The Constructive Criticism of the Mainstream Theories

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Abstract: Here is a very short recapitulation concerning the basic problems solved within the Scale-Symmetric Theory (S-ST) that are not solved or are described incorrectly within the mainstream theories. Incompleteness and partial incorrectness of the internal structure of the Higgs field and Einstein spacetime applied in the predominant mainstream theories cause that there appear many wrong interpretations. In the Einstein spacetime, energy is equivalent to mass but direct transformation of mass into pure energy and vice versa is impossible. Due to the quantum entanglement, there is the wrong interpretation of the Michelson-Morley experiment which leads to the illusion of acceleration of expansion of the Universe. Why we cannot detect the gravitational waves moving with the luminal speed? Why the Cosmos did not collapse at the beginning of the big bang and where is the antimatter? Why the Universe is flat? The rest mass of the Higgs boson is wrongly interpreted so there appears the hierarchy problem. The assumed origin of dark matter is incorrect. The many-worlds interpretation within the Quantum Physics (QP) is incorrect. The three-valence-quarks model of baryons is incorrect (for a half of century we cannot calculate exact mass, spin and muon radius of proton). QED neglects the weak interactions of electrons but due to the free parameters gives the correct results. The flexibility of the closed strings in M/string theory cannot lead to constancy of the gravitational constant. The origin of DNA must follow from ultimate theory (in the very early Universe there appeared the precursors of the DNA composed of neutrinos).

1. Introduction

In the predominant mainstream theories, i.e. the General Relativity and Quantum Physics, there appear the physical constants such as reduced Planck constant ħ, gravitational constant G and speed of light in "vacuum" c. It suggests that same unification of these theories, if it at all is possible (the Scale-Symmetric Theory (S-ST), [1], [2], shows that unification of these theories within the same methods is impossible), will have a lower limit for size, i.e. the Planck length, and the upper limit for speed i.e. the c. On the other hand, the long-distance quantum entanglement leads to superluminal speeds. It suggests that some unification of the two predominant mainstream theories will be incomplete. Just there should appear some speed scales and S-ST is the lacking part. Knowing the S-ST, we can eliminate all wrong assumptions and interpretations in the mainstream theories. Here, we will describe some of them.

What is the S-ST? Some extension of General Relativity [3] leads to the non-gravitating, non-relativistic, superluminal pieces of space (tachyons, plenums). The S-ST starts from colliding big pieces of space. Such a collision led to expanding liquid composed of tachyons/plenums – it is the big bang. The gas composed of the tachyons is the modified Higgs field.

To the modified Higgs field we can apply the Kasner metric [4] that is a solution to the vacuum Einstein equations. The Kasner solutions we interpret as the virtual tori/cyclones and one-dimensional virtual oscillations which lead to virtual loops in the modified Higgs field.

To quantize the sizes of the virtual Higgs cyclones, we need additional conditions (the three additional laws of conservation) that lead as well to the four succeeding phase transitions of the modified Higgs field [2]. The phase transitions lead to the speed scales.

Due to the four succeeding phase transitions, there are in existence the five scales i.e. the Higgs field composed of tachyons (the gravitational fields are the gradients in the modified Higgs field – they are produced by the Einstein-spacetime components), superluminal-quantum-entanglement scale, luminal Planck scale concerning the Einstein-spacetime components, observed-particles scale and cosmological scale [2]. The main part of S-ST leads to the internal structures of bare objects and to the origin of the physical constants [2], [5].

The phenomena characteristic for the observed-particles scale lead to the structure of the core of baryons and next to the atom-like structure of baryons [2].

The core of baryons is composed of entangled and/or confined Einstein-spacetime components which are the carriers of gluons – they are the neutrino-antineutrino pairs [2]. The total weak charge of the Einstein-spacetime components is equal to zero so it is much more difficult to detect the Einstein-spacetime components than the neutrinos.

The General Relativity concerns the gravitational fields produced by the Einstein-spacetime components and neutrinos (they can be entangled and/or confined). The Standard Model concerns the phenomena in the Einstein spacetime (for example, entanglement, confinement, production of virtual and real particle-antiparticle pairs, their polarization, production of condensates and loops, propagation and rotation of entangled Einstein-spacetime components, and so on).

2. The wrong assumptions and wrong interpretations in the mainstream theories
2.1.

In the Einstein spacetime energy is equivalent to mass but direct transformation of mass into pure energy and vice versa is impossible.

Due to the Higgs mechanism [6], [2], the Einstein-spacetime components have gravitational mass. To produce the Principle-of-Equivalence particles there are needed the pieces of space i.e. physical volumes/tachyons/plenums [3]. On the other hand, the photons and gluons are the rotational energies of the Einstein-spacetime components [2]. Transformation of the rotational energies into volumes/tachyons/plenums and vice versa is impossible. Nature cannot transform motions into physical volumes and vice versa.

