

## Energy in the Universe and its Syntropic Forms of Existence According to the BSM - Supergravitation Unified Theory

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**Abstract:** According to the BSM- Supergravitation Unified Theory (BSM-SG), the energy is indispensable feature of matter, while the matter possesses hierarchical levels of organization from a simple to complex forms, with appearance of fields at some levels. At the fundamental level, where the primary energy source exists, the matter is in its primordial form, where two super-dense fundamental particles (FP), with parameters associated with Planck scale parameters, exist in a classical pure empty space (not a physical vacuum). This primordial form of matter exists in the super-heavy black holes located in the center of each well formed galaxy. The next upper level of matter organization includes the underlying structure of the physical vacuum, called a Cosmic Lattice. It contains two forms of Zeropoint energy: Static (enormous) and Dynamic (weak). The Static energy is directly related to the Newtonian mass by the Einstein equation  $E=mc^2$  and it is a primary source of the nuclear energy. The Dynamic energy is responsible for the existence of the electric and magnetic fields, the constant speed of light and the quantum mechanical properties of the physical vacuum. The next upper energy level is the dynamical energy of excited atoms and molecules. At this level hidden energy wells exist, such as the internal energy of the electron and the internal energy of atoms with more than one electron. The next upper energy level is at some organic molecules and particularly in the biomolecules that contain ring atomic structures. In such a structure, some quantum states are not emitted immediately, but rotating in the ring. While in organic molecules the energy stored in such a ring is released by a chemical process, in the long chain molecule of proteins and DNA the stored energy can be released simultaneously by specific triggering. The released energy by DNA molecule is a sequence of entangled photons carrying the genetic information encoded by the cordons. This mechanism, predicted in BSM-SG theory, is very important for intercommunication between the cells of the living organism. The next upper level of energy organization may exist in the brain since it contains billions of atomic rings. The next hypothetical upper level of energy organization, predicted in BSM-SG is an information field that is connected to the brain but may physically exist outside of it. This field might be localized in a finite volume so it differs from the EM field we use for communication. According to the BSM-SG theory, the energy conversion from the primary energy source to the complex upper levels of matter and field organization is a permanent syntropic process based on complex forms of spatial resonance interactions.

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What is the relation between the energy and matter? Is the physical vacuum a pure empty space? What does define the constant velocity of light, while knowing that the definition of velocity is a distance over time? Is there primary etalons of space and time? Are we sure that the Einstein equation  $E = mc^2$  does not have a limit in the micro-scale? These are fundamentally important questions, while their discussion is usually avoided. The theoretical physics must be a reliable fundamental base for all fields in physics. However, we must accept unexplainable postulates and rules, sometimes in conflict with the human logic. One such example is the claim that the human logic fails in quantum mechanics and particle physics. This, however, opens the door for speculations that might lead to wrong conclusions.

We could not unveil the secrets of the Universe if neglecting the fundamentally important philosophical principles: logical understanding, physical reality and causality (the cause precedes the consequence). The ignorance of these principles might be a reason for the discrepancy between the theoretical understanding from one side and unexplainable phenomena from the other. A recent example for such a discrepancy is the failure of the Theoretical physics to recognize the feasibility of cold fusion. The origin of all problems in contemporary physics is deeper in its fundamental base: the concept of space, adopted a century ago. The concept of space, known as a physical vacuum is not correct. This leads to a wrong vision about the microcosmos and Universe.

