Quantum gravity is a result of U(1) repulsive dark energy

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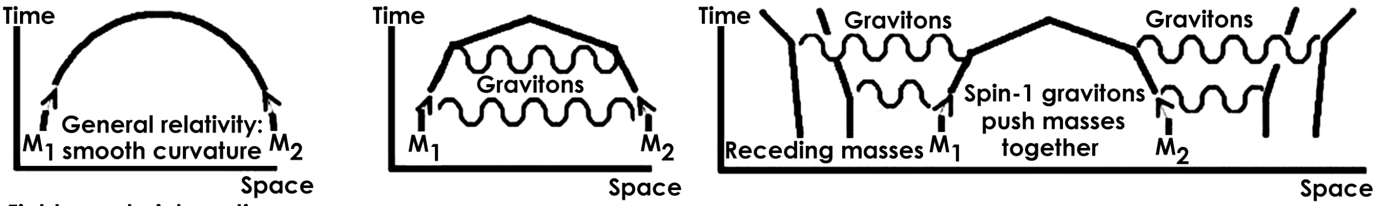
We have non-speculative, concrete evidence that *dark energy is the mechanism of gravity*, analogous to the U(1) spin-1 electrodynamics field equation, so the lagrangian for repulsion of masses has a similar propagator for repulsion of similar charges in QED (Moller scattering). Therefore, in the presently-observable (low energy) limit of quantum gravity (*very* small coupling), Feynman's well-tested rules for calculating the perturbative expansion of the path integral show that: (a) *only the term for 2-vertex, tree-level interaction (Moller scattering) diagram in the perturbative expansion makes a significant contribution at low energy* (the tiny gravity coupling suppresses the more complicated interactions in the expansion, since they have more vertices and hence pick up higher powers of the very small coupling), and (b) the cross-section (relative interaction probability, i.e. square of the sum of amplitudes), is *proportional to the square of the coupling*. So since a weak interaction $v + p \rightarrow v + p$ (neutrino-proton scattering), at 1 GeV has cross-section, $\sigma_{v\text{-}p} \approx 10^{-42}$ m^2, the scattering of a graviton by a proton, $g + p \rightarrow g + p$, has the cross section: $\sigma_{g\text{-}p} = \sigma_{v\text{-}p} (G_N / G_{\text{Fermi}})^2 \approx 10^{-108}$ m$^2 \approx \pi (2GM/c^2)^2$. This predicts the cosmological acceleration due to dark energy, $a = c^4/(Gm)$, or $G = c^4/(am)$, and automatically quantizes mass, revising the electroweak theory to include quantum gravity, with U(1) hypercharge now generating both dark energy and quantum gravity. (Ref.: http://vixra.org/abs/1111.0111 and http://vixra.org/abs/1302.0004 .)

The isotropic cosmological acceleration a of isotropic surrounding mass-energy m causes isotropic outward force ma. By Newton's 3rd law, there is an equal and opposite force, converging inward. The asymmetry or fraction of this total inward force intercepted by a mass of gravity cross-section area $\sigma_{g\text{-}p}$ at distance R from the observer is the ratio of the cross-section area to the total area for that distance $\sigma_{g\text{-}p}/(4\pi R^2)$, so the force of gravity is the total inward force multiplied by this fraction: $F = ma\sigma_{g\text{-}p}/(4\pi R^2)$. Using $\sigma_{g\text{-}p} \approx \pi (2GM/c^2)^2$ quantizes mass and gives $a = c^4/(Gm)$. If $a = Hc = c/t$ (see page 6 of http://vixra.org/pdf/1302.0004v2.pdf), then $a = c^4/(Gm) = ct$, i.e. Riofrio's empirical law: $c^3/(Gm) = t$.

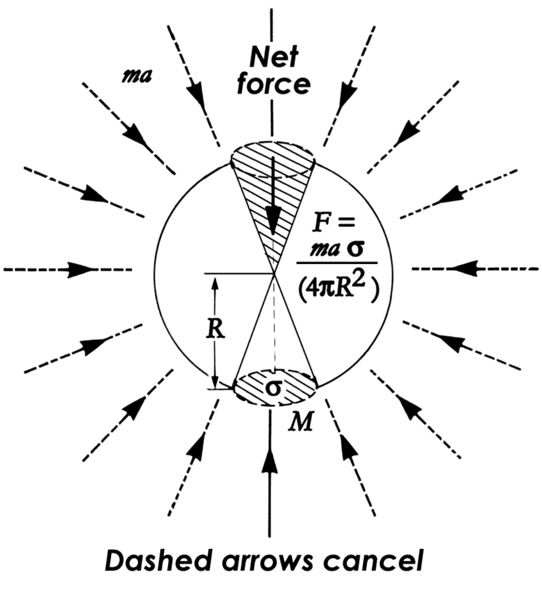


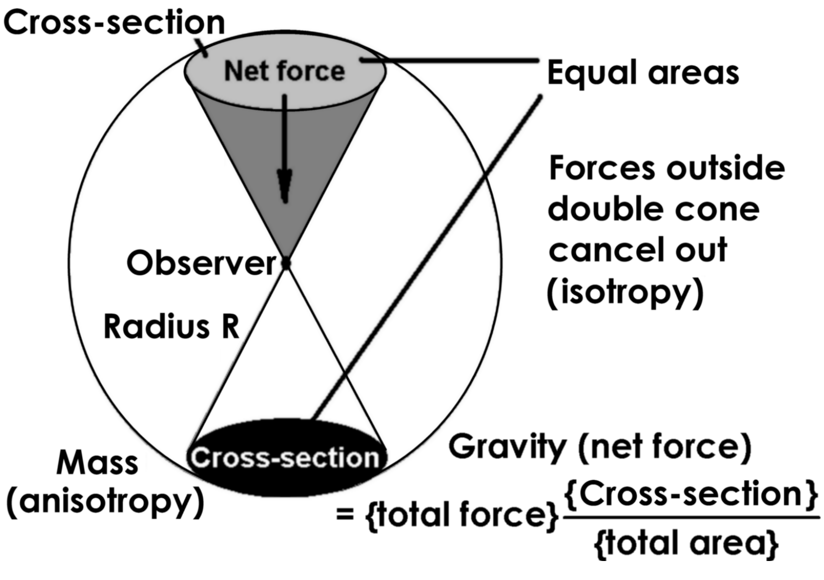
Field quanta interactions are simply ignored

Spin-2 graviton theory ignores other masses

Spin-1 graviton theory shows that exchange of gravitons causes both dark energy and gravitation effects

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





Galaxy clusters repel by spin-1 field quanta exchange, causing cosmological acceleration a, and a radial *outward* force from us, $F = ma$ by Newton's 2nd law, implying equal inward force by Newton's 3rd law (the mediator we shall call the *graviton*, although it is also dark energy). Gravity is the asymmetric portion of the total inward isotropic force, due to screening by cross-sections. The fraction of the total inward force intercepted by cross-section πr^2 at distance R from an observer is $(\pi r^2)/(4\pi R^2)$, permitting checkable predictions.