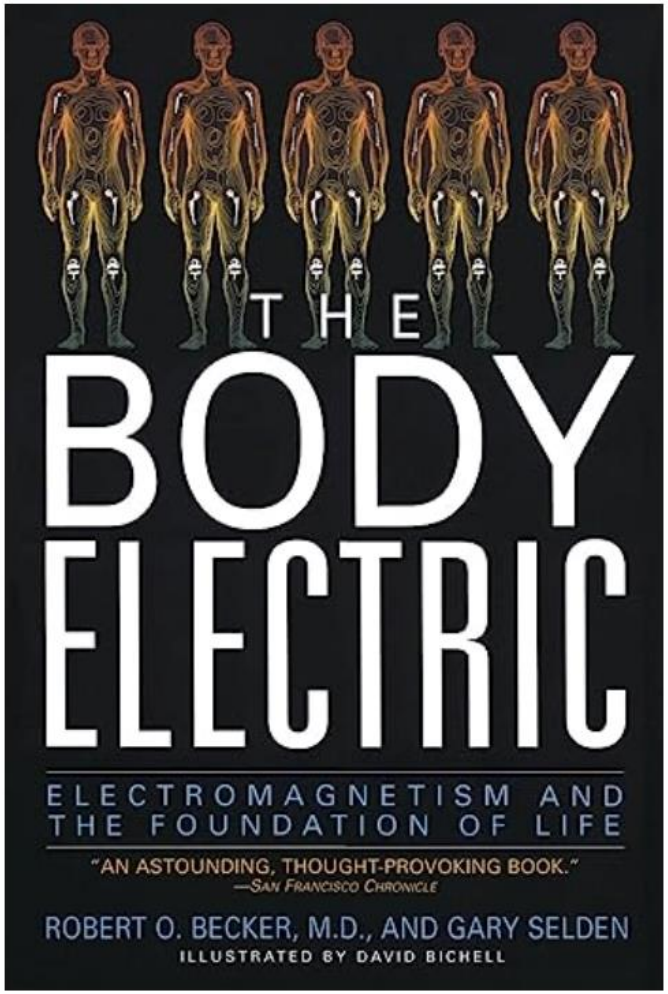
Breathing With The Earth

Inspired by the book

The Body Electric:Electromagnetism and the Foundation of Life

Chapter 14: Breathing with the Earth

Robert O. Becker, M.D., and Gary Selden. Quill Books, William Morrow and Co., 1985



1. Earth's Magnetic Field

2. Earth Space Interaction

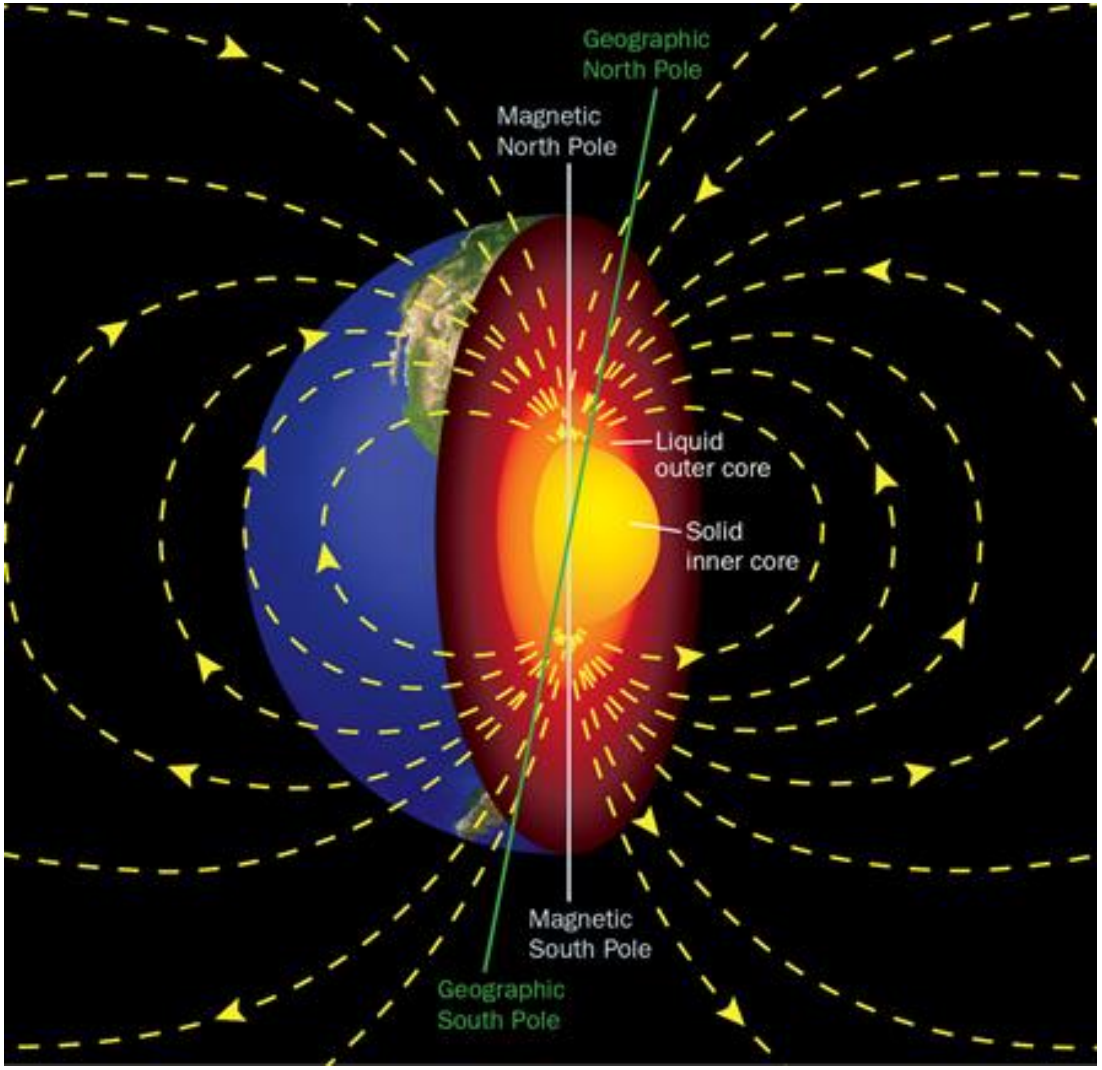
3. Earth's Geomagnetic Field

4. Schumann Resonance

5. The Human Electromagnetic Spectrum

1. Earth's Magnetic Field:

Earth's iron core creates a magnetic field with lines of force



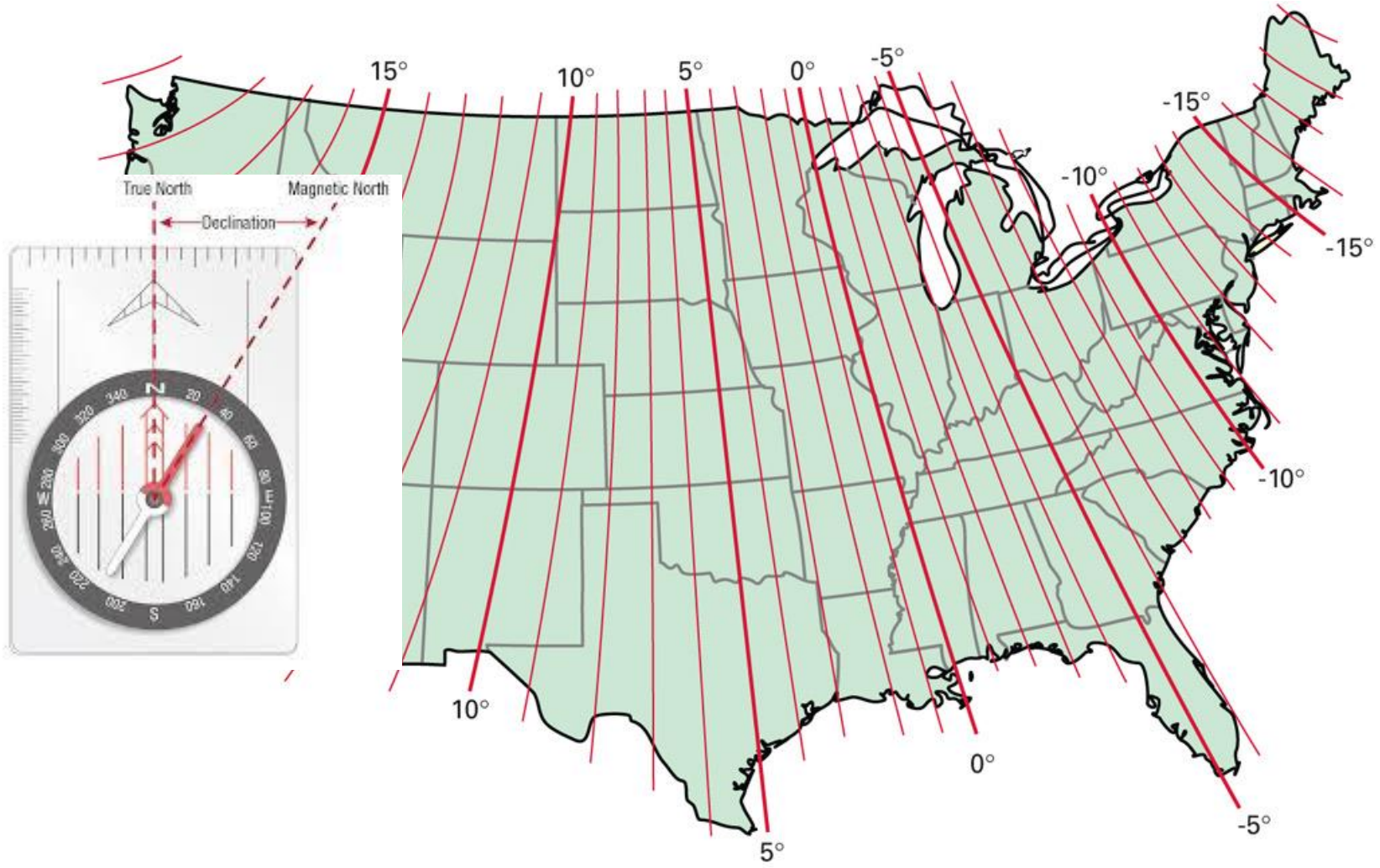
https://www.sciencenews.org/article/spinning-core

Magnetic and Geographic Poles do not lay on top of one another

The north and south magnetic poles move over time

North Magnetic Pole Locations

The needle of the compass points along magnetic lines of force. The difference between the direction of the magnetic lines of force and geographic north is called magnetic declination.



2. Earth Space Interaction

The earth's electromagnetic field is largely a result of interaction between this magnetic field emanating from the planet's molten iron-nickel core, and charged particles entering the earth’s atmosphere from space.

