THESIS

Low Energy Nuclear fusion chain Reaction (LENR) is a new source of carbon free energy and a non-mechanical engine

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DESCRIPTION

The motion of matter, including Low Energy Nuclear Reactions (LENR) and gravity, the description of which is the task of science, can be further cognized solely on the basis of a new scientific paradigm:

Postulating the primacy of the movement of our world as a way of its existence, as its absolute attribute, which is confirmed by all our experience.

Our world cosmos is the only entity that unites absolutely everything: Material bodies, physical fields and ether, object and subject, current and conductor, "moving body" and "perpetual motion machine" with power N=h/tP (absolute invariant) in one person and singular [1].

The materiality of cosmos lies in its motion, which is the process of transformation of Baryonic Matter (BM) through neutrinos (as a "displacement current") into "Dark Matter" (DM) and back, *i.e.*, material energy induction.

Cosmos motion is a non-mechanical periodic process of spherical runoff source (convergence divergence) according to the Hubble Planck factor (H-h), which is the cause of formation, existence and motion of material bodies. This material current creates on the equipotential surfaces the tension acceleration (difference of energy potentials), which causes any movement of matter [2].

The baryon mass formation of cosmos, which is its fundamental movement and mode of existence, occurs as a volumetric spherical convergence of matter from all directions in 3-dimensional space and 3-dimensional time, when the density ρ_{bm} BM in a unit spherical volume 1 m³ is equal to the volume derivative of H^3 (change in 3 directions of space):

$\rho_{bm}=(H^3)'=dH^3/dV=3H^2$ m³s⁻² in 1 m⁻³

Cosmos as the Material Energy Field (MEF), is formalized through the MEF tensor: 3 components of the material field strength and 3 components of the energy field strength (energy induction) in the LT (m, s) system of dimensions:

$divM=\rho$,

$divE=0$,

$rotM= -\partial E/\partial t$,

$rotE=j+1/c^2 \cdot \partial M/\partial t$,

$\iint MdS=\iiint divMdV=\iiint \rho dV=m$,

$F=m(M+1/c(v \times E))$,

$j=j_m+j_M=\sum \rho_e=16\pi H^2 c^2$,

$8N=h/t_P=\tau=\sum^V \rho_e T=16\pi Hc^2$,

$hc=32H^2=32/t^2=\rho_e tt_{Pc}=\rho_e t_{Pc}/H=H\alpha\varepsilon_r c=\alpha\varepsilon_r c/t=R_\gamma/$
$R_\infty=H\alpha cnkT_r=4\pi G\lambda_{max}\alpha_W kT_r=32H^2_{\varepsilon0\mu0}c^2$,

where M and E-tensions of the material and energy fields, ρ-material and energy density, N–power Cosmos, h–Plank constant, tP-Planck time, H-

Hubble parameter, $j=j_m+j_M=16\pi H^2c^2$ total material and energy "bias current", c-speed of light, hc-speed of transmission of action in LT, $t_P=2H/\pi c^3$-Plank time, Planck h, Hubble H, expansion time of the universe t, fine strukture constant α, Rydberg R_∞, gravitational G, Boltzmann k, temperature Cosmic Microware Background (CMB) T_r in $K\varepsilon_r=nkT$-relict energy density CMB, R_γ–Rydberg unit of energy equal to the ionization energy of a hydrogen atom, λ_{max}–CMB wavelength with maximum intensity in m, υ_{max}–CMB wave frequency in s⁻¹, $(\lambda_{max} \bullet \upsilon_{max}=c)$, $4\pi G$-conversion factor from LT to MLT dimension system: $(LT)=4\pi G \bullet (1$ kg MLT), α_W-constant W.Wien, $\varepsilon_0=1$-electrical constant, $\mu_0=1/c^2$-magnetic constant, c^2-material and energy potential in LT [3].

