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Galactic Route to the Strong Coupling Constant $\alpha_S(m_Z)$ and Its Implication on the Mass Constituents of the Universe

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Abstract

Some fundamental physical quantities need an alternative description. We derive the word average value of interaction coupling constant $\alpha_s(m_z)$ from the observed maximum galactic rotation velocity $|\beta_g| = \frac{|v_g|}{c}$ by the simple relation $\alpha_s(m_z) = \frac{|\beta_g|}{\beta_0} \cdot \frac{1}{\alpha} = 0.117005223$, where $\beta_0 = \frac{\sqrt{3}}{2}$ is the velocity, at which the difference between galactic rotation velocity and *Thomas* precession is equal, and α is *Sommerfeld*'s constant. The result is in excellent agreement with the value of $\alpha_s = 0.1170 \pm 0.0019$, recently measured and verified via *QCE* analysis by *CERN* researchers. One can formulate a reciprocity relation, connecting α_s with the circle constant: $\pi \cdot \alpha_s \approx \frac{1}{\pi \cdot \beta_0}$. It is the merit of *Preston Guynn* to derive the *Milky Way* maximum value of the galactic rotation velocity β_g, pointing to its "extremely important role in all physics". The mass (energy) constituents of the Universe follow a golden mean hierarchy and can simply be related to the maximum of *Guynn*'s difference velocity respectively to $\alpha_s(m_z)$, therewith excellently confirming *Bouchet*'s *WMAP* data analysis. We conclude once more that the golden mean concept is the leading one of nature.

Keywords

Strong Coupling Constant, Sommerfeld' Constant, Gravitational Coupling Constant, Galactic Velocity, Structure-Matter Theory, Reciprocity Relation, Goldem Mean Hierarchy, Mass and Energy Constituents of the Universe, Superconductivity, Matter-Antimatter Asymmetry, Unification of Science

1. Introduction

Recently, significant experimental, as well as theoretical advances, have been made in relation to coupling constants that determine the strength of forces exerted in a physical interaction. In relation to the strength of the forces, one usually decides strong coupling constant α_s, electromagnetic *Sommerfeld* constant α, weak coupling constant α_w, and gravitational constant α_g. In this contribution we relate the strong coupling constant $\alpha_s(m_z)$, responsible for nuclear stability and taken at the *Z*-boson mass scale m_z = 91.1875(21) GeV, to the galactic rotation velocity $\left|\beta_g\right| = \frac{\left|v_g\right|}{c}$ and to *Sommefeld*'s constant α [1], thereby using results of *Guynn*'s excellent structure of matter and space approach [2]. Our numerical result can be compared with α_s recently measured and verified by *QCE* analysis given by *CERN* researchers [3]. These results were compared to *Mozafari*'s extended coupling constant approach [4] and to the unification attempt given by *Pellis* [5] [6]. Last but not least, the intrinsically local *IRT* theory of *Suleiman* in its application to disk galaxies can deliver comparable results for the strong coupling constant [7]. We are dealing with very simple mathematical relationships as already given in recent publications [8] [9]. In summary, it can be seen that we are on the proper route towards unification of physical science without the nonsense of complex physical theories like *QED* [7]. The simplicity in the scaling of interacting rotating entities from particles to galaxies shows the beauty of our cosmos. The given approach should be applied also to the gravitational coupling constant, thereby continuing the work of *Pellis* [5] [6] respectively *Maruani* [10]. The weak force and coupling constant α_w, accounting for decays in particle physics, were not considered in this contribution. However, you can follow a recommended lecture by *Tina Potter* about this theme [11].

Furthermore, it was shown that the mass respectively energy constituents of the universe can simply be related to the maximum β_m of *Guynn*'s difference velocity respectively the fifth power of the golden mean. The good agreement with experimental values is surprising. The hierarchy of the golden mean was illustrated by a figure.

