Foundation for Mind-Being research

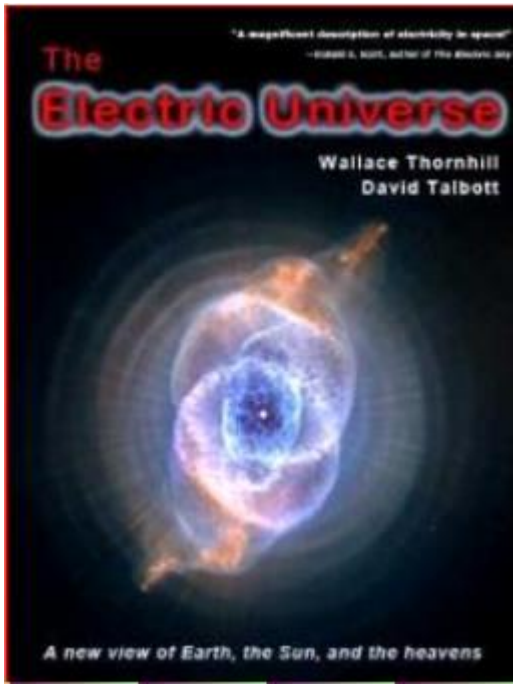
SEGMENTS FROM A COURSE ON THE NATURE OF MIND-BEING

The Relationships and Evidence: Consciousness, Science, Spirituality, and Nature of the Universe

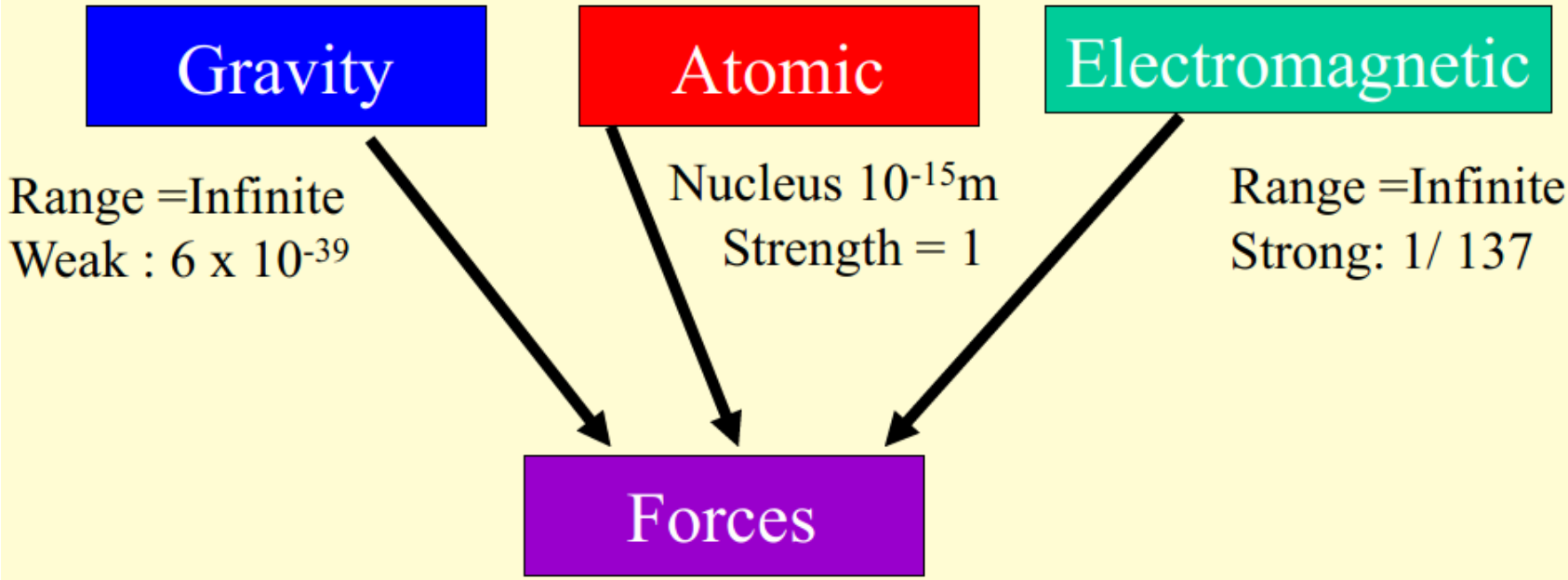
The Electric Universe – Wallace Thornhill, David Talbott
A Beginner's View of Our Electric Universe – Tom Findlay
2012: living in an Electrical Universe – Karl Maret. Council Grove Conference, April 11, 2012
Notes by Jerry Gin

THE ELECTRIC UNIVERSE

- New view of Universe: Universe is fundamentally electrodynamic
- Gravity may also be electrodynamic
- Authors:
  - Wallace Thornhill
  - David Talbot
  - Donald Scott
  - L Kortvelyessy
  - Tom Findlay
  - Others



Physics only Measures Forces



Both Gravity and Electromagnetism have Infinite Range
but Electromagnetism is 10^{36} times stronger !!!

1,000,000,000,000,000,000,000,000,000,000,000,000 X
Yet Astrophysics is Obsessively Focused on Gravity !!!

Slide and other yellow slides from Dr. Karl Maret,
Council Grove Conference, April, 2012

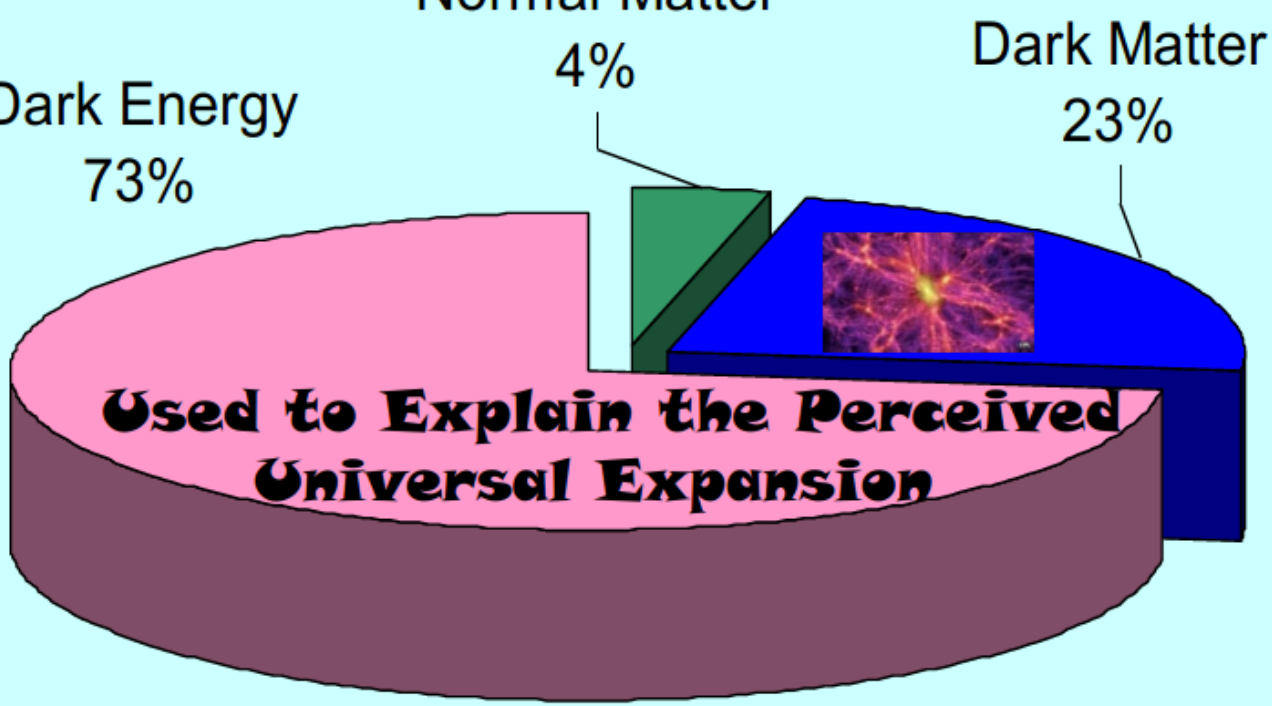
Since 1998, Science believes : Universe is made out of:

This is all we can observe directly

Gas, planets, stars, galaxies

Most is so diffuse it is Invisible

Visible Part is Only 0.5% (H,He) 0.01% All Atoms



More than 96% is not seen but Inferred !

(Dark Matter & Energy by Gravity & Red Shift)

Slide from Karl Maret, Council Grove Conference, April, 2012

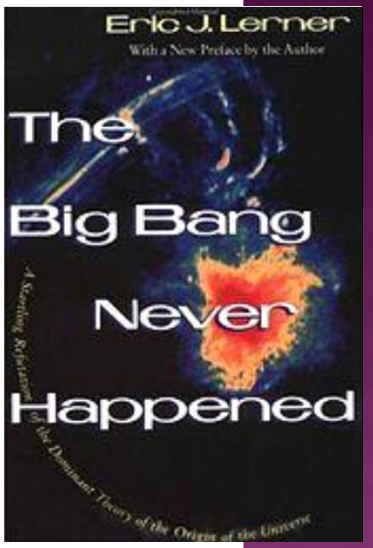
FUNDAMENTAL ERROR IN COSMOLOGY

- Fundamental error: Devotion to an electrically neutral, gravity driven universe
- "Big Bang" – bizarre
  - Filled with black holes, dark matter, dark energy and other incomprehensible objects
  - "In the beginning there was nothing- which exploded." Terry Pratchett, SF writer
- Unyielding faith in Gravity
  - Weakest force known to science – gravity
  - Unimaginable energy in space: create concepts to explain it – black holes, dark matter, dark energy
- Cosmologists ignores/misinterprets plasma
  - Fundamental state of matter: constitutes 99% of visible universe
  - Treats plasma mechanically as a magnetizable gas without regard to its primary role of electric currents in space plasma

THE BIG BANG AND THE EXPANDING UNIVERSE

- Big Bang Hypothesis rests on 2 assumptions:
  - Redshift of objects in deep space indicate primarily that objects are receding (i.e., redshift implies distance)
  - Gravity alone (weakest force in the universe) determines the structure and behavior of matter on the cosmic level
  - The 2 assumptions have encouraged theorists to ignore role of electricity in the plasma universe
    - Redshift inconsistent with belief of many objects believed to be at greater distance is actually much closer. Also see galaxies or quasars at "similar" distances have different redshifts
    - Gravity too weak to have its effect on universe
      - Gravity must act instantaneously to carry out its effect (orbits of planets, etc.) and is thus much faster than the speed of light. This is not the case.
        - Newton: Gravity must act instantaneously
        - Einstein: Speed limit is speed of light; but for orbits of planets and of the Milky Way, effect of gravity must be instantaneous – but it is not

BIG BANG NEVER HAPPENED



- Plasma process: Other alternative to Big Bang cosmology
  - Eric Lerner – plasma physicist
- Problem with Red Shift – within heart of nearby spiral galaxy is a quasar whose light is billions of light years away
  - Calls into question of the validity of Big Bang and model of the universe

THEORY THAT WORKS

- No Big Bang, no dark matter, no role of gravity, no black holes – in plasma based electric universe
  - Alfen in 1937 proposed:
    - Galaxy contains large scale magnetic field
    - Charged particles move in spiral orbits within field due to forces in the magnetic field
  - Anthony Peratt- simulations and experiments showed
    - Interaction between cosmic Birkeland filaments and their field produce accumulation of matter at the currents' intersections, leading to galactic structure and rotational motions that match observations

ELECTRIC UNIVERSE EXPLANATIONS

- Explanations of stars, planets, comets, etc. explained by electrical interactions - electric current flow – without need for:
  - Black holes, dark mater, neutron stars, pulsars and other explanations by astro-scientists
- Electrical stresses grow and diminish continually – occurs with stars – where they can split apart or eject giant gas and solid planets – where they are maneuvered to locations where an electrical balance occurs
  - Gas giant planets, under electrical stress, go through same process, producing smaller bodies of moons

Consequences of an Electric Universe

- The Big Bang is not a useful theory
- The Universe is constantly recreating itself
- Elements are created through Nuclear Fusion via the Z-pinch effect inside the Extremely Hot Solar Corona
- Stars are fed by massive Plasma Flows within galaxies and between galaxies in Intergalactic Space

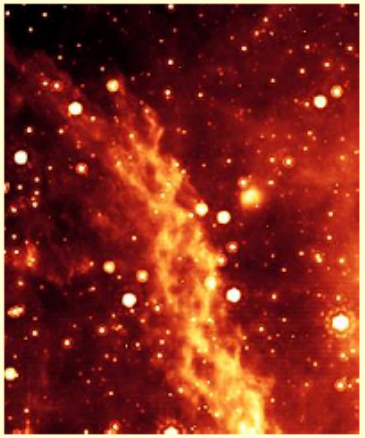
Consequences of an Electric Universe

- Black Holes and Neutron Stars are theoretical inventions and may be unnecessary for the new cosmology
- Dark Matter and Dark Energy are not necessary
- 99.9% of the universe consists of plasma, the 4th State of Matter, that can be found existing as dark currents, or in glowing and arcing mode, including the Sun.

Living in an Electric Universe

- 99% of the Universe is made of Plasma
- Plasma Physics is not usually applied to astrophysics where gravity is thought to be the predominant force

Cygnus Loop of the Veil Nebula.
Image: Blair, R. Sankrit
(Johns Hopkins Univ. / NASA



Twisted current filaments in the Double Helix Nebula near the center of the Milky Way, in infrared light. Image: NASA/JPL

- The Hubble telescope has shown us images of massive plasma flows as giant currents interconnecting stars and even galaxies

POWER OF ELECTRICITY

- Free electrons 2000 times lighter than protons
  - Primary carriers of electric current
    - Responsible for current flow in fluorescent light
  - Comparison of electric force between electron and proton and gravitational attraction between them:
    - Electric force is 10^{39} times stronger than gravitational force
      - Richard Feynman calculation: Gravitational force between 2 persons standing next to each other – imperceptible. If persons had 1% more electrons than protons, repelling force enough to lift the weight of entire Earth

PLASMA & ELECTRICITY IN SPACE

- States of matter
  - Solids – thermal energy low, atoms rigidly bonded
  - Liquid – temperature rises, bonds loosened
  - Gases – higher temperatures, atoms & molecules move freely
  - Plasma – higher temperatures, atoms break apart (ionization), electrons or negative components separate from atom, leaving the remainder of the atom, the positively charged ion. This is plasma.
    - Plasma – collection of charged ions (+ and -) as well as non-ionized or neutral atoms or molecules
    - Is an excellent conductor of electricity (far better than copper)
    - As a moving conductor in space, develops electric currents and magnetic fields in response to ambient magnetic field
      - Results in complex behavior
    - Examples: neon light, auroras in polar skies, Earth's ionosphere (weekly ionized plasma), lightening stroke
      - Glow from exciting electrons of non-ionized atoms and drop back to lower state results in emission of light
      - Also when electrons combine with positive ions, light is emitted

WHAT IS ELECTRIC UNIVERSE?

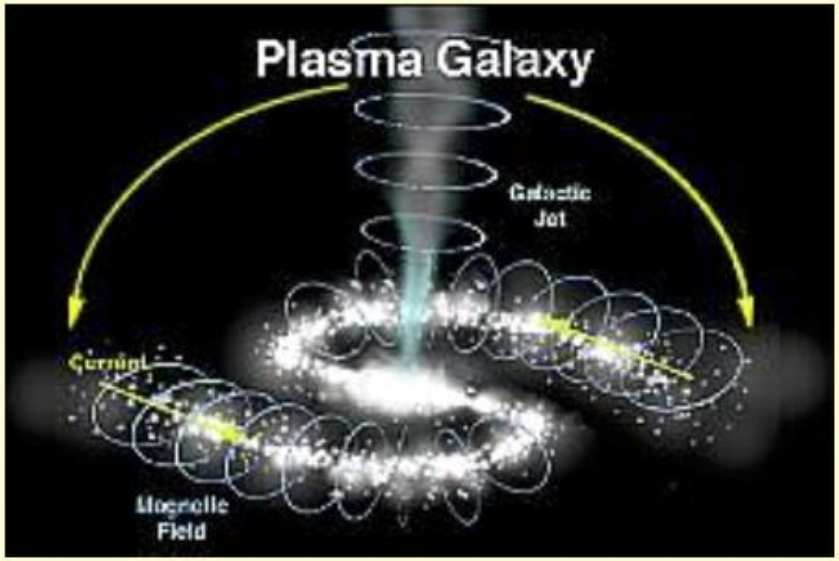
- In light of knowledge about plasma and electricity, new way to interpret scientific data for understanding the universe
  - Gravity plays a secondary role behind far more powerful electric force
  - Lab studies: Plasma "pinches" into filaments, sheets and cells (charged bodies) from electrical environment
    - Will sort elements into shells of like elements, generates radial streamers and spiraling streamers to exotic symmetrical configurations – mimics what we see in the cosmos
    - Flat rotation curves of spiral galaxies – form from powerful electric currents intersecting in a plasma
      - Does not need invisible matter (dark matter) to force stars to rotate in a rigid plate
  - Plasma makes up 99.999% of the universe

MORE ON PLASMA

- Earth's ionosphere – a weakly ionized plasma that does not glow
- Free electrons in metals – should be considered as plasma – reason they are good conductors
- Boundaries of Earth's magnetosphere – are invisible planet sheaths that define electrical influence of the enclosed planet. Excited particles widely separated in space- so plasma sheaths do not glow
- Sun and all stars – considered to be balls of plasma
- Lightning streamers – channels of plasma (narrow channels of atmospheric atoms/molecules of which about 20% are ionized)

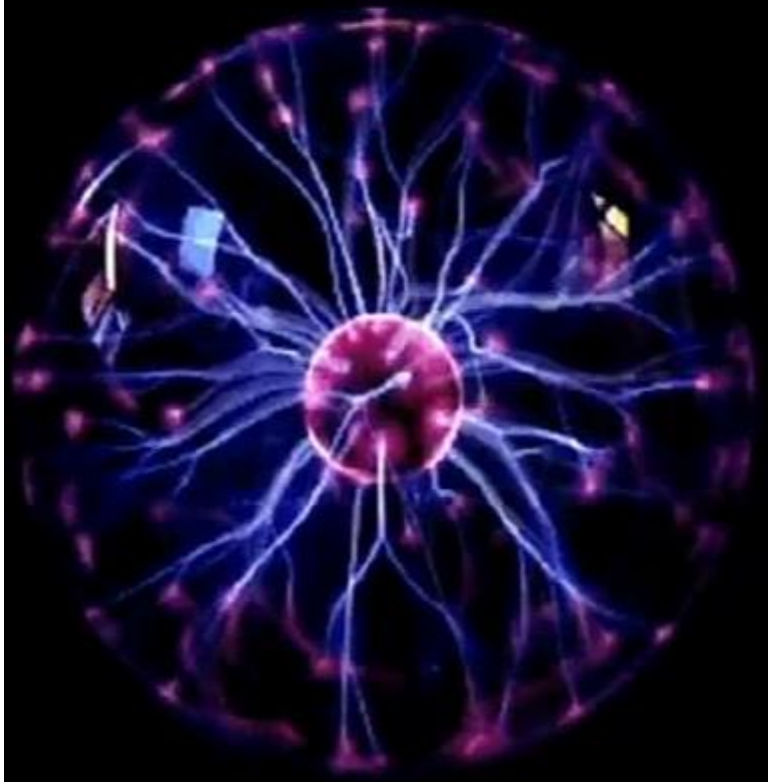
Our Plasma Universe

- Plasma fills 99.999% of space
- Stars and Galaxies are born from Plasma



- This Electric Universe model is more realistic than a theory based on 0.001% of visible matter with the rest Imaginary “Dark Stuff” !

