

New Gravity, Happily Divorced from Relativity

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An error in Newton's law of gravity is corrected by removing all mass from his equation, causing the demise of the invalid Planck units and the disappearance of gravitational mass. In GR, the assumption that g is constant for all substances becomes logically impossible. The assumed constancy of the speed of light is also a false assumption, requiring that theory to be replaced as soon as possible. It is shown that the source of gravity is almost certainly electrostatic in nature, the attractive force being proportional to the number of nucleons in objects, shedding some light on the construction of neutrons and nuclei. Some favorable experimental evidence is given and a simple experiment proposed.

Keywords: Gravitational mass; Planck units; Gravitational Constant; Electrostatic Gravity; Neutron; Nucleus; Strong Force; Pioneer 10 and 11.

1. Introduction

Herein, it is shown that

1. A gravitational field does not cause relativistic effects, contrary to popular belief, hence the divorce.
2. Mass and matter were never equivalent. Mass is now part of matter, whereas it was the quantity of matter. A new name would have been useful.
3. GR is based on false assumptions.
4. The real law of gravity is not dependent on mass. Gravitational mass does not exist.
5. The problem with Newton's law of gravity enabled the invalid Planck units to be created.
6. A new source of gravity in matter is needed (and found).
7. Neutrons have both types of charge.
8. Experimental evidence is favorable.

The principle of Conservation of Total Energy (CTE) states that energy cannot be created, nor destroyed, and includes the principle of Equivalence of Mass and Energy, $E = mc^2$ [1], i.e. mass is potential energy (PE) and may be considered to be a very highly concentrated form of energy ($m = E/c^2$).

In his "Principia" (1687) [2], Newton defined mass as the quantity of matter. Mass now also refers to the specific substance (inertial mass), which is relativistic) from which, it is postulated, all particles are constructed

Electric charges also exist, attached to mass, and they attract and repel each other, so even without gravitational mass they could coagulate, form into atoms and even larger objects. Matter can now be described as a conglomeration of mass and electric charges, the latter having no mass. Charged particles in matter could even be the source of gravity instead of mass.

Around the turn of the twentieth century, it was realized that lengths of material objects in motion would be changed compared to their stationary size, and this would be accompanied by relative changes in the mass and natural frequencies of those "gross bodies", so the subject of relativity was created (by the Special Theory of Relativity (SR) [3]). Later, this was extended to cover relativistic changes due to gravity in the General Theory of Relativity (GR) [4], which also claimed to be a theory of gravity.

2. Correcting the Background

Gravity is the tendency for matter to physically attract other matter. Other properties that have been attributed to it, such as causing relativistic effects, have no evidence to support them, often being the result of jumping to wrong conclusions. For example, the transfer of energy to objects by raising them against the force of gravity results in a gain in inertial mass in those objects in their own frame (sometimes called potential energy), and this was supposedly caused by the gravitational field. Mass increase is more properly explained by applied energy (force \times distance, or resulting kinetic energy), and the equivalence of mass and energy, whereas no physics is known to enable gravity or speed to cause the mass to increase.

That is, gravity is not responsible for relativistic changes. Gravity is a separate subject, hence it is now divorced from relativity. "Gravitational effects" are now transferred to the "stationary" frame in relativity.

In SR and GR, relativistic changes were mistakenly assumed to be caused by speed and gravity, which can cause those changes to be applied in wrong circumstances, such as in "free fall".

Newton's law of gravity gives the attractive force between two objects of mass M and m , which, when expressed mathematically, is force

$$F = GMm/d^2 \quad (1)$$

where d is the distance between the objects and G is the factor of proportionality. He assumed mass was the quantity of matter, but, in modern physics it now has the new meaning. To avoid confusion, it is suggested that Newton's meaning of 'mass' be called 'Newton's mass' or 'bulk'. It's new meaning causes the constant of proportionality (G) in Newton's law of gravity to be an unwanted variable. In fact, G has the wrong dimensions for a universal constant, all of which have the dimensions of energy \times length. To correct the dimensional problem requires the masses M and m in eq. (1) to be replaced with non-relativistic items representing the forces of attraction of the matter comprising the objects.

