Planck data and correction of Frampton's repulsive gravity

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P. H. Frampton (author of *Gauge Field Theory*), in 2012 published a paper(1) noting that in observed *flat* spacetime the Friedmann-Robertson-Walker (FRW) metric of general relativity *reduces to a simple Newtonian form, where a very simple repulsion term can be added for dark energy.* Frampton postulated *ad hoc* outward acceleration due to dark energy: $a_\Lambda = 2GM\Omega_\Lambda/R^2$. The net outward acceleration is this law minus inward-directed gravity deceleration, $a_g = GM\Omega_{\text{matter}}/R^2$.

$$a_{\text{net}} = a_\Lambda - a_g = (2GM\Omega_\Lambda/R^2) - (GM\Omega_{\text{matter}}/R^2)$$
$$= (GM/R^2)(2\Omega_\Lambda - \Omega_{\text{matter}})$$

Frampton used WMAP results ($\Omega_\Lambda = 0.72$, $\Omega_{\text{matter}} = 0.28$), resulting in $a_{\text{net}} = (GM/R^2)(1.44 - 0.28) = 1.16(GM/R^2)$. Using WMAP data gave spuriously exact agreement with the cosmological acceleration to 4 significant figures (Frampton ignored the error limits). Using new Planck data from March 2013(2) ($\Omega_\Lambda = 0.683$, and $\Omega_{\text{matter}} = 0.317$):

$$a_{\text{net}} = (GM/R^2)(1.366 - 0.317) = 1.049(GM/R^2),$$

much closer to $a_{\text{net}} = GM/R^2$, the 1996 U(1) spin-1 exchange repulsion that accurately predicted both cosmological acceleration and gravitation(3) prior to the 1998 discovery of cosmological acceleration(4,5) as shown in Fig. 1.

The relationship between our fact-derived dark energy acceleration law $a_{\text{net}} = GM/R^2$ and Frampton's *ad hoc* $a_{\text{net}} = a_\Lambda - a_g = (GM/R^2)(2\Omega_\Lambda - \Omega_{\text{matter}})$ is now merely 1.049, less than 5% difference, and much smaller than the error limits established by different measurements of dark energy.

PROOF OF THE CORRECT DARK ENERGY REPULSION LAW USING QUANTUM GRAVITY

The cosmological observation that masses repel, the outward "dark energy" induced acceleration being equal and opposite to Newtonian attraction, $a = MG/r^2$, predicts gravity, because masses "attract" *by being pushed together due to repulsion by larger distant masses surrounding them in the universe.* This convergence of force pushes masses together more strongly than they repel one another, as shown in Fig. 1. (This mechanism is generally analogous to the Casimir force.) Graviton scatter has a predictable cross-section area(6): $\sigma_{gravity} = \sigma_{neutrino} (G_{\text{Newton}}/G_{\text{Fermi}})^2 \approx \pi (2GM/c^2)^2$.

(1) Newton's 2nd law, the isotropic cosmological acceleration a of isotropic surrounding mass-energy m gives radial outward force, ma.

(2) By Newton's 3rd law, there is an equal reaction force, converging radially inward, ma.

(3) Gravity is an asymmetry, equal to the portion of the total inward force ma intercepted by cross-section σ_g at distance R from observer.

(4) This fraction of the total inward force which causes gravitation is the ratio of the cross-section area σ_g to the total sky area, $\sigma_g/(4\pi R^2)$.

(5) Gravity is therefore this fraction multiplied by the total inward force ma giving: $F = ma\sigma_g/(4\pi R^2)$.

(6) Inserting $\sigma_{g-p} \approx (2GM/c^2)^2$ quantizes mass and also predicts the cosmological acceleration due to dark energy, $a = c^4/(Gm)$, or $G = c^4/(am)$.

