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From constructal theory up to fundamental principles of helical geometrodynamics

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Abstract

In our transport systems, we can observe that the principle of a minimal volume, of the same mass, is a fundamental condition. It can be a car or a commercial ship, size does not matter, the geometric principle is the same in this transport rule.

The Kepler conjecture optimizes the spheres arrangement in a minimum volume, the tetrahedron. In a dynamic geometry we can observe several tetrahedrons flows. Much more, we have 2 distinct helical chirality of this chain of tetrahedrons that are flowing. Starting with the observation of nature, extended to entire observable world and, further, to the intuitive fields, the most observable common geometry of transport is the helical shape. The geometry is in fact the information and we must to observe it and now we can read it.

Our rational or intuitive mind, show us the same, that the most efficient transport, in nature, must be a helical geometry. So that, from scientific zone to intuitive zones, we found the most common geometry, a helical one. It appears that everything tends to build up a lot of wormholes, helical flows. For short distances, a local transport, they have a helical wave behavior. For long distances, there is a mass transport in helical geometry.

We found 4 fundamental rules of helical interactions, named "Fundamental Code". It became the first principle rules in nature design, from sub-atomic clusters to galactic clusters.

Any theory of natural world, new or old, must include this "helical key". For this reason was started the Unified Fields Theory - Helical Geometrodynamics, in a new time-space concept.

Keywords: constructal design, unified fields, quantum mechanics, general relativity, helical interactions, strings theory.

Introduction

Constructal law started by Adrian Bejan [1] in 1996 as a summary of all design generation and evolution phenomena in nature, bio and non-bio, covers the tendency of nature to generate designs to facilitate flow. The entire design observable in nature means self-organization and self-optimization.

Starting from Constructal law and the easier access to the imposed currents that flow through a finite system, we came with our theory of the transport efficiency in the nature by self-assembly of the matter in interaction with the environment.

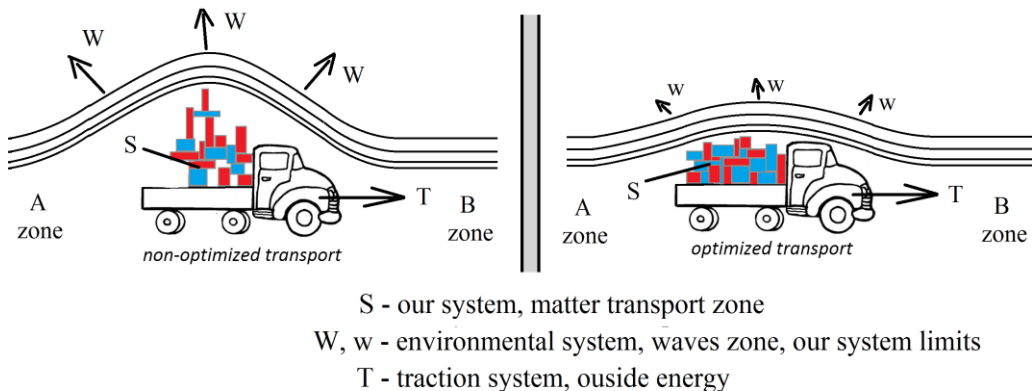
In our transport systems, we can observe that the principle of a minimal volume, of the same mass, is a fundamental condition. It can be a car or a commercial ship, size does not matter, the geometric principle is the same in this transport rule.

We will start to explore a transport system as a general principle.

In this analyse we have always three different subsystems interacting: luggage, vehicle and environment. The luggage is the matter, our system during its time evolution.

Matter, the transporting energy and another matter as medium, are three different subsystems in any sort of transport system. We observe that energy and medium of transport is outside of our luggage, outside of our interested subsystem. (Fig.1)

Fig.1. Geometric principle of a transport system optimized and non-optimized.



Also any sort of transport has a sense, from “A” zone to “B” zone or inverse, in opposite direction. So, our observations supposed that the transport has a geometric shape, with a sense of evolution. At the same time we followed our system, outside system and the tractor system, all of these three subsystems interacting. We supposed that the action of environment and the action of tractor element force our luggage to arrange, in an optimal manner, for transport.

That means the “self-assembled” luggage system may be the result of two external actions, the tractor and the environmental system. But our system is not a single luggage, many “self-assembled” subsystems forming the matter and so on.

The matter flows, from any “A” zone to any “B” zone. That means it is not a static geometry and it have a sense of flow. Any matter transport contain subsystems and are forced to construct a specific flow geometry, in accord with tractor and environmental systems. That means interactions.

We understood that the environmental interactions, as pressure or any sort of forces, put borders and limits to our self-assembled luggage.

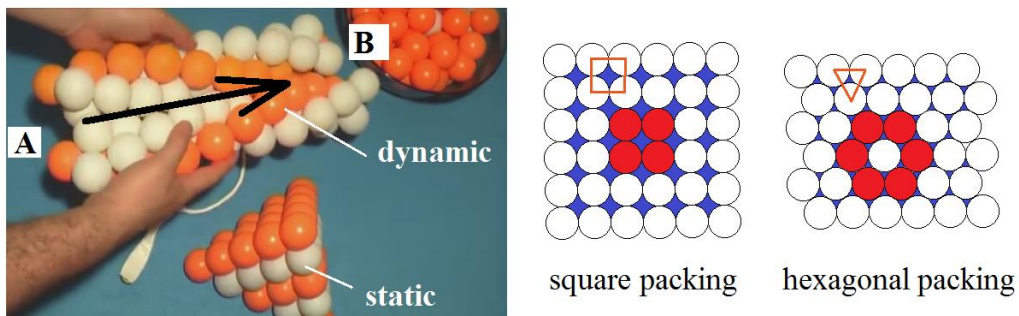
We suppose that the smallest particles of universe are not like a cube, cylinder or cone. We assumed that the smallest particles of universe, our luggage, tend to be spherical. The same the biggest particles, all stars and planets from our universe.

Sphere is a clew of flows, we suppose the most stable geometry and is not included in this paper.

Fundamental principle in static and dynamic paking

The first close packing spheres was made in the 17th-century. Johannes Kepler, mathematician and astronomer, says that no arrangement of equally sized spheres filling space has a greater average density than that of the cubic close packing (face-centred cubic) and hexagonal close packing arrangements. The density of the hexagonal arrangement is around 74.05%. It is a mathematical conjecture about spheres packing (volumes without dynamics) in three-dimensional Euclidian space. (Fig.2)

Fig.2 Kepler conjecture is a static packing arrangement, not a dynamical one.



In 1994 Fejes Tóth mathematically proved that the hexagonal lattice is the densest of all possible bi-dimensional packing, as mentioned by Conway and Sloane. [2] Now it may be possible to discover, in the natural world, this self-optimized spheres arrangement, as a constructal and fundamental law. Now we may to observe the principle of natural self-assembled in triangular (hexagonal) section lattices.

Much more, in a three-dimensional Euclidian space, we can be capable to observe many tetrahedrons flowing. The matter is flowing, it is not a static system.

