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Quarks And Gluons Composed Of String Structures Interpreted By Yangton And Yington Theory

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Abstract
According to Standard Model, quarks and gluons are subatomic particles derived from a mathematical model based on quantum field theory and Yang Mills Theory. In contrast, based on the Yangton and Yington Theory, all subatomic particles are composed of string structures made of Wu's Pairs, the building blocks of the universe. In this paper, it is proposed that quarks are composed of three twisted strings made of positron, electron and graviton which can very well explain that up quark has 2/3 charge and down quark has -1/3 charge. In addition, with the directions of up quark and down quark of string structures, eight gluons can be formed in one to one correspondence to the gluons of Standard Model having up quarks and down quarks of red, blue and green colors.
Keywords: *Subatomic Particle, Standard Model, Wu's Pairs, Yangton and Yington, String Theory, Quark*

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I. Standard Model

Subatomic particles [1] 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) [2] 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.

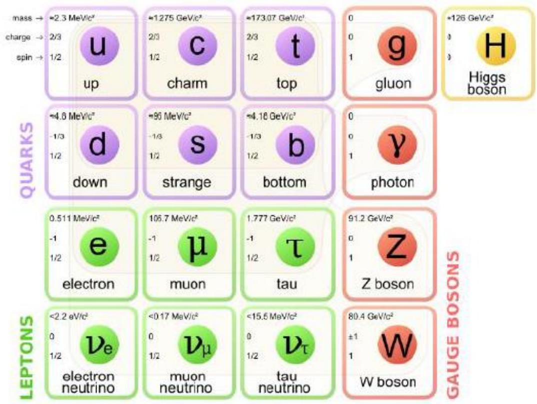

Fig. 1 The elementary particles of the Standard Model.

II. Yangton and Yington Theory

Yangton and Yington Theory [3] is a hypothetical theory of Yangton and Yington circulating antimatter 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 [4], can be made of Wu's Pairs by string force [5], the Yangton and Yington attractive force between two adjacent Wu's Pairs. Furthermore, subject to the structures, the composite subatomic particles are made of elementary subatomic particles (string structures) by four basic force including gravitational force, electromagnetic force, weak force and strong force [5]. Yangton and Yington Theory not only explains the formation of subatomic particles in compliance with String Theory and Unified Field Theory [6], but also interprets the correlations between space, time, energy and matter [7].

III. String Theory and Yangton and Yington Theory

General Relativity [8] and Quantum Field Theory are not compatible. In order to combine them with Unified Field Theory, physicists suggested that all matter, instead of a point structure, must have a linear structure with 10 dimensions like Calabi-Yau manifold (Fig. 2) [9], which is known as "String Theory" [4].

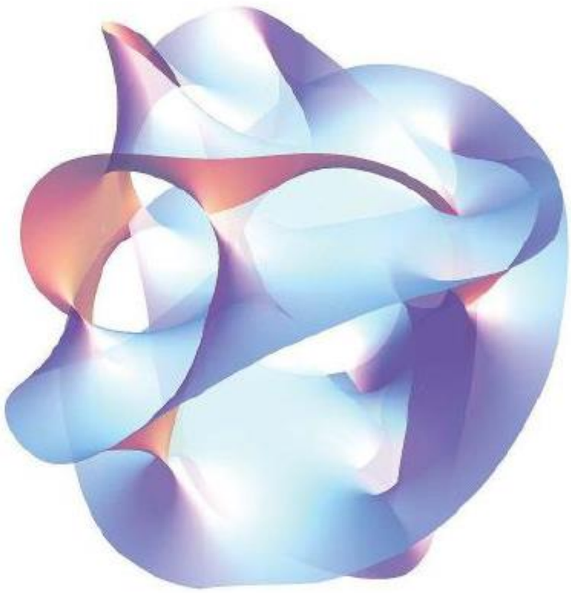

Fig. 2 A cross section of a quintic Calabi-Yau manifold.

Physicists have absolutely no idea what the structures of quarks and photon are, even with the state-of-the-art LHC [10]. However, based on the Yangton and Yington Theory, all subatomic particles should have a string structure is not only very possible, but also quite obvious.