What Is Plasma?



- Moving plasma generates electric currents and forms current sheets, filaments and bubbles
- It produces radiation over large parts of the electromagnetic spectrum

Complex Plasma Behavior

- The flow of electricity through plasma causes glows, arcs, jets, filaments, beads, bubbles, kinks, 'sausages,' tornadoes and explosions...
- ...just as we see in the lab
- ...just as we see in deep space

Courtesy: www.holoscience.com

Common Examples of Earthly Plasma

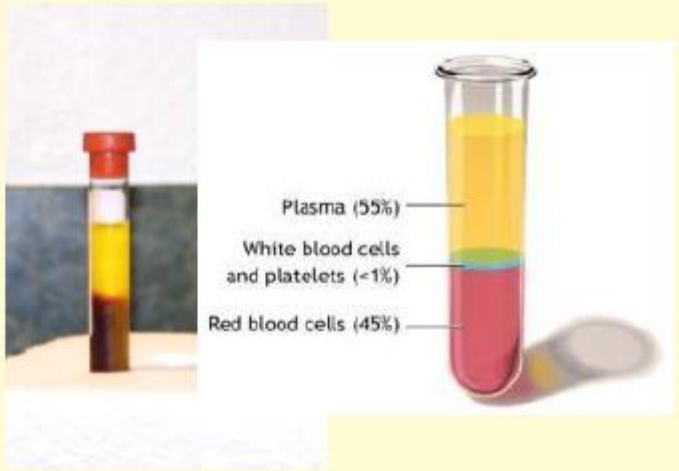
- Dark Current Plasma –

  55% of blood (plasma)

  contains ion Na+,K+, Cl-, Ca++

  Can be used as life-giving transfusions

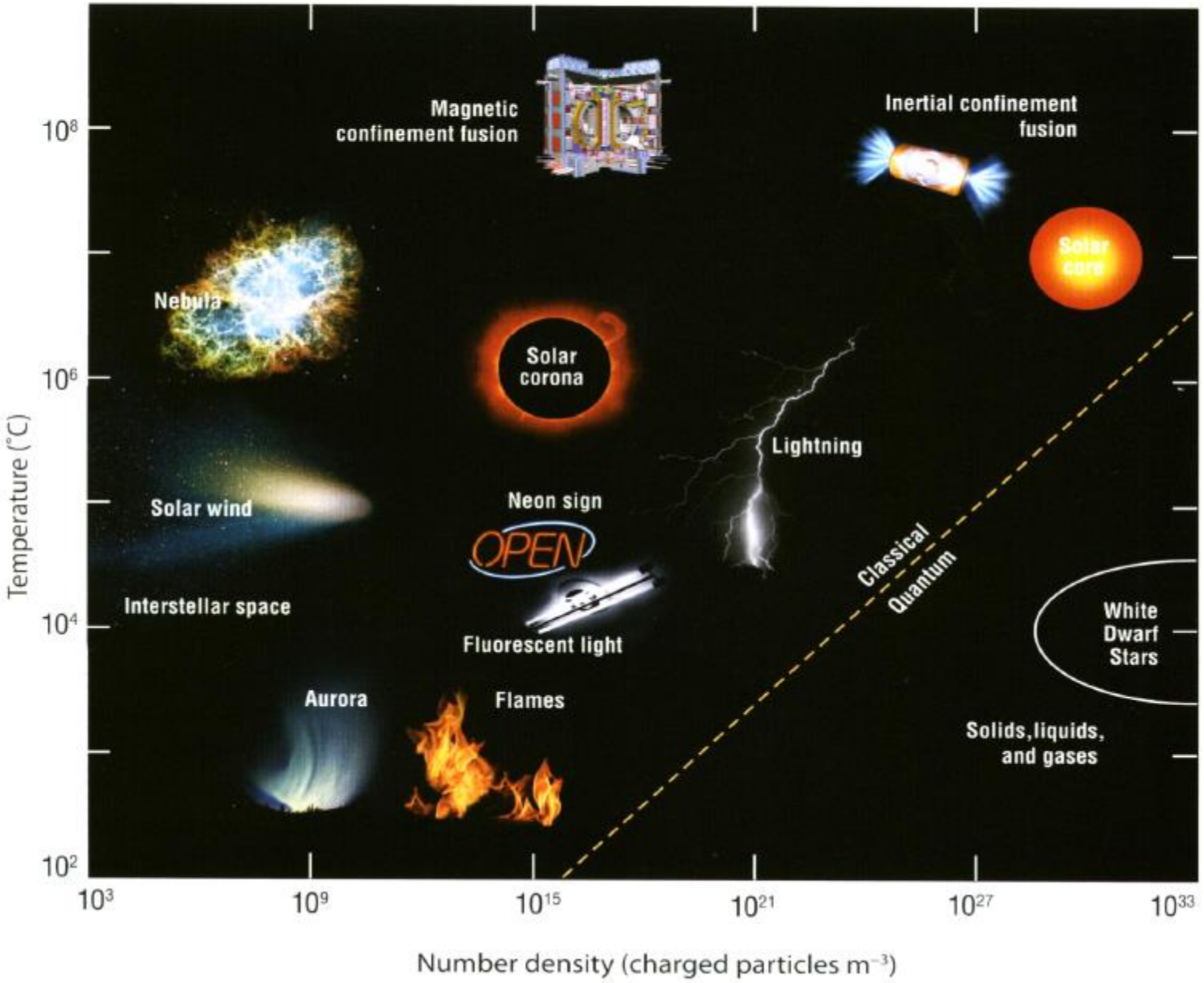
  Is found in Solar Wind – Auroras



- Glowing – Fluorescent Light
  - High voltage gas discharges

- Arcing – Lightning, Arc Welding

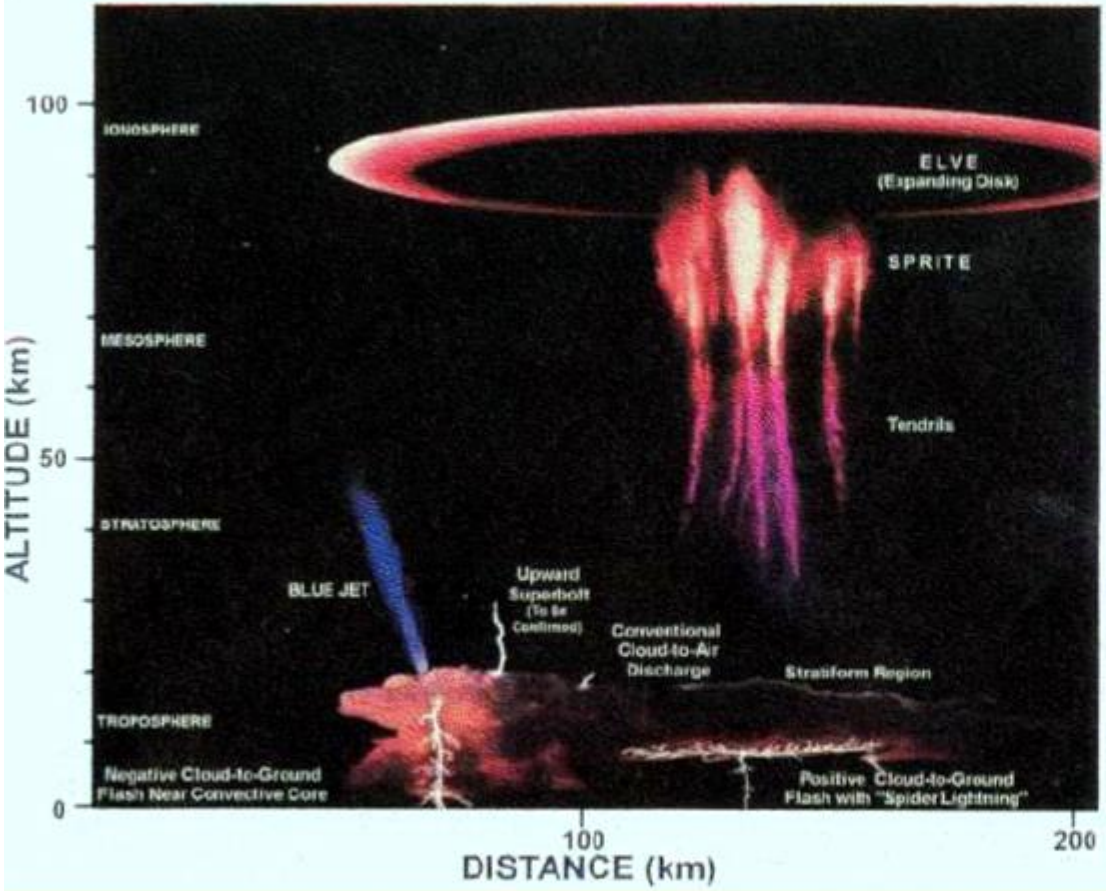
Types of Plasma

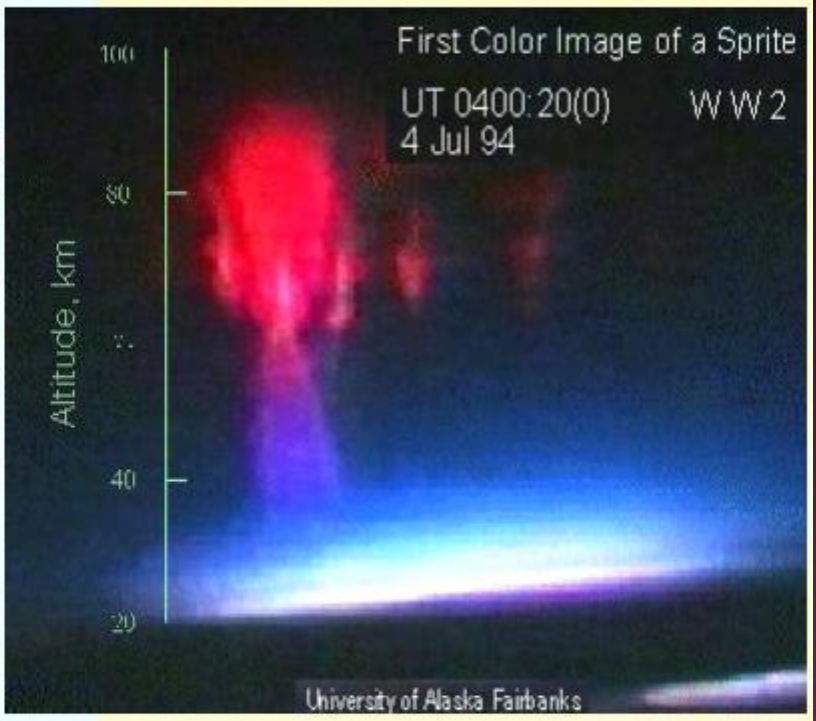


Lightning

- An example of plasma present at Earth's surface.
- Typically, lightning discharges 30,000 amperes at up to 100 million volts, and emits light, radio waves, X-rays and even gamma rays.
- Plasma temperatures in lightning can approach ~28,000 Kelvin and electron densities may exceed 10^{24} per cubic meter.

Elves and Sprites (Plasma TLEs)



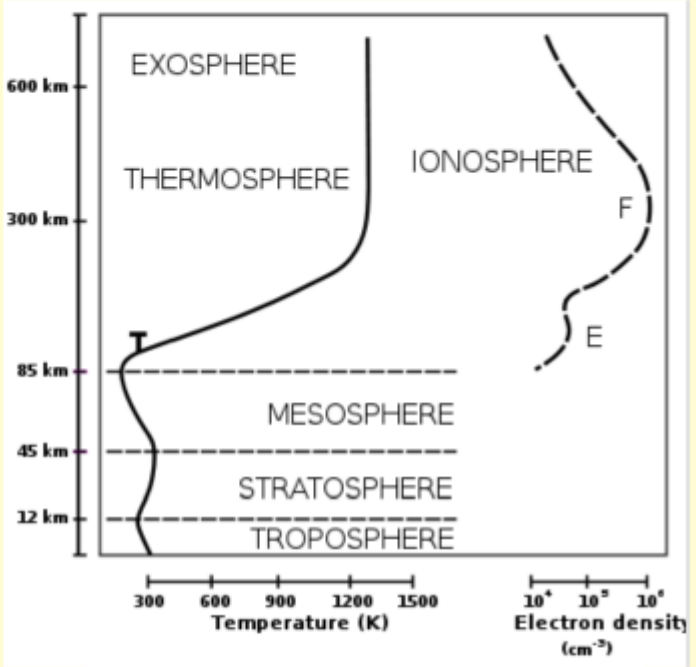


First Image in 1994

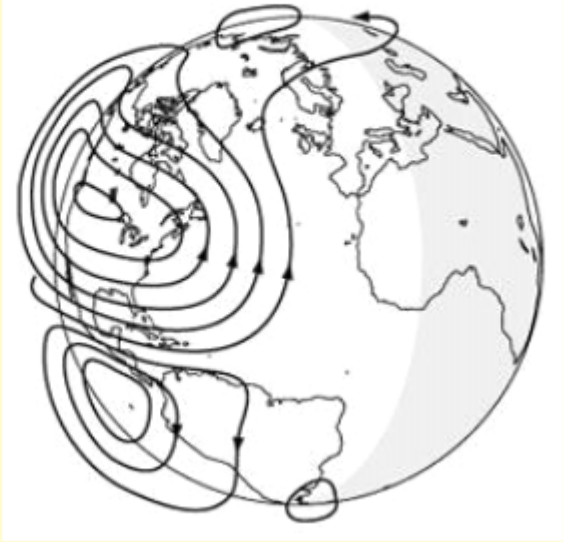
- These are Transient Luminous Events (TLEs) arising above Lightening in Clouds
- Elves are disk-shaped regions of luminosity, lasting less than a thousandth of a second.
- Sprites are weak luminous flashes that appear directly above an active thunderstorm, predominantly red, they usually last no more than a few milliseconds
  - Source: http://www.albany.edu/faculty/rgk/atm101/sprite.htm

Ionosphere

- Upper atmosphere ionized by solar radiation – Plasma Sheath of Earth
- Inner edge of magnetosphere
- Varies in height and intensity of ionization day versus night, during seasons and during solar events
- Important indicator for "Space Weather" and radio communications



- Right: Electric currents in sun-facing side of ionosphere



ELECTRICITY AND MAGNETIC FIELDS

- Prominence of magnetic fields in space
  - 1950's Magnetospheres came into our lexicon
  - Magnetic fields arise from electric currents
    - Astronomers ignore magnetic fields from electricity – imagine it must come from "dynamos" inside celestial bodies or simply say it's origin is unknown
  - Plasma – far better conductor than copper
    - Because of impedance, energy in magnetic fields will be dissipated in the form of light, heat and radio waves
      - See powerful radio transmissions from cosmic sources as being common
    - Particle in plasma in space tenuous – 1 particle per cubic centimeter
      - But volume of space is huge- and with the weak electric fields, easily and efficiently delivers the currents that power stars and galaxies

Earth's Magnetosphere

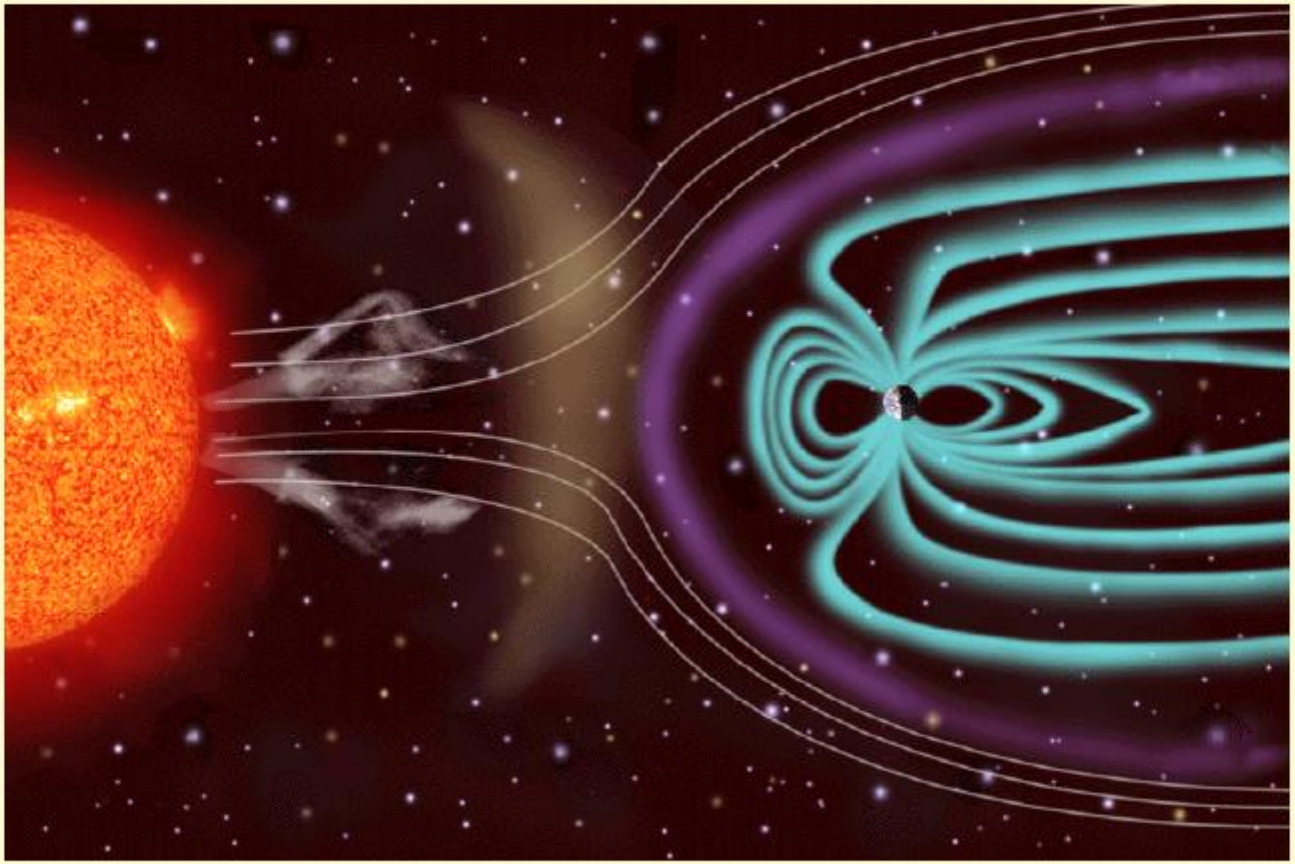
The natural magnetic field of our earth is important for all life forms as a navigational and orientation field. It also protects us against solar emissions.

