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Review Article

Advances in Theoretical & Computational Physics

Superunification: Pure Mathematics & Theoretical Physics

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Abstract

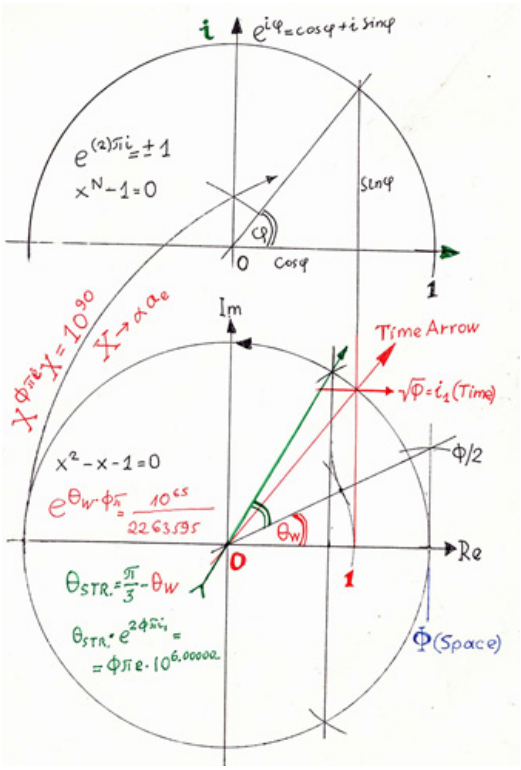
In case if we complete the Gaussian type classical pure mathematics with cardinally new discoveries, then the problem of the super unified field theory as smoothly continued from the Standard model becomes just technical. This article is intended to demonstrate the quintessence of what is happening to theoretical physics because of the completion of pure mathematics. A comprehensive rendition of the superunification theory, please, find on the website: finaltheory.net.

We are prompted to make the following two nearly evident statements:

1. The unified theory of physics should be an efficient synthesis of all the scientific knowledge available to the human civilization at the current moment. However, as history of the 20th century testifies, all our scientific knowledge based upon the analytical and experimental methods, however great they are, appear to be practically insufficient to approach the unification problem. It should be strictly noticed that, according to the Kurt Goedel's theorem on incompleteness of formal systems, the unified theory of physics will necessarily belong to a higher system than physics itself. The absolutely higher system is only one and it is the pure mathematics unified by Gauss two centuries ago out of higher arithmetic, algebra and geometry.
2. By the abovementioned reason the superunification has to be a kind of performance of the Pythagoras' (arithmetization) and Plato's (geometrization) concepts.

Now we will pursue concrete and constructive goals. First, we reformulate Newton's "First Rule of Reasoning" in an extreme minimax form: Logic is what achieves the greatest possible by the least possible. The greatest is the physical Universe; the least is the mathematical point. Thus, the question is: How the latter behaves until it transforms into the Universe we observe?

The Euclidean system undergoes the following algorithmic bifurcation such that (Figure 1)



Carefully investigating the picture, we are prompted to postulate that in the post-Euclidean geometry

$$\alpha.\ \Phi \equiv \textbf{Newton's absolute space};$$

$$\beta.\ \left\{\sqrt{\Phi} = i_1\right\} \equiv \textbf{Newton's absolute}; \quad \textbf{true mathematical time};$$

$$\gamma.\ \Phi^3 i_1 \equiv \textbf{Four - dimensional space - time};$$

$$\delta.\ \arctan 1/2 \equiv \Theta_{Weinberg(Electroweak)};$$

$$\varepsilon.\ \left\{.\pi/3 - \Theta_W\right\} \equiv \Theta_{Strong\ nuclear\ force}.$$

