Energy Observations of Flowing Forms

The invisible describing the visible.

QATUAN

Biopiscinas & Ecopaisagismo

World Water Community

FAZENDA LIMARIA

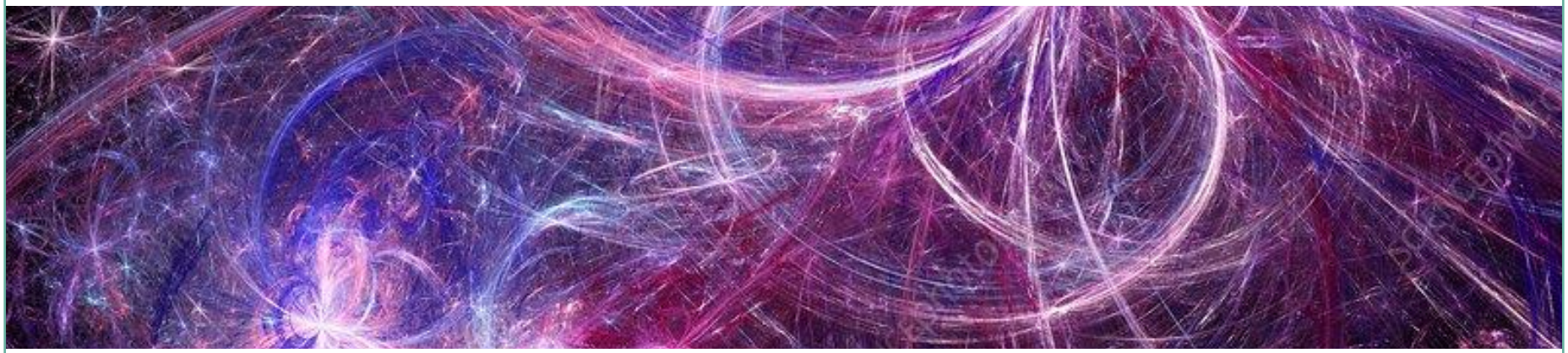
ecopools UK

Local: Cavalcante GO

Data: 03/12/2023

Part 1.

Plasma



The word plasma is used to describe a wide variety of macroscopically neutral substances containing many interacting free electrons and ionized atoms or molecules, which exhibit collective behavior due to the long-range coulomb forces. Not all media containing charged particles, however, can be classified as plasmas. For a collection of interacting charged and neutral particles to exhibit plasma behavior it must satisfy certain conditions, or criteria, for plasma existence.

Plasma:

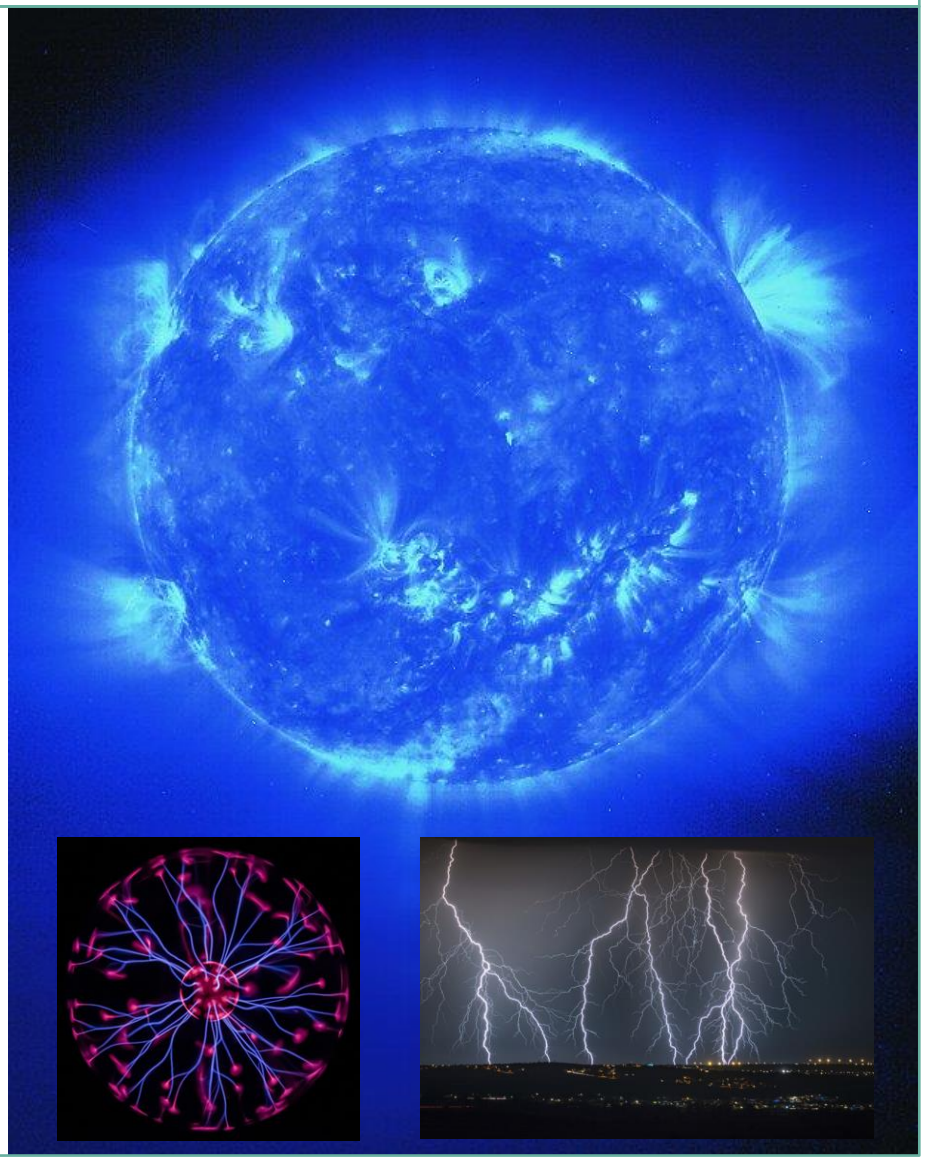
What the HELL is Plasma?

Plasma is superheated matter – so hot that the electrons are ripped away from the atoms forming an ionized gas. It comprises over 99% of the visible universe. In the night sky, plasma glows in the form of stars, nebulas, and even the auroras that sometimes ripple above the north and south poles. That branch of lightning that cracks the sky is plasma, so are the neon signs along our city streets. And so is our sun, the star that makes life on earth possible.

Plasma is often called "the fourth state of matter," along with solid, liquid and gas. Just as a liquid will boil, changing into a gas when energy is added, heating a gas will form a plasma – a soup of positively charged particles (ions) and negatively charged particles (electrons).

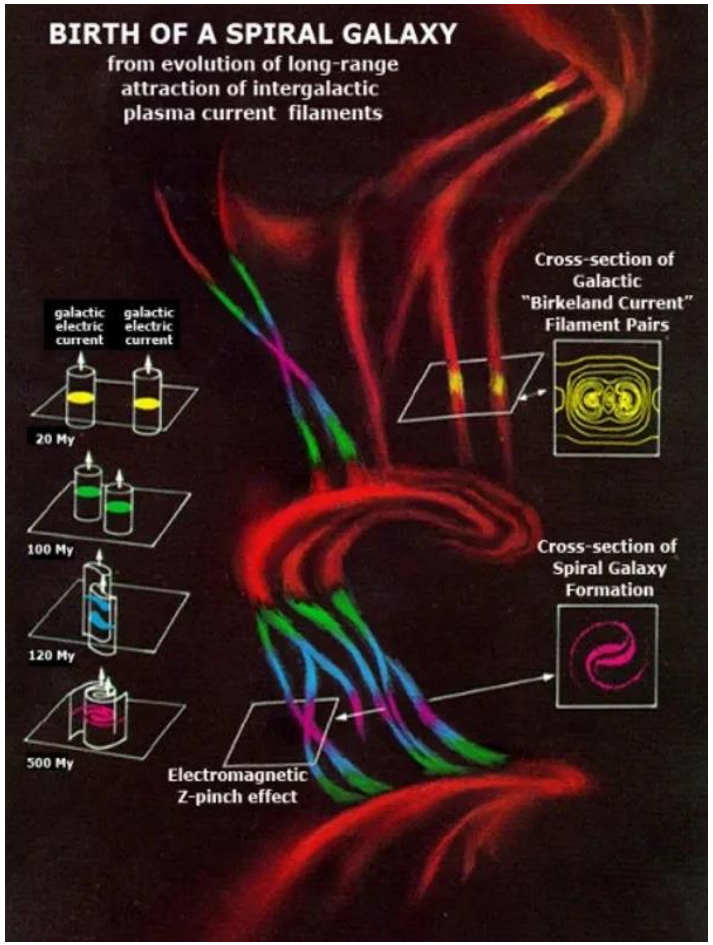
Because so much of the universe is made of plasma, its behavior and properties are of intense interest to scientists in many disciplines. Importantly, at the temperatures required for the goal of practical fusion energy, all matter is in the form of plasma.

Researchers have used the properties of plasma as a charged gas to confine it with magnetic fields and to heat it to temperatures hotter than the core of the sun. Other researchers pursue plasmas for making computer chips, rocket propulsion, cleaning the environment, destroying biological hazards, healing wounds and other exciting applications.

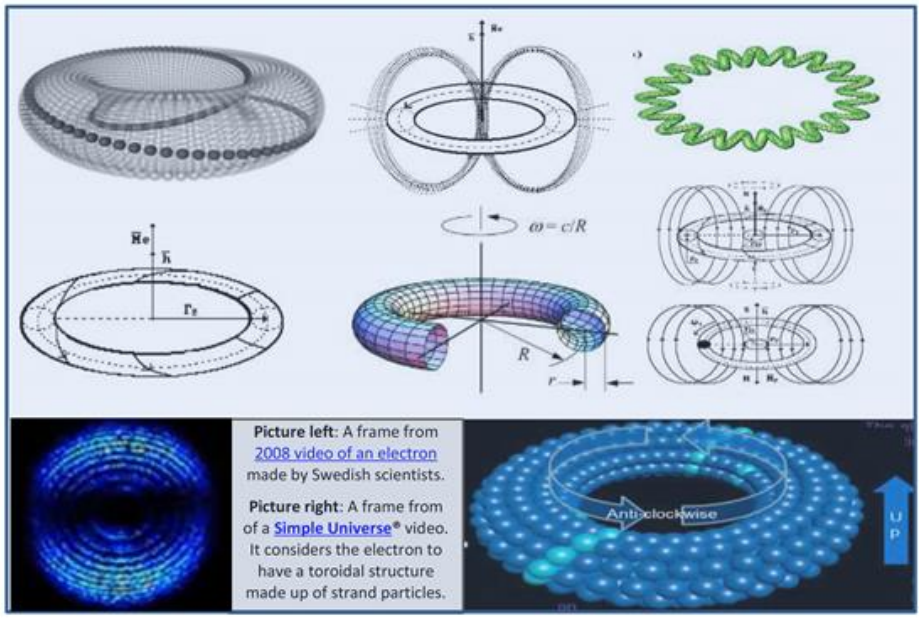


The Spin Torus Energy Model and Electricity

In geometry, a **torus** (pl.: **tori** or **toruses**) is a surface of revolution generated by revolving a circle in three-dimensional space one full revolution about an axis that is coplanar with the circle. The main types of toruses include ring toruses, horn toruses, and spindle toruses. A ring torus is sometimes colloquially referred to as a **donut** or **doughnut**.



If the axis of revolution does not touch the circle, the surface has a ring shape and is called a **torus of revolution**, also known as a **ring torus**. If the axis of revolution is tangent to the circle, the surface is a **horn torus**. If the axis of revolution passes twice through the circle, the surface is a **spindle torus** (or *self-crossing torus* or *self-intersecting torus*). If the axis of revolution passes through the center of the circle, the surface is a degenerate torus, a double-covered sphere. If the revolved curve is not a circle, the surface is called a *toroid*, as in a square toroid.



Electrostatic principles:

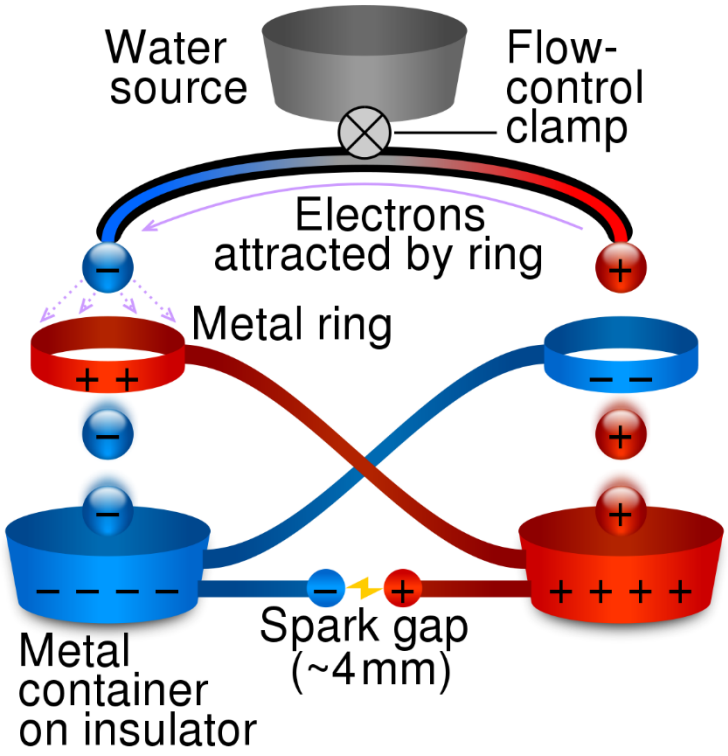
The Spin Torus Energy Model and Electricity

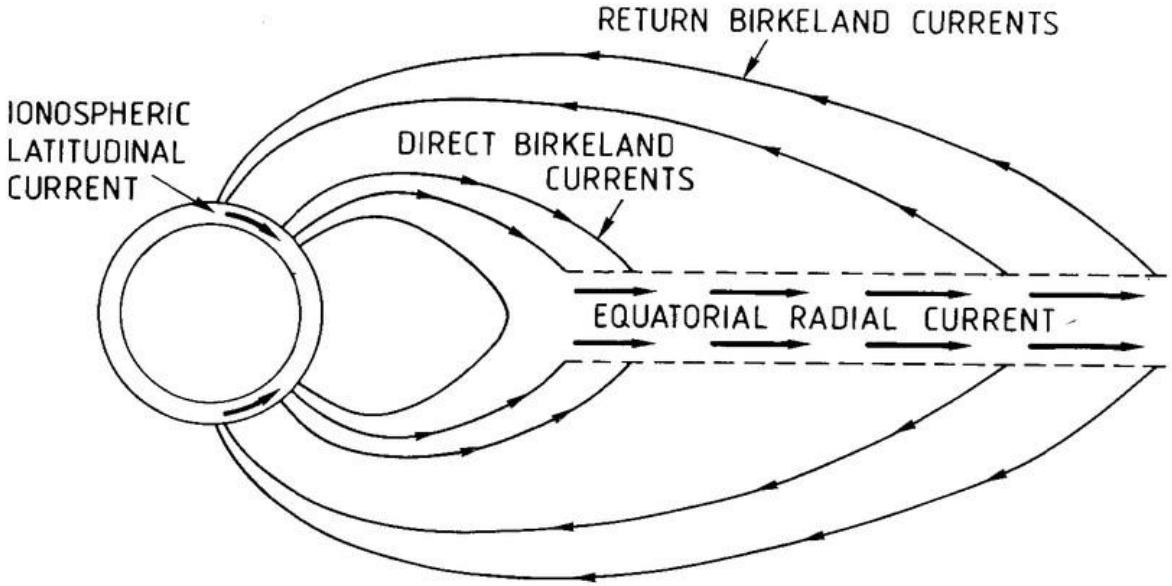
The **Kelvin water dropper**, invented by Scottish scientist William Thomson (Lord Kelvin) in 1867,[1] is a type of electrostatic generator. Kelvin referred to the device as his **water-dropping condenser,** or **Lord Kelvin's thunderstorm**. The device uses falling water to generate voltage differences by electrostatic induction occurring between interconnected, oppositely charged systems. This eventually leads to an electric arc discharging in the form of a spark. It is used in physics education to demonstrate the principles of electrostatics.

Principles of operation

A small initial difference in electric charge between the two buckets, is necessary to begin the charging process. The right bucket has a small positive charge. Now the left ring also has some positive charge because it is connected to the bucket. The charge on the left ring will attract negative charges in the water (ions) into the left-hand stream by the Coulomb electrostatic attraction. When a drop breaks off the end of the left-hand stream, the drop carries a negative charge with it. When the negatively charged water drop falls into its bucket (the left one), it gives that bucket and the attached ring (the right one) a negative charge.

The opposite charges which build up on the buckets represent electrical potential energy, as shown by the energy released as light and heat when a spark passes between them. This energy comes from the gravitational potential energy released when the water falls. The charged falling water drops do work against the opposing electric field of the like-charged containers, which exerts an upward force against them, converting gravitational potential energy into electrical potential energy, plus motional kinetic energy. The kinetic energy is wasted as heat when the water drops land in the buckets, so when considered as an electric power generator the Kelvin machine is very inefficient. However, the principle of operation is the same as with other forms of hydroelectric power. As always, energy is conserved.





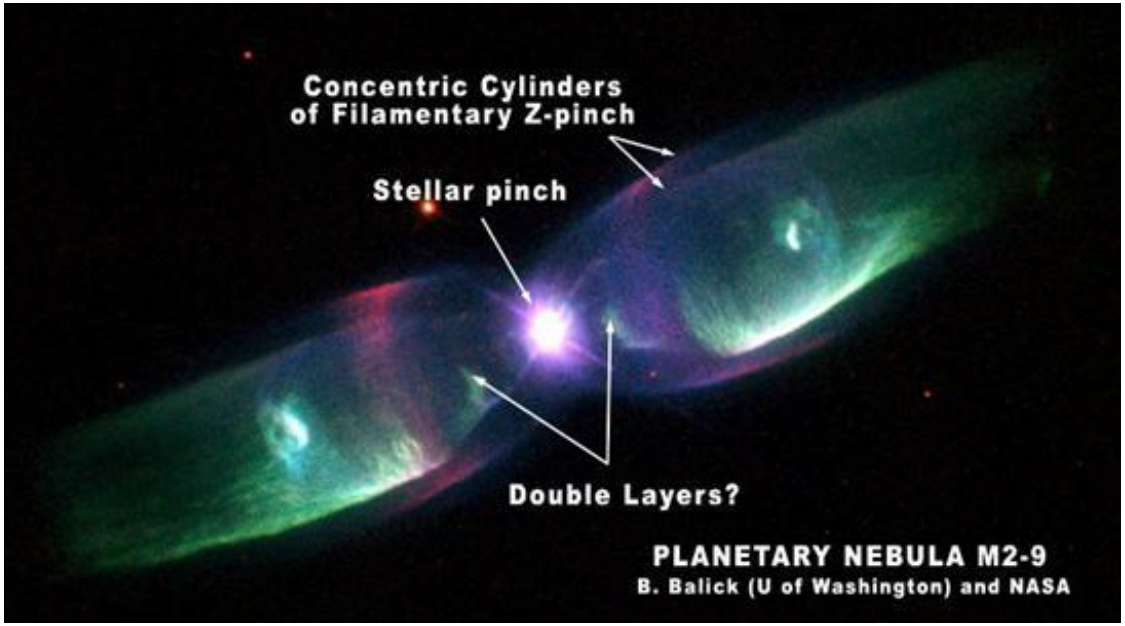
The configuration of Jupiter's magnetosphere

A schematic of the radially directed corotation enforcement current (CEC) that flows in the equatorial plane. The field-aligned Birkeland currents that close this current are also shown. Figure reproduced from Vasyliunas, 1983.