The work is completed by a consideration about superconductivity and its connection with the number φ^5 as an indicator of phase transitions, followed by a final chapter on nature's effective numbers.

This contribution pursues and upgrades a recently given one [8] and prearranges an upcoming contribution incorporating discoveries of the past.

2. Galactic Route to the Strong Coupling Constant

In the following, we apply the new structure of matter and space approach of *Preston Guynn* [2], based on the seminal idea to consider the action of *Thomas* precession [12] in difference to the rotation velocity $\beta = v/c$ of moving bodies (entities) from particle scale to galactic one. His result for the difference velocity β_d is given by the equation

$$\beta_d = \beta\left(2 - \frac{1}{\sqrt{1-\beta^2}}\right) = \beta(2-\gamma) \tag{1}$$

where γ is the *Lorentz* factor. Figure 1 depicts the difference velocity curve with its maximum β_m and the fundamental velocity $\beta_0 = \frac{\sqrt{3}}{2}$, where β_d becomes zero. The maximum at $\beta_1 = 0.6083087004577$ near the golden mean $\varphi = \frac{\sqrt{5}-1}{2} = 0.6180339887$ has the value

$$\beta_m = \sqrt{3}\left(\sqrt[3]{2} - 1\right) = 0.450196459 \approx 5\varphi^5 = 0.4508497 \tag{2}$$

The maximum galactic rotation velocity β_g of spiral galaxies like the *Milky Way* star system was given by *Guynn* in terms of the *Lorentz* transform, taken over the electron cyclotron rotation between β_0 and a slightly adapted β_2' (see Figure 1) [2]

$$\beta_g = \frac{1}{\pi}\left(1 - \frac{1}{3\sqrt{\theta_{ec}}}\right) \approx -0.000739437964740 \tag{3}$$

where

$$\theta_{ec} = \int_{\beta_0}^{\beta_2'} \frac{1}{\sqrt{1-\beta^2}} \mathrm{d}\beta = 0.11059667926806 \tag{4}$$

For sake of upcoming scaling use, we share the interesting integration of β_d between zero and β_0 giving exactly

$$\int_0^{\beta_0} \beta\left(2 - \frac{1}{\sqrt{1-\beta^2}}\right) \mathrm{d}\beta = \frac{1}{4} \tag{5}$$

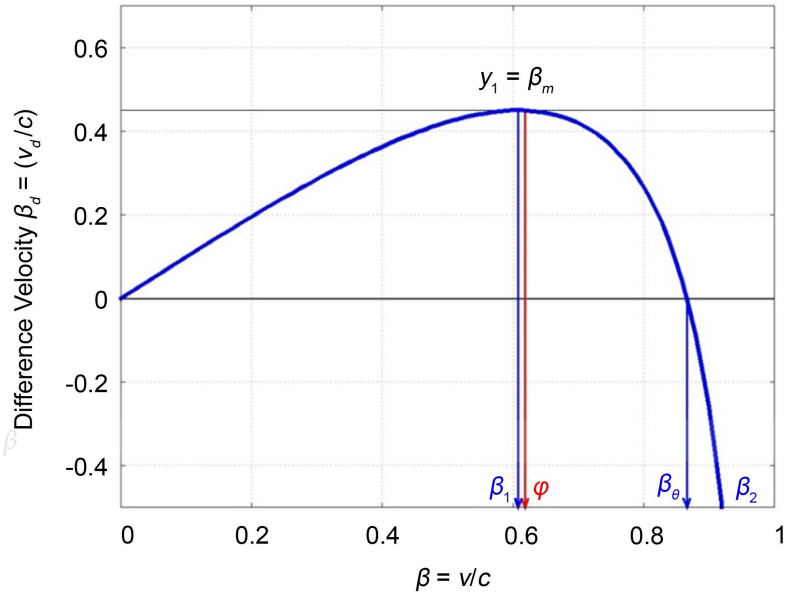

Figure 1. Difference velocity β_d versus rotation velocity β after *Guynn* [2]. The red arrow points to the value of the golden mean φ near β_1.