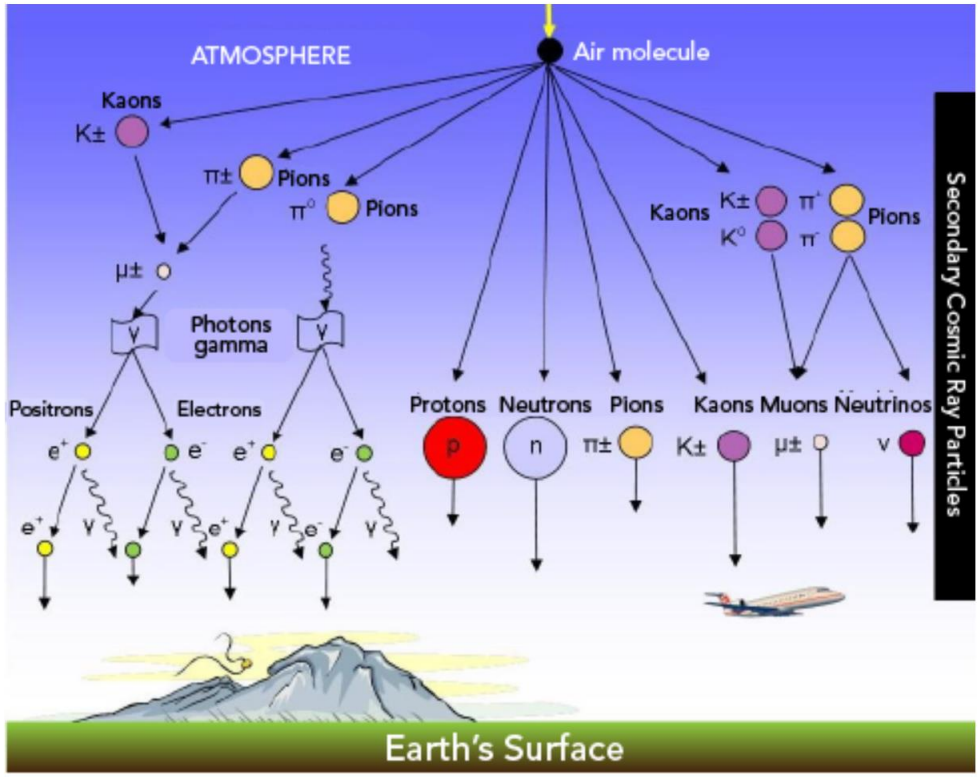
These charged particles are often referred to as cosmic rays, and the vast majority come from our sun.

Cosmic rays are high energy particles emitted by celestial objects, including the sun, stars, and galaxies. They consist mostly of protons, with sequentially decreasing amounts of alpha particles, carbon, nitrogen, oxygen nuclei, electrons, and gamma rays (photons)

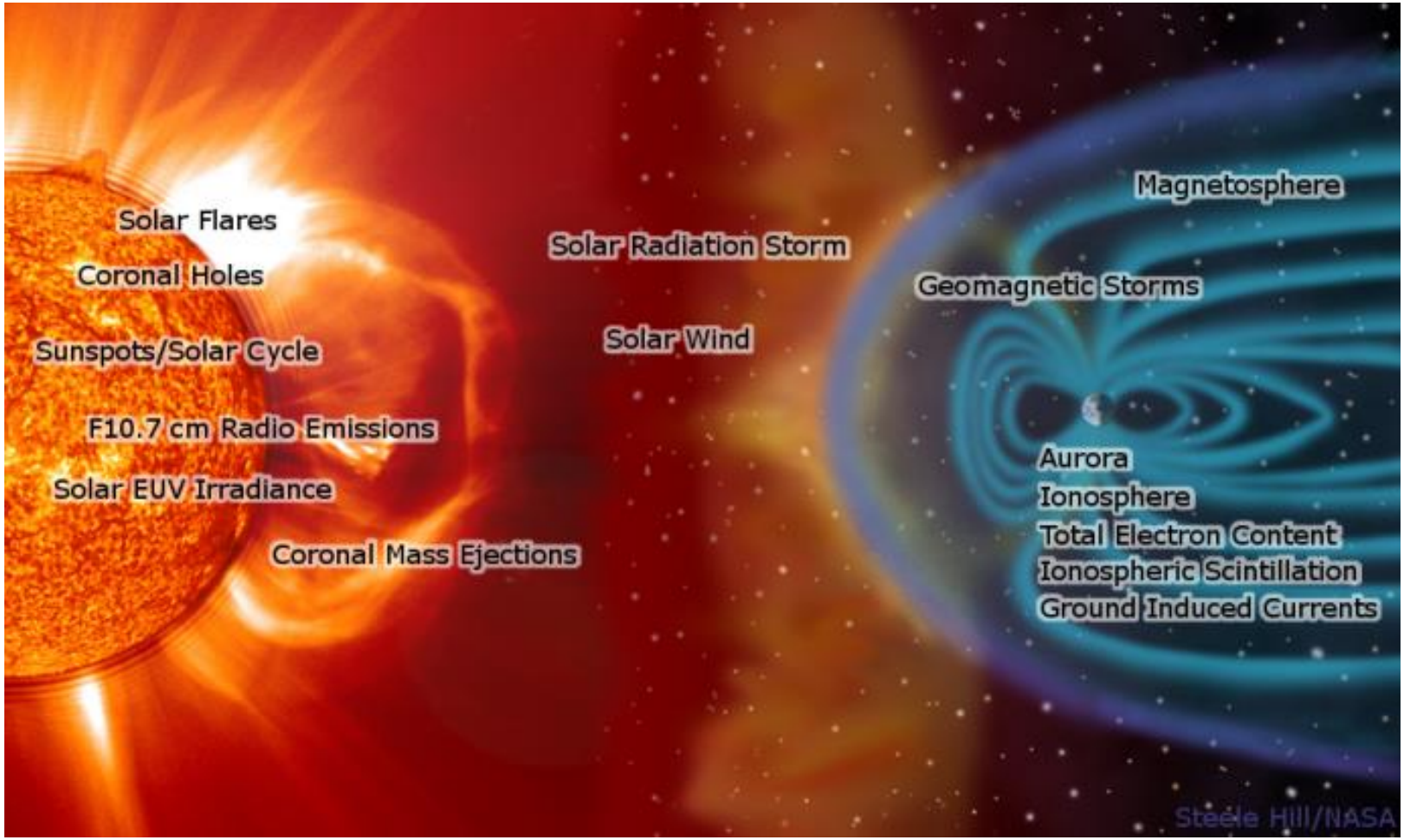
These may be broken down in the earth's atmosphere to secondary particles

https://letstalkscience.ca/educational-resources/backgrounders/what-are-cosmic-rays

let's talk science



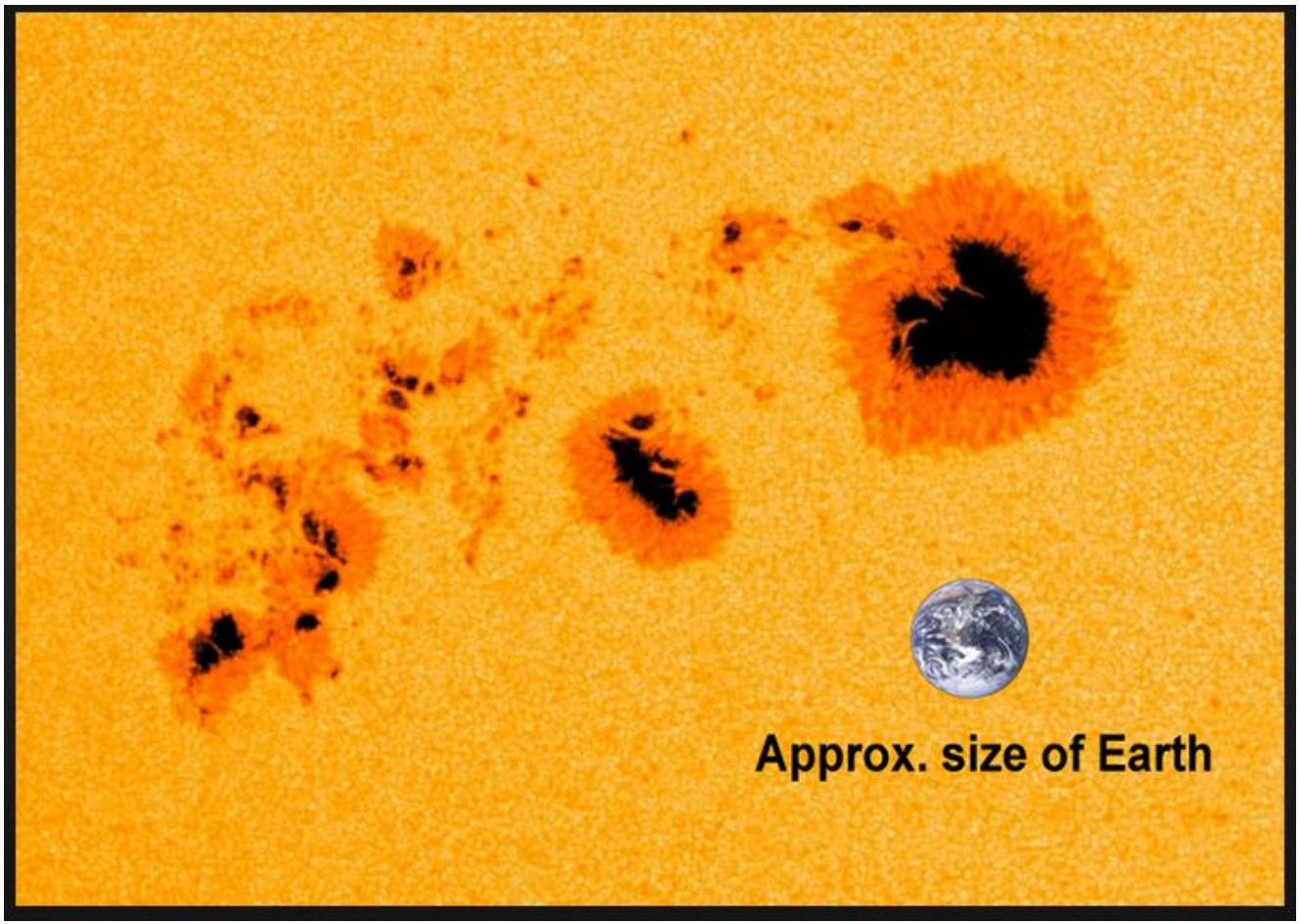
The sun radiates cosmic ray energy through sunspots, flares, prominences and the corona. This energy is called the solar wind, and interacts with the earth's magnetosphere, ionosphere, and magnetic field



http://www.swpc.noaa.gov/phenomena

Sunspots are dark areas that become apparent at the Sun's photosphere as a result of intense magnetic flux pushing up from further within the solar interior. Areas along this magnetic flux in the upper photosphere and chromosphere heat up, and usually become visible. This causes cooler (7000 F), less dense and darker areas at the heart of these magnetic fields than in the surrounding photosphere (10,000 F) - seen as sunspots.