Auroras

When the Solar Wind sends charged ions into the atmosphere it causes excitation of atoms and

the color displays of the Aurora Borealis in the North and Aurora Australis in the South

Solar Wind: Earth - Sun Plasma Dialogue



This Dark Current Plasma comes from Ions and Electrons ejected by the Sun

IEEE TRANSACTIONS ON PLASMA SCIENCE, VOL. PS-14, NO. 6, DECEMBER 1986

Model of the Plasma Universe

HANNES ALFVÉN, LIFE FELLOW, IEEE

- Hannes Alfven was 1970 Nobel Laureate who proposed the Electric or Plasma Universe
- Was father of Magnetohydro-dynamics
- 1986 IEEE paper

PLASMA UNIVERSE

HAS A CELLULAR STRUCTURE

MAY CONTAIN ANTIMATTER

IS **NOT** CREATED BY CONVENTIONAL BIG BANG

IS PENETRATED BY A NETWORK OF CURRENTS WHICH
TRANSPORT ENERGY OVER LARGE DISTANCES
PRODUCE DOUBLE LAYERS WHICH ACCELERATE
PARTICLES TO VERY HIGH ENERGIES

IT ALLOWS NEW APPROACHES TO THE ENERGY RELEASE IN
DOUBLE RADIO SOURCES
QSO:s, SIEFERTS, ETC.

THE PLASMA IS OFTEN DUSTY

CRITICAL VELOCITY PHENOMENON OFTEN IMPORTANT AND

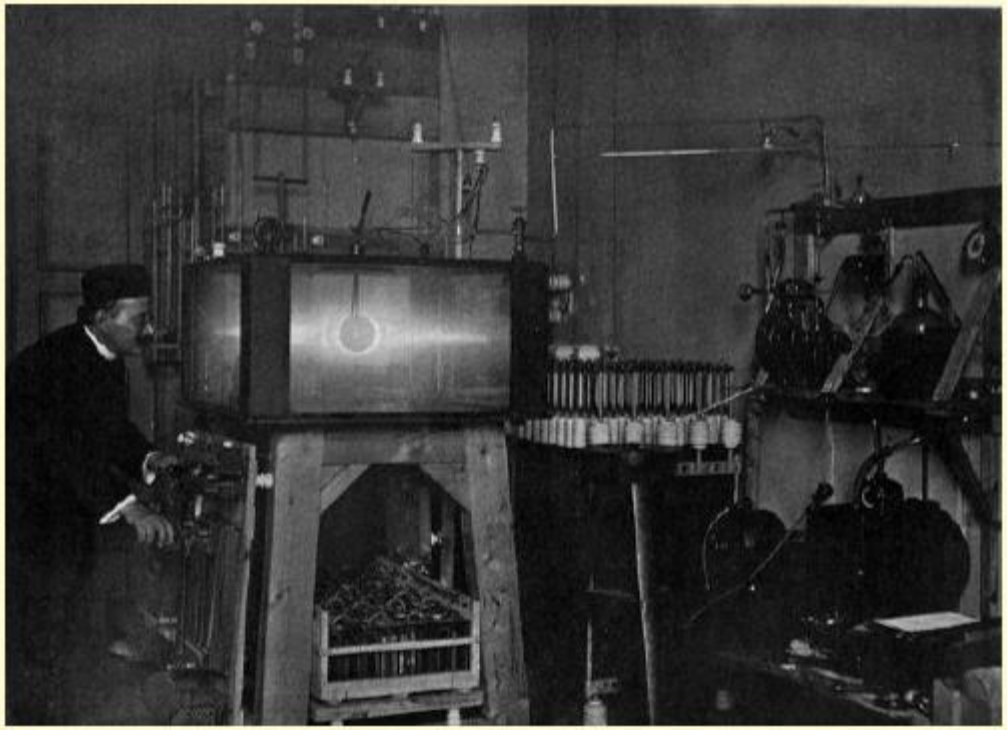
ALLOWS A NEW APPROACH TO COSMOGONY
(= ORIGIN OF SOLAR SYSTEM)

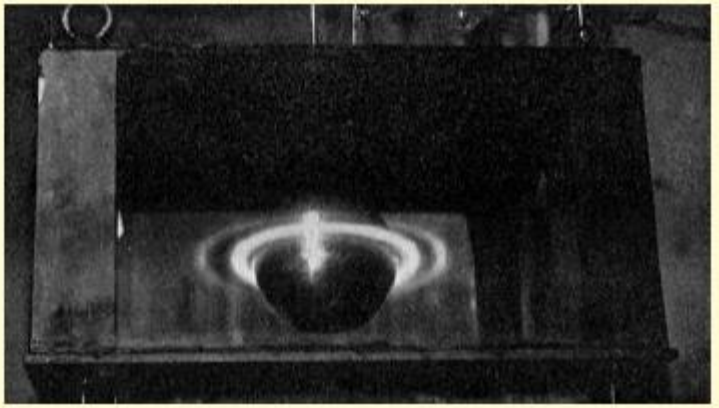
PIONEERS IN PLASMA PHYSICS

1867-1917

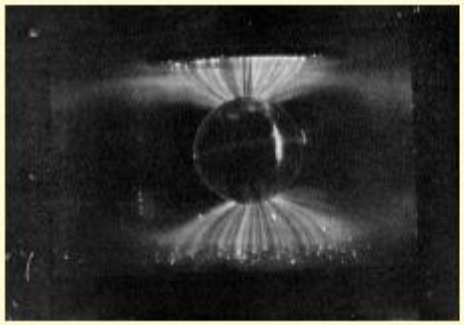
- Kristian Birkeland – Norweigian scientist – nominated for Nobel prize 7 times
  - Created “Terrella” (little Earth) as magnetic ball in space to study plasma.
  - Measured magnet fields of Earth’s polar regions. Studied Northern Lights and origin of auroras
    - Experiments suggested charged particles from sun, guided by Earth’s magnetic field, produced circumpolar rings of auroras
    - Showed electric currents flow along filaments shaped by current-induced magnetic fields: Birkeland Currents

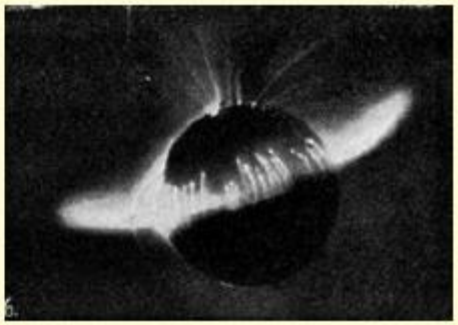
Birkeland's Terella Experiments (1906 -1908)





Terella simulation of Rings





From Birkeland's 1908 book: The Norwegian Aurora Polaris Expedition 1902-1903

In 1994 space scientists suggested Saturn's rings may be dirty plasma phenomena

Spiral Aurora Borealis in Finland: An Ionospheric Plasma Phenomena

Birkeland already created Artificial Auroras in 1896 in an "Auroral Jar"

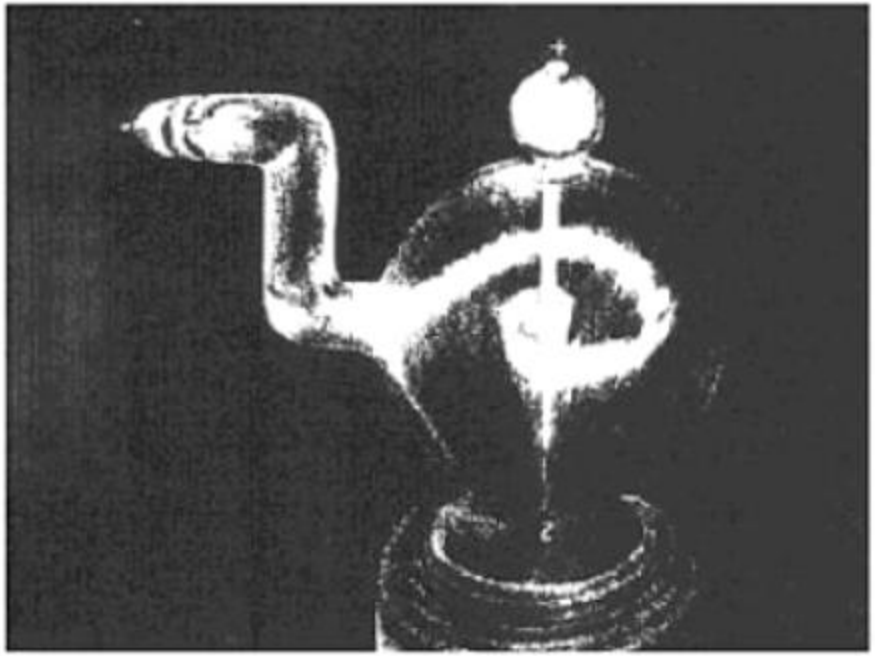
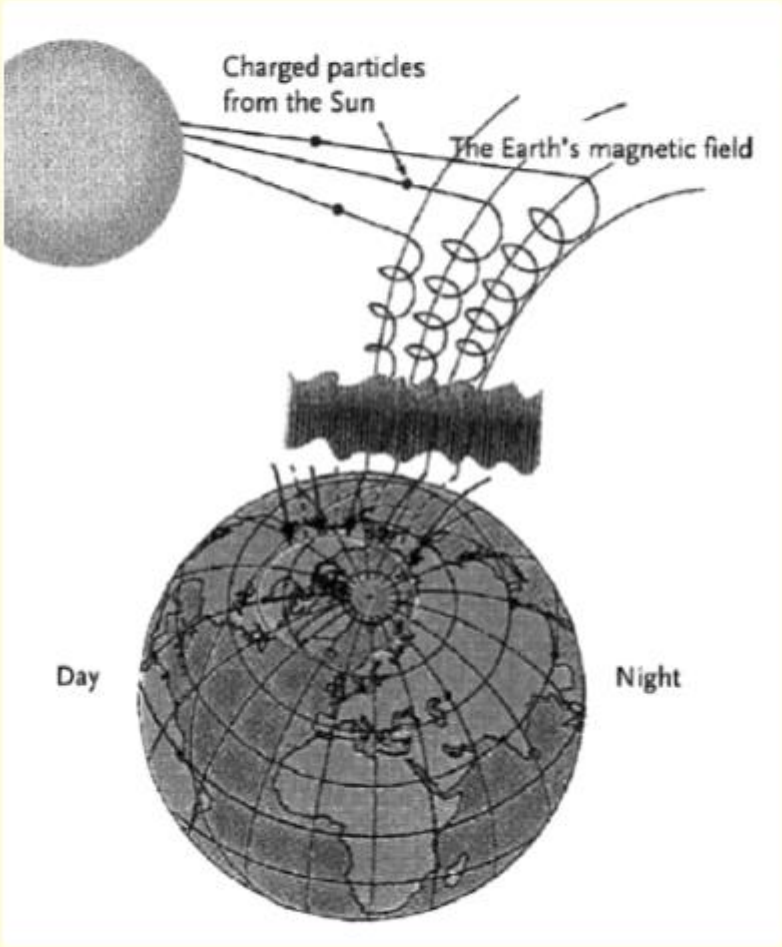


Figure 8. Example of the first artificial aurora produced inside a device that Birkeland called an auroral jar, taken from Birkeland's paper of March 1896. The picture shows his most successful simulation of artificial auroral emissions produced with cathode rays in the discharge tube. The tube was placed in a large magnet. The cathode was located in a twice-bent glass tube that merged into the container. The anode was mounted in a small sphere connected by a narrow tube to the large sphere.

Birkeland's Auroral Theory



- He was first to suggest that charged particles from the sun spiraled along Earth's magnetic field lines to collide with atoms and molecules in the atmosphere, exciting them with each collision, thus causing the auroras

MORE ON PLASMA BASED ELECTRIC UNIVERSE

- Cosmic magnetic fields confirms that the fundamental state of space plasma is electrically dynamic
  - Plasma in relative motion generate electric currents in each other
  - Electric current filaments abundant over cosmic distances- are sufficient to organize galaxies where they intersect and to power their stars
    - As compared to plasma between stars and galaxies (the intergalactic space) – a star is like a speck of dust and a galaxy is like a piece of fluff
    - Galactic cores – have stupendous focused energy
      - Birkeland currents can generate such energy, as well as polar jets, double radio sources, and synchrotron radiation – all explainable by plasma cosmologists
      - Not explainable by standard astronomer theories

ELECTRIC CIRCUITS IN SPACE

- Electric circuits extend throughout the universe
  - Galaxies threaded on magnetic fields generated by electric currents
  - Galaxies and stars born from a natural charge imbalance
- Birkeland Currents
  - In plasma, electrons travel parallel to the direction of the magnetic force and experience no deflection and no entanglement
  - These currents form invisible cosmic “transmission lines”
  - Current flows in alignment with magnetic field and is “pinched” into long filaments by the magnetic forces associated with the current (”z” pinch effect since magnetic field assigned to z axis)
  - Filaments twist into a rope-like structure called “Birkeland currents”
    - Filaments twist together in a faster and faster electrical whirlwind
      - Electric force is trillion trillion trillion times more powerful than the trivial force of gravity

BIRKELAND CURRENTS

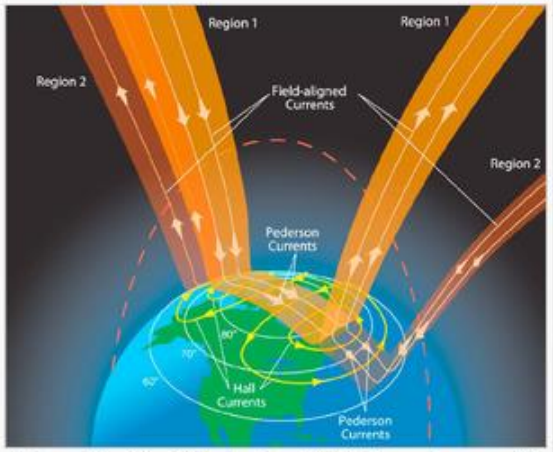
- Currents flowing through ionized matter
- Surrounded by self-produced magnetic fields
- Magnetic fields keep together plasma currents
  - Currents entwine to form bifilar pairs that have overall rotational force and exist in all scales of size
  - Responsible for formation of all major bodies in the plasma environment of space
  - Their attractive rotating electromagnetic forces explains rotations of galaxies, stars, planets and moons

Birkeland Current

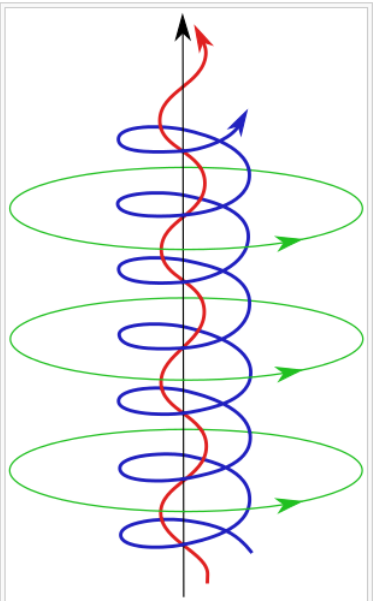
- Both in the laboratory and in the cosmos, a pair of such spiraling currents will be observed.
- The interlinked pair will at first be magnetically drawn together.
- But after a certain proximity is achieved, a force of repulsion is generated that holds them apart.
- This configuration is extremely stable.
- The resulting tightly wound pair is called a Birkeland current.

- The attractive/repulsive forces acting on this pair of currents creates a twisted, constricting cylindrical volume inside the spiral where extreme compression of matter can take place.
- When this occurs in cosmic space, the associated plasma filaments can be observed by the radiation they emit.

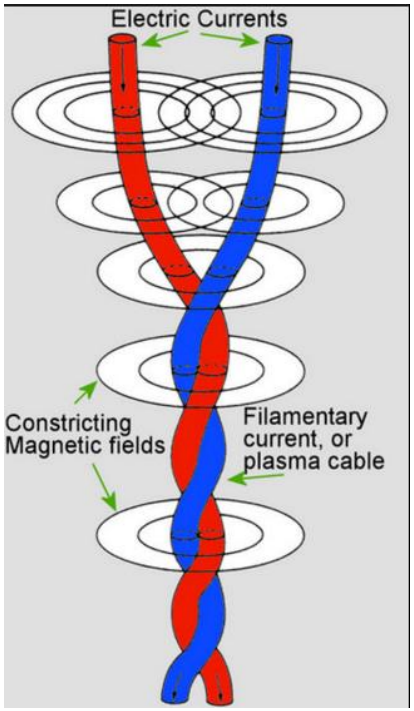
BIRKELAND CURRENTS

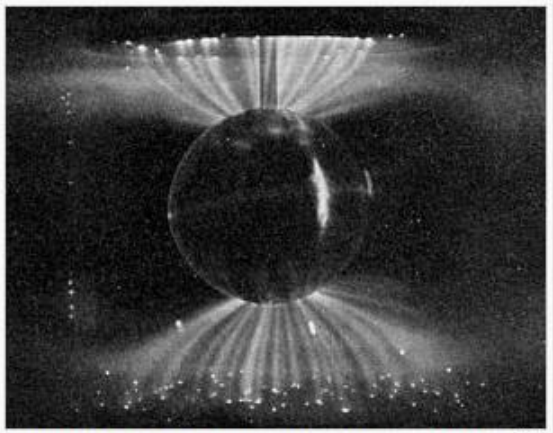


Schematic of the Birkeland or Field-Aligned Currents and the ionospheric current systems they connect to.[1]



The complex self-constricting magnetic field lines and current paths in a Birkeland current that may develop in a plasma (Figure 15.3.2, Alfvén and Arrhenius, 1976)[2 1]

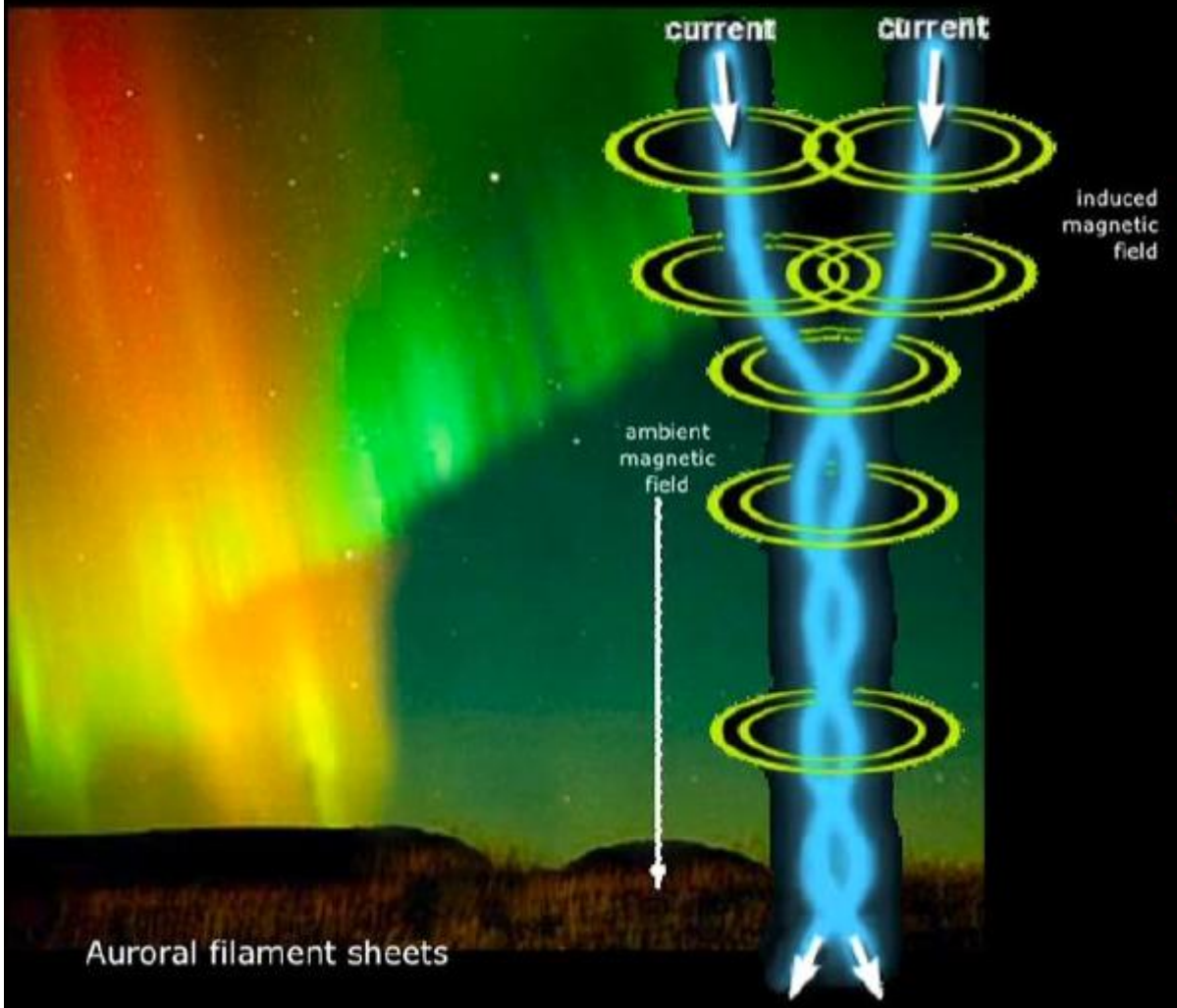




Auroral-like Birkeland currents created by scientist Kristian Birkeland in his terrella, featuring a magnetised anode globe in an evacuated chamber.

