A new Approach for Study of Gravity and Inertia from the Point of view of BSM – Supergravitation Unified Theory

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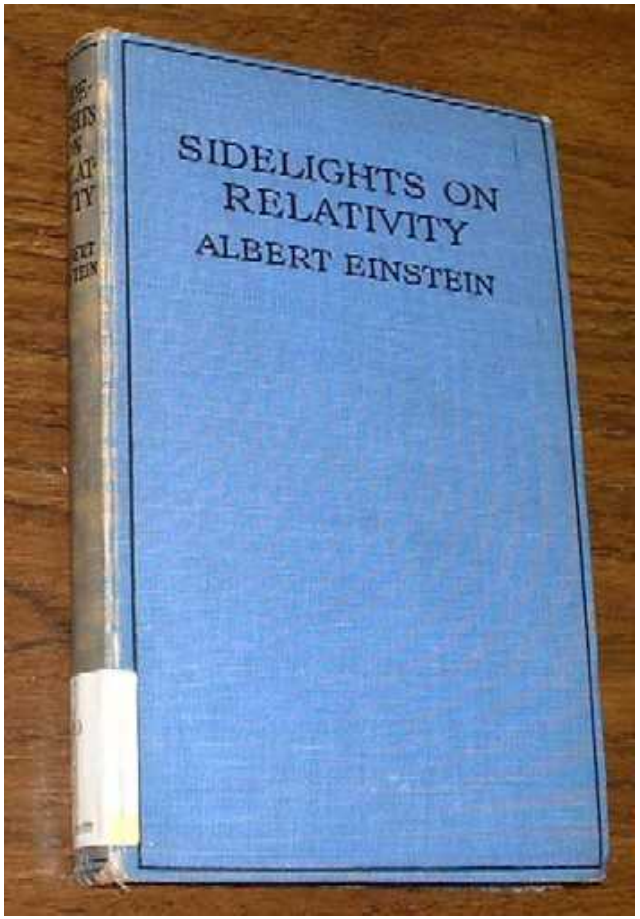
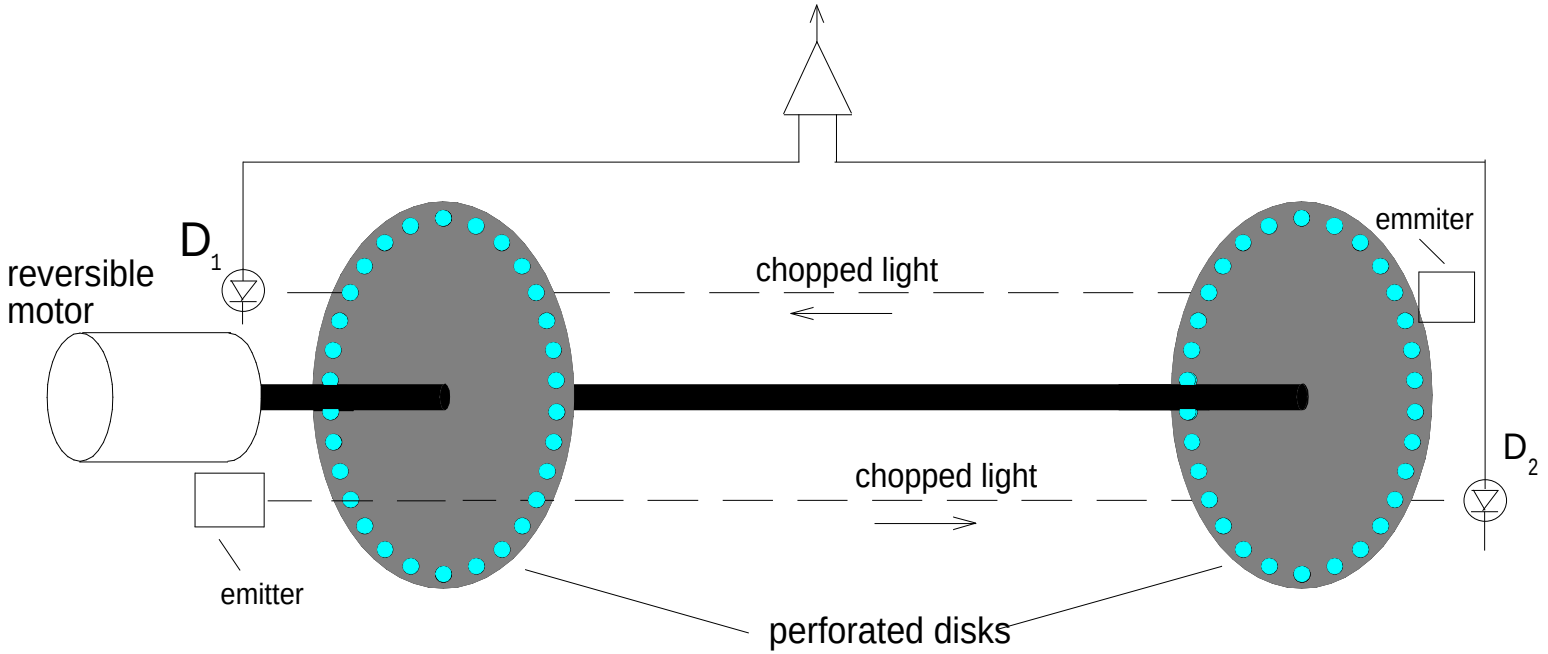
- After development of General Relativity Einstein found that Ether is needed for explaining the space curvature. “Without Ether the General Relativity is unthinkable” (Einstein, Sidelights of Relativity (1922))

