My Path to the Theory of Everything

Sylwester Kornowski

Abstract: Here I described how my adventure with the final theory began and my ways of thinking that led to the next stages on the road to a full understanding of Nature.

1. Introduction

There are dozens of unsolved basic problems in orthodox physics, which leads to the conclusion that orthodox physics is far from the Theory of Everything (TOE). It is assumed that the path to TOE leads through quantum gravity and preons to reduce large number of different particles. Problems appeared when the Heisenberg's uncertainty principle was applied to quantum preons smaller than $\sim 10^{-18}$ m – very high masses of preons were obtained in relation to the lightest known particles, so the problem of the origin of very high binding energy of preons appeared.

Here I present the view that TOE is the lacking fundamental theory based on the theory of successive phase transitions of the initial inflation field (it was classical field) and on the Titius-Bode law for the nuclear strong interactions (I call it the Scale-Symmetric Theory (SST)). All other theories are a consequence of such TOE. Gravity and other interactions cannot be unified via the same methods because the interactions are very different. But we can unify them through relationships between the quantities characterizing their sources.

But let's start from the beginning.

2. The beginning and breakthroughs in my adventure

In 1971, I graduated in physics at the University in Poznań (UAM) and started working as a physics and astronomy teacher at a high school in the city of Szczecin (the age of the students was 16-19 years). It all began with a question I asked myself when I was preparing for the next lessons – what will I tell students when they ask what is the internal structure of the spin, charge and mass of the bare electron? They did not ask, but the inability to describe the physical side of the internal structure caused that I passionately began reading books in the field of particle physics.

The tables of elementary particles contained several hundred particles and the number of baryons was the highest. In the final stage of the decays of baryons, a nucleon always appeared, so the thought appeared that the structure of nucleons is the source of the observed baryonic zoo. For 5 years, from 1971 to 1976, I searched for regularities in the masses of baryons, and in 1976 I experienced a revelation – I found two empirical formulae, one related to hyperons and the other to baryon resonances. It wasn't until the beginning of 1985 that I understood the physical meaning of such formulae.

It took another 12 years (1985-1997) before I discovered the most hidden part of the Theory of Everything that is its core – these are the successive phase transitions of the initial inflation field that lead to five basic size scales in Nature. These are the sizes of tachyons (they are components of gravitational fields), of carriers of quantum entanglement (entanglons) and cores of neutrinos, baryons and the Protoworld. We can consider 1997 a landmark in the formulation of the lacking part of the TOE.

The next step was to understand the internal structure of photons and gluons.

3. Two empirical formulae for baryons and their implications

I noticed that the following formula describes how to calculate the mass of a hyperon, $M_{n,d}$:

$$M_{n,d}\,[\mathrm{MeV}] \approx 939 + 176\,n + 26\,(d - 1)\,, \tag{1}$$

where $n = 0, 1, 2, 3$ (the $\pm n$ defines the strangeness of baryons) and $d = 1, 2, 4, 8$ (they are the selected Titius-Bode numbers: $d_{TB} = 0, 1, 2, 4, 8, 16$, and so on) [1]. Much later, in paper [2], I showed that the Titius-Bode law for the nuclear strong interactions (sTBL) for baryons is associated with fractal geometry i.e. travelling half-distances, distribution of sources of interactions, and the creation of consecutively smaller self-similar physical objects/loops – it is because of the symmetrical decays of virtual bosons (bifurcation).

In formula (1), for a nucleon it is $n = 0$ and $d = 1$ which gives $M_{0,1} = 939$ MeV. For hyperon lambda we have $n = 1$ and $d = 1$ which gives $M_{1,1} = 1115$ MeV. For hyperon sigma $n = 1$ and $d = 4$ which gives $M_{1,4} = 1193$ MeV. For ksi $n = 2$ and $d = 2$ which gives $M_{2,2} = 1317$ MeV and for omega $n = 3$ and $d = 8$ which gives $M_{3,8} = 1649$ MeV.

The second empirical formula defines the mass distances between the baryonic resonances and between the resonances and hyperons [1]

$$\Delta M_{ij} \approx 200\ \mathrm{MeV},\ 300\ \mathrm{MeV},\ 400\ \mathrm{MeV},\ 700\ \mathrm{MeV}. \tag{2}$$

I needed the next nine years (1976-1985) to understand the origin of formulas (1) and (2).

