawing such a parallel from the plane of biology to the plane of quantum phenomena is based on the universality of the method of growth of matter from within and the unity of all that exists.

W. Pauli guessed and spoke very often about this universal method of growth of matter and expansion of space due to dividing with doubling and the emergence of new symmetries, discussing natural symmetries and quantum processes. It seems that W. Pauli was very close to discovering the secret of bifurcation with doubling, which is clearly demonstrated by DNA, and the image of the Mobius strip visited him more than once. It should be assumed, analyzing his letters to W. Heisenberg shortly before his death, that he was almost there. [49] [32] [33] [34]

W. Heisenberg notes: “I once asked Wolfgang why he attached so much importance to the process of bifurcation, and received approximately the following answer: “... The process of bifurcation, or bification, as I imagine it, could explain a lot to us here, because it somehow very naturally expands the space of nature, thereby creating the possibility of new symmetries. In the ideal case, one could think that all real symmetries arose as a consequence of such bifurcations.” [49] [50] [51]

So part of the universal algorithm of dividing with doubling was 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 clarification.

Analysis of the Zeldovich model (Fig. 1).

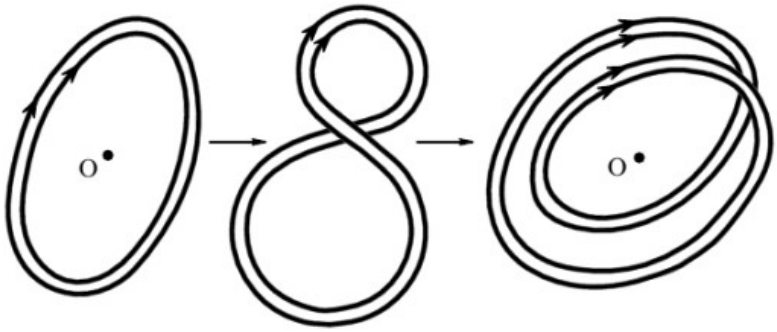


Figure 1. Zeldovich figure-eight magnetic loop stretched, turned over,
And folded onto itself with the doubled magnetic flux. Magnetic diffusion
Is needed to smooth the magnetic field in the place where the loop was twisted. [11]

According to the model scheme of the fast dynamo by Ya. Zeldovich (**Fig.1**), 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 by 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 the scheme by Zeldovich, 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 the folding in half occurs, that is, the insertion of the arms into each other, 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 about the Zeldovich model.

As can be seen, despite the differences, what is common in both schemes is the process of stretching the magnetic loop until it doubles, followed by doubling it and doubling the magnetic flux.

It should be noted, however, that in both models (Fig. 1 and Fig. 2), the original magnetic loop is a toroidal loop with a length of **L** and a cross-section of **S**, and in both models we are talking about the diameters of the loops, that is, they are initially represented in the geometry of a circle-donut.

Also, both models indicate that the original loop undergoes expansion-stretching by two times. But then the question remains for both models – what is the reason to stop the loop from expanding when it has stretched exactly twice, and not more or less?

Despite the differences in the algorithms for doubling the magnetic flux in the circuits, the models have in common the end result – after superimposing (adding) 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 fairly rational thought arises – after all, Nature does not have measuring instruments to stretch the original magnetic loop like an elastic band exactly until its diameter doubles and then ultimately obtain two identical folded loops whose diameter is equal to the diameter of the original.

How can Nature achieve such incredible precision without having hands, rulers and other tools 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 her ability to find a solution so accurately and quickly and achieve her intended goal – to double the magnetic flux?

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

The answers to questions on the existing models of Alfven and Zeldovich and the visualization of the process of doubling the magnetic flux are given by the Geometry of Möbius. As already indicated above, the original magnetic loop is represented as a Möbius ring with one inverse turn. The inverse reversal is its original InfoGenome, which needs to be doubled – this is **the first**.

Its doubled expansion is obtained by the universal method of bifurcation (fibration) along the line of Möbius curvature, that is, the magnetic loop is stratified filamentarily in accordance with the hydrodynamics properties (similar to symmetrical DNA dividing). According to such a geometric transformation, it automatically becomes twice as long and doubles both its length and its InfoGenome (inversion) – this is **the second**.

According to the properties of the magnetic loop in the proposed geometry with this method of filamentary bifurcation/fibration and due to the presence of two inversions the loop acquires a twisted configurability of the lemniscate-"eight" – this is **the third**.

Further, the Mobius magnetic loop in the form of an "eight" with a doubled inversion can add the arms of the "eight" coaxially, while the length of the doubled magnetic 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 **Fig. 3** below illustrate the stages of the proposed description of doubling.

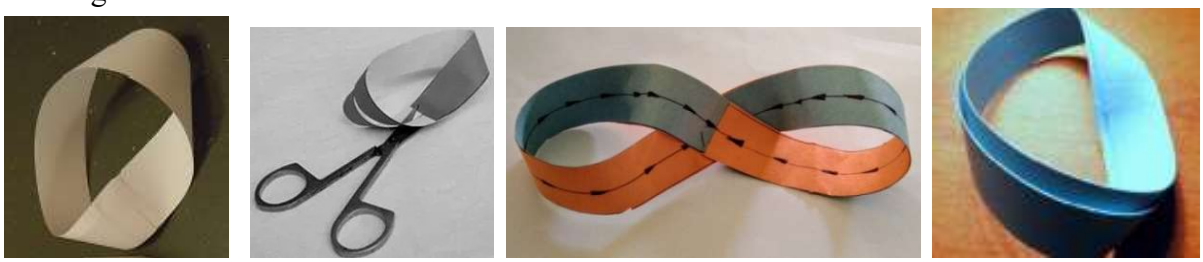


Fig.3 Mobius Monopole. Fibration. Two-loop Mobius Dipole in two states – lemniscate-«eight» and double ring.

