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Supreme Theory of Everything: The Fundamental Forces in Quantum Hysteresis

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Abstract

Gravity is considered one of the most mysterious of the four fundamental forces, a well-studied but poorly understood phenomenon in science. Newtonian physics and General Relativity have studied it from outside. Based on fundamental forces the Grand Unified Theory (GUT) and the Standard Model (SM) of Particle Physics study from the inside. GUT and SM explain three fundamental forces that govern the universe: electromagnetism, the strong force, and the weak force. The fourth fundamental force hopes that must be gravity, which the SM cannot adequately explain. The research aims to explain fundamental forces and their interactions based on the hysteresis law. The hysteresis law studies the fundamental forces from both inside and outside, so, I hope it can explain the rules and principles of the universe from the microworld to the macroscopic world. The united force of the three fundamental forces in high energy singularity (vertical asymptote) of the hysteresis becomes the weakest like weak interaction and continuously like strong force but has an infinite range like electromagnetic interaction. In this sense, it may be called gravity. Unfortunately, gravity is not an individual force; it is the positive singularity or high energy asymptotic sum of three fundamental forces emerging from the depth of the hysteresis of the subatomic particles.

Keywords

The Fundamental Forces, Alternative Fermi-Dirac Distribution, The Vertical Asymptote of Hysteresis, Gravity

1. Introduction

Once physicists realized that nuclei consisted of positively charged protons and uncharged neutrons, they had a problem with their hands. The electrical forces among the protons are all repulsive, so the nucleus should simply fly apart! [1]

The strong nuclear force does not have any effect on electrons, which is why it does not influence chemical reactions. Unlike the electric forces, whose strengths are given by the simple Coulomb force law, there is no simple formula for how strong nuclear force depends on distance [1]. By the understanding of physics at that time, positive charges would repel one another and the positively charged protons should cause the nucleus to fly apart. However, this was never observed. New physics was needed to explain this phenomenon [2].

Nucleus forces are complex in nature and difficult to understand [3].

…A stronger attractive force was postulated to explain how the atomic nucleus was bound despite the protons' mutual electromagnetic repulsion [2].

Physicists working to find a so-called Grand Unified Theory (GUT) aim to unite the electroweak force with the strong force to define an electronuclear force, which models have predicted but researchers have not yet observed.

The final piece of the puzzle would then require unifying gravity with the electronuclear force to develop the so-called theory of everything, a theoretical framework that could explain the entire universe [4].

Unifying gravity with the electronuclear interaction would provide a more comprehensive theory of everything (TOE) rather than a Grand Unified Theory. Thus, GUTs are often seen as an intermediate step towards a TOE [5].

The Standard Model explains three of the four fundamental forces that govern the universe: electromagnetism, the strong force, and the weak force. The fourth fundamental force is gravity, which is not adequately explained by the Standard Model [6].

So far, no particle accelerator has reached energies high enough to unify the strong force with electromagnetism and the weak interaction. Including gravity would mean yet more energy [7].

Above-listed contradictions are not just in minor details but are very fundamental.

Let's look at how physics describes this situation.

Electrostatic repulsion between protons is overcome by strong nuclear force between nucleons. The stability of a nucleus is affected by the interaction between the strong nuclear force and the electrostatic force (**Figure 1**) [8].

Even now, this explanation displayed in **Figure 1** is valid.

Physicists, however, have found it pretty difficult to merge the microscopic world with the macroscopic one. And so far, no one has come up with a good way to merge those two worlds [4].

STE is revealing incorrect laws created in the past. But I did not want to deny the great discoveries of physical science, to contradict or oppose anyone. I remember the speech of Owen Chamberlain "The development of physics, like the development of any science, is a continuous one. Each new idea is dependent upon the ideas of the past" [9]. Here, I'm just following the law of hysteresis. To create the law of hysteresis I have used only trigonometry. For, of all the branches of mathematics, trigonometry alone can easily express all the laws of nature which