Birkeland currents in space

Kristian Birkeland

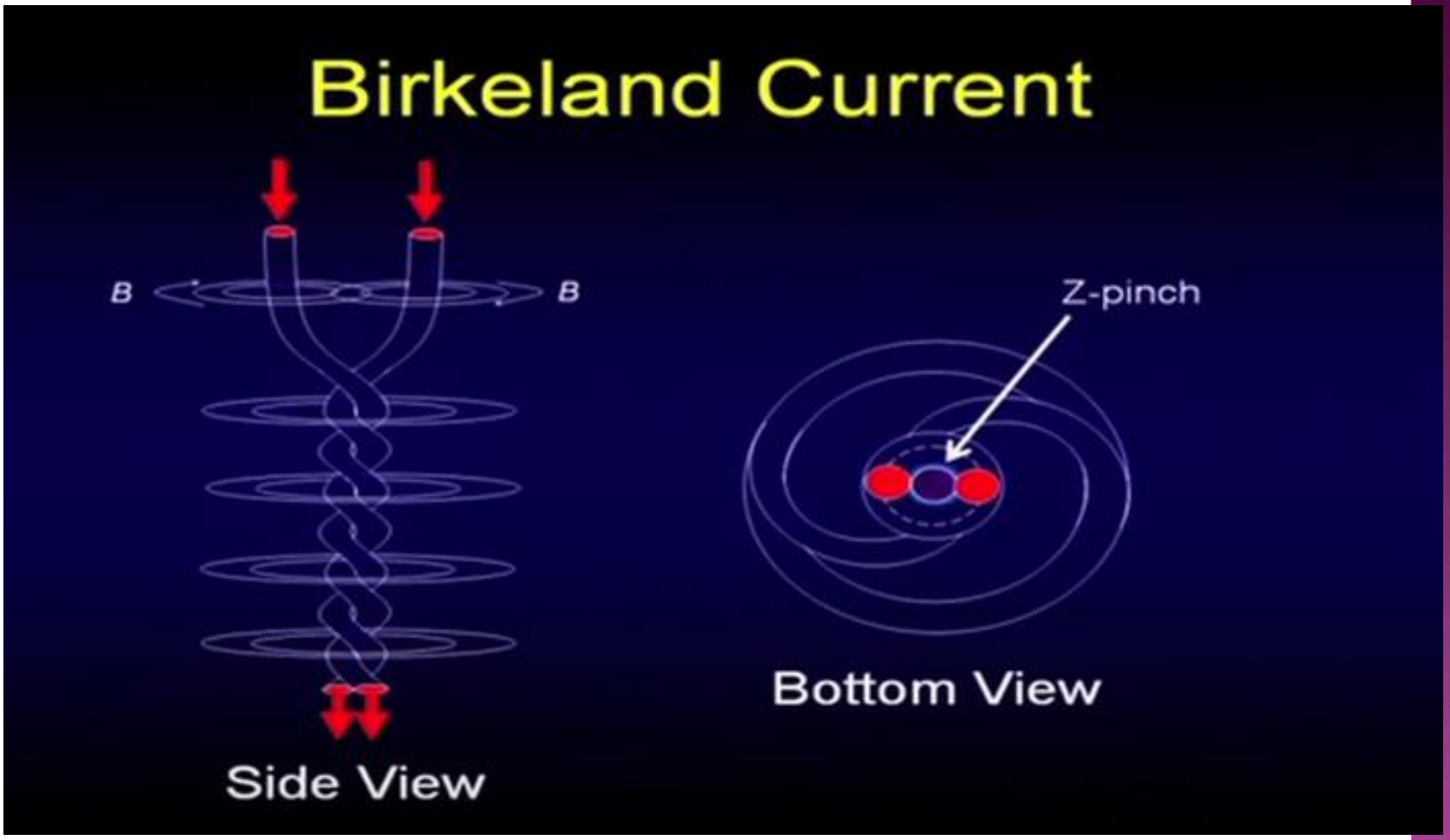


- Electricity flows through plasma in the ambient magnetic field direction
- Current filaments form double helix or 'twisted pairs' at every scale, from the laboratory to galaxies

Z-Pinch Effect

- High-intensity electric current passing through a plasma will take on a corkscrew (spiral) shape discovered by Birkeland.
- These most often occur in pairs and tend to compress between them any material (ionized or not) in the plasma. (Known as the "z-pinch" effect.)
- Cosmic matter tends to form an abundance of filamentary, stringy structures.

- If the initial velocity of the particle is perpendicular to the magnetic field, the path that the particle takes is a circle in the plane perpendicular to the field.
- However, if the initial velocity of the particle is at an angle different from 90° to the magnetic field (perhaps slightly in the same direction of the field), then the path will be a helix, a spiral.
- The stronger the field is, the smaller the radius of the circle will be. No matter what the initial direction of the current stream, it will end up following the direction of the magnetic field.



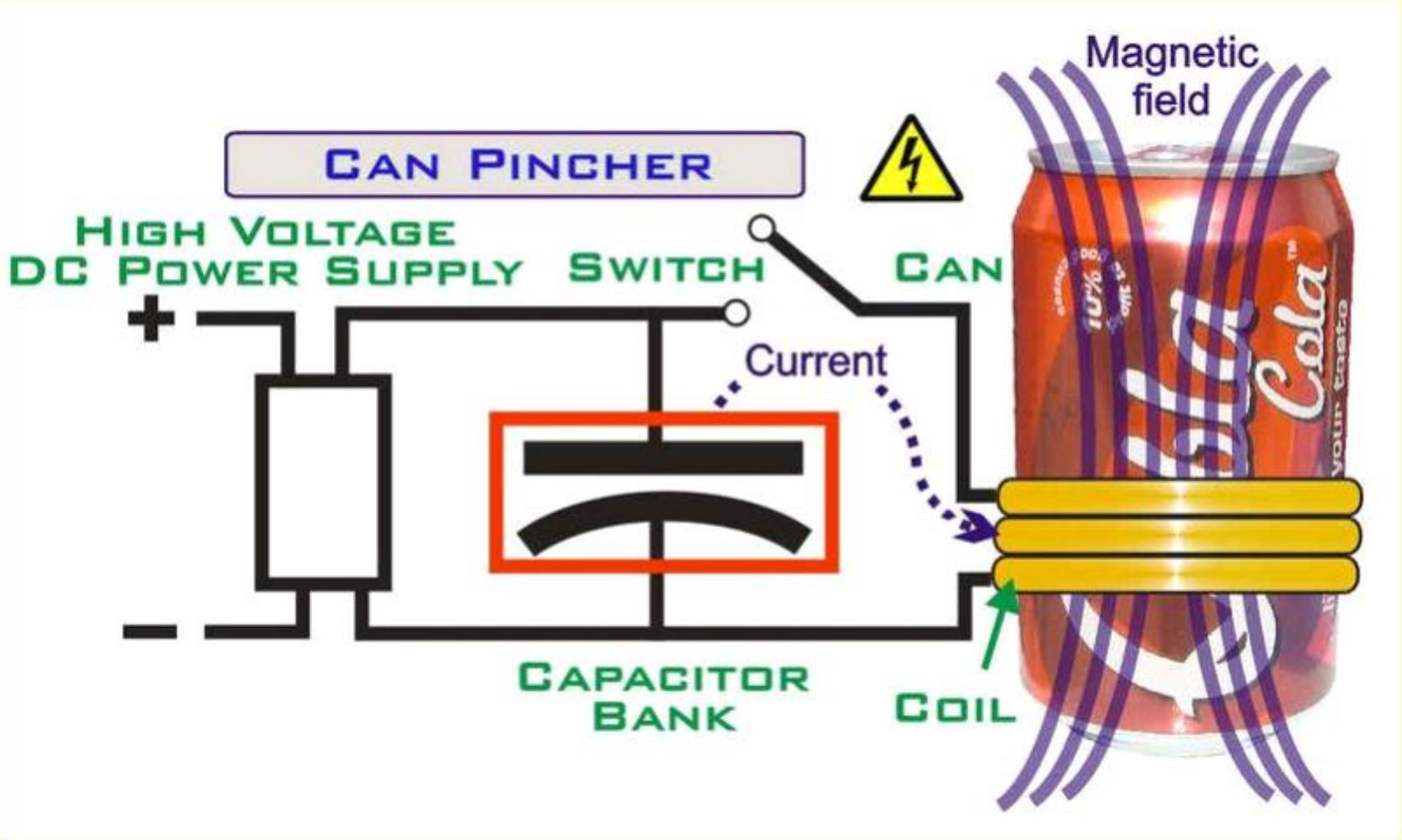
The Z-Pinch Effect - Chuck Missler

Plasmas Pinch off when Conditions are Right : Called Bennett or Z-pinch

Image: **JPL/NASA**

- Example of plasma pinch seen in the Ant nebula
- In the center of the Z-pinch, extremely intense fusion processes create new elements

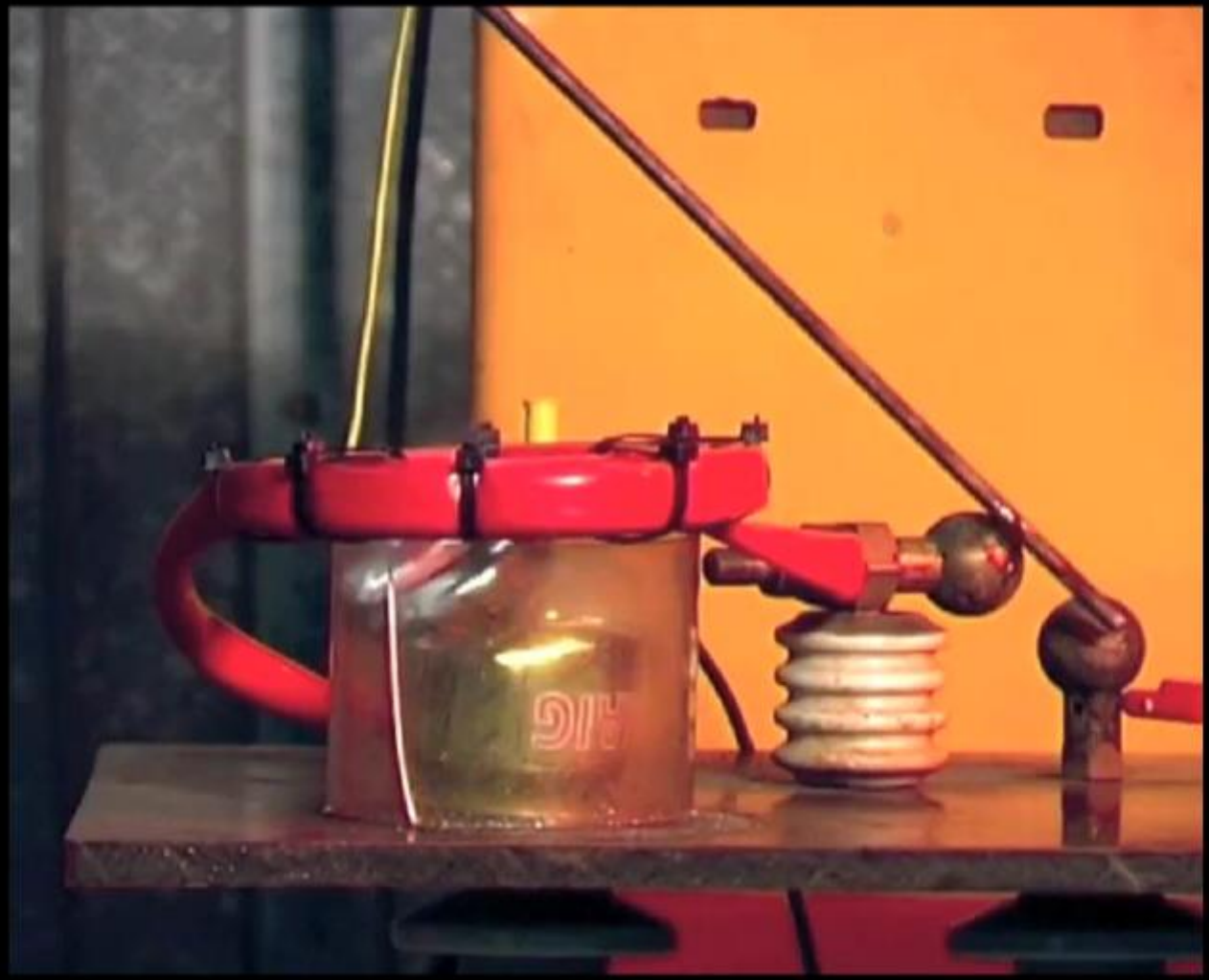
Demonstrating the Bennett Pinch



Demonstrating the Z-Pinch Effect Experiment by Wal Thornhill

Courtesy: www.holoscience.com

Demonstrating the Z-Pinch Effect Experiment by Wal Thornhill



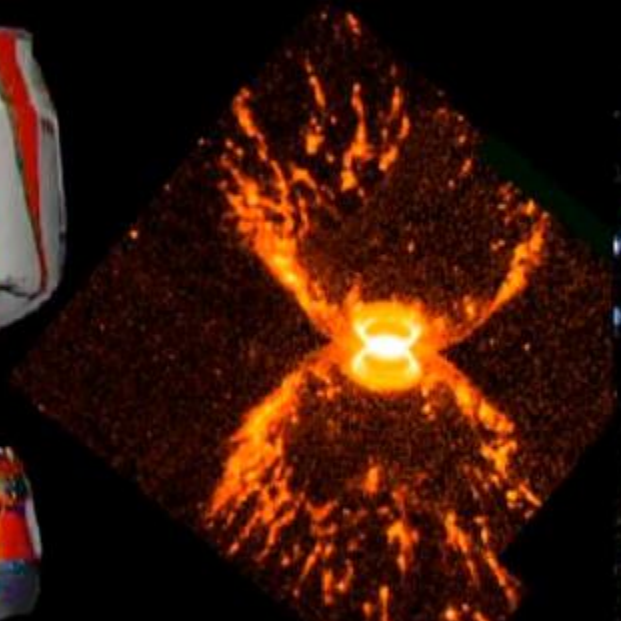
Courtesy: www.holoscience.com

Demonstrating the Z-Pinch Effect Experiment by Wal Thornhill

- Can is compressed radially and vertically
- Demonstrates how plasma forces shape the universe

Courtesy: www.holoscience.com

The Bennett Pinch

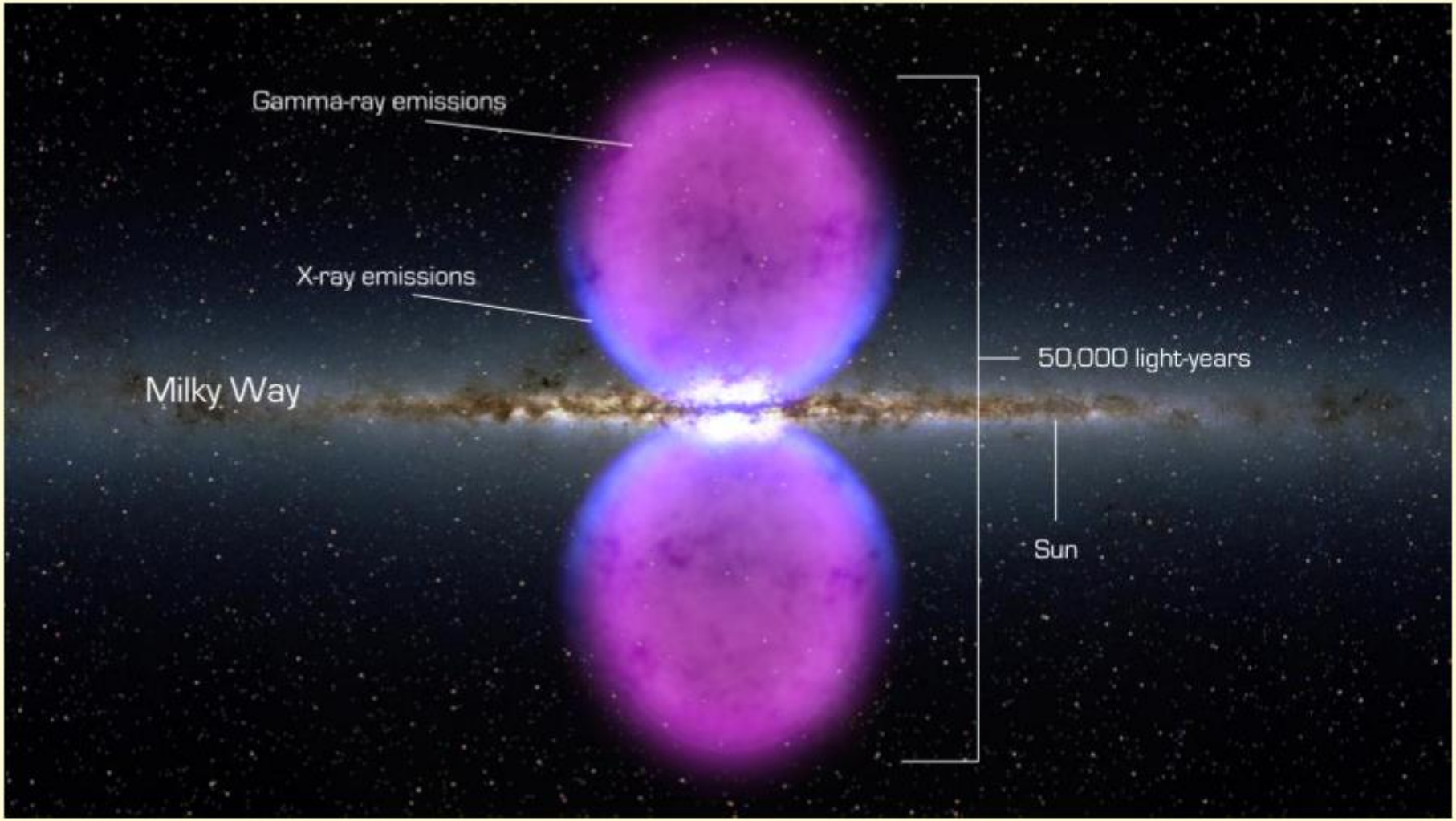


Southern Crab Nebula
R. Corradi, NASA

Supernova 1987A
NASA/STScI/CfA/ P. Challis

The hourglass-shaped magnetically-pinched linear discharge is also called a Z-pinch or 'Bennett pinch'