When two Wu's Pairs come together in the same circulation direction (both spin up or spin down), they stack up on each other at a locked-in position, where Yangton of the first Wu's Pair attracts and line up to the Yington of the second one due to the attractive force between Yangton and Yington particles of two adjacent Wu's Pairs. This induced force from Force of Creation between the two Wu's Pairs in the same circulation direction is called "String Force". (There are zero net interactions between two adjacent Wu's Pairs in opposite circulation directions because of the cancellations of attraction and repulsion forces between Yangtons and Yingtons). By repeating the stacking processes, strings (such as gravitons), balls (such as electrons and positrons) and other related structures can be made of Wu's Pairs. These are called "String Structures" (Fig. 3) [1], which complies nicely with String Theory.

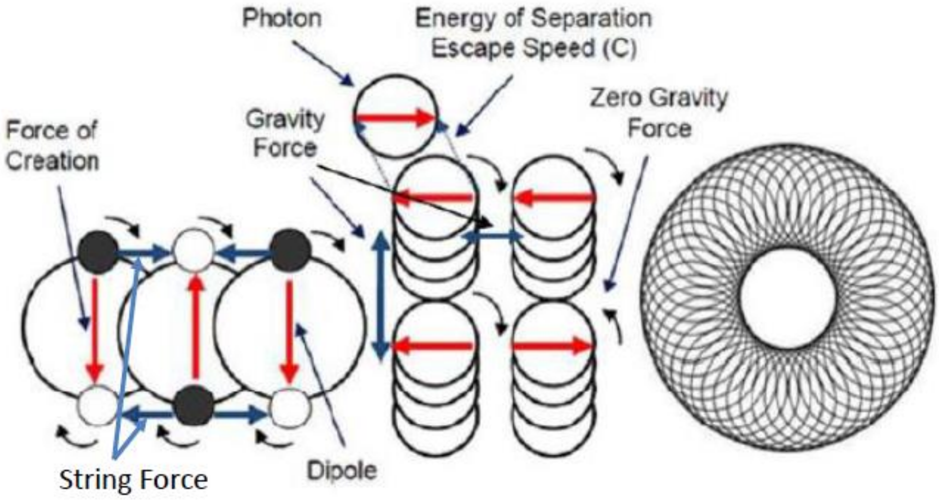

Fig. 3 Wu's Pairs stack up in a preferred direction by string force to form string and ring structures.

IV. Graviton and Gravitational Force

When two string structures come together in the same circulation direction, they can attract each other at the ends of the strings by locking the Yangton of one string to the Yington of the other string (this is known as String Force). Otherwise, there is no interaction if they are in the opposite circulation directions. However, when two string structures come together side by side, no matter the circulation direction, they can adjust themselves to attract each other by forming a group of string forces between them, as the Yangtons of one string contact the Yingtons of the other string during each cycle of the circulations. This attraction only force is known as "Gravitational Force" (Fig. 4) and the string structures that produce the gravitational force are called "Gravitons" including quarks, leptons and bosons, except photon and gluons without string structures and adjustable circulations.

