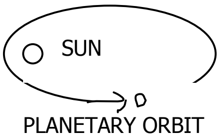
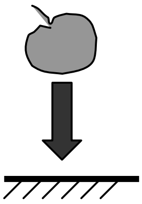
An improved diagram for explaining quantum gravity (N.C.: 30 April 2013)

Ref.: http://vixra.org/abs/1302.0004, http://vixra.org/abs/1301.0188, and http://vixra.org/abs/1301.0187



Kepler's 3rd Law of planetary motion: $T^2/R^3 = k$ (a constant), where T = time per orbit, and R = mean distance from the sun. Speed v = (circumference of orbit)/(time taken) = $2\pi R/T = 2\pi/(Rk)^{1/2}$. Acceleration, $a = v^2/R = 4\pi^2/(R^2 k)$. (Hooke's inverse-square law.)

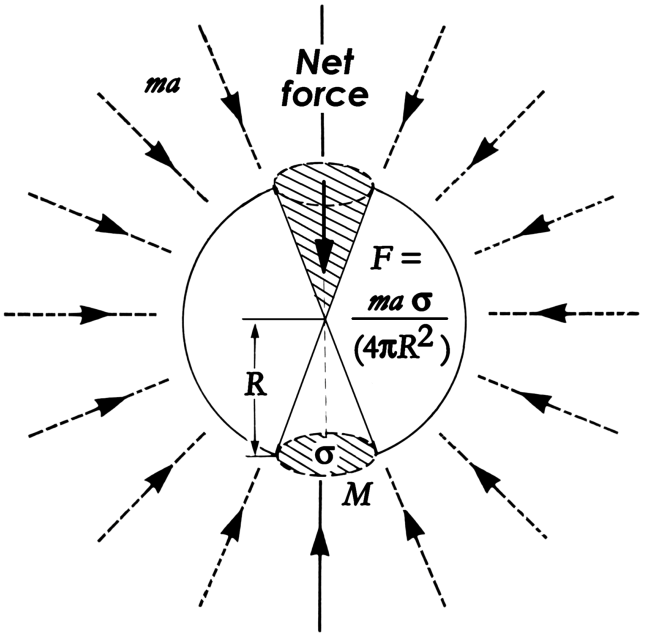
Galileo's law of gravity, $d = ½ at^2$, where t = time, and a = gravitational acceleration near sea level = 9.8 m/s^2. For the Moon at 60 earth radii, the inverse-square law predicts the acceleration is 60^2 times less, or $9.8/60^2$, agreeing well with: $a = v^2/R$.



Newton correlated Kepler's solar system attractive force with Galileo's terrestrial gravitation measurement, testing it for the Moon using his centripetal force law: $a = v^2/r$. Newton in 1687 published the inverse square law, with an addition postulated proportionality to mass. He proved that the inverse-square law holds if all the distributed mass of the earth is treated as being located in the middle. Using Laplace's symbol G, the acceleration $a = MG/R^2$, where M is the mass of the attractor, R is distance. Newton's second law (F = Ma) converts $a = MG/R^2$, into the force law $F = MMG/R^2$. Einstein in 1916 used it in general relativity as the low-velocity, weak field limit.

Gravitons push fundamental particles together, since particles have a graviton scatter cross-section that intercepts gravitons from large distant masses. The observed isotropic cosmological acceleration is: $a = 7 \times 10^{-10}$ ms^{-2} which for mass m gives outward force by F = ma, which by Newton's 3rd law yields an equal inward isotropic force, ma.

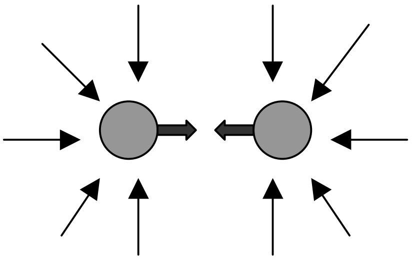
$$\sigma_{\text{gravity}} = \sigma_{\text{weak}} (G_{\text{Newton}}/G_{\text{Fermi}})^2 = \pi(2GM/c^2)^2$$



Dashed arrows cancel $g = Mc^4/(amR^2)$

The gravity cross section of a fundamental particle of mass M in the planet earth below an observer intercepts the fraction of the graviton force coming upwards behind that area, so that the downward force from above that same area of sky is uncancelled. This "asymmetry" pushes things down with acceleration g (distinct from cosmological acceleration). The fraction of the inward force screened by a fundamental particle of mass M at distance R from an observer is its gravity cross-section area, divided into the total area at that distance, $4 \pi R^2$. See: http://vixra.org/abs/1302.0004

George Lewis LeSage's 1784 theory of gravitational attraction as a mutual "shadowing" or shielding by atoms from an unexplained all-round fabric of space. But LeSage could not make useful predictions with his theory, and predicted drag effects.



The attraction effect above can be studied using the bubbles on washing-up water in a sink, "indenting" the water surface pressure. Whenever 2 floating soap bubbles drift close enough to overcome the molecular (particle) drag of water, they *accelerate* together.

Gravitons push fundamental particles together where they screen each other from gravitons originating from larger, distant masses. A direct proportionality to mass is proved by the fact that no overlap occurs, due to the small cross-section for quantum gravity, as established from Feynman's rules by scaling the cross-section from the weak interaction of neutrinos to graviton scattering by square of the coupling. The small gravity coupling thus produces a minute cross-section. This predicted the amount of dark energy or cosmological acceleration in 1996, two years before confirmation by Saul Perlmutter using supernova redshifts.

As for Casimir radiation in the vacuum, these offshell force-causing gravitons cause no drag or heating, but fundamental forces and resistance to accelerations (inertia and momentum).