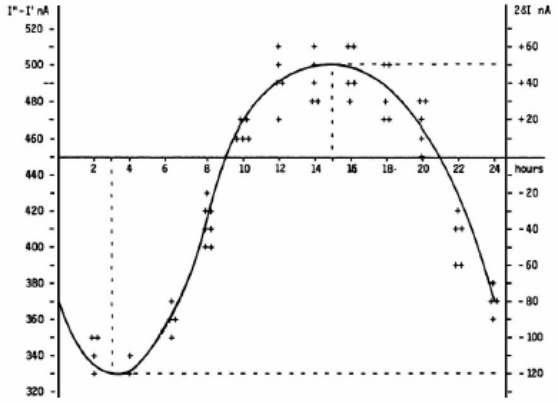
Einstein accepted the existence of non-material type of Ether. His only argument against the material Ether is that physicists failed to suggest a working model (1920 year statement).



Stefan Marinov's Coupled Shutters Experiment detects our motion in absolute space (Ether) by the difference of counter propagated light pulses



First publication in Russian Journal Physical Thoughts, 1984

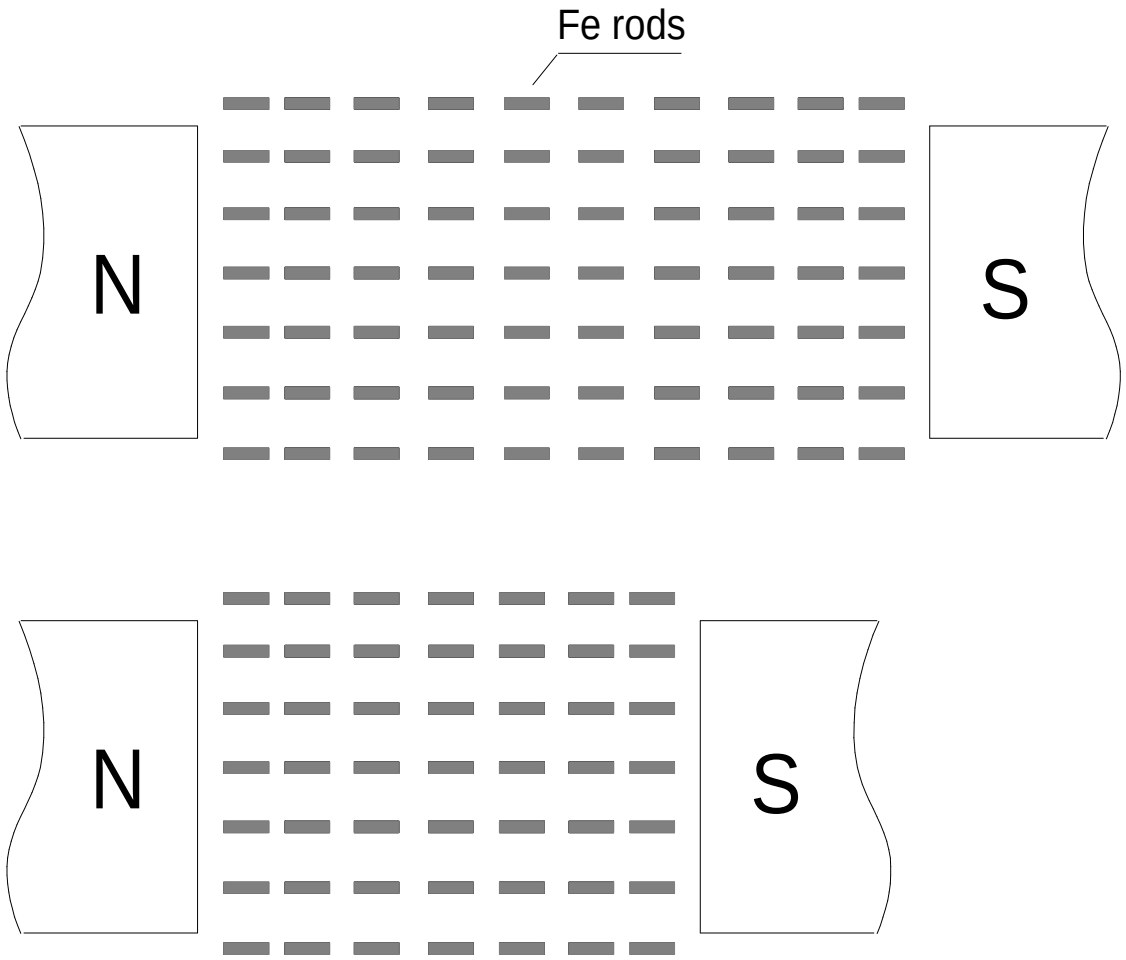


S. Marinov, Progress in Physics, v.1, 31-37, (2007)

- Plot of measured signal for 24 hours

Simple example for illustration of Action at a Distance

(Fe rods allows propagation of magnetic field at larger distance)



Framework of BSM-SG Unified Theory

-Empty Euclidean space - no physical properties

- Two superdense elastic Fundamental Particles (FPs)