With this method of bifucation with doubling, both at the stage of doubling the ring length and at the stage of nesting the two formed loops into each other, the dimensions

completely coincide without the use of measuring instruments. Due to this transformation process during bisection/fibration and the formation of a double magnetic ring, the magnetic flux doubles.

Thus, the seed elements for the spontaneous generation of a hydromagnetic dynamo in the supporting cosmic medium are etheric monopoles – dynamic quantum-mechanical units in the geometry of a magnetic loop closed inversely. The properties of the geometry of the Mobius strip ensure the receipt of a double magnetic flux when dividing a magnetic loop in such a configuration and the formation of magnetic dipoles and further topological knots of magnetic dipoles.

The next point that needs to 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 talk about the length of the ring.

Considering that the hydromagnetic dynamo is a large-scale process that occurs in a region of space, and, as indicated above, such a region can be a mega-quantum called a "black hole", or the hydromagnetic dynamo functions in stellar and planetary bodies, the power of this process is determined not by an increase in magnetic flux due to multiple division of a single loop, but by the simultaneous division of an array of magnetic loops concentrated in a region of space and reaching a critical value.

The array of magnetic loops exhibits a **collective bifurcation effect**, which can be explosive in nature or function for a long time as a hydromagnetic dynamo effect in planetary and stellar bodies. Collective effects that manifest themselves in the micro-world of matter are currently of great interest and are actively studied in condensed matter.

As illustrated above and according to the new proposed hydromagnetic dynamo model, doubling the magnetic flux and maintaining all dimensions during the transformation of the magnetic loop is naturally provided exclusively by the magnetoelectric properties of the original magnetic loop in the Mobius geometry without the use of contrived forces and elements.

In the new proposed model of a hydromagnetic dynamo based on the fibrations of the original magnetic loop, it is necessary to emphasize two states of the Mobius Magnetic Dipole: a lemniscate-shaped “figure eight” and a double pseudo-ring, which visualize the physics of the “***proton-electron***” and “***neutron***” dualities, respectively [32], [33].

MOBIS LOOP TRANSFORMATION.





The "eight" dipole is "proton-electron". ***The double pseudo-ring is "neutron"***.

A double pseudo ring ("***neutron***") is obtained as a result of coaxial nesting of the arms of the "figure eight" dipole ("***proton-electron***"). It should be emphasized that these states are spatially and geometrically transformable into each other and are nothing more than modifications of a magnetic loop with two inversions.

Such a magnetic loop has an analogue in quantum mechanics. This is a spinor with a half-integer spin, that is, with a spin of 1/2. As is customary in quantum mechanics today, spin **½** belongs to a system that returns to its original state after 2 full revolutions, that is, after a rotation of 720°.

One example is a Möbius strip with one turn, when an object moves **along it**. Then, having made one circle of 360° (having walked around the ring once), the object will end up at the same point, but on the other side of the sheet, and in order to return to the point where it started, it will have to go through another such circle of 360°, that is, a total of two such circles of 720°.

But the object does not have to set off twice, it is enough to go once along the tape, which has two turns, and then it will return to its original position, making one forced march along the tape. Therefore, according to the accepted notation in QM, a **tape with two turns corresponds to a spin of ½.**

At this point it is appropriate to say that in the case of the transformation of two states of a dipole, it is not an object moving as a "particle" along a tape with one or two turns that is considered, but the spatial turns are performed by the entire system as a whole, and the geometry of the system includes two turns of 180 degrees and a total of 360.

As can be seen, there can be a significant difference in approaches to the issue of spin if it is considered on the basis of moving particles along a certain geometry or on the basis of the movement of the entire system as a whole, which itself has this geometry.

If we return to how this is considered in quantum mechanics based on the particle paradigm, then today it is customary to consider the spins of the ***proton***, ***electron*** and ***neutron*** to be equal to **½.**

If we consider the proposed geometric transformations of the Magnetic Dipole in its two states, then the spin **½** belongs to the entire structure as a whole in its two states – the "eight" ring "***proton-electron***" and the double pseudo-ring "***neutron***". That is, the spin **½** is the mutual spin of the Magnetic Dipole, the arms of which play the role of opposite charges and the dipole functions as a synchronized **two-arm oscillator**.

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

These geometric transformations have a huge degree of significance for the parallel explanation of many phenomena that have not yet received due interpretation 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.

It is appropriate to recall that at the time of the birth of Quantum Mechanics and the creation of the famous relativistic equation by P. Dirac, the insightful W. Heisenberg noted, conducting an analysis of the content of this equation, that it would be possible to solve the riddle of the "proton" and "electron" in the equality of their charges and the large difference in their masses only after "***a unified theory for the physics of the proton and electron together***"

had been created. The issues of creation of this unified theory in the format of Möbius geometry are considered in [30] [32] [33] [49] [50].

The following conclusions can be drawn from geometrical transformations of Magnetic Dipole:

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 of the Magnetic Dipole decreases and the "***Center-Periphery***" scheme is formed. [33]

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 (coaxially) nested into each other and the structure acquires external neutrality, but in a doubled version. As a stable element, the state "***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 a "***proton-electron***".

3. These transformations are important for creating a visualization when considering 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, the components of these states should be considered as geometrically transformable into each other. This is the basis of radioactive transformations.

When considering issues related to the hydromagnetic dynamo, these mutually inverse transformations provide both a visualization of the process of generating a double magnetic flux itself and allow one to visualize thermonuclear transformations, which in the current paradigm are explained using atomic "particles".

As shown in [32] [33] [34] [49] [50], in the hydromagnetic dynamo effect in the fibration phase of the magnetic loop, the etheric matter is transformed into baryonic matter with the actualization of the external magnetic field, the properties of charge and mass, in other words, the etheric magnetic monopoles are transformed into magnetic dipoles.