Elementary particles, bodies and fields are the corresponding dynamical states Material and Energy Field (MEF), and neutrino is a material energy "displacement current", matter in the convergence divergence process from DM to BM.
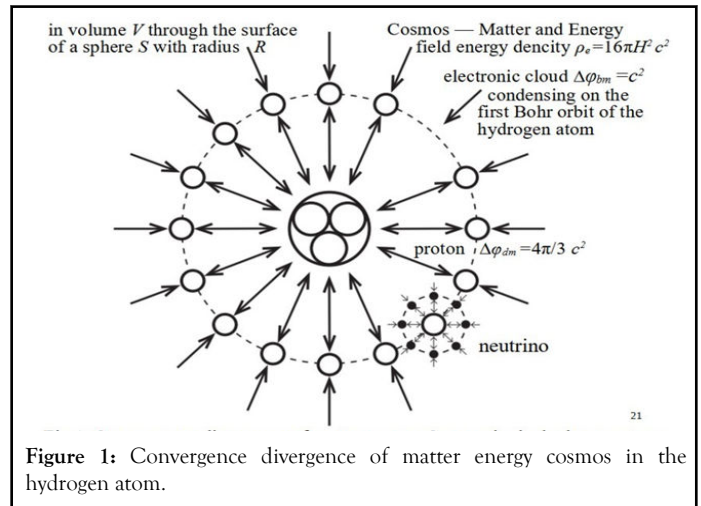

Figure 1: Convergence divergence of matter energy cosmos in the hydrogen atom.
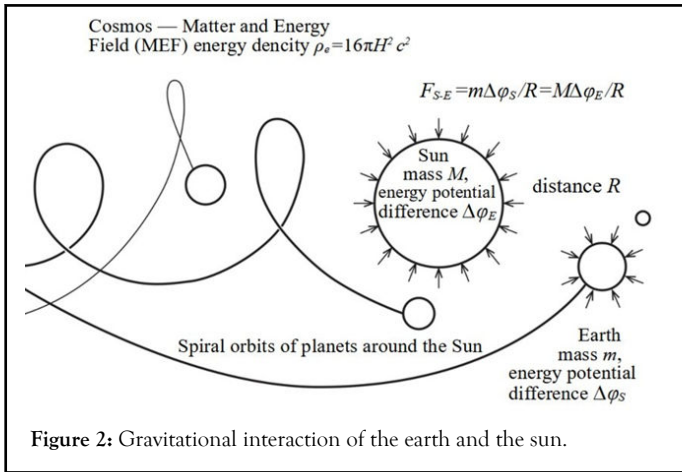
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Figure 2: Gravitational interaction of the earth and the sun.

For the gravitational motion of two point bodies along an arbitrary trajectory, performing work A=FR, solutions of the equations are simplified, and the traction force is "gravity" at v << c is equal to

$F=m(M+1/c(v \times E) \approx m \times M$,

or, in its usual form, the gravitational force of bodies of masses m and M:

$F=ma=m(\varphi_2-\varphi_1)/R=m\Delta\varphi/R=mGM/R^2=mMh/4\pi R^2 t_p=mM_\tau/4\pi R^2=mE_\tau/4\pi R^2=mMt\rho_e/4\pi R^2=mM\rho_e/4\pi R^2 H$,

where, m and M=Scalar quantities of masses of two bodies,

a=Acceleration tension,

R=Distance, radius, resistance,

G=Gravitational constant in MLT.

Physical and mathematical solutions of the motion are found: For the hydrogen atom, sun and earth, supernova SN1987a, CMB, gravitational waves and neutrinos, Mach's principle, connection of fundamental constants, falsifiability and experiments [4].

The chain reaction of cold nuclear fusion (LENR) occurs in the Sun, in the Earth and other planets during the fusion of stars and "black holes" and supernova explosions after neutrino cooling, (such as SN1987A), in plants and animals under the influence of neutrinos and antineutrinos formed , in particular, during β^+ and β^- decay of radioactive isotopes ^{238}U, ^{235}U, ^{232}Th, $^{40}K_{19}$, $^{14}C_6$ (in the atmosphere), $^{56}Ni_{28}$, $^{63}Ni_{28}$ (artificial radioactive isotopes), with the synthesis of new elements and heat release [5].