https://www.swpc.noaa.gov/phenomena/sunspotssolar-cycle



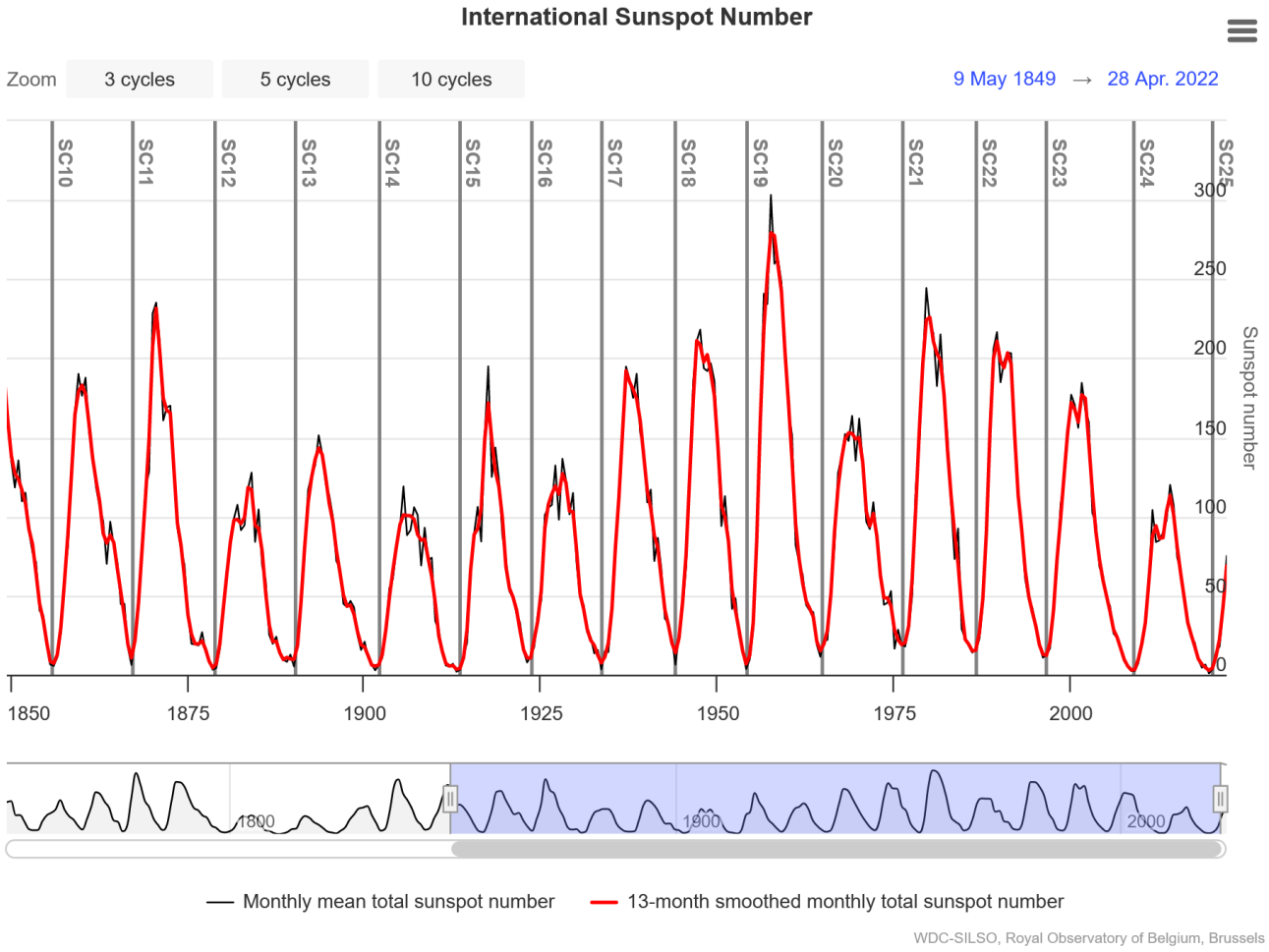
NASA https://phys.org

The number of sunspots reaches a maximum every 11 years

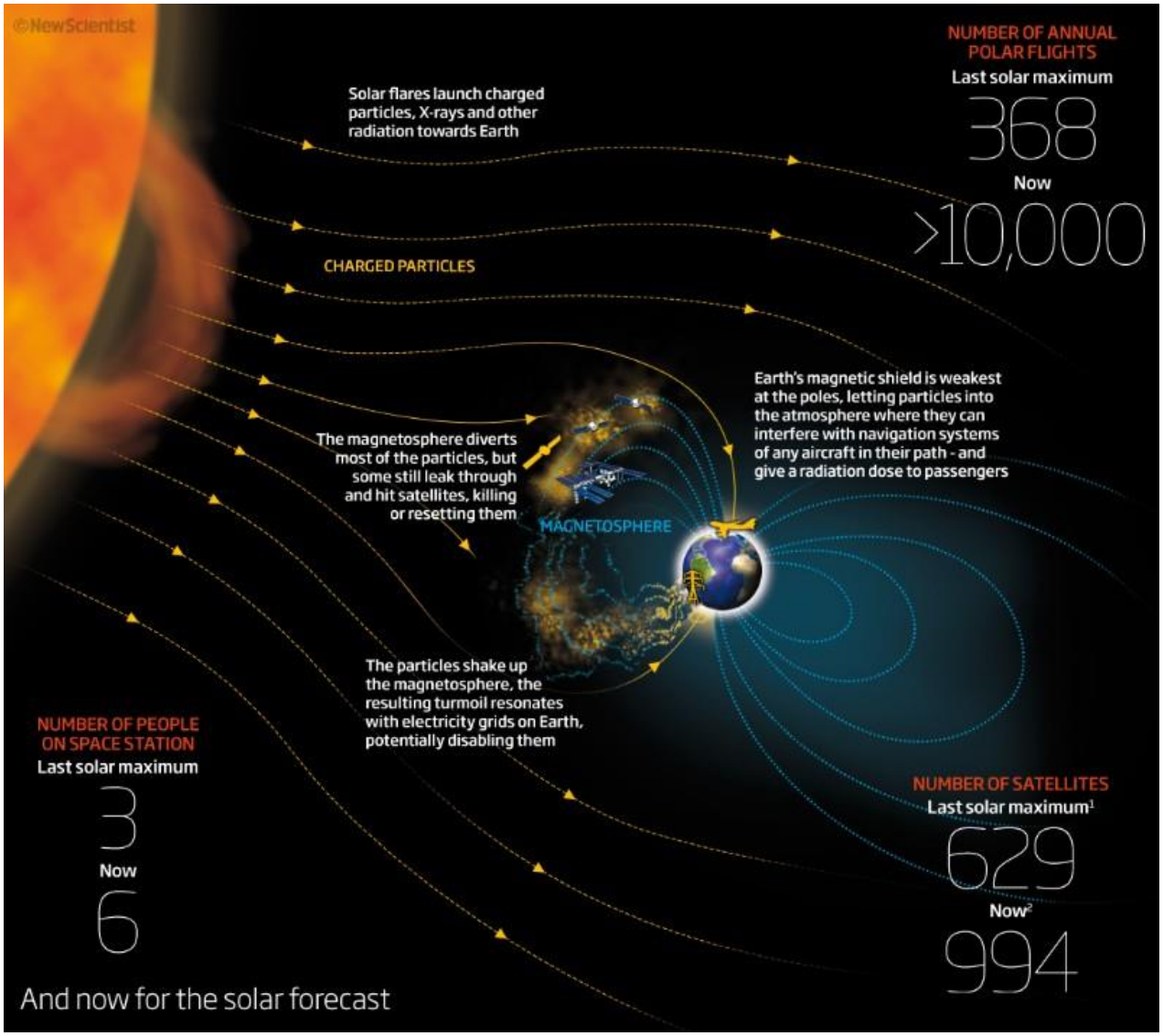
https://www.spaceweatherlive.com/en/solar-activity/solar-cycle/historical-solar-cycles.html

activity began. You can zoom in on this plot by selecting a time period that you wish to view. Every dataset can be toggled on or off by clicking on the corresponding description under each graph and it can be exported as a JPG, PNG, PDF or SVG file.

Solar activity | Auroral activity | Reports | Archive | Community | Gallery | Help | Links



The earth's magnetosphere diverts most cosmic energy particles.