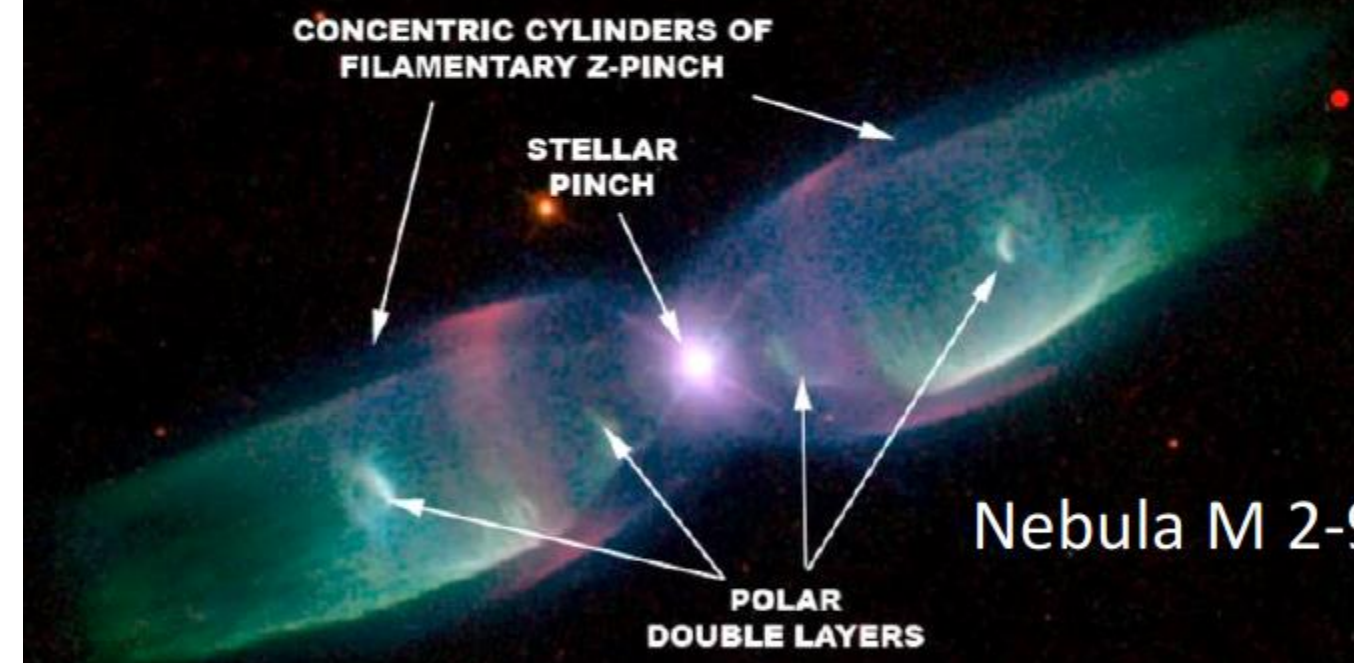
Courtesy: www.holoscience.com



NASA: Artist conception

- These lobes are energy emissions spanning half the size of our galaxy and fill half the sky
- They contain the energy of 100,000 supernova

Electric Universe Cosmology

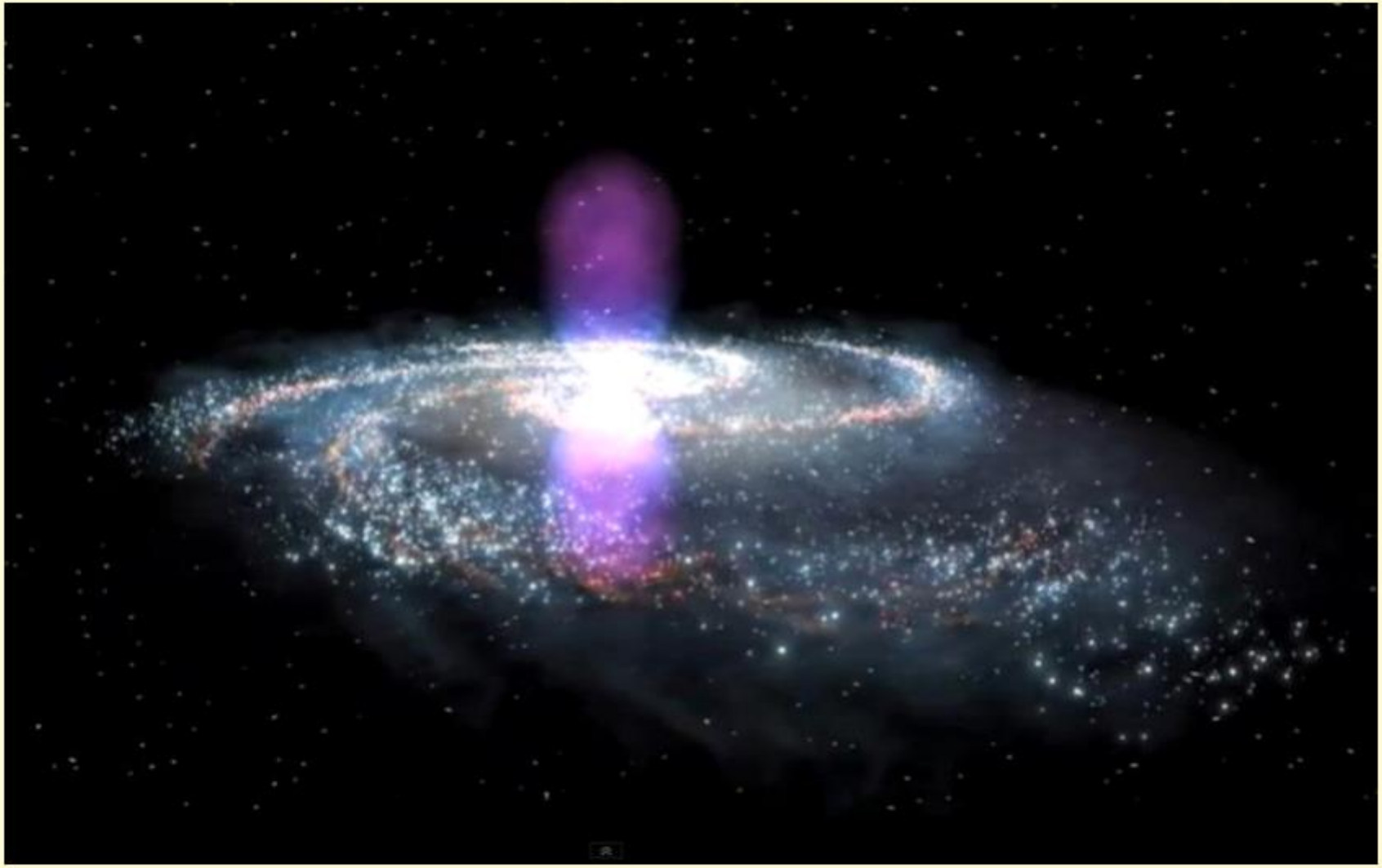


- a guiding principle of EU cosmology is convergence of *all* human knowledge..

Nebula M 2-9

Courtesy: www.holoscience.com

2010: Huge Gamma Ray Bubbles found



- The new Fermi Gamma Ray Space Telescope found these structures which may only be a few million years old

Irving Langmuir (1881 – 1957) Gave Name to Plasma Physics

- 1932 Nobel laureate Irving Langmuir studied electric plasmas in his General Electric laboratory
- He first used the name 'plasma' to describe the almost lifelike, self-organizing behavior of ionized gas clouds in the presence of electrical currents and magnetic fields.
- Plasma (from Greek) means: “something molded or created”
- Named electric plasma after plasma found in blood
- *"Except near the electrodes, where there are sheaths containing very few electrons, the ionized gas contains ions and electrons in about equal numbers so that the resultant space charge is very small. We shall use the name plasma to describe this region containing balanced charges of ions and electrons."*

PIONEERS OF PLASMA PHYSICS -2

- Irving Langmuir- coined term “plasma” because life-like properties of plasma resembled blood plasma
  - Plasma responds to charged objects by producing formations like cell walls – “Langmuir Sheaths” – often called “Double Layers” (DLs) of opposite charge.
    - Across sheath, there is strong electric field; while on both sides of double layer, electric field is much weaker
    - The insulating Langmuir sheath allows for proximity of highly charged celestrial bodies without expected electrical exchange
    - Double layers can accelerate particles to cosmic ray energies

DOUBLE LAYERS

Double layers are one of the most important aspects of the self-organizing characteristics of cosmic plasma, as we will see.

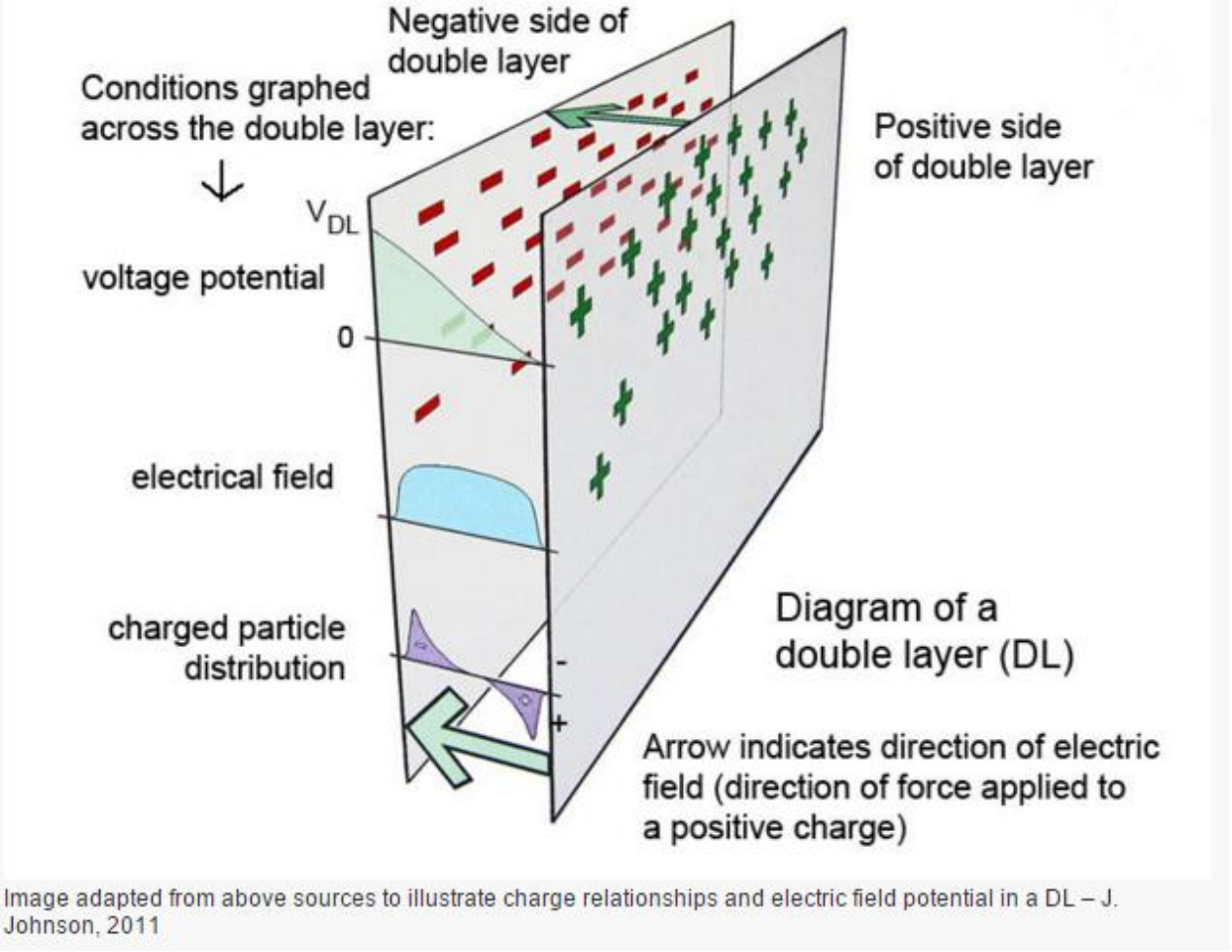


Image adapted from above sources to illustrate charge relationships and electric field potential in a DL – J. Johnson, 2011

https://www.thunderbolts.info/wp/2011/12/03/essential-guide-to-the-eu-chapter-5/

PIONEERS OF PLASMA PHYSICS -3

- Hannes Alfren – received Nobel prize for work on “magnetohydrodynamics”
  - Plasma in space is electrically “quasi neutral”.
    - However, its temperature, density, and chemical composition vary from place to place. At boundaries between plasma of different characteristics, a “cell wall” or “double layer” is formed, across which a voltage is generated. Plasma cells moving relative to one another induce electric currents in each other.
      - At largest scale – see superclusters of galaxies - composed primarily of plasma – moving relative to each other. Every plasma cell at smaller scale is embedded in externally generated fields and will develop filamentary currents that form currents within. The power within those circuits is dissipated by objects like rotating spiral galaxies and the stars within the galaxies.

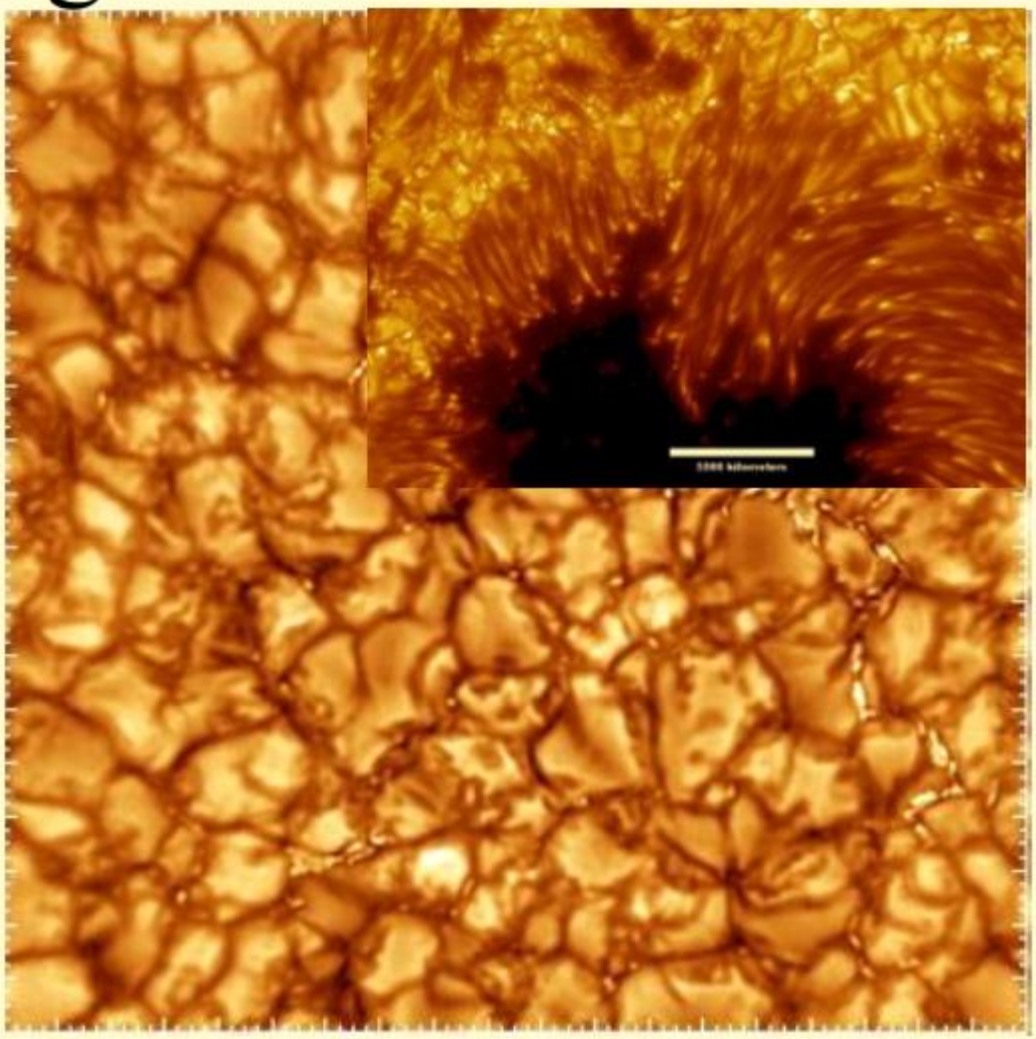
SUN'S OPERATION

- Sun does not operate by gravity moderated nuclear explosions
- Sun operates as a concentrated ball of electrically excited plasma
  - Its visible glowing surface maintained in an arc mode by a drift of electrons flowing inward from the distant cathode region of solar system – the heliopause
  - And by positive currents flowing into its poles from the interstellar circuit
  - Sun – analogous to an enormous fluorescent light that glows around a smaller solid and much cooler anode core