Now we use *Sommerfeld*'s constant α as well as β_m, β_0 and β_g to develop simple relations between coupling constants like the world average value of the strong interaction coupling constant $\alpha_s(m_z)$. The first relation is

$$\alpha_s(m_z) \approx \frac{\beta_m^2}{\sqrt{3}} = \frac{\beta_m^2}{2\beta_0} = 0.117055 \tag{6}$$

One can formulate another numerical relation for the strong coupling constant $\alpha_s(m_z)$

$$\alpha_s(m_z) \approx \frac{2}{\sqrt{3}\pi^2} = \frac{1}{\pi^2 \cdot \beta_0} = 0.1169956 \tag{7}$$

Using this result, the galactic velocity β_g can be rewritten into [3]

$$|\beta_g| \approx \frac{\sqrt{3}}{2} \cdot \alpha \cdot \alpha_s = \beta_0 \cdot \alpha \cdot \alpha_s = 0.000739403 \tag{8}$$

or vice versa

$$\alpha_s(m_z) = \frac{|\beta_g|}{\beta_0} \cdot \frac{1}{\alpha} = 0.117005223 \tag{9}$$

This may serve as a determination equation for the strong coupling constant at the Z-boson mass scale, because the *Milky Way* maximum galactic rotation velocity is obviously accurate to eight decimal places [2]. This value for $\alpha_s(m_z)$ was precisely confirmed by measurement besides *QCD* analysis at *CERN* [3]:

$$\alpha_s(m_z) = 0.1170 \pm 0.0019 \tag{10}$$

with uncertainties ± 0.0014 (fit) ± 0.0007 (model) ± 0.0008 (scale) ± 0.0001 (param).

As in the case of *Sommerfeld*'s constant [1] [8], one can formulate a reciprocity relation by connecting α_s with π. Both reciprocity relations may be compared in the following [9]

$$\pi \cdot |\beta_g| \approx \frac{1}{\pi \cdot \alpha^{-1}} \tag{11}$$

$$\pi \cdot \alpha_s \approx \frac{1}{\pi \cdot \beta_0} \tag{12}$$

Equation (11) points to the photonic-electromagnetic footings of the Universe.

3. Alternative Approaches for $\alpha_s(m_z)$

Mozafari recently published an interesting conjecture about the existence of fifth and subsequent forces beyond the known four ones (strong, electromagnetic, weak, and gravitational) [4]. His approach for the strong coupling constant α_s leads to the relation

$$\alpha_s(m_z) = \frac{\sqrt{\pi}}{10 \cdot \sqrt{\ln(10)}} = 0.1168065 \tag{13}$$

The conjecture of the possible presence of further extremely weak ubiquitous forces could perhaps help to explain the baryon asymmetry of the universe or give a hint for the existence of a parallel universe with opposite chirality. In a previous publication, the present author already posed the question about the existence of a Multiverse [13].

Turning to results of the *IRT* theory and matter—dark matter coupling in disk galaxies [7], one can give a further relation for α_s

$$\alpha_s \approx \frac{1}{5}\cdot\frac{r_c}{r_s} = \frac{1}{5}\left(\frac{\ln(3)}{\ln(2)} - 1\right) = 0.1169925 \tag{14}$$

where r_c is the core radius of the galaxy, representing the distance from the galaxy center to the core where matter density is one-half of the central matter density, and r_s is the half-velocity radius.

A golden mean-based geometrical suggestion for the value of α_s used a simple reciprocity relation already applied in [14]. One can split this relation delivering a term that represents the inverse circumsphere radius $\frac{1}{r_{circ}} = \frac{2}{\sqrt{3+\varphi}}$ of a regular icosahedron of unit edge length

$$\frac{1}{5\sqrt{\frac{2}{\varphi} - \frac{\varphi}{2}}} = \frac{1}{5}\sqrt{\frac{\varphi}{2}}\cdot\frac{2}{\sqrt{3+\varphi}} = 0.116900 \tag{15}$$

Importantly, the vortex structure of the electron was recently described as an icosahedral *Moebius* ball [15].