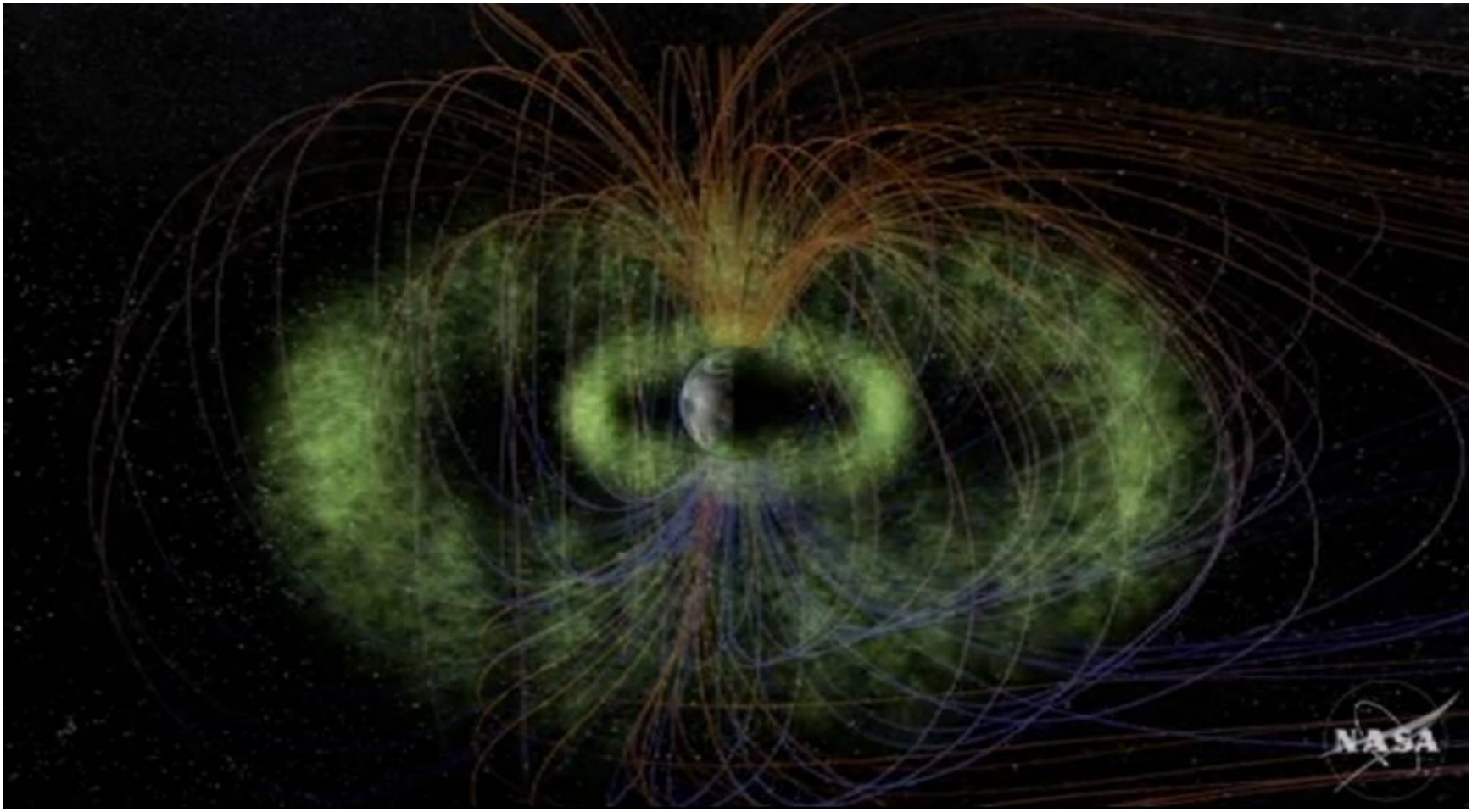


Solar radiation and the magnetosphere

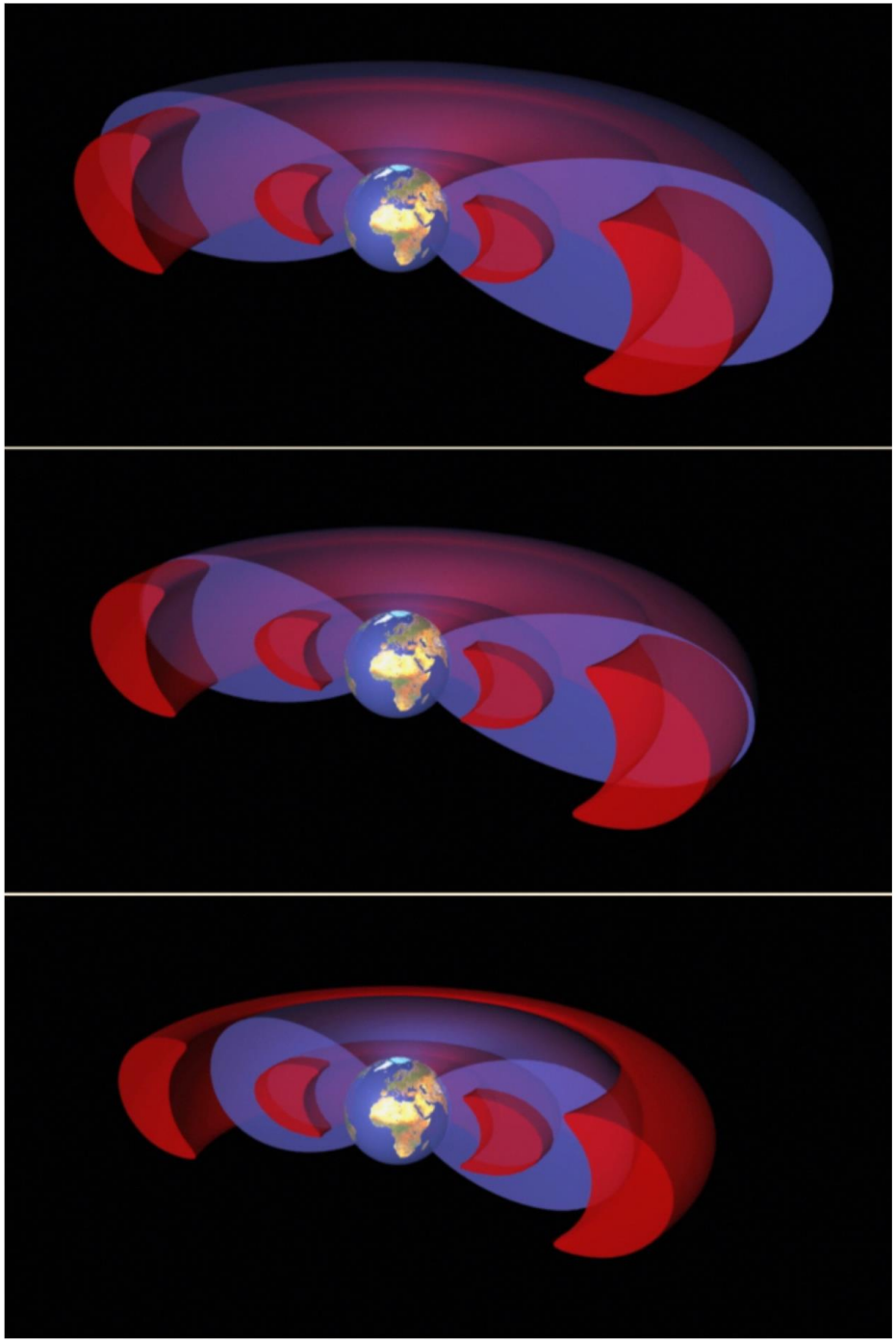
https://www.newscientist.com/article/mg21328505-200-earth-in-for-bumpy-ride-as-solar-storms-hit/

The earth also captures high energy particles from the solar wind

Van Allen Radiation Belts



https://www.nasa.gov/mission_pages/sunearth/news/gallery/vab-graphic.html



Earth's plasmasphere and the Van Allen belts

These images show how the relative locations of the outer boundary of the Earth's plasmasphere, (the plasmapause, shown in blue) and the van Allen belts (shown in red) change according to geomagnetic conditions.

The plasmasphere – the innermost part of the Earth's magnetosphere – is a doughnut-shaped region of low energy charged particles (cold plasma) centered around the planet's equator and rotating along with it.

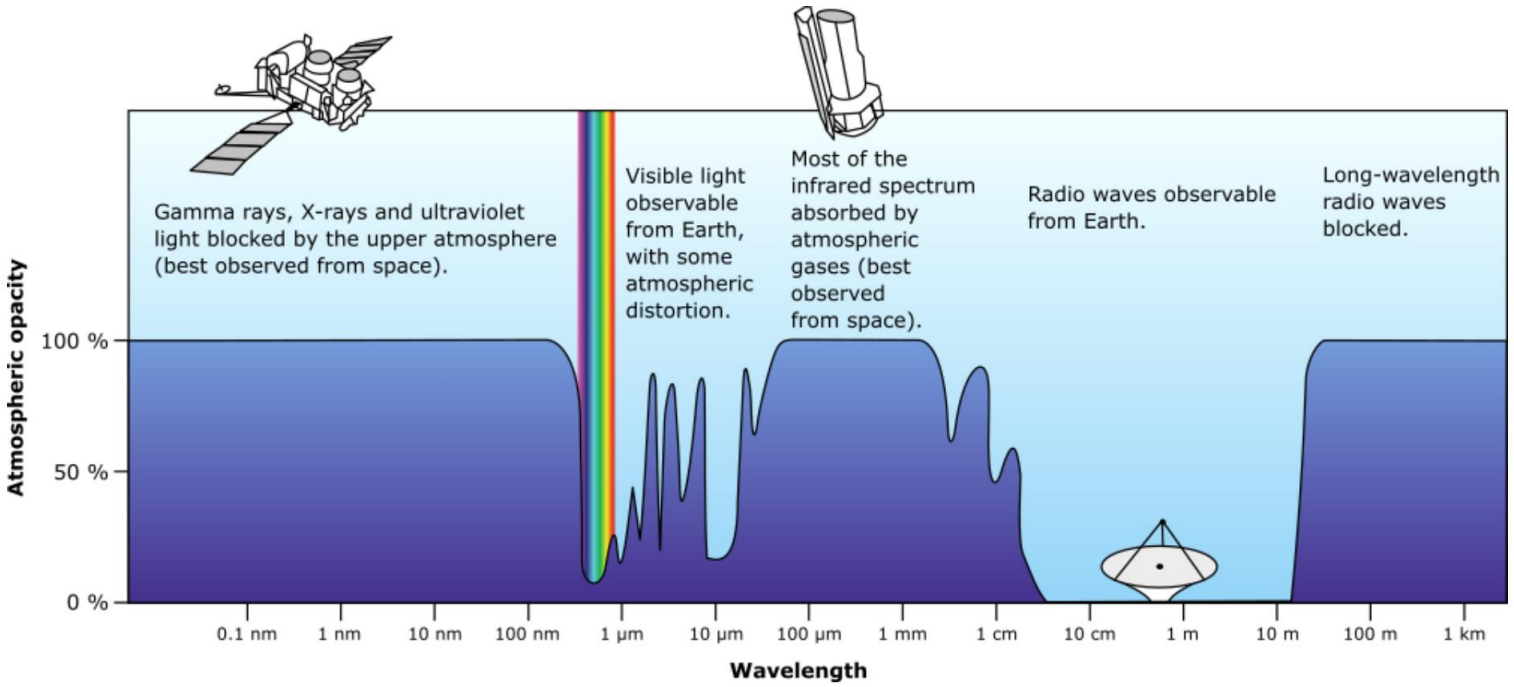
Its toroidal shape is determined by the magnetic field of Earth.

The plasmasphere begins above the upper ionosphere and extends outwards, with the outer boundary varying (depending on geomagnetic conditions) from 4.5 Earth radii (R_E) to 8 R_E.