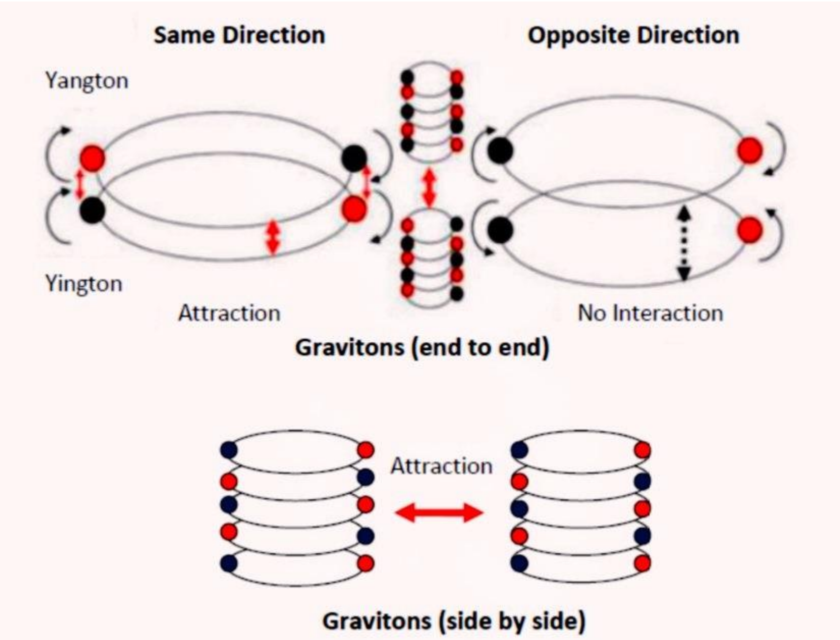

Fig. 4 Gravitational force between two graviton particles

V. Electron and Positron and Electrical Force

When a number of Wu's Pairs come together they can stack up to form a string or ring structures, or cross each other's orbits to form a structure that is either with Yingtons circulating the Yangton center as the electrons or with Yangtons circulating the Yington center as the positrons (Fig. 5) [5].

Because photon, a free Wu's Pair, can be either absorbed or emitted from an electron jumping between two energy levels in an atom, it is proposed that "Electron" is composed of a number of Wu's Pairs, where Yangtons are loosely confined in the center due to the compression of the centrifugal force generated by the circulation of Yingtons. Similarly, "Positron" is composed of a number of Wu's Pairs, where Yingtons are loosely confined in the center due to the compression of the centrifugal force generated by the circulation of Yangtons. Therefore, electron can have an appearance looks like a sphere of Yingtons, and positron, on the other hand, can have the appearance looks like a sphere of Yangtons.

Because of the attraction between Yangton and Yington, a strong attractive force can be generated between an electron and a positron. Also, a repulsive force can be formed between two electrons and between two positrons. These forces are named "Electrical Force". When a positron meets an electron, because of the attraction, they collide and destroy each other to release gamma ray (γ). This phenomenon is known as "Positron-Electron Annihilation" [11].

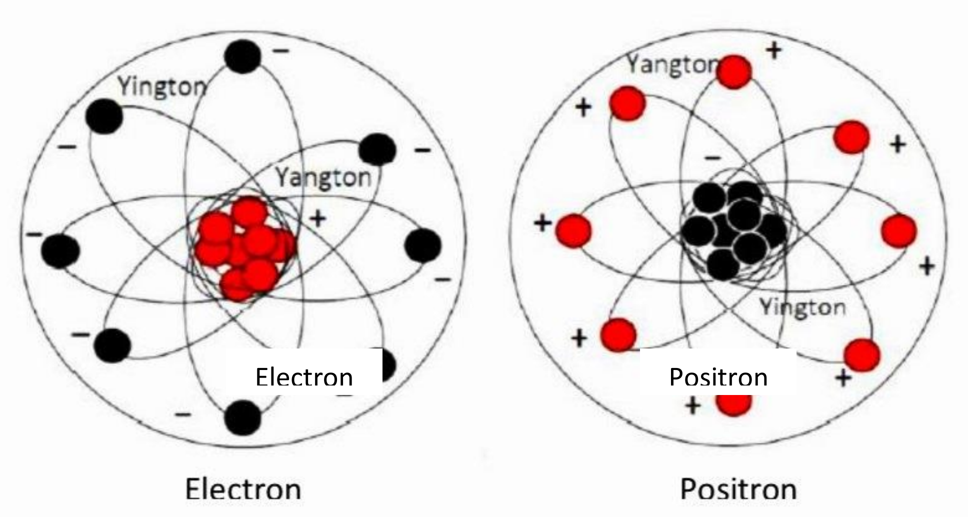

Fig. 5 Hypothetical structures of electron and positron.

The spherical structures of electron and positron are based on the following reasons:

1. The attractive force between electron and positron is similar to that between Yangton and Yington.
2. The repulsive forces between two electrons and between two positrons are similar to that between two Yangtons and two Yingtons.
3. Electron must be a cluster of Yingtons and positron must be a cluster of Yangtons.
4. Because Wu's pairs (Yangton and Yington pairs) are the building blocks of all matters, also Yangton and Yington cannot be separated from each other, therefore an electron can only be structured as a sphere made of Yingtons with a core of Yangtons. Similarly, a positron can only be structured as a sphere made of Yangtons with a core of Yingtons.