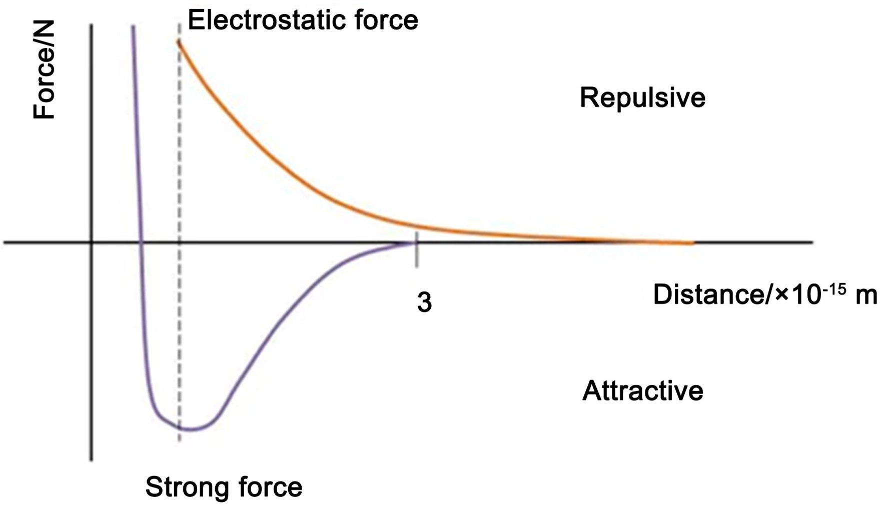

Figure 1. The magnitude and direction of strong nuclear force varies with the distance between the nucleons [8].

we seek, for nature, itself is a work of geometry. For above theoretical questions can be answered by my proposed theory, which is easy and understandable for everybody.

I would like to give a brief comment on Figure 1 because I doubt it. There are two big unsolved problems included in Figure 1.

First, according to Heisenberg's uncertainty principle [10] [11], the electromagnetic force and strong nuclear force fly out infinitely at distances less than 0.5 fm in Figure 1 due to vertical asymptotes. What this means is that the nucleus explodes and annihilates. If so, nature including us won't exist really. However, in reality, the extinction process is not observed at all. On the contrary, as they get closer, the nucleons do not fall toward each other, and the atom and nucleus exist only when the forces of attraction and repulsion are balanced. When the nucleus is affected by the outside impact the radioactivity intensifies. Therefore, it can be said that the mathematical formulation of the fundamental forces is wrong.

Second, where is the hypothesized strong nuclear force? The strong force shown in Figure 1 is not a strong nuclear force, but it is the exchange interaction of the electroweak force and the hypothesized force, which is the bold black curve displayed in Figure.

Do Heisenberg's uncertainty principle and Yukawa's law are the same as the inverse-proportionality law (IPL) [12] or the inverse-square law (ISL)? [12] [13] Yes, approximately. The differences between these exponential approaches are only accuracy, respectively. For this reason, Figure 1 and its theory are false.

In this Section, I discussed the contemporary scientific explanation for the fundamental forces is discussed, in the next Section then discuss the unification principle of the fundamental forces based on the hysteresis of the STE. Finally, I try to show the experimental evidence and recent findings concerning the fundamental forces.

2. Exchange Interactions of the Fundamental Forces

Oops! We see the strong nuclear force doesn't go infinite in **Figure 2**. It is correct and a miracle. But how? Does it is an experimental result or a theoretical assumption?

There is no simple formula for how strong nuclear force depends on distance. Roughly speaking, it is effective over ranges of ~1 fm but falls off extremely quickly at larger distances (much faster than 1/r2). Since the radius of a neutron or proton is about 1 fm, that means that when a bunch of neutrons and protons are packed together to form a nucleus, the strong nuclear force is effective only between neighbors [1].

It means that the strong nuclear force and electromagnetic force are saturated less than 1 fm of distance.

For determination of the behaviors of the fundamental forces, we must use the Fermi-Dirac distribution, because fermions dominate in the nucleus.

The Standard Model includes 12 elementary particles of spin 1/2, known as fermions. According to the spin-statistics theorem, fermions respect the Pauli exclusion principle. Each fermion has a corresponding antiparticle. Fermions are classified according to how they interact (or equivalently, by what charges they carry) [14].

For a system of identical fermions in thermodynamic equilibrium, the average number of fermions in a single-particle state is given by the Fermi-Dirac (F-D) distribution [15] [16]

$$f_{(\text{Fermi-Dirac})}(E) = \frac{1}{e^{(E-E_F)/kT}+1} \tag{1}$$

where E is probability energy, energy in Fermi level, k is Boltzmann constant and T is the absolute temperature in Kelvin. The Fermi-Dirac distribution is plotted for a few temperatures (**Figure 3**).