Date: 10 September 2013
Satellite: Cluster

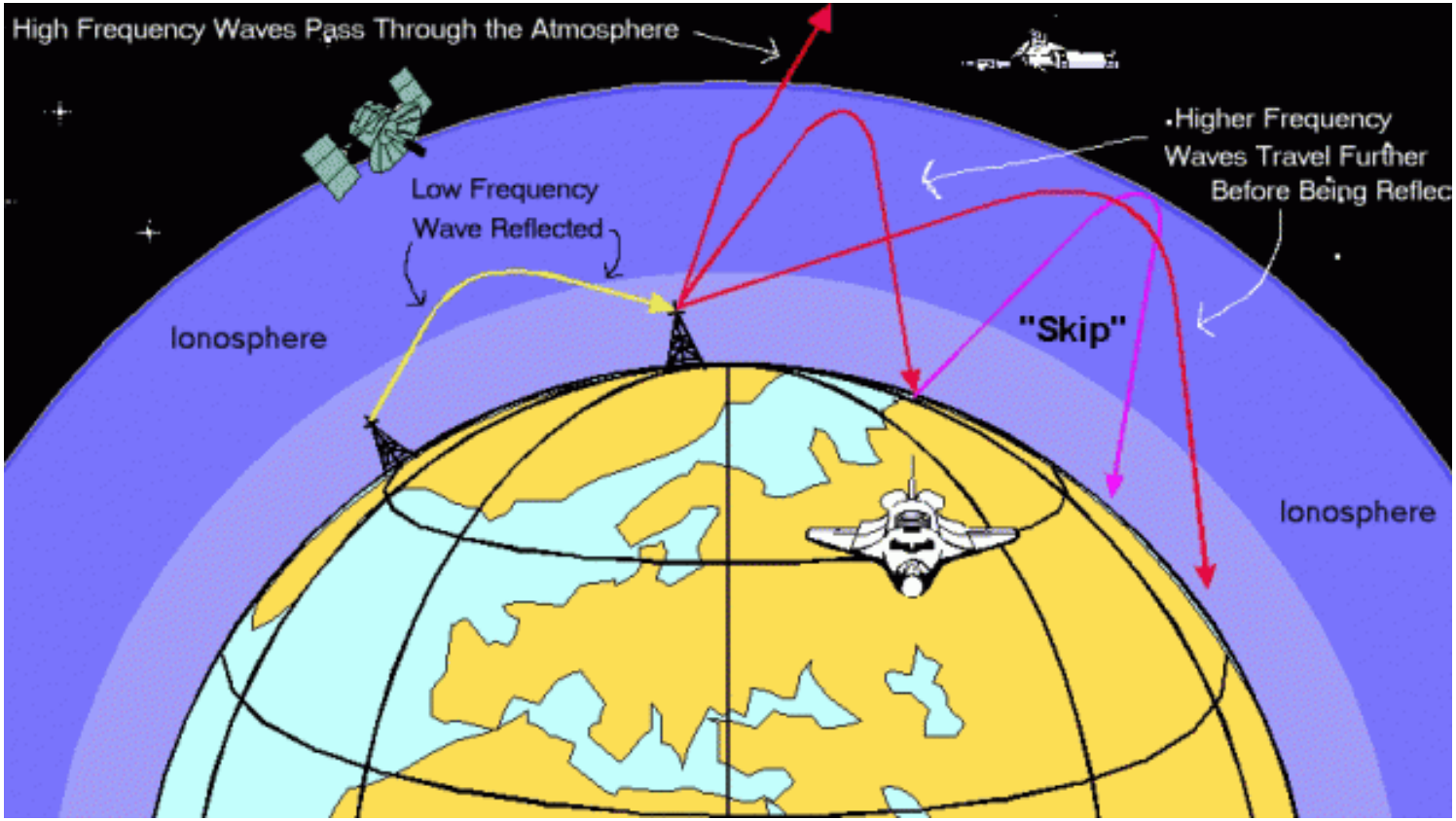
https://sci.esa.int/web/cluster/-/52831-earth-plasmasphere-and-the-van-allen-belts

The ionosphere contains a high concentration of cosmic particles and is electromagnetically active. Low frequency radio waves are reflected; Higher frequency radio waves travel further before being reflected, and radio waves within the radio window
can penetrate the atmosphere from both directions.



https://charleslabs.fr/en/project-Radio+Astronomy+Basics

This means that not only can radio waves of a certain frequency band be reflected around the earth for telecommunications, but also the frequency band in the radio window can pass from space to our radio telescopes on earth.

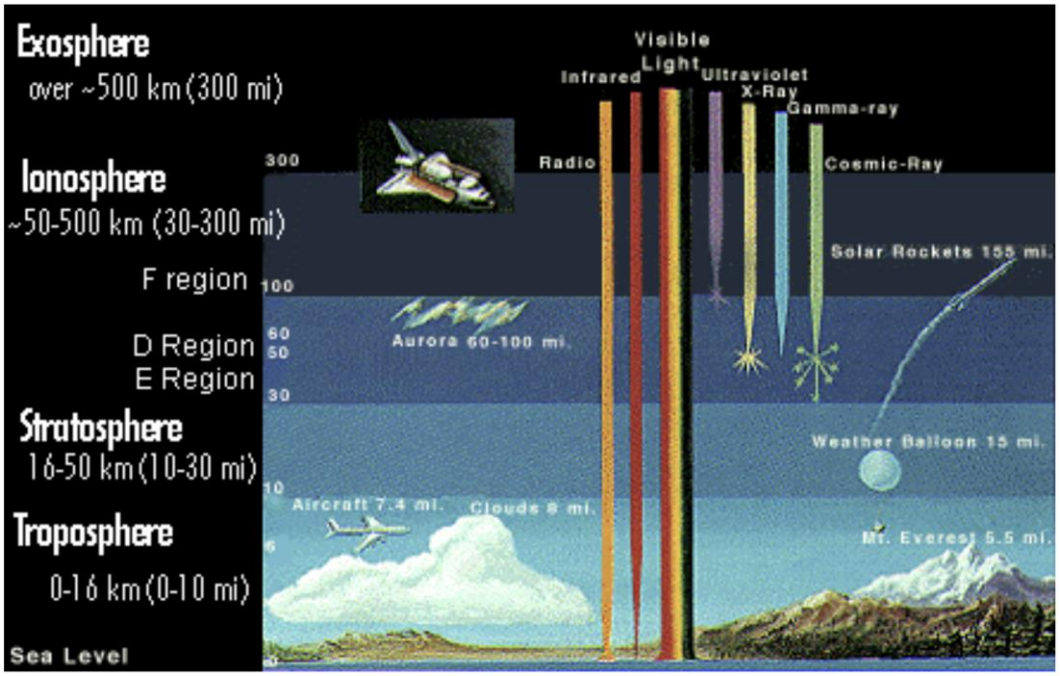


http://www.swpc.noaa.gov/phenomena/ionosphere

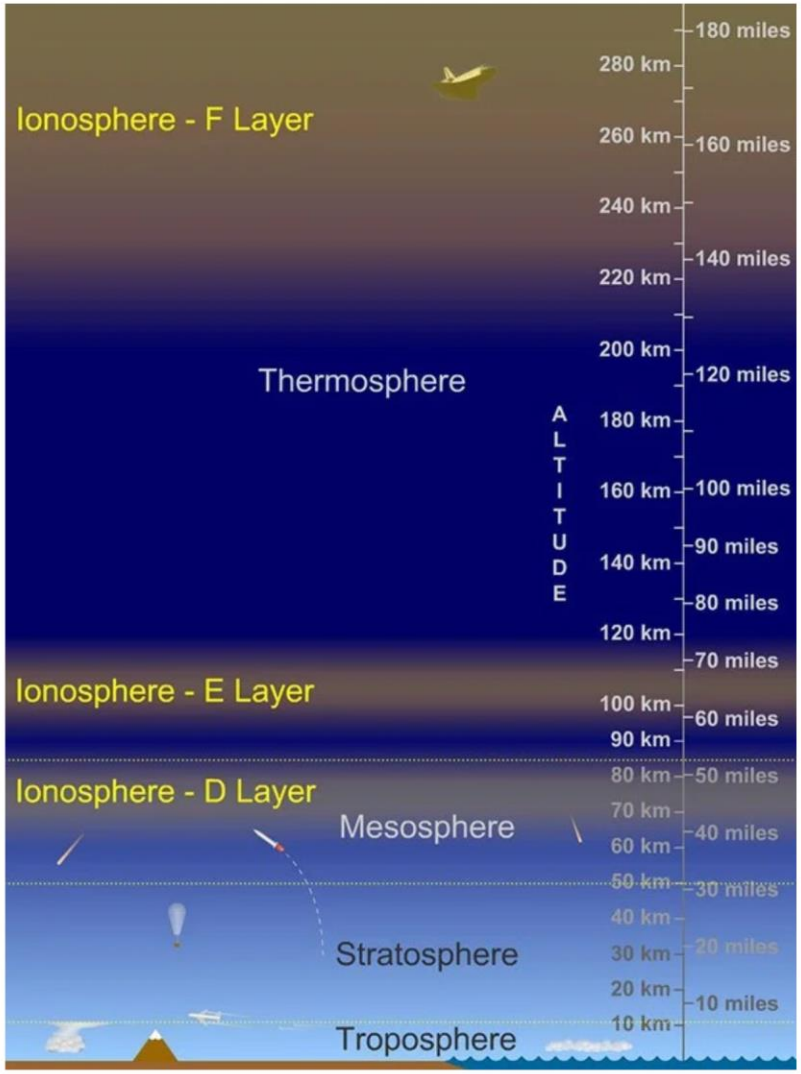
Microwaves are absorbed by moisture in the atmosphere; the most energetic UV is absorbed by ozone in the atmosphere; oxygen and nitrogen atoms in the thermosphere absorb nearly all x-rays and gamma rays;
the Earth's atmosphere and magnetic field absorb nearly all cosmic rays.

https://www.researchgate.net/profile/Hatice-Aylin-Karahan-Toprakci

Due to spectral variability of the solar radiation and the density of various constituents in the atmosphere, layers are created within the ionosphere, called the D, E, and F-layers.



Particle density is highest in the upper, or F region during both daytime and nighttime. The D region disappears during the night compared to the daytime, and the E region becomes weakened.