The ratio of the incorrect dimensions of $G, (M^{-1}L^3T^{-2})$, the (supposed universal) gravitational constant, to the natural universal constant $hc, (ML^3T^{-2})$, the main constituent of the Sommerfeld fine structure constant [5], enabled Planck (in 1899) to define *absolute* values for mass squared (hc/G), length, and time, etc., known as Planck units [6]. The existence of *absolute* values for these dimensions offended the principle of relativity, indicating an error in the dimensions of G , but, they were accepted as a gift from heaven and were used in sub-theories in physics, the error in the dimensions of G being overlooked!

To correct the above error also requires the masses M and m in Newton's equation to be replaced with non-relativistic items. Consequently, the new dimensions of G (now being the same as the other universal constants) are doubly suited to the requirements of nature.

3. New Gravity

It is now proposed that the masses in Newton's equation are replaced with the ratios of the weight of the objects to the standard weight ($w_1 w_2$), being directly proportional to their actual attractive potentials, in which case the law of gravity becomes

$$F = Gw_1 w_2 / d^2. \quad (2)$$

So there is no such thing as gravitational mass, and it never really existed. The new dimensions of G are ML^3T^{-2} , independent of altitude or substance variations of the objects.

In practice, the weight ratios of the two objects in Eq. (2) *have always been used* in the determination of G , equivalence with mass being assumed, i.e. the numbers are still the same, but it is the dimensional change to G that governs in fundamental physics.

The Planck units become meaningless. The principle of relativity is then preserved and physics theories must be re-visited where Planck units have been involved.

In another paper [7] the correct relativistic changes to mass, length, and frequency are derived for objects in stationary and moving frames of reference (accelerated to a constant speed relative to the home (stationary) frame). Hence, in moving frames, as speed c is the product of l and f , $c = \gamma^{-2/3} c_0$, so is NOT a universal constant as demanded by SR. GR assumes the SR error of a constant speed of light in its concept of "spacetime" [6, p. 59], upon which its gravity theory heavily depends.

From the claimed equivalence of inertial and gravitational mass, it is widely claimed that g is the same for all substances, so this should be a subject for investigation. GR is also partly based on this postulation [6, p. 8], but mathematical logic denies the truth of this possibility. As gravity does not emanate from mass, the force of attraction F cannot be proportional to mass m . Hence, by Newton's second law of motion, $g = F/m$, g cannot be the same for all substances. All bodies containing a mixture of many different substances could produce a near constant value for g .

GR simulates gravity by assuming space distorts. Any theory simulating gravity will have some apparent successes, but they do not necessarily confirm the theory. Explaining the advance of the perihelion of Mercury, or any other apparent success, with a theory based on false postulations does not hold much credence

as experimental evidence. Thus, GR theory is shown to be heavily dependent on false assumptions, has no valid basis for its existence, and should be replaced as soon as possible.

Why anyone would now choose GR in preference to a theory based on confirmed physics, is not scientifically understandable.

4. A Realistic Source of Gravity

To accompany the new law of gravity, a non-relativistic source of gravity emanating from matter is urgently required to permit a sensible theory of gravity that obeys the laws of physics.

As gravity does not emanate from mass, the charged particles in matter appear to be the only logical alternative, but gravitational attraction is extremely small compared to electrostatic forces provided by the charges. This problem is resolved below.

The work of Kopernicky and Hughes [8] appears to satisfy the above requirements, and offers a very convincing theory that a tiny difference between the forces of electrostatic attraction and repulsion (in favor of attraction) between electrically neutral atoms (matter) separated by macroscopic distances could be the source of gravity and naturally leads to an inverse square law of attraction between objects at distances of separation greater than a millimeter or so.

Since the above satisfies the requirements for a non-relativistic source of gravity in matter, and no other possibilities appear to exist, *it is claimed that gravity is the average residual attraction of matter to other matter resulting from their electrostatic dipoles in random attitudes, at distances very large compared to the dipole spacing*. For more information see [8,9]. Other theories dependent on electrostatic dipoles in matter may also exist.

Since they have a similar weight to protons, neutrons must possess one dipole with their charges separated. Thus, each nucleon provides one dipole, and the attractive force due to each atom is proportional to its mass number. In relativistic circumstances the mass of each nucleon changes, but the number of them (controlling the attractive force by an atom) does not change.

It is postulated that neutrons are needed in nuclei to provide the necessary binding forces, with their negative charges placed against and interposed between the positive charges of two or more protons. When sharing their negative charge with several protons, neutrons would be expected to form weaker bonds, leading to less stable nuclei. It is envisaged that the opposite charges on neutrons and protons in the nucleus are in contact but do not annihilate each other, while the positive charges on the neutrons are relatively well separated. These "contact forces" are far greater than those from separated charges, probably being the source of the so called "strong force".