Since fermions have 1/2 spin, they must be determined by the F-D distribution. But according to the hysteresis law, it will be correctly determined by following another Fermi-Dirac Distribution (Formula (2)) and not by the traditional F-D distribution (Formula (1)). We are calling it an Alternative Fermi-Dirac distribution.

2.1. Alternative Fermi-Dirac Distribution

We processed a new formula for Fermi-Dirac distribution based on the law of the open hysteresis (**Figure 4**). I have used Formula (2) for my different research [12] [18] [19] [20] [21]:

$$e(x) = \frac{t \cdot \sin(x \pm \theta)}{|\cos(x)|} \tag{2}$$

where $F(x)$ is probability energy, t is the amplitude of wave function, θ is the incident angle of the photon and x denotes the degrees of a circle. θ denotes the external influence applied energy or force.

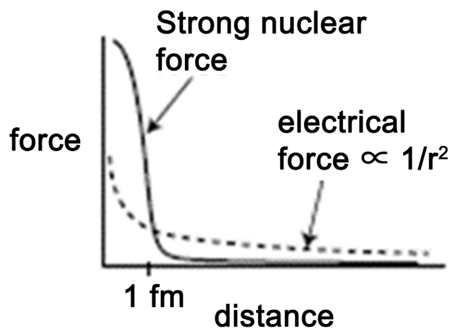

Figure 2. Strong nuclear force and electric force [1].

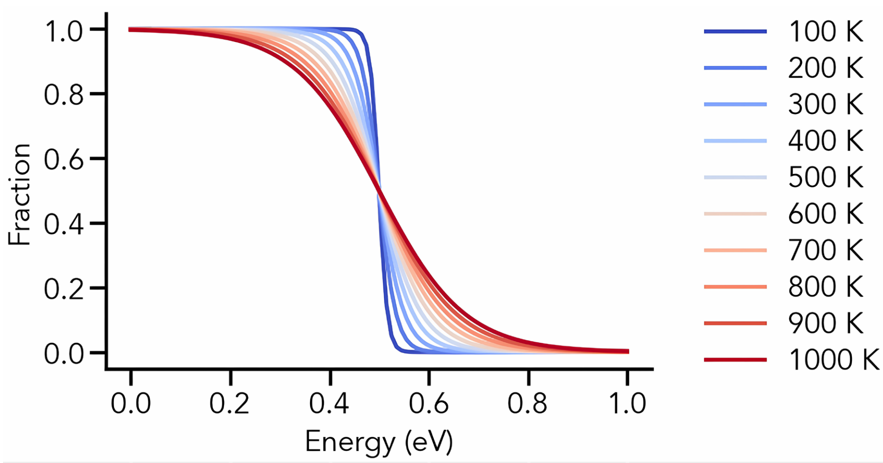

Figure 3. The Fermi-Dirac distribution is plotted for a few temperatures [17].

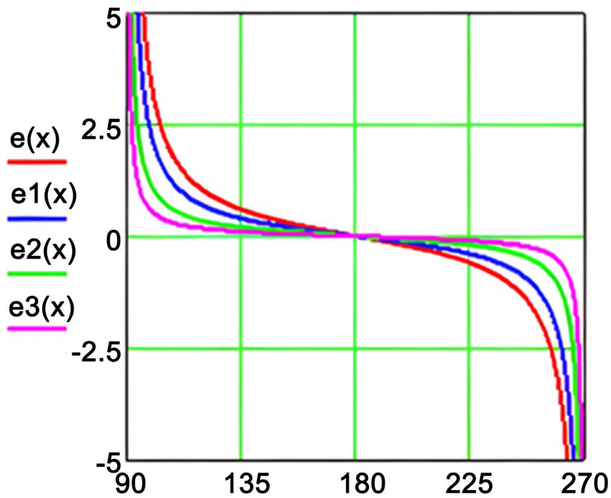

Figure 4. Alternative Fermi-Dirac distribution is plotted for amplitudes (maybe temperatures).