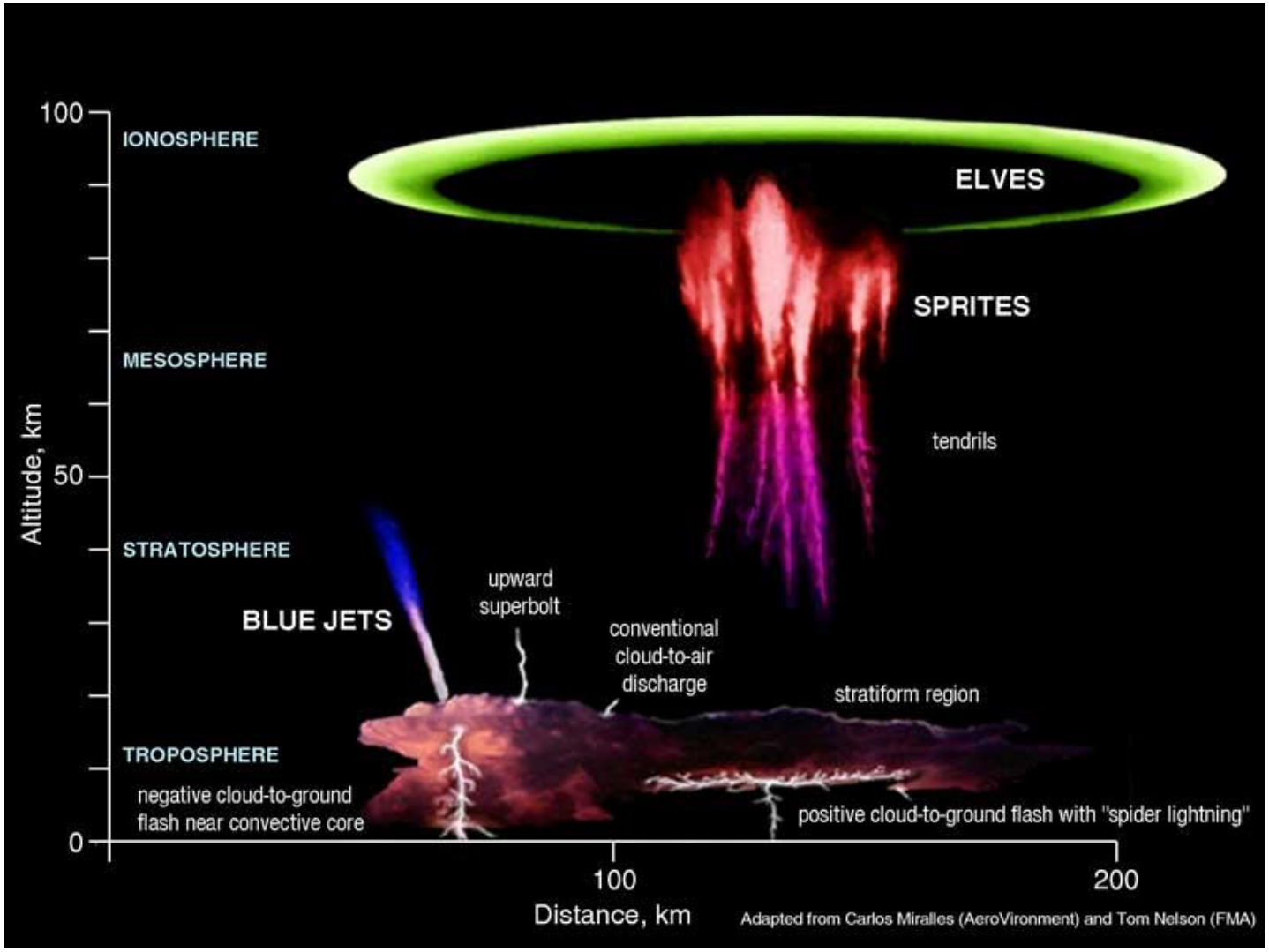
https://www.biologicalmedicineinstitute.com/post/2019/09/20/schumann-resonances-and-their-effect-on-human-bioregulation

Surges in charged particles from the solar wind result in magnetic storms in the ionosphere. These interfere especially with radio communications.

They also also result in the Aurora Borealis
in the northern hemisphere and the Aurora Australis in the southern

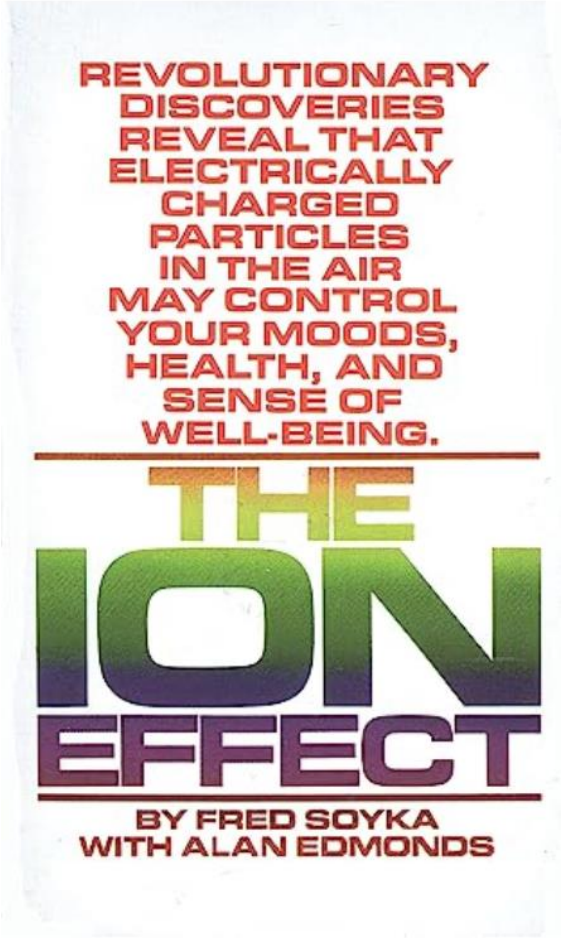
http://www.softservenews.com/photos.html

In addition, the upper atmosphere lights up with
blue jets, sprites, and elves, which last only a fraction of a second



https://weather.com/news/news/transient-luminous-events-mysteries-sky-20130731

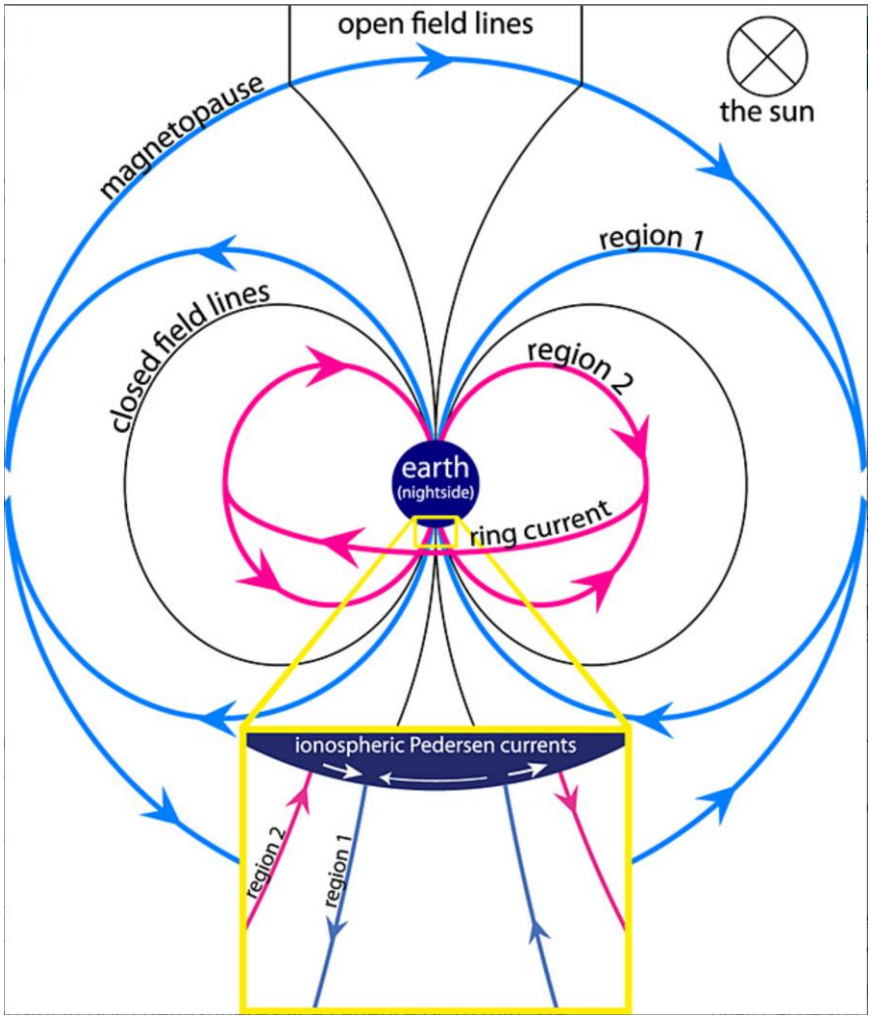
The polarity of atmospheric ions has been shown to correlate with human physical end emotional health. Negative ions are believed to be healthful, while positive ions are believed to be harmful.



3. The Geomagnetic Field

The ionosphere acts not only as the reflection or absorption layer of the radio wave, but also as a layer of electric current.

Currents also exist in the magnetosphere



https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2014JA020138#

The distribution of particles within the ionospheric layers is not uniform. Movement of these cosmic particles varies from day to night, and is influenced by a number of factors including the solar wind and Lightning.

From physics, it is well known that the movement of charged particles itself induces electromagnetic fields, so it is not surprising that these currents affect terrestrial radio propagation.

https://www.skybrary.aero/articles/ionosphere

These ionospheric currents flow according to the Ohm's law, but due to the pre-existing geomagnetic field due to the earth’s core, conductivity is not uniform, resulting in parallel, Pedersen and Hall conductivities or currents. These currents cause a large part of the variation of the geomagnetic field.

These currents also vary with the lunar day and month, and there's also a yearly change as earth revolves around the sun.

As atmospheric conditions change the radio window can expand or shrink. On clear days with perfect conditions signals as high as 300GHz have been detected on earth.