VI. Quarks

According to Yangton and Yington Theory and String Theory, all subatomic particles have string structures composed of Wu's Pairs. Also based on Standard Model, up quark has 2/3 charge and down quark has -1/3 charge. Therefore, as shown in Fig. 6, it is proposed that up quark has a three strings structure including two positron strings (2 x 1/3 charge) and one graviton string (1 x 0 charge) for a total of 2/3 charges. Down quark on the other hand, also has a three strings structure including one electron string (1 x -1/3 charge) and two graviton strings (2 x 0 charge) for a total of -1/3 charges.

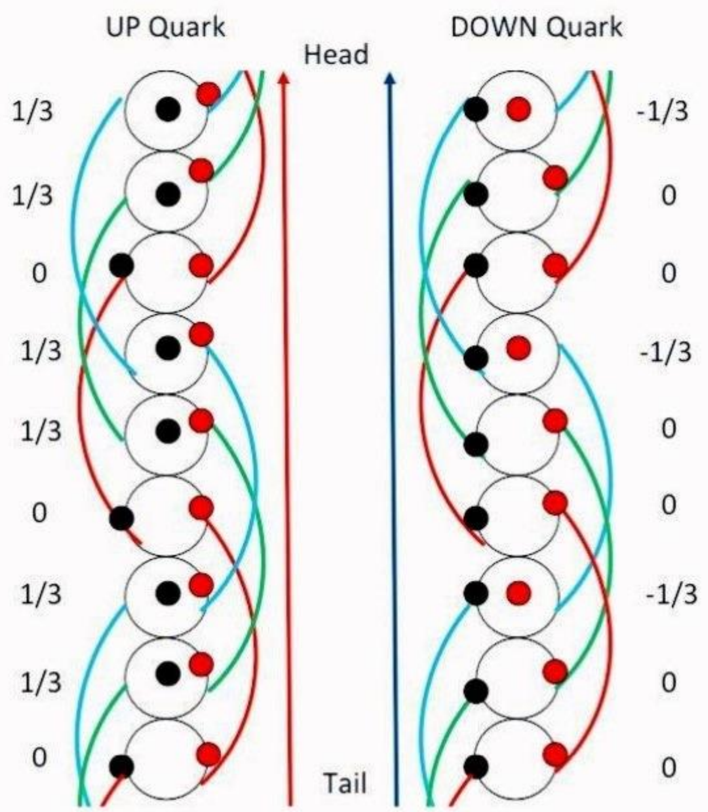

Fig. 6 Three threads string structures of UP Quark (Charge 2/3) and Down Quark (Charge -1/3) based on Yangton and Yington Theory.

In addition, both up quark and down quarks have heads and tails which require proper type of Gluons for right connections.

VII. Colors of Quarks

In addition to the asymmetry due to the uneven distribution of Yangton and Yington in Wu's Pairs, there is another asymmetry called "Color" [1] specified by red, blue and green colors according to Standard Model that are related to the orientation between two connected quarks. Because each proton or 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.

VIII. Gluons

According to Standard Model, gluons are strong force carriers which connect between up quarks and down quarks in proton and neutron. There are a total of eight gluons with the following arrangements: U(D)U/RBG, U(D)U/RGB, U(U)D/RBG, U(U)D/RGB, D(D)U/RBG, D(D)U/RGB, D(U)D/RBG and D(U)D/RGB. Where U is adjacent up quark, D is adjacent down quark, (U) is non-adjacent up quark, (D) is non-adjacent down quark, R is red color, B is blue color and G is green color.

In contrast, based on Yangton and Yington Theory, gluons are only allowed to connect to either two head-in or two tail-in up quarks and down quarks in proton and neutron. A gluon connected to two up quarks or two down quarks with one head-in and one tail-in is prohibited simply because that they can connect themselves without any external connector. As a result, there are eight gluons (Fig. 7) composed of string structures made of Wu's Pairs that are equivalent to the eight gluons in Standard Model as follows:

1. U(D)U/HH = U(D)U/RBG
2. U(D)U/TT = U(D)U/RGB
3. D(U)D/HH = D(U)D/RBG

4. D(U)D/TT = D(U)D/RGB
5. U(U)D/TT = U(D)D/TT = U(U)D/RBG = U(D)D/RBG
6. U(U)D/TH = U(D)D/TH = U(U)D/RGB = U(D)D/RGB
7. U(U)D/HT = U(D)D/HT = U(U)D/RBG = U(D)D/RBG
8. U(U)D/HH = U(D)D/HH = U(U)D/RGB = U(D)D/RGB

Where U is adjacent up quark, D is adjacent down quark, (U) is non-adjacent up quark, (D) is non-adjacent down quark, H is head-in, T is tail-in, R is red color, B is blue color and G is green color.

