

The Theory of Interaction Between the Matter of the Universe and Physical Vacuum¹

(a review of the collection of articles by V. V. Chernukha "Physics of the Unknown Reality")

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"The Physics of an Unknown Reality", a collection of articles by the Russian theoretical physicist Victor Chernukha, is the development of a unique theory which was published in 2008 in the monograph "Polarization theory of the Mega-Universe ". It's the only theory for today that can claim the status of a basis of the "Theory of Everything"².

Many researchers express dissatisfaction with existing contradictory ideas about world order which do not allow to understand the nature of living matter, consciousness, thought and numerous observed anomalous phenomena of nature. Some of them have offered and continue to offer options of changing the existing paradigm that would allow us to advance in the creation of the "Theory of Everything". But no significant success has been achieved until recently. Therefore, many physicists consider the creation of a universal "Theory of Everything" an unrealizable dream and a waste of time. A. Einstein, who was the first to begin to seek a common approach to describing the world order, spent the last 30 years of his life on the development of a unified field theory, but without success. These failures are due to the fact that it is almost impossible to guess the initial postulates of the "Theory of Everything" that would adequately reflect the properties of the Mega-Universe ", and one of its small parts, the Universe. It is still not clear what kind of environment created the Universe with its huge mass, in what way, and how that environment itself was formed.

V. Chernukha set himself the task of developing a universal "Theory of Everything". He wondered which criteria should be met by the postulates of the universal theory.

1. Translation of the article from Russian into English is made by Sergey Bugaev
2. V. Runov "The Dream of the " Theory of Everything "- History, Achievements, Perspectives," Delphis, No. 1 (89), 2017, p. 80-88

This approach allowed him to formulate the four initial postulates, that expand the ideas about the worlds of the Mega-Universe", the properties of matter, space and time and that do not impose restrictions on the applicability of the theory.

As the initial state of the world order V. Chernukha took an out-of-nature environment in which every physical quantity is zero. This environment is capable of creating non-zero physical values of Nature through the so-called polarization processes, keeping the total values of the physical quantities that are formed equal zero. Thus, only the laws of conservation of physical quantities determine possible changes in Nature. One postulate is, in the general case, the complexity of all physical values (including space and time), which creates new physics.

In the mentioned above monograph, V. Chernukha was able, using the four initial postulates, to solve a number of chronic problems of physics, to study the nature of a fairly wide spectrum of anomalous phenomena and to show that the polarization approach allows one to study phenomena of the living nature and the human society.

According to the polarization theory, there are three types of worlds possible in the Mega-Universe". They differ in the symmetry of space, which determines the properties of their matter. Each of these worlds is characterized by its world constant. The formation of the three types of worlds with zero mean values of physical quantities occurs when the symmetry of their space grows in complexity. In the primary space with the translational symmetry appear inclusions with axial symmetry of space, and in it - ones with central symmetry. One of the inclusions with the central symmetry of space is the physical vacuum of the Universe, which has spherical symmetry of space that creates the gravitational force. The properties of the matter of the Universe must be described by three world constants - the speed of light, Planck and gravity constants. The polarization theory of the Universe operates only with these constants, and this means that it is a general theory that has the right to claim a status of the "Theory of Everything".

The ideas about the physical vacuum of the polarization theory radically differ from Dirac's physical vacuum of orthodox physics. Physical vacuum today is a virtually unknown reality, and the existing theories don't take its influence on processes of the Universe into account. This gives rise to numerous problems in understanding the properties of the Universe.

The need to take the influence of the physical vacuum into account in the studies of the universe is demonstrated by V. Chernukha in the collection of articles "Physics of the Unknown Reality" (2018). In twenty articles of the collection the author considers a wide range of problems, obtaining a quantitative agreement of calculations with experimental and observational data. This confirms the representations of the polarization theory of properties of the physical vacuum.

A brief summary of the articles, giving an idea of their subject matter and the results, is given the introduction.

The first block of articles in the collection consists of articles that describe the problems of particle and fields physics, and the second block - ones about the formation and evolution of the Universe and the Solar System. The accuracy of the description achieved here is striking, and some of the results are sensational.