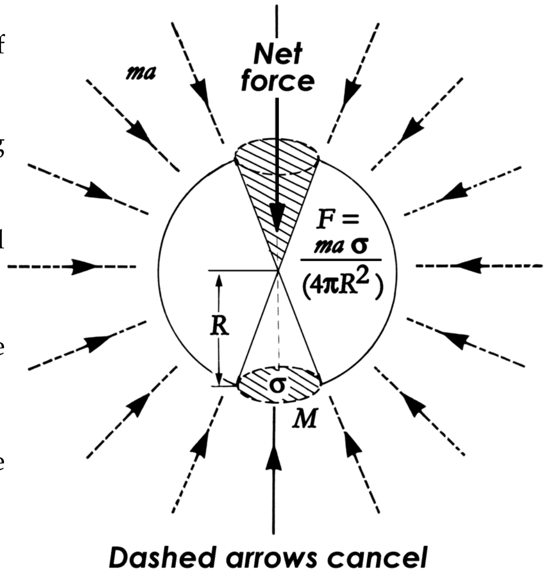

Fig. 1. "Attraction" due to convergence of repulsive force from isotropic distribution of large distant masses in the universe. So if this distant surrounding matter did not exist, gravity would be a *repulsive* force.

In 1996, this predicted the 1998 dark energy results successfully. Since $a = Hc = c/t$ [7,8], it follows that $c^4/(Gm) = c/t$, which is the theory for Riofrio's empirical law: $tc^3 = Gm$.

Re-writing Riofrio's law as $c^2 = Gm/(ct)$ and squaring gives us $c^4 = (Gm)^2 / (ct)^2$, which we substitute into $a = c^4/(Gm)$:

$$\text{outward cosmological acceleration, } a = c^4/(Gm)$$
$$= (Gm)^2 / [(ct)^2 (Gm)] = Gm/ (ct)^2$$
$$= Gm/ r^2.$$

This cancels repulsive gravity entirely if the universe is static, but the recession of distant masses causes an asymmetry and generates a net gravity force. To understand this, an apple is repelled by the earth's mass with an upward acceleration, but it is pushed down by a twice this acceleration by much larger (although more distant) receding galaxies in the universe. The result is the observed net downward acceleration due to gravity.

To avoid confusion, it must be emphasised is because the distant galaxy clusters are receding freely and are *not static* that they are able to generate the net inward reaction force (Newton's 3rd law, or conservation of momentum) which gives us gravity.

If all the distant masses were *stationary* then the mutual repulsion law would cancel out and apples would not fall because the net inward repulsion from distant masses could cancel the repulsion between the apple and the earth. The reaction force from the expansion of the universe is identical to the direct repulsion force, so there are *three* terms in force acting on an apple which causes it to fall:

(1) dark energy pushing apple *downwards,* due to mutual repulsion with distant masses: acceleration, $a = -Gm/ r^2$.
(2) dark energy pushing apple *upwards,* due to mutual repulsion between particles in apple and earth: $a = +Gm/ r^2$.
(3) dark energy pushing apple *downwards*, due to Newton's 3rd law reaction force *from accelerating matter,* $a = -Gm/ r^2$.

The overall effect of these three contributions gives the Newtonian gravitational law, a net downward acceleration of apples:

$$a_{\text{net}} = a_{\text{apple-distant mass}} - a_{\text{apple-earth}} + a_{\text{reaction to cosmological acceleration}}$$
$$= (Gm/ r^2) - (Gm/ r^2) + (Gm/ r^2)$$
$$= Gm/ r^2.$$

Therefore, the overall repulsion from distant masses *which are receding* is *twice* as strong as the repulsion with *non-receding* nearby masses, which explains the net imbalance, gravity. This can be correlated with Frampton's convenient *ad hoc* factor of two in $a_\Lambda = 2GM\Omega_\Lambda /R^2$. The very subtle nature of this mechanism explains why it has remained hidden.