2.2. Fundamental Forces in Order

To keep the stable nucleus the hypothesized force (real strong nuclear force) and the electromagnetic force must be equivalency and they are (super)symmetry to the axis of the weak force (**Figure 3**). The strong force equals electromagnetism, and both forces have saturation limits. The exchange interactions of the three fundamental forces happen along the axis of the weak force and are determined by Formula (2). Based on the periodic table, atoms cannot contain much more than about 100 protons. The range of electromagnetism is infinite and two protons would be able to feel each other no matter how far apart they are [22]. The purple-colored force shown in Figure 5 is not a strong nuclear force but the result of the exchange interactions of both real strong force and electromagnetic forces.

Now, we may call this black-curved hypothesized force the real nuclear force or force of hysteresis holding the atom together. However, if this force is higher than the electromagnetic force, the nucleus collapses into its center, and if less it flies out. The nuclear force is significant over very short distances within the nucleus. In other words, it (the bold black curve) looks like an antiferromagnetic in the aspect of magnetism, antiferroelectric character electrically.

Figure 6 exhibits that at high temperatures, the exchange interaction between the strong nuclear force and electromagnetic force is (super)symmetry in a period because of hysteresis saturations at vertical asymptotes (90˚ and 270˚).

(a) Proton-rich or gamma decay or electromagnetic force together with weak force transits to strong nuclear force and (b) neutron-rich or alpha decay and but the strong nuclear force cannot transit to electromagnetic force due to its strongest capability and short range.

The weak force transits to electromagnetic force and unifies in one force, which is called electroweak force Figure 4(b).

The work of U.S. particle physicist Sheldon L. Glashow, U.S. theoretical physicist S. Weinberg, and A. Salam showed that the electromagnetic and the weak nuclear forces can be unified and understood as a single interaction, called the

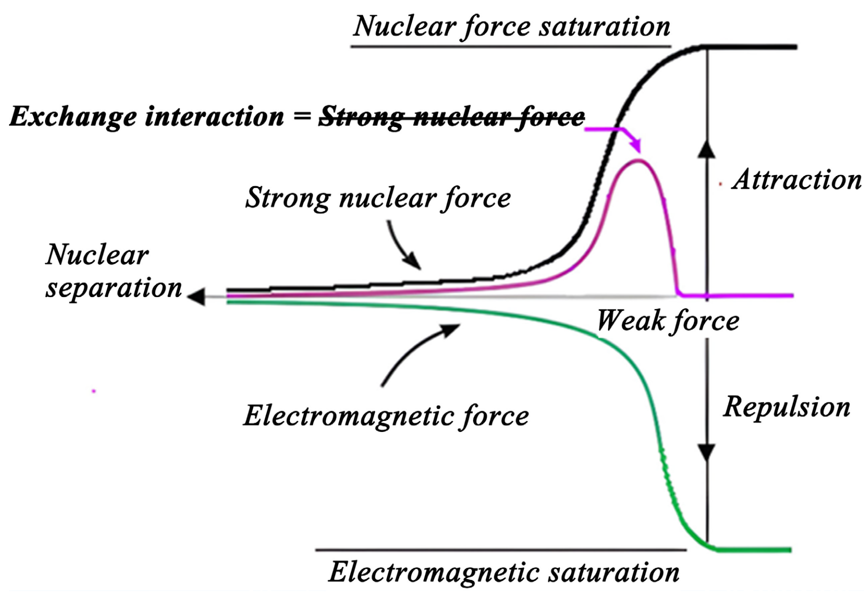

Figure 5. Open hysteresis as an interaction of the electromagnetic force and strong nuclear force (The illustration is processed based on Figure 1).