Because pion(s) very often appears in the decays of baryons, I assumed that the mass of 176 MeV **that appears in formula (1) is its relativistic mass. But due to the mass of baryons and their size, the increase in the mass of the pion cannot be due to gravitational interactions, but rather due to the nuclear strong interactions of some baryon core with the relativistic pion. The golden thought was that the baryon core is a physical black hole for nuclear strong interactions.**

Experimental data in the 1970s showed that the singlet neutron-proton effective range is ~2.7 fm while the triplet one is ~1.7 fm. Finally, after the great mental torture, there was the thought that they should be the radii of the last and last but one Titius-Bode orbits for nuclear strong interactions.

One of the most important moments on my way to TOE was deciphering the Titius-Bode law for nuclear strong interactions [1]

$$R_d = A + dB\,, \tag{3}$$

where A ≈ 0.7 fm is the equatorial radius of the core of baryons, B ≈ 0.5 fm, and d = 0, 1, 2, and 4.

It was EUREKA and the rest was achieved much easier.

Notice that $R_{d=2} = 1.7$ fm and $R_{d=4} = 2.7$ fm. Next I calculated that on the first orbit above the Schwarzschild surface for the nuclear strong interactions (i.e. on the d = 2 orbit) the relativistic mass of the neutral pion is ~176 MeV as it is in formula (1).

In addition, I assumed that the strong Titius-Bode law (sTBL) applies outside the core of baryons and that the internal structure of the baryon core determines the range of such interactions. Formula (1) is for the pions that behave similar to electrons in atoms while formula (2) is for the gluon loops which overlap with the Titius-Bode orbits for nuclear strong interactions.

The first formulation of the theory describing interactions outside the baryon core appeared in 1985 and was included in my popular scientific book published in Polish in 1996 [3].

4. My way to size scales and structure of the core of baryons

We have the Planck scale (L_P is ~10^{-35} m) which is the lower limit for particles whose inertial mass is equal to gravitational mass (the principle of equivalence) and to which Einsteinian equivalence of mass and energy applies. There is also the baryon scale (L_B is ~10^{-15} m).

There was a thought to calculate the cosmological scale. Knowing the mean density of the Universe (~10^{-26} kg/m^3) and age of the Universe (13.8 Gyr i.e. ~10^{26} m), we can calculate its approximate mass (M_U is ~10^{52} kg) and then assuming that it was initially a gravitational physical black hole ($L_C = 2R_{Schwarzschild} = 4GM_U/c^2$), we can calculate its approximate size (L_C is ~10^{25} m).

Notice that

$$L_C / L_B = 10^{40}, \tag{4a}$$
$$L_B / L_P = 10^{20}. \tag{4b}$$

So there was the thought that maybe neutrinos are made of non-principle-of-equivalence particles with size, L_E, close to

$$L_P / L_E = 10^{10} \tag{4c}$$

because such a value leads to a formula containing the Titius-Bode numbers

$$L_m / L_k = 10^{10 \cdot d}, \tag{5}$$

where d = 1, 2, 4. In such a way, in my theory, appeared the superluminal entanglons (i.e. the binary systems of closed strings) which are responsible for the superluminal quantum entanglement [1]. The entanglons are built of the tachyons [1] so we have 5 basic size scales.

Because we observe the symmetry breaking along the spin direction of fermions in the weak decays, so I assumed that in the cores of fermions, besides the spin speeds (the toroidal motions), there must be also the poloidal motions. The simplest object which can have both the toroidal and poloidal motions is a physical torus or thin loop which surface looks also as a

torus. Moreover, to ensure stability of a physical torus, there must appear radial motions which create a condensate in centre of the torus. Then I understood that the virtual or real loops created inside the torus/electric-charge in the core of baryons are responsible for the nuclear strong interactions while the central ball/condensate is responsible for the nuclear weak interactions.

The first version of the theory containing the size scales in Nature, describing the internal structure of the core of baryons, Titius-Bode law for strong interactions, and the structure of other particles appeared in 1997 [4].

Over the years, my theory was significantly improved and its current condition has been presented in the papers [1], [2], [5], [6] (and many others). Several ideas were removed that did not stand the test of time.

The basic size scales lead to the degrees of freedom of tachyons, entanglons, core of neutrinos, core of baryons and core of the Protoworld which is described within the cosmological scale (i.e. 6, 10, 26, 58 and 122) – these degrees of freedom are encoded in the Wow! signal [7] so extraterrestrial civilizations probably know my theory. Sometimes it seemed to me that someone gave me some solutions.