- radius ratio of indestructible FPs: 2/3

- bulk vibration proper frequencies with average value equal to Planck's frequency 1.855 x 10^{43} Hz

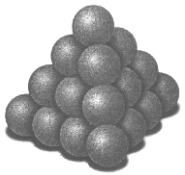
- **A fundamental law of Super Gravitation (SG):** the forces between FPs are inverse proportional to the cube of the distance

$$F_{SG} = G_o \frac{m_{01} m_{02}}{r^3}$$

where: G_0 – SG constant, m_{01}, m_{02} – SG masses, r - distance

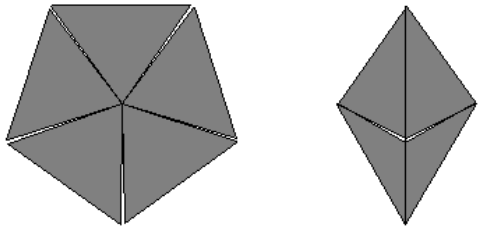
• **Energy** is inseparable feature of FPs and their formations with interactions governed by the SG law.

Structural formations of FPs of the same type at the lowest level of matter organization

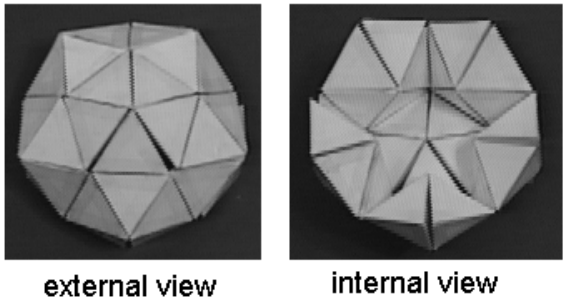


(TH)

Primary Tetrahedron



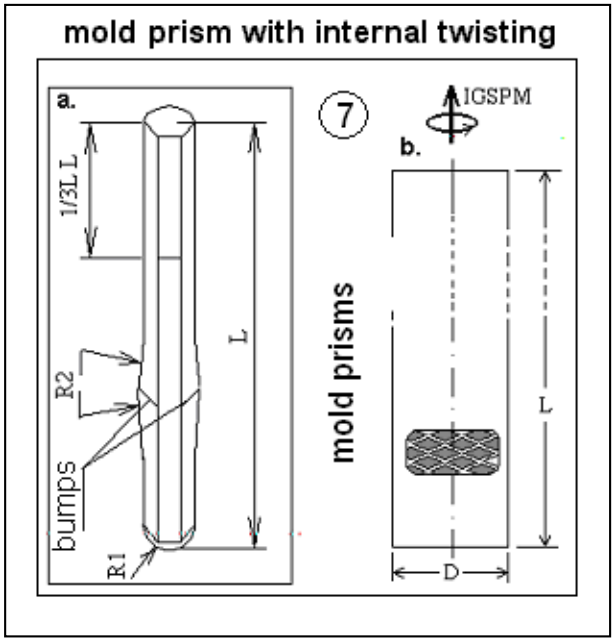
Quasi Pentagon (QP)



external view internal view

Quasi Ball (QB)