If we continue the fibration phases of one magnetic monopole, then as a result of subsequent phases (second, third, etc.), according to the established algorithms of bipartition, topological knots of magnetic dipoles are formed, which forms the "***Center-Periphery***" scheme based on the alternate arrangement of dipoles in the "***proton-electron***" state and dipoles in the "***neutron***" state, in other words, their alternation forms a stable atomic block based on actualized interrelations. [30] [32] [33] [34] [35] [49] [50]

The principle of this alternation may be related to the Pauli exclusion principle, which is used in Quantum Mechanics and means the following: two or more identical fermions (particles with half-integer spin) cannot simultaneously be in the same quantum state in a quantum system. Mostly these quantum states are described relative to electrons.

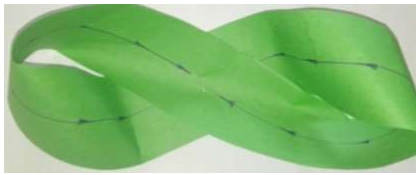
But the "particle" paradigm is greatly simplified in the format of a "***unified theory for the physics of the "proton-electron" together***", when these two components are components of a single whole, performing the act of spinning as a single whole. The particle paradigm has not justified itself, has complicated the physics of the quantum world and significantly slows down its understanding and further development of thought.

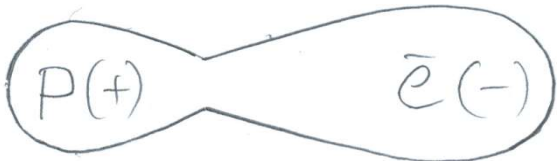
The proposed new model of hydromagnetic dynamo on geometric transformations based on the method of fibration of the initial magnetic loop – monopole – in the geometry of the Mobius strip with one inverse turn and its transformation into a magnetic dipole and then into a set of dipoles connected in a topological knot. [32], [33] Magnetic Dipole is a seamless structure consisting of two mirror-asymmetric components. Based on the formed topological connections of dipoles, atomic elements are constructed according to the organization of the algorithm of bifurcation with doubling.

Each atomic element is a certain finite formula of a set of topologically related magnetic dipoles in the expanded state "proton-electron" and the doubled state "neutron". Examples of atomic elements based on the dipole structure of the first two periods of the Periodic Table are given in [33]. In article here, only models of the hydrogen atom and its isotopes, as well as the helium atom, are given as a visual example. It should be noted that the model is presented in a general schematic manner and without taking into account the numerical parameters of the components.

SYMBOLS ON THE SCHEMES OF ATOMIC ELEMENTS.

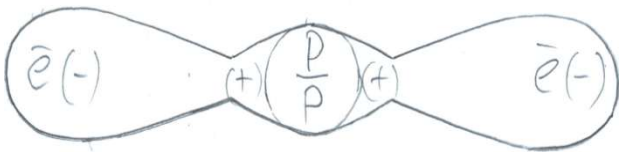
1. MOBIUS DIPOLE (proton-electron).



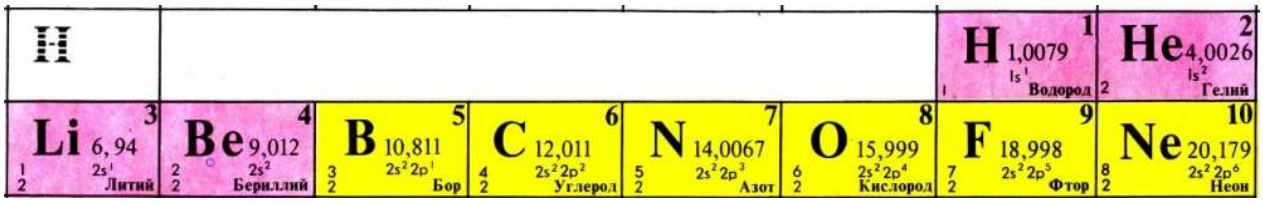


2. **LINK CONNECTION OF TWO MOBIUS DIPOLES.**





3. N – NEUTRON.

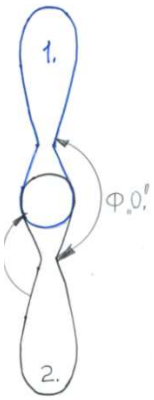


H (HYDROGEN) 1=A=Z(P)+ N=1+0; P=1, N=0
PROTIUM, `H = 1P + 1e ;
DEUTERIUM, ``H = 1P + 1N + 1e
TRITIUM, ```H = 1P + 2N + 1e





PROTIUM.



FIBRATION.

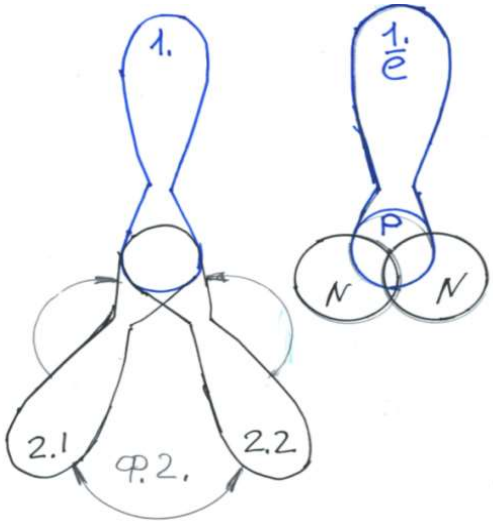




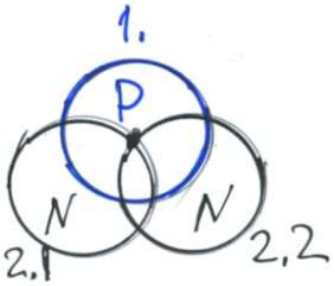
FUSION INTO NEUTRON, DEUTERIUM.

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.