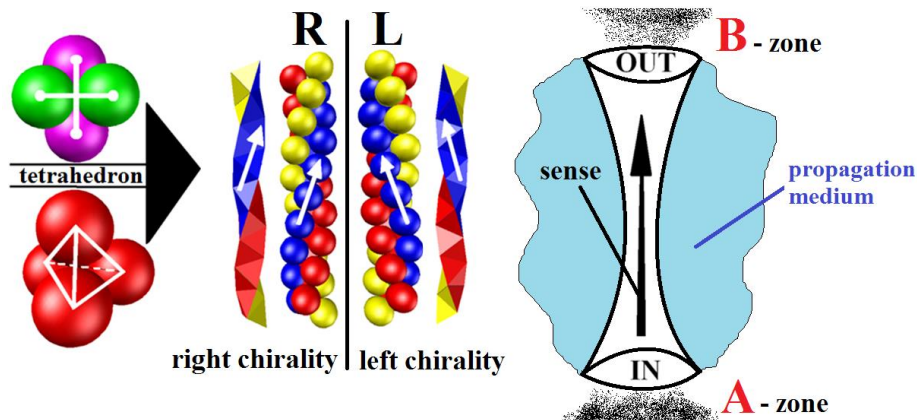
As a simplest constructal principle, all flows may adopt a geometric form of transport depending on the propagation environment and tractor. The luggage interacts with tractor and environment and the first visible result is a geometric shape.

Any geometric principle or rule is the same for all dimensions. That means a geometric principle could be used to any scale of the universe, for detectable matter or not.

The Boerdijk-Coxeter helix, which is obtained as a linear packing of regular (or not) tetrahedron, could be a very efficient solution to some close-packing problems in matter transport. There are two chiral forms, with either clockwise or counterclockwise windings and they are not rotationally repetitive. [3] (Fig. 3)

We know that a transport of matter, from “A to B”, must interact with propagation medium. For this reason the matter transport, as a system, must interact less with adjacent environment, as external system. The packing in a tetrahelix shapes providing a minimal volume in transport. This sort of “cylinder” can be a three dimensional efficient transport “line” of the matter. These transport “lines” can form a three dimensional geometry because our universe has three dimensions. As many “tetrahelix lines” as we put together we can always create a volume.

Fig.3 Kepler conjecture, in a dynamic packing arrangement, became a tetrahelix.
It is a dynamic geometry with sense and chirality.



Our predictions, old and new predictions in natural flow systems

We made a prediction, all transport lines (detectable or not) are flow helical structures. They are three dimensional flow structures, same tornadoes.

There is a sense of transport, from “A to B”, and a chirality of transport. (Fig. 3)

Of course, we are not alone. Rene Descartes, in 1644, had an intuitive and geometric description in his published work. In "Principia Philosophia", at page 213, the structure of magnetic lines of forces is sketched as tiny vortices.

In the entire nature everything has a sense of evolution and a constructal shape of it. Many natural flowing can be seen as tetrahelix flow geometries. It can be possible that everything has a rotation and any of subsystems appear as a rotational geometry and so on. It would be a correlation between flow principles.

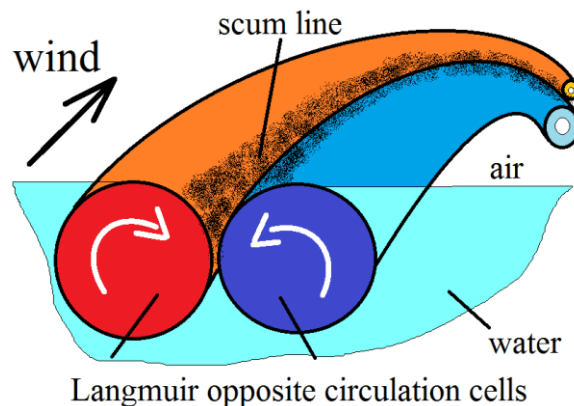
In 1938 Irving Langmuir discovered that when the wind blows across the surface of the water many convection cells begin to take shape. The wind induces helical motions, a circulation pattern below the water. [9] These cells begin to rotate as tubes (arms) below the surface and pointed in the direction of the wind. (Fig. 4) The tubes (arms) rotate in opposite directions. The distance between two bubble lines (and scum) is equal with two vortices.

We supposed that near a left chirality line transport must be a right chirality line transport, as a self-assembled and natural transport.

We made a prediction. Many lines of transport can construct layers only using opposite chirality patterns. The environment, in this case, is the wind. It forces the water (luggage) to be organised in a natural mode.

V.W. Ekman, the most famous oceanographer of his generation (1905), observed the importance of layers in oceanic currents. [10] The oceanic water is a mass transport, a huge luggage interacting with the bottom earth surface and above with the wind.

Fig.4 Schematic illustration of Langmuir circulation cells.



First may be a tractor system and another one may be an environmental system. In his descriptions, the geometries of water transport are spirals, layers or transport lines.

We made some predictions:

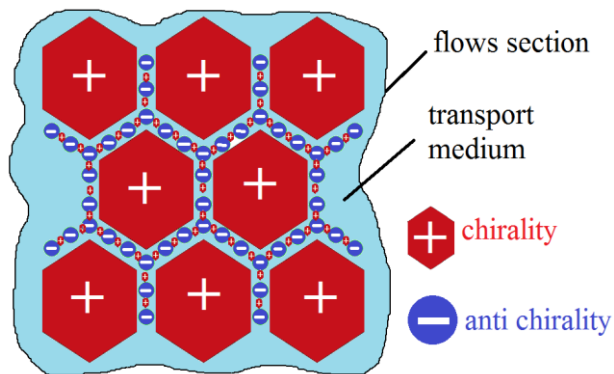
- Every transport line may be, in fact, a three dimensional line, a tornado.
- Every line (tornado) has a sense and a chirality of transport.
- Every line may be surrounded by other lines, in opposite chirality, creating layers (any line may be our system, the luggage, and surrounded lines are environmental system).

Now we can think at transport lines as physical lines of forces, between two points, from “A” zone to “B” zone. These lines of forces can build flow layers, as false surfaces. This is the first indication of James Clerck Maxwell’s version of a theory of molecular vortices. He proposed vortices as a physical representation of lines of force, which is developed in his four-part paper “On Physical Lines of Force” (1861-62) [7]. In this paper, Maxwell advances from his discussion of the physical geometry of lines of force, in “On Faraday’s Lines of Force” (1856), to a physical mechanics of the field. Finally, Maxwell unified magnetic fields (transport) with electric fields (transport) using the same geometric principle, a helical one. Maxwell was the first person that was thought an efficient transport system. For this reason he succed to unify electricity with magnetism.

In fact, the most efficient transport means to organize the matter flowing in a specific geometry. Using his intuition, Maxwell began with a model in which all space is filled with vortex tubes. There is, however, an immediate mechanical problem. Friction between neighbouring vortices would lead to their disruption. Maxwell adopted the practical engineering solution. He inserted “idle wheels” or “ball bearings” between the vortices. After that, the vortices could rotate in the same direction without friction. He published picture of the vortices, represented by an array of rotating hexagons, the Maxwell's molecular vortex model.

Now we can extract and predict the first geometric rule of transport, an efficient chiral flow is surrounded by anti-chiral flows. The alternating chirality appears to be very important in matter transport, detectable or not detectable. (Fig. 5)

Fig.5 Chiral and anti chiral geometry of helical flows (the same sense of flow in section).

