

THE ZERO POINT FIELD

“The emptiness is the beginning and the end of everything in the universe” (Ervin Laszlo)

“Throughout empty space there is energy”
(Nikola Tesla)

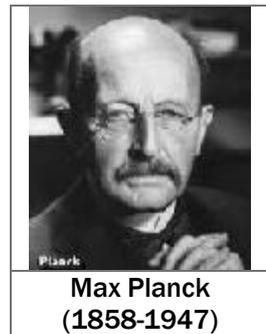
“Emptiness is the basis of all things. Due to emptiness things can change, things can change can appear and disappear” (Dalai Lama)

“The real is emptiness and emptiness is real” (Taoism)

Zero Point Field and Zero Point Energy

Zero Point Field (ZPF) is a physical phenomenon discovered in the early 20th century, intuited by Nikola Tesla and investigated by physicists such as Albert Einstein, Max Planck and Walther Nernst. The expression “Zero Point” refers to the physical vacuum of a certain volume of space and the absolute zero temperature, the lowest possible energy level.

Absolute zero is the lowest possible temperature. Corresponds to the zero value of the Kelvin scale and is equal to -273.15 °C. According to the third law of thermodynamics, absolute zero is an unattainable limit.



This vacuum, in reality, is not entirely possible, i. e. the total vacuum is impossible, because there is always a residual electromagnetic radiation of different frequencies, which cannot be eliminated. This radiation corresponds to the lowest possible energy status. Any other energy is always above this minimum value. Quantum physics has shown that there is no such thing as emptiness or nothingness. The void is really a *plenum*. Behind the emptiness of matter and energy there is a swarm of subatomic activity.

The general idea of Zero Point Energy was first introduced by Max Planck in 1911, in an attempt to understand the interrelationship between matter and radiation in the black body. A black body is a theoretical physical object that absorbs all the light and radiant energy that falls upon it. Planck demonstrated that there is an energy gap between the atoms. But he established that this energy is present everywhere and all the time, so he considered it as a constant, without any influence on matter. For Planck, space is a *plenum*, a structure that bases everything, the underlying structure of all things, as Aristotle asserted.

According to Aristotle's *plenum* theory, matter forms a continuous and compact whole. He thus opposed Democritus' theory that matter is discontinuous, formed by atoms, indivisible particles.

The concrete concept of Zero Point Energy was developed by Albert Einstein and Otto Stern in 1913 [Einstein & Stern, 1914]. They published an article in which they suggested the existence of a “residual energy” from an empty system at absolute zero temperature, the lowest possible energy level. This residual energy appeared as a term added to the formula proposed by Planck in 1900: $\frac{1}{2}\hbar\nu$, being ν the frequency of a quantum harmonic oscillator (at absolute zero temperature) and \hbar the Planck constant (h) divided by 2π .

In the 1930s, physicist Paul Dirac developed a theory that referred to an energy reservoir located on a deep physical level, energy that he called “Zero Point Energy”. According to Dirac, it is the bottom sea corresponding to a set of fluctuating or random energies of the different frequencies of electromagnetic waves. It is what we now call the “Sea of Dirac” or “Quantum Foam”.

In the sea of Dirac there is production and annihilation of pairs of particles and virtual antiparticles that cannot be directly observed. The universe is a boiling sea of particles that appear and disappear continuously. That's why they are called “virtual particles”, because they only exist in a very short period of time. Virtual particles jump into existence apparently from nowhere and return to nothing nanoseconds later.

Elementary particles interact continuously with the vacuum. Empty space boils with activity. Particles cannot be separated from the surrounding empty space. Quantum vacuum has pressure and energy density. Even space and time vibrate continuously, like a bubbly foam of the magnitude of Planck. At tiny scales, everything is discreet. At larger scales, space and time are shown as continuous.