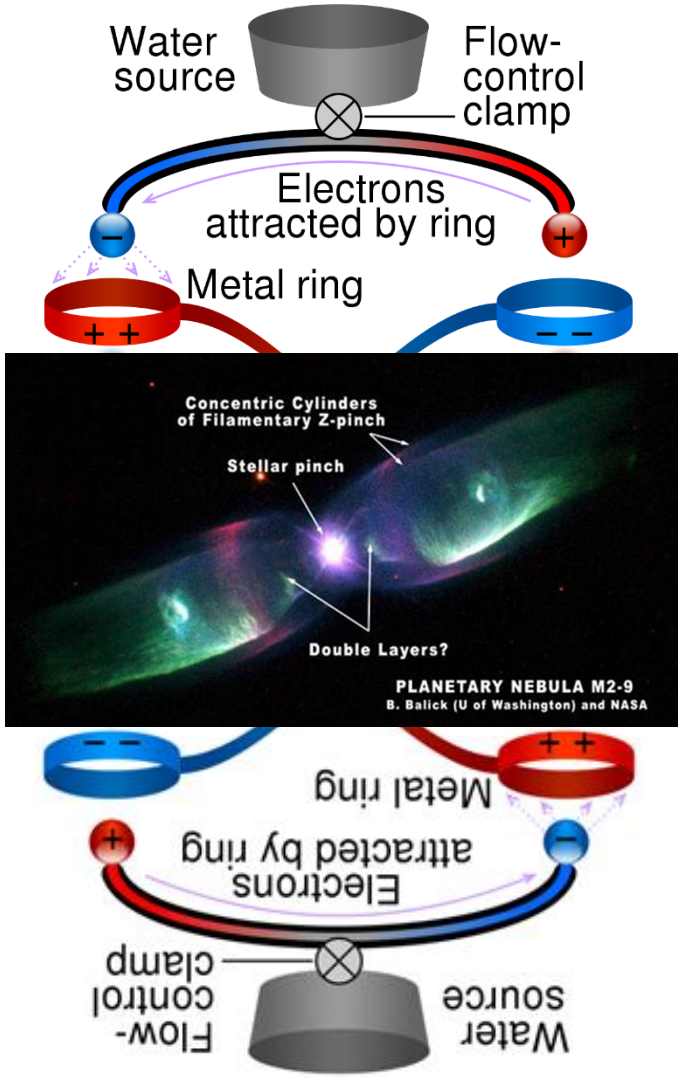
Lorentz Force:

Z-pinch

The Z-pinch is an application of the Lorentz force, in which a current-carrying conductor in a magnetic field experiences a force. One example of the Lorentz force is that, if two parallel wires are carrying current in the same direction, the wires will be pulled toward each other.



In a Z-pinch machine the wires are replaced by a plasma, which can be thought of as many current-carrying wires. When a current is run through the plasma, the particles in the plasma are pulled toward each other by the Lorentz force, thus the plasma contracts. The contraction is counteracted by the increasing gas pressure of the plasma.



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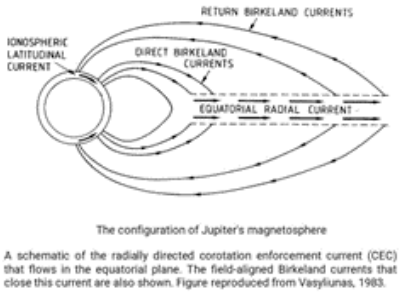

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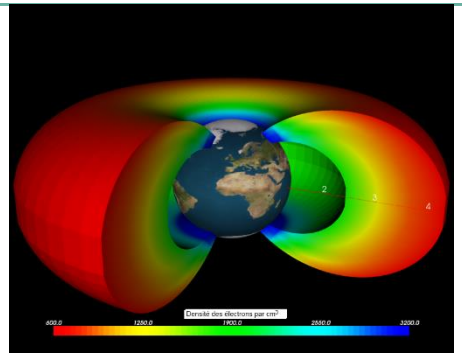
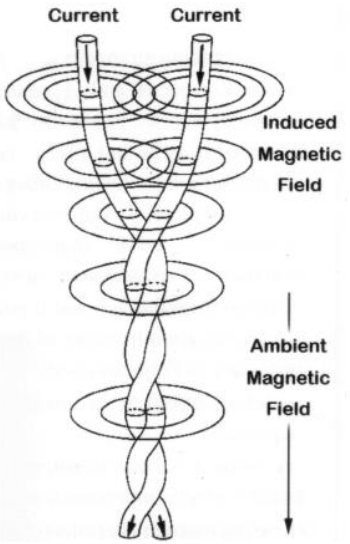
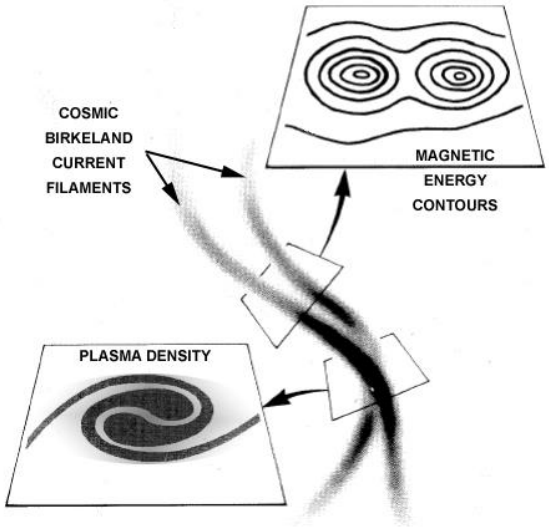
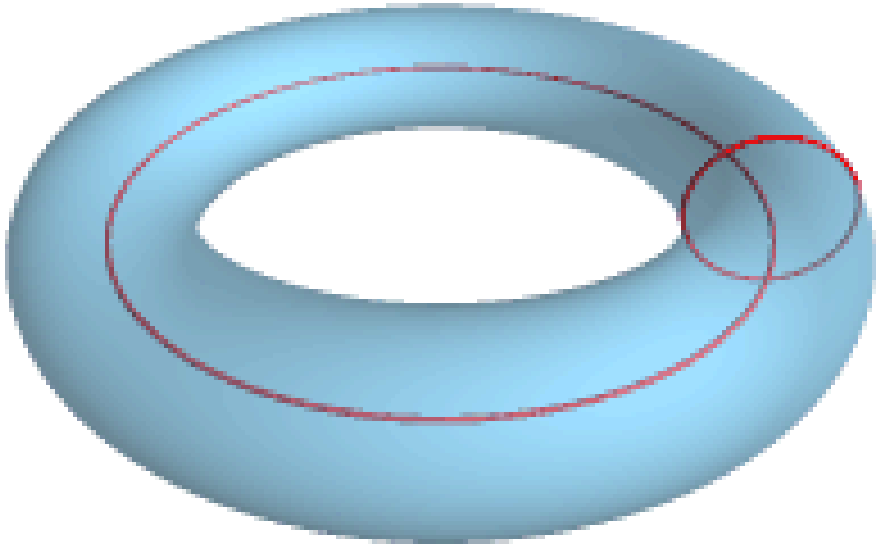


Essentially ~ The electromagnetic force becomes self-reproductive in a plasma state.

Both the Sphere and the Torus become themselves, relevant through all scales of reality. As covered through Ring Theory.

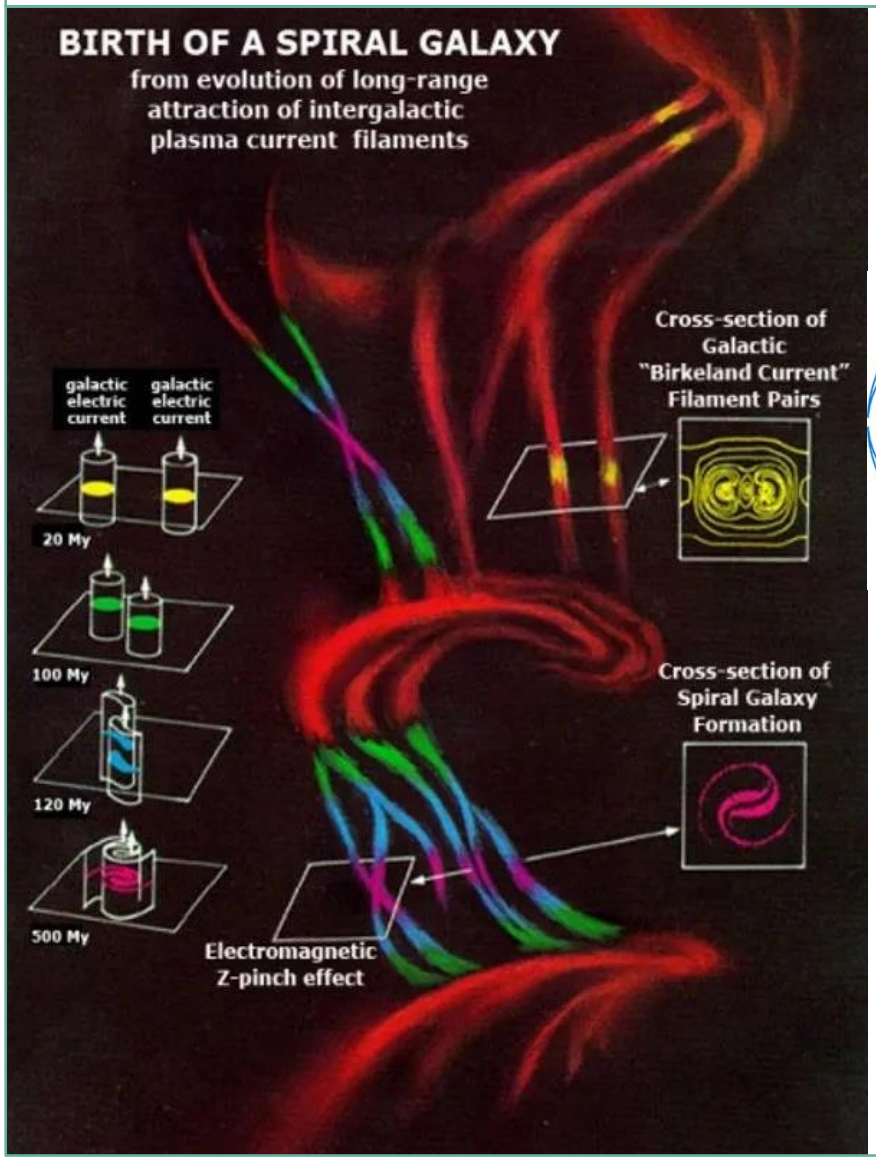


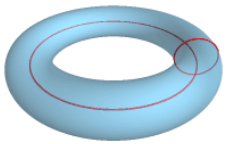


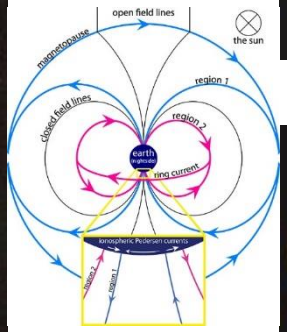


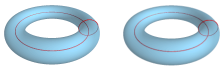
As the distance from the axis of revolution decreases, the ring torus becomes a horn torus, then a spindle torus, and finally degenerates into a double-covered sphere.

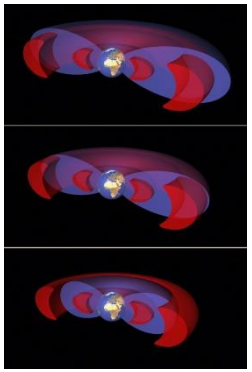
Birkeland Currents





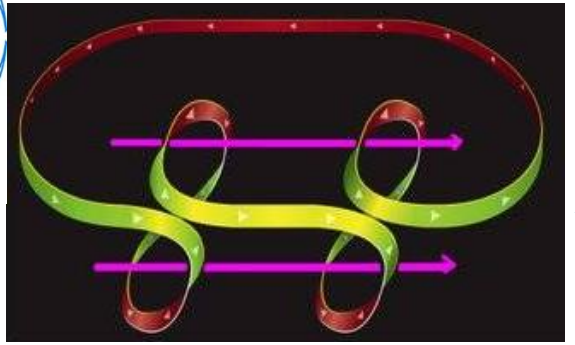




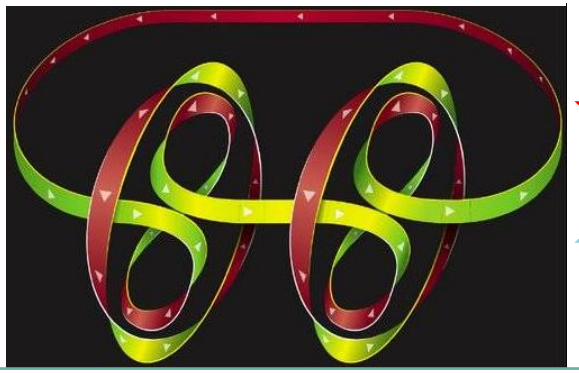


gravitational potential energy

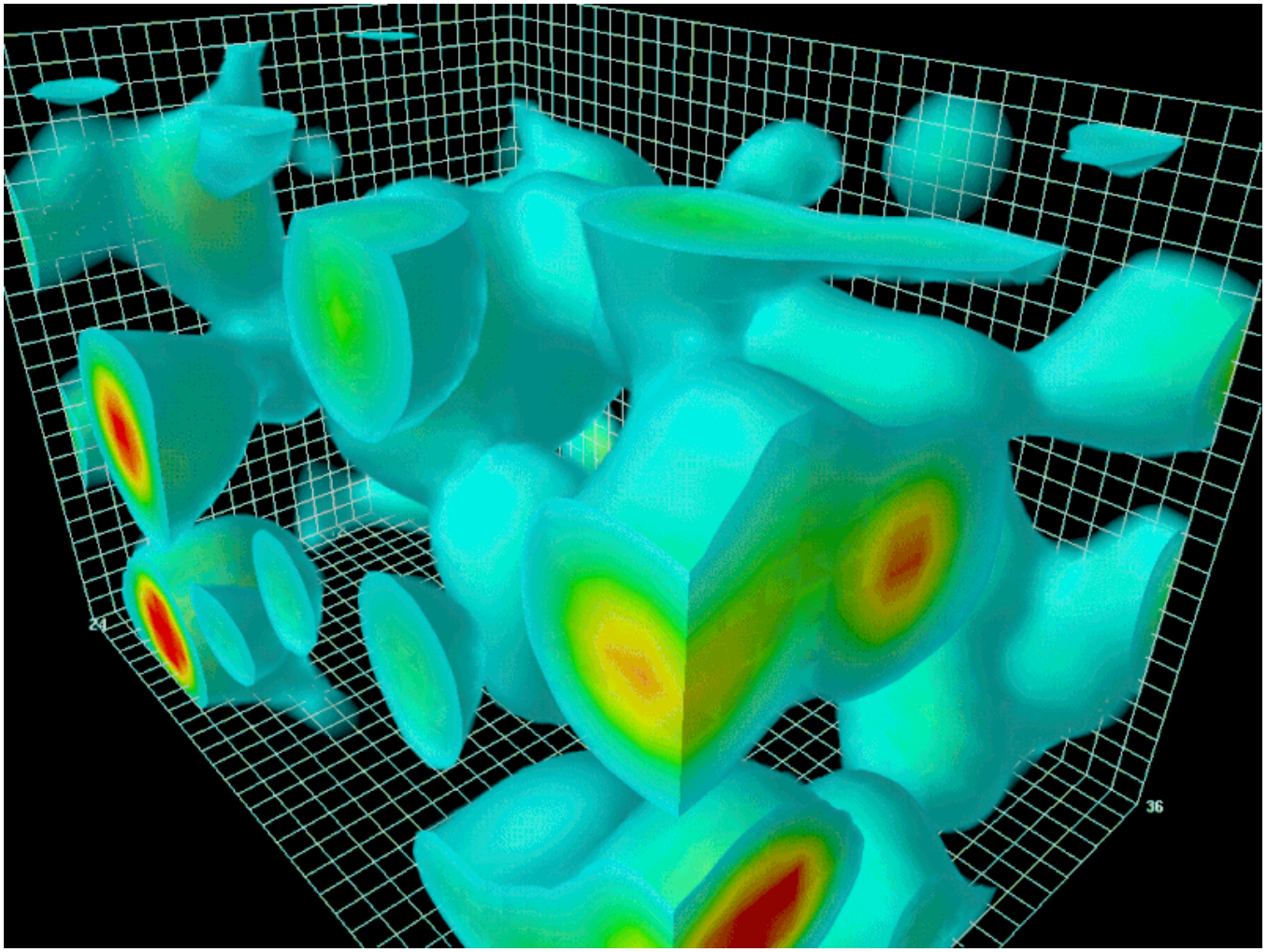
Lorentz force



continuous medium

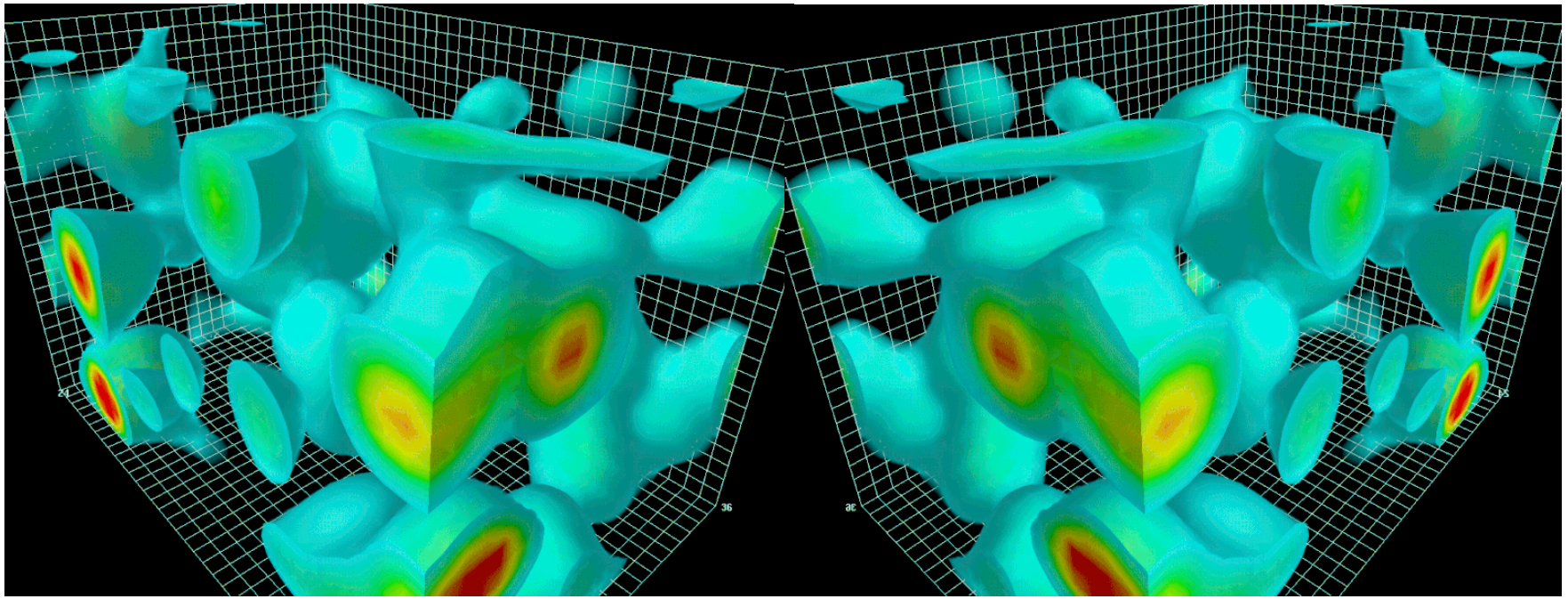


Quantum Field ~ A Continuous Medium



Relativistic quantum electrodynamics, which describes the electromagnetic interactions of electrons and atomic nuclei, provides the basis for modeling the electronic structure of atoms, molecules and solids and of their interactions with photons and other projectiles.

Quantum Field (as a structure?)