Using Newton's 2nd law $F = Ma = GmM/ r^2$, so the underlying force behind gravitation is repulsive and is equal but of opposite sign to Newton's law. Revising electroweak theory to include this U(1) repulsive gauge theory permits hypercharge mixing with SU(2) to generate both dark energy and gravity, predicting quantized masses for the SM.[3,9]

DISCUSSION AND CONCLUSIONS

The discrepancy between Frampton's theory and our mechanism is illusory, using the latest March 2013 data from the Planck space telescope data revised the mass-energy for a flat Friedmann-Robertson-Walker (FRW) metric of general relativity to 4.9% ordinary matter, 26.8% dark matter and 68.3% dark energy[2]. This effect of this Planck data revision to Frampton's theory, which used earlier cosmological data values from WMAP, makes Frampton's theory equivalent to our mechanism of quantum gravity. The error in Frampton's theory is the FRW metric partitioning of Ω.

There is no gravitational deceleration over distances on the order c/H, owing to the mechanism where gravity is a product of the surrounding outward force due to isotropic acceleration of matter radially away from the observer (Fig. 1). General relativity omits the linkage of Λ to G, treating them as independent variables, conflating acceleration data with false assumptions behind the FRW metric of cosmology. This is equivalent to the reporting of medieval fashion of reporting all new unpredicted cosmological observations as "discoveries of new Ptolemaic epicycles". There is *physically no distinction* between dark energy and gravity; they are the same thing, not separate entities.

Contrary to fashionable propaganda, *the current partition of dark energy from the gravitational field is analogous to the partition of between Galileo's terrestrial gravity and Kepler's planetary motions prior to universal gravitation*. Instead of treating gravitation and dark energy as the same entity, Frampton follows FRW dogma, acknowledging doctoring is involved: “Dark energy is the new driving term in the Friedmann equations doctored to fit the observed accelerated expansion.”

Another problem produced by the FRW metric, apart from conflating observational data with the inadequate theoretical description for the mechanism quantum gravity provided by classical general relativity, is the definition of cosmological acceleration itself. Because the Newtonian dogma was set into general relativity as the low-velocity, weak field limit by Einstein in 1915, inward Newtonian gravitational retardation of expansion is intrinsically assumed to be true and is subtracted from the outward cosmological acceleration by the FRW metric.

The quantum gravity mechanism, however, shows that gravity is produced by the effects of the surrounding expansion of the universe. This mechanism shows, in the observer’s reference frame, that the *most distant* receding masses cannot suffer gravitational retardation, simply because there is no significant matter receding at greater distances from them (Fig. 1). Therefore general relativity and the FRW metric produce false results by assuming that gravitational attraction is a universal law. The universal law is the repulsion of masses, a U(1) gauge theory with spin-1 propagators, and the effect of “attraction” is an effect which depends on the receding mass in the surrounding universe.

Instead of building on general relativity’s FRW metric data interpretation, cosmological must be built on quantum field theory, which includes the dynamics. Building on the FRW metric is like building on flat earth theory, epicycles, Phlogiston, or the Piltdown Man delusion/hoax.

REFERENCES

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(2) March 2013 WMAP data reported by http://arstechnica.com/science/2013/03/first-planck-results-the-universe-is-still-weird-and-interesting/ and http://articles.latimes.com/2013/mar/21/science/la-sci-sn-planck-universe-older-13.8-billion-dark-matter-big-bang-20130321

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(5) A. G. Riess, et al. (Supernova Search Team), Astron. J. v116, p1009 (1998), astro-ph/9805201

(6) http://vixra.org/abs/1305.0012

(7) http://vixra.org/pdf/1302.0004v2.pdf at page 6 (1996 prediction of $a = Hc$ for flat and non-FRW quantum gravity)

(8) L. Smolin, *The Trouble with Physics,* Houghton Mifflin, N.Y., 2006 at page 209 (supernova data leads to $a = Hc$)

(9) http://vixra.org/abs/1302.0004 (see also http://vixra.org/abs/1301.0188 and http://vixra.org/abs/1301.0187)