5. Theory of photon and a photon loop in gravitational field of physical black hole. Why in electrodynamics it is assumed that photons have no mass?

It is obvious that the photon frequency, ν [Hz], cannot be an independent entity. Rotation must be assigned to, for example, internally structureless physical volume, i.e. to inertial mass that differs from gravitational mass by the absence of a gravitational field.

The frequency of the elementary photon follows from the rotation of the unitary spin of a neutrino-antineutrino pair as it is in the Scale-Symmetric Theory (SST) [1]. Such a pair is moving with the speed $c = 299{,}792{,}458$ m/s in relation to a system with which it is entangled [8]. There can be the long-distance entanglement of the neutrino-antineutrino pairs so such composite photons also are moving with the speed c. Within SST we calculated the lower and upper limits for mass of the carrier, $M_{Carrier}$, of the photon energy (it is the rotational energy E) [9] (photons in the nuclear strong field behaves as gluons [1]):

$$6.7\cdot10^{-67}\ \text{kg (elementary photon)} \leq M_{Carrier} \leq 1.2\cdot10^{-47}\ \text{kg (composite photon)}\ . \quad (6)$$

Today, most of the CMB photons should have the mass of photon carrier equal to [5]

$$M_{Carrier,CMB\text{-}photon} = 4^{16}\ 2\ M_{Carrier,neutrino} = 2.9\cdot10^{-57}\ \text{kg}\ , \quad (7)$$

where $M_{Carrier,neutrino} = 3.335\cdot10^{-67}$ kg is the lowest mass of neutrino [1].

We proved also that mass of the carrier of the photon energy does not depend on its energy – it follows from internal structure of the two-component spacetime [1], [10]. The two-component spacetime consists of the internally structureless tachyons which rotate (it is the SST Higgs field) and of the neutrino-antineutrino pairs (it is the Einstein spacetime) [1]. Neutrinos placed in such Higgs field produce gradients which are the gravitational fields [1].

According to SST, in addition to the mass of the carrier of photon energy, $M_{Carrier}$, it has a mass depending on the frequency i.e. depending on the angular velocity (or velocities) of the spin of the carrier of photon energy. Such mass is separated from the rotational energy of photon. The rotational energy of the photon is the ordering motion in Einstein's spacetime i.e. there partially instead of the chaotic motions of the Einstein-spacetime components (these are the neutrino-antineutrino pairs with non-rotating spin), parallel motions appear that lower the local dynamic pressure of spacetime. This causes a local increase in Einstein's-spacetime

density, i.e. additional mass appears around the photon. We will call such a mass the spacetime mass of photon (STMP), M_{STMP}. This mass is the mass of photon equal to the rotational energy of the carrier of photon, i.e. for such mass is obligatory the Einstein formula

$$E = h\,\nu = M_{STMP}\,c^2\,, \tag{8}$$

where h is the Planck constant.

As a summary of this part, we can say that there are three basic quantities defining a photon: the mass of the carrier of the energy of photon, its rotational energy resulting from the rotation of the spin of the carrier, and the mass of the additional neutrino-antineutrino pairs around the photon (the spacetime mass of photon). Similar is for neutrinos with rotating spin [11].

The Neutrino Quantum Gravity (NQG) leads to the effective radius of the neutrinos and their binary systems [12].

The neutrino-antineutrino pairs do not annihilate because they are built of the non-Einsteinian superluminal entanglons so energy density (not mass density) inside each effective neutrino is tremendous – it is an equivalence of $\sim 10^{146}$ kg/m^3 – such density causes that today neutrinos are indestructible. Emphasize also that energy frozen inside neutrino is about $\sim 10^{119}$ times higher than their gravitational mass [1].

When a photon approaches the mass generating the gravitational field and both objects are entangled, the kinetic energy of the photon must increase, but we know that its speed c cannot change, so the spacetime mass of the photon (STMP) must increase, and this forces the photon frequency to increase as shown in formula (8).

When an atom emits a photon then the photon carries a part of the zero-energy field (it is equal to the STMP) so binding energy of the atom is higher, which means that the mass of the atom decreases.

