IOSR Journal of Applied Physics (IOSR-JAP)
e-ISSN: 2278-4861.Volume 10, Issue 4 Ver. I (Jul. – Aug. 2018), 50-56
www.iosrjournals.org

Standard Model and Quantum Field Theory versus Wu's Pairs and Yangon and Yangon Theory

Edward T. H. Wu
Corresponding Author: Edward T. H. Wu

[Abstract]: *Standard Model is a group of subatomic particles derived from a mathematical model based on quantum field theory and Yang Mills Theory. In contrast, Wu's Pairs, a physical model are proposed as the building blocks of all subatomic particles based on the Yangton and Yington Theory. In this paper, some critical issues of quantum field theory are discussed, such as "What are the subatomic particles made of?", "What are the symmetries of gluons?", "What are the Higgs Bosons and Higgs field?" and "What the quantum fields really are?" As a result, three innovative theories "Quantum Gravity Theory based on the gravitons of a string structure and the theory of particle radiation and contact interaction", "Quantum Fields based on the distributions of contact interactions caused by particle radiations" and "Unified field theory based on the string structures made of Wu's Pairs and Force of Creation" are proposed.*

[Keywords]: *Standard Model, Quantum Field Theory, Wu's Pairs, Yangton and Yington, String Theory, Unified Field Theory, Graviton, Quantum Gravity, Higgs Boson, Particle Radiation*

Date of Submission: 29-06-2018 Date of acceptance: 16-07-2018

I. Introduction

Despite of the ambiguities in the development of Standard Model [1] and quantum field theory [2], a century later, many crucial questions still remain unanswered as listed in the followings:

a. Basic Structure and Fundamental Force
- What are the subatomic particles [3] made of?
- What are the string structures [4] of subatomic particles?
- What is the fundamental force of four basic forces [5]?
- Is unified field theory [6] real or just a mathematical model?

b. Special Relativity
- Is light speed a constant [7]?
- Can an object travel faster than light speed?

c. Mass and Energy Conversion
- Are mass and energy convertible?
- Can energy be generated from vacuum?
- How can antiparticle pairs be created from vacuum?
- What is a virtual photon?

d. Symmetry
- What are the structures of antiparticles [8]?
- Why some particles have antiparticles but not others?
- What are the structural symmetries of gluons [9]?
- What are the differences of the strong forces [4] between quarks [10] and those between proton [11] and neutron [12], also neutron and neutron?

e. Force Carriers
- Are force carriers a particle?
- What are the structures and properties of force carriers?

f. Graviton and Quantum Gravity
- What is the structure of graviton [13]?
- Can graviton propagate?
- Can quantum gravity theory be derived [14]?

g. Higgs Boson and Mass
- Do Higgs Boson [15] and Higgs field [15] really exist?
- What is the real meaning of mass?

- Can mass change with velocity?

Wu's Pairs [5] and Yangton and Yington Theory [5] are proposed as the building blocks and the foundations of the universe to explain the formations and correlations between subatomic particles, string theory and unified field theory. Standard Model on the other hand, is used to explain the formation and correlations between subatomic particles based on quantum field theory. Since subatomic particles are made of Wu's Pairs according to Yangton and Yington Theory, Standard Model and quantum field theory should align with Wu's Pairs and Yangton and Yington Theory. Therefore, it is the purpose of this paper to correlate quantum field theory with Yangton and Yington Theory so as to find some answers to the above questions as well as the compliances and discrepancies between the two theories.

II. Standard Model

Subatomic particles are very much smaller than atoms. There are two types of subatomic particles: elementary particles, which according to current theories are not made of other particles, and composite particles which are made of elementary particles. Particle physics and nuclear physics study these particles and how they interact.

The elementary particles of the Standard Model (Fig. 1) include:

- Six flavors of quarks: up, down, bottom, top, strange, and charm
- Six types of leptons: electron, electron neutrino, muon, muon neutrino, tau, tau neutrino
- Twelve Gauge Bosons (force carriers): the photon of electromagnetism, the three W and Z Bosons of the weak force, and the eight gluons of the strong force
- The Higgs Boson

Various extensions of the Standard Model predict the existence of an elementary graviton particle and many other elementary particles.