The treatise Basic Structures of Matter – Supergravitation Unified Theory used a new approach by reanalyzing the accumulated observations and experiments, while observing the above mentioned principles [1]. The theory was first published on-line in 2001, archived in 2002 in the National Library of Canada [2] and published as a book in 2005 [3]. Related articles are published in peer reviewed journals [4,5] and conference proceedings. According to this theory the matter possesses hierarchical levels of organization from a simple to complex forms, while the energy is indispensable feature in all these forms. At the fundamental level, the matter is in its primordial form as a bulk of two super-dense fundamental particles in a classical pure empty space (not a physical vacuum). The parameters of these particles are associated with the Planck scale of time (frequency) and size. They interact by Supergravitation forces that in pure empty space are inverse proportional to the cube of distance. This primordial form exists in the superheavy black holes located in the centers of each well developed galaxy, where an enormous abundance of these two particles exists. When the energy to matter ratio is beyond some critical level, a specific process is initiated in which the fundamental particles congregate into self-organized hierarchical levels of geometrical formations, governed by the fundamental SG law. This process leads deterministically to creation of space possessing quantum properties (known as a physical vacuum) and a galaxy as observable matter Chapter 12 of BSM-SG). The space we live in contains a superfine underlying structure, called a Cosmic Lattice, with features quite different from the old Ether concept. The physical properties of the Cosmic Lattice permit explanation of all enigmatic phenomena in Particle Physics, Quantum Mechanics, Relativity and Cosmology.

The analysis of the physical model of Cosmic Lattice permitted to reveal its basic physical parameters, such as: a Static CL pressure, a Dynamic CL pressure, and a Partial CL pressure. The first one defines the Newtonian mass of the elementary particle (a mass equation is derived in BSM-SG, Chapter 3, §3.13). It is associated with a hidden Static Zeropoint energy that is a primary source of the nuclear energy [6]. The second one defines the Zero Point Energy (predicted by Quantum mechanics), which is related to the Electric and Magnetic fields (BSM-SG, Chapter 5). The third one is related to the inertial properties of the elementary particles (BSM-SG, Chapter 10). These features allow making analysis beyond the Newton's laws of gravity and inertia and beyond the theory of Special and General relativity. One important feature of the CL nodes is their ability of self-synchronization with an identified signature - the Compton wavelength. This phenomenon is involved in the definition of the permeability and permittivity of the physical vacuum, which defines the constancy of the speed of light according to the known equation  $c = (\epsilon_0 \mu_0)^{-1/2}$ .

The building elements of the Cosmic Lattice are two types of prisms with opposite internal twisting. The same building elements are embedded also in the elementary particles crystallized in the initial phase of the galactic evolution. All elementary particles are consisted of helical structures, but they are stable only if the helical structures are closed loops. The overall shape of the proton is a twisted torus, while the neutron is a double folded torus. The proton creates an electrical field in the physical vacuum by modulation of the vibration properties of the Cosmic Lattice nodes. The neutron appears neutral at far field because of its shape. In stars the proton and neutrons combine in atomic nuclei as fractal 3-dimensional structures. These structures match extremely well the row and column pattern of the Periodic table of Mendeleev (BSM-SG, Chapter 8). All known features: shell structure, Pauli exclusion principle, Hund's rule, nuclear magnetic resonance, chemical valences and bond directions, obtain clear classical explanation. The electron is a single one coil helical structure of second order, possessing reach oscillation properties defying the specific known features of the electron: quantum mechanical interaction with the CL, preferable quantum energies in orbital motion, anomalous magnetic moment, embedded fine structure constant and lifetime of the electron in the upper excited orbital state in an atom [4]. The internal energy of the electron that supports its oscillation is supplied by the Dynamic energy of the Cosmic Lattice.

The analysis of the atomic spectra of elements with more than one external electron unveils that such atoms possess an energy storage mechanism. Using this feature, the analysis of the ring atomic structures leads to the conclusion that they possess another energy storage mechanism as rotated quantum state in the ring without emission of a photon. This is in agreement with many experimental observations on properties of the biomolecules. The proteins, for example, possess a lot of atomic rings. An enormous number of atomic rings are embedded in the DNA strands. The analysis of the properties of the DNA leads to the conclusion that the energy stored in the DNA can be released by a triggering, such as an excited state propagated by the DNA strands. This invokes an emission of a sequence that carries the genetic information encoded by the codons [7]. In the cells of living organism such triggering may coincide with the

time of cell division. The synchronicity of the sequence can be facilitated by the large number of repeated codons in the gene known as a C-value paradox. Such synchronicity might facilitate the synchronization between the events from different cells causing an avalanche effect. Such effect will cause emission of entangled photons in the broadband infrared and radiofrequency range. Entangled photons have much stronger penetrability and can pass easily through the living tissue. In such way the cell of the living organism might have communication features that are vitally important for their normal live and division. This also explains why the tissue of living organism tries to reject a penetrated foreign tissue. The theoretically unveiled EM properties agree with some theoretical and experimental research of the proteins and DNA, known as solitons [8,9]. The most abundant quantity of atomic rings is in the proteins concentrated in the brain.