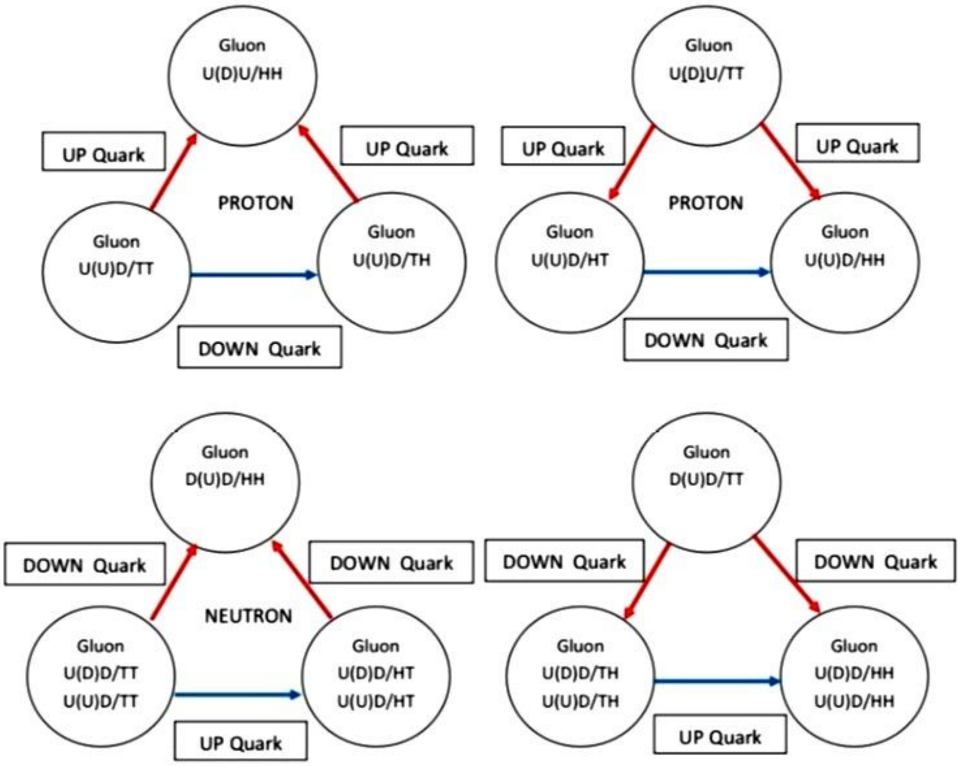

Fig. 7 Eight Gluons: 1. U(D)U/HH = U(D)U/RBG, 2. U(D)U/TT = U(D)U/RGB, 3. D(U)D/HH = D(U)D/RBG, 4. D(U)D/TT = D(U)D/RGB, 5. U(U)D/TT = U(D)D/TT = U(U)D/RBG = U(D)D/RBG, 6. U(U)D/TH = U(D)D/TH = U(U)D/RGB = U(D)D/RGB, 7. U(U)D/HT = U(D)D/HT = U(U)D/RBG = U(D)D/RBG, 8. U(U)D/HH = U(D)D/HH = U(U)D/RGB = U(D)D/RGB. Notations: U is adjacent UP Quark, D is adjacent Down Quark, (U) is non-adjacent UP Quark, (D) Non-adjacent Down Quark, H is Head-in, T is Tail-in, R is Red, B is Blue and G is Green.

We don't know what the inside structures of gluons are, however the fact that gluon is attracted and connected to two quarks by 6 string structures explains why strong force is many magnitudes stronger than electromagnetic, gravitational and weak forces.

IX. Proton and Neutron

A neutron [12] is composed of three quarks, one up quark and two down quarks, and three gluons. Since all matters have string structures composed of Wu's Pairs, it is believed that a neutron containing three quarks and three gluons should have the shape of a donut or a triangular pretzel (Fig. 8).