We shall, of course, attemp to prove the validity of the above fundamental postulates. For this purpose is available the post-Dirac effect of quantum-relativistic theories in the form of the electron magnetic moment anomaly. Therefore, immediately

$$\frac{1}{a_e = 0.001159652099769...} = \sqrt[\Phi^3 i_1]{\mathbf{658361}\cdot 10^{10}} \quad (1);$$

$$\sin\Theta_{Weinberg}\sqrt{\frac{1}{a_e = 0.001159652099833...}} = \mathbf{3667438} \quad (2);$$

$$\cos 2\Theta_{STR.}\sqrt{\frac{1}{a_e = 0.001159652100...}\cdot\frac{1}{\cos 2\Theta_{STR.}}} = \mathbf{320\,906\,457.} \quad (3)$$

Consequently, the absolute geometry of space-time and matter eliminates the post-Dirac anomaly within seconds instead of ten years of work on supercomputers as it was in case of Toichiro Kinoshita's group.

The bold numbers in the above we will name **Harmonious Integers (HI).** These whole numbers occur not by stupid accidence but by deeper reasons of the entire system of mathematical harmony. The method of HIs appears to be the only way the universal machinery proves it self-consistence.

It is provable that the configuration of fundamental symmetries can be defined as

$$5\Phi\,\pi e i_1\sqrt{2}\,. \quad (4)$$

If so, the above HI320906457 is justified by

$$\frac{\mathbf{320906457}\times 5\Phi\,\pi e i_1\sqrt{2.0000000000...}}{9} = \frac{10^{16}}{\mathbf{2256593}}. \quad (5)$$

The key point is, secondly, that the method of mathematical description of the physical Universe is bifurcated into the following two general streams (Table 1):

$$\boldsymbol{X}^{\Phi\pi e}\boldsymbol{X} = \mathbf{10}^{\mathbf{90}}$$

Analysis (*Symbolic*)		**Synthesis** (*Numeric*)
$x^N - 1 = 0$	$\Leftrightarrow$	$\boldsymbol{x^2 - x - 1 = 0}$
$\Downarrow$		$\Downarrow$
Radix **1**	$\rightleftarrows$	Metric Φ
$\Downarrow$		$\Downarrow$
$e^{(2)\pi i} = \pm 1$	$\rightleftarrows$	$e^{5\Phi\pi e i_1\sqrt{2}}$
$\Downarrow$		$\Downarrow$
$\Psi(x,t)$	$\Leftrightarrow$	$\{\Phi\cdot i_1\}$

- Superunified Field Theory -

Fundamental theorem of pure mathematics — Fundamental theorem of absolute geometry

$$\frac{1}{©@} = \frac{\cos^2 i}{\Phi^3 i_1} \quad \rightleftarrows \quad \frac{\Phi}{i_{1,2}} = \frac{\mathrm{Spin}_{\cos 30^\circ}}{\sin\Delta_{\alpha,\beta,Exprm.}}$$

What overrides is the general theorem of the universal system of mathematical harmony is

$$\boldsymbol{X} = \sqrt[\Phi\pi e+1]{\mathbf{10}^{\mathbf{90}}} = 1185403.539676801580... \quad (6)$$

It should be pointed out that infinite fractions like X have no meaning exempt formal exactitude. By this reason the universal mathematical machinery works as simply as any 10-digit electronic calculator in terms of the first order approximations. So, we will shorten the X as

$$X = 1185403.54 \quad (7)$$

What is crucial to be descerned, the mathematical symmetries defined by this new constant are broken in the physical world which case is manifested by the existance of the two anomalies in the form of the Sommerfeld and Dirac constants. Therefore, we are asked to write an evident

$$\frac{\boldsymbol{X}_{1185403.54}\cdot\alpha_{1/137.035999}a_{e(0.0011596521)}}{\mathbf{10}} = 1 + \frac{1}{319.0063275}. \quad (8)$$

The existence of

$$\alpha_{Sommerfeld},\ a_{Electron}$$

is determined by the self-perturbation effect of the entire system of mathematical harmony

$$\frac{\mathbf{378151230}}{\boldsymbol{X}=1185403.54}=319.0063277\,. \quad (9)$$