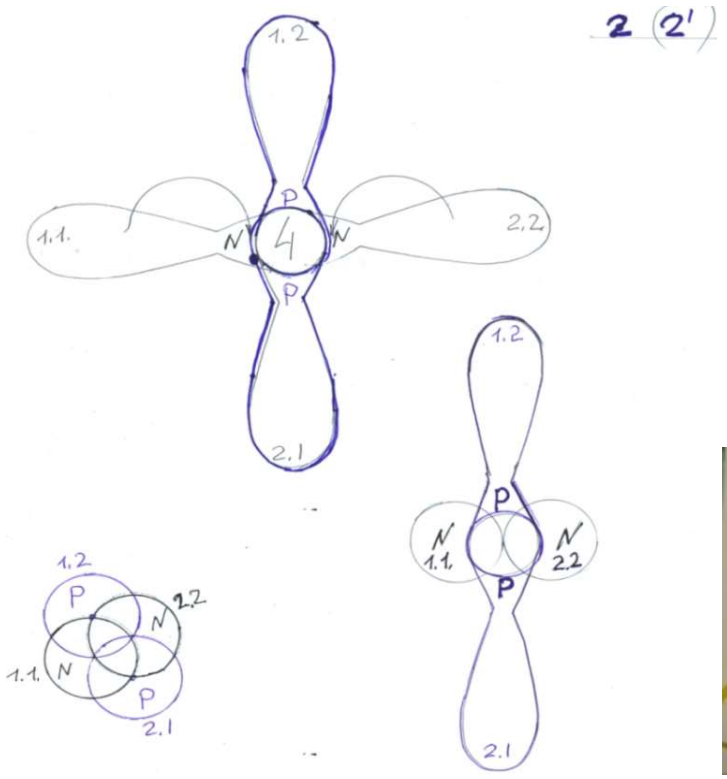
From these examples it is clear that the geometric transformations of the original Magnetic Mobius Monopole (MMM) in the process of its bifurcation with doubling determine the formulas of the resulting chemical elements, the quantization of charges and their multiplicity to the minimum charge, internally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

The issue of charge quantization and the multiplicity of the minimum is covered in more detail in the work [49][33].

It is important to say here that the presented geometric transformations in the format of a new approach based on the ontology of the principle of complementarity and its geometric analogue of the Mobius strip allow us to significantly simplify the ideas about the processes in the micro-world of the atom and look at them from the focus of the "geometric dance" that Nature performs practically on one substantial basis, which corresponds to the simplicity that ancient philosophical views remind us of.

The formation of Helium is the third phase of the fibration of two topologicly linked Dipoles, obtaining four Dipoles from them, two of which remain in the "***proton-electron***" «eight»-state, and two in the "***neutron***" state.

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





As shown in the examples of illustrating the elements of Hydrogen, its isotopes and Helium, in the format of Mobius geometry there are only universal geometric spatial transformations. This simplifies many theoretical issues and gives a visual figurative representation.

From the visualized transformations, it is concluded that the phenomenon of the hydromagnetic dynamo is the **method of formation of atoms**, since the doubling algorithm leads not only to a formal increase in the magnetic flux, but also to its algorithmic structuring. Each increase doubles the loops of the original geometric structure of the monopole, and their algorithmic combinations correspond to the Periodic Table of Atomic Elements, and this is precisely what the process of charge quantization is based on. [49] [33] [34]

The question of why the energy of the magnetic flux 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 two identical copies are obtained, the resulting cells do not decrease by half, but are identical to the original.

The plane of beingness in which the answers to these questions are is the presence of a nutrient MEDIUM. Regarding the bifurcation of magnetic loops, the doubling of the flux is ensured by the supporting Quantum Medium. The Ethereal Quantum Medium ensures the implementation of all mechanisms of life activity and transformations in the etheric magneto-plasma, namely, ***quantum breathing***, ***quantum metabolism***, as well as the ***quantum symbiosis*** of all objects with it. Without recognizing the presence of the supporting Cosmic Medium, almost 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 feeding supporting etheric Quantum Medium (magneto-plasma) – this is the first. 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 when a magnetic loop is divided – the process of bifurcation/doubling occurs according to the universal mechanism, wherever and however it is performed.

Now we need to touch on the following issue. Modern cosmology considers and studies the phenomenon of hydromagnetic dynamo in planetary bodies, stellar bodies, and also during the formation of galaxies. All these objects are the products of the supporting cosmic medium, which I called the etheric Quantum Medium. This name does not contradict those names of the supporting environment that were used by predecessors and are used by contemporaries. It includes those properties of the environment that were described both at the beginning of the development of modern science and in current modern theories.

To the properties of the etheric Medium, designated by my predecessors, I have added those of its properties that have not yet been included in descriptive approaches - this is the representation of the units of the medium matrix as magnetoelectric circuits and quantum-mechanical units in the form of a Mobius ring, performing continuous and non-stop oscillations with the effect of reconnection of opposite flows and the release of magnetoplasm quanta (portions of electricity). It is for this reason that the ether has been considered a luminiferous substance since ancient times.

As has already been shown above, in essence, the cosmic support medium is a matrix of dynamic vortex nodes, in other words, a spin network of quantum units - magnetic monopoles closed through inversion, which ensures the vortex nature of the two-cycle movement and the turbulent state of the medium in which the hydromagnetic dynamo self-generates and acts as a **generator of reality**. More details about the etheric Quantum Medium and its units (monopoles) are presented in [31]. More details about the hydromagnetic dynamo in [34].