Before going further to some hypothetic features of the brain, let us discuss some specific features of the photons revealed in BSM-SG theory. The single photon is an energy quant that preserves its constant energy from the place of its emission to the place of its detection. If excluding the Doppler effect, which is a result of some non-zero velocity between the emitter and receiver, the photon may traverse a vast range of space without losing a fraction of its energy. The BSM-SG analysis reveals the physical aspect of this feature. The photon is a specific wave propagated through the Cosmic Lattice with the velocity defined by the oscillation and synchronization features of the Cosmic Lattice nodes if regarding them as connected oscillators possessing spatial oscillating properties. The waveform of the photon has a helical shape involving combination of positive and negative momentary states of the involved CL nodes and neutral CL nodes states defining the magnetic lines. These states are behind the rotating electrical and magnetic vectors of the photon. If regarding the photon wavetrain as a frozen structure, its wavelength is defined by its helical step. It is known that the energy is carried by the electrical vector. The magnetic lines of the photon are at the periphery of the wavetrain, so they are open at the front and back end. The BSM-SG analysis revealed one specific feature of the magnetic lines embedded in the photon. They serve as a boundary isolation of the rotating electrical vector, so the energy of the photon is preserved during the time of its existence.

The revealed structure of the photon invokes the following idea: What will happen if the front and back ends of a single photon are connected? In this case all the features of the stable photon possessing energy will be preserved. The energy of electrical vector will still propagate with the speed of light defined by the Cosmic Lattice features but this hypothetical closed loop photon will be localized in a finite volume. This kind of closed loop photon cannot be detected by our electromagnetic detectors because it cannot strike the detector. The stability of such close loop wavetrain will be enforced by one specific feature of the magnetic line. The closed loop magnetic line is more stable than the open magnetic line in EM field due to the increased SG forces in the involved phased synchronized Cosmic Lattice nodes included in the loop. It is theoretically and experimentally known that the photon could have a right or left circular polarization that is quite stable. Consequently, the closed loop photon may have a left or right circular polarization referenced to the direction of the electrical field rotated in the loop. Therefore it may carry a single bit of information that we can assign as 0 or 1. Furthermore, the

closed loop photons might be formed of more than one photons in series. Photons connected in series do exist in lasers and they are known as entangled photons. How such closed loop photons could be generated? It is known that in fiberoptics with a gradient refractive index the propagation of light follows the curvature of the fiber. We may expect that a similar microenvironment exist also in the brain.

We may speculate that the existed atomic ring structures in the brain might be involved in generating of closed loops of entangled photons. The neurons in the human brain are interconnected with complex matrices of connections known as synaptic connections [10]. Each of the  $10^{11}$  (one hundred billion) neurons has on average 7,000 synaptic connections to other neurons. The brain of a three-year-old child has about  $10^{15}$  synapses (1 quadrillion). The living cells in the human brain may have micro-volume environment similar as the liquid crystals. It is known that many liquid crystals exhibit circular polarization properties that could be a clockwise or counterclockwise. Then we may speculate that such micro-volume environment with combination of the protein (containing atomic rings) involved in the neurons and synaptic connections could generate combined loops of entangled photons.

In accordance with the above mentioned considerations we may suggest a hypothesis that the human brain, for example, is able to create a complex field of interconnected closed loop photons that will carry complex information [11]. This field even may exist outside of the human brain forming an information field. This kind of field is quite different from the known physical field and it cannot be detected by ordinary EM detectors. Its optimal interaction is only with the brain from which it is created. In some particular cases, however, it may partially interact with a different brain. In this case, however, it must be some kind of dynamic interaction that could appear common for the two different brains. This might be beyond the phenomena known as telepathy and remote viewing.