In the universal system of harmony the superunified field equations can be written in many equivalent ways. For this purpose we have certain general configurations of absolute geometry whose validity has been proved tousands of times in numeric experimentations. First of all, we have

$$\textbf{External geometry}\ \frac{\Phi^3\sqrt{i_1 i_2}}{\text{Spin}}\left\{\dim_{\Phi}\Phi^3 i_1(3+1)\right\}, \quad (10)$$

where Newton's time is bifurcated by deeper algorithmic reasons (we here omit) compelling us to write the mean cosmological time as

$$\sqrt{i_1\left\{i_2=\frac{4}{\pi}\right\}}\,. \quad (11)$$

Since it is theoretically provable that the bare numeric Newton' s constant infinitely tends to the finite fraction 6.673, we may immediately extend the Standard model into gravitation as follows

$$\left\{\Phi^3\sqrt{i_1 i_2}\right\}^{G_{6.673}\left\{\dim G=\Phi^2/\sqrt{2}\right\}}=\cos\Theta_W\cdot 10^{16.0000\ldots}\,. \quad (12)$$

Gravity is universal because of the universality of the Golden section algorithm of geometry.

The configuration of regular topologies in two, three and four dimensions is

$$\textbf{Regular topology}\left\{\begin{array}{|c|c|c|c|}\hline C & F & S & V\\ \hline 5 & 10 & 32 & 5\\ 8 & 24 & 32 & 16\\ 16 & 32 & 24 & 8\\ 24 & 96 & 96 & 24\\ 120 & 720 & 1200 & 600\\ 600 & 1200 & 720 & 120\\ \hline\end{array}^{\times}_{+}\cdot\mathbf{D}\{3\}^{\times}_{+}\cdot\mathbf{D}\{2\}^{\times}_{+}\right\};\quad (13)$$

$$\frac{\mathbf{1157550374}^{\tau e}}{\mathbf{D}\{4\}^{\times}_{+}\cdot\mathbf{D}\{3\}^{\times}_{+}\cdot\mathbf{D}\{2\}^{\times}_{+}}=1.00000000\ldots\,. \quad (14)$$

The method of topological configurations is

$$\{a+b+c+d+\ldots+\}\{abcd\cdot\ldots\}=\{\mathbf{a},\mathbf{b},\mathbf{c},\mathbf{d},\ldots\}^{\times}_{+} \quad (15)$$

In the final theory we have no way around as to perform Pythagoras' (arithmetization) and Plato's (geometrization) concepts. The internal geometry of point-singularity is written by (16)

$$\textbf{Internal geometry}\left\{\frac{\Delta_{Exprm.}\Theta_W\cdot 2\Theta_{STR.}}{\sin\Delta_{Exprm.}\sin\Theta_W\cos\Theta_W\cos 2\Theta_{STR.}}\right\}.$$

The inner geometry owes to (17)

$$\boldsymbol{X}\cdot e^{5\Phi\pi e i_1\sqrt{2}}\cdot\left\{\frac{\Delta_{Exprm.}\Theta_W\cdot 2\Theta_{STR.}}{\sin\Delta_{Exprm.}\sin\Theta_W\cos\Theta_W\cos 2\Theta_{STR.}}\right\}=\frac{10^{65.999999\ldots}}{\cos 2\Theta_{STR.}}.$$

Subtleties go beyond this introduction.