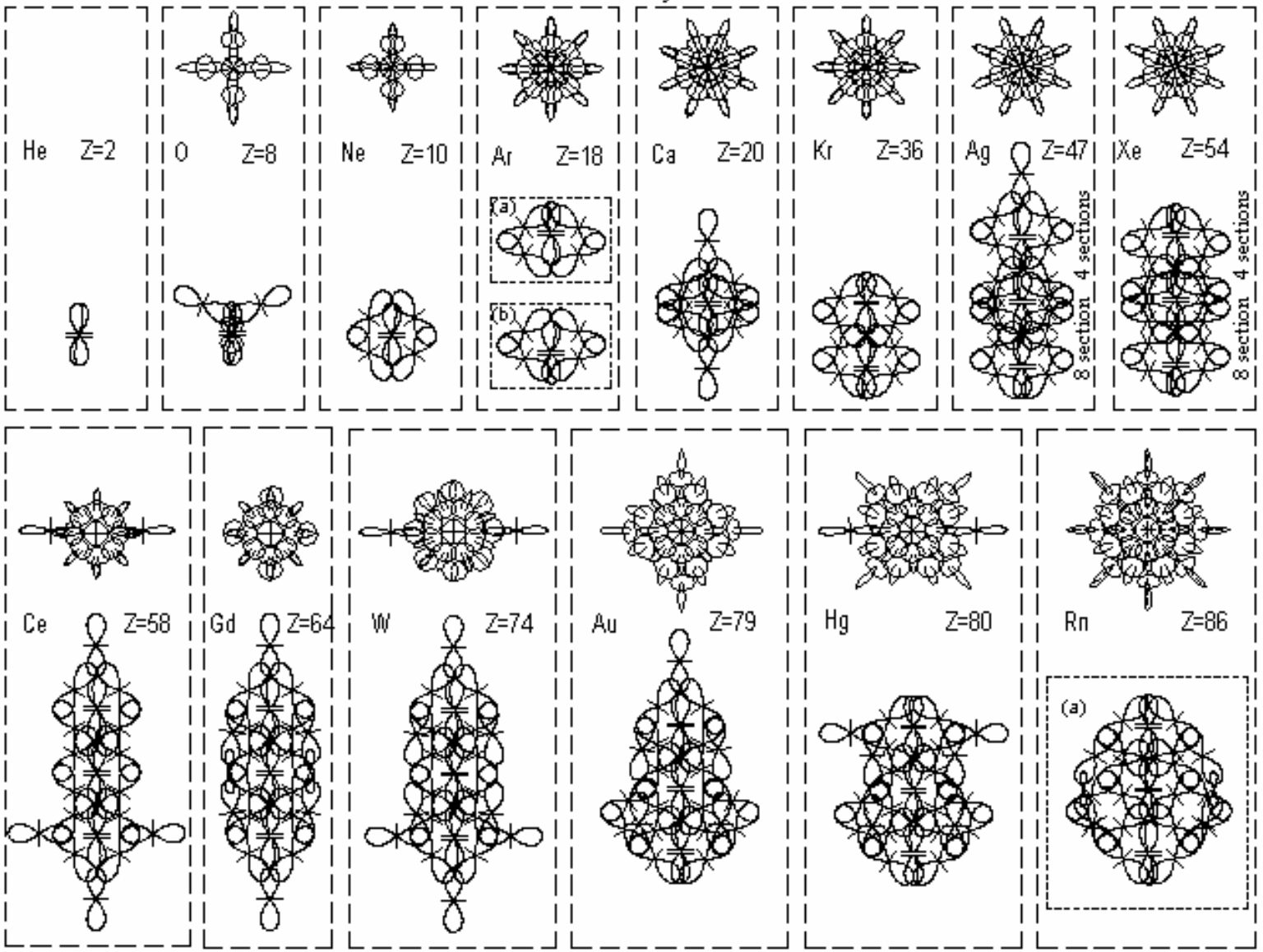
1 QB = 12 QP = 60 TH



Properties of structural formations of FPs below the level of elementary particles

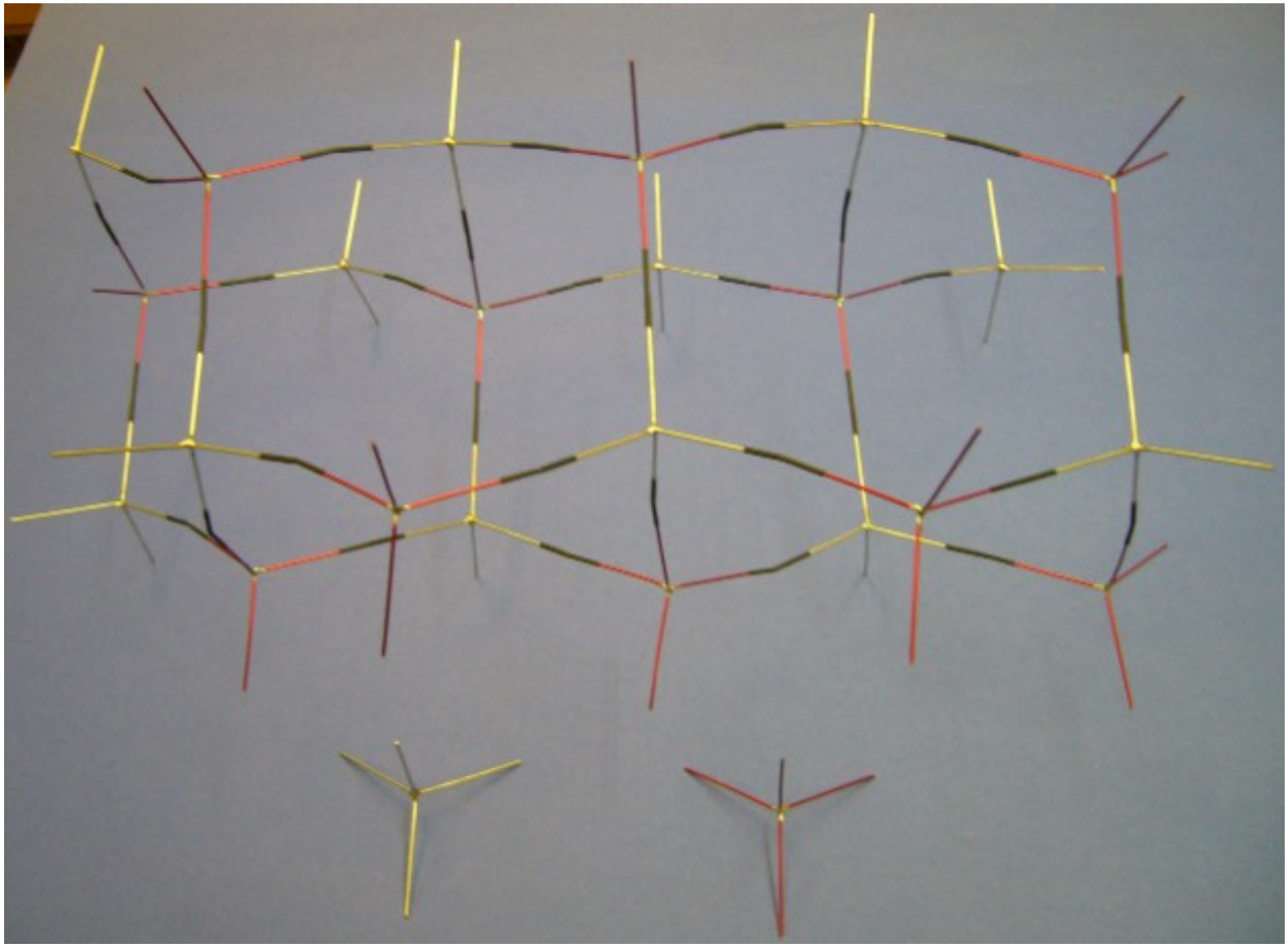
- FPs - **large vibrational energy**, but **low intrinsic inertia**
- **Congregation of FPs in 3D formations** held by SG law
- **3D formations** in hierarchical **levels of matter organization**
- **Mixture of 3D formations from both FPs.**
- **New properties of 3D material formations**
  - **Common vibration modes**
  - Each consecutive formation has a lower common mode frequency
- **Physics of SG law in 3D formations**
  - 3D formations of particular order can absorb a finite vibration energy – **energy well per unit time**
  - **Origin of the SG forces**: vibrational interaction between structures until the involved energy saturates the energy well.
  - SG forces beyond the energy well limit will change their magnitude and even their sign (a feature of SG constant G_0)