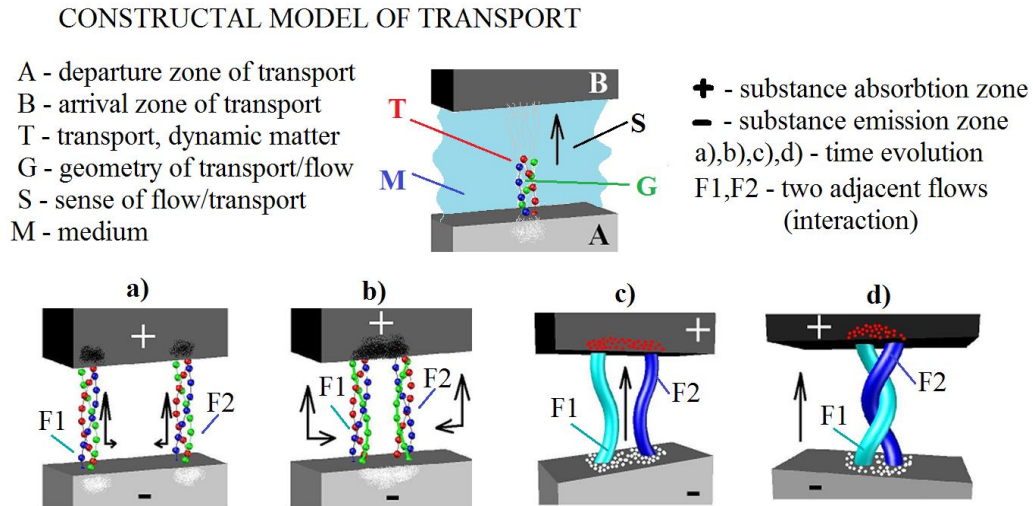


In the old aether theories or any modern particles theory (superstrings theory for example), this constructal principle must be the same. In geometry, the rules are independent of dimensions or time. In the unseen world aether lines or superstring lines are flowing too.

Pozitive, negative or the chirality in transport lines

We see the lines of force as helical transport, from “A” zone to “B” zone. We detect the first interaction rule, in transport, between any two adjacent tornadoes. The geometric pattern of transport is the same, even if small particles are detectable or not, even if the propagation medium is detectable or not. (Fig. 6)

Fig.6 Constructal model of an efficient transport, interactions between two helical flows.



For a single flow, the propagation medium is in fact other flows, local or not.

Plasma exists in many forms in nature and has a widespread use in science and technology. It is a special kind of ionized gas and, in general, consists of positively charged ions, electrons and neutrals (atoms, molecules, radicals). The particles transport, in plasma, appears as same helical geometry.

A model emphasizing more strongly the coupling of charges of opposite sign is the description of plasma as a conducting fluid. This description of plasma transport is called magneto fluid dynamics or plasma fluid dynamics. [11]

In plasma phisics, we are not interested in formulas so that we obseved only the geometry. Charged particle forms two current transport lines with oposite chirality.

It was an intristing ideeaa to corelate the natural chirality, left and right, with charged particles, poztive or negative.

We made a new and one of the most important prediction; in all natural world do not exists "charged systems", it exists only chiral systems of transport. Fluids are not charged systems, they are a turbulent "lines", paralel "lines" and "layers"!

Planets, from our solar system, are not „charged" systems. They are our luggage in a self-assembled positions, with spin motion, with chiral rotations to the

galactic center. The solar system planets may be the witnesses of the flow to „B” zone from one of the chiral galactic arms.

Helical interaction rules between transport lines - “The Fundamental Code”

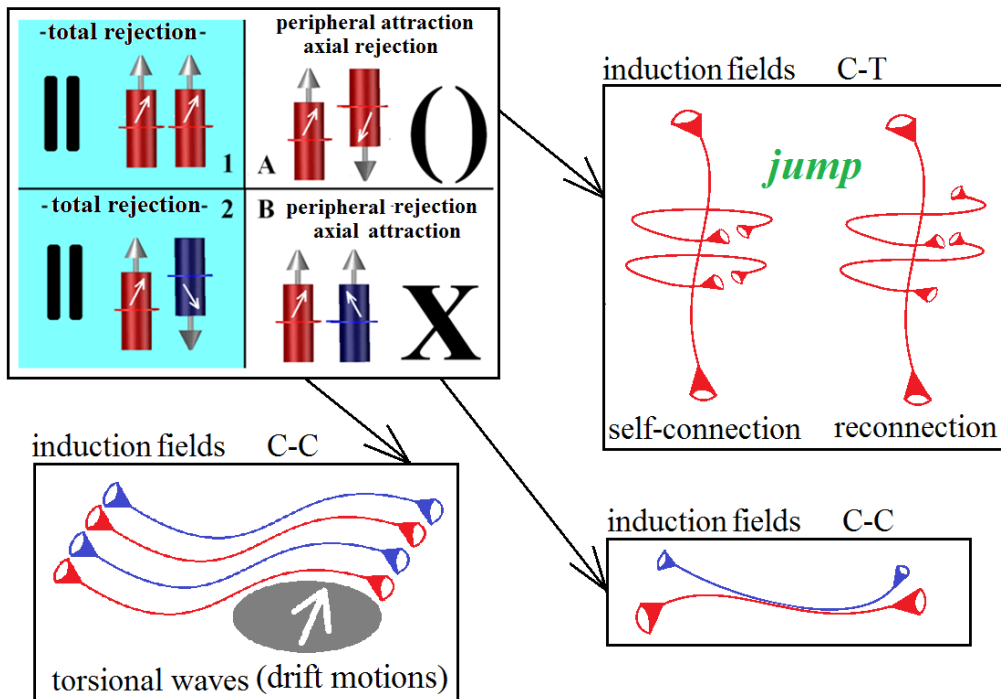
We predict, in nature, a set of fundamental interaction rules between any two neighbouring helical flows, named “Fundamental Code”. (Fig. 7)

Do not meter if the flow is heat transport or fluid transport, magnetic or electric transport, gravitational transport or galactic flows. All nature obeys the first constructal rule, the “Fundamental Code”, a geometric key. (Fig. 7)

We suppose that this geometric solution set of rules, from a dynamic perspective, may change our vision about the fundamental universe.

Fig.7 Fundamental code, a set of interactions rules between helical flows.

The Fundamental Code



Human body or any life form is in fact a large system with many helical flow subsystems. The sort of fundamental helices decide time-evolution of the transport systems, in accord with environment. DNA, the deoxyribonucleic acid, or ARN, the ribonucleic acid, obey this optimized principle of transport. Particles positions (stable clusters of helical flows) may be the witnesses of helical motion.

For a better understanding „The Fundamental Code” include three different symbols II, () and X. It is the foundation, the basic principle in any sort of matter transport, detectable or not. The fluidity of universe, as a detectable or not detectable matter transport, is essential for our understanding.

We observe, in natural flows, that a strong flow can induce another local flows, it can disturb the local transport. As wind induces helical motions in ocean water we understood the motion inductive mechanism. Much more, we predicted that inductive mechanism is generalized.

We predicted two inductive principles, cylinder-cylinder (C-C) and cylinder-torus (C-T) but are not included in this paper (Fig. 7). The principle “C-C” induce opposite chirality and the principle “C-T” induce same chirality.

As a tornado transport in vertical directions, as helical shape, the transport can move horizontally too, in the same time. This is a drift motion. The “C-C” can form a chain as a layer of tornados. It means a geometric mechanism in wave propagation. (Fig. 7)

The two inductive principles and the local transport (waves, drift motions), for a better understanding need a new space-time concept and are not included here.

Is not important why systems are flowing from IN-A zone to B-OUT zone. Is not important the nature of tractor system.