The phenomenology of the modern physics reduces to a configuration

$$\frac{\left\{\begin{array}{l}G_{6.673}\cdot\left\{\dim G=\Phi 2/\sqrt{2}\right\}\\ \cdot h_{6.626086876}\cdot\left\{\dim h=\Phi i_1\sqrt{2}\right\}\\ \cdot m_{e(9.10938188)}\cdot\left\{\dim m=\sqrt{2}\right\}\\ \cdot e^{\pm}_{1.602176462}\cdot\left\{\dim e^{\pm}=\Phi\sqrt{\sqrt{2}}\right\}\\ \cdot c_{2.99792458}\cdot\left\{\dim c=i_1\right\}\end{array}\right\}}{\alpha_{Sommerfeld}\,a_{Electron}}\,. \quad (18)$$

In absolute geometry it is derivable in a most standard manner

$$\sqrt[e]{\textbf{Phenomenology}\left\{\frac{Ghm_e e^{\pm}c\cdot\dim(Ghm_e e^{\pm}c)}{\alpha_{1/137.035999}\,a_{0.0011596521}}\right\}^{2\Phi\pi i_1}}\cdot\frac{\mathbf{46189}}{3}=10^{50}. \quad (19)$$

If so, theoretically

$$Ghm_e ec^{\pm}c=1934.626009 \quad (20)$$

It is not accidental a value, but determined by the system of mathematical harmony, see that

$$\left\{Ghm_e e^{\pm}c=1934.626009\right\}=\frac{\Phi\pi e\cdot 10^{11.00000\ldots}}{\boldsymbol{X}\cdot\left\{\frac{\exists}{©@}\right\}}. \quad (21)$$

Here we encounter the configuration of (sub) quantum leap operators of natural evolution

$$\left\{\frac{\exists}{©@}\right\}=\frac{5.71100522647554761906724\ldots}{5.671432904097838729999\ldots\times\ 0.399012978260252071596 47\ldots}\,. \quad (22)$$

This kind of revolutionary new operators do notably complete pure mathematics enabling the latter to describe cosmogony and cosmology.

We have a quantum jump operator calculated by iteration

$$e^{©}=©^{-1};\qquad \ln©=-©.$$

And we have the Pythogoras and Plato four-world (23)

$$\Phi^3 i_1\cdot\mathbf{D}\{4\}^{\times}_{+}$$

And we have the Pythogoras and Plato four-world (23)

$$\mathbf{\Phi}^3 i_1 \cdot \mathbf{D}\{4\}^{\times}_{+}$$

and we assume that the Bigbang event of cosmogony had been due to a quantum leap process

$$\mathbf{©} \Rightarrow \mathbf{\Phi}^3 i_1 \cdot \mathbf{D}\{4\}^{\times}_{+}$$

Indeed,

$$\frac{10^{46}}{©} = \frac{\Phi^3 i_1}{\mathrm{Spin}_{\cos 30}} \cdot \mathbf{D}\{4\}^{\times}_{+}. \qquad (25)$$

That's why the spin is intrinsic a property of geometry. Remind that in classical quantum mechanics

$$\mathrm{Spin} = \cos 30^{o}$$

Now we are expected to write superunified field equations of absolute geometry. In the universal system there are many equivalent logically consistent ways for composing those equations For example, (27)

$$\textbf{External geometry}\ \frac{\Phi^3\sqrt{i_1 i_2}}{\mathrm{Spin}}\left\{\dim_{\Phi}\Phi^3 i_1(3+1)\right\}\cdot$$

$$\textbf{Regular topology}\ \left\{\begin{array}{|cccc|}\hline C & F & S & V\\ \hline 5 & 10 & 32 & 5\\ 8 & 24 & 32 & 16\\ 16 & 32 & 24 & 8\\ 24 & 96 & 96 & 24\\ 120 & 720 & 1200 & 600\\ 600 & 1200 & 720 & 120\\ \hline \end{array}^{\times}_{+} \cdot \mathbf{D}\{3\}^{\times}_{+}\cdot\mathbf{D}\{2\}^{\times}_{+}\right\}\cdot$$

$$\textbf{Internal geometry}\ \left\{\frac{\Delta_{Exprm.}\Theta_W\cdot 2\Theta_{STR.}}{\sin\Delta_{Exprm.}\sin\Theta_W\cos\Theta_W\cos 2\Theta_{STR.}}\right\}.$$

$$\textbf{Phenomenology}\ \left\{\frac{Ghm_e e^{\pm}c\cdot\dim(Ghm_e e^{\pm}c)}{\alpha_{Sommerfeld}\,a_{Electron}}\right\} = \frac{\mathbf{630069}\cdot 10^{12\times 12}}{e^{5\Phi\pi e i_1\sqrt{2}}}.$$

