In Sphere Theory, the universe is a sphere made of spheres. Most of these spheres are packed in a cuboctahedron structure, but there are inclusion and dislocation defects. As part of the theory the high mass particles come from combinations of the layers of the cuboctahedron structures. The mass of these layers is shown in this paper, but what is interesting, is that there is one layer, that should be the most stable layer, that is missing as a stand-alone layer. Since this layer is one of the major layers for the first 3 dimensional object in the creation of the universe, which is the number of spheres on the 2nd layer of a cuboctahedron, it is proposed here, that it will be the mass of one of the most major components of dark matter. Why is it dark matter? It would be dark matter, because it would be one of the fractals of a stability region in the universe. The actual prediction for this major component of dark matter would be about 12.78 GeV.

Due to the propagation of light, gravity, charge, magnetism etc., and their quantized values, it has been hypothesized that, the universe should be filled with some type of almost homogeneous structure. It was shown in "Discrete Calculations of Charge and Gravity with Planck Spinning Spheres and Kaluza Spinning Spheres"(1) that charge and gravity could be modeled by a sphere with a Compton wavelength radius of the neutron. If the neutron Compton wavelength is important to the propagation of charge and gravity then it is proposed that it also must be connected to some structure of the volume in which these forces are transmitted. "Underlying Cuboctahedron Packing of Planck Spinning Spheres Structure of the Hubble Universe" establishes a strong correlation, on multiple levels, between the larger mass quarks and bosons, and a cuboctahedron –Vector Equilibrium structure using the mass of the neutron and the combining of the layers of a cuboctahedron packing of spheres.

The layers of a cuboctahedron follow a consistent progression for the quantity of spheres that can be packed in a layer. The masses of the w boson, z boson, bottom quark, top quark and the Higgs can be directly correlated to the first few layers of a cuboctahedron structure, and in a mirror manner described in this paper.

I. Calculations

The calculation for the mass of one of the most stable components of dark matter is very simple. It comes to about 12.78 GeV. In the paper of "Predicting the Gravitational Constant from the New Physics of a Rotating Universe" [6] It is shown, that the first 3 dimension object, has 42 components to its structure, which is the 2nd layer of a cuboctahedron made of packed spheres, which is the most efficient way to pack spheres. [7] In the rest of this paper, it is shown that high mass bosons are all parts of the layers of the cuboctahedron structure. One stand alone layer is the 2nd layer of the cuboctahedron, which has 42 spheres. The calculation for the mass of this particle would be as follows.

(42)*0.939565378 Gev/3*.97188= 12.78 GeV

The value of .97188 just comes from a typical ratio of the masses of particles to the layers of the cuboctahedron structure. Sometimes it is about .972 and sometimes about .989 which has to do with accuracy of measurements and sometimes with some, as of yet, undefined mechanism. Regardless the value of the mass of the dark particle, is predicted to be about 12.78 GeV.

When using cuboctahedron packing of spheres, a pattern for the masses of the W, Z, and Higgs bosons and Bottom and Top quarks can be observed. This is a calculated value, which is shown below.

Note that cuboctahedron packing of spheres has a predictable sequence to the amount of spheres contained in each layer.(3)

$$Layer(N) = 10N^2 + 2$$

except layer 0 which is equal to 1

Layer 0 - 1 sphere

Layer 1 - 12 spheres

Layer 2 - 42 spheres

Layer 3 - 92 spheres

Layer 4 - 162 spheres

Layer 5 - 252 spheres

Layer 6 - 362 spheres

Mystery particle at 28 GeV

The mystery particle is a new unexpected particle found at Cern(5) in 2018. Apparently it would require physics so weird that no one has even thought about it. The calculation below shows that it conforms to the cuboctahedron layer structure for sphere theory of physics.

The accepted value for the Z boson mass is as follows.

Mystery particle mass 28 GeV/c2 (5)

If we take the 3rd layer of sphere packed cuboctahedron structure we have 92 spheres. Multiplying this by 1/3 of the neutron mass yields the following;

(92)*0.939565378 Gev/3= 28.81 GeV

The value of 28 and 28.81 GeV are very close. Later on we find other particles that use the 3rd layer of the cuboctahedron. It would seem likely that this mystery particle would come from the decay of these particles. The particles that also use the 3rd layer are the W boson, the Top Quark, and the Higgs particle. The ratio of 28/28.81 is .972, which is very similar to what is obtained with the down quark of .974, which is shown below. Of courses the masses are not that well known, so the exact ratio is not known either.

W and Z Bosons

The W boson and Z boson mediate the weak force. From "Discrete Calculations of Charge and Gravity with Planck Spinning Spheres and Kaluza Spinning Spheres"(1) we found that the forces of charge and gravity could be calculated using 1/3 of the mass of the electron or neutron in the equations. We will also use 1/3 of the masses of the neutron for correlating the masses of the z boson and w boson.