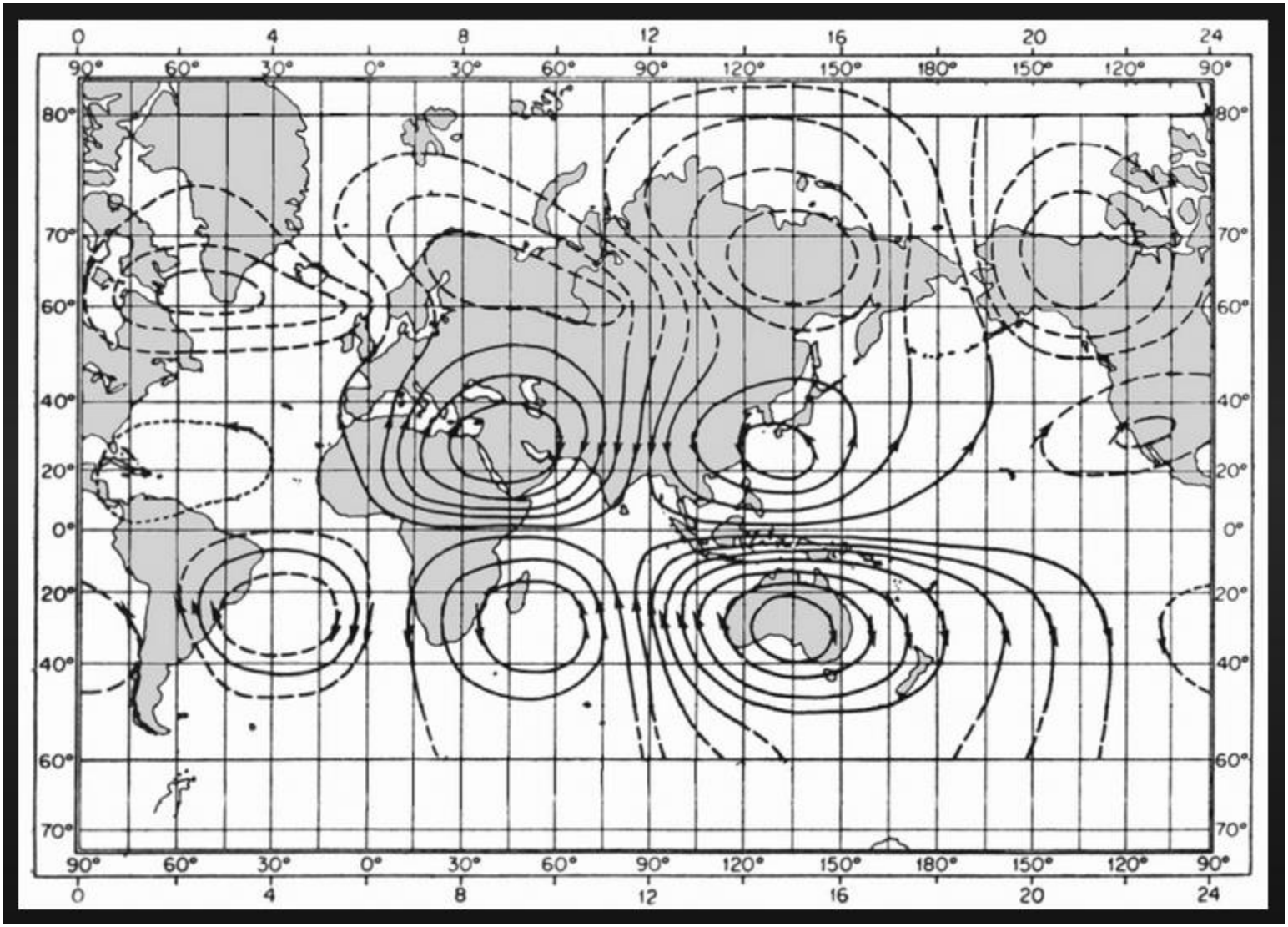
DC telluric (Earth) currents consist of both the natural electric currents flowing within the Earth, including the oceans, and the electric currents originating from man-made systems. These also include geodynamo currents that are presumed to flow in the Earth's core and are responsible for the earth's geomagnetic field.

These telluric currents can also be influenced by the solar wind.
https://www.mdpi.com/2073-4433/14/3/458

The main telluric current loops are very large (covering millions of square kilometers), are fixed with respect to the Sun, and rotate alternately clockwise and counterclockwise (Telford et al., 1990).

https://www.sciencedirect.com/science/article/abs/pii/B9780444538024002086

Telluric currents at the earth's surface



https://www.researchgate.net/figure/Average-telluric-current-vortices-induced-by-the-Sq-variation-at-0600-GMT-modified_fig1_249322793

4. The Schumann Resonance

These telluric currents couple, or interact, with ionospheric currents via atmospheric disturbances, especially lightning, to form low frequency pulsing radio waves. The earth's surface and the ionosphere thus form a resonating cavity enclosing these waves, which are called the Schumann Resonance, named after their discoverer, W.O. Schumann in 1952-4

https://svs.gsfc.nasa.gov/10891

W. O. Schumann

Four distinct periods can be distinguished in the scientific career of Winfried Otto Schumann. The first started with his dissertation and ended with his appointment as full professor in Munich and was mainly dedicated to topics in high-voltage engineering. From the beginning of his professorship in Munich, 1924, until 1951 (the second period) he worked on discharge phenomena in highly ionized gases (plasmas) and also on wave propagation therein. The third period, from 1952 to about 1957, was devoted to investigations of the propagation of ELF waves in the cavity between the Earth's surface and the lower ionosphere. After 1958 and extending after his retirement he worked mainly on problems of the motion of electrical charges under the influence of low-frequency electromagnetic fields.

https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2006RS003495

About 1000 lightning storms at any given time worldwide cause these resonating EM radio waves at 7.8, 14, 20, 26, 33, 39, and 45 Hz to bounce between ionosphere and earth's surface

Click on the black square below

https://svs.gsfc.nasa.gov/10891

Dr. Herbert König, Schumann's successor at Munich University, demonstrated a clear link between the Schumann resonances and brain rhythms. He compared human EEG recordings with natural electromagnetic fields of the environment and found that the so-called alpha waves of 8-13 Hz during brain activity lie in the same frequency range as the first two modes of the Schumann resonance

König also discovered that the dominant brain wave rhythm of all mammals in alpha or resting state is 7.83 Hz .

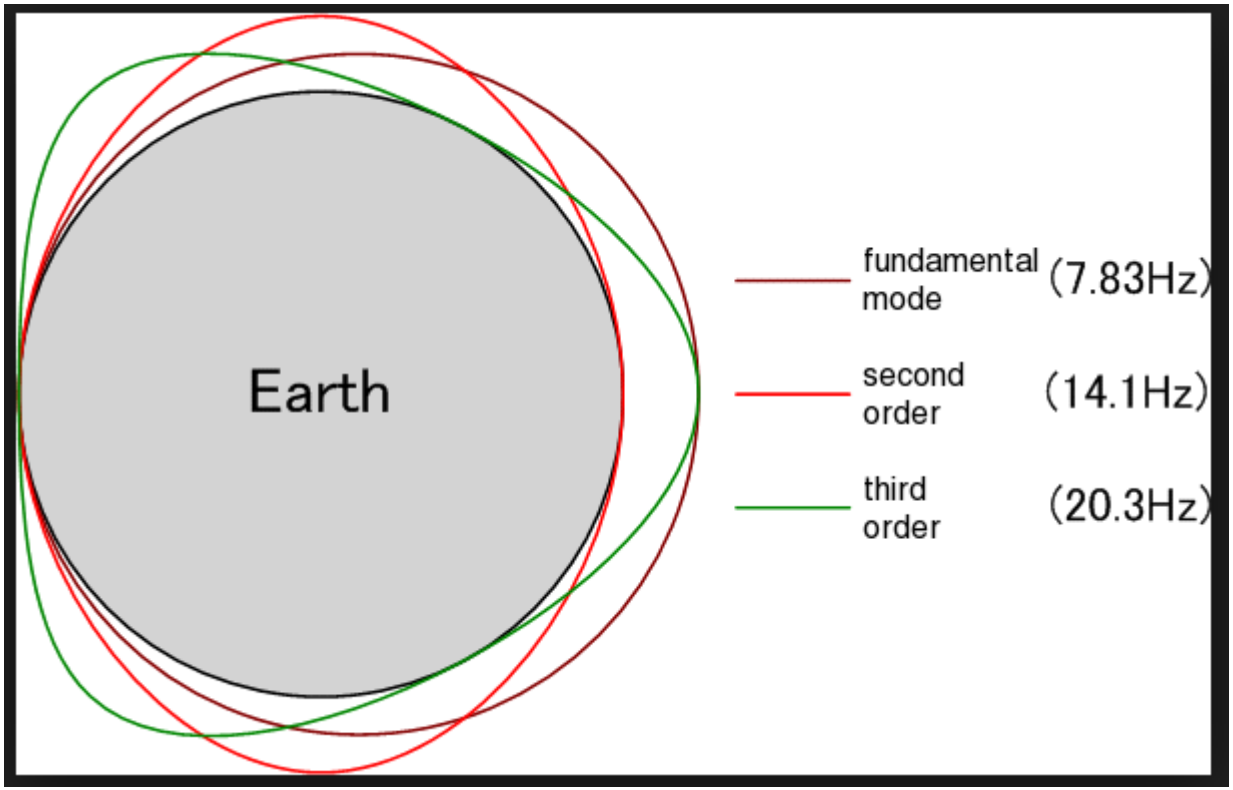
He suggested that the correlation between brain waves and the Schumann resonance was the result of human adaptation to the electromagnetic environment over the long course of evolution.

https://www.biologicalmedicineinstitute.com/post/2019/09/20/schumann-resonances-and-their-effect-on-human-bioregulation

https://qrs-international.com/prof-dr-ing-herbert-koenig-2/?lang=en

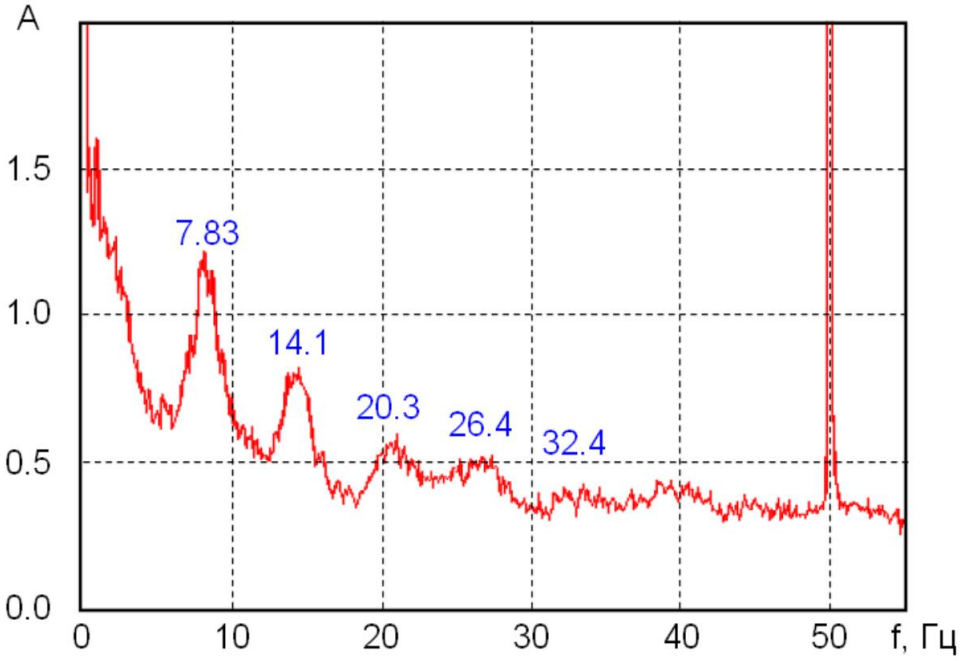
Balser and Wagner in 1960–1963 measured the Schumann harmonics

7.8, 14, 20, 26, 33, 39 and 45 Hertz EM waves



https://en.wikipedia.org/wiki/Schumann_resonances

The first five Schumann resonance modes overlap
with the brain frequency bands or waves.
König speculated that this correspondence is most likely human adaptation to the electromagnetic environment over the long course of evolution.



Fourier transform spectrum of Schumann radio radiation
Vertical axis is amplitude reference
Horizontal axis is frequency in Hz

https://www.biologicalmedicineinstitute.com/post/2019/09/20/schumann-resonances-and-their-effect-on-human-bioregulation

Delta: 0.5 - 4 Hz This brain rhythm occurs in a deep dreamless sleep or unconsciousness. This is associated with drowsiness.

