GFT

CHAPTER NINETEEN

The Unification of Gravity and Electromagnetism: Deriving Newton's Gravitational Force Constant

Having mathematically unified gravity and static electricity through Corollary IIaa, the GFT will now mathematically unify gravity and electromagnetism. This is accomplished by deriving Newton's gravitational force law and Newton's gravitational force constant via the magnetic moment.

The magnetic moment is defined as

$$\mu = \gamma L$$

The gyromagneto ratio is defined as

$$\gamma = -\left(\frac{e}{2m}\right)$$

Via Postulate II angular momentum is defined as

$$L = mcr$$

Via Corollary IIE

$$B = \frac{R}{r^2}$$

Where B is the magnetic field and R is resistance in ohms.

Via Corollary IIB

$$Coulomb's\ Constant = k = Rc$$

The potential energy associated with the magnetic moment is defined as

$$U = \mu B$$

The torque associated with the magnetic moment, μ , tends to align the magnetic moment with the magnetic field B thus forming the lowest energy configuration. The difference in energy between aligned and anti-aligned is defined as

$$\Delta U = 2\mu B$$

This concept of potential energy difference and aligned versus anti-alignment of the magnetic moment is important in that the GFT posits that gravity is the result of the magnetic moment (angular momentum vector) being forced into anti-alignment. Refer to figure 13B .

$$\Delta U = 2\gamma LB \tag{19.1}$$

$$\Delta U = 2\left(-\frac{e}{2m}\right)mcr\left(\frac{R}{r^2}\right) \tag{19.2}$$

By definition $\Delta U = Fr$

Therefore

$$Fr = 2\left(-\frac{e}{2m}\right)mcr\left(\frac{R}{r^2}\right) \tag{19.3}$$

$$Fr = \left(\frac{m}{r^2}\right)\left(-\frac{e}{2m}\right)2Rcr \tag{19.4}$$

$$F = \left(\frac{m}{r^2}\right)\left(-\frac{e}{2m}\right)2Rc \tag{19.5}$$

$$F = \left(\frac{m}{r^2}\right)2\gamma k \tag{19.6}$$

Equation (19.6) can be extended to the magnetic dipole of an electron orbit and the magnetic moment associated with electron spin. Applying this equation to such an orbit properly requires that the equation be expressed as the force acting

pursuant to a single electron. Mathematically this would be expressed as the force per charge on an electron or as $\frac{F}{q}$. Therefore

$$\frac{F}{q} = \left(\frac{m}{r^2}\right) 2\gamma k \qquad (19.7)$$

$$F = \left(\frac{m}{r^2}\right) 2\gamma kq \qquad (19.8)$$

$$\gamma L = \mu = ir^2 = \frac{qr^2}{t} \qquad (19.9)$$

$$q = \frac{\gamma Lt}{r^2} \qquad (19.10)$$

$$F = \left(\frac{m}{r^2}\right) 2\gamma k \left(\frac{\gamma Lt}{r^2}\right) \qquad (19.11)$$

$$F = \left(\frac{m}{r^2}\right)\left(\frac{2\gamma^2 mcrkt}{r^2}\right) \qquad (19.12)$$

$$F = \left(\frac{m^2}{r^2}\right)\left(\frac{2\gamma^2 crkt}{r^2}\right) = \left(\frac{m^2}{r^2}\right)\gamma^2 k \left(\frac{cr_P 2t}{r^2}\right) \qquad (19.13)$$

$$\gamma^2 k = 6.9524 x 10^{31} \frac{Nm^2}{Kg^2} \qquad (19.14)$$

$Let\ r_p = (1.6 x 10^{-35})m.\ This\ is\ Planck's\ Length$

$t = 1 x 10^{-16} s.\ This\ is\ the\ precessional\ period\ of\ an\ orbiting\ electron$

$$\left(\frac{cr_P 2t}{r^2 x\ r^2}\right) = \left(\frac{(3 x 10^8 m/s)(1.616 x 10^{-35} m)(2 x 10^{-16} s)}{(1m)^2 x\ (1m)^2}\right) = 9.6572 x 10^{-43} m^{-2} \qquad (19.15)$$

$$F = m^2\gamma^2 k\left(\frac{cr_P\,2t}{r^2\,x\,r^2}\right) = m^2\gamma^2 k\left(\frac{(3x10^8\,m/s)(1.616\,x10^{-35}\,m)(2\,x10^{-16}\,s)}{(1m)^2\,x\,(1m)^2}\right) \qquad (19.16)$$

$$\left(\frac{cr_P\,2t}{r^2}\right) = \Sigma = cons\tan t = 9.6572\,x10^{-49} \qquad (19.17)$$

$$F = \frac{m^2}{r^2}\left(\gamma^2 k\Sigma\right) = F_{gravity} \qquad (19.18)$$

Equation (19.18) is the unified version of Newton's gravitational force law and is named Michael's Law. If equation (19.18) is to be mathematically representative of Newton's gravitational force law it is necessary that

$$G = \gamma^2 k\Sigma \qquad (19.19)$$

Equation (19.19) is the Daniel's gravitational force constant

$$F = \frac{m^2}{r^2}G = \frac{m^2}{r^2}\left(\gamma^2 k\Sigma\right) = \frac{m^2}{r^2}\left(\gamma^2 k\right)x\left(\frac{cr_P\,2t}{r^2}\right) \qquad (19.20)$$

Note that in equation (19.17) the quantity

$$\left(\frac{cr_P\,2t}{r^2}\right) = \Sigma = cons\tan t \qquad (19.17)$$

is a dimensionless quantity. This quantity is named Traci's constant.

$$G = \gamma^2 k\Sigma = \left[6.9524\,x10^{31}\,\frac{Nm^2}{Kg^2}\right]x\left[9.66\,x10^{-43}\right] = 67.17\,x10^{-12}\,\frac{Nm^2}{Kg^2} = 6.717\,x10^{-11}\,\frac{Nm^2}{Kg^2}$$

$$(19.21)$$

QED