Between IN zone and OUT zone can be a pressure difference, a temperature difference, a potential difference and so on, but the fundamental geometry of the transport must respect the “ Fundamental Code”, a geometric key in a general relativity.

If we can understand the geometry of universe that means we finally can read the hidden information.

In the 1950s and 60s, John Archibald Wheeler speculated that curved, empty space-time could exhibit rich, nonlinear dynamic (geometrodynamics) analogous to the writhing surface of the ocean in a storm [8]. Wheeler exhorted his students and colleagues to explore geometrodynamics by solving Einstein’s general relativistic field equations. Wheeler imagined the universe like a fluid, geometry in a perpetual dynamics. Maxwell thought the same and unified magnetism and electricity. The same rules are in transport of electric or magnetic particles.

“Helical Geometrodynamics” is the new name of “Unified Fields Theory”. This theory (and practice) is in progress and has in its centre the primordial rules set of helical interactions, the “Fundamental Code”.

The “Constructal Theory” became the “Helical Geometrodynamics”, fundamental principles of helical interactions that may explain the geometric face of the entire universe.

We may understand the foundation of fluid mechanics in universe, starting from basic and intuitive rules. From quantum mechanics to classical mechanics there is no reason to change geometric rules. Pitagora’s theorems work in any dimension of triangle. There is a “correspondence geometric principle” between dimensions.

Flows in lines and layers, chirality in the actual science

Actual science already uses lines and layers to study flows. As a principle, the dimension of flow systems must not be important.

For example, the elastic flows of solid materials, in the process of viscoelastic stress analysis, are employing transform methods usually called the “correspondence principle”. This principle is visual, geometric.

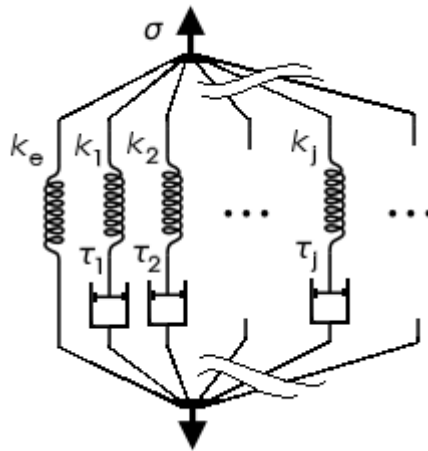
Maxwell-Wiechert model [4], [5], is the most general form of the linear model for viscoelasticity. This generalized model, as many layers interacting, is in fact a similar constructal principle with known physical systems[5], [6]. (Fig. 8)

Assembled in parallel, Maxwell-Wiechert elements represent real flows of matter, a geometric principle of mass transport using layers.

These layers, as logical mechanisms or natural flows, we predict these are a result of combining chirality flows.

As a logical situation, after many observations and comparisons, we think there are three classes of chiral flows.

Fig.8 Schematic of Maxwell–Wiechert model, layers of flow.



A dimensional class of particles can have a natural flow rotation in left handed and right handed. These motions can be conjugated or not. Both of them are present in nature.

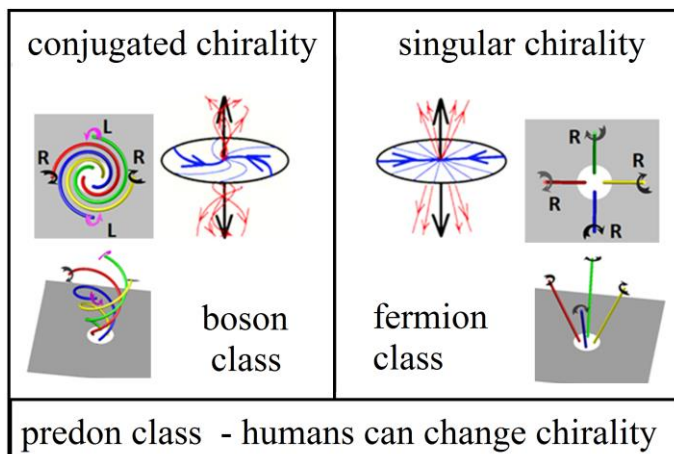
The second class of dimensional particles can be present, in nature, only in a single chirality. There is not a conjugated chirality for it. (Fig. 9)

Because humans can change chirality of some tornadoes, these classes of tornadoes we named “predons”. Bosons, fermions and predons, the three classes, show us a specific behavior in interactions, specific geometries. (Fig. 9)

In every flow we must to know what sort of chiralities are involved to predict flow geometry. On the other hand, if we see the geometry we can predict

chiralities. In the first direction or the opposite direction we'll use "The Fundamental Code".

Fig.9 Boson, fermion and predons, three types of tornadoes.



As we will see, opposite rotations, bosons are conjugated wheel, can form clusters but they can form chains too. They are friendly to each other, they can embrace one another.

Non conjugated wheel are repulsive, fermions cannot form clusters but they can form only chains. They are not so friendly, one to each other.

Bosons can build long and large tornadoes but fermions can build only long tornadoes. For this reason, in particle physics, "The Fundamental Code", became a constructal law.

The sense and the chirality of helical interactions mean a set of constructal rules.

Fundamental particles spin, in our vision, means chirality and (+ spin) or (- spin) means sense of tornadoes.

In a general relativity, "The Fundamental Code" has four situations. Two of them are simple, named total rejection. When two adjacent tornadoes have same sense and same chirality are repulsive, between their axes and ends.

It is a simple and intuitive friction situation. The same for opposite directions and opposite chirality means total rejection. (Fig. 9)

In fermion class situations there is only peripheral attraction. Here only the ends of tornadoes are in attraction. Along tornadoes axis there is only a repulsive friction force.

" () " symbol means axial rejection and peripheral attraction, in fermion class with opposite sense or one after another, chain shape , A-case. (Fig. 10)

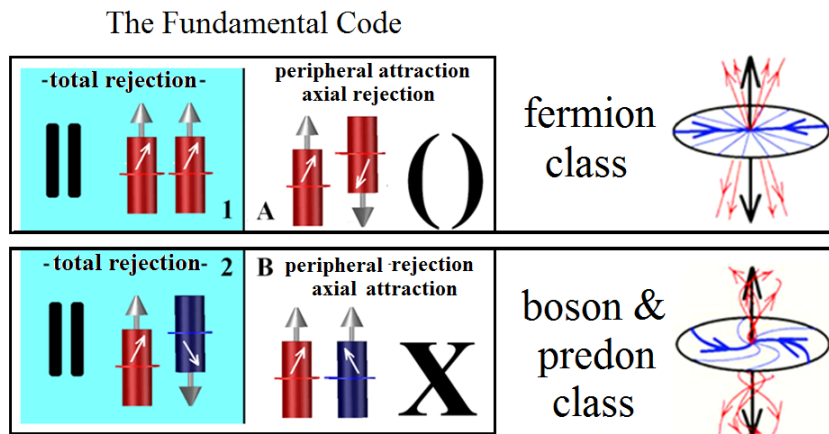
In boson or predon class, with the same sense of flow, appear axial attraction and peripheral repulsion. In this situation boson and predon class do not construct only chains using alternating chiralities, they construct bundles of chains too.

In all cases friction situations are intuitive.

Theory of gravitation, as a kinetic theory of gravity, was proposed for the first time by Nicolas Fatio de Duillier in 1690 and later by Georges-Louis Le Sage in 1748. It was a mechanical explanation for Newton's gravitational lines of force.