But in the Einstein spacetime can appear vortices of photons (in electromagnetic field) or vortices of gluons (in strong field) i.e. vortices of pure rotational energy carried by loops composed of entangled Einstein-spacetime components. Such vortices decrease local pressure in the Einstein spacetime so there are the inflows into the vortices of additional Einstein-spacetime components – it increases local mass density i.e. there appears gravitational mass which, due to the interactions, can be seen by detectors and other masses. This mass is equivalent to the pure rotational energy of the vortex ($M = E / c^2$) [2].

2.2.

Due to the quantum entanglement, the interpretation of the Michelson-Morley experiment is wrong.

Photons can be entangled i.e. there are entangled the carriers of photons (i.e. the carriers of the rotational energies) i.e. the Einstein-spacetime components. Emitted photons, due to the superluminal quantum entanglement, are entangled with their source or with the last-interaction object. The speed c of photons is the speed in relation to the source or to the last-interaction object.

Michelson and Morley tried to detect the relative motion of the Earth and the stationary luminiferous aether. But we can see that the last-interaction object is the beam splitter and, next, the mirrors i.e. the speed of light all the time is the c in relation to the Michelson-Morley interferometer. We can see that due to the quantum entanglement, the real relative motion cannot be detected in the Michelson-Morley experiment.

But in reality, if a cosmic source of light has the going-away radial speed v in relation to Earth (the emitted light is entangled with the source) then the relative speed of light is $\Delta v = c - v$. But due to the last-interaction object, the speed of this light measured on Earth always will be c. We can only measure the change in frequency i.e. the redshift.

The wrong interpretation of the Michelson-Morley experiment causes that in cosmology there appears an illusion of acceleration of expansion of the Universe [7]. Of course, the Special Relativity is correct for masses moving in relation to dominant gravitational field. Just there is the duality of relativity.

The duality of relativity causes that time distance (not spatial distance) to the most distant galaxies is indeed 13.866 ± 0.096 billion years but they are already 7.75 billion years old – just we cannot see the initial period of evolution of galaxies [8].

2.3.

Why we cannot detect the gravitational waves moving with the speed c?

Gravitational waves never will be detected because their existence follows from the wrong assumption inserted into the Einstein field equations. In reality, the luminal speed c appears only in front of the stress-energy tensor. On the other hand, we know that in the Ricci tensor for weak gravitational waves there appears also the d'Alembertian in which appears the c. And it is the mistake. The Scale-Symmetric Theory shows that the gravitational fields are not associated with the luminal Einstein spacetime, they are directly associated with the superluminal pieces of space the modified Higgs field consists of.

The Ricci tensor concerns the modified Higgs field composed of the tachyons/plenums whereas the stress-energy tensor concerns the luminal, confined or/and entangled Einstein-spacetime components. In the modified Higgs field can be produced gradients, not gravitational waves or gravitons.

Due to the weak interactions, which follow from the confinement (to the confinement leads the Mexican-hat mechanism [6]), in the Einstein spacetime can appear local fluctuations, not gravitational waves.

The present-day densities of the modified Higgs field and Einstein spacetime are very different. The 'Einstein-to-Higgs ratio' is about $4 \cdot 10^{42}$ [2] and it is the reason that the gravity is so weak in comparison with the three other forces (electromagnetic, weak and strong).

2.4.

Why the Cosmos did not collapse at the beginning of the big bang and where is the antimatter?

Within the Standard Model we still cannot explain why the Cosmos did not collapse at the beginning of the big bang. Within the S-ST such explanation is very simple. Due to the Higgs mechanism [6], [2], there appeared the Einstein spacetime and whole gravitational field was produced by the luminal Einstein-spacetime components. On the other hand, there was the dynamic pressure in the Einstein spacetime. Value of the gravitational pressure squeezing our Cosmos had overcame the dynamic pressure (due to the dynamic pressure the Cosmos had expanded) for radius greater than about $2.3 \cdot 10^{30}$ m so there was the collapse only of the outer shells of the Einstein spacetime [9].

The Universe appeared in the Cosmos due to a local fluctuation of the Einstein spacetime. Due to the evolution of the fluctuation, there appeared the dark matter (i.e. the additional Einstein-spacetime components entangled with baryonic matter) that caused the exit of our very early Universe from the black-hole state [2].

The cosmic fluctuations in our Cosmos appear as the left-handed or right-handed vortices [2]. The neutrons and protons are left-handed whereas antineutrons and antiprotons are right-handed [2]. We can see that our Universe arose from a left-handed vortex. Such is the origin of the matter-antimatter asymmetry in our Universe.

2.5.

Why the Universe is flat?

The gravitational fields are composed of the tachyons/plenums which have inertial mass only. They are not the Principle-of-Equivalence particles. The gravitons are not in existence. Such fields cannot have infinite density. Due to the internal structure of the Einstein-spacetime components, the gravitational fields produced by them are curved [2]. On the other hand, the Einstein spacetime is flat and there dominate different types of polarization. Density of the flat Einstein spacetime is about 42 powers of ten higher than the inertial-mass density of the gravitational fields so the two spacetimes as a whole are flat [2]. The dark matter and dark energy only insignificantly increase density of the Einstein spacetime inside our Universe [2] (one part in about 10^{55} parts [2]).