Composite subatomic particles such as protons or atomic nuclei are bound states of two or more elementary particles. For example, a proton is made of two up quarks and one down quark, a neutron is made of two down quarks and one up quark, while the atomic nucleus of Helium-4 is composed of two protons and two neutrons.

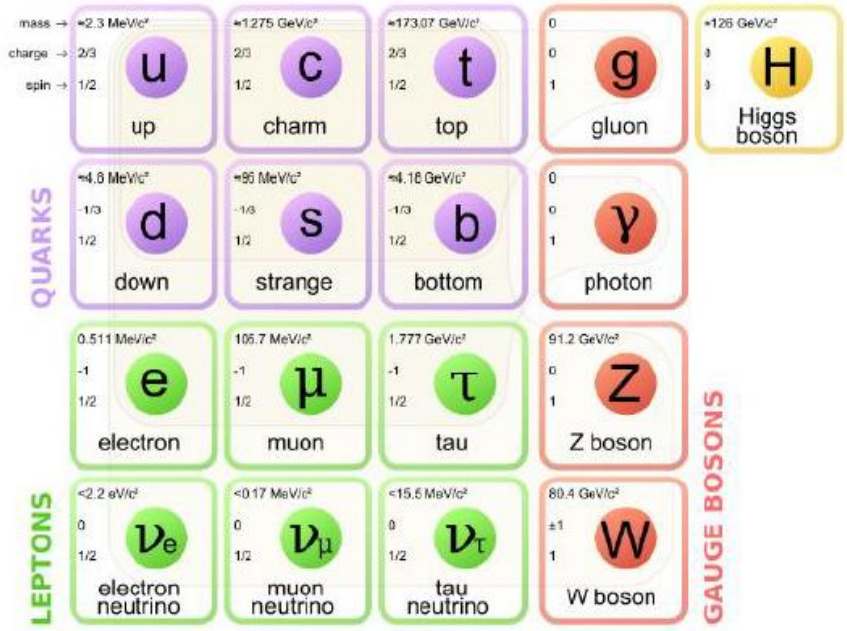

Fig. 1 The elementary particles of the Standard Model.

III. Yangon and Yangon Theory

Yangton and Yington Theory is a hypothetical theory of Yangton and Yington circulating particle pairs (Wu's Pairs) with a build-in inter attractive force (Force of Creation) that is proposed as the fundamental building blocks of all matter in the universe. All elementary subatomic particles having string structures as

proposed by the string theory, are made of Wu's pairs by string force, the Yangton and Yington attractive force between two adjacent Wu's Pairs. Subject to the structures, the composite subatomic particles are made of elementary subatomic particles by four basic force including gravitational force, electromagnetic Force, weak force and strong force. Yangton and Yington Theory not only explains the formation of subatomic particles in compliance with string theory and unified field theory [4], but also interprets the correlations between space, time, energy and matter [16].

IV. String Theory

General relativity [17] and quantum field theory are not compatible, in order to unified four basic forces, physicists suggested that all matter, instead of a point structure, must have a linear structure with 10 dimensions like Calabi-Yau manifold (Fig. 2) [18]. This is known as the "String Theory" [19].