The role of physical vacuum fields in the formation of leptons, quarks, mesons and baryons, was demonstrated. *Five* fundamental interactions were unified, which made it possible to calculate the mysterious fine-structure constant to within the ninth sign. The fifth fundamental interaction is the new interaction, generated by the central symmetry of the space of the physical vacuum, which connects three interactions between charges with gravitational interaction, which until now has not been possible to unify.

The masses of all the leptons, quarks, and some bosons generated by the primary particle of the Universe – Planck's scalar boson, were calculated with a high precision. The theory gives record accuracy: the mass of the electron, which is 22 orders of magnitude less than the mass of the Planck's particle, was calculated with an error of hundredths of percent (!). Thus, it was shown that the nature of the particle mass is polarizational, and not determined by the Higgs mechanism, as is generally assumed in the Standard model of elementary particles. A neutral scalar boson with a mass of 125.2 GeV, called the Higgs boson in this model, is only one of the bosons of the spectrum of fundamental particles. Since the masses of the fundamental particles are parameters of the Standard Model, this result means that the polarization theory of particle formation is a generalization of the Standard Model that takes the gravity and complexity of the space into account.

Today, the problem of interpretation of quantum mechanics can not be considered solved, because one can not get rid of the emerging paradoxes. This also applies to its probabilistic interpretation. For a universal theory, it is unacceptable, since it doesn't allow to describe micro- and macro worlds in a unified way. Therefore, the paper in which the Schrodinger equation for the wave function is derived and a deterministic interpretation of quantum mechanics is given, which has no paradoxes, is fundamentally important.

One of the articles of the collection describes the structures of massless boson and neutrinos, which in the polarization theory are composite particles. They are formed by bound fundamental particles with positive and negative masses that compensate each other. Unlike today's views, the

masses of all three types of neutrinos are zero. The polarization model of neutrinos determines the composition of the fundamental particles that form them. It is consistent with the experimental data on neutrino oscillations, since in the Universe the interaction between neutrinos and particles is realized by a neutrino component with a positive mass and energy.

Another outstanding result is obtained in the theory of nuclei. In the polarization model of nuclei their mass is determined by a formula not a lot different from the semiempirical formula of Weizsacker, obtained in the drip model of nuclei and describing the mass of the nuclei well enough. It is also shown that the existence of magical nuclei is due to central symmetry of the spatial the distribution of protons and neutrons in them, which is determined by the physical vacuum.

The main contradiction of the modern physical paradigm is the classical description of the matter of the Universe with the simultaneous quantum description of the microworld. It is absent in the polarization theory, which is a quantum theory at all hierarchical levels. The quantum polarization model of formation, evolution and structuring of the Universe (including the Solar System), developed by V. Chernukha, is consistent with observational data. In the polarization model there are no hypotheses of the Big Bang, inflation or dark energy, and the gravitational masses of particles, unlike in general relativity theory, do not distort space. The polarization model allowed not just to calculate the parameters of the modern Universe, but also explain the formation of a spectrum of stellar and galactic systems, including the relatively recently discovered giant superclusters. Formation of the latter contradicts the adopted Λ CDM model that assumes homogeneity and isotropy of the Universe on a large scale. Thus, the problematic Λ CDM model has new quantum alternative. This creates an intrigue, on the development of which depends the evolution of our ideas about the world order.

There is a notable block of articles from the collection "Physics of Unknown Reality", in which polarization approach is used to study the nature of earth life and its evolution. In contrast to the hypothesis of "reduction of the living matter to the inanimate matter", in the polarization theory, the fundamental particles of living matter differ from particles inanimate matter in phase. The polarization approach revealed the fundamental nature of a universal genetic code and allowed to represent the human body as a connected system of a biological body of inanimate matter and structure of living matter, consisting of six hierarchical, which is born in a physical vacuum and controls the development of the biological body. These ideas about the human body are close to the Vedic concepts.