The gravitational field is therefore basically electrostatic in nature, so-called gravitons will not exist, and the field exists from the moment of creation of the dipoles.

As Einstein said in 1920 (the Leyden address),

"Of course it would be a great advance if we could succeed in comprehending the gravitational field and the electromagnetic field together as one unified conformation.

And, by Michael Faraday (1830's),

"Universal gravitation is merely a residual phenomenon of electrical attraction and repulsion."

It seems that a hundred and eighty years have been wasted on other theories.

5. Experimental Evidence

In Section 2 above, it was shown that gravity is not expected to cause relativistic effects. It should be possible to test this by changing the gravitational field strength near a stationary atomic clock by *moving (from afar) a suitably heavy object* closer to the clock and observing any change in the clock's emitted frequency. No change in the frequency means that a gravitational field does not cause relativistic effects, contrary to popular belief [5, p. 474]. In fact, relativistic effects really should not be expected as the change in gravitational potential energy (force times distance moved) for the clock is zero. Moving the clock instead should cause a significant change in its frequency, if the object is sufficiently heavy.

It is instructive to see that, in the Pound and Rebka experiment [10], for a difference in gravitational field strength between vertical points A and B, the theory is manipulated to predict the same change in frequency as would be caused by the energy required to move an object from A to B in the average field strength. This confirms that applied energy causes the change, and not the difference in field strength; the gravitational field acts only as a catalyst by providing an opposing force.

Attributing relativistic changes to gravity and speed was unfortunate as they have sometimes been applied in incorrect circumstances, such as in "free-fall", where no energy is applied.

Since gravity is involved in the condition known as free-fall, it is mentioned here. Since no energy is being supplied to an object in free fall, there can be no relativistic effects. It has been shown above that the resulting law of gravity (eq. 2) computes the same as Newton's classical equation (i.e. with non-relativistic masses) that existed before relativity theories were produced, and as there are also no relativistic effects in bodies in free-fall, the frequency shifts of radio signals from spacecraft Pioneer 10 and 11 predicted by such theories should not occur, and it was found to be so by Renshaw [11]. In 1999 he showed that the apparent problem of disagreement between actual and relativity predicted frequencies and position in space did not exist if Newtonian Doppler equations (pre relativity) were used in the calculations.

6. Conclusion

The dimensions of gravitational constant G are altered so that it remains constant in relativistic circumstances. Consequently, the invalid "Planck Units", which violated the principle of relativity by attempting to define absolute quantities, and which were dependent on the dimensions of G , are now meaningless.

It is a logical necessity that a non-relativistic source of gravity closely associated with matter must exist. Mass does not qualify. The discovery of the Kopernicky theory, and Spears work have enabled a sensible theory of gravity to be postulated, based on known cause and effect instead of unsubstantiated postulations. The source of gravity now appears to be a tiny difference between the forces of electrostatic attraction and repulsion (in favor of attraction) between electrically neutral matter, the dipoles formed by the nucleons and electrons supplying those forces.

The masses in Newton's law of gravity are replaced with numbers related to the actual force of attraction between objects.

Gravity at small and subatomic distances, being far smaller than local electrostatic forces, is also meaningless, which clears up some long held problems of gravity at those distances.

With weight as a byproduct of the electrostatic charges in atoms, it follows that neutrons must have one positive and one negative charge, thereby creating very strong electrostatic binding forces with the protons in atomic nuclei.

Gravity is the tendency for matter to physically attract other matter. Other properties that have been attributed to it, such as causing relativistic effects, have no evidence to support them, often being the result of jumping to wrong conclusions, such as assuming that relativistic changes are due to gravitational fields instead of energy changes, and stellar 'lensing' also being attributed to gravity, without proof.

The GR theory has been shown to be heavily dependent on false assumptions, and is therefore useless as a theory of gravity.

The foundations of some theories have, unfortunately, been unconfirmed postulations and assumptions, which, probably due to the passage of time, are now often assumed to be facts.

Why anyone should now choose GR in preference to a theory such as outlined herein is un-understandable.

Gravity was a little strange, indeed, but is now much clearer;

It also agrees with Michael Faraday and fulfills Einstein's wish.

References

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