

Correlation Of The Imbalance Of Electric Charges To Universal Gravitation

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Abstract: Many theories support that both static electricity and gravity contain properties that allow items to orbit or float around them. Quantum physics, the science of the very small, attributes this to positive and negative charges. General relativity physics, the science of the very large, attributes this to gravity. This paper attempts to discuss any similar properties and dialogue about proofs that suggest that these two concepts may be similarly related. It will examine the relationship between static electricity and gravity by utilizing common examples, formulaic expressions, and everyday equations.

Index Terms: Charge, Electricity, Force, Gravity, Orbit, Quantum, Static.

1 INTRODUCTION

SCIENTISTS the world over have searched, for many years, to combine both the theories of General Relativity and Quantum Physics. It is well known that Albert Einstein tried to tackle this ideal, and even self-taught physicists like Matvei Petrovich Bronstein. Groundbreaking discoveries have been released in attempts to unify the theories, however, incremental steps seem to be the most efficient way to get closer to finally solving the problem. As a computer scientist and system engineer, I offer one more step in the collaboration through scientific research and study towards the unification theory.

2 SUPPORTIVE THEORIES

2.1 General Observation from Forums

A forum user by the name of w1z4rd from South Africa [1] pondered the following general theory: "Today I was watching a QP (Quantum physics) [documentary] about how no matter how small the pieces they blast the bits of an atom off, they still [can't find out] where mass and gravity come from. After watching it, I decided to light up a smoke, and opened a full pack of smokes (yes I know [it's] bad for my health)... the thing clear plastic wrapper I have, instantly stuck to my monitor thanks to static electricity. So here was a piece of [nonmagnetic] plastic, sticking [vertically] to my LCD monitor. This got me thinking to the magnetosphere generated by our molten core [dynamo] at the [earth's] crust, and I got to thinking... what is the difference between static electricity and gravity, [because] they both seem to do the same thing[?]" Based on this general observable context, I pondered the same thought: what is the intrinsic difference between both gravity and static electricity. And, what attempts have been made to unify them and understand the similarities between the two?

2.2 The Electromagnetic Force

According to Dr. Paul Tiskus 0, Departmental Chair of Educational Studies at the Feinstein School of Education and Human Development in Rhode Island College, "Oppositely charged particles attract each other, while like particles repel one another. Electrons are kept in the orbit around the nucleus by the electromagnetic force, because the nucleus in the center of the atom is positively charged and attracts the negatively charged electrons." This begs the question of unilateral theory in which the same force that pushes or keeps the electron in its orbit due to the same fast-moving rotational force that keeps the moon around the earth, and the earth in orbit around the sun.

2.3 Electron Rotational Spin and Magnetic Forces

Author Gengyun Li 0 describes that "the electron has both intrinsic electric field and intrinsic magnetic field. The electron's intrinsic electromagnetic field has both energy and angular momentum. The electron spin is the electron's electromagnetic field angular momentum." As a result rotational spin causing the magnetic field within an electron seems similar to the rotational field created through earth's magnet field and could be a contributing factor to the gravitational effect the earth exerts on the moon similar to that of an electron and its nucleus. Similar properties could be holding the electron and moon in orbit. Vis-à-vis the moon/electron similarity in suspension within their orbital planes.

2.4 Comparing Gravitational and Electrical Forces

The website "the Physics Classroom" 0 postulates that "Gravitational forces and electrical forces are often compared to each other. Both force types are fundamental forces which act over a distance of separation. Gravitational forces are based on masses attracting and follow the law of universal gravitation equation.

$$F_{\text{grav}} = G * m_1 * \frac{m_2}{d^2}$$

where m_1 and m_2 are the masses of the attracting objects (in kg), d is the separation distance as measured from object center to object center (in meters) and G is a proportionality constant with a value of $6.67 * 10^{-11} * N * m^2/kg^2$. Electrical forces are based on charged objects attracting or repelling and follow the Coulomb's law equation (as stated above). Some of the problems on this set will involve comparisons of the magnitude of the electric

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force to the magnitude of the gravitational force. The simultaneous use of both equations will be necessary in the solution of such problems.” This leads one to believe that the two theories have been, indeed, combined together in such a way that their intrinsic similar properties have been observed mathematically and, in essence, have some sort of relational property between the two.

2.5 Grand Unified Theory (GUT)

A quick definition from the Encyclopedia Britannica 0 of the Grand Unified Theory says that it “already seeks to tie gravity with the three gauge interactions of the Standard Model: the electromagnetic, weak, and strong nuclear interactions.” This lends to the belief that the electroweak (combination of electromagnetic and weak forces) is only a stepping stone to the final combination of all theories.

