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1.0 Abstract

This paper shows that the gravitational constant is approximately $3.7*10^{-122}$ assuming gravity travels through one level of dimensions. It is also explained why the gravitational constant is smaller than this because gravity may actually travel through multiple levels of dimensions and curve our perception of space.

Sarnowski showed in “Evidence for Granulated Space” (1) that gravitational forces can be calculated from Spheres within Spheres. In Sarnowski’s paper “The Holographic Principle and How can the Particles and Universe be Modeled as a Hollow Sphere”, it was shown that the outer surface of a sphere packed with spheres, closely matches the amount of discontinuities created when packing spheres concentrically and thus predicts the amount of equivalent mass in the universe (2) Using Planck Pressure and the parameters derived for the Planck Sphere in “Evidence for Granulated Space” (1) and “The Holographic Principle and How can the Particles and Universe be Modeled as a Hollow Sphere”(2) paper shows that the Cosmological Constant is the inverse ratio of Planck Spheres in the Hubble Sphere Universe.

2.0 Assumptions

Note that calculations for this paper are in section 4.

Assumptions

Where c = The speed of light
and h=Planck Constant
and G=Gravitational constant
and pi=π
and R=Hubble Sphere Radius
N=the number of Kaluza Spheres on the surface of the Planck Sphere
P=the number of Planck Spheres on the surface of the Universe

3.0 Background Calculations

3.1 Modeling Elementary Gravity

In this section we work on developing the following equation.

$$N = 2\pi^3 hc / G(Mn)^2 \quad [3.1.0]$$

Compton Radius of Neutron $$r = \frac{h}{cMn} \quad [3.1.1]$$

Compton Frequency of Neutron $$f = \frac{Mnc^2}{h} \quad [3.1.2]$$

where pi or π is pi or π
where h is plancks constant
where c is speed of light
where Me is the mass of the electron
where Mn is the mass of the neutron
where Mp is the mass of the proton
and G is the gravitational constant

“N” is a number of Kaluza discontinuities within a Planck. It is proposed that mass, forces, charge etc., comes from imperfect packing of spheres. If one has a basket of spheres normally if they were perfectly packed it could result in a cuboctahedron structure. However if there was a force that pulled all of these spheres toward a center then the spheres would also try to pack in concentric shells. It can be shown mathematically that the amount of defects that would occur would be equal to the amount of spheres on the final layer of packing and the effective radius for calculating momentum is 0.25r. So a sphere with radius 100 spheres would have total defects of 4*pi*100^2. Therefore, if the universe or a particle or deeper dimension yet, is actually a packing of spheres there would be two opposing packing techniques. Packing everything perfectly in a cuboctahedron structure or packing spheres concentrically in shells. These two different opposing packing techniques would give rise to forces, mass etc. This paper intends to show how an equation could be formed to model gravity.

We start with the traditional equation for the force of gravity and then modify it to obtain an elementary gravity.

$$F = \frac{GM1M2}{r^2} \qquad [3.1.3]$$

A number of questions arise.

1. Is not F=ma? Is there some mass times acceleration that is equal to the gravitational force? If one breaks down gravity into one tiny object that carries force is there a point at which that mass times acceleration, or more accurately quantum gravitational momentum (graviton) times rate of graviton emission, that is equal to the traditional equation for gravitational force. Is the graviton a virtual momentum or virtual force?

2. Is there some elementary mass, just like there is an elementary charge where, at some discrete point, M1 and M2 would have a smallest value and are directly related to distance “r”. Therefore the equation became modified to the following. In this model, the mass of the neutron, is proposed to be the mass “M”.

$$ma = \frac{GMM}{r^2} \qquad [3.1.4]$$

One wonders if the particles we experience are made of much smaller particles. One sees evidence of this possibility with Planck length. In this model this smaller mass is evaluated as the mass of the neutron “M” over some number “N”.

$$\frac{M}{N} a = \frac{GMM}{r^2} \qquad [3.1.5]$$

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What is the acceleration of, A square, a circle, a sphere, a spherical shell? A spherical shell works for both force of charge and force of gravity. When attempts to pack spheres concentrically around other spheres a certain amount of defect space is made in relation to perfect packing. It can be shown that this amount of defect space is equal to the outer layer of spheres. So this is justification for using a hollow sphere when the actual geometry is not an actual hollow sphere. So the equation for acceleration of a spherical shell is as follows.