This looks as the end product of workings of the ultra-operator of fundamental symmetries

$$e^{5\Phi\pi e i_1\sqrt{2}}. \qquad (28)$$

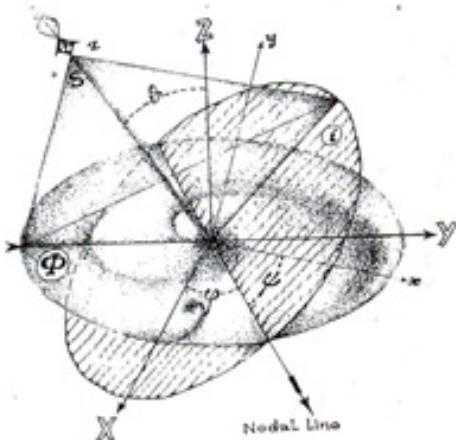
This looks as the end product of workings of the ultra-operator of fundamental symmetries

$$\sqrt[\cos 2\Theta_{STR}]{\mathbf{630069}} = \frac{10^{17.999999...}}{\mathbf{1724}};$$

$$\left\{\frac{\mathbf{2043635703}}{\mathbf{1724}}\right\}^{\Phi\pi e+1} = 10^{90.000000001...}; \qquad (29\text{-}31)$$

$$\mathbf{2043635703}\cdot\frac{©@}{\exists} = \frac{i_1 i_2}{2}\cdot 10^{7.99999...}.$$

The space and time vectors intercross in two ways: either by the straight angle giving birth to electromagnetic waves or by the angle inverse to the fine structure constant forming the basic structure for fermion particles. Therefore we have a quantum gyroscope which does constantly oscillate, translate and rotate because of perpetual space-time bifurcations (Figure 2):



Thus, given that

$$\Delta_{Exprm.} = \frac{1}{\alpha} = 137.035999^{\circ}, \qquad (32)$$

the quantum gyroscope provides the general energy-matter foundation as

$$\{\Phi\cdot 90\cdot i_1\}\{\Phi\cdot 137.035999\cdot i_1 = \sqrt[\Phi\pi e]{\frac{10^{68.0000...}}{e^{\Phi\pi i_1}}}. \qquad (33)$$

Fermion particles will owe to

$$\sqrt[e]{\left\{\Phi\left\{90\cdot 137.035999...\right\}i_1\right\}^{\Phi\pi i_1}} = \mathbf{3}\cdot 10^{9.9999...}. \qquad (34)$$

Then, the unit particle is derivable as beutifully as (35)

$$\left\{\Phi\left\{90\cdot 137.035999...\right\}i_1\right\}\cdot$$
$$\cdot Ghm_e e^{\pm}c\cdot\dim(Ghm_e e^{\pm}c) = \sqrt[\Phi]{\mathbf{142736}\cdot 10^{23}}.$$

The full blown electromagnetic electron is described by (36)

$$\sqrt[\Phi]{\left\{\Phi\left\{90\cdot 137.035999...\right\}i_1\right\}\cdot\left\{\frac{Ghm_e e^{\pm}c\cdot\dim(Ghm_e e^{\pm}c)}{\alpha_{Sommerfeld}\,a_{Electron}}\right\}} = \mathbf{471\,758\,482}.$$

To the same Pi-rule is subject the electroweak electron (37)

$$\left\{\Phi\left\{90\cdot 137.035999...\right\}i_1\right\}\cdot$$
$$\cdot\left\{Ghm_e e^{\pm}c\cdot\dim(Ghm_e e^{\pm}c)\right\}\cdot\frac{\Theta_W}{\sin\left\{\Delta_{Exprm}=\alpha^{-1}\right\}} = \sqrt[\Phi]{\frac{10^{37}}{\mathbf{7043}}},$$

et cetera, and so on.