4. Gravitational Invariant α_g

The hierarchy of coupling constants could be continued with the given $|\beta_g|$ approach. However, first the previous work of *Pellis* [5] [6] and that of *Maruani* [10] should be quoted here. For α_g we have the known relation

$$\alpha_g = \frac{G\cdot m_e^2}{\bar{h}\cdot c} \approx 1.7518\times 10^{-45} \tag{16}$$

where G is the gravitational constant, m_e the electron mass, $\bar{h}$ the reduced *Planck* constant, and c the speed of light. Some years ago, *Pellis* contributed an elaborated unification of coupling constants and dimensionless physical constants [5] [6]. In this work, he linked, for instance, *Sommerfeld*'s constant α with the *Planck* length l_{Pl} and the electron radius r_e to the relation

$$\alpha_g = \left(\alpha\frac{l_{Pl}}{r_e}\right)^2 \tag{17}$$

Maruani has derived an impressive reciprocity relation between gravitational force F_g, electromagnetic force F_e, and *Planck* force F_P [10]

$$\delta = a_g = \frac{1}{\alpha}\frac{F_e}{F_P} = \alpha\frac{F_g}{F_e} \tag{18}$$

The reader may study the original work of *Pellis* respectively *Maruani* to learn more about details of their work.

5. Reciprocity Relation between Mass Constituents of the Universe

Whereas we have completed the coupling constant formulas with reciprocity relations (11) respectively (18), there are further such relations, with which the present author has described, for instance, the fifth power of the golden mean based mass respectively energy constituents of the Universe [16] [17] [18]. Such quantum gravity formulas were obtained by a probabilistic quantum entanglement calculation [19] [20] [21]. An important role plays *Hardy*'s maximum quantum entanglement probability being as well the fifth power of the golden mean φ [22] [23].

Recasting the matter amount Ω_M respectively the (cold) dark matter amount Ω_{DM} giving

$$\Omega_M \approx \frac{1}{10}5\varphi^5 = 0.04508\,,\quad \Omega_{DM} \approx \frac{1}{10}\left(5\varphi^5\right)^{-1} = 0.22180 \tag{19}$$

a reciprocity relation was confirmed between Ω_M and Ω_{DM} indicating a persuasive result for the pure dark energy Ω_{DE} [3]

$$\Omega_{DE} \approx 1-\frac{1}{10}\left(5\varphi^5+\left(5\varphi^5\right)^{-1}\right) = 0.73311\left(73.31\%\right) \tag{20}$$

This relation can be reformulated using Equation (2) indicating a quite simple reciprocity relation in terms of the maximum of the difference velocity β_m

$$\Omega_{DE} \approx 1-\frac{1}{10}\left(\beta_m+\frac{1}{\beta_m}\right) = 0.73285\left(73.29\%\right) \tag{21}$$

The reader may also follow an earlier given cosmic constituent approach by using the circle constant [24]

$$\Omega_M \approx \frac{\pi-3}{\pi} = 0.045070\,,\quad \Omega_{DM} \approx 5\cdot\Omega_M = 0.225350 \tag{22}$$

The **W**ilkinson **M**icrowave **A**nisotropy **P**robe (*WMAP*) measurement has revealed for the constituents preliminary values of $\Omega_M = 0.04628(93)$, $\Omega_{DM} = 0.2402(87)$, and $\Omega_{DE} = 0.7135(96)$ [25]. However, the comparison would suggest checking the dark matter constituent of the *WMAP* experiment. *Bouchet* has specified these data by adapting from *Planck* satellite 2015 **C**osmic **M**icrowave **B**ackground (*CBM*) power spectra a best-fit model [26]. The power spectrum is given as $P(k) = \left\langle \left|\delta_k\right|^2 \right\rangle$, where $\delta_k = \sum \delta \cdot \mathrm{e}^{-ik\cdot r}$ is the *Fourier* transform of the cosmic density fluctuation $\delta = \frac{\rho-\overline{\rho}}{\overline{\rho}}$. The fit revealed "final" constituents for baryonic matter $\Omega_M = 0.049$, dark matter $\Omega_{DM} = 0.268$, and dark energy $\Omega_{DE} = 0.683$.

