

Is There a Force of Gravity?

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In undergraduate physics, the Newtonian concept of an attractive force between masses that is proportional to the product of the masses divided by the square of their separation is taught. When one advances to the more advanced concepts of gravitational theory as posed by General Relativity, the concept seems to change to where what we experience as a force is really the result of an inertial acceleration in "space-time".

It behooves us then to examine that concept in detail. Consider two points on the Earth, perhaps London, England and Melbourne, Australia. In both of these cities, observers experience a downward "pull" towards the Earth's center. (We can ignore the centrifugal acceleration caused by Earth's rotation since, at the most, it represents only 0.3% of the Earth's gravitational acceleration and consider the Earth to be a closed system for the purposes of the discussion, all velocities and accelerations are relative to the center of the Earth and, since both London and Melbourne are nominally at the same elevation which does not change, considerations of time dilation in the gravitational field are irrelevant. These clarifications are required because a pair of individuals whose thinking processes were limited attempted clouds the discussion by introducing them in response to a previous posting.) Inertial acceleration is defined as the second derivative of position with respect to time, and since London and Melbourne are within the closed reference frame represented by the Earth they do not change their separation with respect to each other but they do experience the force of gravity as acting in essentially opposite directions. Since are observed not to undergo spatial acceleration with respect to each other and the center of the Earth, that observed force of gravity CANNOT result from an inertial acceleration. It can only result from an actual force attracting those cities towards the Earth's center in accordance with the classical Newtonian concept of gravity. It cannot result from a spatial acceleration in "space-time" as is asserted by specious interpretations of both Special and General Relativity. The force is REAL. It is much more than a mathematical abstraction!

In response to a previous posting of this material, the writer received an E-Mail claiming that the writer was in error. It asserted that Melbourne and London were really in a "flattened" orbits around the center of the Earth and experienced the "force" if gravity because they were restrained from following

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their null geodesic orbits by the Earth's surface. What appeared to be the "force" of gravity resulted from that restraint because it prevented these two cities from following their null geodesic path? This is a rather frivolous response. If the cities were to fall through the Earth, the inertial force produced by the resulting second derivative of position with respect to time and the gravitational force would cancel and the cities would experience no net force. The attractive force that they actually experience verifies that gravitational force and inertial acceleration are different phenomena describing TWO effects, gravitational attraction and inertial acceleration. There is no way of avoiding the conclusion that the former applies a force as the result of the proximity of masses and inertial acceleration applies a force as a result of the second derivative of position with respect to time. It is only in the never-never world which mathematics allows one to be foolish enough to consider that they were different aspects of the same phenomena.

As a digression, the interchange of electric and magnetic energy in a resonant circuit is conventionally treated as a single phenomena and treated by a single set of mathematics, as is the interchange of potential energy and kinetic energy when an object is in orbit. In actuality, in the resonant circuit, the energy is alternately stored in a capacitor as an electric stress in its dielectric and is stored in the inductor in its magnetic lines of force. The actions of both of these devices are independently described by their own mathematical laws. It is only when they are connected together do their laws combine to provide an action we experience as resonance in which energy is cyclicly interchanged between the two devices. I can hold a charged capacitor in one hand and an inductor in the other hand. It is only when they are connected together that resonance occurs. The same conclusion holds true for gravitation. Gravitation forces and acceleration forces are independent effects which, when coupled, account for orbits as if a single process were involved. The orbital motion results from the cyclical interchange of energy between the two independent effects.

Mathematics is a useful tool, but it seems to have been forgotten that it is only a tool, it should never be used as a substitute for the intelligence needed to understand of the "mechanism(s)" involved. Physics seems to be the only science that attempts to abolish "mechanism" and rely solely on mathematics and experiment. This probably results from the fact that understanding the "mechanisms" which are involved requires an innate talent that probably cannot be taught in schools and is as rare as the musical aptitude which allows an individual to play a violin in Carnegie Hall. It is no wonder that physicists work so hard to relegate the idea of "mechanism" to the trash bin of history. It avoids the embarrassment of admitting that they do not understand their subject.

The source material for this posting may be found in "Gravity" (1987), "The Einstein Hoax" (1997), and "Corrections to Residual Errors in Special Relativity (1999) located at <http://www.members.aol.com/einsteinhoax/site.htm>.
EVERYTHING WHICH WE ACCEPT AS TRUE MUST BE CONSISTENT WITH EVERYTHING ELSE WE HAVE ACCEPTED AS TRUE, IT MUST BE CONSISTENT WITH ALL OBSERVATIONS, AND IT MUST

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BE MATHEMATICALLY VIABLE. PRESENT TEACHINGS DO NOT ALWAYS MEET THIS REQUIREMENT. THE WORLD IS ENTITLED TO A HIGHER STANDARD OF WORKMANSHIP FROM THOSE IT HAS GRANTED WORLD CLASS STATUS.

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