BSM Atlas of atomic nuclear structures Projection views of selected elements



Note: (a) and (b) are polar sections of the nucleus with two selected planes. The angle between them is 22.5^{o}

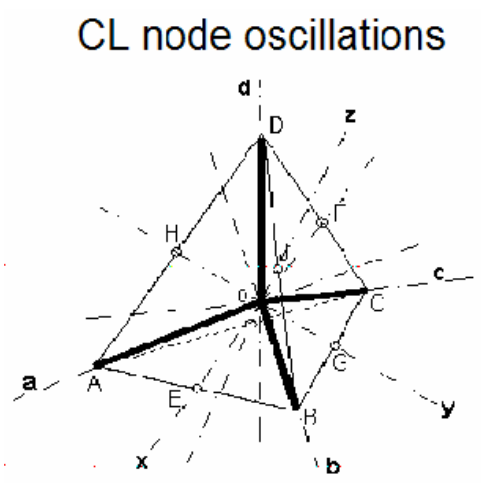
Mockup for illustration of CL nodes arrangement in CL space

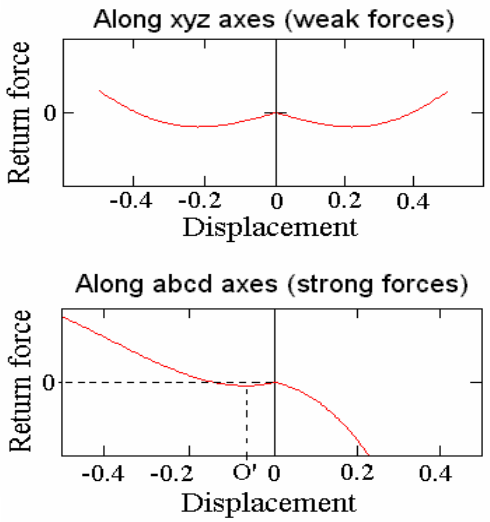


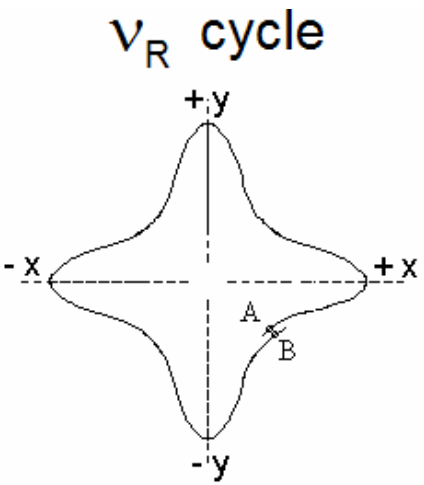
Cosmic Lattice (CL) - alternatively arranged right and left-handed flexible CL nodes formed by 4 prisms of same type

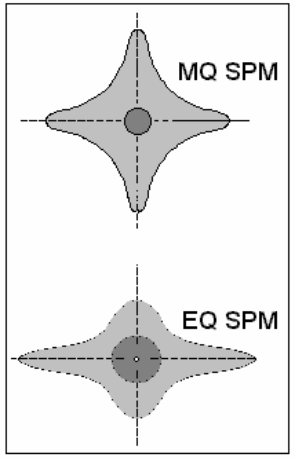
- **Gaps between the CL nodes:** permiting spatial oscillations under SG law
- **Return forces:** - symmetrical along *xyz* axes (weak forces) and asymmetrical along ***abcd*** axes (strong forces).
- **Result:** Complex CL node oscillations (defined by NRM and SPM vectors)

- two identified frequencies : $n_R = 1.09 \times 10^{29}$ Hz – defines light velocity and $n_c = 1.236 \times 10^{20}$ Hz – SPM vector (Compton) frequency – involved in QM interactions and constancy of light velocity









Electrical, Magnetic and Gravity fields

• **Electrical, magnetic and EM fields (light)** involve CL node oscillations along **xyz** axes (weak forces)

• **Newtonian Gravity** (inverse square forces) is a propagation of the Supergravity (inverse cube forces) by the **abcd** axes (strong forces) of CL nodes

• **The oscillating CL nodes** behave as Phase Lock Loop generators. They are easily sinchronized by phase, which propagates at one CL node distance for one NRM cycle – a definition of speed of light.