Why in electrodynamics it is assumed that photons have no mass? Both the Einstein spacetime and photons consist of the neutrino-antineutrino pairs. Masses of the carriers of photons are an indistinct part of the ground state of the Einstein's spacetime so they are components of the zero-energy field. Such components cannot transfer any energy to the detector so they are unobservable. The same concerns the STMP – such mass for a local observer is a part of the zero-energy field. But an external observer, e.g. of the Galaxy, see also the gravitational field of the STMPs moving inside the Galaxy because they increase the mean density of the Einstein spacetime inside the Galaxy.

Every kind of pure energy (i.e. of massless energy) that organizes motions in Einstein's spacetime carries the spacetime mass that increases the local density of Einstein's spacetime. There is obligatory the Einsteinian principle of the equivalence of pure energy and spacetime mass associated with such energy.

For neutron black hole (NBH) [5] is

$$R_{o,NBH} = G\,M_{NBH} / c^2\,, \tag{9}$$

where $R_{o,NBH}$ is the equatorial radius of the NBH ball filled with neutrons, G is Newton's gravitational constant, and M_{NBH} is the mass of the gravitating NBH.

Formula (9) says that orbital speed of photons on the NBH equator is c while their radial speed is equal to zero – it means that photons are trapped.

It is easy to calculate that values of the first and second cosmic velocities of photons on the Schwarzschild surface of the NBH are equal and such value is equal to c divided by the square root of 2. We can calculate also spin speed and radial speeds of a photon loop in infinity: it is 0 and c respectively. Calculate the ratio of the wavelengths of the photon loop, $\lambda_\infty / \lambda_{Sch}$, as measured by the observer at infinity and when the loop overlaps with the equator of the Schwarzschild surface. We can apply formula (8) so we have

$$1 / \lambda \sim M_{STMP} . \tag{10}$$

To the M_{STMP} we can apply the Einstein formula

$$M_{STMP,Sch} = M_{STMP,\infty}(1 - v_{spin,\infty}^2 / v_{spin,Sch}^2)^{-1/2}, \tag{11}$$

where $v_{spin,\infty}^2 = G\, M_{NBH} / R$ and $v_{spin,Sch}^2 = c^2 /2 = G\, M_{NBH} / R_{NBH,Sch}$, where $v_{spin,\infty}$ and $v_{spin,Sch}$ are the spin speeds of the photon loop at infinity and when the loop overlaps with the equator of the Schwarzschild surface respectively, and $R_{NBH,Sch}$ is the Schwarzschild radius of the NBH.

From (10) and (11) we have

$$\lambda_\infty / \lambda_{Sch} = (1 - R_{NBH,Sch} / R)^{-1/2} . \tag{12}$$

It is consistent with the General Theory of Relativity.

6. My path to dark matter (DM)

I have been wandering for years to find out what dark matter is. Initially, like many physicists, I assumed it was cold baryon matter, but then using the theory belonging to the cosmic scale I received too low the baryon mass of the observed universe.

Later, I noticed that the mass of the core of the Protoworld [5] was about 5.4 times higher than the baryon mass contained in it. On the other hand, observational data showed that the ratio of the mass of dark matter to the baryon mass is just about 5.4 so I assumed that as a result of some phase transition, the Protoworld decayed to the Einstein-spacetime components. But then such dark matter (i.e. the free additional neutrino-antineutrino pairs – they interact only gravitationally) is no different from dark energy.

And then, it was at the beginning of 2019, I had a revelation. I needed a particle of dark matter with a mass equal to the mass of the core of the baryons (i.e. I needed the mass equal to 727.44 MeV) because then the Protoworld made of such particles was a stable object. I have calculated that the torus mass of the same size as the torus in the baryon core but with neutrino-antineutrino pairs rotated 90 degrees ($\pi/2$ [radian]) has a mass of just 727.43 MeV [5], [13].

The difference between photons and DM structures is that in photons the spins of neutrino-antineutrino pairs are perpendicular to the direction of motion so they can rotate while in DM structures the spins are parallel or anti-parallel to the direction of motion so they cannot rotate so they do not interact electromagnetically.

Just before the beginning of the expansion of the Universe, such DM particles decayed to DM loops that increased in size with the expansion and evolution of the universe.

Let us emphasize that DM loops appeared in my Scale-Symmetric Theory (SST) as early as 2014 when I described the anomalous rotation of spiral galaxies [14].

Minds are the DM structures which are the knots of tangled DM loops – see [15] and many others. The DM knots interact because of the superluminal quantum entanglement. The same elements in different DM knots attract each other so it causes a war of domination between different elements.