In terms of streams of tiny unseen particles Le Sage called ultra-mundane corpuscles. In their visions, the undetectable particles impacting all material objects from all directions. There no one has thought of a possible pattern of particle bombardment [12].

Fig.10 “Fundamental Code” – classes and constructal geometries.



In our days, the CMB is a cosmic background radiation and that is fundamental to observational cosmology because it is the oldest light in the universe.

The cosmic microwave background is polarized and there are two types of polarization, say cosmologists. They are called E-modes and B-modes. This is in analogy to electrostatics, in which the electric field (E-field) has a vanishing curl and the magnetic field (B-field) has a vanishing divergence [13].

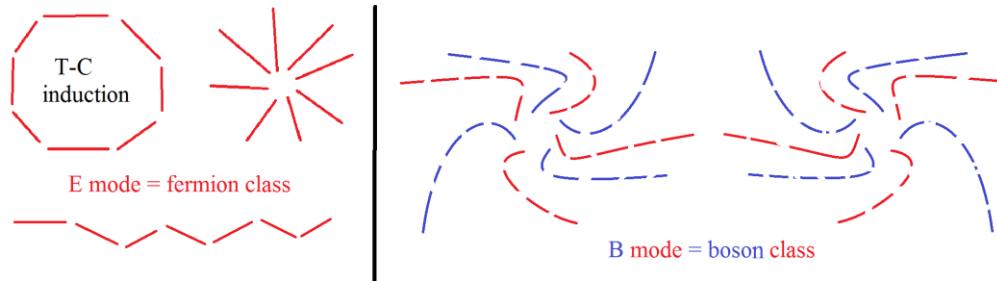
We predict that CMB, as a thermal radiation, is natural transport network of clusters. It obeys “The Fundamental Code”. E-modes are fermion class and B-modes are boson class. The information of gravitational-wave signature of inflation is hidden in geometry. So that we predict, using “The Fundamental Code” that gravitons flow in fermion class but there are another type of flows. There are under graviton flows in a boson class. (Fig. 11)

Milky Way has spiral arms, with different chirality.

Because “the wind blow” above planets they are self-arranged in arms, “Langmuir cells”. So, we predict that any planet of any spiral shaped galaxy are flowing, to the galactic centre, only using boson class of tractors.

The Constructal Law” of galactic transport is a detectable geometry. Seeing flow patterns and using the “The Fundamental Code”, from now we can understand the nature of gravity or “under gravity”.

Fig.11 “The Fundamental Code” applied in cosmology.

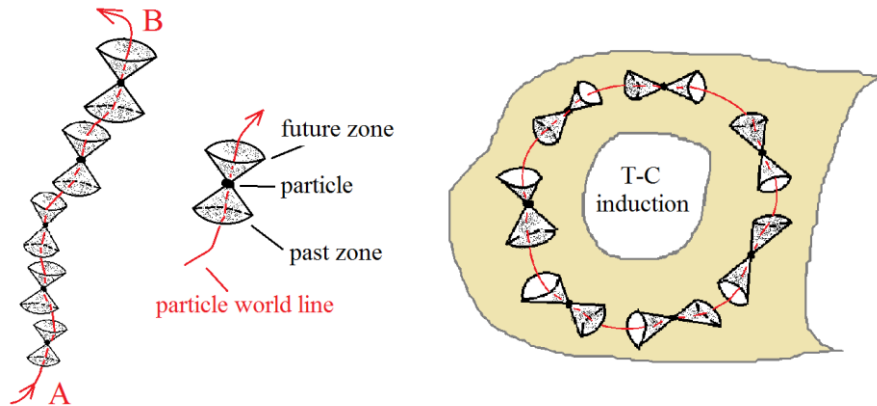


We predict that “The Fundamental Code” must be present in any advanced theory that attempts to describe the universe, using rotor fields. Without rotation we cannot apply it and we consider that the universe is not understood.

“The Fundamental Code”, from universe to quantum mechanics

The British mathematical physicist, Roger Penrose, published in 2004 “The Road to Reality: A Complete Guide to the Laws of the Universe”. [14] Roger Penrose tried to explain universe using the string theory, loop quantum gravity or twistor theory. Twistor theory was first proposed by Penrose, in 1967, as a possible path to a theory of quantum gravity [15].

Fig.12 A chain of tornadoes in transport, the same geometry in Roger Penrose theory.



The geometric path of transport from A point to B point, for Penrose, is essential. At one point he made a geometrical sense of this transport idea, needed the notion of a twisted bundle. In our opinion, in this situations, a transport line, a tornado, acquires more tornadoes than the only one. (Fig. 12)

In our opinion “Penrose’s laws” must be “constructal laws” and much more must be “optimal transport laws”. This book covers the basics of the Standard Model of

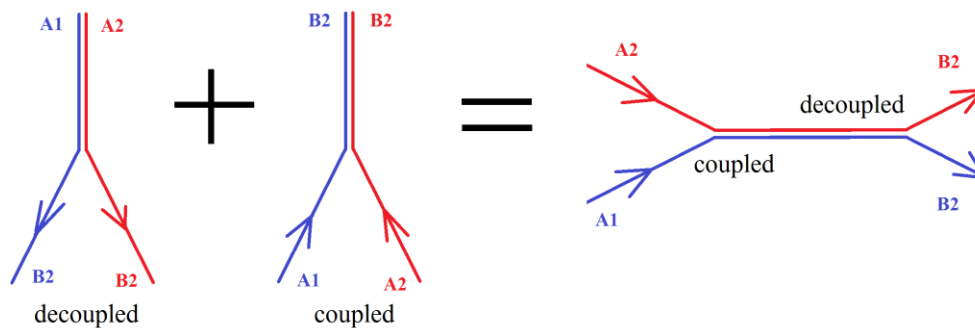
particle physics, putting general relativity next to quantum mechanics. The unification of these two theories, in our opinion, is possible only using “The Fundamental Code”, a geometric set of rules in helical interactions.

Ideas of this “another ones” go back to about 1919, when Theodor Kaluza and Oskar Klein provided an extension of Einstein’s general relativity in which the number of „spacetime dimensions” is increased from 4 to 5. [14]

We predict that gravity is quantic flows, in fermion class, flowing in parallel lines of force, as repulsive toranadoes, in ”E mode” of „The Fundamental Code”.

Penrose quantum spin networks design, in Kauffmann algebra, [16] show us many layers interacting. Quantum mechanical angular momentum is the base of the quantum spin network theory. Kauffmann observed the same key, spin, in relationship with quantum mechanics and relativity.

Fig.13 B mode interaction, same direction opposite chirality of two layers.