In August 2008, the results of a theoretical study "***Dynamo action in Möbius flow***" were published in ***Physical Review E***. [12]

This theoretical proposal concerns the issues of organizing the wrapped configuration of the plasma flow in the stellarator equipment for the purpose of keeping this 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». [12]

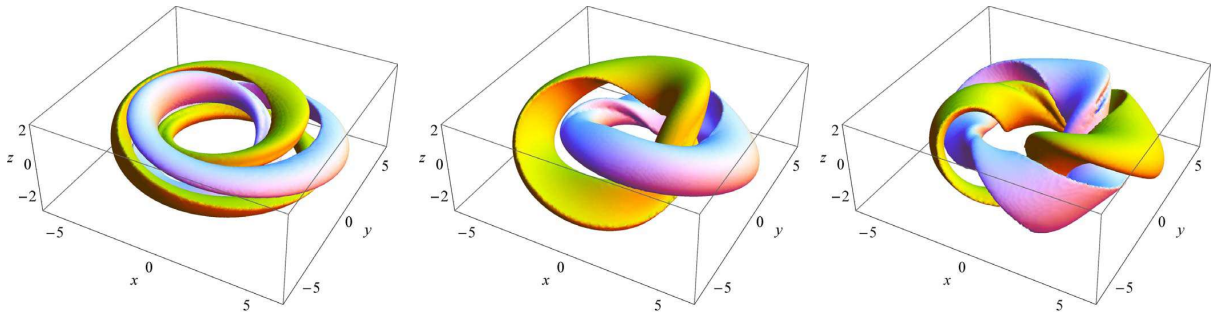


FIG. 3. _Color online_ Upper panels: snapshots of the isosurfaces of *B*2, where *B* is 1/3 of its maximum value, for a growing magnetic field generated by the Möbius flow in _a_ run 1, _b_ run 3, and _c_ run 8 of Table I. Color indicates the general field direction along each isosurface _magnetic lines are not necessarily confined to the isosurfaces_: red-blue _yellow-green_ colors indicate magnetic field with *Bu*_0 _*Bu*_0_ _cf. Fig. 1. [12]

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». [12]

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». [12]

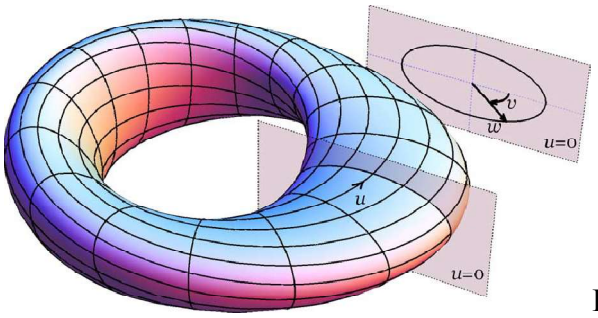


FIG. 1. _Color online_ A Möbius channel _n=1/2_ with elliptical cross section, as given by Eq. _3_ with R/b=4, a/b=2. The coordinate lines of u and v are shown solid, the former being the streamlines. The inset shows the cross section, as indicated, with the definitions of v and w illustrated. The surface shown is w=1. [12]

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." [12]

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». [12]

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 magneto-plasma along the spatial configuration in the form of a Mobius strip. And this directly indicates the correctness of the **fundamental conclusion** has been 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***".

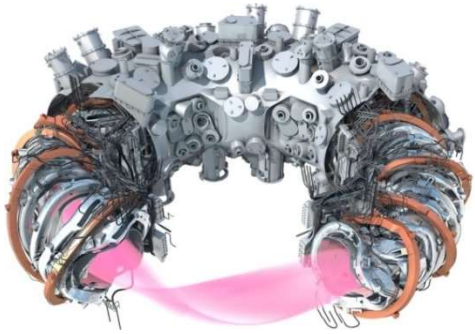
The theoretical proposal [12] for recreating the phenomenon of a hydromagnetic dynamo in laboratory conditions for the purpose of conducting thermonuclear fusion on stellarators correlates with the **fundamental conclusion** made in [31] about the structure of the supporting network as a matrix of magnetic loops-monopoles topologically closed through inversion, i.e. in

the geometry of the Mobius strip, which provides those properties of the etheric medium that are necessary for the spontaneous generation of a hydromagnetic dynamo and its maintenance. It is precisely the structure of the etheric Quantum Medium, mediated by the principle of complementarity, that is the **starting point** from which my theoretical reasoning began in the author's monograph [30] and was continued in the subsequent works indicated [31]-[35].

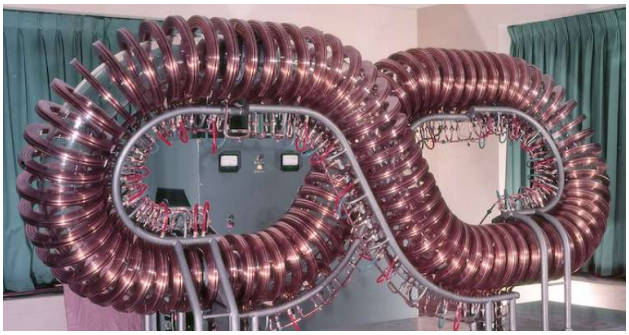
The magnetic Mobius Monopoles of the etheric Quantum Medium are precisely those sub-micro-embryos that create collective flows of conductive quantum fluid (magneto-plasma) and generate the effect of a hydromagnetic dynamo based on the laws of hydrodynamics. And the Quantum Medium of such vortex units is indirectly turbulent, and its units are topological.

As shown in [31], Möbius magnetic monopoles, in which complementary magnetic duality and, accordingly, the property of generation (hydromagnetic dynamo) are indirectly embedded, can be candidates for explaining “dark matter”, since they are magnetoelectrically neutral (their magnetic field has no external manifestation) and on their basis baryonic matter (dipole magnetic formations with an external magnetic field) is generated by the method of fibration/bifurcation of magnetic loops with doubling of magnetic flux.