2.6 Theory of Everything (ToE)

Steven Weinberg 0 defines the ToE as a hypothetical single, all-encompassing, coherent theoretical framework of physics that fully explains and links together all physical aspects of the universe. Again, it seeks to combine all known plausible forces into one grand force equation to explain the optimum forces at work throughout the physics of the universe.

2.7 GUT, ToE, and String Theory

In another forum, users GlassRockets and corpuscle64 0 postulate the variant differences between ToE, UFT, and GUT. The following is the dialogue unfolding (bullet-pointed for ease of following the conversation):

GlassRockets. “Theory of everything [versus] unified field theory [versus] grand unified theory? What’s the difference between them all?”

corpuscle634. “A theory of everything describes all of the fundamental forces including gravity. In principle it explains everything in the universe. A grand unified theory unites electromagnetism, the strong force, and the weak force. A unified theory in general unifies two or more forces, there isn’t one ‘unified theory.’ Electricity and magnetism were unified, and then electromagnetism and the weak force were unified.”

GlassRockets. “So the only difference between a theory of everything and a grand unified theory is that it also unites gravity with the other 3 fundamental forces?”

corpuscle634. “Yeah, assuming that there are only four fundamental forces, which there probably are.”

GlassRockets. “Is string theory a theory of everything or a grand unified theory?”

corpuscle634. “Theory of everything. I’m sure that it’s possible to write down a string theory which doesn’t include gravity, but that kind of misses the point.”

GlassRockets. “Hmmm... okay one last question! Is there any other popular [theories] of everything or is string theory the main one?”

corpuscle634. “Not that I’m aware of. Loop quantum gravity (LQG) 0 is the most popular alternative to string theory as a quantum gravity theory, but it’s not a theory of everything as its scope is limited to gravity. You would use a GUT to explain everything else.

Put simply, LQG (an attempt to merge quantum mechanics and general relativity) says that gravity is totally different from the other three, and it doesn’t make sense to unify

them all. Little bit less intellectually satisfying, I guess, but there’s no reason we should assume that the universe behaves in a nice way.” Watching this dialogue unfold reminded me of childhood questions that I would ask, myself, to many of my instructors. When observing obvious laws and trains of theories, why would something that appeared to be so related, yet have so many limitations, and not be explored any further. With the plethora of theories that already exist, we must be on a precipice of combing all into one grand one that unifies all.

2.8 Speed of Light Limit

Recently, ABC News 0 reported that there was proof that the speed of light is no longer the limit for the speed or acceleration that a mass object could go. The theory that the speed of light is the limit to how fast an individual can go may be limited to our perception of what the speed of light entails. Specifically, what is “light”? Light is our visual perception of what we can see. It is only a tiny spectrum of what actually exists. As seen in the scale model diagram above, the speed of light is primarily based on the visible light spectrum, which is only a tiny bit of the electromagnetic spectrum. As a result, there are things that exist outside this realm, and are Multi-dimensional in movement. This causes one to believe that the multi-dimensional realm are thus not thoroughly explored to the fact that items can move without having to exist in what we would call the “visible realm”.

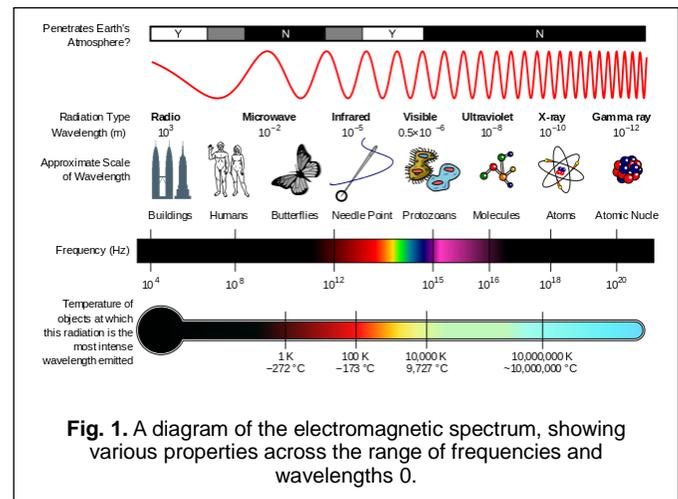


Fig. 1. A diagram of the electromagnetic spectrum, showing various properties across the range of frequencies and wavelengths 0.

So in essence and conclusion, the speed of light can be breached, as there are things moving outside of that realm. And the notion that nothing can move faster than that is based on our own physical abilities to see something moving as opposed to attributing the fact that two things can exist simultaneously in the same space because the object may be moving faster than the speed of visible light that we can see. Gravity and electrostatic / electromagnetism properties may also fall into said category.

3 METHOD OF OBSERVATION

3.1 Scientific Method 0

Make Observations. What do I see in nature? This can be from one’s own experiences, thoughts, or reading.

Think of Interesting Questions. Why does this pattern

occur?

Formulate Hypotheses. What are the general causes of the phenomenon I am wondering about?

