Converting Newton's Gravitational Constant to the Quantum Maximum for Mass Density

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Introduction

Newton's formula for the force of gravitational attraction between two masses is the following:

$$G = gravitational\ constant = 6.67259e-11\ N\left(\frac{m}{kg}\right)^2$$

$$F_{grav.} = gravitational\ force = G\frac{mass_1 \times mass_2}{r^2}$$

$r =$ *distance in meters between the centers of mass 1 and mass 2*

The problem with Newton's formula is that it assumes that all of mass is contained within the center of the mass. This, of course, is not true. Mass is contained within a volume of space. The ratio of this mass to the volume of space it occupies identifies density:

The Density of Mass Contained within a Regular Sphere

$$\rho = density = \frac{mass}{4\pi r^3/3}$$

$r = radius\ of\ the\ sphere$

As the radius of the sphere decreases for the same mass (as in the case of neutron stars, for example) density increases by the cube of the inverse of the decrease:

let "r" decrease by "1/2" for the same mass

$$\rho = \frac{mass}{4\pi(1/2)^3 r^3/3} = \frac{8(mass)}{4\pi r^3/3}; \qquad increased\ density\ of\ "\left(\frac{1}{1/2}\right)^3 = 2^3"\ or\ 8\ times$$

Newton's Gravitational Formula Cannot Account for the Volume which Contains Mass

The difficulty with the Newtonian formula is that it cannot account for the way that gravity operates within the volume containing any mass. Newton's formula assumes that, as a falling object reaches the boundary of the volume of the mass, that boundary is irrelevant. Newton assumes that all of mass is contained in the gravitational center point. Therefore, acceleration would still increase by the inverse of the square of the remaining distance to the center point for any object falling within the volume containing the mass, . This, however, has been proved not to be the case.

A hole or pathway would have to be created to allow an object to fall within the volume containing the mass. Actually, the gravitational influence would be reduced as the object fell through the hole. This has been confirmed by research from the Gravity Recovery and Climate Experiment (GRACE) satellites which showed that the lower gravitational influences around the Hudson Bay were partially due to ice age depressions of the land by ice sheets, ice sheets which had subsequently melted. The lowest gravity had been recorded by the satellites for the western and eastern sides of the bay, the areas which had been depressed the most under now-melted ice[1].

Newtonian mathematics provide that, when the falling object reaches the last unit from the center point, acceleration rates would tend towards infinity. The distance from the center

[1] *How can parts of Canada be 'missing' gravity?* by Jacob Silverman. http://science.howstuffworks.com/environmental/earth/geophysics/missing-gravity.htm

point at which this sudden increase in acceleration would occur would depend only upon the unit of measurement which had been chosen. If we were using inches as our distance measure, an acceleration rate approaching infinity would occur one inch from the center point. For the standard meter unit of measure, the acceleration rate approaching infinity would occur one meter from the center point. Obviously non of this is realistic. The Newtonian formula simply cannot account for gravitational influence within the volume containing any mass.

The Newtonian gravitational constant converts mass as defined by "weight" into acceleration as provided by the gravitational fields generated by the masses. The gravitational constant uses strictly Euclidean/Cartesian analytic geometry. It requires that the gravitational fields of two masses must influence one another from a distance. Gravity is reduced to a point upon the graph and the graphed distance between the points must represent vacuum or a space of separation between the two masses.

These Newtonian Euclidean/Cartesian gravitational mechanics are extremely accurate for masses which retain a distance of separation. The radial distance of the earth's orbit around the sun can be accurately calculated by Newton's gravitational constant, the mass of the sun and the period of the orbit (365.25 days). The gravitational deficiencies of the Hudson Bay sink are accurately mapped by satellites which have a measurable outward migration in their orbits under the influences of the diminishing gravity for the areas over which they are passing[2] .

However, when opposing masses are joined[3] by gravitational influence to become one mass, Newton's Euclidean/Cartesian mechanics are inadequate. Density, which is defined by the ratio of mass (as "weight") divided by the volume, is not accounted accurately. To do so requires that Newton's Euclidean/Cartesian measure of distance be converted to a quantum. That quantum is the geometric radius of the mass. A maximum gravitational force occurs at the boundary (the surface) of the mass's volume. Newton's formulation is inaccurate within the volume of the mass. This is proved by the Hudson Bay sink which has deficient gravity when measured either at the surface of by orbiting satellite. Gravity is defined by the amount of mass contained between the surface and the center. Any object dropping in a hole would encounter less and less mass as it fell through the volume of mass and the Newtonian formula for gravitational force as "G(m)/ r^2" would simply be inaccurate for the fall in the hole in the volume of the mass. For any mass falling to the surface of larger mass, Newton's formulation must be converted to a quantum by the following:

$$g = quantum\ gravitational\ maximum; \quad x = quantum\ distance = \frac{distance}{r}; \quad r = radius\ of\ volume$$

$$g = G\frac{mass}{r^2} = \frac{g}{(x=1)^2}; \quad \{acceleration\ at\ distance\ "x"\} = \frac{g}{x^2}$$

PROOF: THE CASE OF EARTH'S SURFACE MAXIMUM

$$g = 6.67259e\text{-}11\frac{5.97219\ \ 10^{24}\,kg}{\left(6.371\ 10^{6}\ \ meters\right)^2} = 9.81\ \ m/\sec^2$$

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[2] Ibid.

[3] The quantum-dimensional theory of gravity proposes that mass expands quantum space by an amount predicted by quantum dimensional mathematics. When the force of expansion between two opposing masses is neutralized by the opposition, quantum space forces a contraction of the distance of opposition in order to combine the masses into a single unit. Newtonian gravitational mechanics are accurate for conditions in which the force of combination is opposed by counter forces such as centrifugal force. See my book *The Quantum Dimension.*