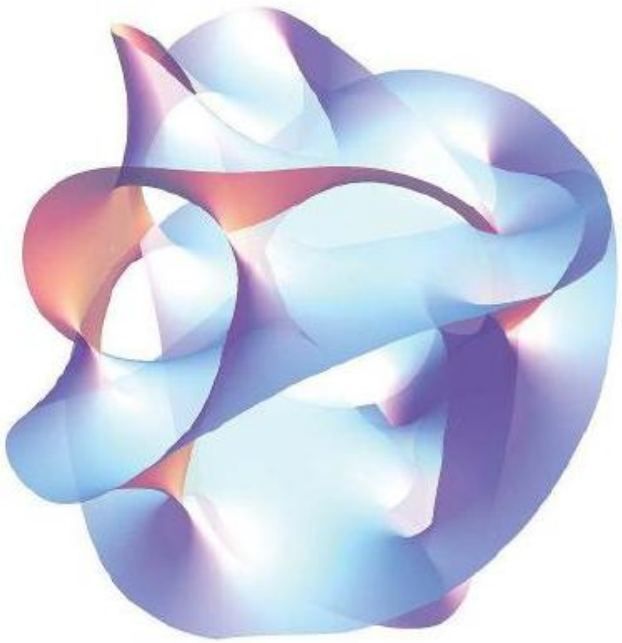

Fig. 2 A cross section of a quintic Calabi-Yau manifold.

Physicists have absolutely no idea what the structures of quarks and photon are, even with their state-of-the-art LHC [20]. However, based on the Yangton and Yington Theory, that all subatomic particles should have a string structure is not only very possible, but also quite obvious.

Wu's Pair is a pair of Yangton and Yington particles circulating in an orbit held by the inter-attractive Force of Creation between the two particles. When two Wu's Pairs come together with the same circulation direction, there is an interaction, which I call "String Force", that one Wu's Pair will stack up on top of the other one at a locked-in position where Yangton of the first Wu's Pair is lined up to the Yington of the second one, such that a string or ring structure of Wu's Pairs can be formed (Fig. 3), which matches very well with the string theory.

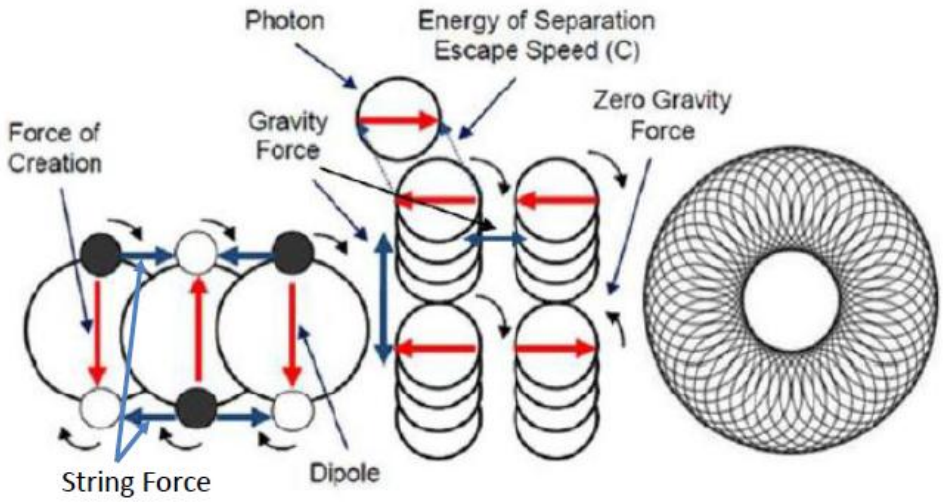

Fig. 3 Wu's Pairs stack up in a preferred direction by string force to form string and ring structures.

V. Special Relativity

Standard Model and quantum field theory are derived based on quantum mechanics and Einstein's Special Relativity [21]. Although special relativity is opposed by Yangton and Yington Theory, the absolute light speed observed at light source is always a constant 3×10^8 m/s, simply because that the photon generation process [22] is a corresponding identical event, where constant relative light speed can be measured by the corresponding units at different locations.

In fact, when a photon emitted from a light source, it travels under two influences, ejection motion and inertia motion [22]. In other words, the light speed observed by the observer at any observation point (**C**) is a vector summation of the Absolute Light Speed 3×10^8 m/s, the moving speed of the photon away from the light source observed at the light source ($\mathbf{C_S}$), and the "Inertia Light Speed", the moving speed of the light source away from the observer or his inertia system observed at the observation point ($\mathbf{V_S}$). This theory is named "Equation of Light Speed" [22].

$$\mathbf{C} = \mathbf{C_S} + \mathbf{V_S}$$

Where $\mathbf{C_S}$ is the Absolute Light Speed and $\mathbf{V_S}$ is the Inertia Light Speed.