The spacetime mass of the photons (STMPs) is a kind of dark energy because such mass is composed of the free additional neutrino-antineutrino pairs. Such pairs interact only gravitationally as it is in the ground state of the Einstein spacetime.

7. Transition from quantum mechanics to classical mechanics or vice versa Why doesn't the mathematical formalism of Quantum Mechanics (QM) and General Relativity (GR) appear in the lacking part of the Theory of Everything i.e. in SST?

The quantum behaviour of a composite particle can be defined as successive processes of its disappearance and appearance, often in very distant regions of the Einstein's spacetime or other fields, so the average state of the particle is described by a wavefunction by which the probability of finding a particle at a given point in spacetime or other field can be defined. Due to the superluminal entanglons of which neutrinos and their pairs are made, quantum behaviours may be nonlocal.

Quantum behaviours of particles occur when their average densities do not differ significantly from the density of spacetime increased by the densities of the fields mixed with it. Note that, in general, Einstein's-spacetime density ($\sim 10^{28}$ kg/m^3) dominates over the densities of other fields, so the average density of quantum particles must be similar to or lower than density of the Einstein spacetime. For example, according to SST, density of the pions is $\sim 10^{18}$ kg/m^3 while of bare electrons $\sim 10^{7}$ kg/m^3 so they are the quantum particles.

Density of the neutrino core is $\sim 10^{38}$ kg/m^3 so trajectories of neutrinos are classical. Similar is for the SST tachyons ($\sim 10^{86}$ kg/m^3) and entanglons.

We should also pay attention to the fact that the causes of quantum behaviour are classical phenomena, i.e. the exchange of energy and spin through the exchange of superluminal entanglons.

Even a quantum superposition is misinterpreted – different parts of a composite particle can be in different states, but a given point of such a particle cannot be in two or more different states at the same time, so it's a classical superposition.

The high density of Einstein's spacetime in relation to average particle densities and densities of other fields causes our Universe to be flat.

But in baryons, so also in protons and neutrons, there is a torus whose surface density is about three hundred thousand times higher than on surfaces drawn in Einstein's spacetime. This means that in rotating neutron stars on in the neutron black hole, the angular velocities of neutron stars and Einstein's spacetime are the same, i.e. the neutron stars always have spherical symmetry.

We see that the high surface density of the baryon torus causes it to behave classically. This means that some particles in nucleons can behave in a quantum way but the nucleons as a whole move along classical trajectories. For example, the Earth as a whole behaves classically.

But someone can say that we are observing the diffraction pattern of nucleons, so they are also quantum particles. This is not entirely true. Nucleon is a composite particle with quantum elements, so it can deflect on slits, but the nucleon-torus path is strictly defined and in the future it can be observed using neutrino beams.

My theory shows that the torus in the baryon core behaves classically, so the central condensate in its centre and the averaging positions of the relativistic pions are precisely defined.

The dominant spin-1/2 classical torus/electric-charge in the core of baryons (with quantum elements) changes everything – instead of the wavefunctions of individual baryon components, we can immediately look for stable or metastable distributions of all components so this is a statistical approach that radically simplifies the theory of hadrons.

It is the reason that in SST there does not appear the mathematical formalisms of QM and GR. Of course, we use some elements of relativistic theories (some of them are derived within SST as it is shown, for example, in formulae (9)-(12)) because they are classical theories. For example, the Kasner's solution in my opinion leads to torus described within the Scale-Symmetric Theory [16].

8. The fundamental relationship between the sources of all interactions [1]

We can write the ultimate equation which ties the properties of the pieces of space (i.e. tachyons) with the all masses/sources responsible for the all types of interactions.

The fundamental relationship looks as follows

$$4\pi m_{tachyon}\rho/3\eta = (2m_{closed\text{-}string}/\hbar)^2(2m_{neutrino}/\rho_E)^{1/3}(m_{bare(electron)}/2)c(X/H^+)^{1/2}. \quad (13)$$

The $4\pi/3$ on the left side of equation (13) shows that the tachyons are the balls. The mean mass of tachyons is the mean mass of the source of the fundamental interaction that follows from the direct collisions of tachyons and their viscosity which results from smoothness of their surface. The ρ is the mass density of the tachyons (it is not the inertial mass density of the Higgs field). The η is the dynamic viscosity of the tachyons.