The distribution of these discontinuities can be summed to be a spherical shell. This is shown in the paper “The Holographic Principle and How can the Particles and Universe be Modeled as a Hollow Sphere”(2)

$$a = \frac{2}{3} r (2\pi)^2 f^2 . \qquad [3.1.6]$$

Then the equation evolved more to

$$\frac{M}{N}\frac{2}{3}r(2\pi)^2 f^2 = \frac{GMM}{r^2} \qquad [3.1.7]$$

where r is a radius and f is frequency.

Then the equation evolved more to

$$\frac{M}{N}\frac{2}{3}r(2\pi)^2 f^2 = \frac{GMM}{4\pi r^2} \qquad [3.1.8]$$

Propose that all masses and charges are divided by 3. Thus the equation becomes;

$$\frac{M}{N}2r(2\pi)^2 f^2 = \frac{GMM}{4\pi r^2} \qquad [3.1.9]$$

Propose that radii are different, depending which force they are experiencing. The rational for this is explained later in the discussion. It has to do with how the discontinuities are more concentrated at the center and the concentration of defects decreases inversely proportional to the radius. A radius of 10 would have approximately 20 percent defects, but a radius of 20 has only about 20 percent defects. To compensate for a large sphere the radii "r" are each divided by 4. Thus the equation becomes;

$$\frac{M}{N}2r(\pi)^2 f^2 = \frac{GMM}{\pi r^2} \qquad [3.1.10]$$

This simplifies

$$N = 2\pi^3 hc / G(Mn)^2 \quad [3.1.11]$$

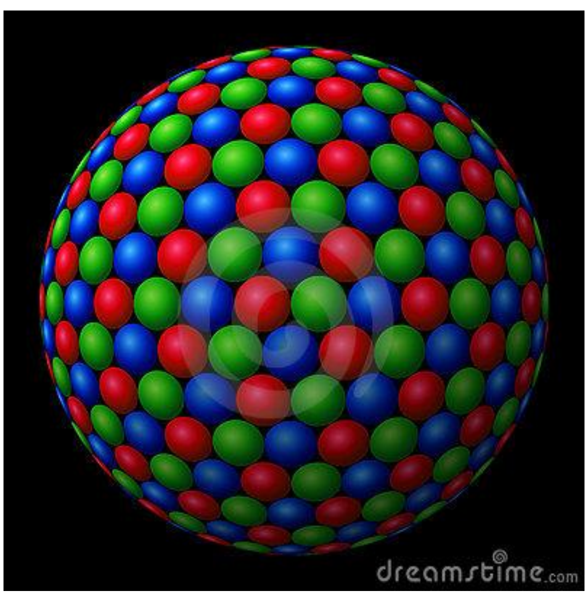
Where substituting values from the appendix gives a value of N.

$$N = 6.57920\,(31) * 10^{40} \quad [3.1.12]$$

It is proposed that the sphere described, the Planck, is composed of Kaluza. The number N would then be the number of Kaluza on the outside layer of the Planck. In section 5 and 6 it is shown that the Planck and Kaluza give meaning to some of the Planck dimensions. Where N is the number of Kaluza Spheres on the surface of the Planck Sphere. This number "N" is clearly reminiscent of the Dirac's large number hypothesis.

3.2 The Holographic Principle and How can the Particles and Universe be Modeled as a Hollow Sphere

In Sarnowski's " The Holographic Principle and How can the Particles and Universe be Modeled as a Hollow Sphere" It was shown that the outer layer of a sphere is nearly equal to the total amount of discontinuities created when packing spheres into a spherical shape, which is Sarnowski's explanation for mass and energy in the universe. The simple calculations are shown below for reference.