Theta: 4 - 7 Hz This brain rhythm is associated with drowsiness. It also occurs at the first stage of sleep and during deep meditation, when we are awake but open to mental imagery.

Alpha: 7 - 12 Hz This is the major rhythm seen in a normal, relaxed adult. It is present during most of life. It is considered a common state during alertness but not actively processing information

Beta: 12- 30 Hz Beta reflects highly active processing. It occurs during normal waking consciousness and outward attention. Slow beta: 12-17 is normal information processing and mental activity; Fast beta: 17-30 is heightened alertness and fight or flight, or anxiety.

Gamma: 30 - 100 Hz This is associated with waking states and can occur when we are simultaneously processing information in both brain hemispheres. Whales and dolphins also operate in these frequencies.

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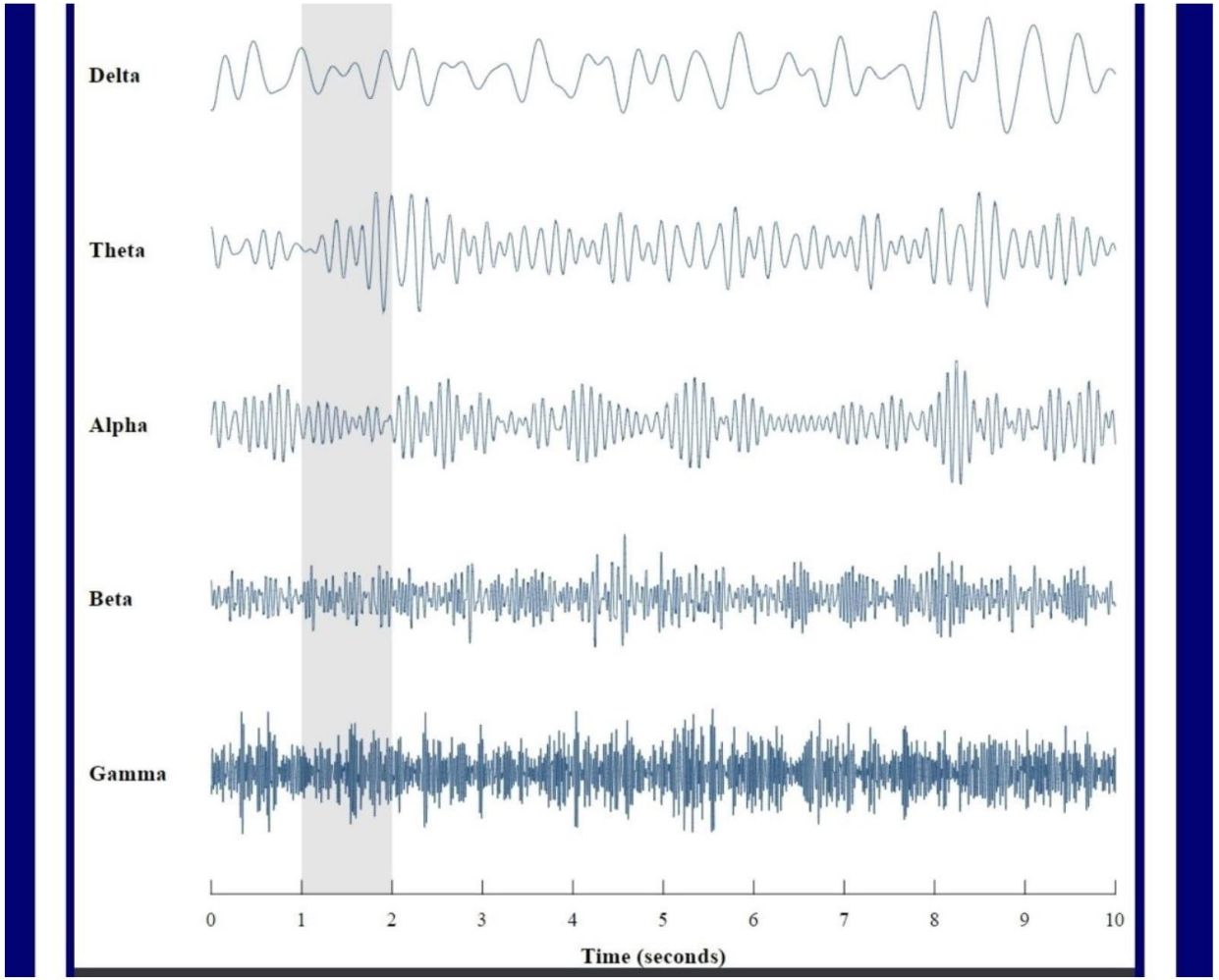
These brain waves are only 5, and they cover frequencies that go from 1 Hz to 150 Hz,
They are known as Delta, Theta, Alpha, Beta, and Gamma.



Brain Waves Classification
By Laurens R. Krol – Own work, CCo, https://commons.wikimedia.org/w/index.php?curid=97235905

https://www.humanfrequencies.com/human-electromagnetic-field-2/

Research carried out by E. Jacobi at the University of Düsseldorf showed that the absence of Schumann waves creates mental and physical health problems in the human body.

Jacobi, E., O. Richter, and Gertrud Krüskemper. Simulated VLF-fields as a risk factor of thrombosis. International journal of biometeorology 25, no. 2 (1981): 133-142.

Following up on this research, Professor R. Wever from the Max Planck Institute for Behavioral Physiology in Erling-Andechs began a study where he built an underground bunker that completely screened out magnetic fields. He then had student volunteers live in the bunker for four weeks, where they were hermetically sealed in this environment. Throughout the four weeks, Professor Wever noted that the student's circadian rhythms diverged and that they suffered emotional distress and migraine headaches…

Wever then added the Schumann frequency back into the environment and the results were astonishing. After only a brief exposure to 7.8 Hz (the frequency which he had been screening out), the volunteers' health stabilized.

Wever, R., 1979. The Circadian System of Man: Results of Experiments Under Temporal Isolation. Springer-Verlag.

https://www.biologicalmedicineinstitute.com/post/2019/09/20/schumann-resonances-and-their-effect-on-human-bioregulation

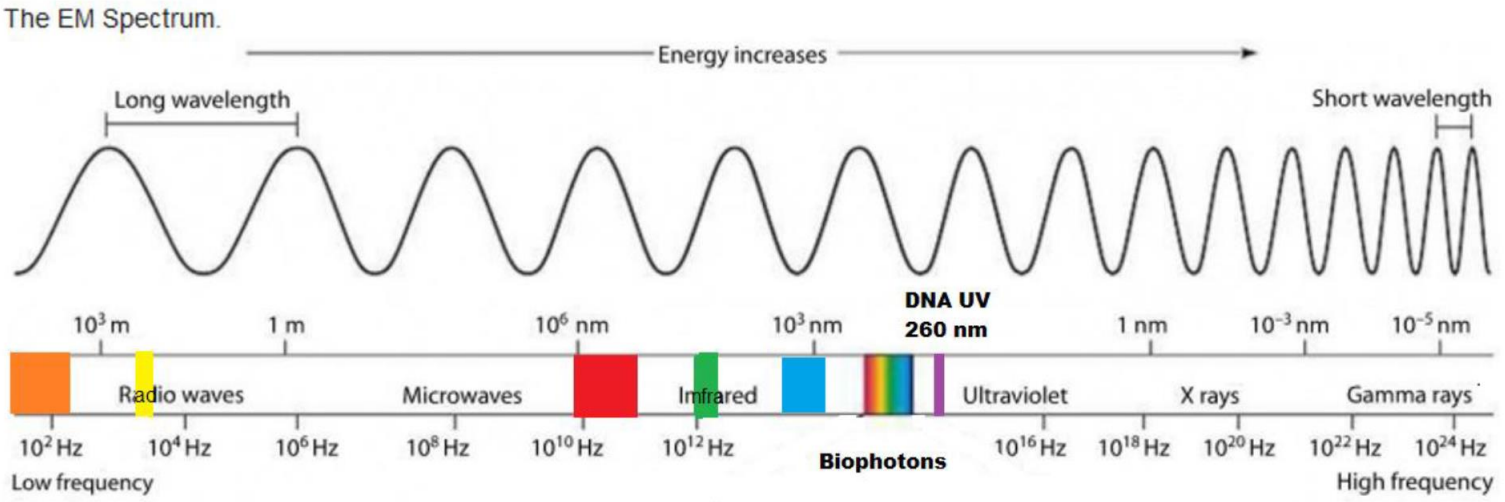
Robert O. Becker has demonstrated the existence of a direct current (DC) electromagnetic field in living beings. Based on his work revealing the electromagnetic nature of biology and biological organisms, Becker found that significantly more patients were signed into psychiatric services just after magnetic disturbances than when the field was stable.

Other important pioneering researchers in the field of the electromagnetic nature of biological organisms include Herbert Fröhlich, Freeman Cope, Cyril W. Smith, Mae Wan Ho, Fritz-Albert Popp, Emilio Del Giudice, Abraham R. Liboff, W. Ross Adey, Jacques Benveniste, Roger Penrose, Stuart Hameroff, P. C. Endler, Michel Schiff, Luc Montagnier, Michael Persinger, Martin Chaplin, and Karl Pribram

These researchers have shown that the human being emits EM radiation from a large portion of the EM spectrum.

The earth/cosmos EM field seems to play a major role in keeping our body electric functioning properly.

The Human EM Spectrum



ECG EEG EMG 0-200 HZ ..

DNA Radio/Sound 1 KHz Radio

Frohlich: 10-100 GHz-> Microwave

Optical Phonon -> 0.3 to 30 THz

Buehler: 215-400 THz Near Infrared

DNA 260 nm Popp et al UV

NAME	ORG	RESEARCHER	TYPE	BIO FREQ	FREQ UNITS	FREQ EXP
ECG				0-100	HZ	
EEG				0-100	HZ	
EMG				10-200	HZ	
RADIO	DNA	MONTAGNIER	ACOUSTIC PHONON	1	KILOHZ	10^3
					MHZ	10^6
MICRO WAVE		FROHLICH	PHONON	10-100	GIGAHZ	10^9
INFRA RED			OPTICAL PHONON	.3-30	TETRAHZ	10^{12}
NEAR INFRA RED		BUEHLER	PHOTON	215-400	TETRAHZ	10^{12}
VISIBLE LIGHT		POPP	PHOTON	428-750	TETRAHZ	10^{12}
ULTRA VIOLET		POPP	PHOTON			

https://www.paradigmshiftnow.net/reorganization/human_energy_field/perspectives_on_electromagnetism_and_life/perspectives_on_em_and_life.pdf