• **Spontaneous self-synchronization** of the CL node exists at Compton's frequency (SPM vector) with lengths equal to a whole number of Compton's length.

Newtonian mass of an object and prediction for mass manipulation by modulation of CL space parameters

• **Newtonian gravitation is a long distance SG field propagated by CL space**. The prism's SG field frequency is higher than the CL node one, so the SG field propagation is partially influenced by the CL space condition.

• **The selfsynchronization appears as recombining zeropoint waves.** They are responsible for the constant value of e_0 and u_0 defining the constant light velocity and the constant value of the Newtonian mass.

• **The normal value of selfsynchronization** corresponds to a **normal Newtonian gravitation** between the elementary particles, while a disturbed value should cause a partial attenuation of the gravitation.

• **The normal selfsynchronization assures also a normal inertial properties** of elementary particles in CL space (folding and unfolding of the CL nodes, displaced by the denser internal lattice of the particle)

• **Conclusion: A temporal disturbance of the self-synchronisation of the CL nodes around a solid object should affect its gravitational and inertial mass with a simultaneously disturbance of the light and EM waves in the surrounding zone.**

Non-inertial displacement with a reduced inertial mass

• The **Newtonian mass of the elementary particle** is expressed by the Static CL pressure exercised on the impenetrable volume of the particle

$$m = (P_S / c^2)V_H \quad (kg) \quad Mass\ equation\ (BSM, Chapter\ 3)$$

Asymmetrical disturbance of CL pressure surrounding a particle should affect its mass asymmetrically - the particle will get a non-inertial space displacement – equivalent to unidirectional affected mass. This effect should be propagated to atoms, molecules and solids.

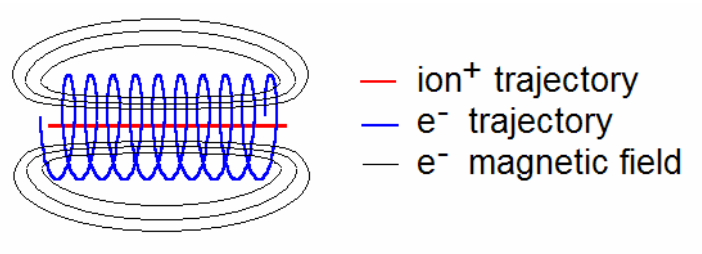
• In Chapter 10 of BSM-SG, it was shown that the **inertia of a solid object** is related to the integral inertial momentum of displaced and folded CL nodes, which is expressed by the **force moment vector**, $\mathbf{E_{IFM}}$**.** It can describe any kind of motion: uniform, rotational and accelerated.

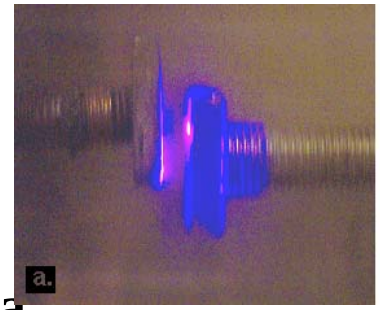
• **Prediction:** An **Asymmetrically Disturbed Selfsynchronization (ADS**) around a solid object will cause a directional change of the gravitational and inertial mass of the object and the surrounding gas molecules – a **propulsion effect with non-inertial properties.**

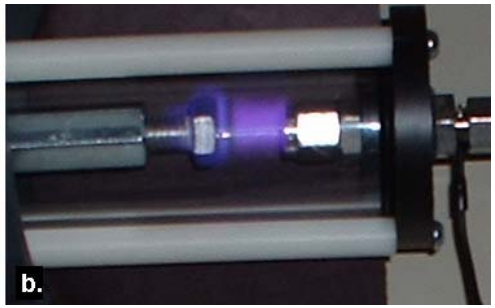
• **Acceleration with a reduced gravito-inertial mass** – an unique force field according to a modified Newton's law $\delta F = \delta m.a$

Stimulated Anomalous Reaction to Gravity (SARG) effect by Asymmetrically Disturbed Selfsynchronization

- **Accessing the CL node SPM (Compton's) frequency** 1.236×10^{20} Hz by using the unveiled oscillating properties of the electron.
- **Heterodyne mechanism**: using a comparatively low frequency for accelerated electrons moving in a helical trajectories with their confined velocities (energies of 13.6 Ev, 3.41 Ev, 1,51 Ev).
- **Requirements:** Each electron must be bound to a single ionized atom. While the ion moves reversibly, the bound electron trajectory is helical.

