

## **Preface of the Vladimir Leonov to volume 1 Quantum Energetics. Theory of Superunification.**

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I wrote the preface to Volume 1 in 2009 when I was preparing a translation into English of my main book Quantum Energetics. Volume 1. Theory of Superunification. Cambridge International Science Publishing, 2010, 745 pages. This book in Russian was written by me in 1996...2000. Finally, the very fact of creating the theory of Superunification as the main physical theory of all times and nations was accomplished. However, the scientific community does not know practically anything about the theory of Superunification, because it does not read thick books, and I did not write small articles. I was always very busy and did not have time to write small articles in magazines. In addition, the editorial policy of magazines left much to be desired. If you have written a new theory that its publication in the magazine will have a problem. Given the existing editorial policy of magazines, even Einstein could not publish his articles. The theory of Superunification is a new quantum theory in which so far no one understands anything. But I am not only a theoretical physicist, but I am also an experimenter, inventor and entrepreneur in the field of new energy and new space technologies. My quantum engine (Leonov's drive) without fuel is 100 times more efficient than a liquid rocket engine (LRE). The e-print viXra is a very convenient archive for quickly and freely posting new scientific discoveries and inventions.

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At the very beginning of 1996 I was lucky enough to discover purely theoretically the quantum of space-time, named subsequently as the quanton. This was preceded by 30 years of continuous meditations regarding nature of electromagnetism and then gravity.

The discovery of the quantum of space-time was immediately followed by the discovery of the superstrong electromagnetic interaction (SEI) - the fifth force, which was the subject of search by physicists throughout the entire 20<sup>th</sup> century.

It is gratifying that I was not lonely in this search. In 1985 the book "Superforce. The search for a grand unified theory of nature" by the outstanding English theoretical physicist Paul Davies, was published. Actually, in order to combine the four known forces of nature (electromagnetism, gravity, nuclear and electro-weak forces) it is necessary to have a fifth force in the form of a Superforce. Only the Superforce can subordinate weaker forces, including nuclear. This is the gold rule of mechanics. There is iron logic in this.

The very idea of the Superforce was brilliant in its basis. Paul Davies anticipated events, and it remained only to realize the idea of the Superforce in the form of superstrong electromagnetic interaction. This was the concretization of the general theoretical idea to a concrete physical category.

The fundamental discoveries of the quantum of space-time (quanton) and superstrong electromagnetic interaction served as a basis of the creation of the

theory of Superunification of fundamental interactions which is the subject of the first volume of this book. The theory of Superunification reveals the united nature of electromagnetism, gravity, nuclear and electro-weak forces as different manifestations of superstrong electromagnetic interaction.

In order to be objective, it is necessary to note that the creation of the theory of Superunification was helped by the colossal work of a large number of physicists both theoretical and experimental, throughout the entire 20<sup>th</sup> century, and in previous centuries, starting with Newton. To me it remained to only generalise their work, after cleaning darnel from seeds.

New ideas are important in physics and such ideas were advanced by brilliant minds. First of all, it is the concept the idea of the unified field of Albert Einstein, directed to the unification of electromagnetism and gravity. In his work Einstein had time to combine space and time into the united substance the space-time, carrier of which, as it has now been established, is the quantum of space-time (quanton). Quantum theory has been expanded by the real quantization of space-time. It was possible to prove that the law of relativity is the fundamental property of the quantized space-time, uniting the quantum theory and the theory of relativity. But space-time itself is a united carrier of electromagnetism and gravity. This is the unquestionable experimental fact, observed everywhere. The very ideas of the unified field and Superforce proved to be equivalent on the road to the integration of interactions.

The concept of the electromagnetic nature of gravity was first advanced by Michael Faraday who attempted to prove this experimentally. In spite of the failure of his experiments, he was confident that he was right. It is also necessary to give due credit to H. Lorentz, who assumed that there is a special medium – the carrier of electromagnetic energy which is the carrier of all known forces (interactions). This it was also the threshold of the fifth force. But in this case Lorentz erroneously connected this medium with the hypothesis of gas-like aether whose insolvency was confirmed in the experiments by Michelson and Morley. These are the paradoxes of history.