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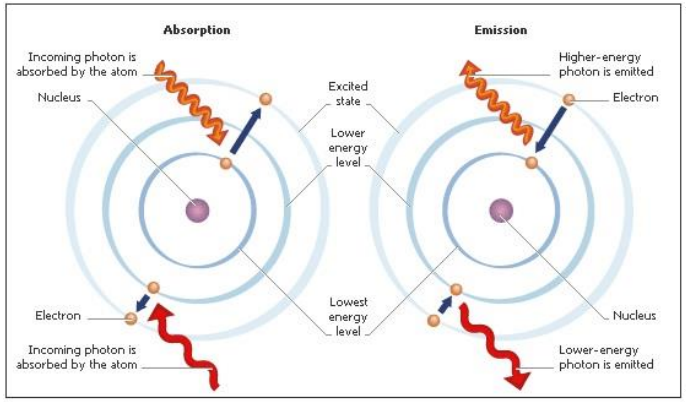
Quantum Mechanics:

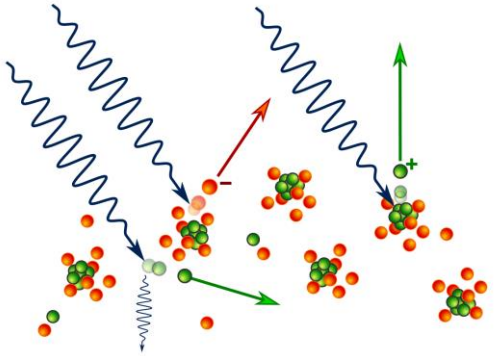
Overview and fundamental concepts

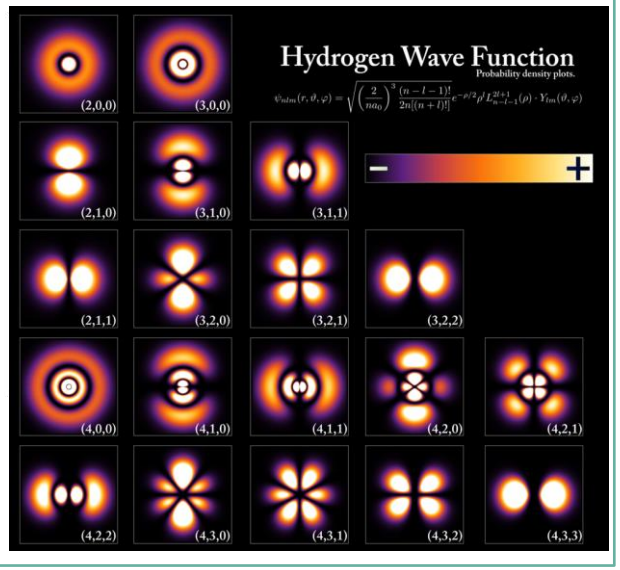
Quantum mechanics allows the calculation of properties and behaviour of physical systems. It is typically applied to microscopic systems: molecules, atoms and sub-atomic particles. It has been demonstrated to hold for complex molecules with thousands of atoms,[4] but its application to human beings raises philosophical problems, such as Wigner's friend, and its application to the universe as a whole remains speculative.[5] Predictions of quantum mechanics have been verified experimentally to an extremely high degree of accuracy. For example, the refinement of quantum mechanics for the interaction of light and matter, known as quantum electrodynamics (QED), has been shown to agree with experiment to within 1 part in 10^8 for some atomic properties.

Quantum electrodynamics

In particle physics, quantum electrodynamics (QED) is the relativistic quantum field theory of electrodynamics. In essence, it describes how light and matter interact and is the first theory where full agreement between quantum mechanics and special relativity is achieved. QED mathematically describes all phenomena involving electrically charged particles interacting by means of exchange of photons and represents the quantum counterpart of classical electromagnetism giving a complete account of matter and light interaction.







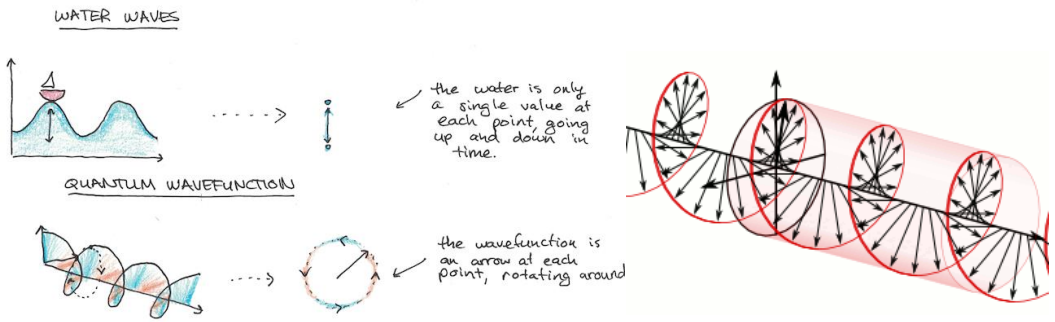
Compton scattering (or the **Compton effect**) is the quantum theory of high frequency photons scattering following an interaction with a charged particle, usually an electron. Specifically, when the photon hits electrons, it releases loosely bound electrons from the outer valence shells of atoms or molecules.

Quantum Mechanics:

What is the wave function of water?

In summary, the use of solving for the wave function of water is to obtain a complete, though approximate, understanding of its molecular state and properties.

This is done by treating water as a multiparticle system and using quantum chemistry packages to compute the ground state electron wave function and potential energy surface. This information can then be used to predict various aspects of a water molecule, such as bond lengths and angles.

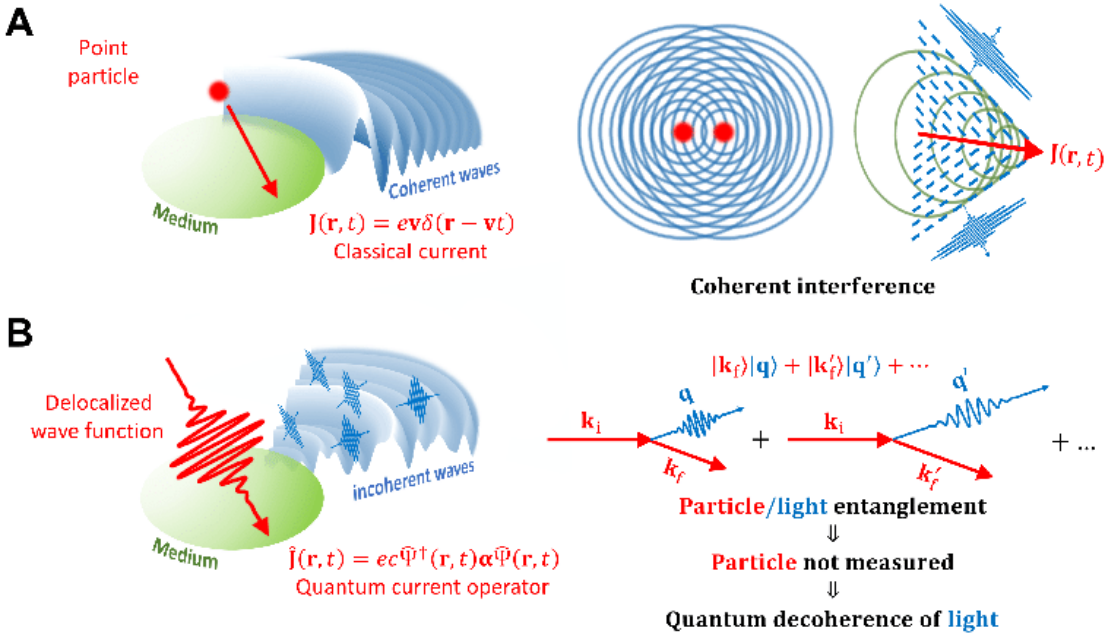


Excitation of waves by free particles: classical versus quantum theory.

(A) Classical wave dynamics. A point particle with velocity v passes through an optical medium and emits waves that may interfere coherently. The classical emitter current density J(r, t) = ev⍰(r – vt) emits a temporally coherent shock wave.

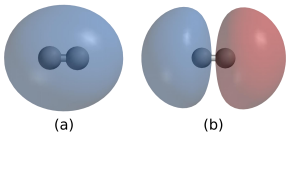
(B) Quantum description. A quantum particle is described by a delocalized wave function ⍰(r, t). A current operator^Joperator^ operator^J (r, t) is then associated with the particle.

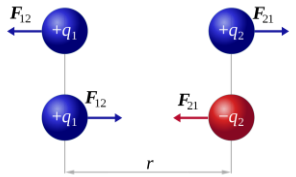
Even when the initial particle is only described by a single momentum k i , it may spontaneously emit many wave quanta (momenta q, q′, …). The waves are then entangled with the particle because of momentum conservation (leaving the final particle having momenta k f , k f ′, … respectively). When only the emitted waves are observed, this entanglement can lead to quantum decoherence and lack of interference visibility, resulting in the emission of incoherent radiation.

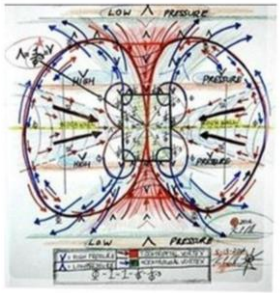


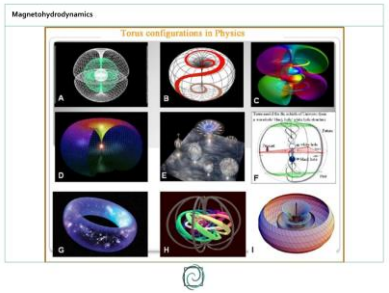
The Entire Universe is spinning, vibrating, flowing, oscillating, flashing, translating and rotating ~ often in more than one place simultaneously, in fact; "rarely" in one place at a time.

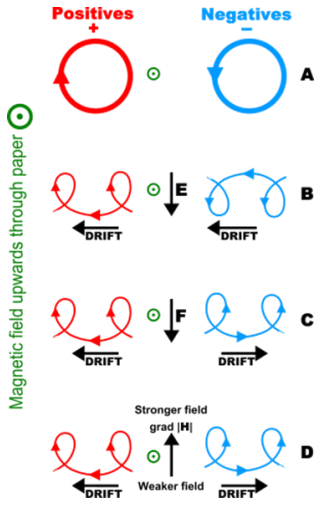
A **Birkeland current** generally refers to any electric current in a space plasma, but more specifically when charged particles in the current follow magnetic field lines (hence, Birkeland currents are also known as *field-aligned currents*).

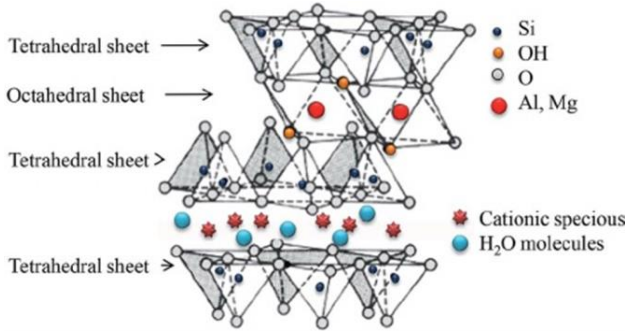






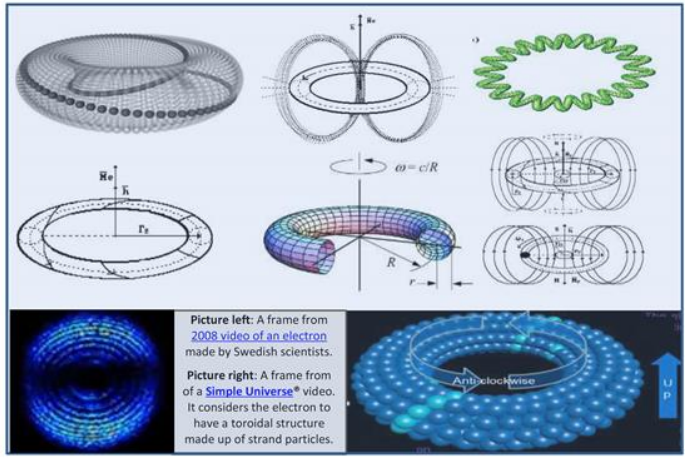


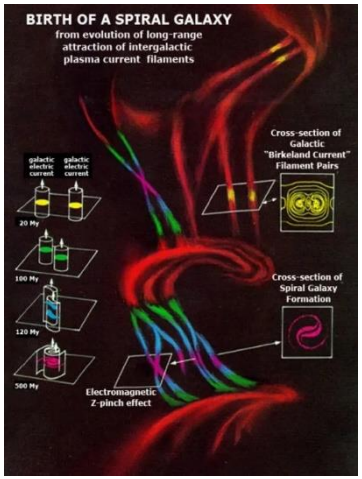


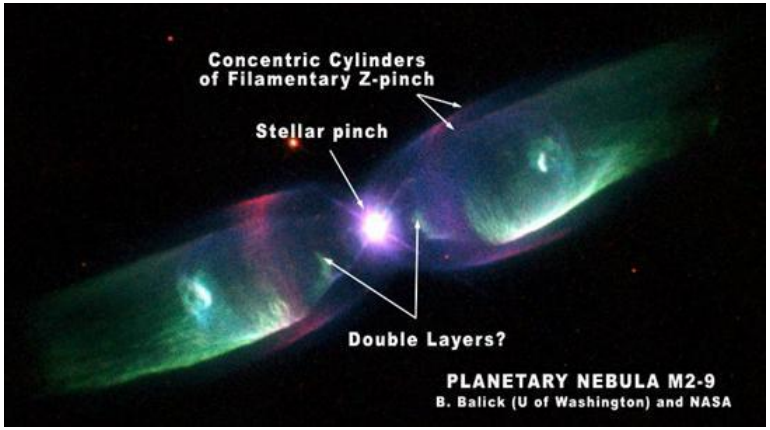


They are caused by the movement of a plasma perpendicular to a magnetic field.

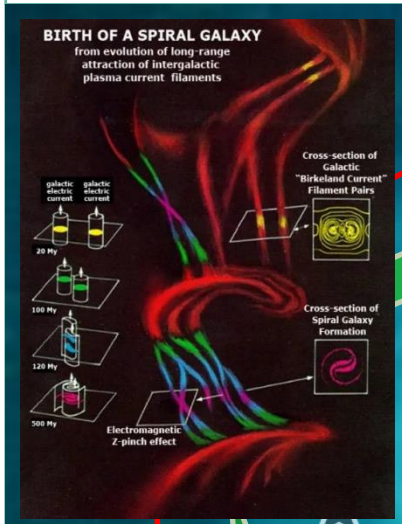
Birkeland currents often show filamentary, or twisted "rope-like" magnetic structure.

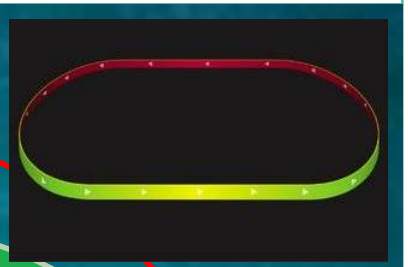


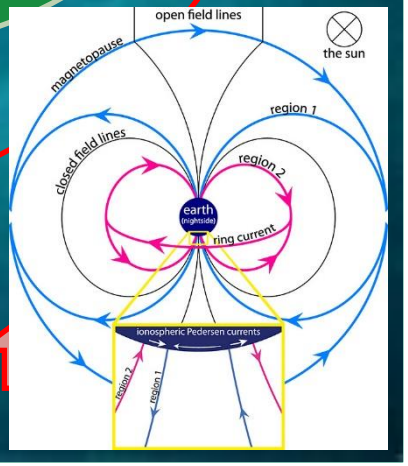




Quantum Field of Electromagnetic Reality Within a Toroidal Plasma Existence



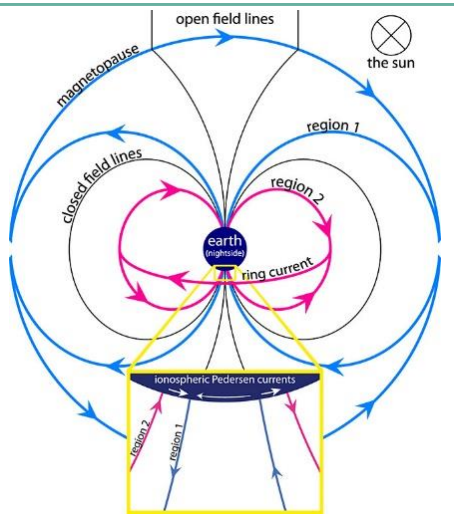


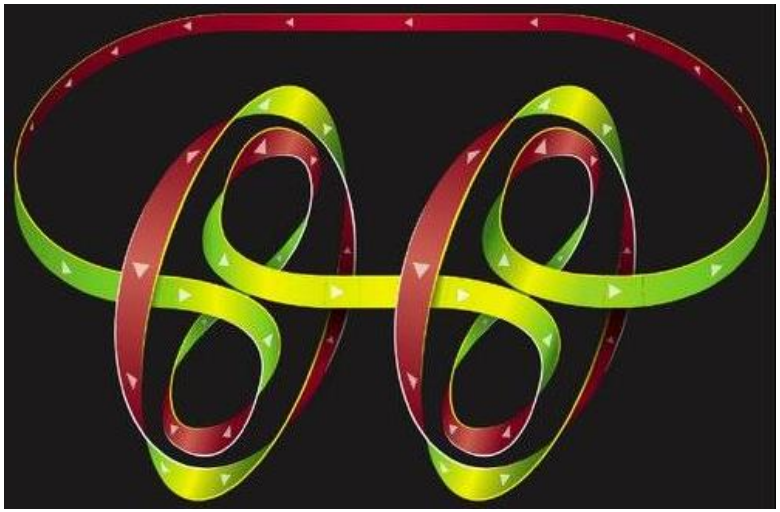


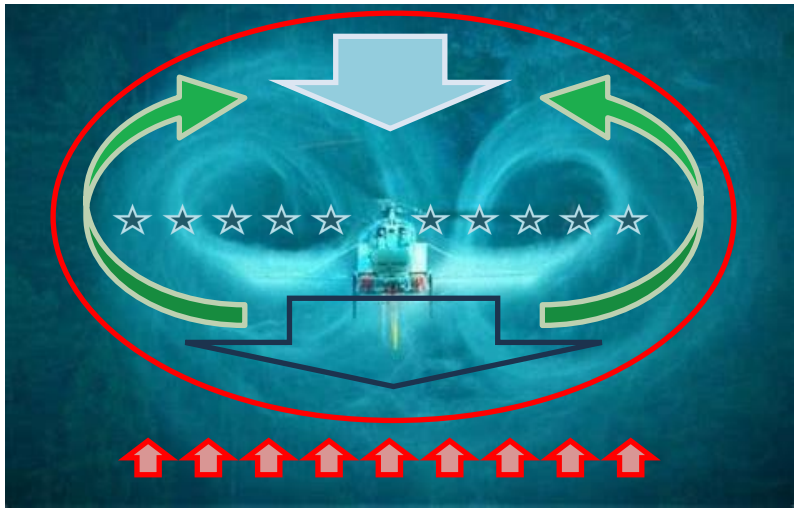
Electro-Magneto-Hydrodynamics (MHD)

Essentially ~ The electromagnetic force becomes self-reproductive in a plasma state.

Both the Sphere and the Torus "act" in unison. Hydrodynamically in terms of the fields that their combined forces create: Fractals upon Fractals through the scales, in a perpetual state of exchange that we don't "see", but experience.