The accepted value for the Z boson mass is as follows.

Z boson 91.1876±0.0021 GeV/c2 (2)

If we take the 2nd and 5th layer of sphere packed cuboctahedron structure we have 42 and 252 spheres. Multiplying this by 1/3 of the neutron mass yields the following;

(42+252)*0.939565378 Gev/3= 92.077407044 GeV

When we take the ratio of the actual Z boson mass to this calculated value we obtain.

0.99033631

The accepted value for the W boson mass is as follows.

W boson 80.385±0.015 GeV/c2 (2)

If we take the 3rd and 4th layer of the sphere packed cuboctahedron structure we have 92 and 162 spheres. Multiplying this by 1/3 of the neutron mass yields the following;

(92+162)*0.939565378 Gev/3= 79.5498686 GeV

When we take the ratio of the calculated value to the actual mass of the w boson we obtain 0.98961085

It is interesting that the Z boson and W boson would use different layers for calculating their masses. It is also interesting that the measured values are nearly symmetrical with the calculated values. That this is so is a freakish accident or z and w bosons are connected to a cuboctahedron structure.

Bottom Quark and Top Quark

If we take the 0th and 1st layer of the sphere packed cuboctahedron structure we have 1 and 12 spheres. Multiplying this by 1/3 of the neutron mass yields the following;

Actual Bottom quark mass 4.18 GeV

Cuboctahedron Layer 0 + Layer 1 = (1+12)*0.939565 Gev/3= 4.07 Gev

When we take the ratio of the calculated mass to the actual measured value of the Bottom quark mass we obtain 4.07/4.18=0.974

Top quark mass 173.4 Gev

If we take the 2nd 3rd 4th, and 5th layer of the sphere packed cuboctahedron structure we have 42, 92, 162, and 252 spheres. Multiplying this by 1/3 of the neutron mass yields the following;

(42+92+162+252)*.939565378 Gev/3= 171.627 Gev

When we take the ratio of the calculated value to the actual measured value of the Top quark mass we obtain 171.627/173.4=0.9898

It is interesting that the bottom quark and top quark would use different layers for calculating their masses. It is also interesting that the measured values are nearly symmetrical with the calculated values. That this is so is a freakish accident or bottom quark and top quark are connected to a cuboctahedron structure. Note that the ratio of the bottom quark and top quark masses, to the calculated values are not as equal at the w and z boson.

Higgs Bosons

The mass of the Higgs is not well defined, but two values are being discussed. Which I have quoted from the following article(4)

Higgs upper mass boson 126.6±0.3±0.7 GeV/c^2(4)

Higgs lower mass boson 123.5±0.9+0.4-0.2 GeV/c^2(4)

If we take the 4th and 5th layer of sphere packed cuboctahedron structure we have 162 and 252 spheres. Multiplying this by 1/3 of the neutron mass yields the following;

Cuboctahedron Layer 4 + Layer 5

(162+252)*0.939565378 Gev/3 = 129.66 Gev

When we take the ratio of the actual upper measured value of the Higgs mass to the calculated we obtain 126.6/129.66=0.9764

Or alternate version

If we take the 2nd and 6th layer of sphere packed cuboctahedron structure we have 42 and 252 spheres. Multiplying this by 1/3 of the neutron mass yields the following;

(42+362)*0.939565 Gev/3 = 126.53 GeV

When we take the ratio of the actual lower measured value of the Higgs mass to the calculated we obtain 123.5/126.53=0.9761

It is interesting that the upper and lower Higgs mass would use different layers for calculating their masses. It is also interesting that the measured values are nearly symmetrical with the calculated values. That this is so is a freakish accident or bottom quark and top quark are connected to a cuboctahedron structure. Note that the ratios are almost identical. The cuboctahedron layers can be combined in a number of ways that result in values that are close to the measured values of the mass of the Higgs.

III Discussion

To my knowledge there is no mainstream proposal for the mass of the bosons or the large mass quarks. The, strong, correlations of the layers of the cuboctahedron, with the masses of these particles, on multiple levels could be reason for studying this relationship further. It seems clear, that a cuboctahedron/vector equilibrium structure of the universe, is a possibility. The mystery particle at 28 GeV also seems to conform to this model.

Please note that the masses of the top quark and the sum of the masses of the w and z boson are nearly identical. While this has not gone unnoticed in the past it seems to be serendipitous that a cuboctahedron layer combination was found for each.

Please note that more light will be shed on the Higgs Boson's mass or masses when the Large Hadron Collider is updated.

References

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6) http://vixra.org/pdf/1903.0253v3.pdf

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