The ZPF has peculiar characteristics, where paradoxes exist and where there are enormous possibilities:

- Whether we empty or not, it is present everywhere, permeating all space.
- As the lowest possible energy of a system, it cannot be eliminated.
- It is fluctuating. ZPF fluctuations are detectable when all energy has been removed and at absolute zero temperature, the lowest possible energy status.
- It is a sea of virtual energy, the basis that generates all things without being generated by other things.
- It is an inexhaustible source of energy available everywhere. It is a gigantic power reserve. It is not really known how much energy the empty space contains. According to Feynman, “There is enough energy inside the space in this empty cup to boil all the oceans of the world”. The observable universe is a set of waves on an immaterial sea, which we perceive as emptiness, but which is really an enormous field of energy.
- It is a realm of power that is beyond space and time. It is a kingdom in which everything is possible, where space, time and matter do not exist. There is only unmanifested energy.

- It is the consciousness of the universe that contemplates and connects all things.
- It marks the transition between the unmanifest and the manifest. In this sense, it is a universal archetype.
- It is a generator of order from disorder.
- It is a primordial substance, an undifferentiated “prime matter” which, when it is differentiated, gives rise to the universe.
- It sustains all matter because it is at the deepest level. It is the foundation of matter. What makes the cosmos intelligible, what gives it all meaning and reality, is paradoxically what is beyond the manifested: the unmanifest.
- By acting at a deep level, it is a source of power from which we could perhaps act on gravity and inertia.
- It is not observable because it is the lowest possible energy state. It can only be perceived by contrast. We observe light –as electromagnetic wave that is– because it is above the minimum energy of ZPF.
- It is the universal driving force behind manifest phenomena. It is the pattern that gives unity and coherence to all manifested things. The ZPF contains all the patterns of what exists and what can exist.
- It is the non-local communication factor between the different parts of a whole. It communicates the molecules and cells of living beings. Life itself is made possible by interactions of molecules and cells with vacuum. There is a brain Internet. Each neuron in the brain can connect at the same time and talk to all the others simultaneously at a deep level.
- It is a big memory store. Short and long-term memory does not reside in the brain, but in ZPF. The brain is just an instrument of memory stored in the ZPF. Consciousness, including memory, is not brain function.
- Particles gain and lose energy constantly in the ZPF, maintaining a dynamic equilibrium. They are recharged by connecting to these fluctuations in the ZPF. The ZPF explains the stability of all matter. Every subatomic particle is in permanent vibration due to a basic energy field that constantly interacts with it.
- Inertia is a phenomenon produced by interaction with ZPF. The inertia property possessed by all objects of the physical universe is simply the resistance to being accelerated through ZPF.
- The ZPF is believed to provide the basis for atomic stability. The electrons that revolve around the nucleus would lose energy by emitting radiation and fall into the nucleus. They lose energy, but at the same time collect energy from the ZPF.

- The stability of the atom is due to the interaction with the vacuum. Even the stability of planets and solar systems derives from the effect of vacuum energy.
- Electromagnetic fluctuations of the ZPF can be the origin of Heisenberg's uncertainty principle (it is not possible to calculate both the velocity and the moment of a particle at the same time). No particle is at rest, but in continuous motion, because the basic energy field is constantly interacting with it. Uncertainty also affects pairs of conjugated variables, such as energy and time.
- Our cognitive processes are interactions with ZPF. This would explain intuition, creativity, as well as parapsychological phenomena such as telepathy, clairvoyance, spontaneous healing, etc.
- We perceive the world through ZPF. When we see something, the image is not in the retina or brain, but outside the physical world, in ZPF. To perceive the world is to tune in to ZPF. We perceive an object resonating with it, synchronizing with it. Reality is the result of the interaction of consciousness with the environment.
- ZPF contains all fields. It is a field of fields or a unified field from which all specific fields emerge (gravity, electromagnetic, weak nuclear and strong nuclear). It contains all the frequencies of what exists and can exist.
- ZPF is a theoretical prediction of the Quantum Electrodynamics (QED), which is considered the most accurate physical theory that exists. According to the QED, the energy density of the Zero Point is 10^{14} joules/m³, which is –according to the formula $E=mc^2$ – equivalent to a mass of 10^{92} Kgr/m³, a mass greater than that of the whole universe. And according to the QED, the number of Zero Point quants of frequency f (and of energy $\frac{1}{2}\cdot\hbar f$) is proportional to the square of the frequency, and the density of the vacuum energy is proportional to the cube of frequency.
- According to Bernard Haisch and Alfonso Rueda[1998], with the ZPF it is possible to derive the famous Newtonian law $F=m\cdot a$. They demonstrated that inertia is the effect produced by the acceleration of matter through ZPF.
- ZPF represents the deep, the unified. ZPF can be a true “theory of everything”, as it would explain the physical universe, mind and consciousness. There is no duality in the deep. There is only one substance, ZPF, from where it all comes from. It is the simplest theory and from which everything (physical and psychic) is explained more easily.
- It is the space of universal consciousness and collective consciousness. If we could control ZPF, we could create reality through our consciousness and thoughts.
- To awaken the ZPF is to awaken to consciousness, unity, the foundation of everything.
- ZPF is the way to unify science and spirituality.