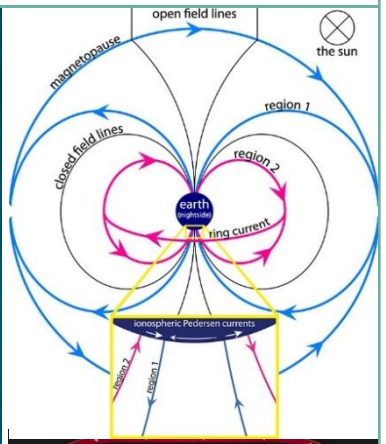


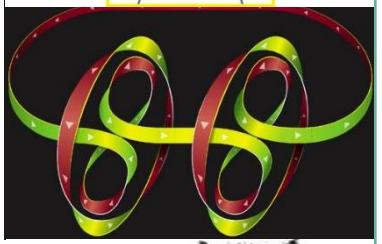
Observation of atomic activity likened at planetary scales ~ allows the activities of humankind "appear" to act in similar fashions to sub-atomic particles;
Thus, we can adopt the form of an Helicopter and it's downdraft to mimic complex energetic realities

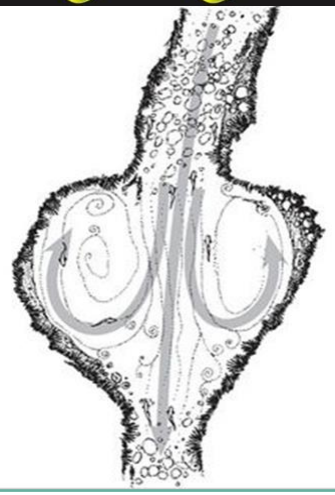
A Helicopter

Interplanetary Forces

Intermolecular Forces

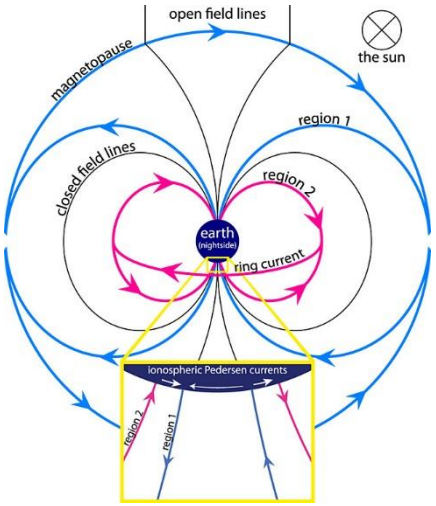


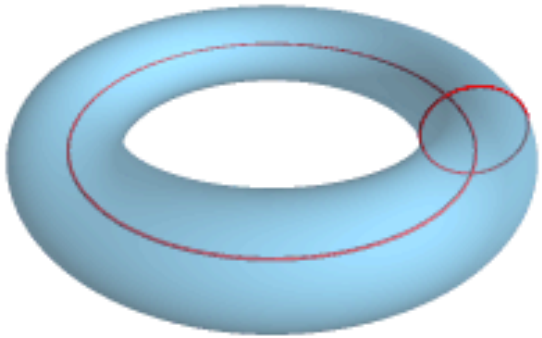


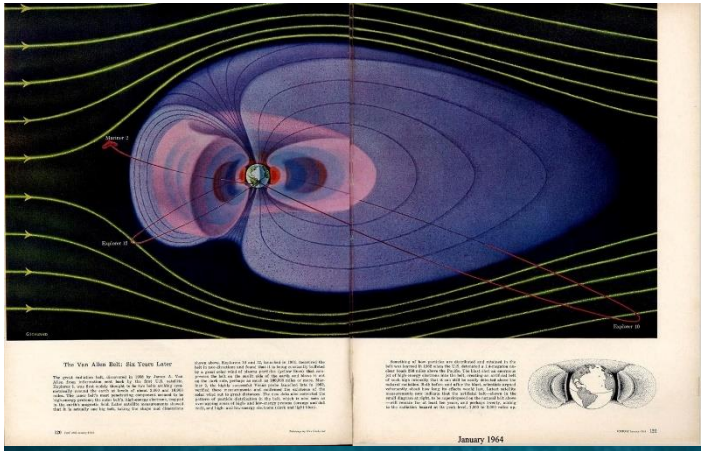


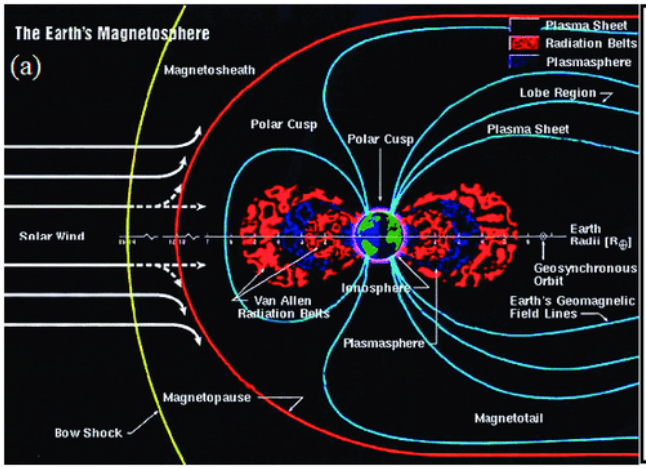
A Very BIG Helicopter, Described in a Plasma State; can EQUALLY be represented as a Very Small Helicopter

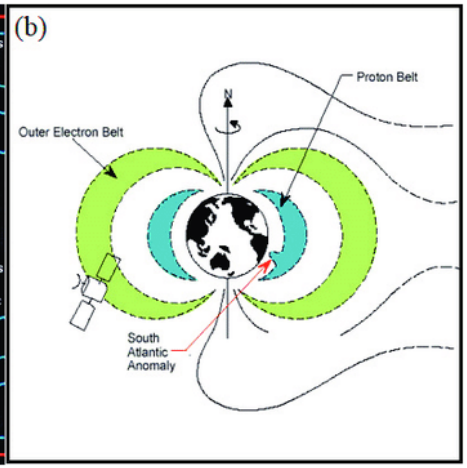
Magnetohydrodynamics (MHD; also called magneto-fluid dynamics or hydromagnetics) is a model of electrically conducting fluids that treats all interpenetrating particle species together as a single continuous medium.

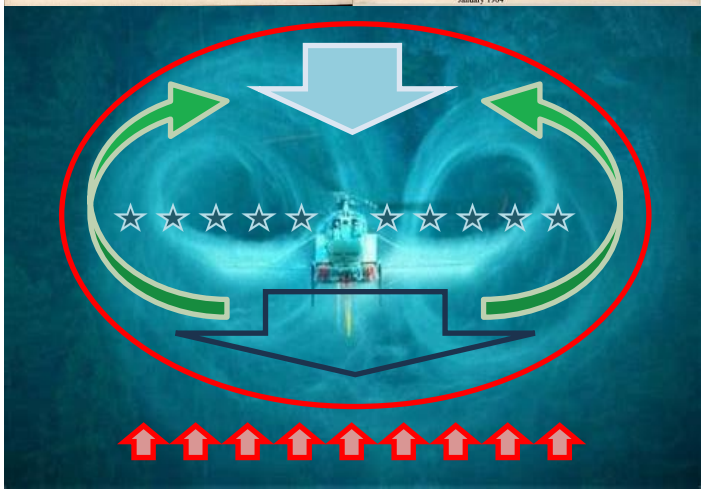




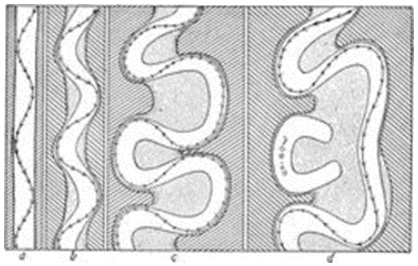




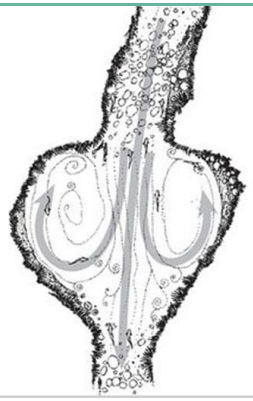




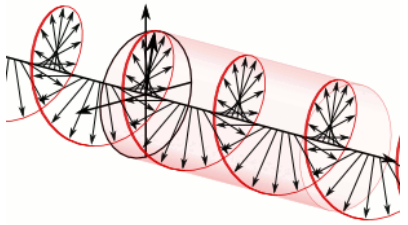
As Observed in The Body of Water ~ "A Continuous Medium" of Electrically Conducting Fluids.

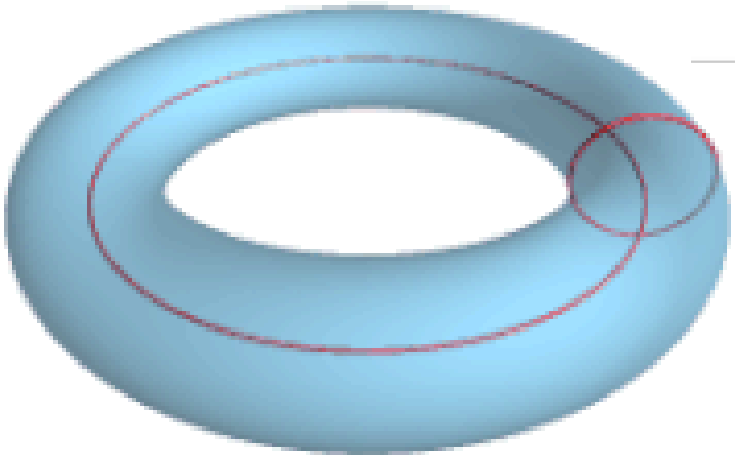


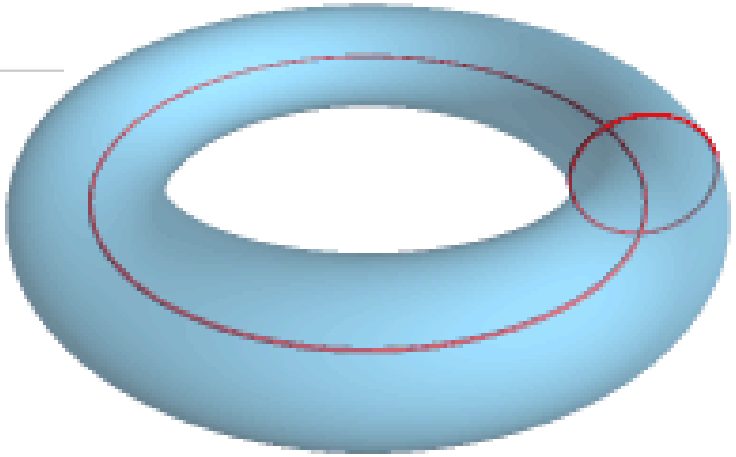
Interplanetary Forces

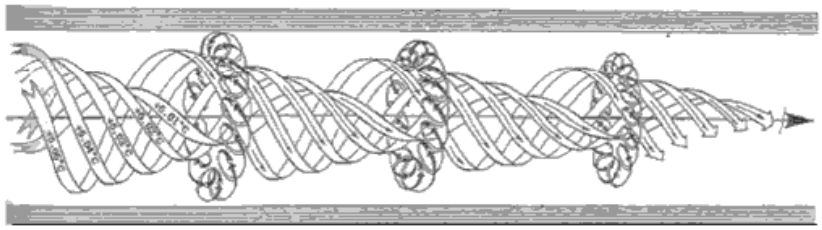


Intermolecular Forces

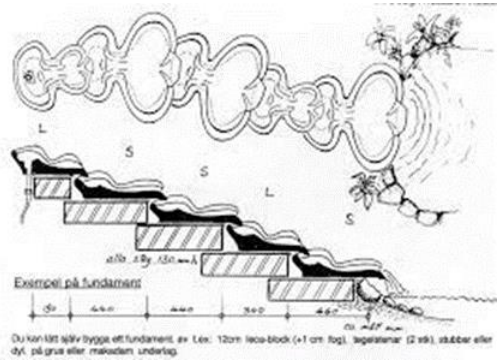






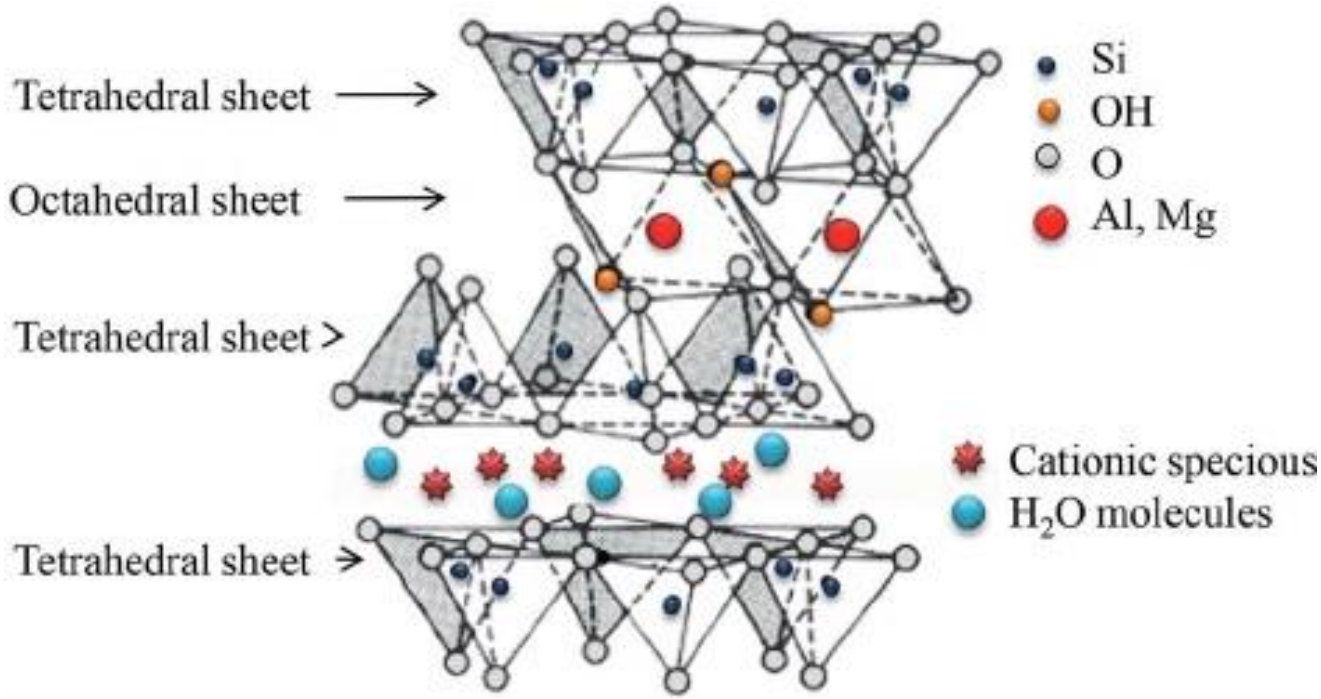


From Callum Coat's book on Schauberger's vorticular flows.



Part 3.

Molecular Structure



Molecular structure is actually three-dimensional, and it is important to be able to describe molecular bonds in terms of their distances, angles, and relative arrangements in space. A **bond angle** is the angle between any two bonds that include a common atom, usually measured in degrees. A **bond distance** (or bond length) is the distance between the nuclei of two bonded atoms along the straight line joining the nuclei.

Polar vs. Non-Polar Bonds and Molecules

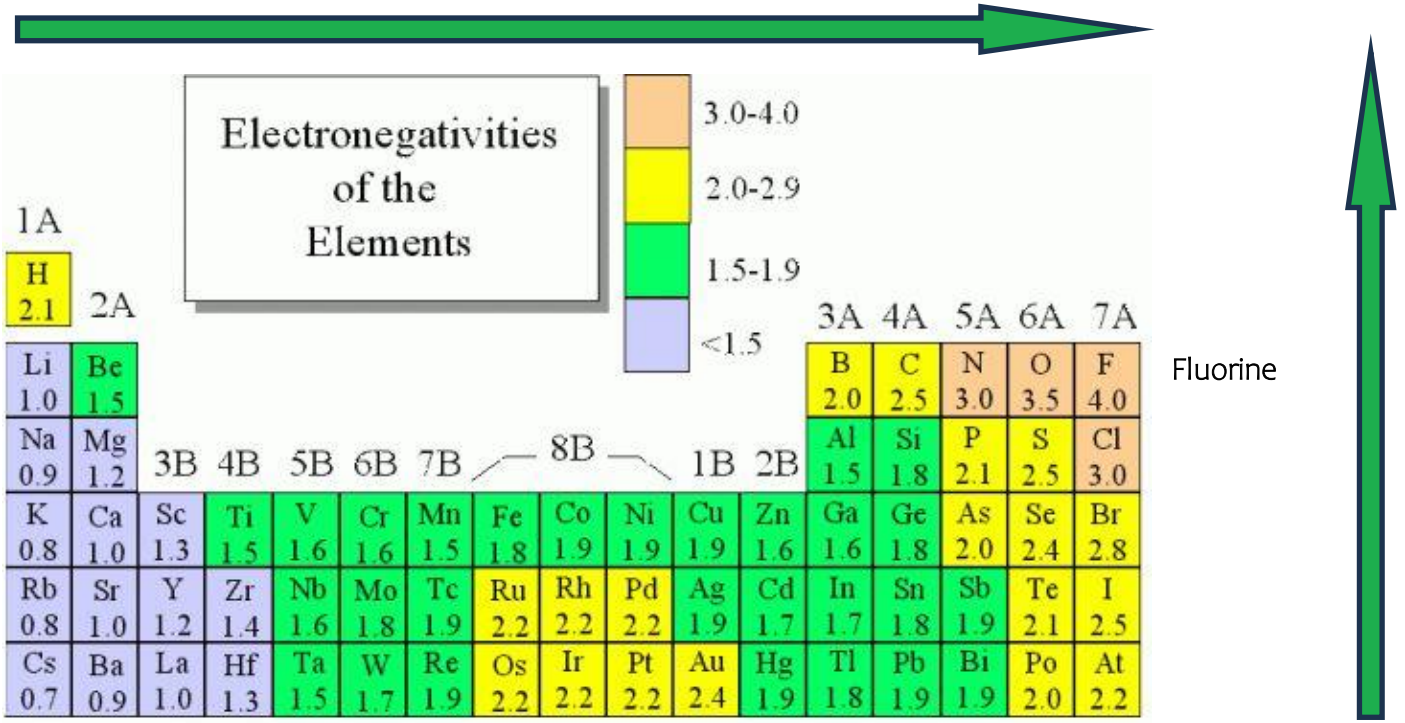
What do polar and non-polar Bonds mean?

In simple terms, polar means oppositely charged, and non-polar means equally charged. Covalent bonds can be polar or non-polar. To understand the difference between polar and non-polar bonds, it is essential to comprehend electronegativity.

What is electronegativity?

Electronegativity is the measurement of how much an atom wants to bond to another atom. Electronegativity increases from left to right and down each column on the periodic table. The Pauling scale describes the electronegativity of an element, with a scale from 0.7 to 4. Fluorine is the most electronegative element, with an electronegativity of 4. Cesium is the least electronegative element with an electronegativity of 0.7.

Hydrogen



Fluorine

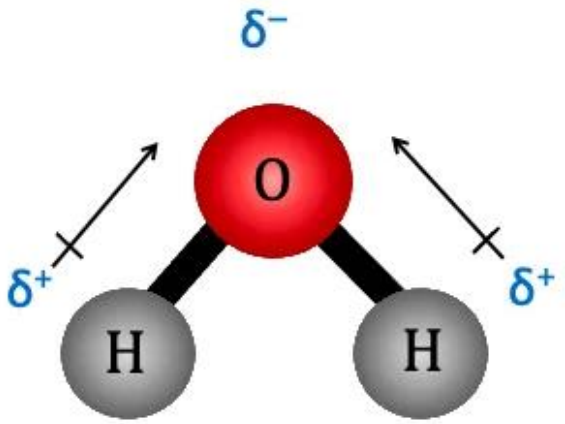
Cesium

Polar vs. Non-Polar Bonds and Molecules

What makes a bond polar?

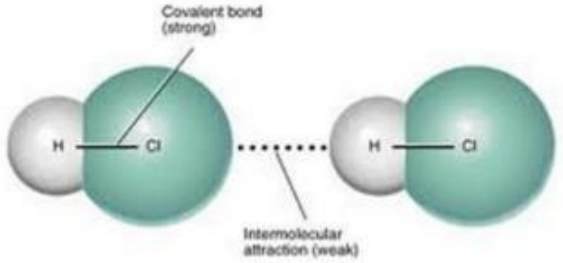
A polar bond is a type of covalent bond. A bond between two or more atoms is polar if the atoms have significantly different electronegativities (>0.4). Polar bonds do not share electrons equally, meaning the negative charge from the electrons is not evenly distributed in the molecule. This causes a dipole moment.

A dipole moment occurs when one end of the bond is positive, and the other end is negative. A classic example of a polar bond is the bond in water between hydrogen and oxygen. The bond is classified as a polar bond because it has a large electronegativity difference of 1.4. The electrons in hydrogen are more attracted to the electrons in oxygen because oxygen is more electronegative.



What makes a bond non-polar?

Non-polar bonds are also a type of covalent bond. Unlike polar bonds, non-polar bonds share electrons equally. A bond between two atoms or more atoms is non-polar if the atoms have the same electronegativity or a difference in electronegativities that is less than 0.4. An example of a non-polar bond is the bond in chlorine. Chlorine contains two chlorine atoms. The electrons are shared equally because the electronegativity difference between the two atoms is zero.