The suggested hypothesis [11] is partly in agreement with the Holonomic Brain Theory of Karl Pribram, which however is more abstractive. The physical base of the information field in our hypothesis is also in agreement with the theoretical work of Andrea Detela. The following extract is the Andrea Detela definition about this field cited in the article *Fabrics of Consciousness* by Robert N. Boyed [12]. *“It is assumed that the biofield is a three-dimensional web woven of vibrating electric and magnetic fields. Lines of these fields are like tiny threads in a three-dimensional textile. These electromagnetic fields display very complex internal organization. We find a peculiar variety of chiral solutions to Maxwell equations, which do not dissipate energy and lead to stable field structures. This is the so-called informational basis of the biofield. The simplest structures of these kind are toroidal knots. When electric charge with very light mass enters the informational biofield, non-linear phenomena take place. These non-linear phenomena are based upon bifurcations in internal electric currents and upon resonance effects between currents and fields. We find an evolution of the field structure. This evolution is a syntropic process, oriented in time. There are several obvious conditions for syntropic behavior, and one of them is [found to be a] quantum coherence in the states of electric charge.*

The suggested hypothesis [11] needs a lot of further research and experiments. One of the first steps will be the attempt for experimental detection of such kind of field that we may associate with the existence of hypothetical aura. To do this we must understand what kind of physical parameter might be affected by the envisioned information field. According to BSM-SG one of the features of the CL space that defines the constant speed of light is the self-synchronization between the Cosmic Lattice nodes. It appears as self-created fluctuation of wavelengths equal to one or whole number of Compton's wavelengths. This corresponds to the predicted fluctuations of the physical vacuum envisioned by Modern Physics. The closed loop photons may slightly change the randomness and isotropy of these self-created fluctuations, which may affect the Brownian motion of the gas molecules occupying this particular volume. As a result it may slightly change the condition of light scattering by the air molecules in the volume occupied by this field. In a properly design experiment such change could be possibly detected. This could be a passive way of detection that should not affect the information field. In the past, another method known as Kirlian effect has been suggested. We do not recommend this method for detection of the information field connected to the human brain, because it uses high voltage potential and broad range of frequencies. Therefore, it may affect in some cases the normal interaction between the information field and the physical function of the brain.

Focusing on the energy of the living organism we may conclude that every living organism needs an internally accumulated energy for living. This energy must be stored in the atomic rings of biomolecules that serve as energy accumulators. How the atomic rings are charged with energy? One of the sources can be a result of chemical processes in the organism related to the digestion. Another type of source is of irradiative kind. One of the natural radiation sources is the EM radiation from the Sun. Today, however, a lot of artificial sources of EM radiation exist. All natural and artificial radiation sources may cause a charge and discharge. The overcharging also could cause a discharge. Some artificial EM sources may cause overcharge following by discharge, which may not be according to the proper period controlled by the living organism. This kind of energy interaction between the living organisms and the natural and artificial radiation sources has not been seriously investigated so far.

## Summary and conclusions

Everything in the Universe from the deeper microcosmos to Cosmology is governed by energetic interactions, while the energy cannot exist independently from matter. This is valid for not alive and alive forms of the Nature. The relation between matter and energy during the galactic evolution phases and the observable matter, according to the BSM-SG theory is illustrated by the matter – energy diagram shown in Fig. 1. At lower level of matter organization, the energy density is extremely high, while it governs simple but strong interactions at extremely high frequency. At higher levels of matter organization the energy density decreases but it governs complex interactions at lower frequencies. The frequency division up to the level of

Cosmic Lattice is based on spatial modes of vibrations. Above this level the frequency division is based on oscillating spatial interactions between the Cosmic Lattice (physical vacuum) from one side and the elementary particles from the other. At higher level of matter organization: atoms, molecules, biomolecules, the interactions become much more complex. The energy density for their interactions is weaker but precisely distributed and channeled. At some higher level of matter organization corresponding to living species, the energy interactions does not obey the second law of thermodynamics, because some energy is extracted from the Zeropoint energy of the physical vacuum due to complex interaction processes.