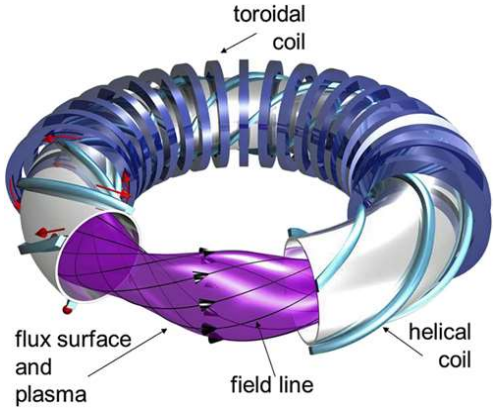
The creation of stellarators with the aim of reproducing the same thermonuclear fusion that occurs in stellar bodies shows that engineering and scientific thought is coming to those schemes of technological structures for working with plasma flow, which in essence exist in natural structures and could be described through the format of Mobius Geometry.



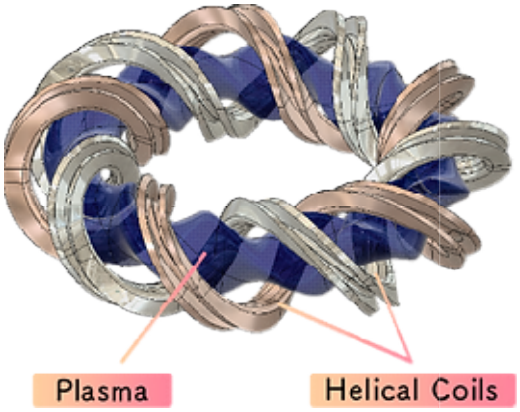
a). [16]



b). [14]



c). [15]

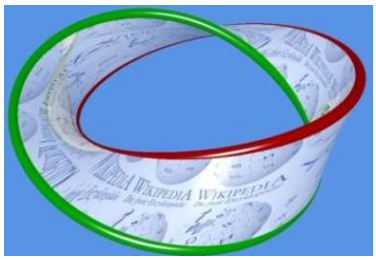


d).

As can be seen from the illustrations **a, b, c, d**, stellarators use the Mobius tracing of the plasma flow, as well as magnetic coils twisted in a spiral according to the same type. Thus, the technological equipment with its forms repeats the natural interrelation of spiral magnetic lines

and the sinusoidal direction of the magneto-plasma energy flow (electricity) created by them in an electromagnetic phenomenon in which the interrelations of the spirals of the magnetic lines and the spirals of the energy flow are in shape of «***Clifford parallels***». [35]

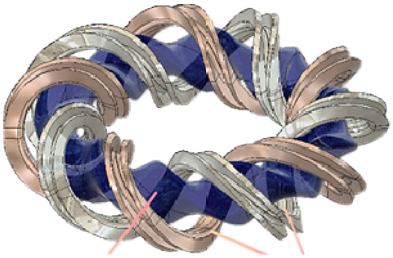
In essence, if we draw fractal-holographic parallels, then DNA is the same "dynamo", only biological.



Mobius strip [Wikipedia].



DNA threads.



Stellarator.

The proposed model, 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 **mechanism** of formation of atomic elements in stellar and planetary bodies, as well as the mechanism of generation of entire galaxies, when the etheric monopoles of the spatial region of the etheric Quantum Medium ("black hole") exhibit a collective effect and a highly aggregative division of a mega-number of monopole loops occurs.

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). [17], [18], [19]

In the recent period, astrophysics has accumulated an abundance of such experimental facts and observations that confirm with high reliability the cosmological ideas of H. Alfvén, and in particular about ***living cosmic plasma*** and its ***magnetic "particles".***

The same "particles" are discussed by Nobel laureate F. Wilczek in his book "***The Lightness of Being: Mass, Ether, and the Unification of Forces***", presenting them as "the primary ingredient of physical reality, which fills space-time and from which everything else is formed. And this primary ingredient of reality is alive, since it is constantly filled with quantum activity." [29]

J. Maxwell's ***vortex wheels***, F. Wilczek's ***primary ingredients***, H. Alfven's ***magnetic particles***, all of these are reflected facets of the same substantial template of etheric magnetic monopoles as vortex nodes that make up a dynamic ***spin network*** of space that is reflected in modern theories. The **framework properties of magnetic monopoles** are the original InfoGenome for EVERYTHING and are the source of magnetism.

"... the essence of the unity of the world should be sought in a special form of self-motion of matter, in a special structure of this self-motion, from which all other features of the

world necessarily grow. This special form of self-motion, having given birth to all other forms of motion of matter, exists together with them, simultaneously constituting their essence." [37]

It should be noted that during the period when H. Alfven expressed his ideas and tried to publish them, they had the status of 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 H. Alfvén's collection of works "Cosmology, History and Theology" was called "Cosmology: Myth or Science?" [20].

In 1984, a heavily revised article by H. Alfvén with the same title was published in the "Journal of Astrophysics and Astronomy" [21].

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 ability of science to study our large-scale environment that a thorough rethinking of the entire physics of space is now underway.

In earlier times, we had access to information from less than one-third of an octave (the visual 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 clear.

Moreover, we can now generalize the results of plasma research from a single small scale to regions of much larger size.

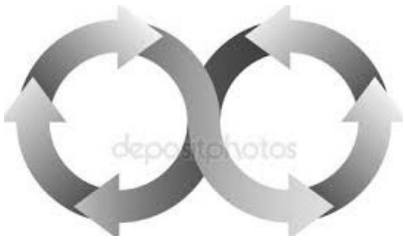
Taken together, all this is leading, or has already led, to a revision of our conception of cosmic plasmas that in many ways allows us to speak of a complete paradigm shift." [20]

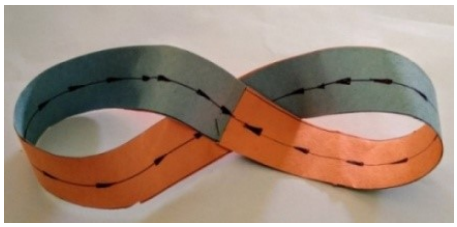
As a consequence of the proposed new model of the hydromagnetic dynamo, I will risk offering a new visualization of the magnetic lines of the Earth's magnetic field, which forms a new look at the already established views on the structure of the Earth's core and the processes occurring there.