DIPOLE-DIPOLE FORCE

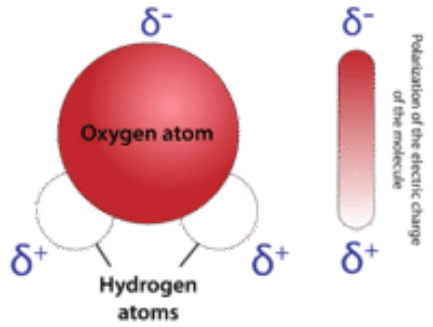
Polar vs. Non-Polar Bonds and Molecules

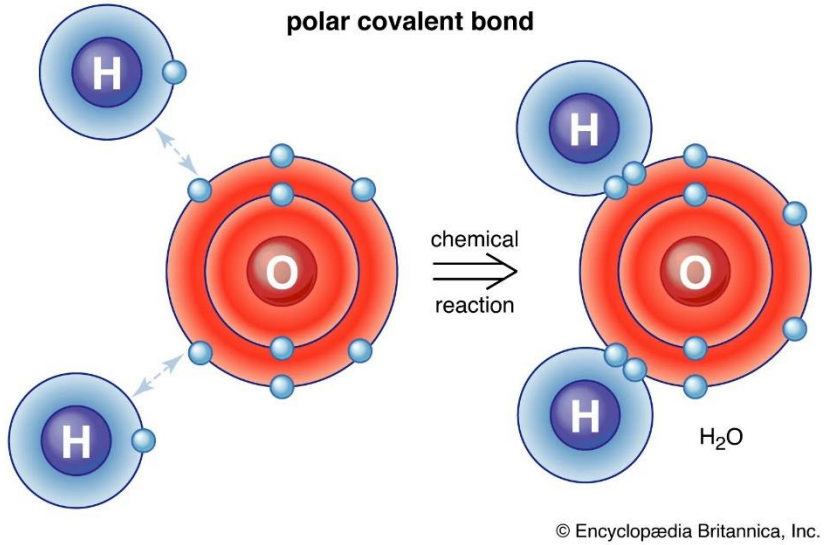
What are Polar Molecules?

In chemistry, the definition of a polar molecule, is a molecule that has a charge on one side of the molecule, that is not cancelled out. It has a region of partial charge. One end is slightly positive one end is slightly negative. They are generally asymmetrical, with an uneven distribution of the electrons.
Polar molecules can have ionic or polar covalent bonds. A molecule with two poles is called a dipole. When you measure the amount of polarity of a molecule, the result is called the dipole moment.
If a molecule is non-polar, then the molecules either share the electrons evenly, e.g. they have a non-polar bond, or the polar bonds are symmetric, in the cases of carbon dioxide or carbon tetrachloride. In those molecules, there are dipoles but they cancel out due to the symmetry.
Polar molecules tend to stick together and line up in groups, which affects the properties of polar compounds like water. Water molecules can actually align themselves in the presence of an electrostatic force. Also, polar solvents tend to dissolve polar solutes, and non-polar solvents dissolve non-polar solutes.

Is Water a Polar Molecule?

Yes, because of the bent non-symmetrical shape of the molecule. More of the electrons are attracted to the oxygen atoms, resulting in a net charge.

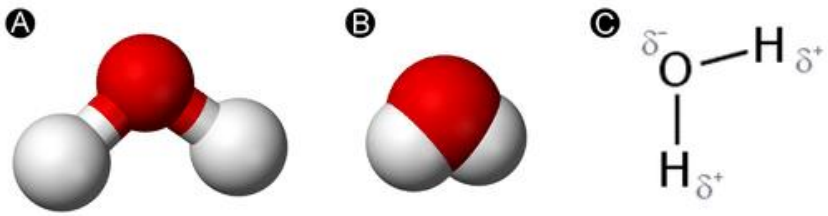




Water is a polar molecule, as greater electron density is found around the more electronegative oxygen atom.

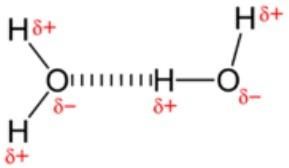
What is the Structure of water:

Water is a simple molecule consisting of one oxygen atom bonded to two different hydrogen atoms. Because of the higher **electronegativity** of the oxygen atom, the bonds are polar covalent (**polar bonds**). The oxygen atom attracts the shared electrons of the covalent bonds to a significantly greater extent than the hydrogen atoms. As a result, the oxygen atom acquires a partial negative charge (δ−), while the hydrogen atoms each acquire a partial positive charge (δ+). The molecule adopts a bent structure because of the two lone pairs of electrons on the oxygen atom. The H−O−H bond angle is about 105 degrees.

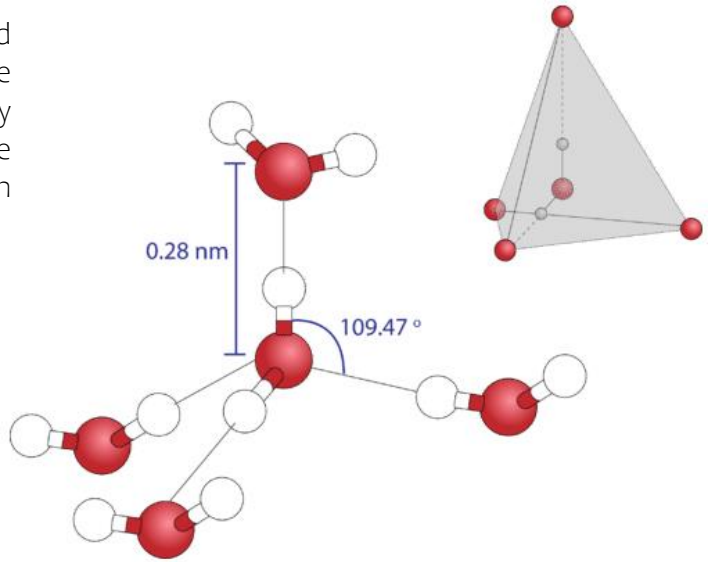


The water molecule, visualized three different ways: ball-and-stick model, space-filling model, and structural formula with partial charges.

Polar molecules attract one another by dipole-dipole forces, as the positive end of one molecule is attracted to the negative end of the nearby molecule. In the case of water, the highly polar O−H bonds results in very little electron density around the hydrogen atoms. Each hydrogen atom is strongly attracted to the lone-pair electrons on an adjacent oxygen atom. These are called hydrogen bonds and are stronger than conventional dipole-dipole forces.



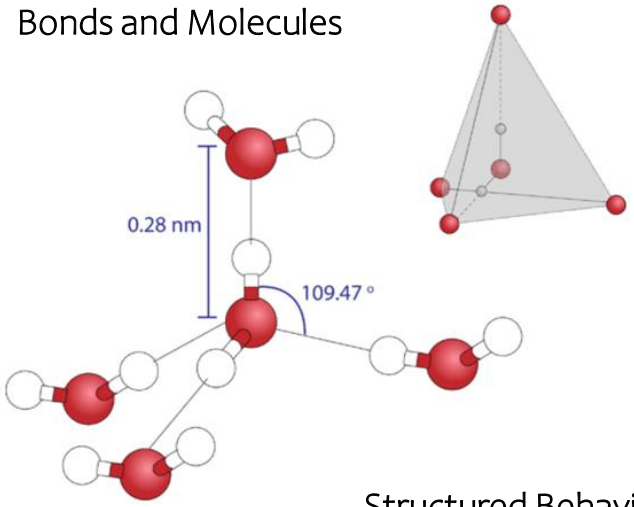
Because each oxygen atom has two lone pairs, it can make hydrogen bonds to the hydrogen atoms of two separate other molecules. The model to the right shows the result — an approximately tetrahedral geometry around each oxygen atom, consisting of two covalent bonds and two hydrogen bonds.



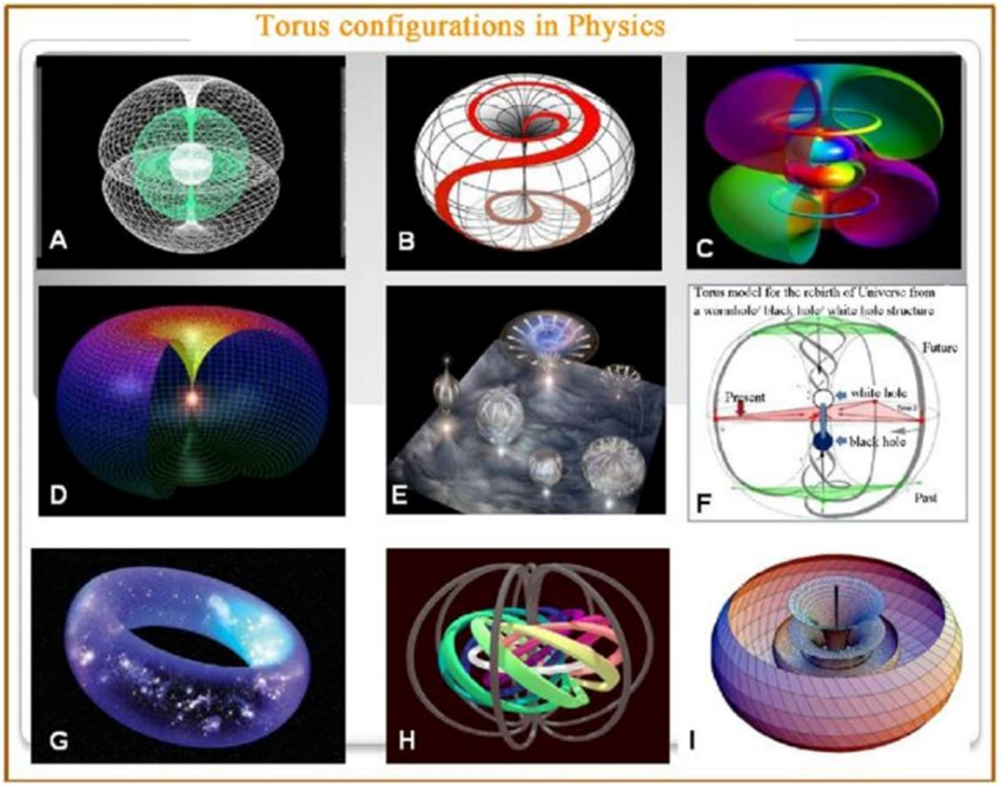
As a result of two covalent bonds and two hydrogen bonds, the geometry around each oxygen atom is approximately tetrahedral.

Structural, Molecular, Magnetohydrodynamics

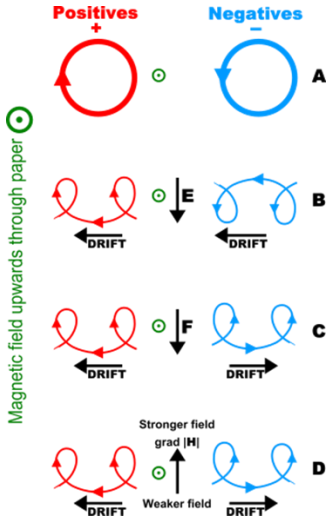
Bonds and Molecules

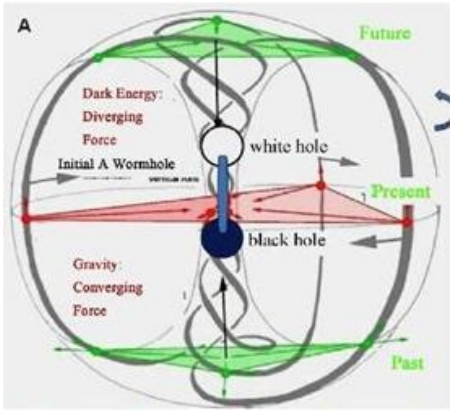


Particle



Structured Behaviour



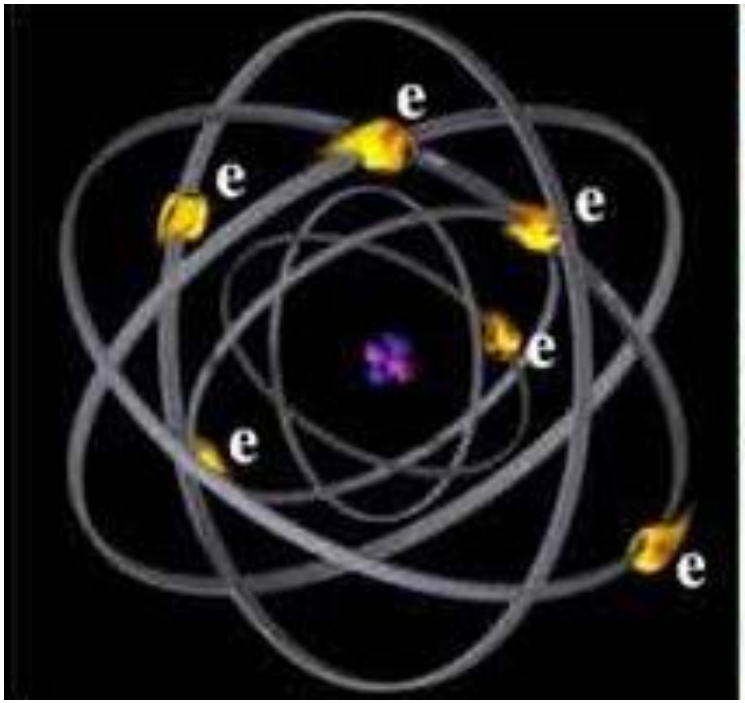


Universe ~ Dimension ~ Theory

A Happy mix of Classical Physics and Quantum Mechanics

Part 4.

Atomic Structure



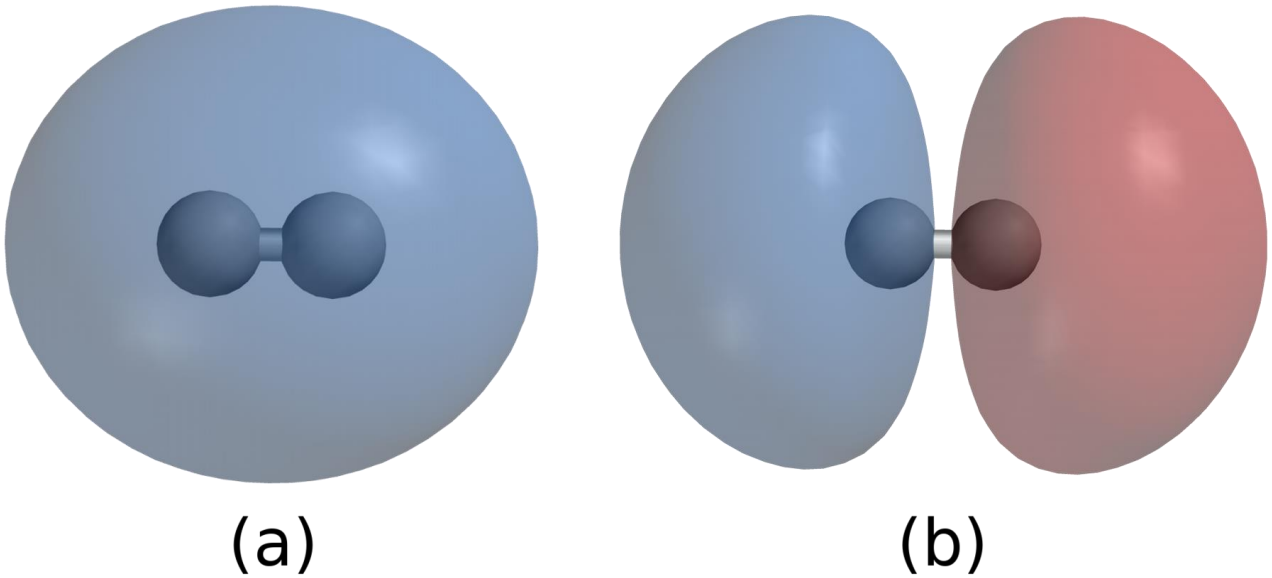
An atom is a complex arrangement of negatively charged electrons arranged in defined shells about a positively charged nucleus. This nucleus contains most of the atom's mass and is composed of protons and neutrons (except for common hydrogen which has only one proton).

Bonds and Molecules

What is a Chemical Bond?

A **chemical bond** is a lasting attraction between atoms or ions that enables the formation of molecules, crystals, and other structures. The bond may result from the electrostatic force between oppositely charged ions as in ionic bonds, or through the sharing of electrons as in covalent bonds. The strength of chemical bonds varies considerably; there are "strong bonds" or "primary bonds" such as covalent, ionic and metallic bonds, and "weak bonds" or "secondary bonds" such as dipole–dipole interactions, the London dispersion force, and hydrogen bonding.

Since opposite electric charges attract, the negatively charged electrons surrounding the nucleus and the positively charged protons within a nucleus attract each other. Electrons shared between two nuclei will be attracted to both of them.



Covalent bonding of two hydrogen atoms to form a hydrogen molecule, H_2. In (a) the two nuclei are surrounded by a cloud of two electrons in the bonding orbital that holds the molecule together. (b) shows hydrogen's antibonding orbital, which is higher in energy and is normally not occupied by any electrons.

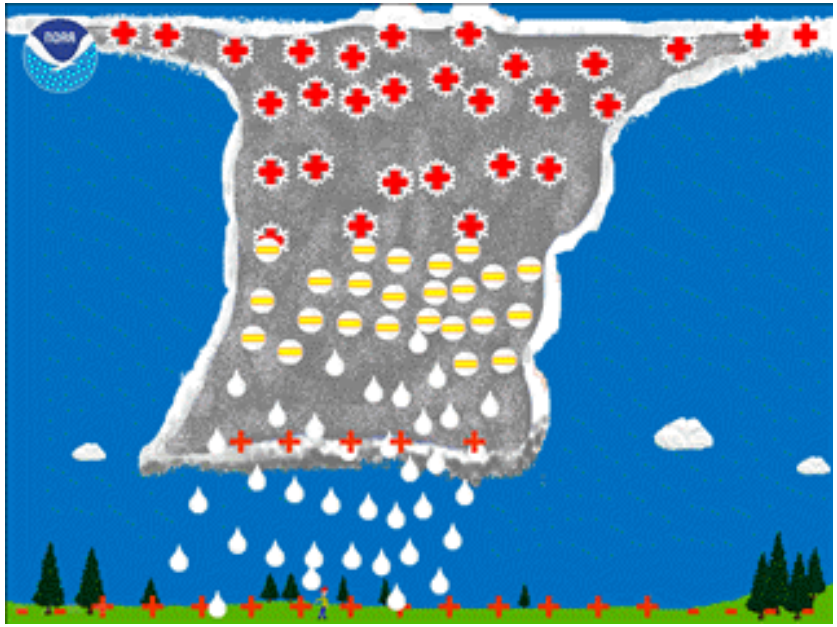
Electricity

What is Electricity?

Electricity is the set of physical phenomena associated with the presence and motion of matter that has a property of electric charge.Electricity is related to magnetism, both being part of the phenomenon of electromagnetism, as described by Maxwell's equations. Various common phenomena are related to electricity, including lightning, static electricity, electric heating, electric discharges and many others.

The presence of either a positive or negative electric charge produces an electric field. The movement of electric charges is an electric current and produces a magnetic field. In most applications, a force acts on a charge with a magnitude given by Coulomb's law. Electric potential is typically measured in volts.

Lightning (pictured) and urban lighting are some of the most dramatic effects of electricity



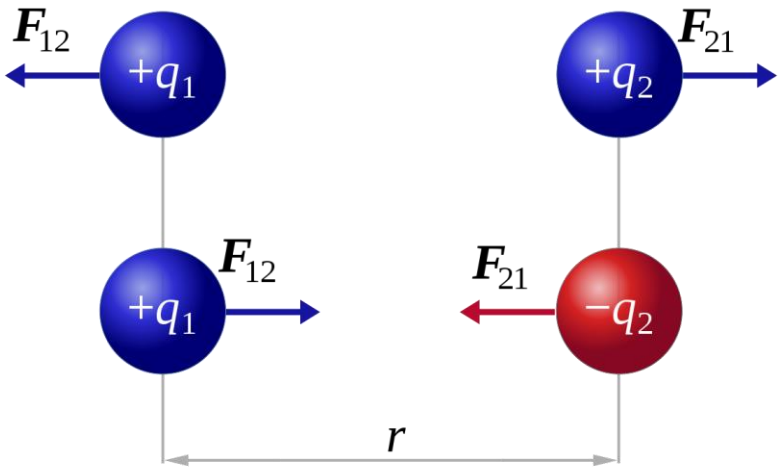
The upper part of the thunderstorm cloud becomes positively charged while the middle to the lower part of the thunderstorm cloud becomes negatively charged.