The model of the evolution of terrestrial life made it possible to accurately enough calculate the dates of global extinctions and to establish that at present there is a confirmed biological process of extinction of species. It is also shown that demographic and historical processes, as well as the evolution of terrestrial life, on the fundamental level is determined by processes of changing the

spectrum of fields, happening in the physical vacuum. This is a completely new view of the nature of evolution life and historical necessity, which provides additional opportunities to predict the future of mankind. In particular, it is shown that the maximum population of mankind will be just two times larger than the current number. If the rate of GDP growth continues to be as stable as it was for the last hundred years, abundance ("the gold century"), which makes the existence of a capitalist formation impossible, will come in just 100-200 years. Few people think today about the forthcoming change of socio-economic formation and the events proclaiming it.

One block of articles has a special place in the collection, it's devoted to problems of current interest - the physics of energy sources working without fuel, and physics of low-energy nuclear reactions. In the framework of the modern paradigm, which does not take the relationship of generator devices with physical vacuum into account, such sources of energy are impossible.

As it is shown in one of the articles of the collection, for the work of low-energy nuclear reactors, it's necessary to create conditions under which their fuel appears to be imaginary subspace of the physical vacuum. In it, equally charged particles attract, i.e. there is no Coulomb barrier and nuclear reactions are possible at low energies. The theory of nuclear reactions in the imaginary space developed by V. Chernukha allowed quantitative analysis of A. Rossi's and A. Parkhomov's experiments with reactor tubes. The collection also analyzes the V. Kurashov's and T. Sakhno's microbiological method of nuclear transmutations, which makes it possible to effectively generate rare isotopes. This is possible, since the internal space of bacteria, like the whole living, is complex. When feeding the bacteria of the nucleus from the environment through membranes fall into the imaginary subspace of bacteria, where transmutations of nuclei occur, which release the necessary amount of energy to maintain the life of bacteria.

The final article of the collection is about the physics of obtaining energy from the physical vacuum. In the circum-scientific circles, the production of excess energy is associated with a hypothetical free energy inherent in a similarly hypothetical ether. In the polarization approach, the work of fuel-free energy generators is based on the creation of such an effect on the physical vacuum at which its zero energy is polarized on the positive and negative components. The latter is, in one way or another (for example, through grounding), is removed, and positive energy enters the generator and is absorbed on the load. Several types of implemented fuel-free generators using this mechanism are considered, and problems that need to be solved for the development of fuel-free energy are discussed. A separate article is analyzes of the physics of the Roshchin-Godin generator, which extracts mechanical energy from the thermal energy of the environment. Such a generator is especially attractive in the face of global warming.

The possibility of obtaining energy from the physical vacuum makes it possible to create space vehicles that do not need chemical or nuclear fuel. The author of the collection suggested the possibility of creating such spacecraft by intelligent species living in a physical vacuum. If their whereabouts is located relatively near the Earth, then frequent visits to the Earth by UFO are possible. Some aspects of UFO physics are considered in the final article of the collection.

It concludes that the scientific and technological revolution is approaching, which will bring research and usage of the physical vacuum properties for practical purposes. Human health depends on the processes in the physical vacuum as well.

The author of the collection could not publish any of the twelve articles of the collection, sent to peer-reviewed journals. The collection describes the formal excuses that the journals used for refusing to review and publish the articles even as discussion papers. Blocking of new scientific ideas without scientific argumentation and refusal of discussion is evidence of a stagnant state of the fundamental science, the psychological unpreparedness of its authorities to change settled, but contradictory ideas about the world order. A hundred years ago the representatives of classical science rejected the quantum ideas about the microworld, but, in the end, they had to retreat. There is no doubt that the notion of world order, on which the Polarization Theory of Mega-Universe (PTM) is built, a number of the predictions of which have already been confirmed experimentally, will supplant the modern picture of the world. One can hope that the publication of the collection will expand the number of supporters of new world outlook and will accelerate the process of adaptation of the scientific community to the new image of the world that opens up qualitatively new opportunities in the knowledge of Nature.

When getting acquainted with the published works of V. Chernukha, one gets amazed by how versatile and accurate tool for cognizing Nature the polarization theory is. It allows one to explore unexplored worlds and eliminate problems inherent in the accepted contradictory image of the world. One can only regret that the fundamental science has already lost ten years, ignoring the polarization paradigm that opens up new horizons in front of it.