The two masses of the closed strings (the entanglon; their total spin is $2\cdot\hbar/2 = \hbar$) on the right side of equation (13) are the carriers of the entanglement. The two masses of neutrinos (i.e. the mass of the neutrino-antineutrino pair) are the source of the gravitational field, linear quantum entanglement and volumetric confinement. The mass of single neutrino is the smallest gravitational mass. In the equation, the smallest gravitational mass is multiplied by 2 that points that the non-rotating-spin neutrino-antineutrino pairs are the components of the ground state of the Einstein spacetime (the ρ_E in the denominator is the mass density of Einstein spacetime). The half of the mass of the bare electron is the mass of the electric charge i.e. the mass of the source of the electromagnetic interaction. The c is the speed of photons and gluons. The X is the mass of the torus/charge inside the core of baryons in which the large loops arise – they are responsible for the nuclear strong interactions. The H^+ is equal to $(X + Y - \text{binding-energy})$, where the Y is the source of the nuclear weak interactions in the baryons at low energy.

To give possibility for a quick verification of correctness of equation (13), we write here the needed values [1]:

$m_{tachyon}$ $= 3.752673\cdot10^{-107}$ kg,
η $= 1.87516465\cdot10^{138}$ kg/(m s),
ρ $= 8.3219243620109\cdot10^{85}$ kg/m^3,
$m_{closed\text{-}string}$ $= 2.3400784191307\cdot10^{-87}$ kg,
$\hbar$ $= 1.0545715483339\cdot10^{-34}$ J s,

$m_{neutrino}$ = $3.3349306182144 \cdot 10^{-67}$ kg,
ρ_E = $1.10220055 \cdot 10^{28}$ kg/m^3,
c = $2.9979245801192 \cdot 10^{8}$ m/s,
$m_{bare(electron)}$ = $9.0988302032434 \cdot 10^{-31}$ kg,
X = 318.29553671300 MeV,
H^+ = 727.44012298929 MeV.

The left and right side of the ultimate equation is $6.9761159243710 \cdot 10^{-159}$ kg s/m^2.

9. Summary

Here I showed my way of thinking that led me to new key ideas to formulate the missing part of the theory of everything.

These key ideas are: the basic phase transitions of the initial inflation field whose left helicity led to the observed matter-antimatter asymmetry, the Titius-Bode law for nuclear strong interactions, the theory of photon which leads to the three different quantities characteristic for each photon, the origin of dark matter and dark energy, and the origin of the transition from quantum mechanics to classical mechanics or vice versa.

In the summary, we should also mention the great differences between gravitational fields and quantum fields – the observed differences result from the different properties of the SST Higgs field and Einstein's spacetime respectively which are the components of the two-component spacetime.

The basic physical constants (they are calculated within SST from the initial conditions [1]) are constant because the two-component spacetime has a rigid boundary with a radius of $\sim 10^{30}$ m.

The speed of light in "vacuum" c is not an invariant.

Mathematical physics without a holistic/full physical context is an unbelievable science.

We have shown that protons and neutrons are classical objects with quantum elements defined in this paper, so they are semi-classical or semi-quantum particles if you prefer. This allows the quantum theory of baryons to be replaced by a classical theory with statistical elements. For example, the spin-1/2 torus in the core of baryons is the dominant classical object while the Titius-Bode orbits/tunnels for the nuclear strong interactions are precisely located as in classical mechanics. But, for example, a quantum pion changes its positions on a Titius-Bode orbit in a discontinuous manner so we can treat the pion statistically as a classical loop with zero angular momentum [1].

Interactions can be directional, planar, volumetric, or the result of direct contact. Interactions can also be superluminal, at c speed, or subluminal. Gravity is the creation of gradients in the SST Higgs field by masses, electromagnetism is the polarization of the Einstein's flat spacetime using a virtual quantum electron-positron pair or/and it involves the exchange of photons, the strong interaction is the exchange of gluons or one or more gluon loops – strong fields are characterized by internal helicity, the weak interaction is the exchange of the Einstein-spacetime condensates, the confinement is the superluminal volumetric interaction with finite range (we can call it the volumetric entanglement with finite range or the neutrino quantum gravity (NQG)), the entanglement is the superluminal

directional interaction, and the fundamental viscous interaction is the contact interaction (this is the initial super-force we estimate at ~ $<10^{170}$ [N] per two colliding tachyons).

The variety of interactions presented above makes their complete unification unattainable. We can only tie sources and carriers of the interactions through successive phase transitions of the inflation field.