Elecrostatic Force?

What is Electrostatic Force?

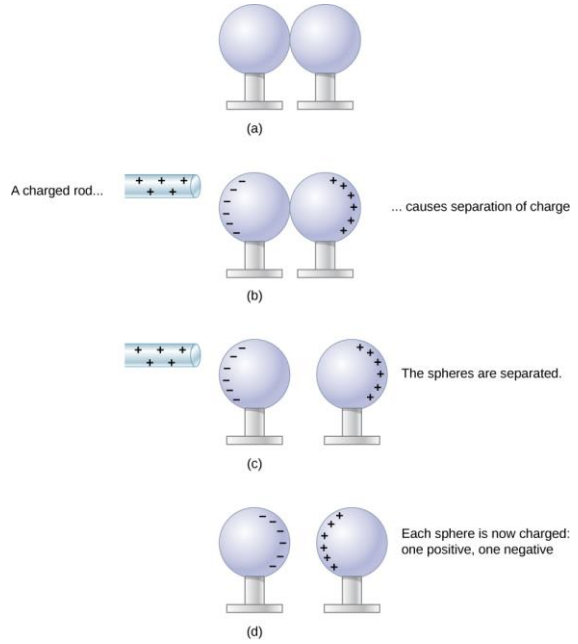
Coulomb's law

Coulomb's inverse-square law, or simply Coulomb's law, is an experimental law[1] of physics that calculates the amount of force between two electrically charged particles at rest. This electric force is conventionally called *electrostatic force* or Coulomb force.[2] Although the law was known earlier, it was first published in 1785 by French physicist Charles-Augustin de Coulomb. Coulomb's law was essential to the development of the theory of electromagnetism and maybe even its starting point,[1] as it allowed meaningful discussions of the amount of electric charge in a particle.



$$\left|\boldsymbol{F}_{12}\right| = \left|\boldsymbol{F}_{21}\right| = k_e \frac{|q_1 \times q_2|}{r^2}$$

The magnitude of the electrostatic force $\boldsymbol{F}$ between two point charges q_1 and q_2 is directly proportional to the product of the magnitudes of charges and inversely proportional to the square of the distance between them. Like charges repel each other, and opposite charges attract each other.



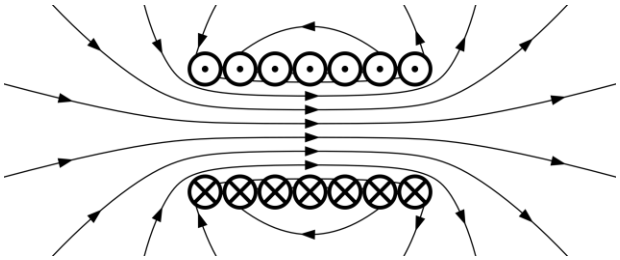
Charging by induction. (a) Two uncharged or neutral metal spheres are in contact with each other but insulated from the rest of the world. (b) A positively charged glass rod is brought near the sphere on the left, attracting negative charge and leaving the other sphere positively charged. (c) The spheres are separated before the rod is removed, thus separating negative and positive charges. (d) The spheres retain net charges after the inducing rod is removed—without ever having been touched by a charged object.

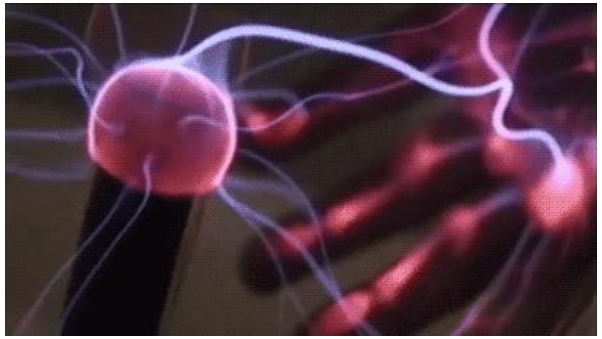
Electromagnetism

What is Electromagnetism?

In physics, **electromagnetism** is an interaction that occurs between particles with electric charge via electromagnetic fields. The electromagnetic force is one of the four fundamental forces of nature. It is the dominant force in the interactions of atoms and molecules. Electromagnetism can be thought of as a combination of electrostatics and magnetism, two distinct but closely intertwined phenomena.

Electromagnetic forces occur between any two charged particles, causing an attraction between particles with opposite charges and repulsion between particles with the same charge, while magnetism is an interaction that occurs exclusively between charged particles in relative motion. These two effects combine to create electromagnetic fields in the vicinity of charged particles, which can accelerate other charged particles via the Lorentz force. At high energy, the weak force and electromagnetic force are unified as a single electroweak force.



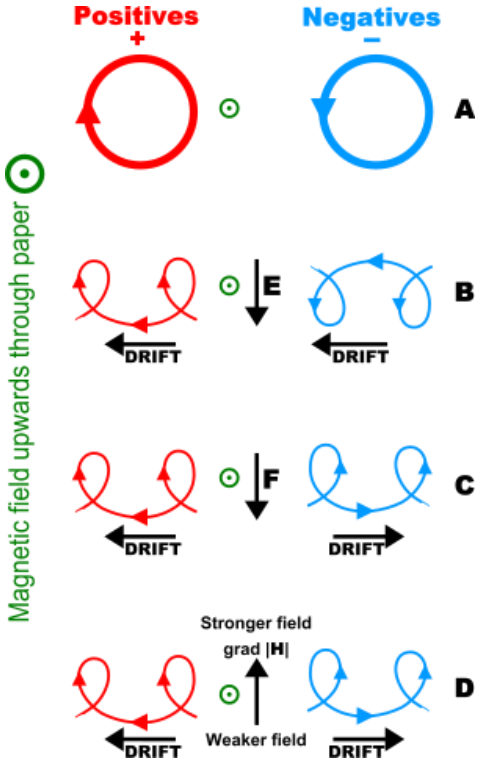


The electromagnetic force is the second strongest of the four known fundamental forces. It operates with infinite range.

Some scientists hypothesize that a fifth force might exist, but these hypotheses remain speculative. It is possible, however, that the fifth force is a combination of the prior four forces in the form of a scalar field

Electromagnetic interactions are responsible for the glowing filaments in this plasma globe

In many cases of practical interest, the motion in a magnetic field of an electrically charged particle (such as an electron or ion in a plasma) can be treated as the superposition of a relatively fast circular motion around a point called the **guiding center** and a relatively slow **drift** of this point. The drift speeds may differ for various species depending on their charge states, masses, or temperatures, possibly resulting in electric currents or chemical separation.



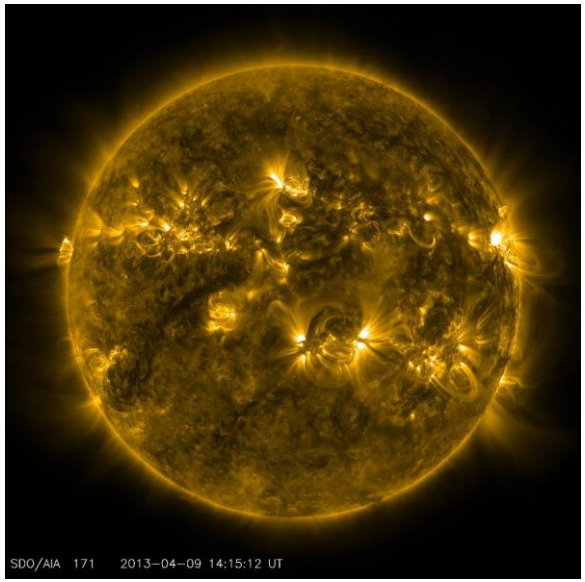
Charged particle drifts in a homogeneous magnetic field. (A) No disturbing force (B) With an electric field, E (C) With an independent force, F (e.g. gravity) (D) In an inhomogeneous magnetic field, grad H

Magnetohydrodynamics

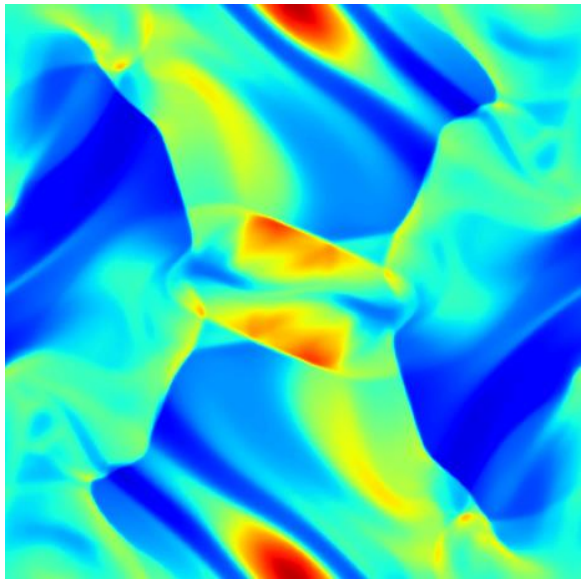
What is Magnetohydrodynamics?

Magnetohydrodynamics (**MHD**; also called **magneto-fluid dynamics** or **hydromagnetics**) is a model of electrically conducting fluids that treats all interpenetrating particle species together as a single continuous medium. It is primarily concerned with the low-frequency, large-scale, magnetic behavior in plasmas and liquid metals and has applications in numerous fields including geophysics, astrophysics, and engineering.

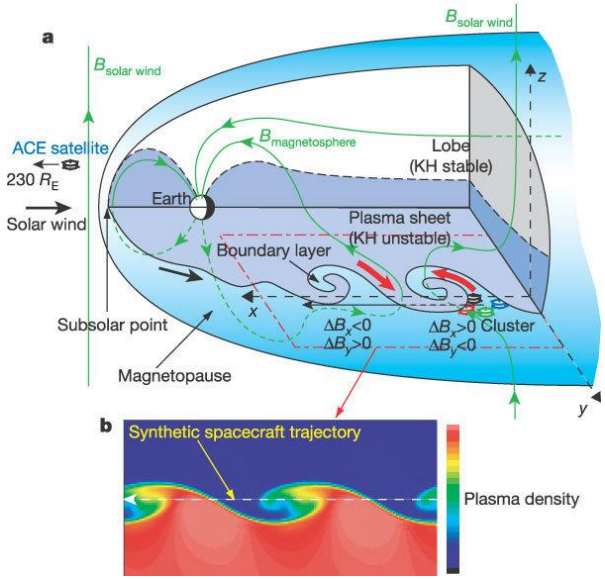
The word *magnetohydrodynamics* is derived from *magneto-* meaning magnetic field, *hydro-* meaning water, and *dynamics* meaning movement. The field of MHD was initiated by Hannes Alfvén, for which he received the Nobel Prize in Physics in 1970.



The plasma making up the Sun can be modeled as an MHD system



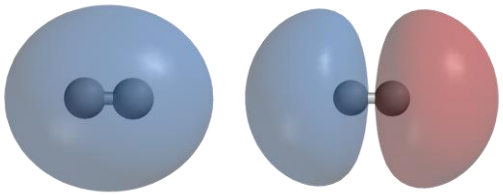
Simulation of the Orszag–Tang MHD vortex problem, a well-known model problem for testing the transition to supersonic 2D MHD turbulence

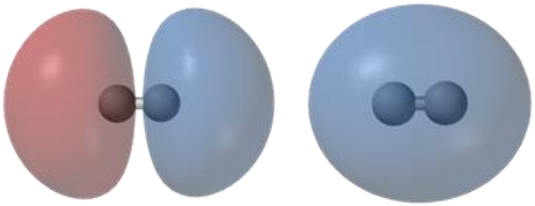


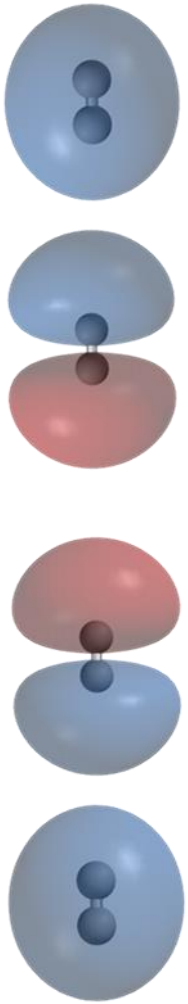
Schematic view of the different current systems which shape the Earth's magnetosphere

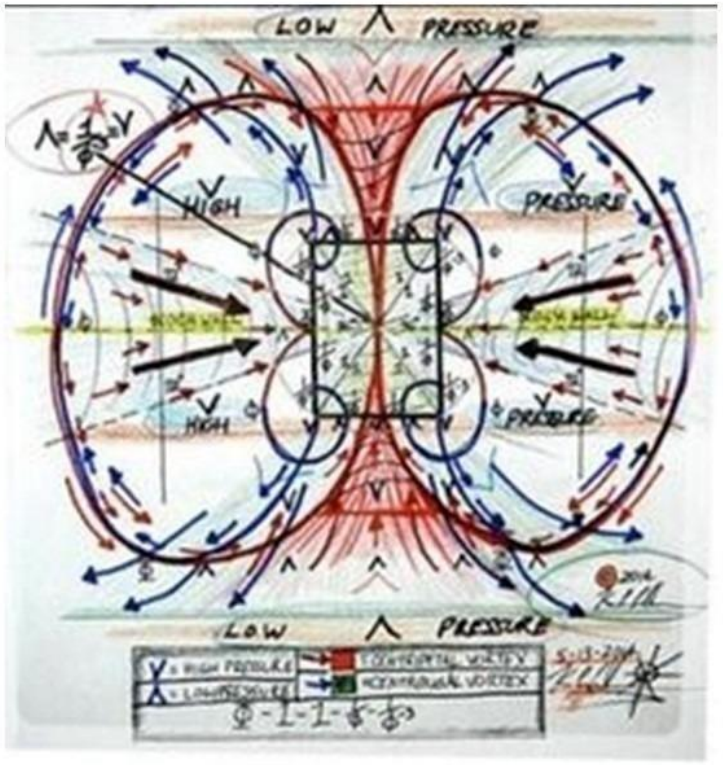
Magnetohydrodynamics

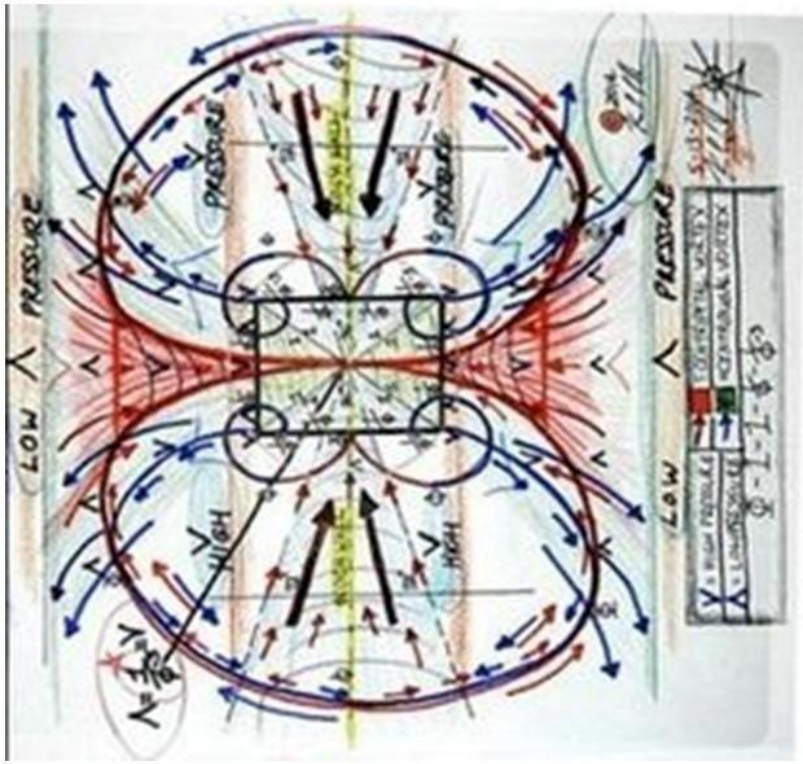
Double Helix Toroid Model ~ found When examining Vorticity in the movement of matter