Sun's Photosphere is made up of Myriads of Magnetic Field Cells

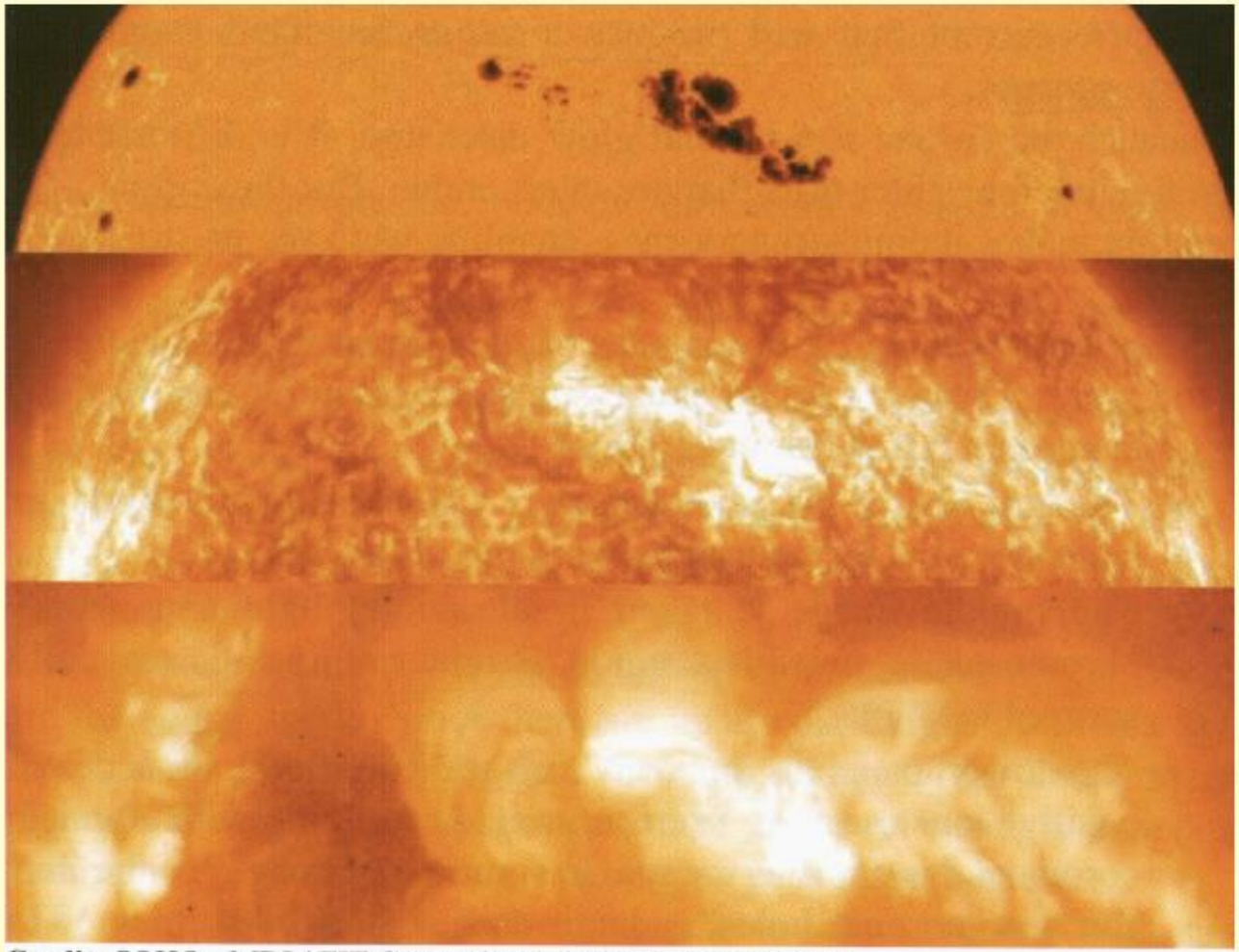
- New Telescope offers highest resolution of 12,000 x 12,000 miles in area of view

- Bright and dark areas coexist creating cellular pattern



Credit: BBSO/NJIT

Sun Spots at Various Wavelengths



Credit: SOHO - MDI / EIT Consortiums, Yohkoh / SXT Project

Photosphere
Visible Light
(Lower Intensity)

Chromosphere
Ultraviolet Light
(Higher Intensity)

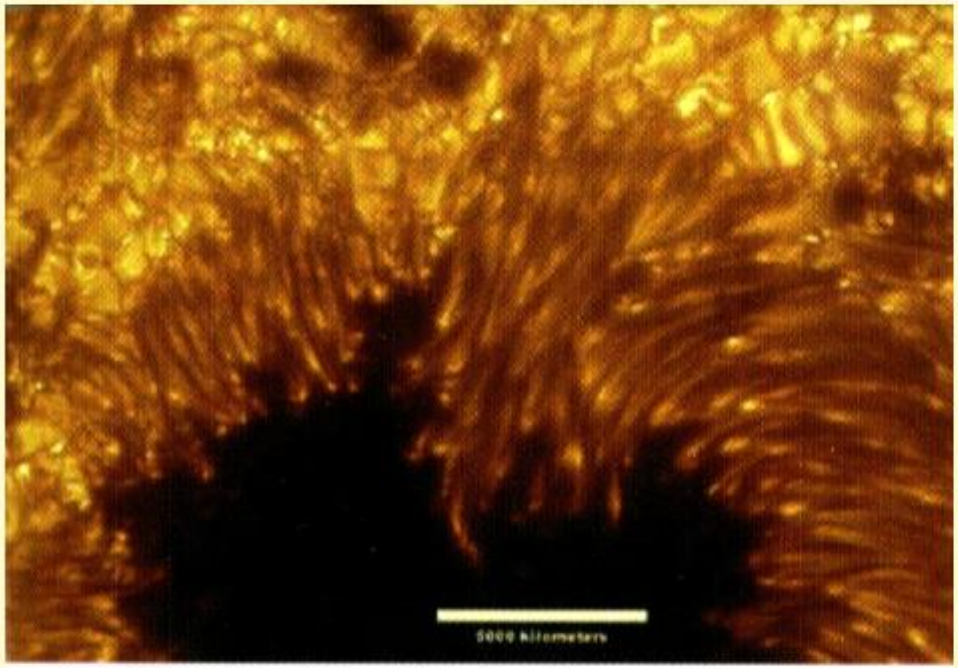
Corona (Discharge)
X-Ray Image
(Highest Intensity)

Solar Dynamic Observatory UV Image March 30, 2010

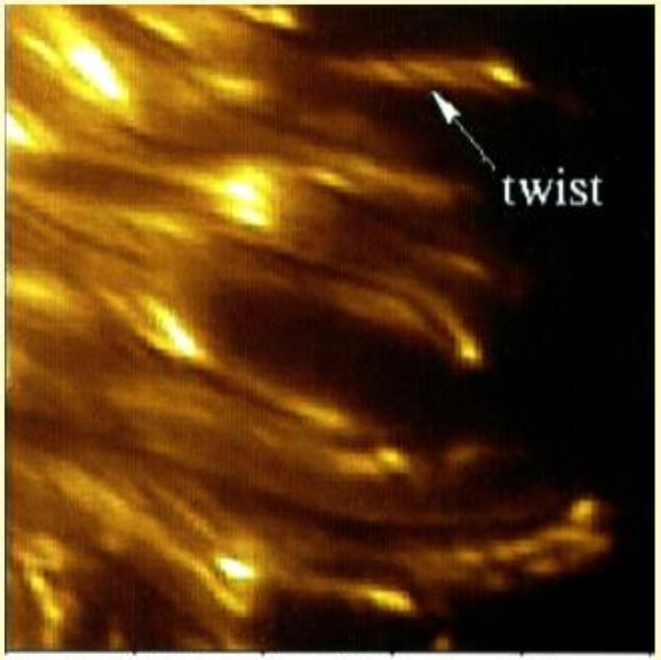
SUN'S CHROMOSHERE

The Sun's chromosphere seen in detail by the Hinode spacecraft. Where astrophysicists expected to see a calm region called the chromosphere, they saw a seething mass of swaying spikes. "Everything we thought we knew about X-ray images of the Sun is now out of date," says Leon Golub from the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts. "We've seen many new and unexpected things."
Image: Hinode JAXA/NASA

Sunspot Filaments or "Streamers"



Credit: SST, Royal Swedish Academy of Sciences

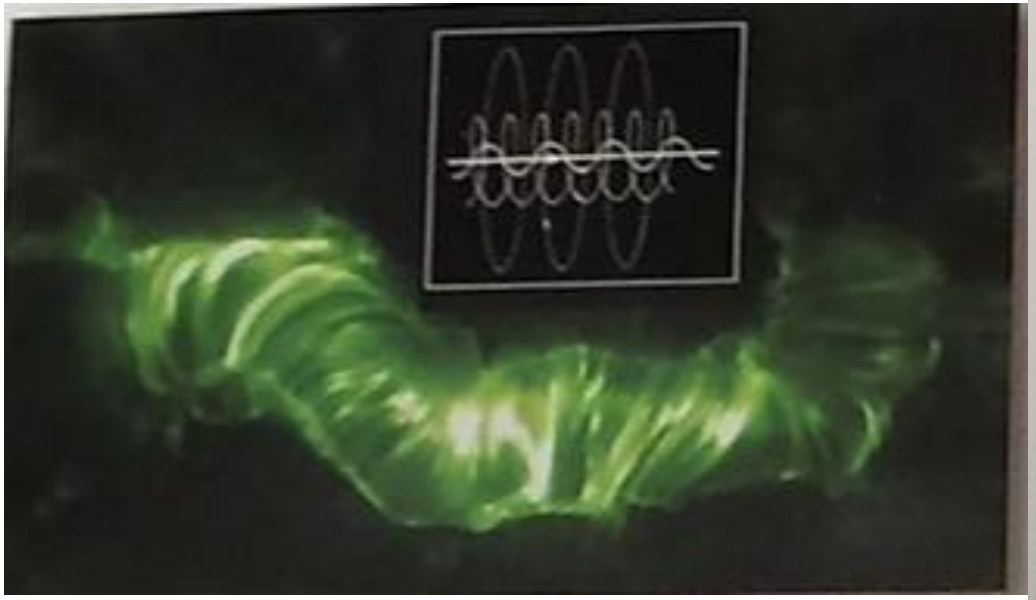


Credit: SST, Royal Swedish Academy of Sciences

- These are typical of Plasma Discharge Phenomena
- One can see Twisted Birkeland Currents in the filaments

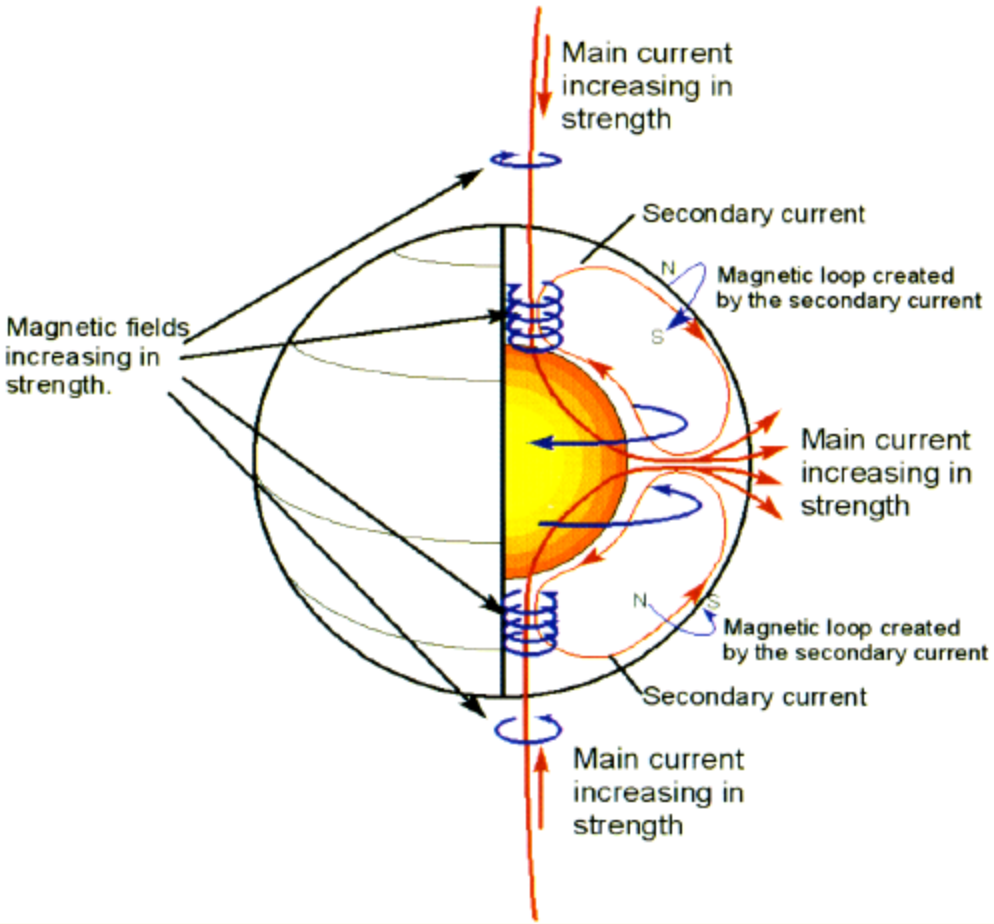
UV IMAGE OF SOLAR FLARE

- Shows current filament in plasma



This remarkable close-up ultraviolet image by NASA's TRACE satellite shows an active region on the sun, just after a massive flare erupted. Dubbed the 'slinky,' each loop is far larger than the diameter of the Earth.
The inset shows a model of current filaments in plasma. The lines represent both current paths and magnetic field lines. In the strong currents associated with a solar flare, the solar gases are heated to millions of degrees and the helix develops kink instabilities which eject the hot plasma into space. The cause is electrical, producing the secondary magnetic effects seen here.
Credit: NASA, Trace

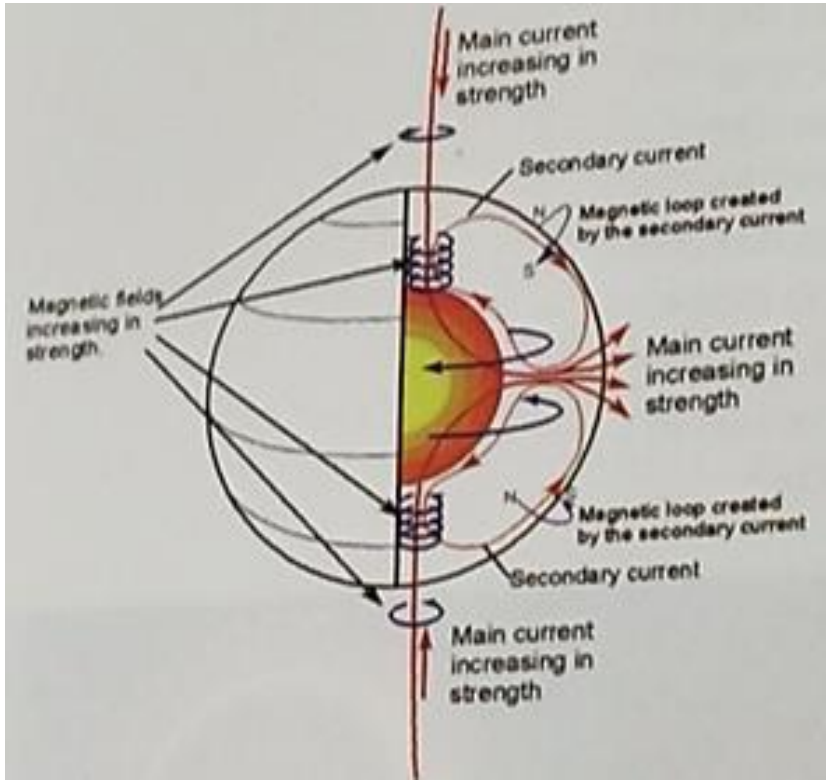
Sun may be Supplied by Electric Plasma Currents from Galactic Arm of Milky Way



- Primary Currents are from Stellar and Galactic Interactions
- Secondary Loop Currents also flow in Sun's hemispheres giving rise to complex Magnetic Loops observed
- No Magnetic Fields without Current Flow

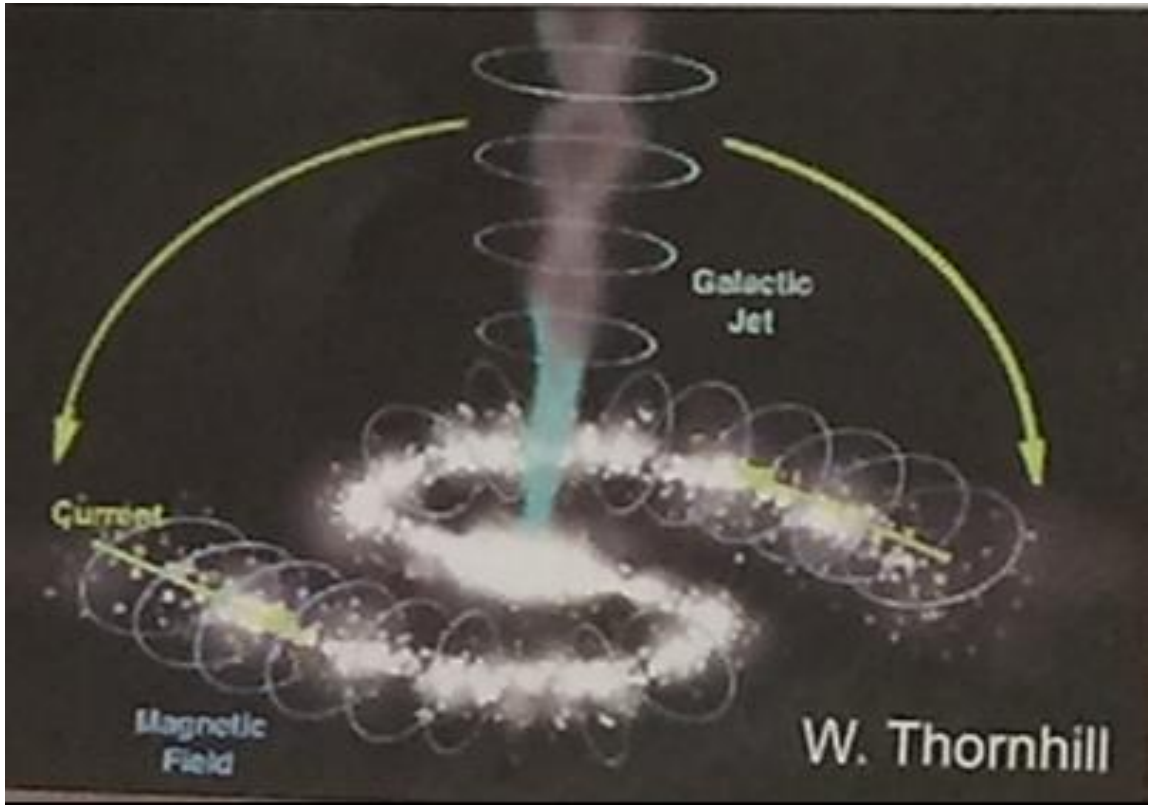
PRIMARY AND SECONDARY ELECTRIC CURRENTS IN THE SUN

"Primary and secondary electric currents in the Sun." Using Alfvén's circuit diagram of the Sun, Professor Scott offers the following explanation for solar magnetic field reversals: "If the main magnetic field that induces the surface currents is growing in strength, the surface current will point in one direction. If the main magnetic field weakens, the secondary surface currents will reverse direction." This 'transformer' action does *not* require the solar driving current to reverse direction. Credit: Diagram and explanation are from D. E. Scott's *The Electric Sky*, pp. 112-3.