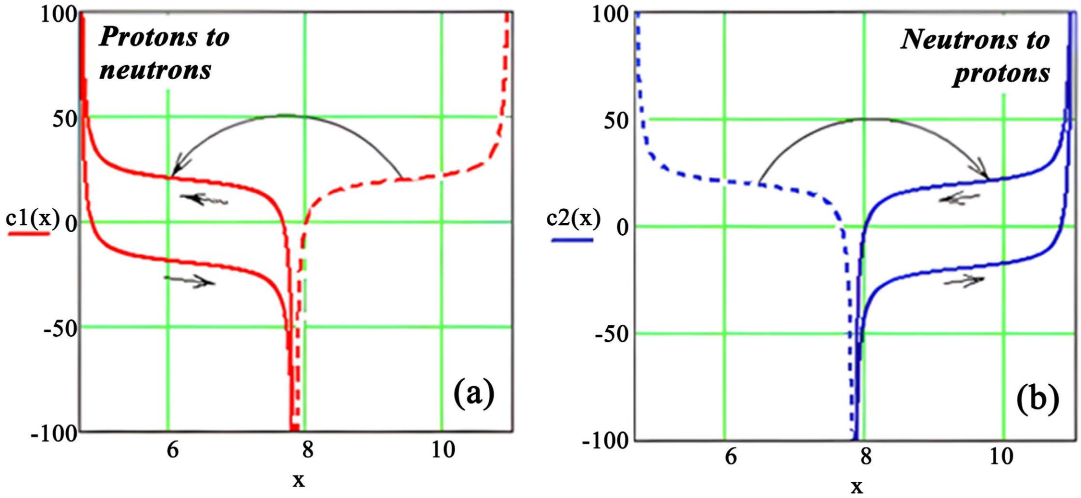

Figure 6. Transitions of the fundamental forces to each other in the closed hysteresis of a nucleus.

electroweak interaction [23]-[30]. In the early 1970s, Gerardus t'Hooft and Martinus Veltman formulated and tested a mathematical theory that further explained the electroweak interaction [28].

The electroweak force can transition to the strong nuclear force. It is a closed hysteresis (**Figure 4(a)**).

2.3. Weirdness of the Gravity

The left side vertical asymptotic axis is the axis of the strong nuclear force, which unites electromagnetic force with weak force (**Figure 5**). The high-energy singularity (vertical asymptote) shown in the upper left corner and the low-energy singularity (vertical asymptote) in the lower right corner of **Figure 4(a)** and **Figure 5** continue to infinite.

It corresponds to the definition of the GUT [5], and the singularity (vertical asymptote) is the same as David Gross's statement that "the bottleneck of particle physics is in the experiment, not the theory" [19] [31].

GUT models predict that at even higher energy, the strong interaction and the electroweak interaction will unify into one electronuclear interaction [5]. But on the contrary, the electroweak force will unify into a strong nuclear force (**Figure 7**).

Figure 4 and **Figure 5** show that the transition and merger phenomenon described above is likely to occur around the high-temperature singularity and the low-temperature singularity of the hysteresis. For this reason, it manifests that there lies a closed hysteresis in the nucleus.

This closed hysteresis includes the total combined force of the three fundamental forces summarized in high energy singularity (vertical asymptote). The three forces preserve their functions and characteristics unchangeable in a vertical asymptote of the hysteresis. Since this combined force becomes the weakest due to weak force it has an infinite range due to electromagnetic force. In this sense, it can be called gravity. In this case, we can tell fearlessly that yes, it is

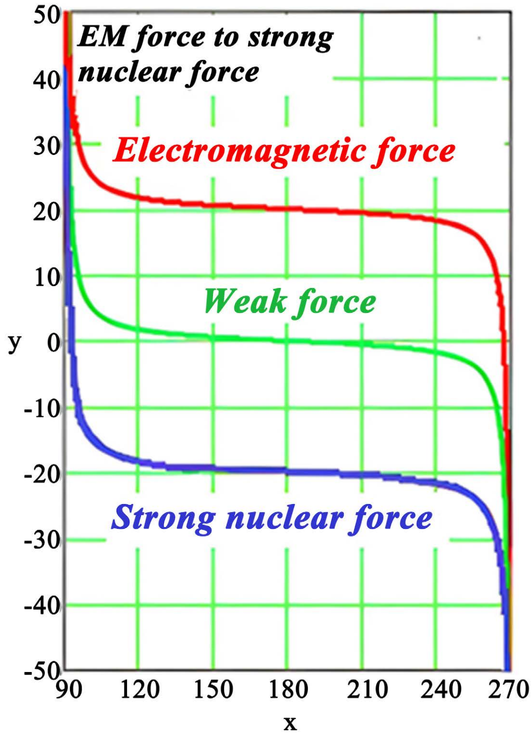

Figure 7. Transitions of the electroweak to strong nuclear forces.

gravity. It can be no other than a gravitating force. So, it is not so strong, but intermediate, because the strong nuclear force is stronger than the remaining two forces. In other words, the long-range gravitation force dominates in the Universe. Gravity is omnipresent, so, the graviton must be everywhere. Unfortunately, there is neither graviton nor any special mediator particle anywhere due to gravitation is not an independent force. All the carriers (gluons, photons, and W and Z bosons) of the three fundamental forces are the carriers of gravity. So, the long-range gravitation force dominates in the Universe. The long-range gravitation force dominates in the Universe.

