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Theory on Presence of Anti-Gravitational Field

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Abstract: ***According to the third law of motion, to every force there exists an equal and opposite force of reaction. This opposing force is felt by the first body due to the second but as both are equal in magnitude and opposite in direction these bodies don't collide with each other. Thus we can think about the presence of a repulsive gravitational force.***

Keywords: Gravitation, Dark matter, Space-time curve

1. Introduction

The gravitational force is the universal force which is said to exist between any two bodies in the universe. Newton, approximately, 3 centuries ago, gave the laws of motion and gravity, now widely known as Newtonian gravity. According to the third law of motion, to every force there exists an equal and opposite force of reaction. This opposing force is felt by the first body due to the second but as both are equal in magnitude and opposite in direction these bodies don't collide with each other. Thus we can conclude the presence of a repulsive gravitational force. The school of thought presented by Quantum Mechanics does not consider gravitation as a force at all. Rather it is the manifestation of matter curving the fabric of space and time causing matter and light to trace a path which appears to be falling into the more massive of the two objects. Quantum mechanics tries to conclude that the presence of gravity as an attractive force because of matter and energy tends to follow a certain curve in space-time. An attempt is made to draw parallels with both the theories leading to the concept of Antigravity, i.e. the force equal in magnitude but opposite in nature to the known gravity with the help of general relativity and effect of dark energy. The present paper tries to present each of these theories and draw a conclusion regarding the presence of anti-gravitational field.

Newtonian Theory

The Newtonian Theory, derived from the three Laws of motion, clearly indicates the presence of Ying to every Yang. It is what maintains the balance of the universe. Gravitation, as given by the law, is no different. But it too clearly indicates that gravitation is the force due to themass of a body, with the effectmore prominent on the lighter mass. But it describes gravity as being only attractive and acting over long distances.

Considering the law, the Earth should have fallen into the Sun (for eg.) if it not had been spinning and subsequently revolved around the sun. This is possible only because of the presence of a pseudo-force called centrifugal force as felt by the earth.

Thus we can infer from the laws that there must be an equal and opposite force acting on both the bodies. But an anomaly rises when we consider gravitation restricted to the conventional systems. Because mass cannot be negative and hence gravitation cannot have repulsive nature. This is when we look into the quantum mechanical view of gravitation.

Quantum Mechanical Theory

In the case of General Relativity, Gravitation isn'tconsidered a force at all. Rather, it is the manifestation of matter curving the fabric of space-time causing matter and light to trace geodesics which, to us, appear like falling in towards the more massive object. Thus, by the virtue of matter and its tendency to curve space-time we have gravitation in our universe. The bullet point here is the "nature of matter".

So gravitation appears to be attractive because matter and energy, as we know them, tend to curve the space-time a certain way. What if the curvature was so that things appeared to fall away? That's the premise of "dark energy". It is different, vastly, from dark matter which is just regular matter with positive gravity but is "dark" in the sense that it reacts so weakly with ordinary matter or light that it is immensely hard to observe or detect. Dark energy is believed to be the cause of the accelerating expansion of the universe and hence the explanation behind the notion of the cosmological constant. It indeed has repulsive gravitation but is, as of this writing, undetected. It is considered, from its effects on the universe, to make up a huge chunk of all matter and energy.[1]So in our universe the only example of gravitational repulsion appears to be from the negative pressure effect of dark energy.[2]

Dark Energy

Independently of its actual nature, dark energy would need to have a strong negative pressure (acting repulsively) like that of radiation in a meta-material. In order to explain the observed acceleration of the expansion of the universe. According to general relativity, the pressure within a substance contributes to its gravitational attraction for other things just as its mass density does. This happens because the physical quantity that causes matter to generate gravitational effects is the stress–energy tensor, which contains both the energy (or matter) density of a substance and its pressure and viscosity. In the Friedmann–Lemaître–Robertson–Walker metric, it can be shown that a strong constant negative pressure in all the universe causes an acceleration in universe expansion if the universe is already expanding, or a deceleration in universe contraction if the universe is already contracting. This accelerating expansion

effect is sometimes labeled "gravitational repulsion", which alters the overall evolution of the universe at the cosmological scale, typically resulting in the accelerating expansion of the universe despite the attraction among the masses present in the universe. The acceleration is simply a function of dark energy density. Dark energy is persistent: its density remains constant (experimentally, within a factor of 1:10), i.e. it does not get diluted when space expands. [3]

Spin of the Species

The necessary condition for gravitation force to exist between two objects is existence of spinning charges in each object. Each object may contain both positively and negatively charged spinning components. In such a case the resultant spin current in each object is an integral (sum) of all contributing spin currents.

Spinning objects with similar charge polarity (the same sign) would attract themselves gravitationally. For example, spinning electron would gravitationally attract another spinning electron. Spinning objects with opposite charge polarity (the opposite sign) would repel one another gravitationally. For example a spinning electron would be gravitationally repelled by a spinning proton. Matter and antimatter should repel one another gravitationally.

Spinning atoms or objects composed of atoms (not ions) in their neutral state should not alter the S field or associates forces, because the increment in angular velocity of spin is identical for electrons and protons in atomic nuclei so that the cumulative spin current for such object remains unchanged.[4]

Repulsive Gravitation in the Nature Solar winds

Our Sun is known to emit so-called “solar wind” composed of protons. “Clouds” of such protons of varying size and intensity reach Earth every day. On approach they are redirected by the Earth’s magnetic field towards magnetic poles. The question arises in regards to protons travelling away from the Sun at great speeds, and not orbiting the Sun as every other object does but instead travelling along a straight line away from Sun. Because they spin. According to the discussion presented earlier in this article, spinning protons generate repulsive gravity force with atoms and accelerate away from Sun, as long as they spin.

2. Conclusion

1) Mass might not be the actual cause of gravity, but may only be a scalar by which we can measure the force. The amount of mass may involve having more number of gravitons in, and around them.
2) As much as gravitation is influential in keeping the heavenly bodies close-by and us, sticking to the ground, the Repulsive gravitation is influential in keeping the bodies from colliding with each other.
3) The presence of Graviton, though not exactly known much about, is influential in defining the exact nature of gravity.
4) The Dark Energy and dark matter are not much known about, but may have more influence on us than that accounted for, or thought of.
5) If the method of harvesting repulsive energy is found, we may go virtually fuel free for locomotion.
6) Travelling at extremely high speeds may be possible
7) Not much energy might be expended on escaping the gravitational fields for Space-missions.
8) The repulsive gravitational field exists not only in deep outer spaces but right under our nose. It occurs in every neutron and is generated by every proton that spins.
9) Anti-matter and matter might actually repel each other not as a virtue of their mass, but because of their opposite spins.

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