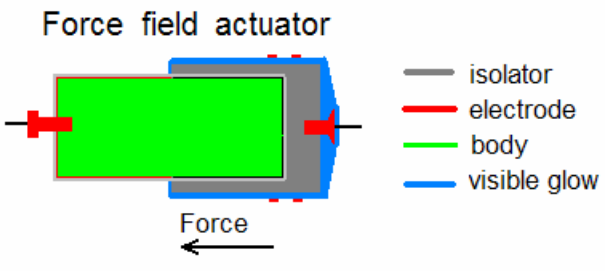




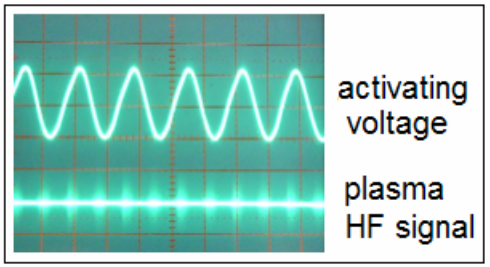


- **Investigation of EM activated plasma**
- **Identified technology:** Plasma thrusters (actuators) without propellant
- **The propulsion effect observed by some researchers was not explained so far.**
- **Nobody so far envisioned an existing gravito-inertial effect and its potential.**
- **The method will work** at normal air pressure and in vacuum if the object is surrounded by a gas envelope
- **Optimization of the ADS effect from a BSM-SG point of view:** combined electrical and magnetic field, geometry, selection of materials and working gas.

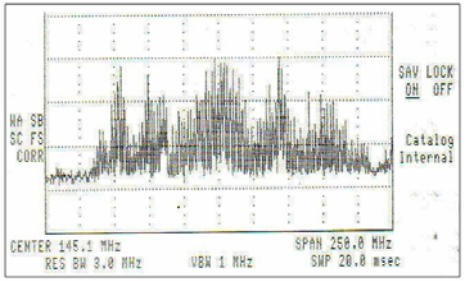
Laboratory experiments



Signal waveforms

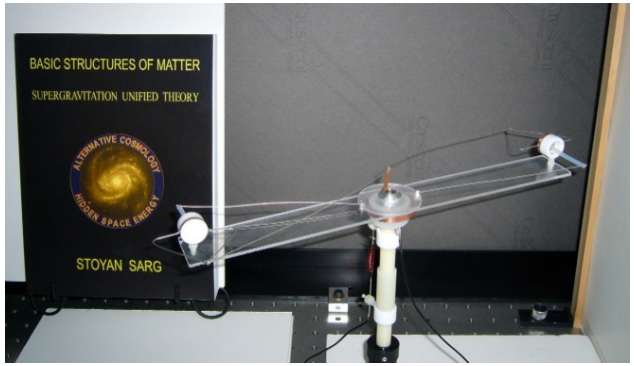


HF spectrum

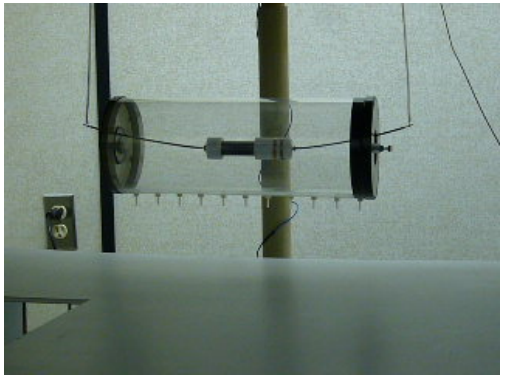


Demonstration of SARG effect

$$\delta F = \delta m.a$$



Rotating plasma actuator in air environment. (Demonstrated at 26 Annual SSE conference, May 30 – June 2, 2007, East Lansing, MI).



Plasma actuator enclosed in a volume of a cylinder – the whole cylinder moves.