What is gravity, anyway? Other forces are mediated by particles… Gravity doesn't seem to be like that. Most physical theories say it should be carried by a hypothetical massless particle called a graviton. The problem is, that nobody has found gravitons yet, and it's not clear that any particle detector that could be built could see them [32] [33].

The gravity may be explained by the hysteresis law of the STE. The high-energy singularity of hysteresis is a unique gateway of the strong nuclear force interacting with the external world without any effect on the atomic electrons or chemical reactions. On the other hand, this reveals that there is hysteresis in the nucleus and maybe also in nucleons and quarks.

From subatomic particles to the entire Universe is full of hysteresis [34]-[46]. It means that it has information memory due to hysteresis in everything.

From Figure 4(a) and Figure 5 I also assume that the low-energy singularity (vertical asymptote) says a lot about particle physics, dark matter, dark energy, and cosmology.

So, we see that the asymptotic freedom exactly happens at the negative and positive singularities of the hysteresis.

Finally, I would like to answer the above-mentioned problems [4]:

Q: So far, no particle accelerator has reached energies high enough to unify the strong force with electromagnetism and the weak interaction. Including gravity would mean yet more energy. …To reach grand unification energies, particles would need at least a trillion times as much, so physicists are left to hunt for indirect evidence of such theories [6].

A. According to STE, the energy of the singularity (vertical asymptote) goes seemingly infinite. Gravity is not an independent force and the sum of the three fundamental forces itself is always active. There is no cross point of gravity on the vertical asymptote.

Q: Another prediction of some types of the GUT is the existence of magnetic monopoles, isolated "north" and "south" poles of a magnet, and nobody has seen one of those, either. It's possible we just don't have a powerful enough particle accelerator. Or, physicists could be wrong about how the universe works.

A. Everything works along the law of the hysteresis, which has two poles we called them as positive and negative singularities. We never find any monopole anywhere.

3. Conclusions

1) The interactions of fundamental forces cannot be explained by all the exponential formulas such as inverse-square law, inverse proportionality law, the formula of conventional Fermi-Dirac distribution, and Heisenberg's uncertainty principle. Because they try to determine the fundamental forces from outside. The GUT and Standard model of particle physics study them from the inside but use exponential functions.

2) According to STE, the electromagnetic force and nuclear strong force inside the nucleus are equal to each other, because of their saturations.

3) The electromagnetic force transfers to strong nuclear force, as a result of which the singularities (vertical asymptotes) of the hysteresis exist.

4) The real strong nuclear force (we call them the force of hysteresis combined force, or unified force) is the strength of hysteresis holding the atom together.

The hysteresis force and the electroweak force unify in the positive singularity (vertical asymptote). This unified force becomes the weakest due to weak force but it has an infinite range due to electromagnetic force. In this sense, it can be called gravity. It is gravity. The high-energy singularity of hysteresis is a unique gateway of the real strong nuclear force interacting with the external world without any effect on the atomic electrons or chemical reactions.

5) Three fundamental forces govern everything. Gravity is not an independent force and is the sum of the three fundamental forces itself.

6) We cannot find any cross point of gravity on the vertical asymptote.

7) Everything works along the law of the hysteresis, which has two poles we called them as positive and negative singularities.

8) The low-energy singularity (vertical asymptote) of the hysteresis can say a lot about particle physics, dark matter, dark energy, and cosmology.

Conflicts of Interest

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

References

[1] Crowell, B. (2009) The Strong Nuclear Force, Alpha Decay and Fission. In: Crowell, B., Ed., *Light and Matter*. http://www.vias.org/physics/bk4_03_04.html

[2] Strong Interaction. https://en.wikipedia.org/wiki/Strong_interaction

[3] Nuclear Force—Definition | Properties of Nuclear Force, 2017. https://physicscatalyst.com/article/nuclear-forces/

[4] Rehm, J. and Biggs, B. (2021) The Four Fundamental Forces of Nature. Science & Astronomy. https://www.space.com/four-fundamental-forces.html

[5] Grand Unified Theory (GUT). https://en.wikipedia.org/wiki/Grand_Unified_Theory

[6] DOE Explains...the Standard Model of Particle Physics. https://www.energy.gov/science/doe-explainsthe-standard-model-particle-physics