According to Yangton and Yington Theory, Wu's Pairs are the finest building blocks of all matter in the universe. When a Wu's Pair separates from the surface of a substance (string structures) to form a free photon, it can be accelerated by the repulsive force caused by the Yangtons and Yingtons between photon and Wu's Pairs, to reach an extremely high speed ($3x10^8$ m/s). Therefore, it is suggested that the Absolute Light Speed $3x10^8$ m/s is the limit of the speed any object can move in the universe. However, in theory, there should be no limit.

VI. Mass and Energy Conversion

It is assumed that mass and energy are convertible such as that Yangton and Yington Particles (energy particles) can be produced by the energy generated from the Big Bang explosion. However, to make the conversion permanent, an external energy must apply to overcome the activation energy like any chemical reactions. Because of this reason, antiparticle pairs can be generated from vacuum by external energy. Also, heavy particles can be formed from lighter particles [23] and gamma ray can be generated from antiparticle annihilations [24]. Furthermore, a virtual photon can be used to represent an energy transformation process.

VII. Symmetry

7.1 Anti Particles

According to Yangton and Yington Theory, all subatomic particles are made of Wu's Pairs, a pair of Yangton and Yington circulating particles. Because of this symmetry, it makes no difference in structure while switching the positions between Yangton and Yington particles such as that in photon and gluons. Therefore, antiparticles such as anti-photon and anti-gluons do not exist.

However, for a structure with uneven distributions of Wu's pairs such as electron [4], a different structure can be formed while switching the positions between Yangton and Yington particles. Therefore, antiparticle such as positron (anti-electron) [4] does exist.

7.2 Colors of Quarks and Gluons

In addition to the asymmetry due to the uneven distribution of Wu's Pairs, quark has another asymmetrical property called "Color" [10] specified by red, blue and green colors that are related to the orientation between two connected quarks. Because each proton and neutron contains three quarks and each quark only allows one color (red, blue or green), there are a total of eight possible gluons with the following arrangements: UDU/RBG, UDU/RGB, UUD/RBG, UUD/RGB, ddu/RBG, ddu/RGB, dud/RBG and dud/RGB. For example, UDU/RBG represents a gluon connected between two up quarks with red and green colors, influenced by a down quark of blue color.

7.3 Strong Forces Between Proton/Neutron and Neutron/Neutron Pairs

According to Yangton and Yington Theory, gluons [9], the strong force carriers, are the connectors of two quarks influenced by the third quark with a mixed color of preferred orientation. But what is the bonding force between two neutrons or between one neutron and one proton in the nucleus? It is assumed that they could superimpose to each other such that the gluon in one neutron will match with its influence quark in the other neutron or proton to form a close packed structure (Fig. 4). Therefore, the force between two adjacent neutrons, or a neutron and proton pair has no difference to the strong force between the three quarks inside a single neutron or proton.