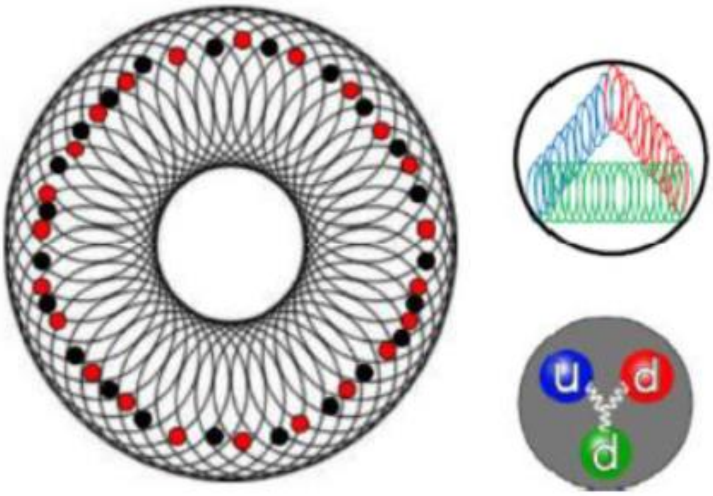

Fig. 8 A hypothetical structure of neutron.

A proton [13] is also composed of three quarks, two up quarks and one down quark, and three gluons. Therefore, like the neutron, a proton containing three quarks and three gluons should also have the shape of a donut or a triangular pretzel. However, because of the Inverse Beta Decay, it is believed that a proton contains a neutron with an embedded positron and electron neutrino (Fig. 9).

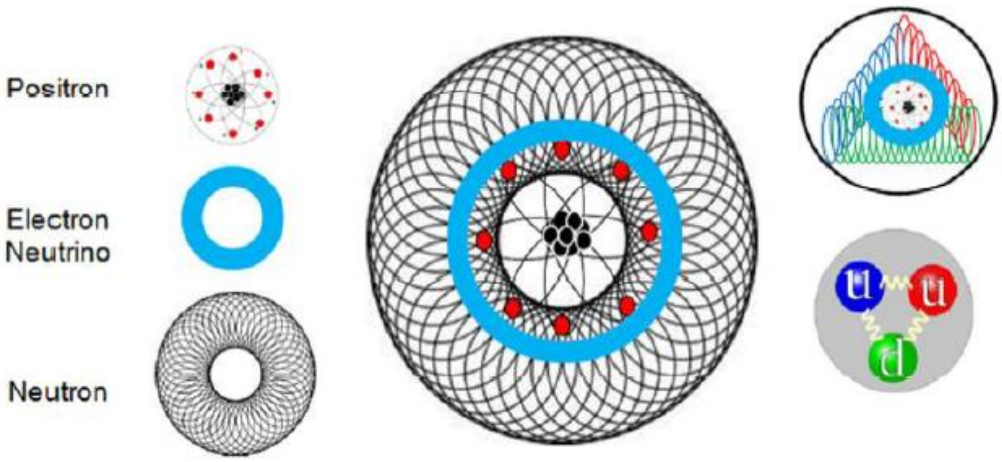

Fig. 9 A hypothetical structure of proton.

X. Weak Force, Strong Force and Gravitational Force in Nucleus

Weak force, strong force and gravitational force are found both inside and between protons and neutrons in the nucleus.

The bonding force between neutron and positron (part of proton) is known as "Weak Force" (Fig. 9) [14]which is generated between the Yingtons in the neutron and the Yangtons on the surface of the positron.

Gluon is the carrier of strong force which connects two quarks in a proton or neutron. Gluon can also connect two adjacent neutrons or a pair of neutron and proton [15]. When a neutron comes close to a proton made of a neutron, positron and electron antineutrino, both the weak force between neutron and positron (Fig. 10), and the strong force between neutron and neutron (Fig. 10) by sharing gluons are generated to overcome the repulsive force between two protons (or two positrons) so as to keep them together inside the nucleus.

Furthermore, gravitational force can also be generated between the two neutrons in the nucleus with either the same or opposite circulation directions (this is revised from my previous publication [5]).