- According to Ervin Laszlo, ZPF is a universal field of information that he calls it the “Akashic field” or “A-field”, a holographic-type field that contains and connects everything. For Laszlo, ZPF includes consciousness. ZPF is believed to be the boundary between Akasha (or Akashic field) and the known space that hosts matter.

The Higgs field is a field that permeates the entire universe and is responsible for the inertia of the bodies to be accelerated. The mass is precisely the resistance of the Higgs field, the field responsible for the particles having mass. Particles that have no mass (such as photons) travel at the speed of light without resistance.

Faraday introduced the concept of field in electromagnetism. The important thing is not the source but the force that acts in space. Einstein said that the only fundamental physical reality was the field itself, the underlying entity.

The Casimir effect

This is a phenomenon that had already been observed in the past. When two neutral metal plates (without electrical charge) and in the vacuum are very close together, they are attracted by an unknown force. This phenomenon was explained theoretically by physicist Hendrik Casimir in 1948, and measured for the first time in 1997. The explanation is that when the two very smooth plates are approached, fluctuations of the electromagnetic waves of wave amplitude greater than the distance between the plates are dislodged from the space between these plates. Then the difference in electromagnetic pressures between the outer and inner space produces the effect of the attraction phenomenon of the two plates. It is the Casimir effect.

Casimir force, the attractive force caused by quantum vacuum fluctuations, is significant when the space between the two plates is less than 100 nanometers. This force is proportional to the inverse of the fourth power of the distance between the plates.

The Casimir effect is considered the simplest experimental evidence of ZPF existence. It is a very important phenomenon in nanotechnology.

The ether

The history of ether is long:

- In ancient Greek times, it was believed in the existence of a universal energy field called “ether”, which was considered to be the essence of space and the “air” that the gods breathed. Pythagoras and Aristotle identified it as “the fifth element” of creation, in addition to the famous 4 elements (earth, air, fire and water).
- Newton –the father of modern science– used the term “ether” to refer to the invisible substance that pervades the universe.

- For Maxwell, the ether was a material substance, but more subtle than the physical bodies and existing in empty space. Maxwell was the first to propose that absolute space was the support of electromagnetic waves. What vibrated with electromagnetic radiation was the ether.
- The Michelson-Morley experiment of 1887 showed that there is no absolute space, and the concept of ether has since been discarded. But in 1986, the journal Nature published a letter entitled “Special Relativity” in which it described an experiment carried out by Ernest W. Silvertooth with a more sensitive instrument (an interferometer), in which he claims to have detected an absolute movement of the Earth with respect to ether. Later, in other articles, he would specify the movement: the Earth moves at 378 Kms/sec towards the constellation of Leo, a result that seems to coincide with the speed of the Cosmic Microwave Background (CMB) made by the COBE satellite. The CMB is a form of electromagnetic radiation discovered in 1965 that fills the universe completely. It is believed to be the echo that comes from the beginning of the universe (the Big Bang).
- Nicola Tesla spoke of an “original medium” that fills all the space and he associated it with the ether that carried the light. For Tesla, ether is the universal and inexhaustible source of energy. When cosmic energy acts upon it, it becomes matter. When this action ceases, matter vanishes and returns to the ether. Tesla's vision fell into oblivion, but today it is once again being considered. Actually, the ZPF is the new name for the old ether.