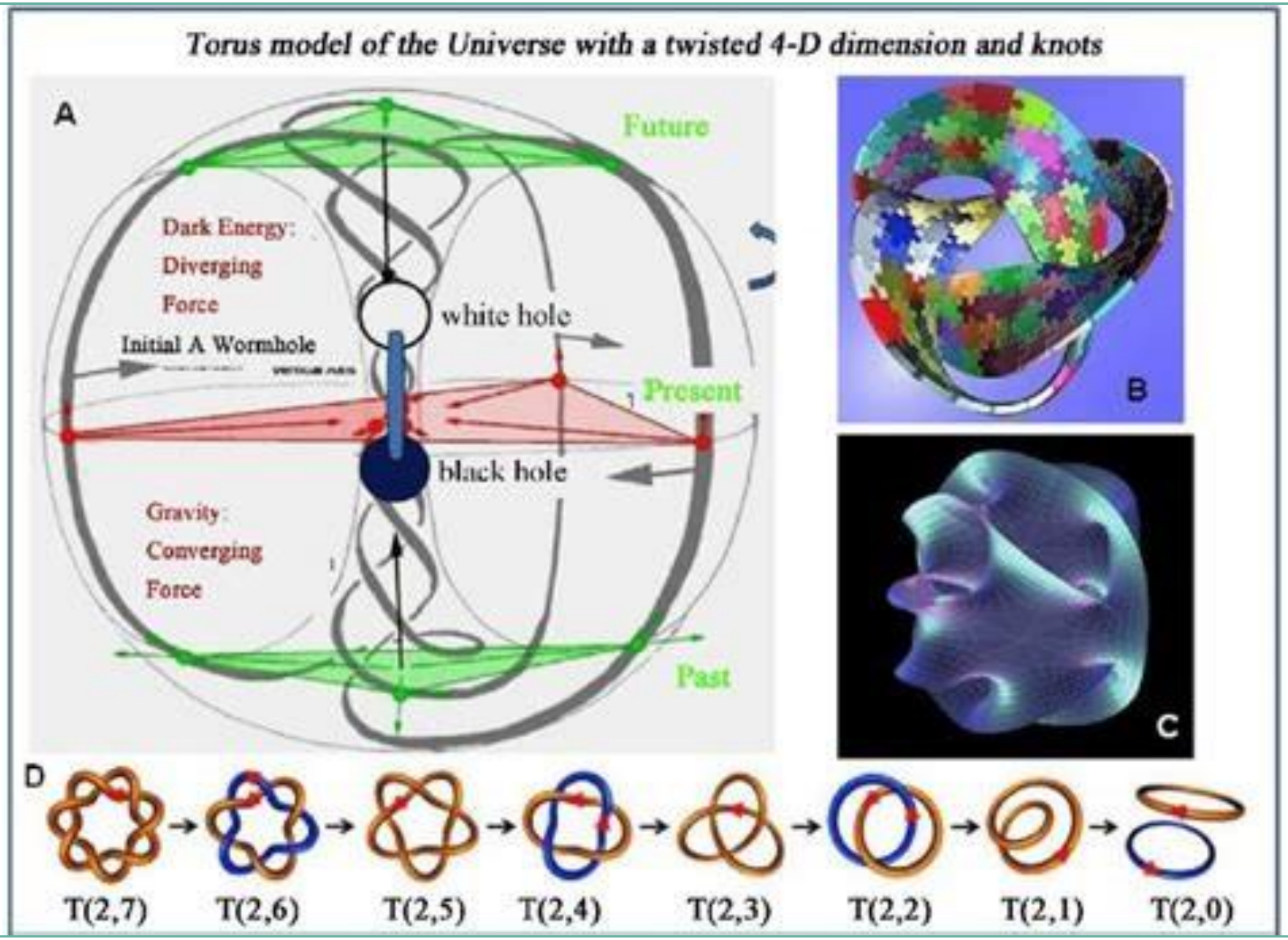


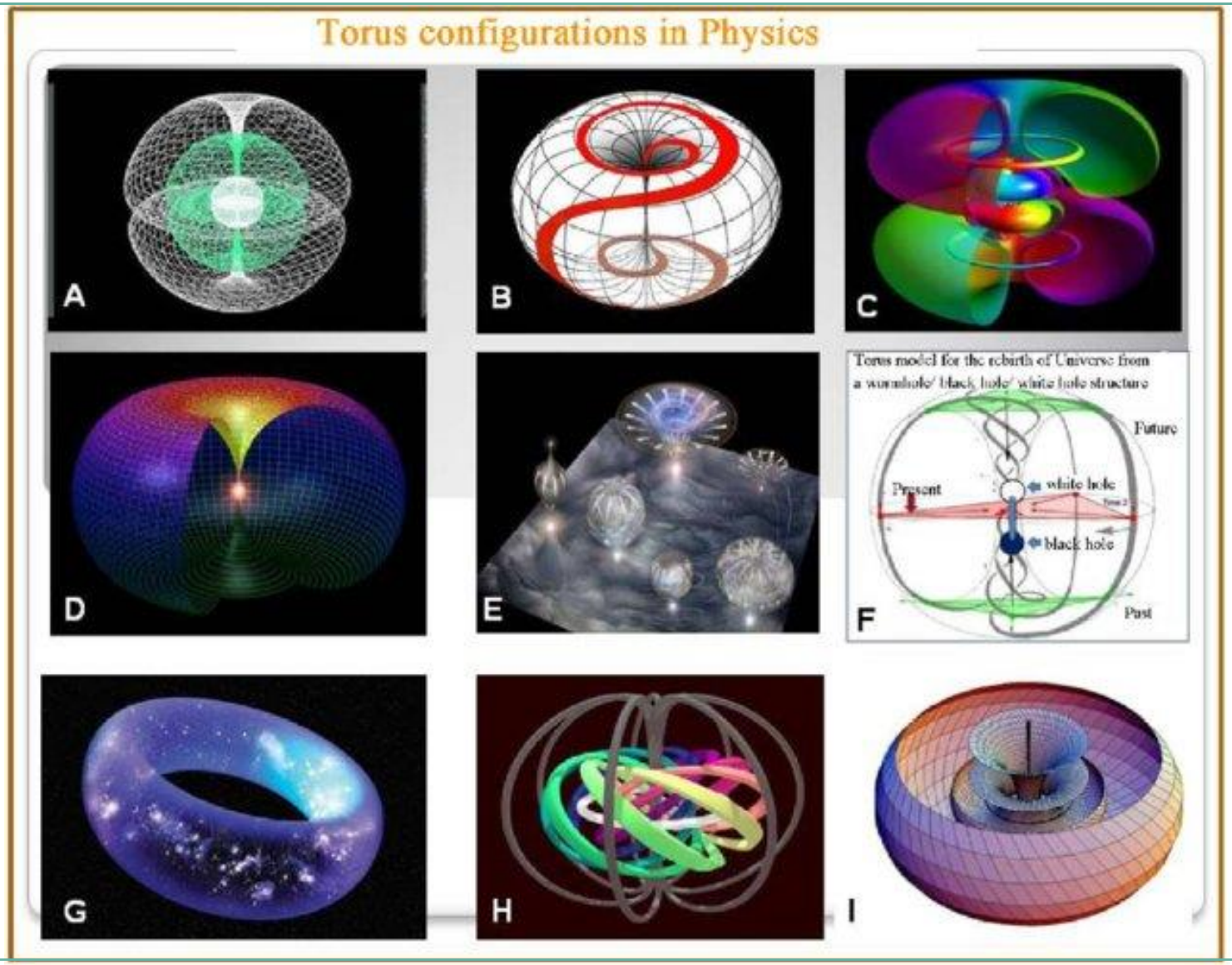









Torus model of the Universe with a twisted 4-D dimension and knots
A
Future
Dark Energy:
Diverging
Force
white hole
Initial A Wormhole
Present
black hole
Gravity:
Converging
Force
Past
B
C
D
T(2,7)
T(2,6)
T(2,5)
T(2,4)
T(2,3)
T(2,2)
T(2,1)
T(2,0)

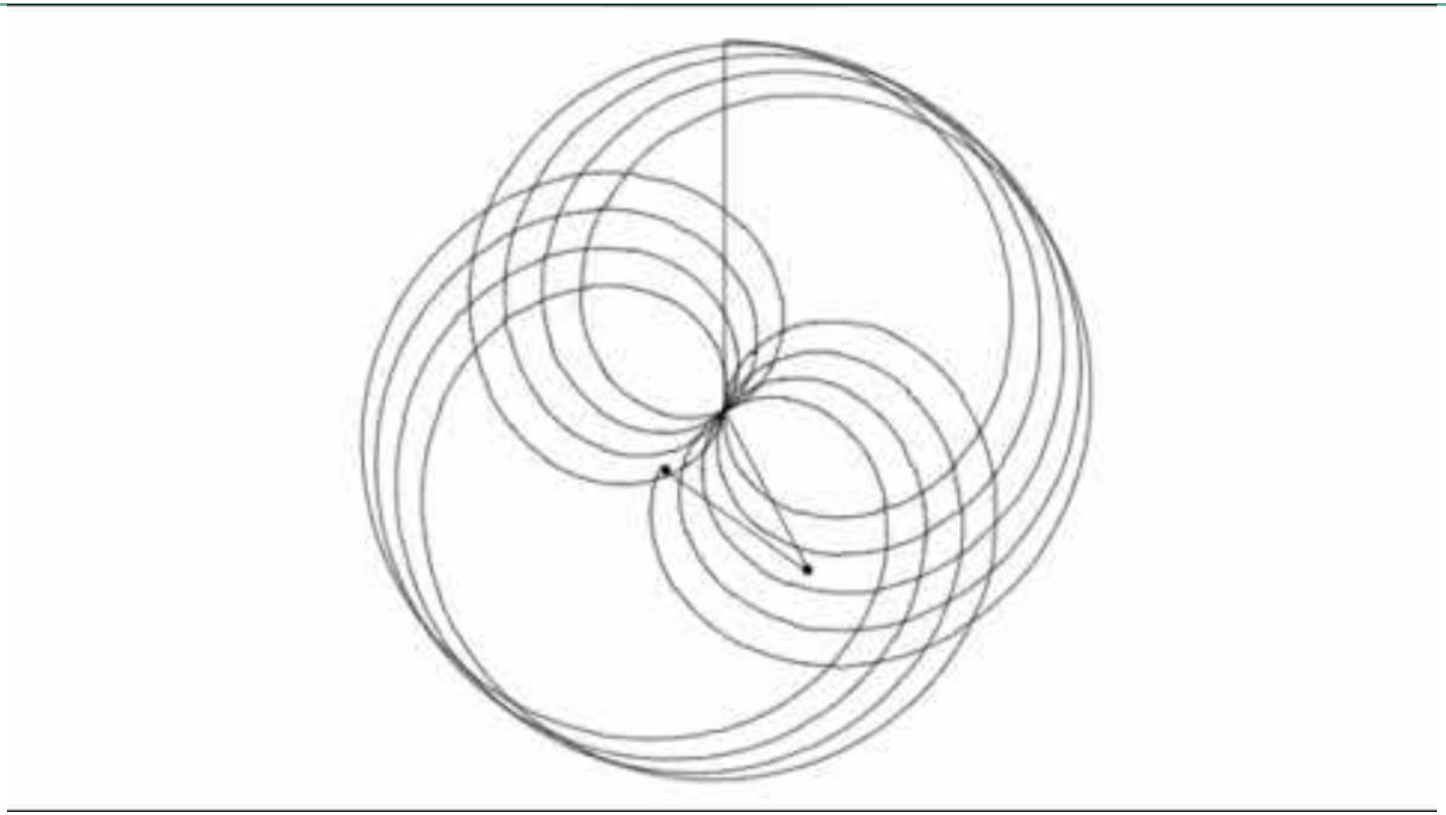

Torus configurations in Physics
A
B
C
D
E
Torus model for the rebirth of Universe from
a wormhole/ black hole/ white hole structure
Future
Present
white hole
black hole
Past
F
G
H
I

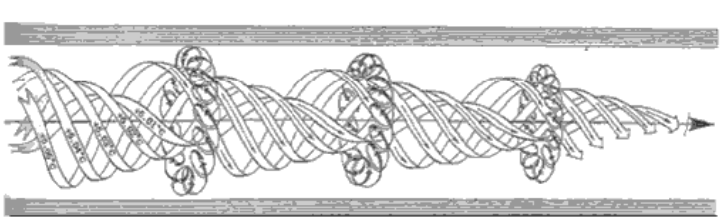
Part 5.

Water

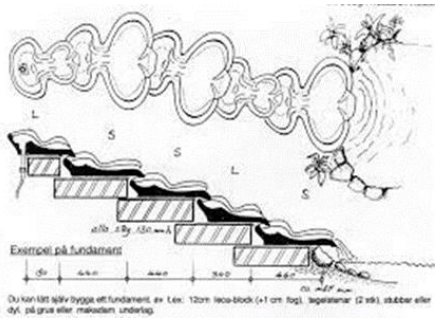
An Observable ‘AND’ Continuous Medium.

As Observed in The Body of Water ~ How might "A Continuous Medium" of Electrically Conducting Fluids flow?

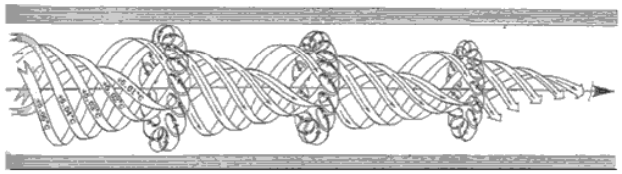




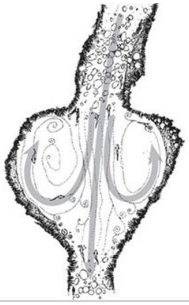
From Callum Coat's book on Schauberger's vorticular flows.

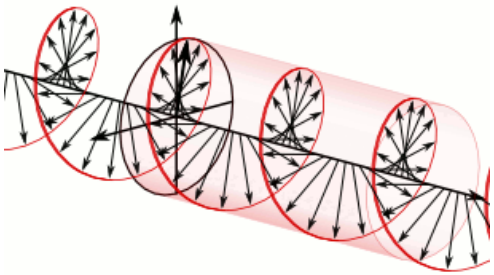


Rejuvenation process of a River.



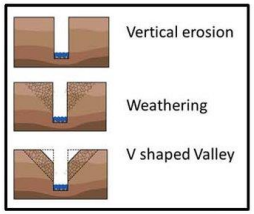
From Callum Coat's book on Schauberger's vorticular flows.





Upper Course

flows with high velocity
V-shaped valley
vertical erosion dominates
waterfalls, rapids, gorges etc.

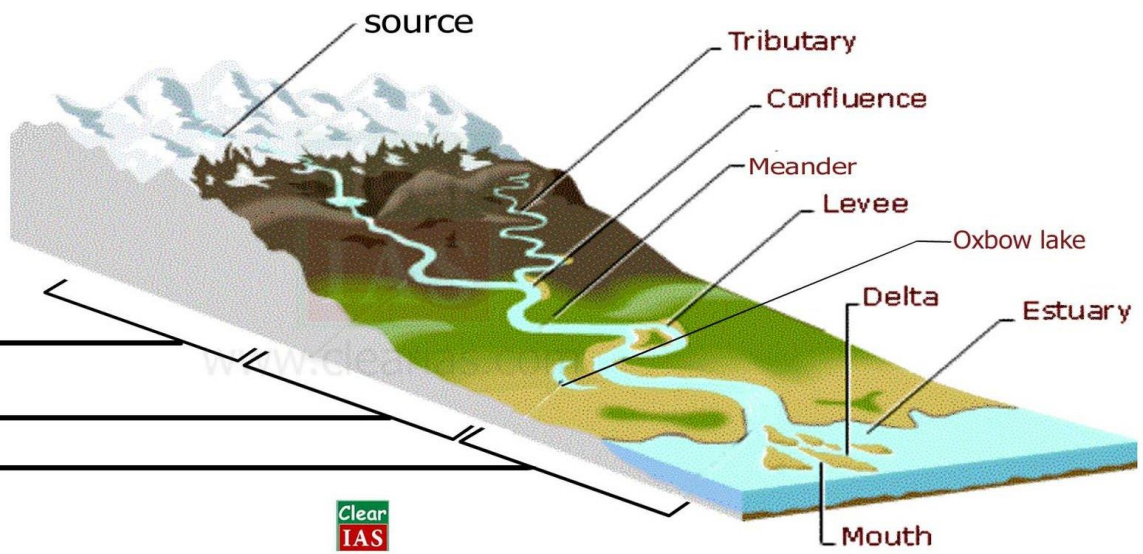


Middle Course

flows with moderate velocity
vertical and lateral erosion
plenty of streams
meanders, alluvial fans etc.

Lower Course

flows with low velocity
lateral erosion dominates &
wide channels
extensive flood plains
braided channels,
levees, oxbow lakes, meanders, deltas etc.



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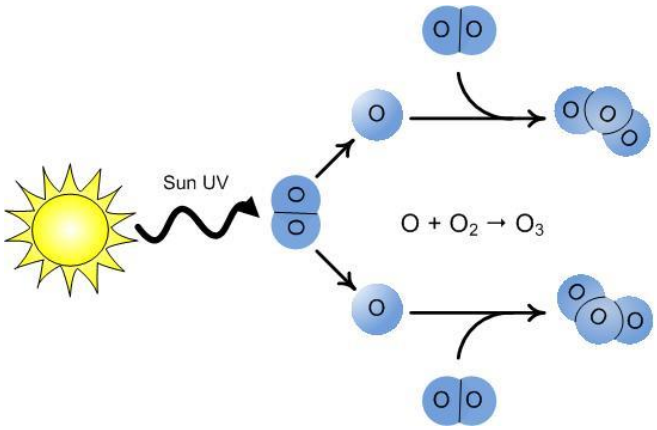
Stages of a River

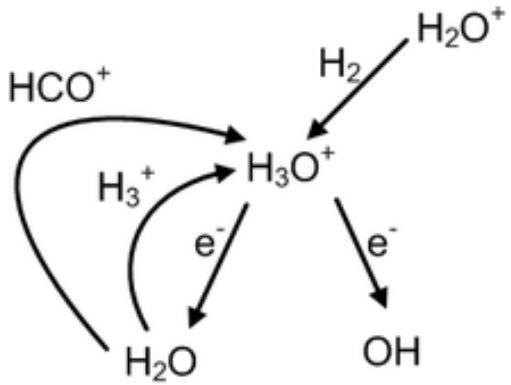
Note ~ The Fractal flow-pattern of a river, replicates the Birkeland current.

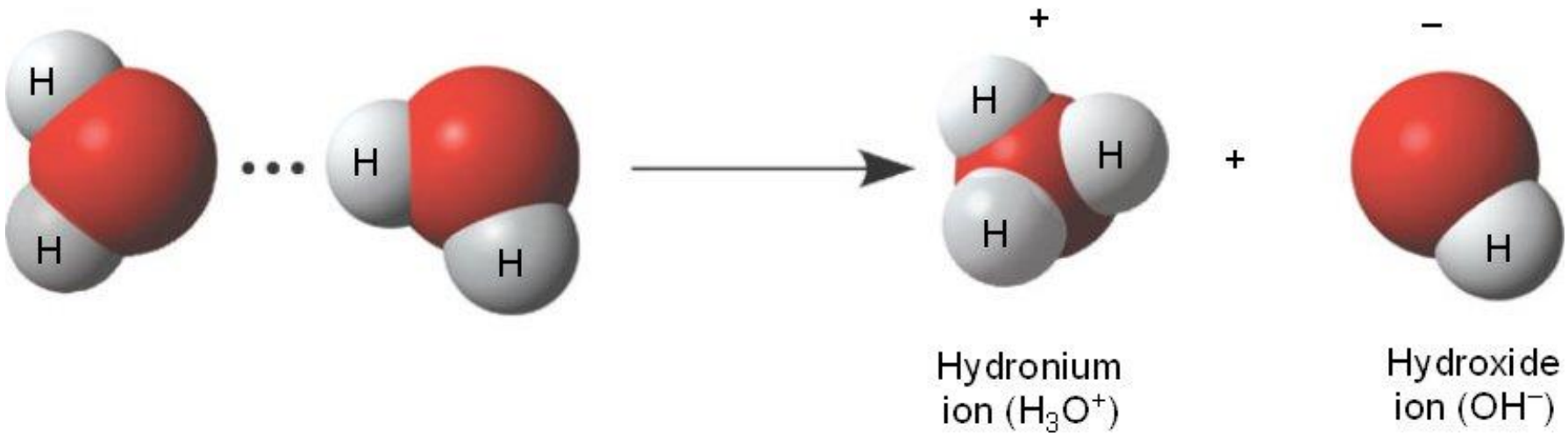
What then, is the Structure of "Structured" water:



Very similar to Solar photons bumping into Oxygen, making Ozone ~ Although a little more complex in form, water bumping into photons and radical ions or electrons creates hydronium and hydroxides or hydroxyl groups.

Thus: the molecular structure of water can be structurally modified by means of specifically designed forms, that encourage particular energetical interactions among the content carried.





In a **hydroxyl** group (**-OH**), a hydrogen atom is bonded to an **oxygen** atom, which in turn is bonded to the carbon skeleton of the organic molecule.The electronegative **oxygen** atom confers **polar** (and **hydrophilic**) properties to this group.
Do not confuse this functional group with the hydroxide ion, **OH^-** .

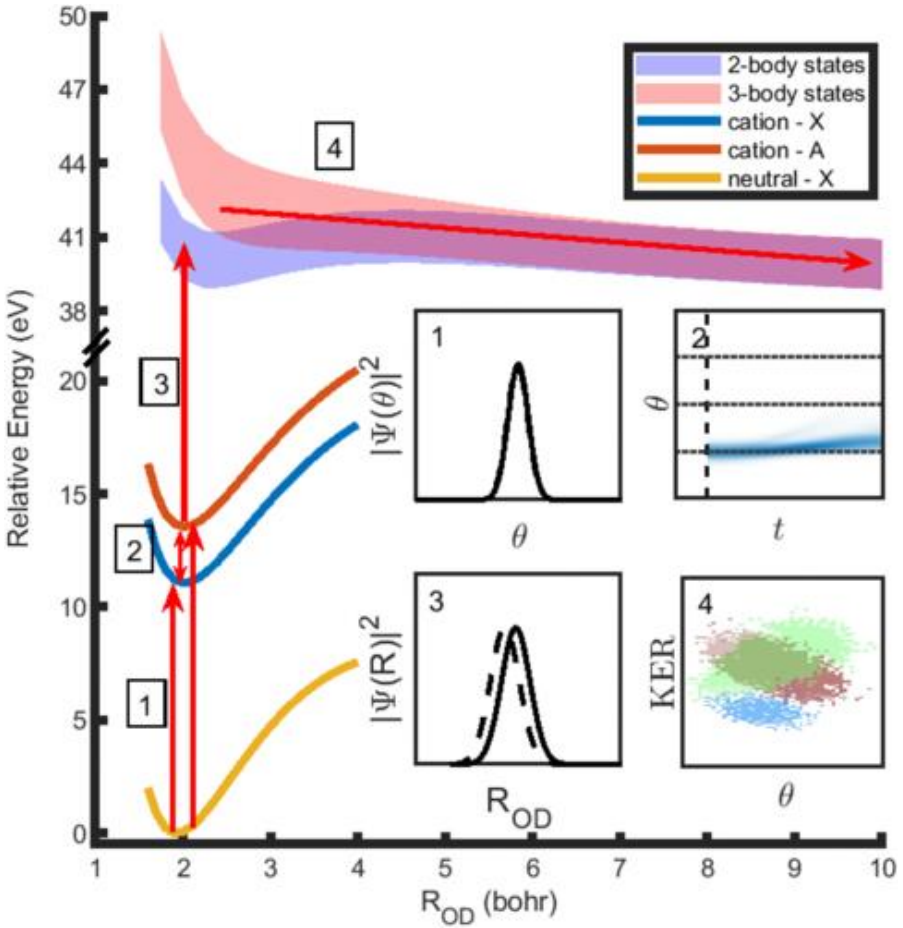
What then, is the Structure of "Structured" water:

So! Can we say that flowing water is ionized by the MHD of the atomic molecular structure?