When I started work on the creation of the theory of Superunification, theoretical physics operated with greatly differing concepts as fundamental length, the Dirac magnetic monopole, quantization, super-strings, quarks, symmetry, and others. I realized that from the viewpoint of the united positions all these separate physical concepts must be connected together. In my hands I had the quantum of space-time (quanton) and superstrong electromagnetic interaction. These were strong arguments for the correctness of the selected direction of studies. Ideas hanged in the air and the course of events was no longer dictated by me but by theory. It was hit in the purpose. Everything rapidly fitted into proper places and a clear picture of the universe appeared. The human mind is far more powerful than the finest and most sensitive apparatus and is capable of penetrating into areas where such instruments are powerless. This concerns the region of the ultramicroworld of quantons at lengths of the order of  $10^{-25}$  m. This is exactly where the fundamental length, Dirac's monopole, superstrings and quarks have found shelter.

The theory of Superunification could not be created without the use of the brilliant concept of quarks - the initial building blocks of the universe. In the theory of Superunification the concept of quarks from quantum chromodynamics (QCD) was transferred from the structure of hadrons to the structure of the quantized space-time. Specifically, the quantum of space-time (quanton) consists of quarks. All the contradictions of QCD are thus removed. Further, it was quite easy to determine the structure of the proton and the neutron and define the nature of nuclear forces and the mechanism of the formation of mass of elementary particles.

Instead of three fractional quarks in the structure of hadrons, the quanton as the quantum of space-time, includes four whole quarks: two electrical ( $+1e$  and  $-1e$ ) and two magnetic ( $+1g$  and  $-1g$ ), uniting electricity and magnetism in the united substance - electromagnetism. This is the first stage on the road to integration, missed by theoretical physicists. The presence of the elementary electric charges is not doubted by anybody, in contrast to the fractional charges. The effects which are attributed to the indirect manifestation of fractional charges are unconvincing, and they can be explained by other approaches.

As far as the magnetic quarks (Dirac's monopoles) are concerned, their reality does not fit the fundamental nature of the laws of electromagnetism and Maxwell equations. Dirac was the first who began to search for the relationship between the electrical and magnetic charges. Unfortunately, his solution  $g = 68.5e$  proved to be erroneous and is corrected in the theory of Superunification. On the basis of the analysis of Maxwell's equations for the vacuum  $g = Ce$ , where  $C$  is the speed of light in vacuum. The relationship  $g = Ce$  (or  $C = g/e$ ) determines symmetry between electricity and magnetism, the general carrier of which is the quanton. And on the contrary, applying the perturbation method to the quanton, the analytical conclusion of Maxwell's equations was obtained for the first time, explaining the nature of electromagnetism and vacuum.

The problem of symmetry and asymmetry is connected with the structure of the quantized space-time. The electromagnetic symmetry of the quanton is confirmed by the symmetry of Maxwell's equations in vacuum. This was already indicated by Heaviside, reducing Maxwell's equations in vacuum to the symmetrical form and defining bias currents by the reality of displacement from the equilibrium of electrical and magnetic charges in vacuum. For more than a century Heaviside's foresight remained a hypothetical assumption. In the theory of Superunification the reality of the electrical and magnetic bias currents is confirmed by the quantized structure of space-time. The procedure of calculation of real bias currents proved to be not so complex. I would like to note that real electromagnetic, yes even gravitational phenomena, are characterized by very small displacements of charges inside the quanton from the equilibrium state.

It has been established that quantized space-time itself is electrically asymmetric, i.e., besides quantons it includes a certain surplus of electrical quarks (whole electrical monopoles). Specifically, the electrical asymmetry of quantized space-time determines the entire variety of living and inanimate nature. The variety of only four quarks was required to create our universe. These four quarks (two

electrical and two magnetic) are connected inside the quanton. Calculations show that in nature there are no forces capable of splitting the quanton into separate quarks. Free magnetic charges are absent for this reason in nature. But still there are two excess electrical quarks, not connected inside the quanton. Specifically, these two excess quarks determine the electrical asymmetry of the quantized structure of space-time. Because of their presence there is a material (ponderable) matter generating gravity. In this plan Einstein's idea about the nature of gravity as the real distortion of the quantized space-time found its confirmation before the theory of Superunification.

It has been established that gravity appears as a second formation inside the quantized space-time. Gravity begins with the generation of mass in elementary particles. This is observed quite clearly in the generation of mass in the electron (positron). Actually, if we throw the entire electrical quark (elementary electric charge) into the quantized space-time, then under the action of the ponderomotive forces the quantons are pulled to the central electrical perturbing charge, compressing the quantized medium near the charge and extending it on departure. The quantized space-time is spherically bent (deformed) around the perturbing charge and the charge acquires its mass, degenerating into the electron. In fact, the masses, in the understanding of the material world, as is today accepted, simply do not exist in nature.

