New Concepts in Gravitation

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[Abstract](#)

The gravitational force of the Sun, based on observations, is derived as the product of the acceleration times the area of a circle with radius equal to the semimajor axis of revolution. This quantity is constant for all planets, asteroids, and artificial satellites; it is independent of the mass of the attracted body. The equation for the sequential mean distance of the planets from the center of the Sun is derived as $r = B \cdot C^n$, where B and C are constants and n is the sequential number of the bodies. The correlation coefficient is 0.997. It is concluded that gravitation is quantized. When the gravitational force is calculated by this new equation ($F_s = a \cdot A$), there is a highly significant correlation between the magnitude of perturbative forces and the eccentricity of the orbit of the planets and the asteroids. A graph of the maximum inclination of the orbit of each planet to the equatorial plane of the Sun shows no correlation between the inclination and the eccentricity of the orbit. Thus general relativity cannot explain the eccentricities. The residual advance of the perihelion of Mercury of about 0.1″ per revolution is explained by the fact that the direction of the advance coincides with the direction of the movement of the solar system in space, as detected recently by measurements of anisotropy in the cosmic microwave background radiation. An equation for the eccentricity is presented as the ratio of the sum of perturbations to the gravitational force of the Sun. By analysis of data it is shown that Kepler's second law is not a general law; i.e., equal areas are swept in approximately equal intervals of time only near the aphelion and the perihelion. Indeed, if Kepler's second law were a general law, it would be inconsistent with his first and third laws. New units of force and energy are presented.

KEYWORDS and PACS
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[gravitation](#), [Kepler's third law](#), [Titius-Bode law](#), [distance law](#), [perihelion advance of Mercury](#), [eccentricity](#), [Kepler's second law](#), [units of force and energy](#)

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