We predict that quantum interactions have constructal rules and these are „The Fundamental Code” (Fig. 13). But a Feynman diagram is a representation of quantum field theory processes, as particle paths. The particle trajectories are represented by the lines of the diagram, which can be different, depending on the type of particle [18]. Presented as geometry, the Feynman diagram represent a helical interaction process and we predict that it contain “the code”. (Fig. 13)

“The Fundamental Code”, gravity flow and string theory

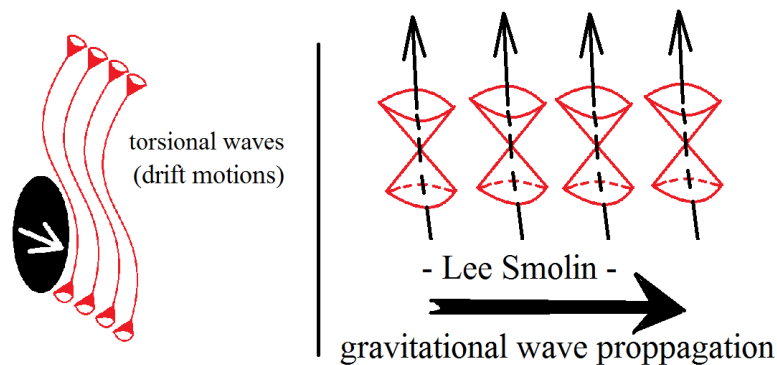
Lee Smolin, one of the authors of loop quantum gravity theory, studying spin networks of Penrose, had an idea. He saw quantum geometry from a “minimal volume” perspective [17]. We already know that he was the best idea. Gravitational waves, in Smolin vision, respect the drift motion principle, tornadoes as waves (Fig. 14).

Leonard Susskind, one of the authors of Strings Theory, said that the strings are, in fact, another point of view of Feynman diagrams. Particle trajectories are replaced by strings [18]. Here appeared layers as D-branes.

D-branes are a class of extended objects upon which open strings can end with Dirichlet boundary conditions, after which they are named (Fig. 15).

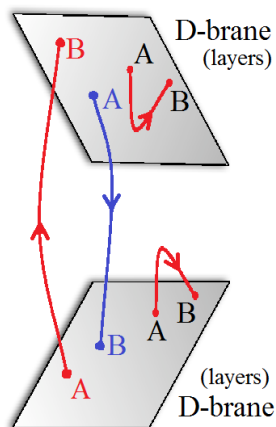
We predict that layers, in string theory, must be a boson class interaction, as Langmuir cells, as conjugated chirality. In this situation, any string theory must contain rules of helical interactions too.

Fig.14 Gravitational waves as drift motions of helical transport.



A constructal law must force a geometric structure to determine efficient transportation. That means in strings interactions we must see “the code”.

Fig.15 D-branes are overlapping layers and helical transport is rolled layers.

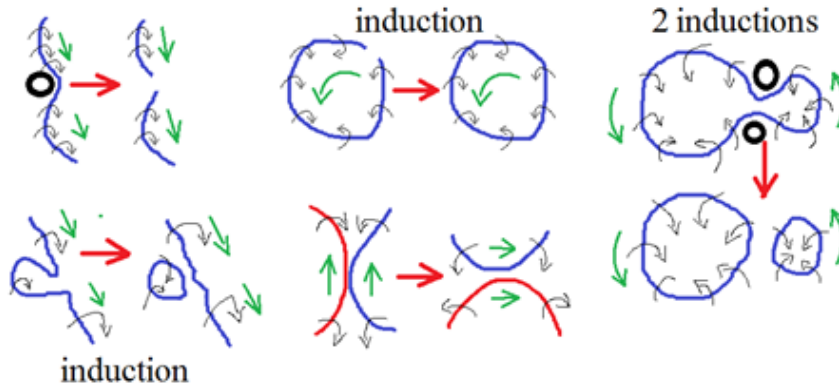


String theory is a flow fields theory, an unified theory.

Michio Kaku, another string theory author, published a kind of interactions rules [19]. These rules have a geometric representation too. These string interactions are intuitive and, using the “Fundamental Code”, we can complete and correct string interactions rules (Fig. 16). Closed strings are induced. Coupled and decoupled strings depend of sense and chirality of flow motions.

Kaku mentioned an idea of Albert Einstein and Nathan Rosen, an electron is a mini black hole.

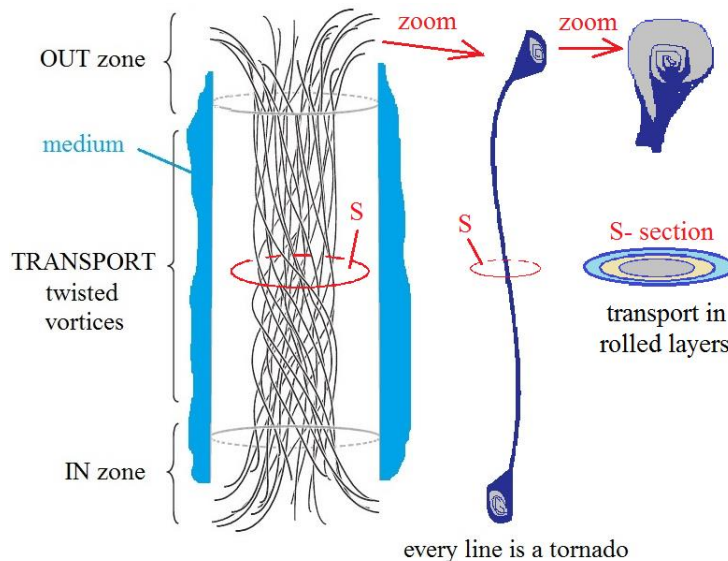
Fig.16 “The Fundamental Code” and interactions in strings theory



The “mini black holes” idea was reintroduced, in string theory, by Stephen Hawking. Any mini black hole is made of “p-branes” in Hawking vision and other physicist authors [20].

We predict that a single string is made of many wrapped layers on an axial transport, as “p-branes”. But every layer contains many conjugated strings, many another wrapped layers and so on (Fig. 17).

Fig.17 Every transport line is a tornado and every tornado contains many lines (B- boson class).



We made a prediction. The information that enters and exits from any “worm hole” is in fact the geometry, made by the nature and parameters of transport. It is

look like DNA primordial information.

“Mini holes”, the fundamental geometry in natural transport processes

Of course, the elephant DNA does not born a mouse. That means a constructal key is involved in evolution process. The evolution depends of environmental conditions and primordial helical flow transport. We predict that any plant, any animal or human body, in their evolution, use “transport holes” and “transport rules code”.

Much more we predict that DNA self-replication mechanism use the cylinder-cylinder inductive principle (C-C). For growth and development is needed boson class of interaction.

To flow in layers and lines is a natural transport too, not only in string theory or any final theory. Any line or layer can be a part of an environment for other layers and lines. Any transport system is environment for others and inverse. This principle of a “General Relativity” is specific for any system flow. So that the Unified Fields Theory turns into a helical flows theory and need another time space concept, not included here.

Any science using fluid motions as fundamental concepts use current lines and layers. It was understood more near the natural flow systems and natural evolution. In nature, for evolution, is not so important the energy, the tractor. We consider the tractor is outside of any systems (luggage) therefore to adapt the geometry at energy or environmental conditions is the most important.

In fact the “minimal energy” of a system means its ability to change its geometry for an efficient transport. A system means geometry, means information. Changing this efficient geometry it uses “energy” to do it. To preserve the energy is equal to preserve the efficient transport geometry. To describe the time evolution of any geometry we need a landmark, the “time” concept.

A constructal law does not refer to a type of energy, minimal, maximal or another. A constructal law must refer to the geometry of the most efficient transport. An efficient transport means less energy so that to observe universe in terms of energy is not sufficient. The geometric rules became fundamental and therefore there are in front of energetic rules. Using only energetic rules, we cannot describe the fundamental universe.

Any theory of natural world, new or old, must include this "helical geometric key".

