# The Mass, Size, and Equilibrium Density of the Universe in a Rotating Universe

## 1.0 Abstract

The Big Bang theory basically states that the universe is expanding and that there is point that there could be a critical density at which the universe could go on expanding forever or crunch. The theory of a rotating universe can also have a red shift, but the equations are different and the critical density is different for rotating universe. In fact, the particular rotating universe that this theory deals with is that our universe may be in equilibrium with neither contraction or expansion but with kinetic and potential energy.

In Sphere Theory of the Universe, the universe is rotating. This rotating universe has mass where parts of it are moving at familiar velocities and some are moving at relativistic velocities. Size itself is confused, in that nothing really travels in a straight line, and therefore we are trying to weed out these problems in calculating the size of the universe. It appears that light itself travels in a spiral, which is controlled by gravitational forces. The observed quantities of particles are further complicated in that the relativistic velocities make the quantities of particles look higher. The concentrations of particles are highest at the center of the sphere, but the rotation imparts energy that makes things look like the concentration is mostly uniform. This paper tries to sort out these problems and present a Mass, Size, and Equilibrium Density of the Universe. The mass of the universe, which would include matter, dark matter, and dark energy.

## 2.0 Calculations

What is different about this paper from other papers about the universe is that we have figured out part of the mechanism of the universe that controls the amount of matter and energy in the universe. This was shown in the paper “Predicting the Gravitational Constant from the New Physics of a Rotating Universe”[1] The amount of energy in the universe was found to be proportionally equivalent to $1.8654150388941*10^{81}$ *Neutrons*

### 2.1 Mass of universe

The mass of the universe is related to the amount of Planck Spheres on the outside of the universe, which is related to the amount of discontinuities formed when packing spheres into a sphere. This is shown in the following paper. “How can the Particles and Universe be Modeled as a Hollow Sphere”[2]

The rest mass of the universe is calculated from the following equation.

$$1.8654150388941*10^{81}*\frac{1}{3}*\frac{1}{\pi}*M_n = 1.05523813872938*10^{53}\,Kg \quad [1]$$

The value $N = 1.8654150388941*10^{81}$ was calculated to the energy equivalent particles of the universe. It was found over and over again in sphere theory, that particles are all composed of multiples of 3 components. Therefore "N" is divided by 3. It was found in "Predicting the Gravitational Constant from the New Physics of a Rotating Universe"[1] that the rotational energy of the universe and its Lorentz equivalent was equivalent to $\pi$ times the rest mass. Therefor the equation is divided by $\pi$. Equation 2 is the calculation for the sum energy from a rotating universe.

$$\int_n^{-n} \frac{1}{n} \frac{x^2-(x-1)^2}{(1-(x/n)^2)^{.5}}\,dx = \pi \quad [2]$$

Then the equivalent rest particles are multiplied by the mass of the neutron for a total mass shown in equation 1.

## 2.2 Calculating the Diameter of the universe

$$\sqrt{1.8654150388941*10^{81}\,\frac{1}{3}\,\frac{M_p}{M_n}\,\frac{12^{.5}}{\pi}\,\frac{1}{\pi}\,\frac{1}{4\pi}}\;\frac{h}{4.554032147*c*M_n}*3 = 3.6202034570837*10^{24}\,meters$$

Due to light having to travel in a spiral through the Planck spheres the speed of light must be multiplied by 4.554032147

Density of the universe dividing the mass of the universe by the volume of the universe

$$\frac{1.05523813872938*10^{53}}{[3.6202034570837*10^{24}]^3*\frac{4\pi}{3}} = 9.683574393243118*10^{-22}\,\frac{kg}{m^3}$$

Density of the universe balancing kinetic energy with potential energy from Equation 14 below derived in section 3

$$\frac{[c\pi]^2}{\frac{\pi}{12^{.5}}\frac{2}{3^{.5}}G*[3.6202034570837*10^{24}]^2} = 9.683574393243118*10^{-22}\,\frac{Kg}{m^3}.$$