Quantum mechanics and theories of relativity are the theories of the observer, not Nature itself, because they negate the superluminal nature of quantum entanglement.

Heisenberg uncertainty principle, constancy of speed of light and many other phenomena are the result of such negation. For example, photons moving side by side in the same direction may have different speeds, but their measurements will always give the value of c because the measurement is based on the interaction of photons with the detector. We should try to measure the time needed to travel a specific path by photons or neutrinos emitted by a source moving at a high speed relative to the detector.

The quark model at low energies delayed the proper development of the basics of physics by at least 23 years (since 1997) or 35 years (since 1985). For over half a century, we have not been able to calculate the exact mass, spin and magnetic moment of the proton and neutron based on the initial conditions used in the Standard Model!

It is time to discard the quark model at low energy and radically modify it for high energies because extending the stalemate state discredits physicists.

Quark-antiquark pairs must be replaced by very unstable pairs of gluon loops or pairs of gluon condensates with masses of loops and condensates equal to the masses of quarks [1], [6]. We should not call these new objects quarks just because they have the same masses as quarks. We showed that SST leads to the parameters applied in the Standard Model [17].

Within SST we also described mathematically and physically the inflation and evolution of our Universe, leptons and mesons.

My life was and is ordinary because despite the fact that my second job (without pay) was passion for particle physics, cosmology, and mind physics, I found time for fun (I like dancing), sports (I like swimming) and foreign trips especially to the Canary Islands during the winter. Rather, I didn't torture my family with physics – maybe sometimes.

References

[1] Sylwester Kornowski (23 February 2018). "Foundations of the Scale-Symmetric Physics (Main Article No 1: Particle Physics)" http://vixra.org/abs/1511.0188v4

[2] Sylwester Kornowski (11 January 2016). "Foundations of the Scale-Symmetric Physics (Main Article No 3: Chaos Theory)" http://vixra.org/abs/1511.0284v2

[3] Sylwester Kornowski (June 1996). "Jednolita Teoria Wszystkiego: Wirowanie w zamkniêtej spirali" Wydawnictwo TAJGETA Sp. o.o., Druk:KAdruk – Szczecin, ISBN 83-901005-0-9

[4] Sylwester Kornowski (1997). "General Theory of Singularities" TAJGETA, ISBN 83-901005-1-7

[5] Sylwester Kornowski (14 February 2019). “Foundations of the Scale-Symmetric Physics (Main Article No 2: Cosmology)” http://vixra.org/abs/1511.0223v3
[6] Sylwester Kornowski (3 December 2015). “Reformulated Quantum Chromodynamics” http://vixra.org/abs/1512.0020
[7] Sylwester Kornowski (28 December 2019). “Wow! Signal as a Harbinger of a Revolution in Physics” http://vixra.org/abs/1810.0422
[8] Sylwester Kornowski (1 December 2016). “The Main Absurd Ideas That Destroy Theoretical Physics” http://vixra.org/abs/1612.0003
[9] Sylwester Kornowski (17 November 2019). “On the Neutrino Theory of Light” http://vixra.org/abs/1911.0300
[10] Sylwester Kornowski (15 November 2017). “Two-Component Spacetime as a Mixture of Non-Locality and Locality: A Conceptual Error about Gravitational Waves, the Different Theories of Gravitation and the Matter-Antimatter Asymmetry” http://vixra.org/abs/1711.0324
[11] Sylwester Kornowski (4 December 2017). “The Neutrino Cross Sections in the Scale-Symmetric Theory” http://vixra.org/abs/1712.0083
[12] Sylwester Kornowski (23 September 2019). “Neutrino Quantum Gravity” http://vixra.org/abs/1909.0477
[13] Sylwester Kornowski (15 February 2019). “Properties of Dark Matter Particles” http://vixra.org/abs/1902.0270
[14] Sylwester Kornowski (18 June 2016). “The Dark-Matter Mechanism and Orbital Speeds of Stars in Galaxies” http://vixra.org/abs/1410.0031
[15] Sylwester Kornowski (3 December 2019). “Deterministic Free Will with Resonant Decision Making” http://vixra.org/abs/1912.0066
[16] Sylwester Kornowski (21 December 2015). “General Relativity in Quantum Physics and Chaos Theory” http://vixra.org/abs/1309.0195
[17] Sylwester Kornowski (29 May 2017). “The Scale-Symmetric Theory as the Origin of the Standard Model” http://vixra.org/abs/1705.0332