Helical Geometrodynamics, a new theory about fundamental universe, is about forms and geometries in transformation processes, in natural evolution. We put above some visible and unseen helical interactions, from nature and science.

It is another point of view about the superfluid universe.

Flows and chirality in the natural world

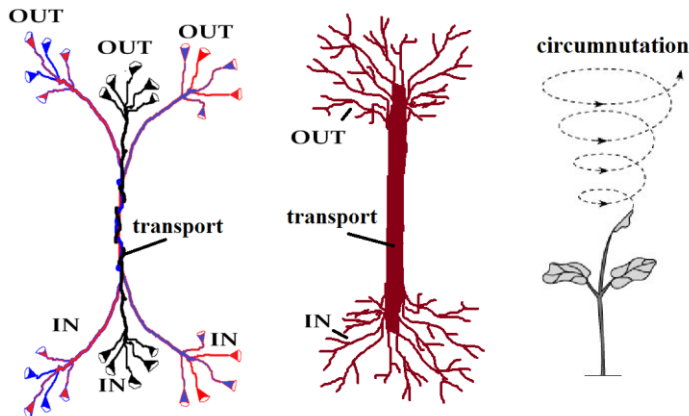
„The code” may explain, from now, all unusual natural patterns, in technics or nature. For example, a real fire tornado is a natural self-assembled flow. In this situation arms and central “cylinder” are in helical shape. The hurricane geometry use the same helical interaction rules, “the code” (Fig. 18).

Fig.18 Fire tornado, B- boson class, arms in opposite chirality (video, youtube.com)



In the nature, plants are living transport systems. Although all fibrils, micro fibrils and cellulose are well known as helical shapes, nobody have an answer, why? Plant organs, such as stems, leaves, roots, etc., display a helical-bending mode of growth movements known as circumnutation [22] (Fig. 19).

Fig.19 Plants grow in B/boson class, arms in opposite chirality, circumnutation.



Much more, many researchers say some like this “unusually tilted helix causes each cell to spiral”. [21]

We predict that stems and roots are rolled layers, leaves are open layers. Pores on roots and flowers are IN and OUT helical holes, half open layers.

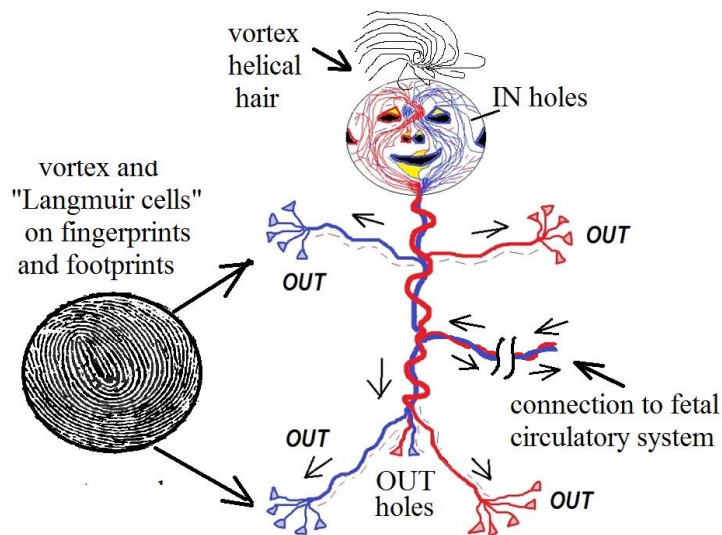
In nature, the animals are living transport systems too. So they have “IN-OUT” transport circuits.

We predict that the animal’s “holes” are the plant’s “pores”. Much more we predict that they have many layers, opened or partial opened, as elongated extremities.

Fingerprint (and footprints) images, generated from 3D scan, are tiny ridges in the surface part of the skin (epidermis) that are formed by lines in the deep skin (dermis) [23]. The patterns are in the form of layers and are so similar with Langmuir cells.

The human hair consists of many layers including the cuticle, the cortex and the medulla. These layers are bound together by the cell membrane complex [24]. Most of the cortical cells are composed of a protein known as keratin. As we expected, a single hair is like an arm, is a helical structure in closed layers. All together, these arms build a tornado structure. The hair flow outside as a tornado (Fig. 20).

Fig.20 Humans and animals grow in B/boson class, arms in opposite chirality.



The skin is made of multiple layers of cells and tissues, which are held to underlying structures by connective tissue. The dislocations are the canonical singularities of two-dimensional stripe patterns in translationally and rotationally invariant systems. These singularities are characterized by a quantity called twist [25]. The same the “Langmuir cells”.

An egg or a seed evolves and develops collecting particles. Both of them use fluid, gas or thermal transport systems for it. So that humans, animals or plants grow in B/boson class, arms in opposite chirality.

In our opinion, in time, the speed of left tornadoes rotation decrease until to the end, to death. They are “C-C” induced tornadoes. This “time” means a number of rotations, tornado cycles.

After dead we think all tornadoes became repulsive, in right chirality. It is the same like a little explosion in time. DNA and RNA are the inductive and primordial tornadoes.

We predict the tornado cycles are interconnected and entire life is dependent on this.

We are not alone in our thoughts.

In 2011 Erik D. Andrulis, from Department of Molecular Biology and Microbiology, Case Western Reserve University School of Medicine, Cleveland, published a strange theory. It was named Theory of the Origin, Evolution, and Nature of Life. In the proposed theory he used, independently, a mechanism, a simple gyre - a spiral, vortex, whorl or similar circular pattern - as a core model for understanding life. He published some rules of gyre interactions too. Unfortunately this heterodox theory was retired after publication.

Flows and chirality in the unseen world

In physics, the fundamental interactions are named the fundamental forces. There are four, in our science: gravitational, electromagnetic, strong nuclear and weak nuclear, described mathematically as fields. We predict that there are many but totally unknown. The nature of tornadoes, involved in interactions, make the difference. Magnetic fields, gravitational fields (and so on) are, in fact, flow of helical fields.

After many observations, we predict that any cluster, as a standard model, is build and surrounded by many flows. That means all IN-OUT flow circuits is inside cluster or outside cluster paths.

Many clusters realised an internal structure, something like as sense filter of helical transport. They construct poles, bundles of OUT circuits and of IN circuits. The minimal number of poles is two: IN and OUT.

These poles can migrate (drift motions) and split with different speeds on cluster surface. This fact is in accordance with external interactions and cluster nature.

For example; the sun's magnetic field changes polarity approximately every 11 years, by Wilcox Solar Observatory, at Stanford University [26].

Earth's magnetic field has changed the magnetic poles many times over the last billion years, according to the geologic records [27].

This drift motions, to collect strings in only two bundles, is named flows polarization. If there are much more than two poles we named not polarized flows.

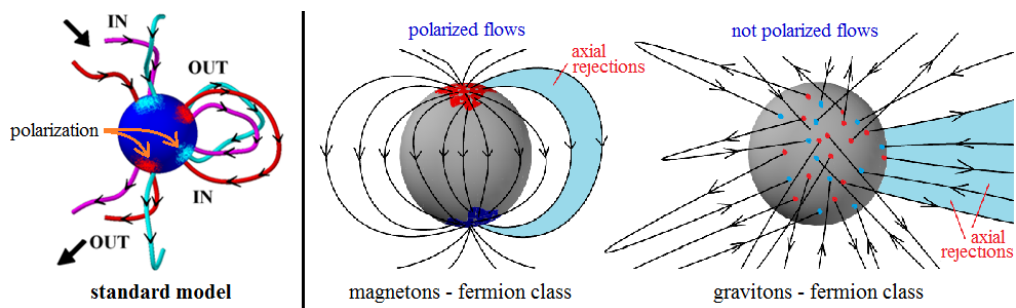
We predict that the magnetons flows, in fermion class, are polarized flows.