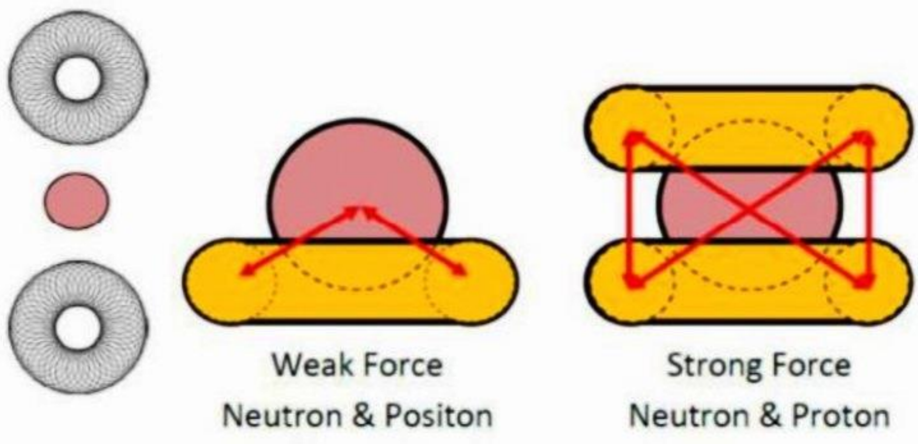

Fig. 10 Weak force and strong force.

XI. Strong Forces Between Proton/Neutron and Neutron/Neutron Pairs

According to Yangton and Yington Theory, in both proton and neutron, gluons [1] (the strong force carriers) serve as the connectors of two quarks influenced by the third quark with a mixed color of preferred orientation. It is proposed that the gluon connected between two quarks in the parent neutron or proton can comply with the quark in the adjacent neutron such that a close packed structure can be formed [15]. For example, as illustrated in Fig. 11, a gluon (UDD) in the parent neutron connected between an up quark (U) and a down quark (D) and influenced by the a third down quark (D), can be connected with the down quark (D) of the adjacent neutron, such that the strong force between two adjacent neutrons, or between a neutron and proton makes no difference to that between the three quarks inside a single neutron or proton.

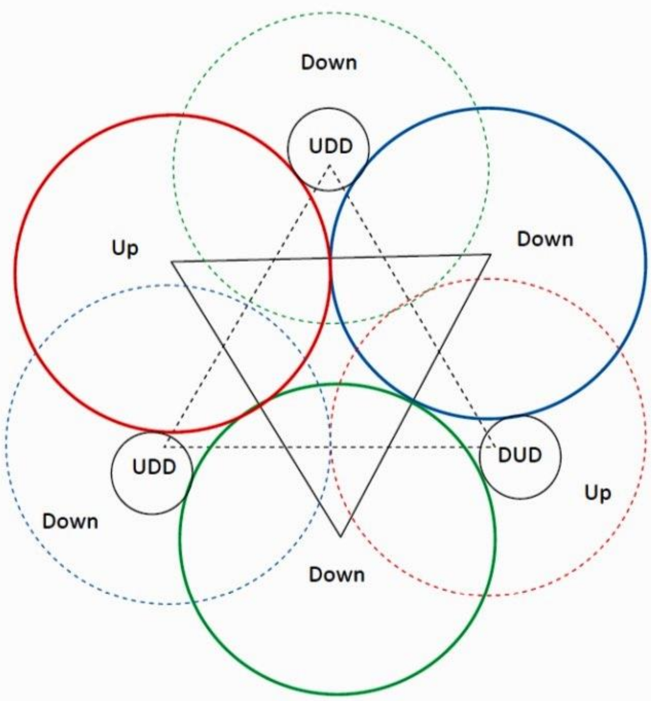

Fig. 11 Strong forces between quarks and gluons and between two neutrons.

XII. Conclusion

According to Standard Model, quarks and gluons are subatomic particles derived from a mathematical model based on quantum field theory and Yang Mills Theory. In contrast, based on the Yangton and Yington Theory, all subatomic particles are composed of string structures made of Wu's Pairs, the building blocks of the universe. In this paper, it is proposed that quarks are composed of three twisted strings made of positron, electron and graviton which can very well explain that up quark has 2/3 charge and down quark has -1/3 charge. In addition, with the directions of up quark and down quark of string structures, eight gluons can be formed in one to one correspondence to the gluons of Standard Model having up quarks and down quarks of red, blue and green colors.

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