Further imagine attempting to place another layer of spheres around this sphere. Initially, the inner spheres have a high percentage of discontinuities, but when one gets to the billionith, billionith, billionith layer, the percentage of discontinuities get very small. How does one figure out the amount of discontinuities? A simple integration can solve this problem! Each layer has $4*\pi*x^2$. So if we use the Equation 3, below, we can find out the total amount of discontinuities. Discontinuities between layers would be

$$Discontinuitiesbetweenadjacentlayers = 4pi*(x+1)^2 - 4pi*x^2$$ from 0 to x [3.2.1]

Integrate Equation 3.2.1 from 0 to x

Let Sd= Sum of Discontinuities between adjacent layers of concentrically packed sphere made of spheres

Integrating Equation 3.2.1

$$Discontinuitiesbetweenadjacentlayers = 4pi*(x+1)^2 - 4pi*x^2$$ from 0 to x [3.2.1]

$$Sd = \int_0^x 4pi*(x+1)^2 - 4pi*x^2 dx. \quad [3.2.2]$$

Therefore

$$Sd = 4pi(x^2 + x) \quad [3.2.3]$$

Please note that, as x becomes very large, only x^2 dwarfs x

And then the equation becomes

$$Sd = 4pi(x^2) \quad [3.2.4]$$

4.0 Calculations of the Cosmological Constant

The value $N = 6.57920*10^{40}$, calculated in equation 3.1.12 is the amount of Kaluza Spheres on the outside of the Planck Sphere. The Planck Sphere is the basic structure of the Universe and the basic building sphere for the Particles of Mass. Originally it was thought that the amount of Planck Spheres on the outside of the Universe should be $N^2 + N$ however to achieve a universe the size of the Hubble Sphere, it was necessary to multiply the value of by $\frac{3}{4*\pi^3}$

Therefore the number of particles(Planck Spheres) on the outside of the Universe becomes

$$P = (N^2 + N)(\frac{3}{4*\pi^3}) = 1.04703*10^{80}$$ [4.0]

However, if P were strictly $N^2 + N$, call it Pn, then the amount of particles on the outside of the universe would be $Pn = (6.57920*10^{40})^2 = 4.3286*10^{81}$ Please note, for simplicity the value N vs N^2 is so small that it is neglected from the calculation. A simple calculation shows a sphere of area $4.3286*10^{81}$ will have a volume of $2.6779*10^{121} spheres$, the inverse of this being $\Lambda = 3.7343*10^{-122}$ thus the close approximation to the cosmological constant. In reduced Planck units the best estimate for the cosmological constant is $\Lambda = 3*10^{-122}$ (3)

Note: This author, Sarnowski, proposes that the Hubble Sphere is the limits of our universe. One notes in equation 4.0. That that the value is divided by π^3 indicating that gravity may be traveling through 3 levels of spheres and this could account for some authors advocating for a universe of 46 billion light years in radius vs this authors, Sarnowski, that the universes size is 13.77 billion light years.

5.0 Discussion

It was shown above that Sphere Theory can account for the Cosmological Constant. The Cosmological Constant is equivalent to the inverse of the amount of Planck Spheres in the universe which comes to the following value of $\Lambda = 3.7343*10^{-122}$. It will be shown in another paper that the cosmological constant can be produced from the amount of elementary gravitons produced since the beginning of the universe. These gravitons, over time change the rotation of the Planck Spheres ever so slightly, but on average change Planck Spheres equally.

6.0 References

1.) http://en.wikipedia.org/wiki/Friedmann_equations
2.) http://vixra.org/pdf/1601.0103v1.pdf
3.) John D. Barrow The Value of the Cosmological Constant
4.) M. J. Sarnowski http://www.vixra.org/abs/1403.0502