The fifth power of the golden mean governs phase transitions from particle to

cosmic scale [18]. If we keep the hierarchy of the fifth power of the golden mean still involved in the inflation of the constituents of the universe, we can write down surprisingly simple

$$\frac{\Omega_M}{\Omega_{DM}} \approx 2 \cdot \varphi^5 \approx \frac{2}{5}\beta_m \tag{23}$$

$$\frac{\Omega_M + \Omega_{DM}}{\Omega_{DE}} \approx 5 \cdot \varphi^5 \approx \beta_m \tag{24}$$

$$\frac{\Omega_{DM}}{\Omega_{DE}} = 0.3924 \approx \frac{5\sqrt{3}}{2}\varphi^5 = 0.390447 \approx \frac{\pi}{8} \approx \frac{\sqrt{3}}{2} \cdot \beta_m = 0.39988 \tag{25}$$

Interestingly, the quotient of baryonic matter to total matter is again related to the golden mean being

$$\frac{\Omega_M}{\Omega_M + \Omega_{DM}} = 0.1545 = \frac{0.6183}{4} \approx \frac{1-\beta_0}{\beta_0} \tag{26}$$

Relation (26) represents another reciprocity relation. The denominator value of 4 can be compared with the integration result given in Equation (5).

When using all possible approximations, we get an over-determined system of linear equations with more equations than unknowns. The simultaneous solutions to these approximations deliver for the constituents calculated values in excellent agreement with the *WMAP* results given by *Bouchet* [26], which can be compared in Table 1 and Table 2. The golden mean conjecture seems to agree better with the experimental values.

With the aid of relation (6) one can replace in the relations (23) to (25) the maximum difference velocity β_m by $\alpha_s(m_z)$ giving $\beta_m \approx \sqrt{2\beta_0\alpha_s(m_z)}$. Equation (24) tells us that dark energy is strongly correlated to the total matter of the universe as a response of galactic matter movement.

When using only two equations, we can present formulas for the constituents with reduced accuracy

Table 1. Solution to a system of 3 linear equations with 2 unknowns.

	φ_m Conjecture
Equation (23)	$x_1 - 0.18007858 \cdot x_2 = 0$
Equation (24)	$1.450196459 \cdot x_1 - 1.450196459 \cdot x_2 = 0.450196459$
Equation (25)	$0.39988 \cdot x_1 + 1.39988 \cdot x_2 = 0.39988$
Result:	$x_1 = 0.04579, x_2 = 0.26613, x_3 = 1 - x_1 - x_2 = 0.68808$
	Golden mean Conjecture
Equation (23)	$x_1 - 0.1803398 \cdot x_2 = 0$
Equation (24)	$1.4508495 \cdot x_1 - 1.4508495 \cdot x_2 = 0.4508495$
Equation (26)	$0.8454915 \cdot x_1 - 0.1545085 \cdot x_2 = 0$
Result:	$x_1 = 0.04852, x_2 = 0.26756, x_3 = 1 - x_1 - x_2 = 0.68392$

Table 2. Mass respectively energy constituents of the universe.