Water ionization is the process of breaking water molecules into hydrogen and hydroxide ions, which can be caused by various factors, such as heat, electricity, radiation, or chemical reactions
Electronic and nuclear dynamics en route to double ionization

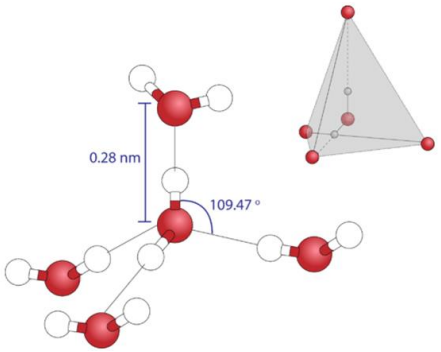
Quantum electromagnetic movement of the atomic molecular structure refers to the quantum fluctuations of the electrons and nuclei in the water molecules, which are influenced by the electric and magnetic fields of light and other sources.
Nuclear dynamics revealed by varying the pulse duration

Image right: Summary plot with PES of relevant states. From high energy to low energy are three-body dissociation states [red (light gray) shading], two-body dissociation states [magenta (dark gray) shading], the cationic A state [brown (medium gray) curve], the cationic X state [blue (dark gray) curve], and neutral X state [yellow (light gray) curve]. The four inset panels replotting the early figures (Figs. 3, 4, and 6). Four different steps participate in the strong-field double ionization of water: (1) tunnel ionization to the X and A states of the monocation, which involves reshaping of the wave function due to R-dependent ionization, (2) near-resonant coupling of X and A states as well as motion on the A state potential, (3) ionization to the dication, which also involves reshaping of the wave function, and (4) dication dissociation, which can be simulated through trajectory calculations.



We CAN say that flowing water is ionized by the MHD of the atomic "molecular" structure?

According to one study, the interaction of light with liquid water can generate quantum coherent domains, in which the water molecules oscillate between the ground state and an excited state close to the ionizing potential of water. This produces a plasma of almost free electrons, which can favour redox reactions, the basis of energy metabolism in living organisms. Illuminating Water and Life..



As a result of two covalent bonds and two hydrogen bonds, the geometry around each oxygen atom is approximately tetrahedral.

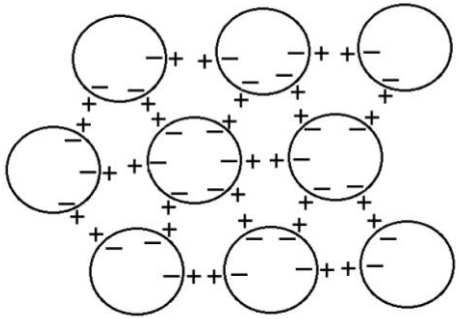
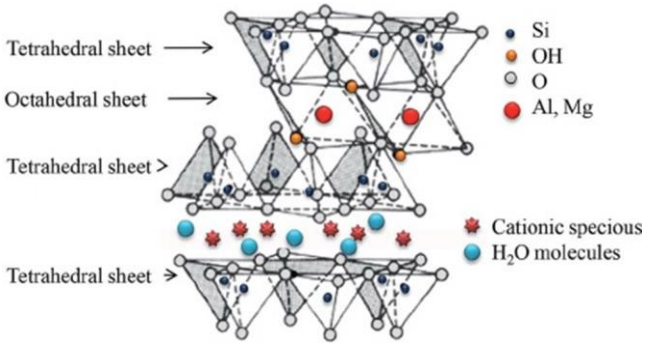


Figure 2: Spherical coherent domains forming a three-dimensional dipole structure; note the six-fold symmetry resulting from the close-packing of spheres.



Clay is composed of an octahedral sheet sandwiched between two tetrahedral sheets. These are the layers of tetrahedrally arranged silicate and octahedrally arranged aluminate groups.

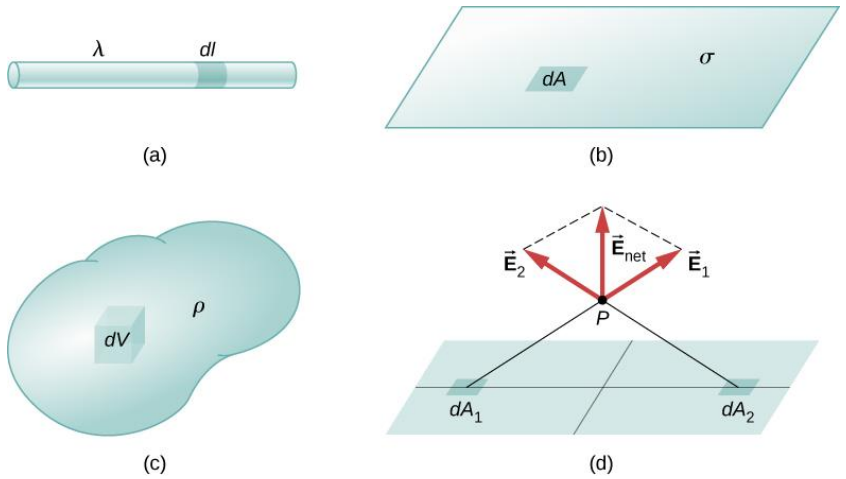
The coherent oscillations maintained by the electromagnetic field trapped within the CDs can occur not just between the coherent ground state and excited state of the electrons of the water molecule, but also between two rotational levels, which produce correlations as large as several hundred microns, giving rise to a common dipole orientation, but a net zero polarization field (on account of its symmetry), unless and until the rotation symmetry is broken. The combination of the coherent oscillations and rotations, therefore, produces phase-locked coherent interactions among the CDs, resulting in stable supramolecular clusters with the electret structure depicted in **Figure 2**. The diagram should be read quantum mechanically, with delocalized clouds of oscillating positive and negative charges between coherently rotating domains.

Therefore, water can be ionized by the quantum electromagnetic movement of the atomic molecular structure as it flows, depending on the intensity and frequency of the external fields and the properties of the water itself. However, this is a complex and dynamic phenomenon that requires further investigation and experimentation to fully understand and verify.

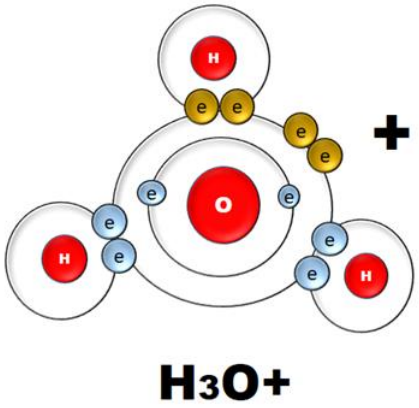
BUT ~ What we're 'actually' observing is an ANIMATE field of Continuous Charge Distribution:

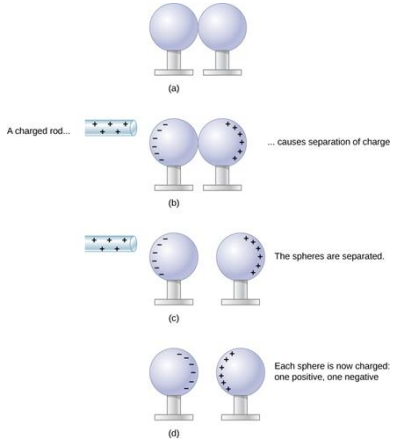
The charge distributions we have seen so far have been discrete: made up of individual point particles. This is in contrast with a continuous charge distribution, which has at least one nonzero dimension. If a charge distribution is continuous rather than discrete, we can generalize the definition of the electric field. We simply divide the charge into infinitesimal pieces and treat each piece as a point charge.

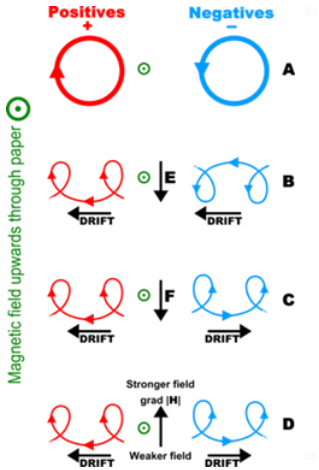
Note that because charge is quantized, there is no such thing as a "truly" continuous charge distribution. However, in most practical cases, the total charge creating the field involves such a huge number of discrete charges that we can safely ignore the discrete nature of the charge and consider it to be continuous. This is exactly the kind of approximation we make when we deal with a bucket of water as a continuous fluid, rather than a collection of H_2O molecules.

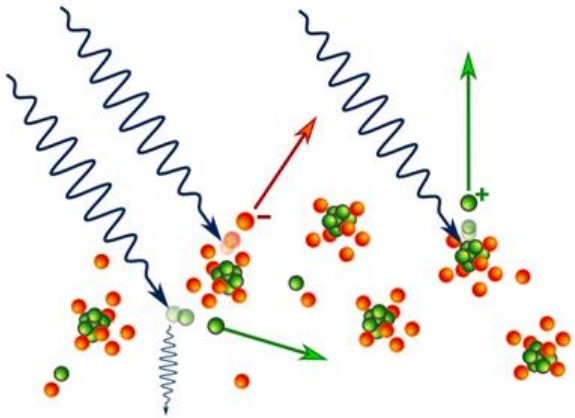


The configuration of charge differential elements for a (a) line charge, (b) sheet of charge, and (c) a volume of charge. Also note that (d) some of the components of the total electric field cancel out, with the remainder resulting in a net electric field.



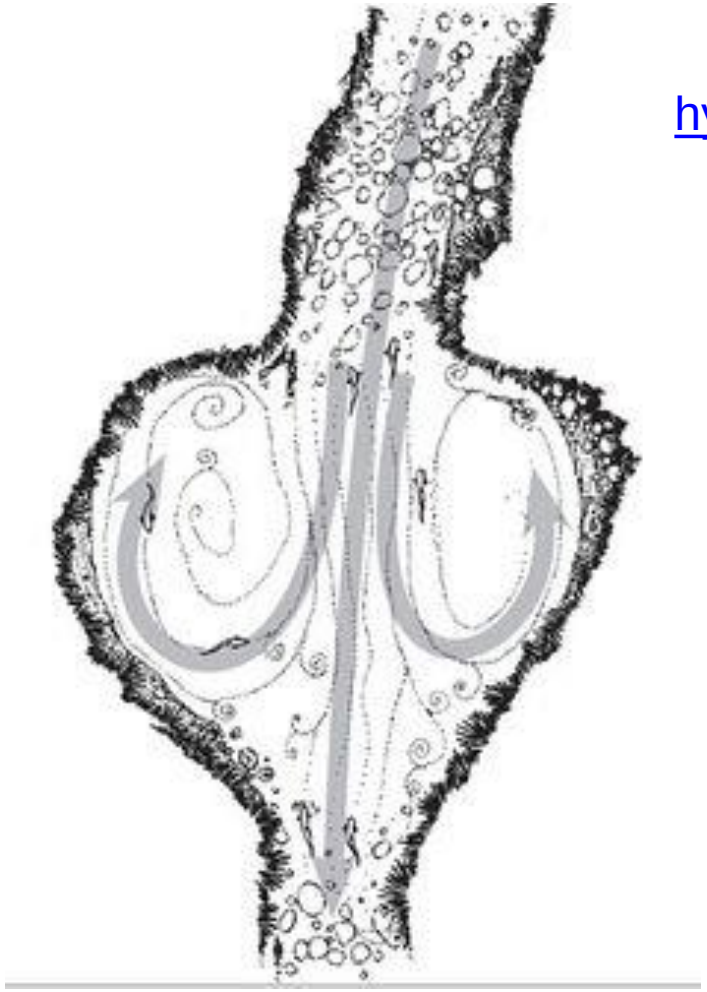




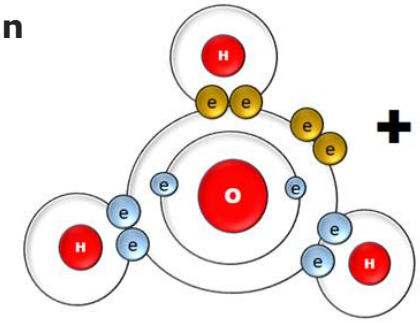


Quantum Theory and Atomic Structure, as an effect of the Quantum Electromagnetic Field:

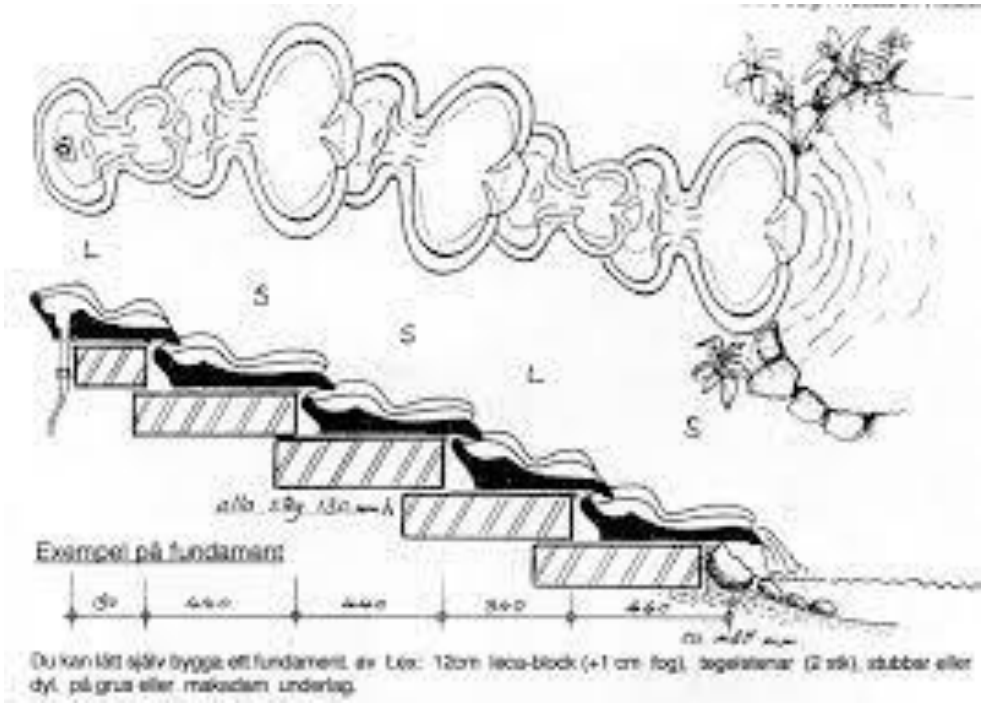
Water; moving through flowing forms, rejuvenates itself as if in a mountain stream; Where the forms can be designed to amplify the effect of the Existing Plasma Relationships within Continuous Medium.



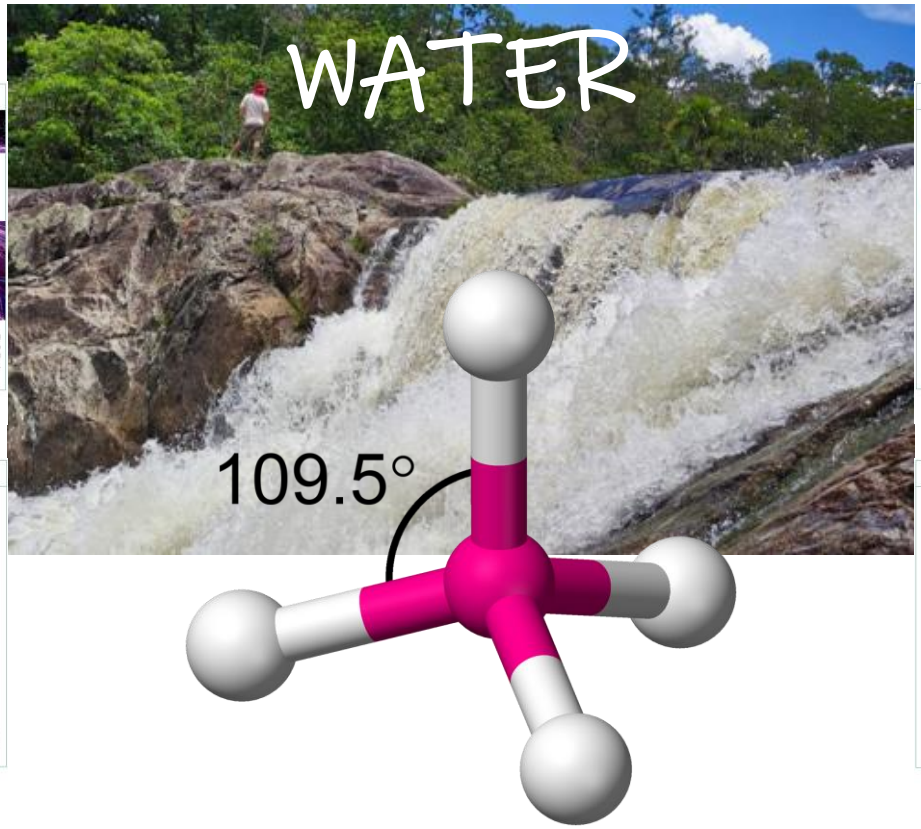
[hydroxyl-hydronium Complex]



H_3O^+



Tetrahedral Symmetry? YES ~ Structure? NOT NECESSARILY.



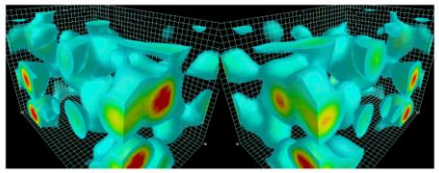
Part 1.

Plasma

The word plasma is used to describe a wide variety of macroscopically neutral substances containing many interacting free electrons and ionized atoms or molecules, which exhibit collective behavior due to the long-range coulomb forces. Not all media containing charged particles, however, can be classified as plasmas. For a collection of interacting charged and neutral particles to exhibit plasma behavior it must satisfy certain conditions, or criteria, for plasma existence.

Part 2.

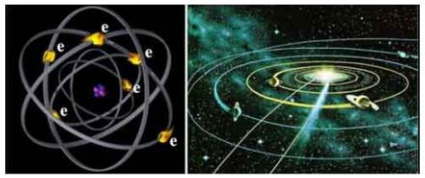
Quantum Field (as a structure?)



Relativistic quantum electrodynamics, which describes the electromagnetic interactions of electrons and atomic nuclei, provides the basis for modeling the electronic structure of atoms, molecules and solids and of their interactions with photons and other projectiles.

Part 4.

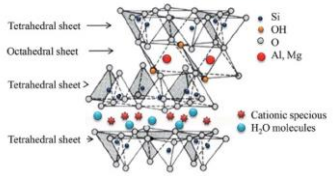
Atomic Structure



An atom is a complex arrangement of negatively charged electrons arranged in defined shells about a positively charged nucleus. This nucleus contains most of the atom's mass and is composed of protons and neutrons (except for common hydrogen which has only one proton).

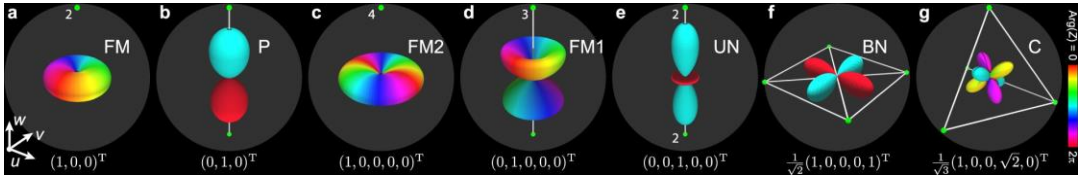
Part 3.

Molecular Structure



Molecular structure is actually three-dimensional, and it is important to be able to describe molecular bonds in terms of their distances, angles, and relative arrangements in space. A **bond angle** is the angle between any two bonds that include a common atom, usually measured in degrees. A **bond distance** (or bond length) is the distance between the nuclei of two bonded atoms along the straight line joining the nuclei.

An international collaboration of scientists has created and observed an entirely new class of vortices—the whirling masses of fluid or air.



"One consequence is that if the positions of two vortices are interchanged, they can leave a trace of the process lingering in the fluid. This trace links the interacting vortices together permanently, like a rung in a ladder." Dr. Magnus Borgh, Associate Professor in Physics at UEA.

Muito obrigado!

World Water Community

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