2.6.

The rest mass of the Higgs boson is wrongly interpreted.

In reality, the true Higgs boson is the binary system of two Einstein-spacetime components with antiparallel spins. Such boson is the zero-spin boson and it can decay to four neutrinos or two photons. Its rest mass is about $1.3 \cdot 10^{-66}$ kg [10]. Its maximum rotational energy is very close to the Planck energy [3]. It solves the hierarchy problem. There can appear condensates composed of such low-rest-mass true Higgs bosons [10]. Due to the internal structure of the core of baryons, there, for example, can be produced the sham Higgs boson with a mass of 125 GeV [2], [10], [11], [12].

The Higgs mechanism I described here [6], [2]. The binary systems of closed strings the Einstein-spacetime components consist of, due to their internal helicities, transform the chaotic motions of the tachyons into the divergently moving ones – it produces the gradients/gravitational fields [2].

Emphasize that the Einstein-spacetime components consist of superluminal objects so energy, not mass, frozen inside neutrinos is tremendous. The geometrical mean of the superluminal energy frozen in a neutrino and its gravitational mass is close to the Planck mass.

2.7.

The assumed origin of dark matter is incorrect.

The cosmic left-handed vortex transformed into the cosmic-structure/Protoworld. Due to its evolution, some part of the Protoworld transformed into the additional Einstein-spacetime components entangled with baryonic matter – it is the dark matter [2]. There can appear 'islands' and 'loops' composed of dark matter which lead, respectively, to gravitational lensing and the Type dark-mater orbital motions of stars in rotating galaxies.

2.8.

The many-worlds interpretation within the Quantum Physics (QP) is incorrect.

The many-worlds interpretation of quantum physics is incorrect. Generally, the photons are the groups of entangled elementary photons so they occupy volumes i.e. there is a distribution of elementary photons in a photon. Observation of one elementary photon causes that whole energy of the photon is accumulated in the point of observation. We cannot say that a photon is simultaneously in two or many different places. We can say only that entangled different parts of the photon occupy different places. The photon composed of entangled elementary photons can change distribution of the still entangled elementary photons. It concerns as well mass and energy of a quantum particle – the portions of mass and energy are still entangled. But we cannot say that charge or spin of a quantum particle as a whole can be simultaneously

in two or more places. The entangled parts of a charge occupy different places but the charge as a whole has simultaneously only one distribution of its parts. There disappears the distribution of the entangled parts of the charge and appear a displaced distribution, and so on. Only observation which lasts longer than lifetime of charge and spin in defined state of distribution of entangled parts can lead to the wrong interpretation that charge and spin can be simultaneously in two or many different places displaced more than size of bare particle.

2.9.

The three-valence-quarks model of baryons is incorrect.

For a half of century we cannot within the three-valence-quarks model of baryons calculate exact mass, spin and muon radius of proton i.e. we cannot calculate the fundamental most important physical quantities. It suggests that this model is incorrect. Is there some alternative solution? Of course, there is such solution within S-ST. The S-ST contains at least 3 times less parameters, is much simpler and gives best, beautiful results. Here [2] I calculated spin and mass of proton whereas here [15] are calculated the electron and muon radii.

Of course, there are in existence the condensates composed of the Einstein-spacetime components carrying masses equal to the masses of quarks but the other properties of quarks are different [2], for example, there is only one color of quarks.

2.10.

QED neglects the weak interactions of electrons but leads to correct results – it is due to the free parameters.

The mainstream theories based on renormalization sometimes give good results but it is due to the free parameters.

It is obvious that electrons can interact also weakly so a complete theory of electrons should take into account these interactions. The QED neglects the weak interactions of electrons with protons but gives good results. It suggests that the QED, in which appears the mathematical indeterminate/incoherent form ($\infty - \infty$ = const.), gives good results only due to the free parameters. The free parameters do not appear in S-ST and within this theory there appear the weak interactions as well. Such theory is very simple and the obtained results are perfect [16], [2].

2.11.

The flexibility of the closed strings in M/string theory cannot lead to constancy of the gravitational constant.

In S-ST, properties of the closed strings and Einstein-spacetime components lead to the value of the G. It follows from the fact that their shapes cannot change [2]. The S-ST leads to the useful and very simple modified M/string theory [2].

It is obvious that lacking part of ultimate theory must lead to the origin of physical constants – the S-ST leads to the origin of physical constants [2], [5].

2.12.

The origin of DNA must follow from ultimate theory.

Within the mainstream theories unmistakably we cannot explain the origin of DNA. The origin of DNA is described within S-ST [2].

The neutrino precursors of the DNA appeared already before the observed expansion of the Universe. There are the four different Einstein-spacetime components and there are the four different bases i.e. A, C, G and T. On the other hand, the tau "neutrinos" consist of three different entangled electron- and muon-neutrinos so there appeared the neutrino precursors of the codons in the DNA composed of three bases. The internal helicity of the double helix is right-handed because such helicity have electrons responsible for the interactions of molecules.

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