After the explosion of SN1987A and volumetric neutrino cooling, a cold nuclear fusion reaction began in the supernova remnant. A month after the explosion, all the energy released by the explosion had already gone in the form of neutrino radiation, but SN1987A first fell in brightness, and then gradually increased in luminosity until it reached a peak on 05.20.1987 (after 80 days) to a magnitude of 2.9. By this time, most of the light came from another energy source: the decay of radioactive isotopes produced by the explosion. The light curve accurately tracked the radioactive decay rate of ^{56}Co (+β decay $p\rightarrow n+e++\nu_e$), $T_{1/2}$=77.27 days) using it as an energy source [6].

By the end of the first month after the explosion of SN1987A, it was noticed that the radiation of the supernova is fueled by the radioactive decay of $^{56}Co_{27}$ formed in the central region of the explosion.

The nature of the source of energy pumping has been established the radioactive decay of the nuclide ^{56}Co, the product of the decay of another radioactive nuclide $^{56}Ni_{28}$ (–ε electron capture (p+e→n+ν_e) and +β decay (p→n+e++ν_e), $T_{1/2}$=6.075 days):

$^{56}Ni_{28}\rightarrow^{56}Co_{27}\rightarrow^{56}Fe_{26}$

$^{56}Ni_{28}$ is formed in the process at the moment or shortly before the explosion in the bowels of SN1987A

The energy of the expanding matter of a supernova is not enough to explain the duration and energy of its outburst, which lasted several months. At the late stage, the supernova glowed due to the energy of the radioactive decay of ^{56}Ni with the formation of ^{56}Co and subsequent decay to stable ^{56}Fe.
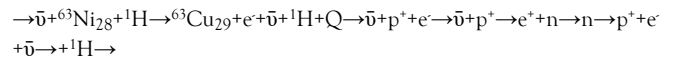
A number of experiments indicate that, in fact, neutrinos at low energies quite noticeably interact with matter.

Under terrestrial conditions, by analogy with SN1987A, it is possible to carry out a chain reaction of cold nuclear fusion (LENR) as a β^+ or β^- decay reaction:

$\rightarrow \bar{\nu}+p^+\rightarrow e++n \rightarrow \quad \rightarrow n\rightarrow p++e-+\bar{\nu}\rightarrow +p+$,

When an antineutrino $\bar{\nu}$ acts on a proton p+ with the formation of a positron e+ and a free neutron n, which partially decays and is absorbed with the formation of isotopes and subsequent emission of the antineutrino $\bar{\nu}$.

One of the real nuclear chain reactions of β-decay (n→p+e-+$\bar{\nu}_e$) along the main channel, when controlled by various methods, is feasible in the laboratory: Passing hydrogen $^1H_1$ (tritium $^3H_1$, deuterium $^2H_1$, water H_2O) through $^{63}Ni_{28}$, (or ^{56}Ni) (artificial radioactive isotope of nickel, harmless to humans, serving as a source antineutrino (neutrino) and substance absorbing neutrons), at t ~ 36.5-1200°C:

$\rightarrow\bar{\nu}+^{63}Ni_{28}+^1H\rightarrow^{63}Cu_{29}+e-+\bar{\nu}+^1H+Q\rightarrow\bar{\nu}+p+e-\rightarrow\bar{\nu}+p+\rightarrow e++n\rightarrow n\rightarrow p++e-+\bar{\nu}\rightarrow+^1H\rightarrow$

With this chain reaction of LENR, along with the transmutation of the nuclei of elements and the release of heat Q, it is possible to generate a high power electric current from emitted electrons, for example, using diamond semiconductors, in particular using carbon ^{14}C (beta galvanic device, beta voltaic generator) or others [7].

The movement of material bodies according to the modern scientific paradigm is a mechanical movement in space and time. In the presented theory, motion is a periodic (with the frequency of Planck's time) process of material energy induction due to the difference in energy potentials formed at a spherical sink source (convergence-divergence). There is only one way to change the difference in energy potentials to create a thrust force at a fundamental level by "burning" the mass, i.e., turning it into radiation, which is what happens with cold nuclear fusion, when the mass decreases [8].

Consequently, during a chain reaction of cold nuclear fusion LENR, several joint processes simultaneously occur in one material body the "engine":

- Synthesis of new elements with the release of thermal energy.
- Generation of electric current.
- Non-mechanical anti-gravity movement of the body in space and time, which can be used for practical purposes.

The conclusions are of a qualitative nature and serve for quantitative experimental confirmation of the stated hypothesis.

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