Search keywords: SARG effect, gravito-inertial propulsion

Method and apparatus for spacecraft propulsion with a field shield protection

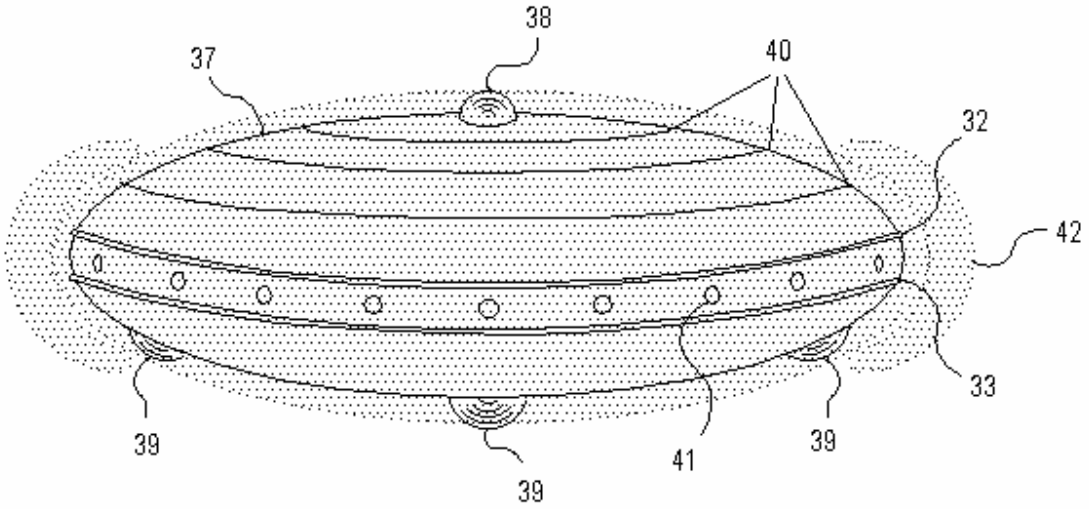


Fig. 8

Patent application
Filed on 26 Aug 2008

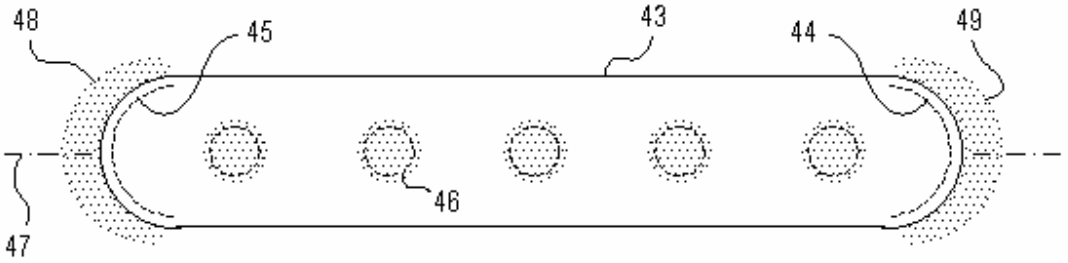


Fig. 9.a

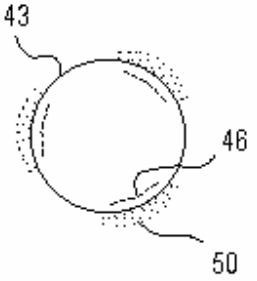


Fig. 9.b

Physical effects accompanying the SARG effect when used as a new propulsion mechanism of a spacecraft

- **A temporal disturbance of light, and EM waves**. Some radars may not detect the spacecraft
- **Emission of electrons and eventually X rays** in a close proximity to the spacecraft
- **A broad band optical radiation** not exhibiting a thermal signature.
- **Fragmentation of the weak Earth magnetic field**. Its restoration may take a finite time due to a finite time for restoration of the normal Zeropoint waves (a normal self-synchronization)
- **The operation of sensitive electronic equipment** near the spacecraft might be temporally disturbed.
- **Staying near the operating spacecraft is dangerous**. The effect will cause longitudinal (shock) waves which are potentially harmful for the living organism. (This issue, requires a new study).

Conclusions

• **The predicted Gravito-Inertial Effect called "Stimulated Anomalous Reaction to Gravity" (SARG) relies on a physical principle not envisioned from the Classical and Modern Physics.**

• **The SARG effect is a change of the physical vacuum parameters, which define the gravito-inertial mass** of the object and the molecules in the surrounding zone. So it provides acceleration with reduced turbulence.

• The propulsion based on SARG effect may work in **atmospheric and in deep space environments.** In the second case the object must be surrounded by a proper gas mixture for creating of EM activated plasma

• **Detectable physical effects** in surrounding zone in case of a strong SARG effect.

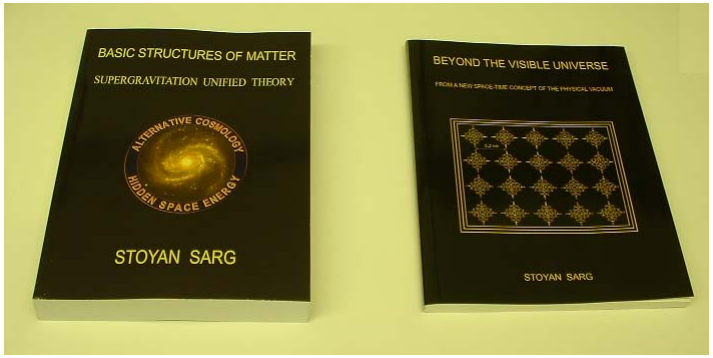
- Non-thermal optical radiation
- Disturbed propagation of light and EM waves
- Fragmented Earth magnetic field
- Longitudinal waves and possibly soft X rays – a biomedical hazard
- EMI noise

The SARG effect is suitable only for spacecrafts for interplanetary and deep space travel.

BSM-SG Unified Theory. Publications and Reports

First publication of the theory in: www.helical-structures.org (2001)

- New approach for building of unified theory and results (//lanl.arxiv.org/abs/physics/0205052)
- First and second electronic editions archived in National Library of Canada, (2002 and 2005)
- Article about the electron in Physics Essays (2003) and other articles in Journal of Theoretics.
- A poster report in Physics of the IIIrd Millennium Conference, 3-5 Apr 2005, Huntsville, AL
- Report (absentia) at 12th Annual NPA Conference, 23-27 May 2005, Storrs, CT
- Report at 13th biennial conference Ultimate Reality and Meaning, 3-6 Aug 2005, Toronto
- Book *Beyond the Visible Universe*, 2005 (popular presentation) ISBN 0-9730515-3-1
- Book *Basic Structures of Matter–Supergravitation Unified Theory*, Trafford Publishing, Canada (full theory - paper back & electronic book), 2006 ISBN 1-4120-8387-7
- Reports at Int. conference *Space, Time, Gravitation*, St. Petersburg, Russia, 7-11 Aug 2006.
- Report and propulsion method demo, 26 Annual SSE Conference, 2007, East Lansing, MI, USA
- Gravito-inertial propulsion effect …, 27 Annual SSE Conference, 2008. Boulder, CO, USA http://www.youtube.com/watch?v=s5ypGrw5q1w
- Books review in Physics in Canada, 62, No 4, p. 206-207, 2006, issued by the Canadian Association of Physicists



- **Patent application: Method and Apparatus for Spacecraft Propulsion, 2008**
- **www.helical-structures.org**