Dark energy

It is believed that the intrinsic energy of emptiness may be responsible for the expansion of the universe, the hypothetical dark energy, reflected as the cosmological constant in Einstein's theory. Perhaps the entire universe has emerged from the energy of ZPF through the Big Bang.

The universe consists of 70% dark energy, 25% dark matter and 5% ordinary matter. Dark energy is also called “quintessence”, as ether was called in the Middle Ages.

The Bose-Einstein condensate

Bose-Einstein condensate is believed to collect the energy from the Zero Point. This condensate is a form of matter formed by particles in the same quantum state and behaves as a single particle. One example is the laser light (coherent light).

In 1924, Einstein and Bose theoretically predicted a phenomenon produced by a grouping of identical bosons –the force-transmitting particles– that were in the same quantum state and at temperatures close to absolute zero, to produce a new class of matter. The inspiring idea was Bose's, who imagined a grouping of photons –the photons are bosons– as if it were a gas of identical particles. The idea became widespread for all types of bosons. At that temperature, the atoms behave more like waves than as particles, creating a single (giant) wave of matter in a

state of quantum coherence.

The phenomenon was confirmed experimentally in 1995, at the University of Colorado, by cooling a sodium atom gas. Previously, in 1938, using helium-4 a phenomenon of zero viscosity was observed, which meant that the resulting product could flow without loss of energy.

There are two types of particles in the universe: fermions (which have an odd half-integer spin) and bosons (which have an integer spin). According to Pauli's exclusion principle, fermions cannot have the same quantum state. On the other hand, bosons can have the same quantum state. When bosons are grouped at temperatures close to absolute zero, the Bose-Einstein condensate phenomenon occurs, which is believed to collect the Zero Point Energy. This new state of matter unites the quantum world (microscopic) and the physical world (macroscopic), which obeys the laws of micro, although its aspect is macro.

The laser is an example of photon grouping in a state of quantum coherence. Another consistent light application is the hologram.

Scalar waves

Electromagnetic waves are transverse waves, i. e. they oscillate or vibrate perpendicularly to the direction of propagation, they lose energy according to the square of the distance from the emitting source. Scalar waves, on the other hand, oscillate longitudinally to the direction of propagation (such as sound), and can propagate over long distances with virtually no loss of energy.

Tesla was the first to discover the scalar waves and conducted several experiments with them using induction coils. He called them “radiant energy”.

These waves were rediscovered by Tom Bearden [2004]. According to this author, scalar waves are energy that flows directly from the vacuum and are created by superimposing two electromagnetic waves in opposition to phase, canceling the transverse waves and creating the scalar wave. Scalar waves are called “torsion waves” and promise free energy when they are controlled.

Tachyonic energy

The word “tachyon” comes from the Greek word “*achys*”, which means “fast” or “accelerated”. Tachyons are hypothetical subatomic particles. So far they have not been detected. They always go in pairs, are always in continuous motion and have a very high frequency of vibration (the highest in the universe). They have opposite charges and neutralize each other. They would travel faster than light (about 27 times). Surprisingly, tachyon velocity grows when the energy decreases. Its mass is imaginary because its square is a negative number. The time in which they manifest themselves is also imaginary. The ZPF is the transmitting field of tachyons.

Tachyonic energy is a primary energy that creates and sustains life, ordering chaos and reversing entropy. It is omnipresent, unlimited, has the ability to create perfect shapes and even heal. It explains the phenomenon of gravity.

Tachyonic energy is also called “Feinberg’s field”, since it was this author who defined it in 1966, based on the hypothetical existence of the tachyon.