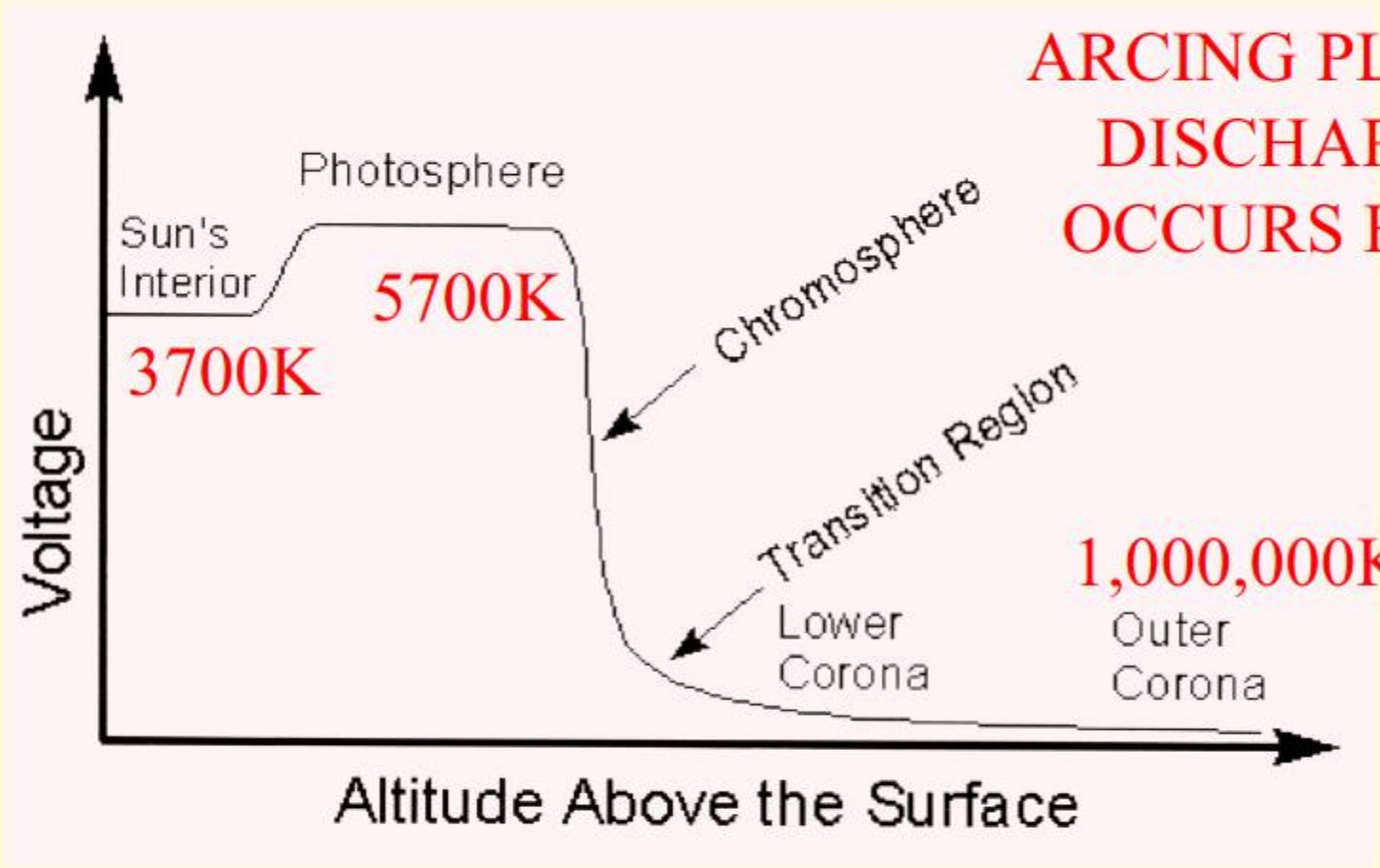


THE GALACTIC CIRCUIT

- Sun occupies a spiral arm of the Milky Way
- Electric currents flow along arms of of the galaxy, creating helical magnetic fields, confining and “pinching” the galactic plasma into the spiral structure.
- Galactic currents are all star’s (including our Sun’s) energy source – eliminates need for internal source of energy at the core



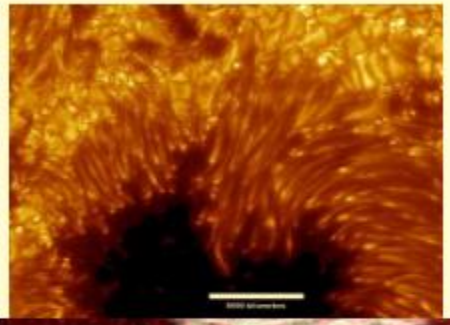
Electric Sun Hypothesis

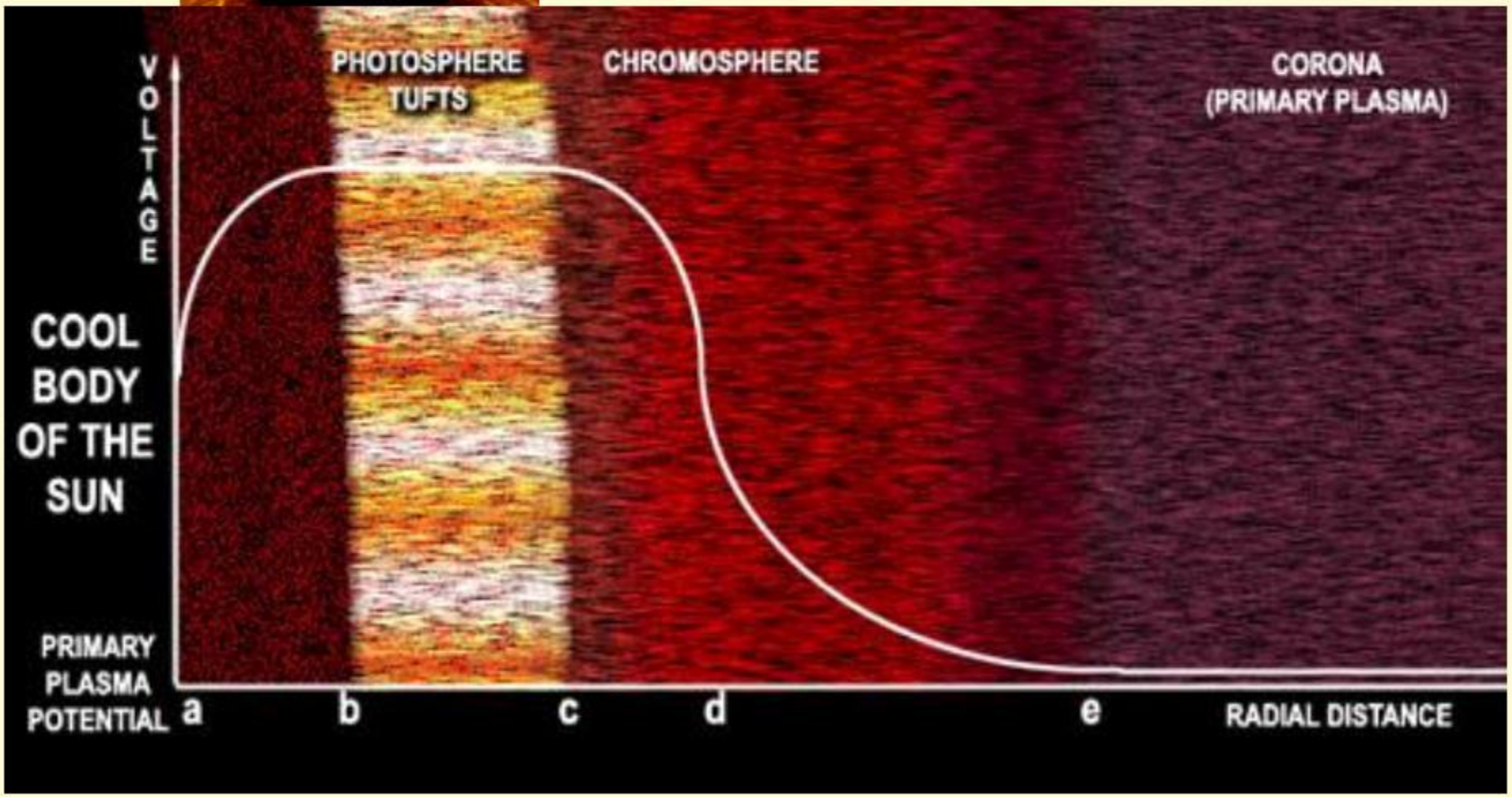


- This is the only model that can explain many anomalies including how high temperature in corona is formed, solar wind stopping, element formation and others

The New Solar Physics

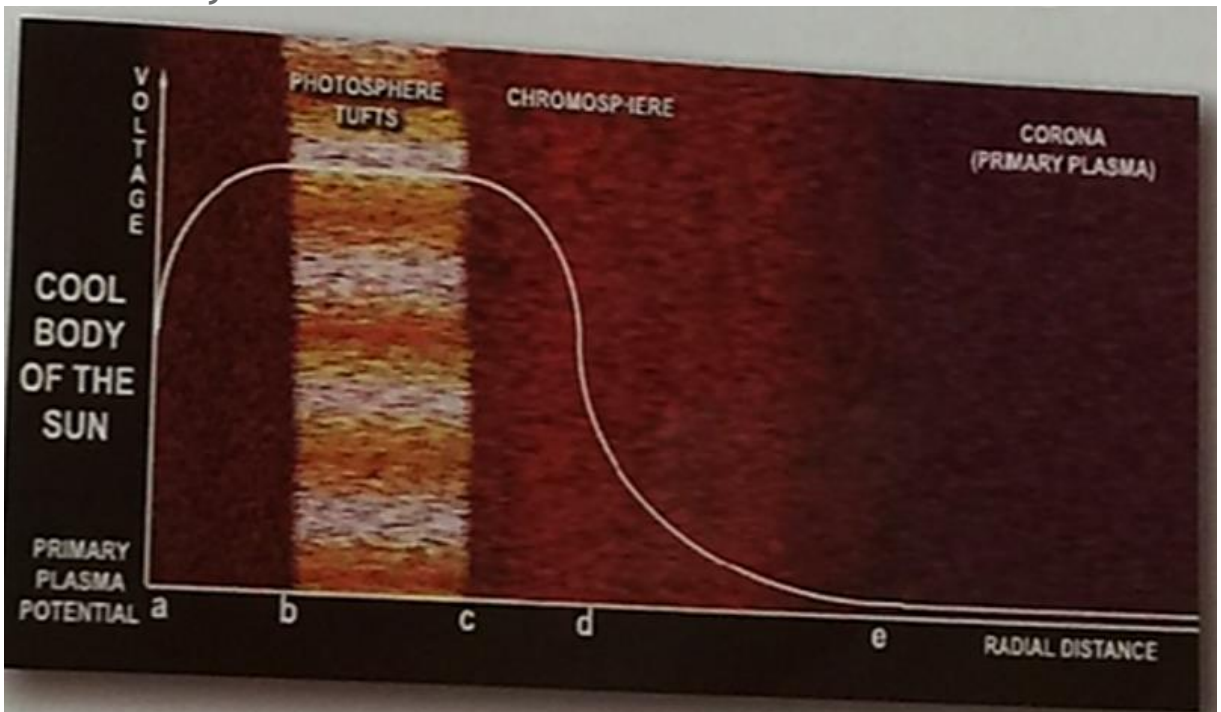
- Left: Sunspots in Photosphere





SUN'S PLASMA SHEATH

- White curve shows voltage changes within solar plasma as we move outward from the body of the sun
  - Positively charged protons "roll down the hill". Photospheric tuft plasma acts as a barrier to limit the Sun's power output. Plateau between b and c and beyond e defines a normal quasi-neutral plasma.
    The chromosphere has a strong electric field which flattens out but remains non-zero throughout the solar system. As protons accelerate down the chromospheric slope, heading to the right, they encounter turbulence at e, which heats the solar corona to millions of degrees. The small but relatively constant accelerating voltage gradient beyond the corona is responsible for accelerating the solar wind away from the Sun.



Warped Current Sheet of the Magnetic Field of the Sun discovered by Pioneer

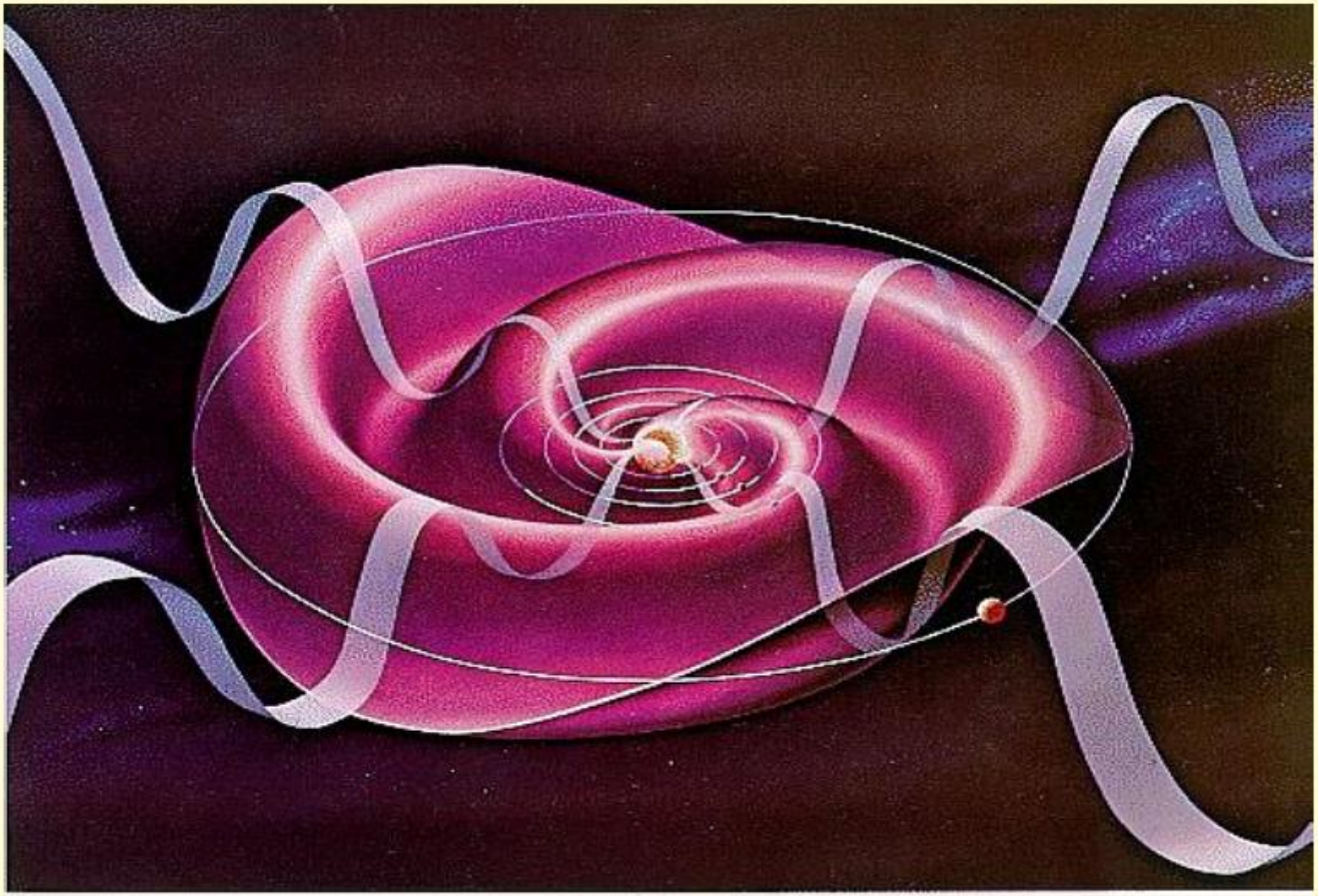


Figure 5-22. In its voyage across the Solar System high above the plane of the ecliptic, Pioneer to Saturn made important discoveries about the structure of the magnetic field of the Sun – the warped current sheet shown here.

3-D Heliospheric Current Sheet looks like cochlea spiral in ear

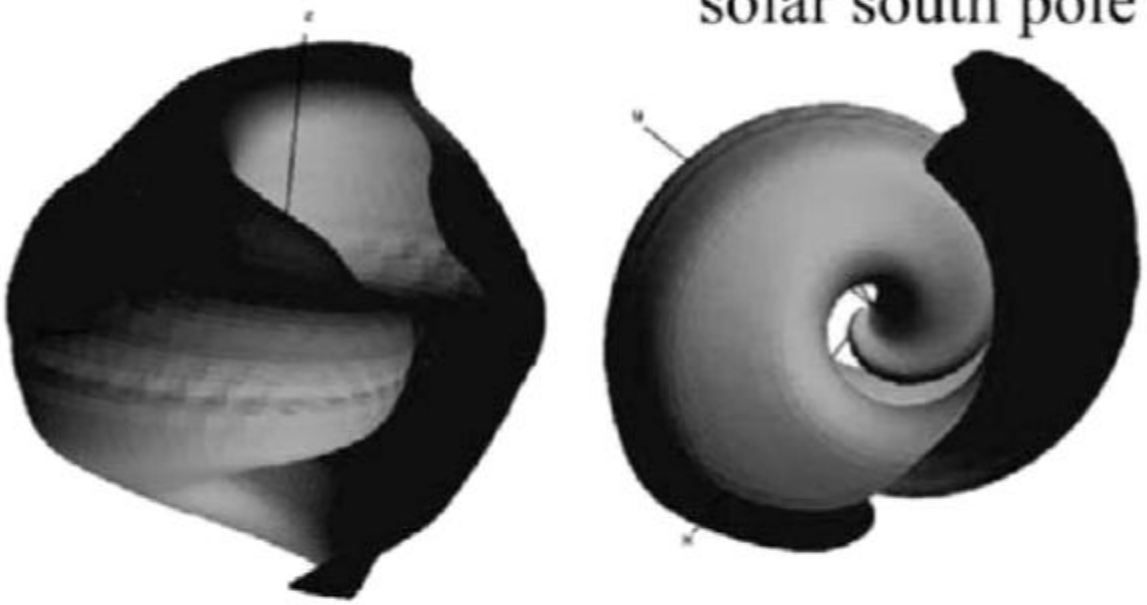
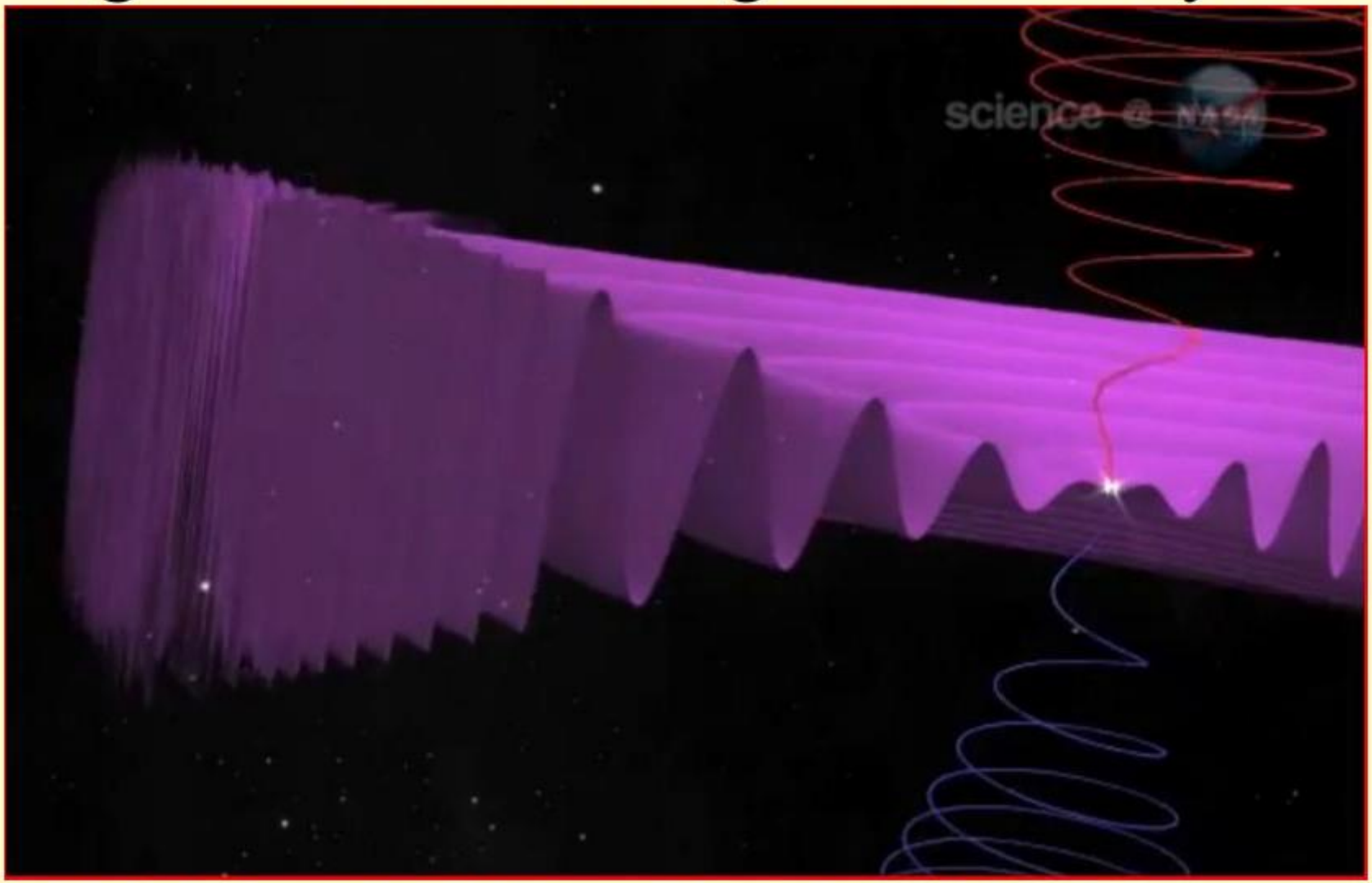


Figure 5. Two views of the heliospheric current sheet (out to 5 AU): (left) the view from Earth and (right) the view from above the south pole of the Sun.