We predict that the gravitons flows, in fermion class, are not polarized flows.

Both of them has axial rejections, ussing the "code". (Fig. 21).

It means that the gravity may be an interleaved transport of fundamental particles, as gravitons. Even if the flows are polarized or not, in fermion class all force lines are repulsive parallel lines. Both situations are in accord with the "fundamental code".

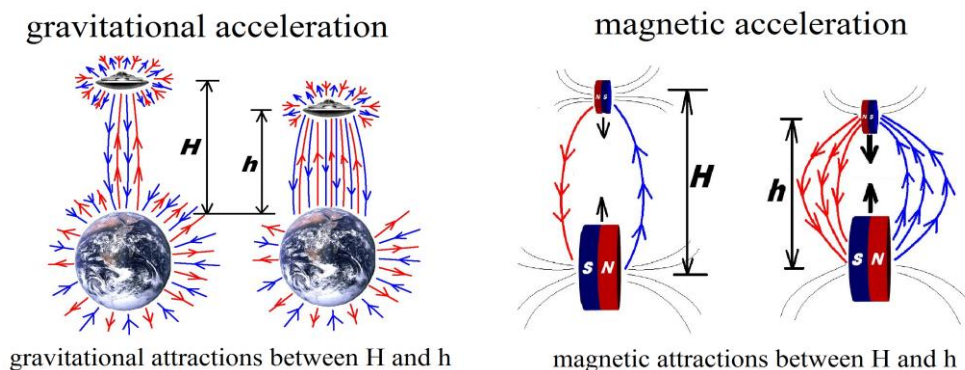
Fig.21 Geometric flows in the standard model, polarized and not polarized flows



Much more, we predict that all "chiral charged" particles, flow in parallel and repulsive paths (strings). We predict that any cluster, with the same class dimensions of surrounded tornadoes, can interact stronger with another.

Polarized flows can produce attraction or repulsion, two permanent magnets as an example. Not polarized flows can produce only attractions, gravity for example.

Fig.22 Attractions between polarized and not polarized flows, fermion class



The attractions depend by how many tornadoes are coupled there. It depends by distance, by number of strings in section (Fig. 22).

We predict to couple (fusion) two tornadoes, or to break (fission) a tornado, are energetic processes. It is a self-assembly process. The geometric transport, our system, can lose some luggage (emission) or can accept other external luggage (absorption). Any of it optimises the transport process, as a result of interactions. Axial attractions, as an entanglement situation of many arms, may explain an unseen world too.

Results

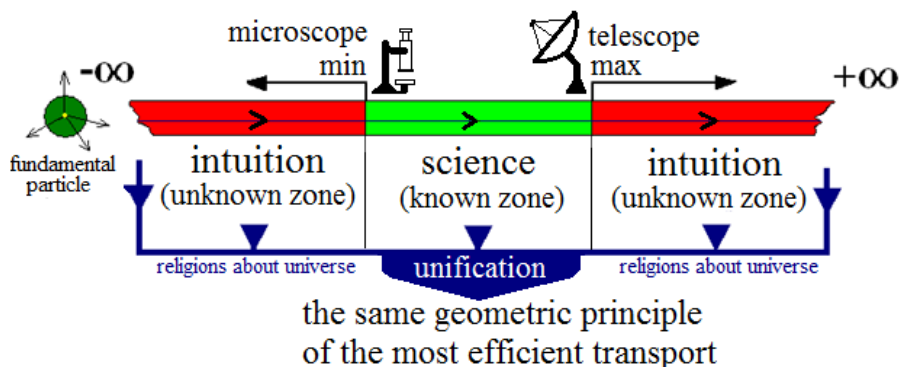
As a scientific method, we made many qualitative observations. We try to understand principled patterns of natural transport, most common, in many branches of science.

The geometric evolution of the entire universe, known or not, is in fact a transport of matter. We supposed that a general and constructal principle must exist and it must refer to this perpetual transport. All transports means patterns, means the most efficient geometry in transport.

So, we followed a helical geometry key, we searched if helical transport is the most efficient transport and especially why. For this reason, compared to our commercial transport, we brought forth basic principles, fundamental ones.

The geometry, the information in fact, is present everywhere, even in humans creations. Therefore our research was not interested only inside of scientific limits, between microscope and telescope dimensions. This is only the known zone. The reality is beyond microscope or telescope limits, beyond actual science barriers. (Fig.23)

Fig.23 The fundamental information is all over, known zone or unknown (intuitive) zone



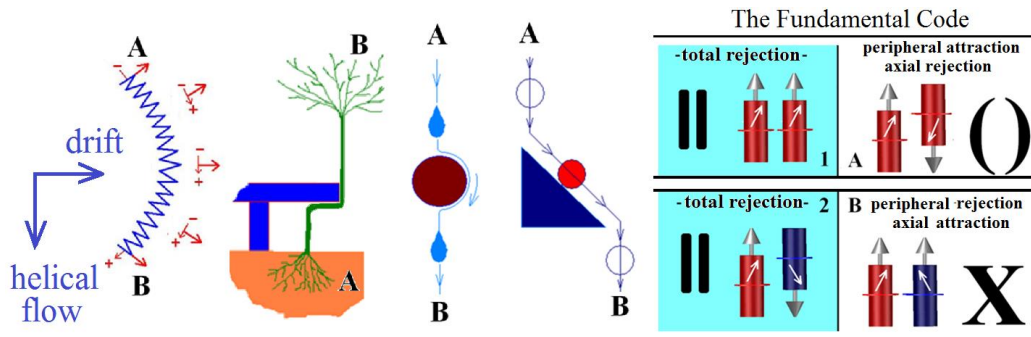
We found, using a comparative procedure, that both of two worlds has the same geometric patterns when describing the creation of universe. Our minds and our bodies use this constructal principle and were created using it. They know how

they are built, using constructal principle. Therefore, from scientific zone to outside zones, we found that the most common geometry is a helical one. Constructal law becomes the starting point of the analysis of helical flows. Basically, helical trajectories of transport appear to be the most efficient forms of natural flow. The interactions of these helical systems of transport, as tornado type, seem to obey strict rules, which can be identified in the natural environment, at any scale. Furthermore, this interaction strict set of rules, called "The Fundamental Code", can be extrapolated to the universes undetectable, to the minimum or maximum.

Conclusions

Now, using geometrodynamics principles, an unified theory is possible to be made. This theory must be one of the helical fields flow, local transport or not. On the flow of the universe, from another perspective, now we can elucidate a lot of issues still misunderstood for the world in which we evolve. The most important thing is to change our perspective, understand similar geometric phenomena of nature through a unique key, that efficiency in transport (Fig. 24). This is ensured by using a specific flow geometries through perpetual self-assembly in helical flow.

Fig.24 Drift local motions and the Fundamental Code, changing perspective.



Helical Geometrodynamics, as the Unified Fields Theory, will describe the fundamental principles of helical flow fields. It will use helical interactions rules. Here are only the basic principles that bind Constructal Theory with Helical Geometrodynamics.

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