This was the first blow of the theory of Superunification to the established dogmas. The realization of the fact that you do not have a mass and you are the structure of the bent space-time, being the composite and indissoluble part of the universe, causes a shock. It already happened in the past. So, for example, all saw, that the Sun does rise and then goes down and the Earth seem by the motionless centre of the universe. Actually has appeared that the Earth rotates around of the Sun. This idea now accepted by everything centuries was forbidden. But even our more educated century is far away from perfection. It is not so simple to accept that isolated objects do not exist in nature. The theory of Superunification opens for us the reality of the open quantum-mechanical systems, including man.

The fact that the mass, as the carrier of gravity, is secondary and is manifested by the special state of superstrong electromagnetic interaction inside the quantized space-time, explains the nature of wave-particle duality. It is completely logical that the mass transfer in space is the wave transfer of the spherical deformation of the quantized space-time around the perturbing charge in the electron (positron) or a group of charges in nucleons. The principle of wave-particle duality is the fundamental property of the quantized space-time when the particle simultaneously shows corpuscular and wave properties.

So it turned out that the analytical derivation of the classical wave equations of particles during their motion in the quantized space-time is not so difficult. The wave mass transfer of particles is the basis of wave (quantum) mechanics. With the discovery of the quantum of space-time (quanton) and the quantized structure of space-time, the quantum theory changes from probabilistic to deterministic. This is what Einstein insisted in endless arguments with Bohr („God does not play dice”).

The theory of Superunification is the quantum theory of the open quantum-mechanical systems.

The theory of Superunification investigates the properties of space-time in the range  $10^{25} \dots 0 \dots 10^{-25}$  m, from the dimensions of the quanton, i.e.  $10^{-25}$  m, to the dimensions of the universe -  $10^{25}$  m, and it is today the most powerful analytical apparatus for investigating the matter. It is gratifying that the structure of the basic elementary particles has been discovered by purely theoretical approaches: electron, positron, proton, neutron, electronic neutrino and photon. This alone has made it possible to save huge means on the construction of superaccelerators. I would like to mention that no accelerator has made this possible. This is the clear manifestation of the power of the theory of Superunification.

It is natural that the nuclear forces, based on the united positions of the theory of Superunification, are also the form of the manifestation of superstrong electromagnetic interaction. Quantum chromodynamics (QCD) did not connect the parameters of nucleons with their mass. However, the quark models of nucleons are one of the achievements of QCD. In order to connect the quark model of the nucleon with the formation of the nucleon mass, it was necessary to understand the nature of gravity. In these terms, the nucleon must be capable of the spherical deformation of quantized space-time, i.e., it must know how to bend it (according to Einstein). This is possible only in one case, if the electrical whole quarks with both positive and negative polarity form the alternating shell of the nucleon. Only this alternating shell is capable of being compressed, compressing the quantized space-time inside the shell and extending it from the outside, forming the nucleon mass.

On the other hand, the electric field of the alternating shell is a short-range field. Specifically, this short-range field ensures the operation of Coulomb attracting forces over a very short distance corresponding to the action of nuclear forces. As a result, the nuclear forces are reduced to the electrical interaction of the alternating shells of nucleons. This is the logic of Superunification when all forces, in the final analysis, are reduced down to electromagnetism. In this case the complete compensation of electrical charges (quarks) of positive and negative polarity in the neutron shell ensures its electrical neutrality. The presence of the uncompensated charge of positive polarity in the proton shell determines its charge.

However, the theory of strong interactions would be incomplete without the calculation of the antigravitational repulsion of the alternating shells of nucleons over distances shorter than the action of nuclear forces. This ensures the stability of nucleons, preventing their collapse and also the collapse of atomic nuclei. Like gravity, antigravity is also widespread in nature. The action of antigravity like that of gravity is determined by the bending (deformation) of quantized space-time. This determines the action of gravitational force on mass. Based on the position of quantum theory, the direction of gravitational force is given by the gradient of the quantum density of the medium, i.e., by nonuniform distribution of the quantons in

the volume inside the quantized space-time. In one case this is the manifestation of gravity forces, in another case of antigravity repulsion.

With interaction of two protons at a large distance they experience the Coulomb repulsion of the charges of positive polarity. With the contact approach of the alternating shells, the Coulomb attraction of the alternating charges of the proton shells exceeds the Coulomb repulsion of the positive uncompensated charges. Further approach of the nucleon shells is limited by their antigravity repulsion, determining the complex nature of nuclear forces. The undoubted achievement of the theory of Superunification is the detection of the zones of antigravity repulsion in nucleons.