It seems no theorist in the history of science has yet designated the nature of a magnetic loop as having an inverse closure and has not proposed a visualization of magnetic lines corresponding to such an assumption. Magnetism is a physical embodiment of the Fundamental Principle of Complementarity (FPC), which means that the magnetic phenomenon initially contains the **duality** of the complementary principle. It is from here that the comprehensiveness of magnetism takes its understanding as the basis of all natural phenomena, and on a complementary 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, where in the dipole version they have an intersection in the center of the planetary sphere.







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

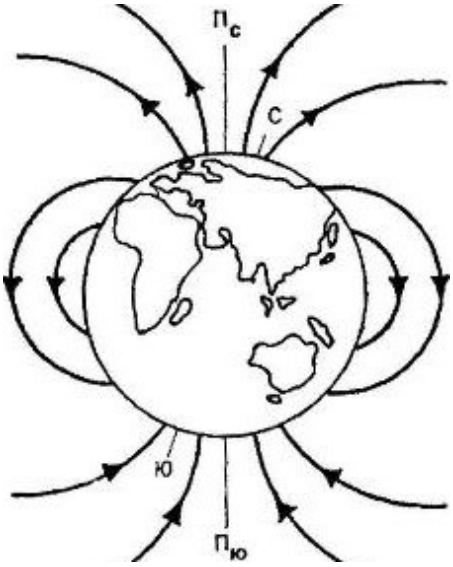


Fig. (1)

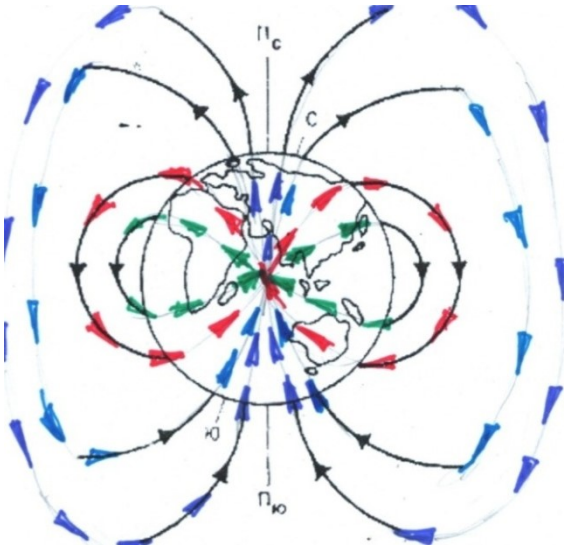


Fig. (2)

Magnetic lines of the Earth in the accepted representation Fig. (1) and the same lines in the proposed dipole visualization Fig. (2).

The 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-star in the stellar-planetary system), there is a gravitational tensor through which the transformation of the etheric magneto-plasma and the synthesis of matter occurs, as described in the work [33], 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 matter with different quantum formulas are synthesized and smelted from the ether using the hydromagnetic dynamo mechanism of daubling of magnetoplasmic flow.

These blast furnace regions are arranged in layers and each blast furnace layer functions in its 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 outer 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 on the basis of the universal basic element of nature and the laws of Unity and Analogy. [33]

The universal dipole scheme can be considered equally in application to the formation of the atomic structure, and the stellar-planetary, as well as to other planes of existence, which are not considered here. This scheme allows us to understand the principle of the gravitational interrelation 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, a reconnection of magnetic lines occurs in the area of their intersection, generating magneto-plasma radiation and the transformation of the magnetic energy of the plasma into thermal and kinetic energy occurs.

The phenomenon of reconnection when plasma flows approach each other is currently being studied in laboratory and astrophysical plasma. [23], [24]

Publication [23] offers experimental data on the study, using laboratory experiments, of reconnection between two flow tubes that are not strictly antiparallel.

"A compression of the antiparallel component of the magnetic field is observed, as well as a decrease in the reconnection efficiency. Simultaneously, we observe a slower plasma heating and enhanced particle acceleration. Three-dimensional hybrid simulations confirm these observations and highlight the suppression of plasma heating and the decrease in reconnection efficiency for these obliquely oriented flux tubes." [23]

The authors of the publication [24] report the following about their results:

"Magnetic reconnection rapidly converts magnetic energy into some combination of plasma flow energy, thermal energy and non-thermal energetic particles. Various reconnection acceleration mechanisms have been theoretically proposed and numerically studied in different collisionless and low-β environments, where β refers to the plasma-to-magnetic pressure ratio. However, none of them have been experimentally confirmed, as the direct observation of non-thermal particle acceleration in laboratory experiments has been difficult due to short Debye lengths for in situ measurements and short mean free paths for ex situ measurements. Here we report the direct measurement of accelerated non-thermal electrons from magnetically driven reconnection at low β in experiments using a laser-powered capacitor coil platform.

We use kilojoule lasers to drive parallel currents to reconnect megagauss-level magnetic fields in a quasi-axisymmetric geometry. The angular dependence of the measured electron energy spectrum and the resulting accelerated energies, supported by particle-in-cell simulations, indicate that the mechanism of direct electric field acceleration by the out-of-plane reconnection electric field is at work. Scaled energies using this mechanism show direct relevance to astrophysical observations." [24]

Also of interest are the experimental results on plasma processes and in particular reconnection issues that have been obtained in the last few years. [25]-[28]

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 transforming the ether magneto-plasma into

baryonic matter, in other words, the process of hydrodynamic generation in the core – the bifurcation of magnetic loops with 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 a visualization, the direction of movement of the plasma flow inside the Earth's sphere is indicated in the illustration (4) below according to the "right hand" rule. In accordance with the chosen direction of magnetic lines (from south to north), in the left dipole arm the plasma flow movement will sinusoidally unscrew, and in the right dipole arm – sinusoidally screw. That is, in the inner space of dipole magnetic loops the movement of internal generated liquid plasma flows will be carried out along the Mobius trajectory and counterclockwise.