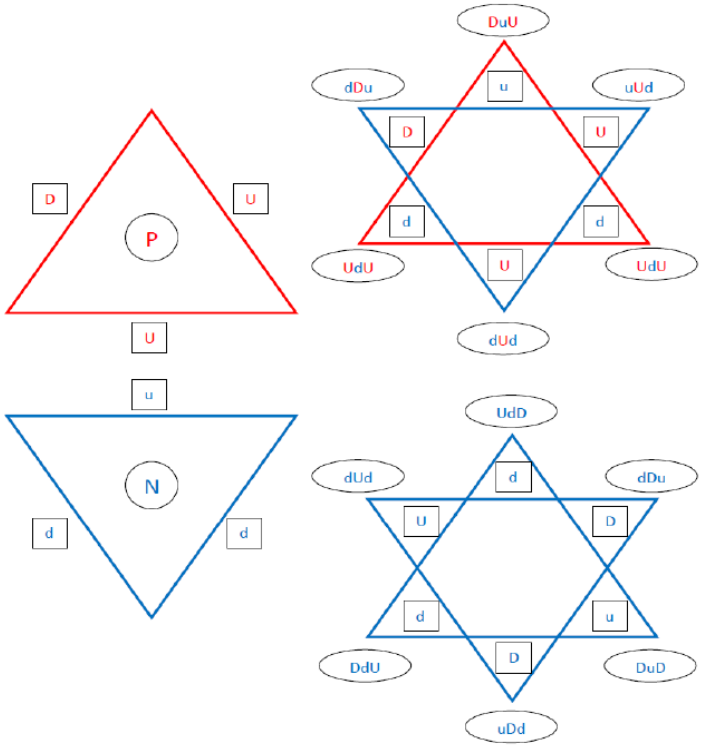

Fig. 4 Strong Forces between Neutron/Proton and Neutron/Neutron Pairs

VIII. Guage Bosons

In Standard Model, Gauge Bosons including photon, gluons, W & Z Bosons and graviton are considered as force particles or force carriers. Because mass and energy are convertible, also force and displacement (structure) together forms energy, therefore Gauge Bosons combined with displacements or structures can be treated as a particle (mass).

According to Yangton and Yington Theory, Photon is the carrier of string force instead of electromagnetic force. Also, electromagnetic force is generated by electrons, therefore electron should be considered as the carrier of electromagnetic force instead of photon.

All Gauge Bosons are force carriers, like photon they shouldn't contain any charge and mass. W+ and W- Gauge Bosons [25], however, both have charges and masses because they are not made of pure force

carriers, instead they are the composites of forces and particles with charges (electron and position). Zero Gauge Boson [25] and graviton on the other hand contain forces and particles (mass) but no charges.

IX. Higgs Boson, Higgs Field and Mass

In Standard Model and quantum field theory, the mass of a particle is defined as the magnitude of the barrier applied to the particle by Higgs Bosons that are generated from Higgs Field. However, what the Higgs Field is and where it comes from remains a mystery. In contrast, according to Yangton and Yington Theory, mass is defined as the total amount of Wu's Pairs [22] in the particle which doesn't change with the speed of the particle or anything else except the conversion between mass and energy.

X. Wave Particle Duality

It is believed that Wave Particle Duality is caused by the spin and circulation of a particle. In other words, not every particle has a wave property, except those that can spin or have a circulation orbit. Because of this reason, Photon and electron are waves but not the Graviton.

XI. Field versus Wave

Field is not generated by wave. In fact, field is generated by the particle radiation and contact interaction [26] instead of wave propagation. That is why photon is a wave but not a field (without contact interaction), and graviton is a field (with particle radiation and contact interaction) but not a wave (without spin and circulation).

XII. Quantum Gravity Theory

There are two problems, infinity and non-renormalization [27], involved in the derivation of a quantum gravity theory based on general relativity and quantum field theory. Spring theory and loop quantum gravity [28] are proposed as two possible solutions.

According to Yangton and Yington Theory, gravitational force can be generated between two string structures made of Wu's Pairs (Fig. 3) [4]. Therefore, a physical model "Graviton" can be built by a string structure made of multiple Wu's Pairs. In addition, quantum field is considered as the distribution of the contact interaction caused by particle radiation upon a unit particle at a point in space. It is believed that a "Quantum Gravity Theory" can be derived based on the graviton with string structure made of Wu's Pairs and the theory of graviton radiation and contact interaction.

XIII. Quantum Fields versus Particle Radiations and Contact Interaction

Conventional gravitational field is the measurement of the strength of gravitational force on a unit mass (m_2 = 1kg) at a point in space. According to Newton's Law of Universal Gravitation, a formula of gravitational field (F_g) can be derived as follows:

$$F_g = G (\sum m r^{-2})$$

Where G is the gravitational constant 6.674×1011 N m^2 kg^{-2} and ∑ is the summation of all $m r^{-2}$.

Since mr^{-2} is proportional to the concentration of the free gravitons emitted from an object m at a distance r, therefore ∑m r-2 is equivalent to the total amount of contact interaction caused by the gravitons emitted from all the objects in the universe upon a unit mass at a point in space. In other words, gravitational field is the distribution of contact interaction caused by graviton radiation from all the objects in the universe upon a unit mass at a point in space.