Constituent	*WMAP* (*Bouchet*)	This Work	
		β_m conjecture	φ conjecture
Ω_M	0.049	0.04579	0.04852
Ω_{DM}	0.268	0.26613	0.26756
Ω_{DE}	0.683	0.68808	0.68392
$\sum\Omega_i$	1.000	1.00000	1.00000

$$\Omega_M \approx \frac{2}{5}\tilde{\beta}\left(\tilde{\beta}-\frac{3}{5}\cdot\frac{\tilde{\beta}}{1+\tilde{\beta}}\right) \tag{27}$$

$$\Omega_{DM} \approx \tilde{\beta}-\frac{3}{5}\cdot\frac{\tilde{\beta}}{1+\tilde{\beta}} \tag{28}$$

with $\tilde{\beta}=5\varphi^5$. One can better adapt the Ω-values by using the pre-factor 0.5884, which is about $5\cdot\alpha_s\left(m_z\right)$, instead of 3/5. The term $\frac{\tilde{\beta}}{1+\tilde{\beta}}$ is proportional to the dark matter density term of the *IRT* theory [27]. Therefore, we can try to make the quantity $\tilde{\beta}$ a variable velocity β. The obtained curves were graphically presented in **Figure 2** by comparing the resulting black Ω-curves with energy densities in green according to the *IRT* theory.

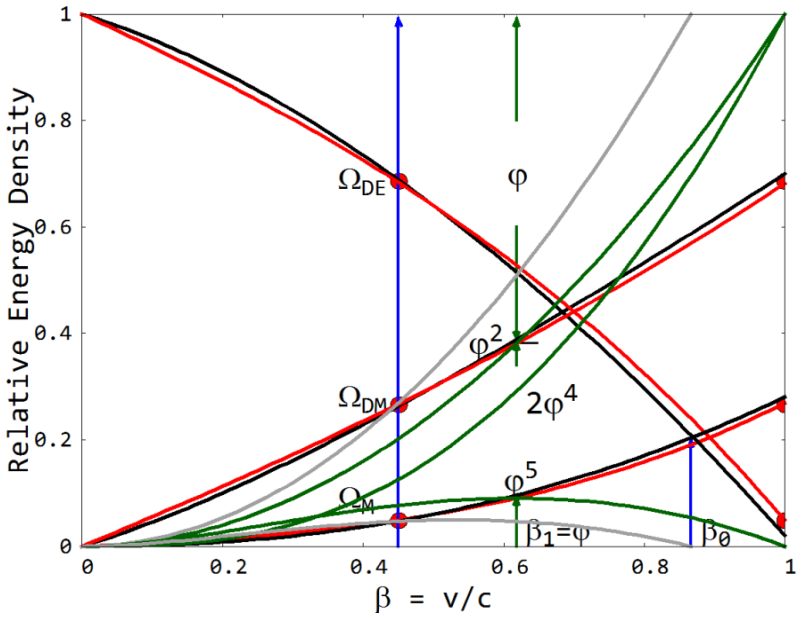

Figure 2. Golden mean hierarchy revealing the mysteries of the Universe. Red circles mass respectively energy constituents of the Universe. Black curves corresponding curves with variable ß. Green curves for baryonic matter, dark matter and total matter according to the IRT theory [27]. Red circles at $\beta = 1$ have been created from the Ω values at $\beta = 5\cdot\varphi^5 \approx 0.4508$ by a shift along the horizontal axis. Red curves follow third degree polynomials. The grey curves were derived from the green ones by replacement of β by β/β_0.

We get an astonishing golden mean hierarchy with many coincidence points that may serve to reveal the mysteries of the Universe. Interestingly, the red marked Ω values at $\beta = 1$ seem to reverse its values, Ω_M becomes about Ω_{DM}, and Ω_{DM} becomes about Ω_{DE}. When not only caused by pure coincidence, it could have far-reaching consequences. Remarkably, the Ω_{DM} curve meets the *IRT* total matter curve at $\beta = \varphi$, represented by an energy density of φ^2. This needs clarification. A further coincidence happens also at $\beta = \frac{\sqrt{3}}{2}$. **Figure 2** conveys the impression that some principle of reciprocity governs the Universe. It should be accompanied by a twin of opposed charge and chirality [28]. Then we might suppose that the Universe was born by pair creation like the electron and the positron, because nature always uses similar techniques from particle scale to cosmic scale.