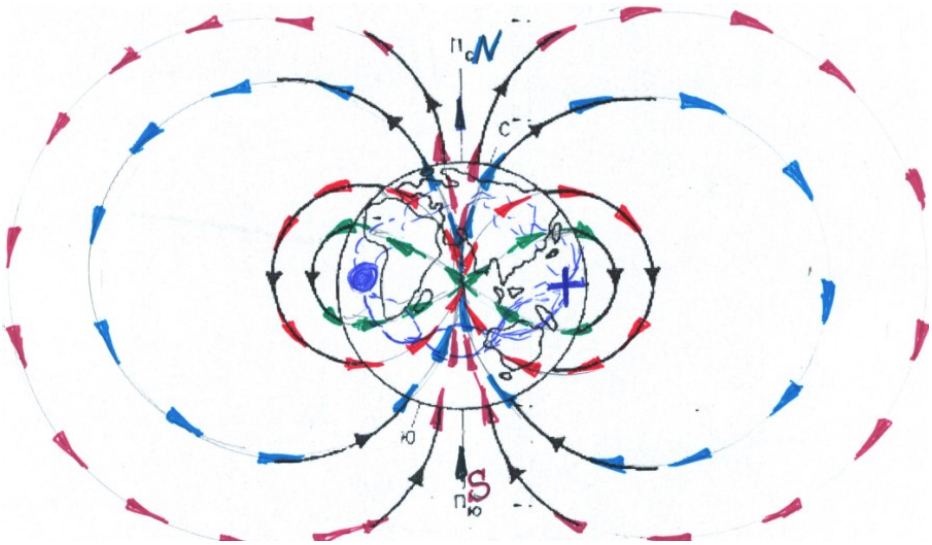


Fig. 4. ***Direction of magnetic lines and direction of internal plasma motion. The "plus" sign means screwing in, the "dot" sign means unscrewing.***

This is the answer of Mobius Geometry to the question that has not yet been answered by the scientific community, namely, why does planet Earth rotate counterclockwise every day.

The form of motion along the Mobius trajectory allows plasma flows to be retained within the planetary crust and, as indicated in the theoretical study [11] and [12], to create an exponentially growing generation from an infinitely small ether embryo. During this rotation, the process of producing chemical atomic elements from the ether in the earth's blast furnace is carried out.

The inverse turn of the magnetic loop, on which the phenomenon of magnetism is based and essentially underlies, creates the generation of a plasma mass in a dipole magnetic structure with two inversions and then the generation of atoms. The process of division of magnetic loops in the method of a hydromagnetic dynamo is algorithmized by domains and each atomic element is an individual formula of the process of bifurcation.

Visualization of magnetic lines in the dipole version gives an understanding of that the center of the planet is not a solid metal core, as it is considered 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 baryon 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 [34, [47] - [58]]. The results of experiments and conclusions of theoretical proposals indicate that the concept of the internal structure of the Earth, according to which the center of the planetary body is a solid metallic core, continues to remain in theoretical views today. No new proposals are yet visible in official sources. 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 a real metal core in the center of the Earth's body, as well as its functional purpose, are too difficult to explain.

I believe that such a concept is formed due to the still insufficient understanding of the importance of the presence of the etheric cosmic Quantum Medium, as such, and its general cosmic role, as well as how the formation of cosmic bodies occurs in it. According to the concept proposed here 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 voltage 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". [4]

"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." [4]

"***This is my feeling as to why we don't make breakthroughs. We should think about things in a different manner***". Nobel laureate G. t` Hooft [13]

CONCLUSION.

In my monograph "Substance. Atom. Theory of Everything" [30], 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 issues of the structure of the supporting Cosmic Medium, the basic element of nature and the atomic model based on it, the method of forming 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.

In subsequent works, based on the monograph [30], applications of the proposed new format to the main issues of theoretical physics were made, including the issue of the phenomenon of hydromagnetic dynamo as a method of forming atomic elements.

In this article, a model of hydromagnetic dynamo is proposed based on the hydrodynamic property of magnetic loop fibration with doubling of its magnetic flux. The magnetic loop is

considered in the variant of topological closure with inversion, which corresponds to the universal natural duality on the ontology of the complementarity principle. With the help of the properties of such geometry, the transformations that occur in the fabric of space during high-speed fibration of the array of magnetic loops are shown, resulting in the formation of atomic elements.

A new visualization of magnetic lines allows us to consider the internal structure of the planet as a liquid conducting magnetoplasmic core and a **hydrodynamic quantum generator** that processes etheric magneto-plasma into baryon matter.

Since the etheric Quantum Medium has a matrix structure, a matrix distribution of the regions in which the hydromagnetic dynamo functions also occurs, remaining in each system-forming object (star, planets) a generator-converter of etheric magneto-plasma, creating domain plasma regions in which atomic elements are molded from magnetoplasmic "plasticine" in accordance with the algorithmic division of magnetic loops.

In addition to this, the new visualization of magnetic lines gives impetus to explaining with greater clarity the process of rotation of the planet around its axis.

Mobius geometry as a geometric analogue of the Fundamental Principle of Complementarity is that Ariadne's thread in understanding the structure of the World Order, as well as the thread that connects theoretical achievements on a single universal basis.

This work is a brief extract from a series of author's works, which includes the illuminated topic. [31] [32] [33] [34] [35] [36]

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