Without considering antigravity it is not possible to explain the accelerated galactic recession in our universe. Our universe is bent and its quantum density gradient of the medium is directed from the centre down to the periphery, ensuring the acceleration of galaxies and their recession from the centre of the universe. Outwardly this resembles the antigravity repulsion of galaxies from the central core of the universe, causing an illusion that this nucleus consists of antimatter. Calculations show that the bending of quantized space-time even in the conditions of strong acceleration is so insignificant that it is not possible to determine it by contemporary astronomical instruments. Therefore, for the astronomer-observer our universe appears to be flat.

The unjustified hopes for the superstring theory found their new embodiment in the theory of Superunification where the quantons can be considered as structural formations locked by power strings. In this case, real infinite electromagnetic superstrings formed by the quantons can be observed in quantized space-time. This has made it possible to calculate the colossal tension of the elastic quantized medium (EQM) which is the quantized space-time.

In this brief preface to volume 1 it is not possible to clarify all problems of the theory of Superunification and show its possibilities. Therefore, I present here for comparison two lists of the key problems of contemporary physics: „Ginzburg’s list” and „Leonov’s list”. The first list of 30 points presented by Nobel laureate Vitalius Ginzburg in a review paper “On some advances in physics and astronomy over the past three years” published in the Russian journal *Uspekhi Fizicheskikh Nauk* (volume 172, No. 2, 2002, pp. 213-219)

**“Ginsburg’s list”:**

- 1. Controlled thermonuclear fusion.**
- 2. High-temperature and room temperature superconductivity.**
- 3. Metallic hydrogen. Other exotic substances.**
- 4. Two-dimensional electronic liquid.**
- 5. Some questions of solid state physics.**
- 6. Second order phase transitions.**
- 7. Physics of surface. Clusters.**
- 8. Liquid crystals. Ferroelectrics. Ferrotoroids.**
- 9. Fullerenes. Nanotubes.**
- 10. Behavior of matter in superstrong magnetic fields.**

11. Nonlinear physics. Turbulence. Solitons. Chaos. Strange attractors.
12. Lasers, masers, superpowerful lasers
13. Superheavy elements. Exotic nuclei
14. Mass spectrum. Quarks and gluons. Quantum chromodynamics.  
Quark- gluon plasma
15. The unified theory of weak and electromagnetic interaction.  $W^\pm$ - $Z^0$ -bosons. Leptons.
16. Standard model. Great integration. Superunification. Proton decay. Neutrino mass. Magnetic monopoles.
17. Fundamental length. Interaction of particles at high and superhigh energies. Colliders.
18. Nonconservation of SR- invariance.
19. Nonlinear phenomena in vacuum and in superstrong electromagnetic fields. Phase transitions in vacuum.
20. Strings. M-theory.
21. Experimental verification of the general theory of relativity.
22. Gravity waves, their detection.
23. Cosmological problem. Inflation.  $\Lambda$ -term and 'quintessence'.
24. Neutron stars and pulsars. Supernova.
25. Black holes. Space strings (?).
26. Quasars and the nuclei of galaxies. Formation of galaxies.
27. Problem of dark matter (hidden mass) and its detection.
28. Origin of cosmic rays with the superhigh energy.
29. Gamma splashes. Hypernovas.
30. Neutrino physics and astronomy. Neutrino oscillations.

Analyzing the Ginzburg list we cannot find there the causal problems of fundamental interactions:

1. In the region of gravity. The reasons for gravity and inertia *are unknown*.
2. In the region of electromagnetism. The carrier of electromagnetism *is unknown*. Maxwell's equations are recorded purely empirically and, until now, do not have analytical derivation.
3. In the field of physics of elementary particles. The structure of none of the elementary particles, including the basic particles: electron, positron, proton, neutron, photon, neutrino, is known. The reason for the formation of mass in particles *is unknown*.
4. In the field of nuclear physics. The nature of nuclear forces and reason for the mass defect of the atomic nucleus as the basis of energy release, *is unknown*.

It is gratifying that all problems of physical science enumerated above are solved in the theory of Superunification, which is the most powerful analytical apparatus for a study of matter.