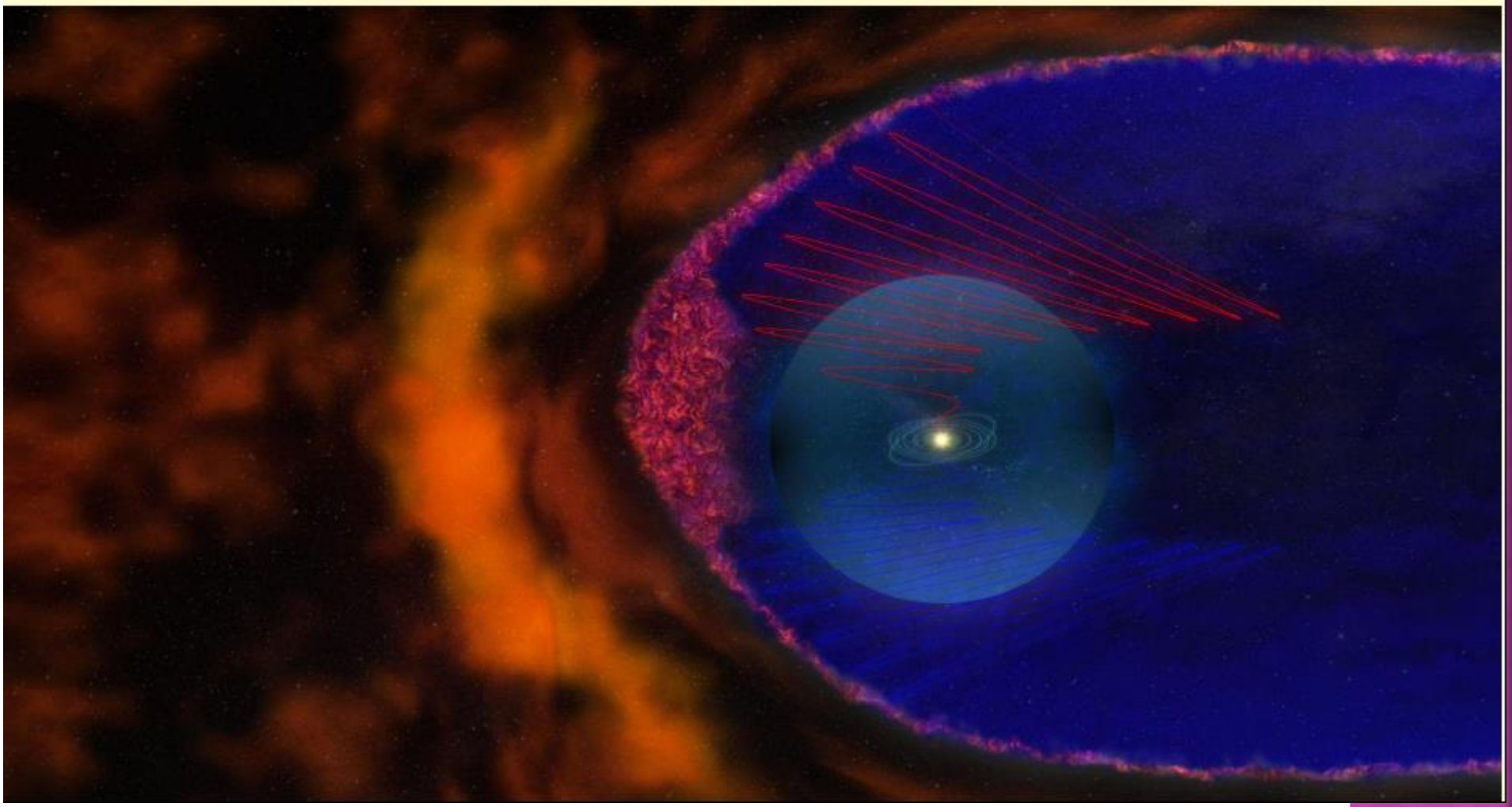
Source: Riley P. et al, JOURNAL OF GEOPHYSICAL RESEARCH, VOL. 107, NO. A7, 2002

Magnetic Froth at Edge of Solar System

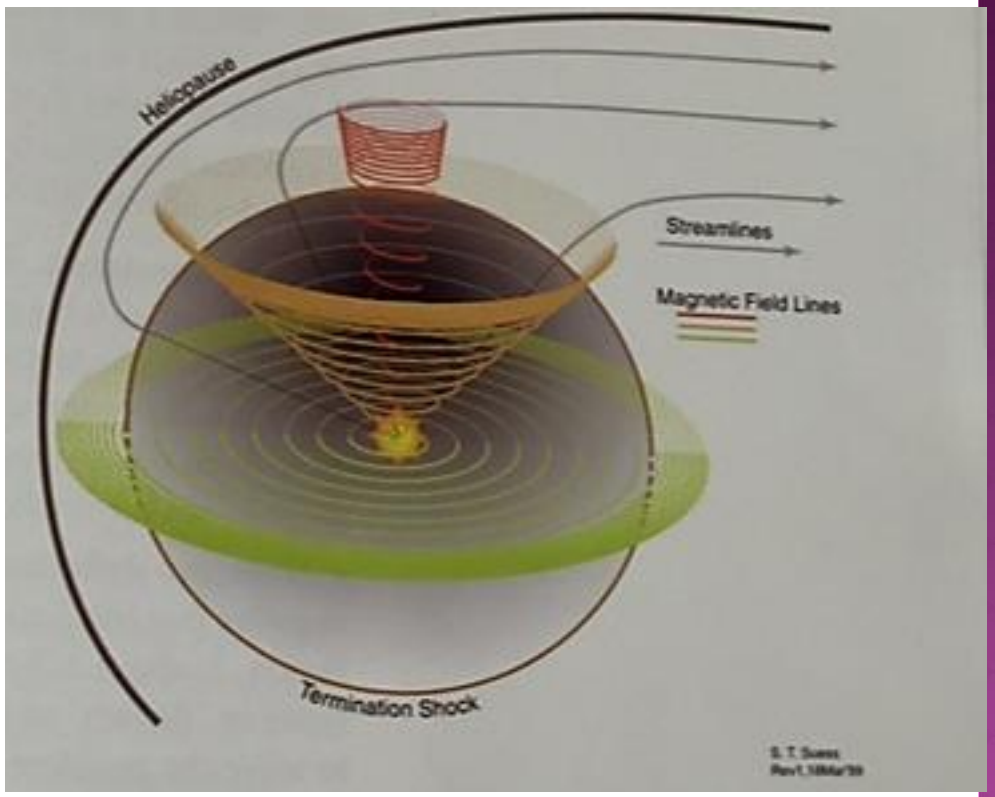


- Sun's Magnetic Field extends to edge of Solar System
- Here field bunches up and twists leading to bubble formation

New Image of Heliosheath: Magnetic Froth at Edge of Solar Magnetic Field interacts with Galaxy

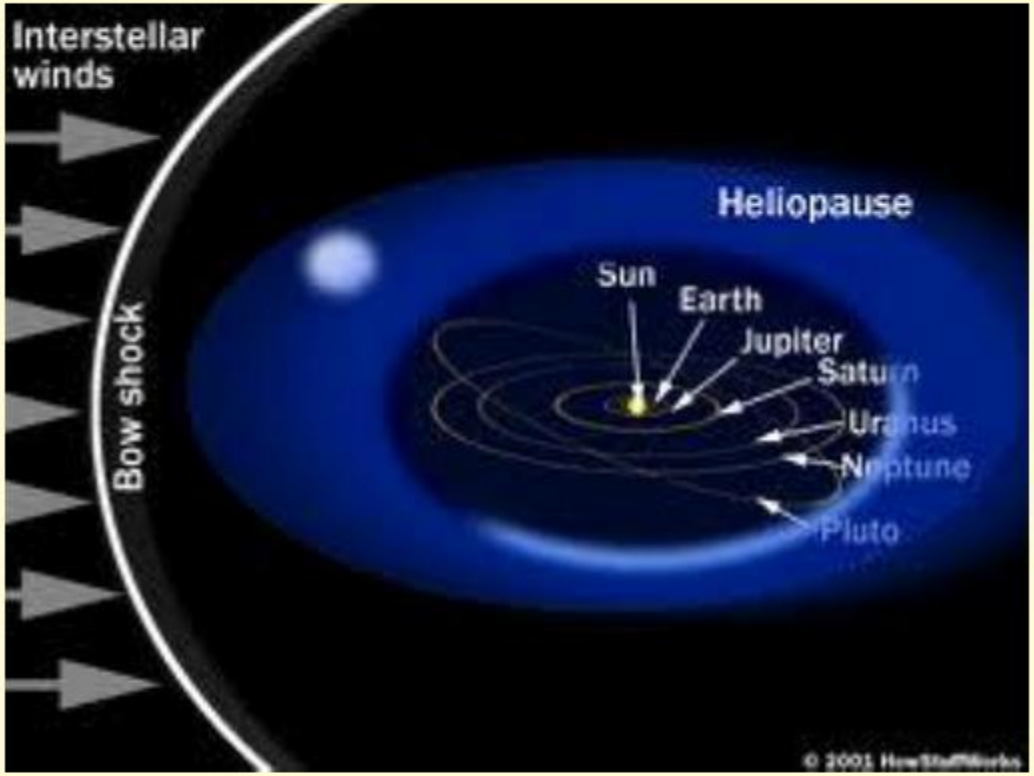


SUN'S MAGNETIC FIELD



The Sun's magnetic field has been mapped above the poles by the Ulysses spacecraft. The thermonuclear model has nothing useful to tell us about why the Sun's magnetic field should have such an odd configuration. Nor does it have any answers to the final destination of the 'open' polar magnetic field lines.
Credit: S. T. Suess.

Solar System is Traversing New Space



- Heliopause is traversing new Interstellar Space
- Brings changes to all planets & Sun's Environment
- May be related to Earth Changes – Up 3-fold

COMETS

- Not bodies of ice – solid rock surface
- Has own charge level (double layer barrier)
- As they move through the increasing positive charge that surrounds the Sun, there is inevitable electric discharge
  - Electrical discharge forms the circular craters of comets
  - Craters in moons, comets are all circular, with smaller craters, also circular within or nearby
    - Can be formed by Birkeland currents discharging
    - Shapes of craters cannot be by meteors striking surface – too round and no elliptical craters

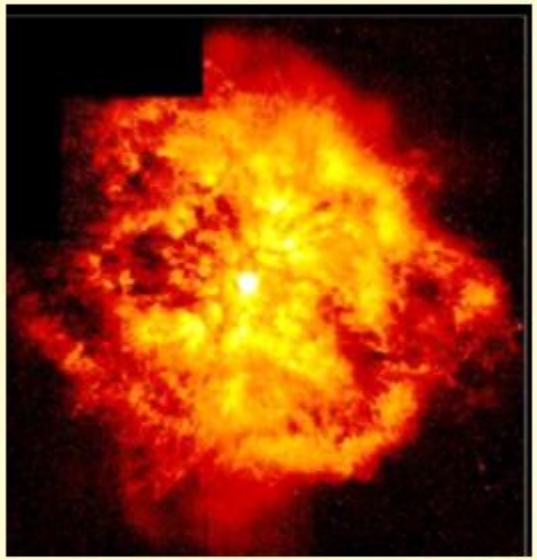
Ionospheric EM Wave Propagation

Ionosphere: D layer (60 – 90 km), E layer (90 – 120 km), F layer (200 – 500 km) most important for radio waves

Ionosphere & Earth forms a Spherical Capacitor that is excited by Lightening creating ELF Cavity Resonances

Nebulas & Galaxies have Massive Plasma Cloud & Filament Interactions

Images: NASA / Hubble



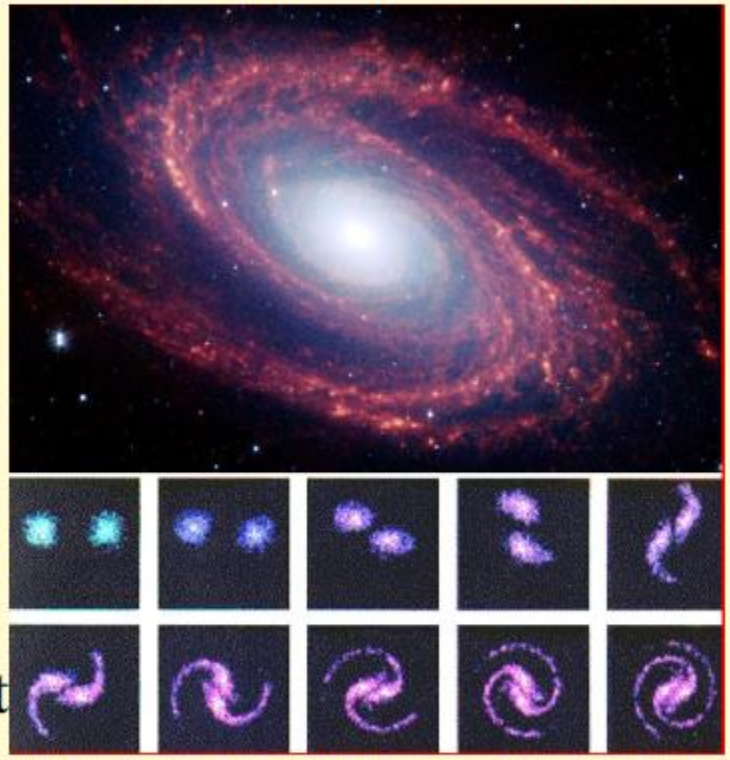
Nebula M1-67

Cygnus Loop

2,600 light years distant

Massive plasma formation

Image: www.thunderbolts.info



Plasma Spiral Formation in Lab

Plasma interactions resemble galaxies at different stages of their life cycle

All of Us are Beings of Made up of Waves and Fields

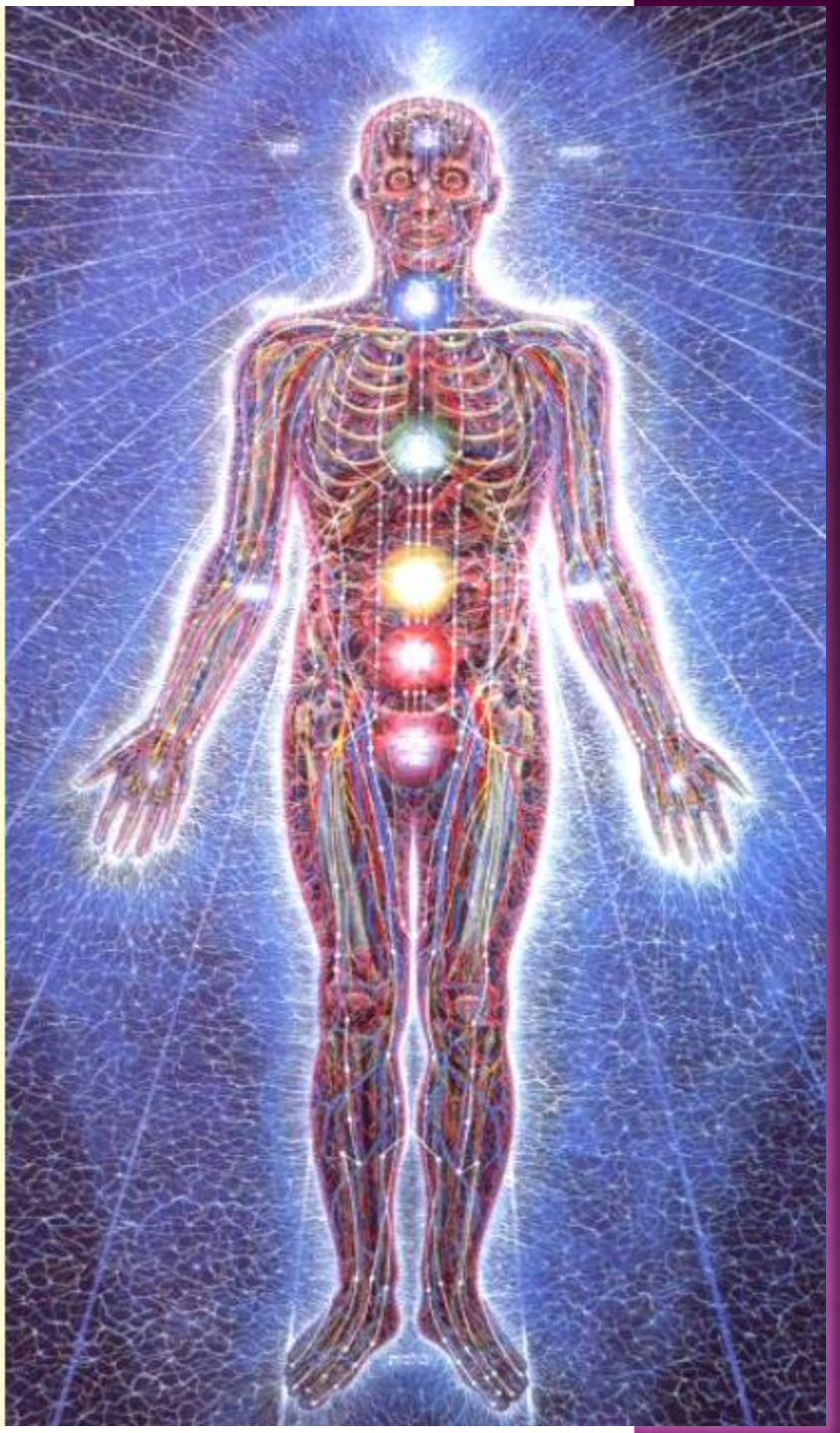


Image: Alex Grey