Vital Energy

Zero Point energy is the source of all energy, including vital energy. The vital energy gets many names:

- In China it is called “*chi*”.
- In Japan it is called “*ki*”.
- In India –in traditional Ayurvedic medicine– it is called “*prana*”, the vital energy present in all things.
- In the biblical tradition it is called “*manna*”.
- The French philosopher Henri Bergson introduced the term “*Élan Vital*”, which is usually translated as “vital force”, a hypothetical force that causes the evolution and development of organisms.
- Baron Carl Ludwig von Reichenbach formulated the hypothesis of the “*Odic Force*” (from the god Odin), a primordial force or energy, the origin of life and from which electricity, magnetism and heat would also come.
- *Pneuma*. This term comes from the ancient Greeks and its literal meaning is “air in circular motion” or breathing, but it also means soul or spirit that connects with the body to keep it alive.
- Wilhelm Reich called it “*orgon*” or “*orgonic energy*”, a universal vital energy that is the union of the polarities: masculine and feminine.

Biophotons

The cells emit electromagnetic radiation, which is measured as photons, the particles of light. These radiations can be the reason for the cells to communicate with each other, between different parts of an organism and for the cohesion of communication between species. All living organisms, including cells, emit an ultra-low light, but detectable. They emit biophotons, the biological photons. Cells communicate by interferences, i. e. by overlapping two or more waves, which produce specific wave patterns. This overlap causes the amplitude of the resulting wave to be overridden or amplified. Identical cells produce the same interference patterns.

This photonic activity is particularly intense in DNA. DNA is a double helix structure based on a long spiral of unfolded dodecahedrons. The DNA molecule has the symmetry of the dodecahedron, since it has 12 pentagons, incorporating through them the golden proportion.

A phenomenon has been observed that is called the “ghost effect” of DNA. This phenomenon was observed by biologist Dr. Vladimir Poponin. A DNA sample is bombarded with a low-

frequency laser. The light is wrapped around the DNA strand. When the DNA sample is removed, a ghost print of some kind remains from the DNA, as the light continues to show the DNA pattern.

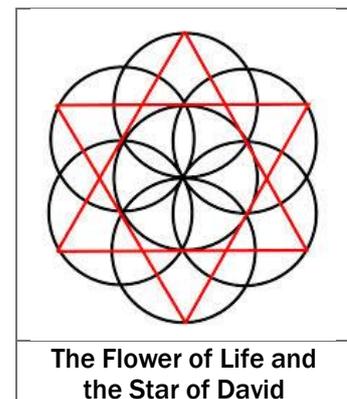
The ZPF and ancient traditions

In the ancient traditions was spoken of a subtle energy present in all space, which is the foundation of reality. This energy can condense to produce material objects.

- According to the Kybalion, “Everything vibrates. Particles, planets, people, etc. vibrate.
- According to the Kabbalah, in all that surrounds us there is an unlimited and indescribable energy; the presence of something divine that escapes our comprehension. There are no fundamental physical entities, but only one: energy. Mass is not equivalent to energy; mass is compacted energy, a manifestation of energy.
- It is identified with the “pure consciousness”. Pure conscience is formless. It is undifferentiated. It is free from opposites. It lacks substance and limits. All that has form comes from the pure consciousness. Thoughts are mental forms. Being undifferentiated, pure consciousness can be identified with emptiness (the nothing) and fullness (the whole).

Sacred geometry

According to sacred geometry, our universe has an underlying and invisible geometric structure –John Wheeler called it “Pregeometry”– which is manifested in a set of geometric archetypes. These archetypes allow us to connect with the deep level of reality, ZPF or pure consciousness, the field where infinite possibilities reside.



- Sacred geometry is behind many phenomena: the growth of plants, the proportions of the human body, the orbits of the planets, the light, the structure of crystals, the music, etc. It was applied by the ancient Egyptians in the construction of the Great Pyramid. It is present in the European churches and cathedrals. According to the ancient mystical schools, sacred geometry was used to create the universe. Einstein used to say, “Physics is geometry”.
- Sacred geometry is connected to proportion. “Scales are profane, proportions are sacred” (Dan Winter).
- Sacred geometry is associated with the circular, the mode of consciousness of the right hemisphere. Linearity is associated with the left hemisphere.