[7] Wolchover, N. and Emspak, J. (2017) The 18 Biggest Unsolved Mysteries in Physics. https://www.livescience.com/34052-unsolved-mysteries-physics.html

[8] HSC Physics Course. Strong Nuclear Force and Stability of the Nucleus. https://scienceready.com.au/pages/nuclear-stability

[9] Owen Chamberlain, Banquet Speech. https://www.nobelprize.org/prizes/physics/1959/chamberlain/speech/

[10] What Is the Uncertainty Principle and Why Is It Important? Caltech Science Exchange. https://scienceexchange.caltech.edu/topics/quantum-science-explained/uncertainty-principle

[11] The Yukawa Particle and the Heisenberg Uncertainty Principle Revisited. Particle Physics. https://courses.lumenlearning.com/suny-physics/chapter/33-1-the-yukawa-particle-and-the-heisenberg-uncertainty-principle-revisited/

[12] Ulaanbaatar, T. (2021) Supreme Theory of Everything: The Open Hysteresis in Place of Inverse-Square Law. *London Journal of Research in Science*: *Natural and Formal*, **21**, 55-69.

[13] Testing the Gravitational Inverse-Square Law. https://physicsworld.com/a/testing-the-gravitational-inverse-square-law/

[14] Standard Model. https://en.wikipedia.org/wiki/Standard_Model

[15] What is Fermi Dirac Distribution? Energy Band Diagram, and Boltzmann Approximation? https://www.elprocus.com/fermi-dirac-distribution-energy-band-diagram-and-boltzmann-approximation/

[16] Reif, F. (1965) Fundamentals of Statistical and Thermal Physics. McGraw–Hill, New York. https://www.scribd.com/document/341881629/Fundamentals-of-Statistical-and-Thermal-Physics-Reif?utm_medium=cpc&utm_source=google_pmax&utm_campaign=3Q_Google_Performance-Max_RoW&utm_term=&utm_device=c&gclid=EAIaIQobChMIiOWussqj_gIVY5_CCh36_wLzEAAYASAAEgJgf_D_BwE

[17] Venkatesan, N. (2020) Intro to Dynamic Visualization with Python—Animations and Interactive Plots. Towards Data Science https://towardsdatascience.com/intro-to-dynamic-visualization-with-python-animations-and-interactive-plots-f72a7fb69245

[18] Ulaanbaatar, T. (2018) Supreme Theory of Everything. *Journal of Astrophysics & Aerospace Technology*, **6**, 22.

[19] Ulaanbaatar, T. (2019) Supreme Theory of Everything. *Advances in Theoretical & Computational Physics*, **2**, 1-6. http://doi.org/10.33140/ATCP.02.02.05

[20] Ulaanbaatar, T. (2020) Supreme Theory of Everything: Whole Universe in a Simple Formula. *London Journal of Research in Science*: *Natural and Formal*, **20**, 73-90.

[21] Ulaanbaatar, T. (2022) A New Concept of the Photoelectric Effect. *London Journal of Research in Science*: *Natural and Formal*, **22**, 1-12.

[22] Lincoln, D. (Video) The Strong Nuclear Force vs. Electrostatic Force—Overview. https://www.expii.com/t/strong-nuclear-force-vs-electrostatic-force-overview-8755

[23] Baltay, C. (2019) Electroweak Interaction. https://doi.org/10.1036/1097-8542.227375 https://www.accessscience.com/content/article/a227375

[24] Glashow, S.L. (1980) Towards a Unified Theory: Threads in a Tapestry. *Reviews of Modern Physics*, **52**, 539-543. https://doi.org/10.1103/RevModPhys.52.539

[25] Lee, T.D. and Yang, C.N. (1956) Question of Parity Conservation in Weak Interactions. *Physical Review Journals Archive*, **104**, 254-258. https://doi.org/10.1103/PhysRev.104.254

[26] Rosa-Agostinho, N. *et al.* (2019) Electroweak Sector under Scrutiny: A Combined Analysis of LHC and Electroweak Precision Data. *Physical Review D*, **99**, Article ID: 033001. https://doi.org/10.1103/PhysRevD.99.033001

[27] Salam, A. (1980) Gauge Unification of Fundamental Forces. *Reviews of Modern Physics*, **52**, 525-538. https://doi.org/10.1103/RevModPhys.52.525