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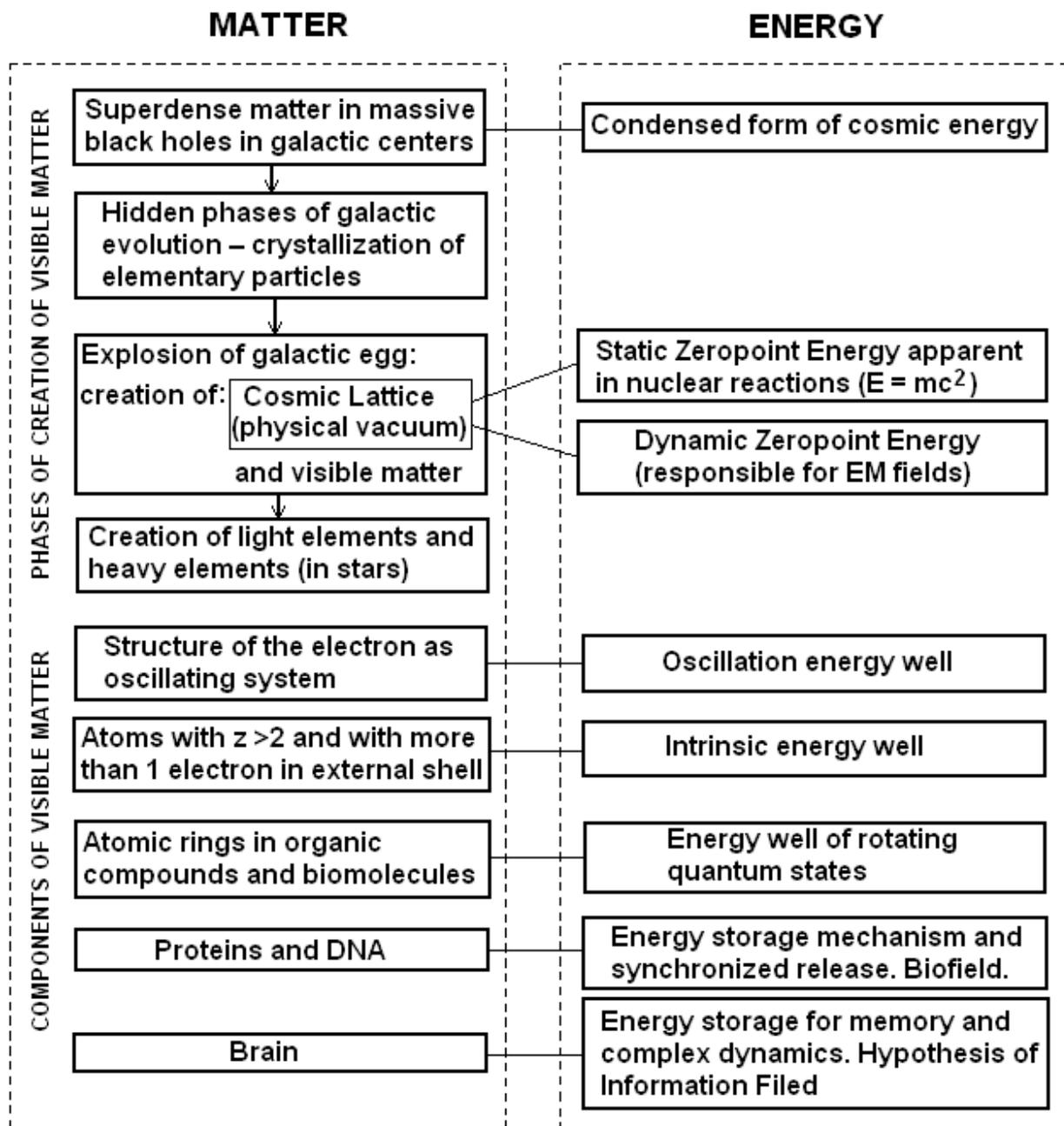


Fig. 1. Matter – energy diagram according to the BSM – Supergravitation Unified Theory