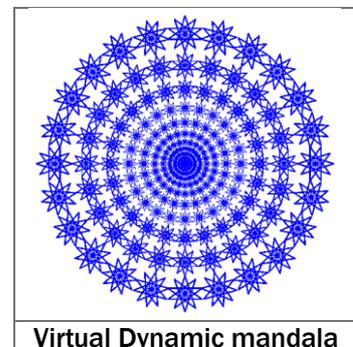
- Jung said that archetypes are forms without content. This means that the geometric pattern is previous to the substance, it is at a deeper level.
- The secret of sacred geometry is not the geometry itself, but rather the subtle vibrations emitted by geometric patterns that connect with our consciousness, which configure it and allow it to penetrate into the deep level of reality.
- We have to make one with the image. Then the mind stops and the soul only perceives, contemplates. One enters into a state of pure consciousness where there is no distinction between the internal and the external, in the essential unity, in the field that connects all things.
- Sacred geometry can be the key to a new post-quantum physics, a new physics based on ZPF or the revival of the old physics based on ether.

Inside the sacred geometry, mandalas stand out:

- Mandalas symbolize the essential structure of the internal and external universe.
- The fractal mandalas connect with our consciousness. A fractal is a repetitive pattern that contains itself. The essential characteristic of consciousness is self-referentiality. Consciousness is based on fractality, on the self-referential, on the circular.
- Mandalas can produce a dynamic effect [see figure].

The Flower of Life (the intersection of 7 circles), in conjunction with the Star of David (the intersection of two opposite equilateral triangles) symbolize the Energy of Zero Point, consciousness, life, light and the power of symmetry and opposites [see figure].

Sacred geometry is spreading thanks to the works of Robert Lawlor, Bruce Rawles and Drunvalo Melchizedek.



Addenda

Free energy devices

There is a growing interest in Zero Point energy, which is reflected in the number of publications on the subject, as its applications are potentially enormous. If we could access that field, we would have virtually unlimited energy at our disposal. This interest is mainly based on the possibility of creating so-called “over unity” free energy devices, which achieve a higher energy output than the input energy required for its operation, extracting energy from the vacuum. This energy would be free, cheap and clean. There are many possible applications: electrical power generation, aerial and terrestrial propulsion, antigravitation, etc.

Since free energy systems violate the principle of energy conservation (first law of thermodynamics), they have traditionally been considered pseudo-science, as they have been related to the ancient efforts to build perpetual motion machines. But this situation is changing radically. There is a lot of research going on right now.

A continuous motion machine

Norwegian artist Reider Finsrud wanted to build a sculpture with its own movement. After many designs and attempts, in 1996 he finally achieved what denotes “Perpetuum Mobile”, a machine that works without electricity, only with the help of magnets. Since its inception on that date, it has been in motion to this day.

Some quotes

- “The Real is the undifferentiated” (Sesha).
- “Throughout empty space there is energy” (Nikola Tesla).
- “The distance, which is the main impediment to human progress, will be completely overcome in thought, word and action” (Nikola Tesla).
- “Null is the same as All” (Rudolf Otto).
- “The Being is nothingness” (Heidegger).
- “The emptiness of the center is that makes the wheel useful” (Tao Te King).
- “To physicists, vacuum has all particles and forces latent in it. It is a far richer substance than the philosophers’s nothing” (Sir Martin Rees).
- “Emptiness is the beginning and the end of everything in the universe” (Ervin Laszlo).
- “Everything is empty” (Buddhism).
- “It is also empty 'Everything is empty'” (Nagarjuna).
- “The real is emptiness and emptiness is real” (Taoism).
- “Nothing is something important” (John Maeda).
- “Emptiness is the basis of all things, because of emptiness things can change, things can appear and disappear” (Dalai Lama).
- “Hear me: I begin with nothing. Nothing is the same as fullness. In the endless state of fullness, fullness is the same as emptiness. The Nothing is both empty and full... That which is endless and eternal has no qualities because it has all qualities” (Jung, The seven sermons to the dead).
- “Each thing is, as it were, in a space of possible states of affairs. This space I can imagine empty, but I cannot imagine the thing without the space” (Wittgenstein. Tractatus, 2.013).
- “The ether energy is pure consciousness energy and since it shapes our entire universe, the universe itself must be a living intelligent being” (David Wilcock).

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