[28] Hooft, G.'t and Veltman, M. (1972) Regularization and Renormalization of Gauge Fields. *Nuclear Physics B*, **44**, 189-213. https://doi.org/10.1016/0550-3213(72)90279-9

[29] Weinberg, S. (1980) Conceptual Foundations of the Unified Theory of Weak and Electromagnetic Interactions, *Reviews of Modern Physics*, **52**, 515-523. https://doi.org/10.1103/RevModPhys.52.515

[30] Weinberg, S. (1967) A Model of Leptons. *Physical Review Letters*, **19**, 1264-1266. https://doi.org/10.1103/PhysRevLett.19.1264

[31] Gross, D. (2015) Future of Particle Physics, Scientific Symposium on the Celebration of Richard Feynmann's Life and Legacy on the Occasion of His 100th Birthday. https://www.youtube.com/watch?v=4RgaWwW0ADw

[32] Lincoln, D. (2014) What Are Gravitons? https://www.pbs.org/wgbh/nova/article/what-are-gravitons/

[33] Wolchover, N. and Emspak, J. (2017) What the Heck Is Gravity, Anyway? The 18

Biggest Unsolved Mysteries in Physics.
https://www.livescience.com/34052-unsolved-mysteries-physics.html

[34] Улаанбаатар, Т. (2018) Тэг рүү тэмүүлэх сингулярын тухайд, ШУТИС эрдэм шинжилгээний бүтээлийн эмхэтгэл, 1/228, 50-58, УБ.

[35] Ulaanbaatar, T. (2019) Formula Extraction in Supreme Theory of Everything. *Advances in Theoretical & Computational Physics*, **2**, 1-3.
http://doi.org/10.33140/ATCP.02.04.01

[36] Улаанбаатар, Т.,Жаргалан, Н.,Батгэрэл, Б. and Сангаа, Д. (2021) Гистерезисийн гогцоог тайлах шинэ боломж, ШУА, Физик, Технологийн Хүрээлэнгийн бүтээл №47, 116-125.

[37] Ulaanbaatar, T., Narmandakh, J., Baltin B. and Deleg, S. (2021) Supreme Theory of Everything: A New Possibility to Open the Hysteresis. *London Journal of Research in Computer Science and Technology*, **21**, 1-7.

[38] Ulaanbaatar, T. (2021) Supreme Theory of Everything: Theoretical Formulation of the Spectral Density of Electromagnetic Radiation Emitted By a Nonblack Body. *Advances in Theoretical & Computational Physics*, **4**, 191-196.
http://doi.org/10.33140/ATCP.04.02.12

[39] Ulaanbaatar, T. (2021) Supreme Theory of Everything: Geometric Methods for the Complex Analysis. *Journal of Current Trends in Physics Research and Applications*, **2**, 1-7.

[40] Ulaanbaatar, T. (2022) Back to the Fundamental Principles of Arithmetic. *Advances in Theoretical & Computational Physics*, **5**, 361-361.
https://doi.org/10.33140/ATCP.05.01.06

[41] Ulaanbaatar, T. (2022) Formula Extraction of Open Hysteresis in Supreme Theory of Everything. *New Trends in Physical Science Research*, **1**, 117-122.
https://doi.org/10.9734/bpi/ntpsr/v1/2809C

[42] Ulaanbaatar, T. (2022) Supreme Theory of Everything. In: *Book Chapter in Research Highlights in Mathematics and Computer Science*, B P International.

[43] Ulaanbaatar, T. (2022) Formula Extraction in Supreme Theory of Everything. In: *Book Chapter in Research Highlights in Mathematics and Computer Science*, B P International.

[44] Ulaanbaatar, T. (2022) Supreme Theory of Everything: Special Theory of Relativity Was Lost from the Beginning. *Journal of Applied Mathematics and Physics*, **10**, 3665-3675. https://doi.org/10.4236/jamp.2022.1012244

[45] Ulaanbaatar, T. (2023) Supreme Theory of Everything: It is Time to Discuss Hubble's Law. *London Journal of Research in Science: Natural and Formal*, **23**, 21-29.

[46] Ulaanbaatar, T. (2023) Supreme Theory of Everything: A Descriptive Study. *New Frontiers in Physical Science Research*, **6**, 53-69.
https://doi.org/10.9734/bpi/nfpsr/v6/8739F