The mass quotient between baryonic mass density and dark mass density or corresponding energy densities according to the *IRT* theory [27], taken at a chosen recession velocity β, not taken as integration over a velocity range as in [27], evaluates to

$$\frac{\rho_M}{\rho_{DM}} = \frac{e_M}{e_{DM}} = \frac{1-\beta}{2\beta} \tag{29}$$

Inserting the last mentioned *CBM* mass constituents into Equation (29) would confirm a recession velocity β between β_1 and β_0 values of *Guynn*'s approach (see **Figure 1**)

$$\beta = 0.73224 \approx \sqrt{3} - 1 = 0.73205 \tag{30}$$

This value is near the arithmetic mean between β_1 and β_0, which is $\beta = 0.737167$ [2].

At β_0 the energy density ratio $\frac{\rho_{DM}}{\rho_D}$ delivers an interesting value (see also **Chapter 7**)

$$\frac{\rho_{DM}}{\rho_D} = \frac{2\beta_0}{1-\beta_0} \approx 12.92820 \approx 13 - \frac{1}{13} + \left(\frac{1}{13}\right)^2 - \left(\frac{1}{13}\right)^3 \cdot \sqrt{3} \tag{31}$$

However, when integrating within the limits between zero and $\frac{\sqrt{3}}{2}$, one gets for the baryonic mass constituent according to the *IRT* theory [27]

$$\Omega_M \approx \int_0^{\frac{\sqrt{3}}{2}} \beta^2 \frac{1-\beta}{1+\beta} \mathrm{d}\beta = 0.0490 \tag{32}$$

and for the dark energy constituent

$$\int_0^{\frac{\sqrt{3}}{2}} \frac{2\beta^3}{1+\beta} \mathrm{d}\beta = 0.16442 \tag{33}$$

$$\Omega_{DM} \approx \frac{8}{5} \cdot \int_0^{\frac{\sqrt{3}}{2}} \frac{2\beta^3}{1+\beta} \mathrm{d}\beta = 0.2678 \tag{34}$$

In an upcoming contribution, we will link all these results to a common pic-

ture by presenting, as already implied, a scaling between *Guynn*'s "structure of matter and space approach" and the *IRT* theory. In this way, the unification of physics is steadily progressing, because the basis of our world is simpler than expected.

6. Rethinking Superconductivity

In previous publications, the present author has questioned the validity of the *BCS* theory. He connected the optimal concentration of superconducting carriers σ_0 with the fundamental number of the fifth power of the golden mean φ documenting the fractal nature of the electronic response in superconductors by the relation [29] [30]

$$\sigma_0 \approx \frac{8}{\pi}\varphi^5 = 0.2296 \approx \frac{3}{13} \tag{35}$$

This optimum is near a quantum critical point in the superconductor phase diagram. The new "structure of matter and space theory" of *Guynn* [2] may be an opportunity of rethinking superconductivity as suggested, for instance, by *Hirsch* [31]. Using the maximum of *Guynn*'s difference velocity β_m, a relation equivalent to Equation (35) would be

$$\sigma_0 \approx \frac{8}{5}\cdot\frac{\beta_m}{\pi} = 0.2293 \tag{36}$$

Also the quotient of the *Fermi* speed v_F to the *Klitzing* speed v_K gives a very simple relation [29]

$$\frac{v_F}{v_K} \approx \frac{2}{\pi}\varphi^5 = 0.0571 \approx \frac{2}{5}\cdot\frac{\beta_m}{\pi} \tag{37}$$

It should not just be mere coincidence that a very simple numerical relationship exists between $\frac{v_F}{v_K}$ and the mass constituents of the Universe including dark matter

$$\frac{v_F}{v_K} \approx \frac{1}{\pi}\cdot\frac{\Omega_M}{\Omega_{DM}} \tag{38}$$

A wanted new theory of superconductivity should consider more global aspects of this physical phenomenon with its important applications, where two electron holes after coupling into a wavy entity disappear in the dark and can reappear in the shape of electron holes, if the temperature rises again above the transition temperature. There is only one type of superconducting charge carriers: electron holes.