Similarly, the electrical field which is defined as the electrical force applied on a single electrical charge in the universe can be interpreted as the distribution of contact interaction caused by electron radiation from all the charged particles in the universe upon a unit charge at a point in space.

As a result, the distribution of contact interaction caused by particle radiation upon a unit particle at a point in space based on a quantized particle can be considered as the foundation of quantum field theory. In other words, quantum fields are not just an imagination but an actual image of the distribution of contact interaction caused by particle radiation upon a unit particle at a point in space.

XIV. Unified Field Theory based on Wu's Pairs and String Theory

According to Yangton and Yington Theory, Force of Creation, the inter-attractive force between Yangton and Yington Pairs is the fundamental force of the universe. Elementary subatomic particles of string structure are composed of Wu's Pairs with string force generated from Force of Creation. Composite subatomic particles are made of elementary subatomic particles with four basic forces induced from Force of Creation. In other words, subject to the structures, all matter in the universe can be structured by elementary and composite subatomic particles with four basic forces based on Force of Creation. This is known as "Unified Field Theory". For example, based on Force of Creation, gravitational force can be created between two graviton particles,

electromagnetic force can be generated between electrons and protons, weak force can be formed between neutrons and positrons, and strong force can be produced between two neutrons, also between a neutron and a proton [4].

In the past few decades, physicists have tried to develop a quantum gravity theory in combination with the quantum field theories of electromagnetic force, weak force and strong force to achieve a unified field theory. So far, there has been a little success in deriving such a theory due to the incompatibility between general relativity and quantum field theory. However, based on Wu's Pairs and Yangton and Yington Theory, subatomic particles with string structures made of Wu's Pairs and Force of Creation can be easily complied with unified field theory.

XV. Conclusion

Standard Model is a group of subatomic particles derived from a mathematical model based on quantum field theory and Yang Mills Theory. In contrast, Wu's Pairs, a physical model are proposed as the building blocks of all subatomic particles based on the Yangton and Yington Theory. Since subatomic particles are made of Wu's Pairs, therefore Standard Model and quantum field theory should align with Wu's Pairs and Yangton and Yington Theory. The correlations of Standard Model and quantum field theory to Wu's Pairs and Yangton and Yington Theory are studied in this paper. As a result, three innovative theories "Quantum Gravity Theory based on the gravitons of a string structure and the theory of particle radiation and contact interaction", "Quantum Fields based on the distributions of contact interactions caused by particle radiations" and "Unified Field Theory based on the string structures made of Wu's Pairs and Force of Creation" are proposed.