When Ginzburg composed his list, he did not know of the theory of Superunification. In order to consider the possibilities of the theory of Superunification and new fundamental discoveries of the quanton and the

superstrong electromagnetic interaction, I have compiled an additional „Leonov’s list” of also 30 new problems in order to enlarge „Ginszburg’s list”.

**‘Leonov’s list’:**

- 1. Primary matter (latent, hidden form), the quantum of space-time (quanton), the discrete structure of quantized vacuum, quantization. Superstrong electromagnetic interaction (SEI). Theory of the elastic quantized medium (EQM).**
- 2. Electrical and magnetic monopoles. Magnetic quark and elementary magnetic charge - Leon. Electrical asymmetry of the universe.**
- 3. Alternating fields, infinite superstrings and their tension.**
- 4. Time as the material category of space-time. Chronal fields. Quanton is a particle of time.**
- 5. Spherical invariance and the principle of the relative-absolute dualism of the quantized space-time.**
- 6. Quantum theory of relativity. Nonlinear relativity.**
- 7. Absolute velocity. Methodology of measurement. Resistance of vacuum to uniform motion and to motion with acceleration.**
- 8. The theory of united electromagnetic field (TUEF) and Superunification, the open quantum-mechanical systems.**
- 9. Quantum nature of gravity. Solution of Poisson’s equation for the spherically deformed vacuum. Nature of mass. Gravitational diagram, well and hill. Mass defect.**
- 10. Balance of gravitational potentials, quantum density and energy.**
- 11. Wave transfer of substance and wave-particle duality. Nature of wave (quantum) mechanics.**
- 12. Structure of electron and positron. Zones of attraction and repulsion.**
- 13. Spin and mass. Equivalence of energy and mass.**
- 14. Sign-alternating shells of nucleons. Nature of nuclear material and nuclear forces. Complex structures of elementary particles. Formation of heavy nuclei. Atomic structures, valence bonds, the stability of molecules. New materials. Fullerenes. Clusters. Electron-positron plasma. Ball lightning.**
- 15. Maximum parameters of relativistic particles.**
- 16. Structure of neutrino. Speed, energy and direction distributions of the neutrino. Methods of registration. Energy-information interactions. Field structure of the DNA. Protection from fluxes of space neutrinos.**
- 17. Derivation of Maxwell’s equations. Nature of magnetism, electricity and electromagnetism. Electromagnetic symmetry of vacuum.**
- 18. Non-radiation of the orbit electron inside the gravitational well of the atomic nucleus. Perpetual motion. Electron motion in vacuum without emission. Nature of superconductivity. Photon electron emission.**

19. **The two-rotor structure of the photon. Wave trajectory of the photon in optical media. Retarding the linear speed of the photon.**
20. **Faster-than-light speeds. Tachyons. Kozyrev waves.**
21. **Free energy, the methods of release. Quantum energetics.**
22. **Temperature of substance. Heat capacity. Quantum thermodynamics. Open quantum thermodynamics systems.**
23. **Cold synthesis of particles and antiparticles. Usherenko effect. Quantum reactors.**
24. **Creation of nonequilibrium force in vacuum. Quantum engines.**
25. **Wave processes in vacuum. Longitudinal gravity waves. The speed of gravity. Veinik's waves. Kozyrev's waves. Torsional oscillations of vacuum.**
26. **Nonlinear energy phenomena in liquid. Electron-positron plasma in a liquid. Quantum heat-generators.**
26. **Antimatter and antigravity. Black and white holes.**
27. **Model of the quantized universe and its latent energy. Space curvature.**
28. **Relaxation of the universe and the motion of galaxies with acceleration.**
29. **Circulation and the conservation of global energy. Problem of eternity.**

I do not comment on the two lists, I simply present them for comparison. The readers have the possibility to study theory of Superunification in greater detail. I would like to mention only that the new fundamental discoveries and the theory of Superunification have high applied value, opening the prospects for quantum energetics - power engineering of the 21<sup>st</sup> century, which includes both the known power cycles (chemical and nuclear reactions), and fundamentally new ones. I also would like to state that the superstrong electromagnetic interaction is the sole energy source of the universe and everything else, including nuclear reactions, are only methods of extracting the energy of this interaction. Our task is to learn to master for the good of the civilization new ecologically safe power cycles, relying on the great opportunities of the theory of Superunification and new experimental facts. This will be described in the second volume of the book: Quantum Energetics, vol. 2. New energy and space technologies. Before then, I would be happy if the theory of Superunification becomes the property of the world scientific community.

The publication of Volume 2 was postponed by me until better times.

#### **Read more:**

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