7. Symphony with Nature's Effective Numbers

In the derived formulas, the reader very frequently found numbers that can be typified as effective numbers of nature, like the *Archimedes* constant π, the golden mean φ and its fifth power, and numbers of the *Fibonacci* number series such as 3, 5, 8, 13, 21, … [32]. Their simplicity and harmony can only be seen

when we look at their infinitely continued fraction representations [33]. Repeated processes of nature up to an equilibrium state are characterized by such fundamental numbers, and therefore also coupling constant and the mass constituents of the universe indicate the signature of such numbers setting the symphony of life and cosmos to music. Remembering, the ε-infinity theory of *El Naschie* deals with such processes [19] [20]. The value of $\beta_0 = \frac{\sqrt{3}}{2} = 0.866025$ is also interesting, because the separation between electron and positron at the moment of pair creation from a photon leads to the separation of $r_0 = \frac{\sqrt{3}}{2} r_c$, where r_c is the *Compton* radius [15]. When transforming the velocity $\beta_0 = \frac{\sqrt{3}}{2}$ to redshift by $z_0 = \frac{\beta_0}{1-\beta_0}$, one gets about $z_0 \approx \frac{4}{\varphi}$. This ratio $\frac{\beta_0}{1-\beta_0} \approx 6.46410$ of the β-axis intercepts with reference to β_0 (see **Figure 2**) may mark the limit of matter—antimatter asymmetry. A *Fibonacci* number based approximation is given by the sequence $\frac{1}{2}\left(13 - \frac{1}{13} + \left(\frac{1}{13}\right)^2 - \left(\frac{1}{13}\right)^3 \cdot \sqrt{3}\right) = 6.46410$ [15]. Again we can find a reciprocity relation connecting an only marginally shifted $\beta_\pi \approx \beta_0 - 0.0004611 = 0.865564304 \approx \beta_0 - \varphi \cdot \beta_g$ with the circle constant π

$$\frac{\beta_\pi}{1-\beta_\pi} - \frac{1-\beta_\pi}{\beta_\pi} = 6.2831845 \approx 2\pi \tag{39}$$

Geometrical frustration can indeed be a source for asymmetric behavior and the appearance of a pseudo-equilibrium state. The present author postulated such a frustration for the double helix of protofilament number of 13 [34].

Surprisingly, the product $\pi \cdot \varphi^5$ of *Archimedes* constant π and the fifth power of the golden mean φ^5 is found in the magic golden ratio architecture of the Great Pyramid at *Giza* as the ratio of the in-sphere volume of the pyramid to that of the pyramid itself [35] [36].

8. Conclusion

If we want to follow the path of unification of physics, then a holistic approach always provides examples for the conjecture that things are simpler than assumed. The present work describes simple reciprocity relationships of coupling constants determining the strength of forces exerted in physical interactions. Such relationships exist for *Sommerfeld*'s constant α, the strong coupling constant $\alpha_s(m_z)$, and also for the gravitational coupling constant α_g. The present work is based on the new structure of matter and space approach of *Guynn.* It underlines the importance of his galactic difference rotation velocity β_g indicating once more its impact on modern physics. The mass respectively energy constituents of the universe Ω_i can simply be related to the maximum of the difference velocity β_m respectively to the strong coupling constant $\alpha_s(m_z)$, confirming by this way a golden mean-based approach as evolutionary principle of

nature. We can draw the following conclusion. The mass respectively energy constituents of our Universe influence decisively the *Milky Way* spiral galaxy and its maximum difference in rotation velocity and therewith the strength of all physical forces via the coupling constants between them.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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