References

[1]. R. Oerter (2006). The Theory of Almost Everything: The Standard Model, the Unsung Triumph of Modern Physics (Kindle ed.). Penguin Group. p. 2. ISBN 0-13-236678-9.
[2]. Zee, Anthony (2010). Quantum Field Theory in a Nutshell (2nd ed.). Princeton University Press. ISBN 978-0691140346.
[3]. "Subatomic Particle" Encyclopedia Britannica. Retrieved 2008-06-29.
[4]. Edward T. H. Wu. "Subatomic Particle Structures and Unified Field Theory Based on Yangton and Yington Hypothetical Theory". American Journal of Modern Physics. Vol. 4, No. 4, 2015, pp. 165-171. doi: 10.11648/j.ajmp. 20150404.13.
[5]. Edward T. H. Wu, "Yangton and Yington–A Hypothetical Theory of Everything", Science Journal of Physics, Volume 2015, Article ID sjp-242, 6 Pages, 2015, doi: 10.7237/sjp/242.
[6]. Beyond Art: A Third Culture page 199. Compare Uniform field theory.
[7]. Edward T. H. Wu. "Vision of Object, Vision of Light, Photon Inertia Transformation and Their Effects on Light Speed and Special Relativity." IOSR Journal of Applied Physics (IOSR-JAP), vol. 9, no. 5, 2017, pp. 49–54.
[8]. https://en.wikipedia.org/wiki/Antimatter.
[9]. B.R. Stella and H.-J. Meyer (2011). "Y(9.46 GeV) and the gluon discovery (a critical recollection of PLUTO results)". European Physical Journal H. 36 (2): 203–243. arXiv:1008.1869v3. Bibcode:2011EPJH...36..203S. doi:10.1140/epjh/e2011-10029-3.
[10]. "Quark (subatomic particle)", Encyclopædia Britannica, retrieved 2008-06-29
[11]. https://en.wikipedia.org/wiki/Proton.
[12]. https://en.wikipedia.org/wiki/Neutron.
[13]. Feynman, R. P.; Morinigo, F. B.; Wagner, W. G.; Hatfield, B. (1995). Feynman Lectures on Gravitation. Addison-Wesley. ISBN 0-201-62734-5.
[14]. Rovelli, Carlo (2008). "Quantum gravity". Scholarpedia. 3 (5): 7117. Bibcode:2008SchpJ...3.7117R. doi:10.4249/scholarpedia.7117.
[15]. http://en.wikipedia.org/wiki/Higgs_boson.
[16]. Edward T. H. Wu. "Time, Space, Gravity and Spacetime Based on Yangton & Yington Theory, and Spacetime Shrinkage Versus Universe Expansion". American Journal of Modern Physics. Vol. 5, No. 4, 2016, pp. 58-64. doi: 10.11648/j.ajmp.20160504.13.
[17]. https://en.wikipedia.org/wiki/General_relativity.
[18]. Greene, Brian (1997), String theory on Calabi–Yau manifolds, Fields, strings and duality (Boulder, CO, 1996), River Edge, NJ: World Sci. Publ., pp. 543–726, arXiv:hep-th/9702155v1, Bibcode:1997hep.th....2155G, MR 1479700
[19]. Polchinski, Joseph (1998). String Theory, Cambridge University Press ISBN 0521672295.
[20]. Highfield, Roger. "Large Hadron Collider: Thirteen ways to change the world". The Daily Telegraph. London. Retrieved 2008-10-10.
[21]. Einstein A. (1916), Relativity: The Special and General Theory (Translation 1920), New York: H. Holt and Company.
[22]. Edward T. H. Wu. "Mass, Momentum, Force and Energy of Photon and Subatomic Particles, and Mechanism of Constant Light Speed Based on Yangton & Yington Theory". American Journal of Modern Physics. Vol. 5, No. 4, 2016, pp. 45-50. doi: 10.11648/j.ajmp.20160504.11.
[23]. J. Christman (2001). "The Weak Interaction" (PDF). Physnet. Michigan State University.
[24]. "The Standard Model – Particle decays and annihilations". The Particle Adventure: The Fundamentals of Matter and Force. Lawrence Berkeley National Laboratory. Retrieved 17 October2011.
[25]. J. Beringer; et al. (2012). "2012 Review of Particle Physics - Gauge and Higgs Bosons" (PDF). Physical Review D. 86: 1. Bibcode:2012PhRvD..86a0001B. doi:10.1103/PhysRevD.86.010001.
[26]. Edward T. H. Wu. "Gravitational Waves, Newton's Law of Universal Gravitation and Coulomb's Law of Electrical Forces Interpreted by Particle Radiation and Interaction Theory Based on Yangton & Yington Theory". American Journal of Modern Physics. Vol. 5, No. 2, 2016, pp. 20-24. doi:10.11648/j.ajmp.20160502.11.
[27]. Rivasseau, Vincent; From perturbative to constructive renormalization, Princeton University Press (1991) ISBN 0-691-08530-7.
[28]. Rovelli, Carlo (August 2008). "Loop Quantum Gravity" (PDF). CERN. Retrieved 14 September 2014.

Edward T. H. Wu "Standard Model and Quantum Field Theory versus Wu's Pairs and Yangon and Yangon Theory." IOSR Journal of Applied Physics (IOSR-JAP) , vol. 10, no. 4, 2018, pp. 50-56.