

The True End of Theoretical Physics

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Abstract: The Theory of Everything (ToE) is the ordinary sum of the Scale-Symmetric Theory (SST), General Theory of Relativity (GR) and Quantum-Physics/Standard-Model (QP/SM). The SST causes that GR and QP/SM transform into the coherent theories without infinities, singularities, approximations, mathematical tricks such as the mathematical indeterminate forms and others, and free parameters. Moreover, within SST we can partially unify GR and QP/SM and show that unification of these theories within the same methods is impossible - it does not follow from incompleteness of such ToE but from the fundamental property of spacetime. Here we listed the basic problems that are solved within such ToE - such list overlaps with the list of unsolved basic problems in cosmology, GR, general physics, QP, high-energy physics, particle physics, astronomy, nuclear physics, high-temperature superconductors, and so on. Scientific journals should not validate incoherent theories because it misleading scientific community and radically increases entropy in physics i.e. radically increases mess in physics.

The Theory of Everything (ToE) is the ordinary sum of the Scale-Symmetric Theory (SST) [1], [2], General Theory of Relativity (GR) and Quantum-Physics/Standard-Model (QP/SM). The SST causes that GR and QP/SM transform into the coherent theories without infinities, singularities, approximations, mathematical tricks such as the mathematical indeterminate forms and others, and free parameters. Moreover, within SST we can partially unify GR and QP/SM and show that unification of these theories within the same methods is impossible – it does not follow from incompleteness of such ToE but from the fundamental property of spacetime.

The SST shows that the succeeding phase transitions of the superluminal non-gravitating Higgs field during its inflation (the initial big bang) lead to the different scales of sizes/energies [1A]. Due to a few new symmetries, there consequently appear the superluminal binary systems of closed strings (entanglons) responsible for the quantum entanglement (it is the quantum-entanglement scale), stable neutrinos and luminal neutrino-antineutrino pairs which are the components of the luminal gravitating Einstein spacetime (it is the Planck scale), cores of baryons (it is the electric-charge scale), and the cosmic-structure/Protoworld (it is the cosmological scale) that evolution leads to the dark-matter

structures (they are the loops and filaments composed of entangled non-rotating-spin neutrino-antineutrino pairs), dark energy (it consists of the additional non-rotating-spin neutrino-antineutrino pairs interacting gravitationally only) and expanding Universe (the “soft” big bang due to the inflows of the dark energy into Protoworld) [1A], [1B]. The electric-charge scale leads to the atom-like structure of baryons [1A].

Below is the list of the basic problems that are solved within such ToE – this list overlaps with the list of unsolved basic problems in cosmology, GR, general physics, QP, high-energy physics, particle physics, astronomy, nuclear physics, high-temperature superconductors, and so on [3]:

- Origin and history of the Cosmos, shape of the Cosmos
- Baryon asymmetry
- Processes that cancel out the zero-point energy of the vacuum
- Dark matter and dark energy
- Problem of time, arrow of time, entropy
- Why quantum gravity does not exist
- Non-locality
- Fundamental physical constants

The seven fundamental forces (the force resulting from dynamic viscosity of non-gravitating tachyons, the directional superluminal entanglement, volumetric confinement, gravitational force, electromagnetic force, weak force and nuclear strong force)

- Mass gap
- Wave-function collapse
- Black holes, supermassive black holes, jets
- Higgs mechanisms for neutrinos and other Principle-of-Equivalence particles, neutrino mass
- Hierarchy problem, Planck mass
- Magnetic monopoles
- Crisis of proton spin, proton muonic-radius puzzle, anomalous magnetic moment of muon
- Modified supersymmetry
- Generations of matter
- Colour confinement
- Strong CP problem
- Galaxy rotation problem
- Supernovae
- Ultra-high-energy cosmic rays
- Dipole anisotropy of CMB
- Space roar
- Quantum chromodynamics, nuclear force, plasma physics
- Temperature superconductors, and so on.....

$$\text{ToE} = \text{S-cales} + \text{QUA-nta} + \text{RE-lativity} = \text{“SQUARE”}$$

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The string theory has come to a deadlock because no one superpartner was detected in LHC experiments at 1 TeV scale. It was obvious that such will be the end of the incoherent string theory because flexibility cannot lead to invariants and higher spatial dimensions are physically impossible (there are possible higher degrees of freedom).

There is zoo of different quantum field theories (QFTs) whereas we need unique QFT. This suggests that we do not understand Nature correctly and that QFT is at least the incomplete theory.

Loop quantum gravity (LQG) tries to quantify gravity but today it does not unify gravity with other interactions.

Today we can unify the all seven interactions only partially via the SST and we can show within SST that unification of GR and SM within the same methods is impossible. It suggests that SST is the missing part of ToE.

Due to the assumed constancy of speed of light in “vacuum” and the probabilities and uncertainties that follow from the invisible for detectors quantum entanglement, the GR and QP are the theories dependent on observer – they are only partially the theories of independent Nature. To formulate ToE, we need an additional theory of independent Nature and SST is such a theory.

Scientific community assumes that to describe the ground state of spacetime, we need QFT. But SST shows that both the Higgs field and the ground state of the Einstein spacetime are grainy and are the classical fields i.e. wavefunctions and operators are not needed. Quantum phenomena, due to the quantum entanglement, appear on higher level of Nature i.e. concern the excited states of the Einstein spacetime.

But classical physics and the semi-classical treatment of quantum mechanics need smooth functions. SST solves this problem. Just time of observation that follows from some interaction, is much, much longer than time needed the spacetime components were at any point of space at least once.

Assume that the shortest time of an observation is about 10^{-25} s. The very simple calculations show that then the tachyons are about 10^{78} times in each point of space so gravitational fields are very smooth for observers and for particles interacting due to the electromagnetic, weak and nuclear strong interactions. On the other hand, the Einstein-spacetime components are about 10^8 times in each point of space so this spacetime is for observers and particles visible by detectors very smooth as well.

SST shows that there are five scales but two smallest scales are below the Planck scale. The three smallest scales are not foamy in a quantum way but are grainy. The granularity is not a consequence of the quantization as it is in LQG but due to the SST inflation. Such spacetime causes that photons are not “knocked” around a bit during their motion.

Due to tachyons, the gravitational fields are “attached” to masses.

References

- [1] Sylwester Kornowski (2015). *Scale-Symmetric Theory*
 [1A]: <http://vixra.org/abs/1511.0188> (Particle Physics)
 [1B]: <http://vixra.org/abs/1511.0223v2> (Cosmology)
 [1C]: <http://vixra.org/abs/1511.0284> (Chaos Theory)
 [1D]: <http://vixra.org/abs/1512.0020> (Reformulated QCD)
- [2] Sylwester Kornowski (2012-2016; but foundations of SST were published already in 1997: see [1A])
http://vixra.org/author/sylwester_kornowski
- [3] https://en.m.wikipedia.org/wiki/List_of_unsolved_problems_in_physics