## 3.0 Calculation of Setting Potential Energy equal to Kinetic Energy for a rotating universe

$$KineticEnergy = E_k = \frac{1}{2} I\omega^2 \text{ where} \quad [4]$$

$$\omega = \frac{v}{r} \quad [5]$$

$$I = \frac{2}{3} m r^2 \quad [6]$$

In sphere theory the original state of the universe was that discontinuities were created by packing spheres around spheres. The concentration of discontinuities, which are proposed to cause mass are more concentrated at the center of the universe. Due to mass appearing to be even distributed throughout the universe it is proposed, in the original state, the kinetic energy in equations 7 and 8 should be ½ of their calculated value. The final value is shown in equation 8.1.

Combining

$$E_k = \frac{1}{2}\frac{2}{3}\frac{v^2}{r^2} m r^2 \quad [7]$$

Which simplifies to

$$E_k = \frac{\pi m v^2}{3} \quad [8]$$

$$E_k = \frac{m v^2}{6} \quad [8.1]$$

where $v = c$ [9]

we must set the kinetic energy equal to the potential energy

Potential Energy= $\frac{\rho G 4\pi r^2 \pi m}{3}$ [10]

When calculating the Potential Energy, $4\pi$, is already built into G there for the Equation is actually

Potential Energy= $\frac{\rho G r^2 \pi m}{3}$ [11]

Setting Equation 8 equal to Equation 11 yields

$$\frac{\pi m (\pi c)^2}{6} = \frac{\rho G r^2 \pi m}{3} \quad [12]$$

The potential energy, specifically the radius squared, must be multiplied by $\frac{\pi}{12^{0.5}}$ to account for the packing of spheres on the outer surface since it is not a solid, but a

packing of spheres. The kinetic energy must be multiplied by the square root of 3 due to the universe actually rotating on 3 axes.

The equation becomes

$$3^{0.5}\frac{\pi m(\pi c)^2}{6}=\frac{\rho G\frac{\pi}{12^{0.5}}r^2\pi m}{3} \quad [13]$$

Solving for density $\frac{[c\pi]^2}{\frac{\pi}{12^{.5}}\frac{2}{3^{.5}}G*[r]^2}=\rho=9.683574393243118*10^{-22}\frac{Kg}{m^3}$ [14]

Equation 14 is an approximation of the equilibrium density. The universe is much smaller than expected, but appears infinite as the curvature curves to a spherical radius. Due to this curvature and the dark energy coming from a rotating universe, the equilibrium density is much higher than a Critical Density of about $9.48*10^{-27}\frac{kg}{m^3}$ of the

$M_p = Massofproton$

$M_n = Massofneutron$

$h = Planckconstant$

$c = speedoflight$

## 4.0 Discussion

The current model of the universe assumes that the universe is expanding. This makes sense to make this assumption due to the red shift of light being more, red-shifted, the farther a light source is from the earth. There are a number of equations that govern how the red shift is calculated.

Gravitational Redshift $[Z+1]^2=\frac{gttreceiver}{gttsource}$ [1]

Transverse Redshift $[Z+1]^2=\frac{1}{1-(v/c)^2}$ [2]

Radial Redshift $[Z+1]^2=\frac{1+\frac{v}{c}}{1-\frac{v}{c}}$ [3]

# The Mass, Size, and Equilibrium Density of the Universe in a Rotating Universe

In Big Bang theory it is assumed that the Redshift is mostly Radial Redshift as shown in Equation 3. Using current technology, it is impossible to measure if the motion is actually Transverse, that is moving perpendicular to our view, or Radially, that is moving away from our view.

This paper calculated a critical density assuming a mostly transverse motion due to a rotating sphere on 3 axes. This will be in keeping with Granular Spacetime as described in Sphere Theory's "Evidence for Granular Spacetime" [3] In Granular Spacetime is was found that the spheres of the construction of the universe can be modelled as spheres spinning on 3 perpendicular axes.

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## 5 References

1 http://vixra.org/pdf/1903.0253v3.pdf
2 http://vixra.org/pdf/1407.0183v3.pdf
3 http://vixra.org/pdf/1601.0234v6.pdf