As it is a common knowledge, the unified field theory, if any, is expected to solve first of all the problem of fundamental fermions. In this respect absolute geometry provides a genial fact of colossal importance for particle physics. We have obtained the holy trinity of the universal system consisting of the fundamental system of

harmony

$$X = \sqrt[\Phi \pi e \div 1]{10^{90}}\,, \qquad (38)$$

and ultra operator of symmetries

$$e^{5\Phi\pi e i_1\sqrt{2}}\,, \qquad (39)$$

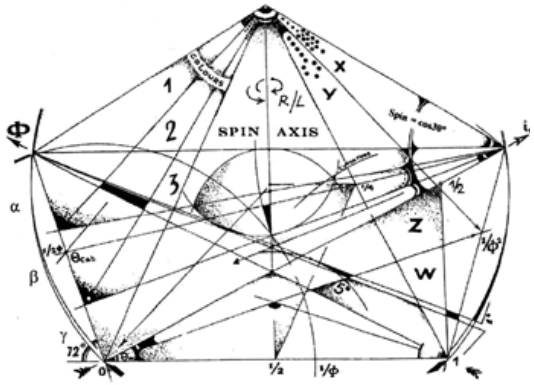
and also operator of spontaneous non-linear evolution

$$\left\{\frac{\exists}{©@}\right\}. \qquad (40)$$

Therefore, we have finally arrive at a truly nontrivial fact such that (41)

$$X\cdot\left\{\frac{\exists}{©@}\right\}\cdot e^{5\Phi\pi e i_1\sqrt{2}} = \{3,5,7,227,65537\}_{+}^{X}\cdot 10^{46.999\ldots}.$$

This notably implies that all the functions of the three overriding operators end up with no more than some algorithmic figure on a complex plane. This in turn means that the general model for fundamental fermions can and must be drawn in two-dimensional projection. So, the Superstructure of space, time and matter had been intuitively constructed 20 years ago without knowing the above final fact of geometry (Figure 3)



This oblate pentagon is still awkward, but, nevertheless, it provides the general idea of constructing each of fundamental fermions as (Table 2)

ν_e^X	ν_μ^Y	ν_τ^Z
$e_{\alpha\beta\gamma}^{XZ}$	$\mu_{\alpha\beta\gamma}^{YW}$	$\tau_{\alpha\beta\gamma}^{XYZW}$
$u_{\beta\gamma}^{1}$	$c_{\alpha\gamma}^{2}$	$t_{\alpha\beta}^{3}$
$d_{\alpha}^{2,3}$	$s_{\beta}^{1,3}$	$b_{\gamma}^{1,2}$

by the way of choosing corresponding parameters from the overall index entourage given by

$$\begin{matrix}\Phi i_1 \\ i_1\Phi\end{matrix} SS^{1,2,3}_{\pm\alpha,\beta,\gamma} \begin{matrix}\uparrow\downarrow X,Y \\ \rightleftarrows Z,W\end{matrix}$$

Subject to the minimax logical reasons the post-Euclidean absolute geometry has to have only one figure for all purposes and that one figure can and must be algorithmically constructed instantaneously and in two-dimensional projection. This truth had been prophesied by Joirdano Bruno in his theorem on natural philodophy:

"The order of a unique figure and the harmony of a unique number give rise to all things." (1591)

The unique number is the golden section constant, **Φ,** being the fundamental invariance of physics, or else, the fundamental metric of geometry. The unique figure in absolute geometry is the Superstructure. And this theory explains not only physics, but also biology up to the gene- chromosome constitution of the species Homo Sapiens Sapiens.

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