Develop Testable Predictions. If my hypotheses is correct, then I expect a, b, c...

Gather Data to Test Predictions. Relevant data can come from the literature, new observations, or formal experiments. Thorough testing requires replication to verify results.

Refine, Alter, Expand, or Reject Hypotheses. Repeat previous step, as needed.

Develop General Theories. General theories must be consistent with most or all available data and with other current theories.

3.2 Process

3.2.1 Formulation of Question

What is static electricity's relationship to gravity?

3.2.2 Hypothesis

3.2.2.1 Curvature

Both gravity and electromagnetisms experience curvature. Objects caught in the curvature are subject to follow its design. As electromagnetism requires a certain charge in its particles to line up in a certain way for such objects to follow its designs, gravity does not appear to have such items (or have yet to be discovered). However, with gravity, it is proven that all items with mass follow this design. As a result, both must follow a similar model to perform their tasks.

3.2.2.2 Repel

For items to go against gravity and electromagnetism, they experience repelling properties. For electromagnetism, it is a known charge that is the same as the electromagnet. For gravity, things do float against it, with the help of magnets and coolant (liquid nitrogen). As a result, the latter concludes that there is some direct correlation between gravity experienced on this planet and magnetism. If with the aid of magnetism gravity can be defeated, there must be a relationship model that they both attune to.

3.2.2.3 Attract

Like electromagnetism, gravity also attracts items: mass. If something has mass, it is attracted like magnet to it. Whereas anti-gravity must also be attracted to itself. The only difference with magnets is that the attractive properties depend on polar opposite charges. However on the molecular level, the same happens with items that contain mass: electrons repel each other because they have the same charge (albeit the repelling is minute).

3.2.2.4 Multi-dimensional

Various objects and theorems have shown objects to be multi-dimensional, and having an interesting affecting on the present visible dimension. For instance, a sphere viewed in a two-dimensional plane while passing through it will appear to start off as a small dot, then grow in size, reach a maximum, and then then die back down into said dot and disappear. That doesn't mean that the sphere never existed, but that the energy it used to push things aside

while I appeared (say a line [matter] was nearby and was gently "pushed" out to the side while the "circle" grew, and thus affected by it, and then as the "circle" diminished, it would return back to its normal state – knowing that the mysterious "circle" affected it). And in that way, gravity and static electricity may affect things for the moment and seem to appear out of "nowhere", and then die down as their charges or interaction with matter decreases.

3.2.3 Prediction

Through a series of experiments, will prove that there is an inverse between the strength of the magnet and gravitational pull.

3.2.4 Testing

3.2.4.1 Physical Experiment

Create a static electricity charge on paper and then seeing it affects the strength of the magnet. Will see if it's harder or easier to pull the magnet straight up.

3.2.4.2 Thought Experiment

If the static electricity of a two items together allows them to stick together, negating gravity, then the masses of both objects are attracted to each other in a stronger attraction than naturally occurring gravity.

3.2.5 Analysis

3.2.5.1 Physical

3.2.5.1.1 Experiment #1

Used the backing of a sticker from car cling decal to create a static charge. Confirmed the charge on a drinking glass. Placed magnet on paper and tested strength. Negligible change. Tried rubbing magnet on the paper various times, then tested strength again. Negligible change. Will try using a method to measure small changes in strength.

3.2.5.1.2 Experiment #2

Mix salt and pepper flakes together on a flat surface. Charge a plastic comb with static electricity. Hover the comb over the flakes and watch as the flakes are attracted to the comb through electromagnetism properties.

3.2.5.1.3 Experiment #3

Blow up a regular rubber balloon and cut slips of ribbon out of a plastic grocery bag. Tape the bag ribbons together to make loops. Charge the ribbons with static electricity using a cotton cloth. Charge the balloon the same. Hold balloon and throw the ribbons above it. The ribbons should float away from the balloon. Move the balloon to keep the ribbons floating.

3.2.5.1.4 Experiment #4 0

Take strands of holiday tinsel (1mm wide or smaller) and tie together by the ends. Take a PVC pipe charge the pipe by rubbing on clean, dry hair or cotton cloth. Hold pipe away from body, and throw tinsel right above pipe. It should float away. (Rubber balloon can be used instead of PVC pipe.)

3.2.5.2 Thought

3.2.5.2.1 Magnet's Effect on Static Electricity

Albeit small, the change in magnetic measurement to gravity should be able to be determined even on a microscopic level. We should be able to see that static electricity would affect the amount of strength that a magnetic object would have when trying to pull the object straight up.

3.2.5.2.2 Gravity's Effect on Masses

Masses are attracted to each other in a gravitational pull, especially in large scales on a planetary level, or larger. What is attracting these things to each other? Dark Matter? What is it "inside" of each mass that "attracts" it to another mass? At certain distances, the objects (mass) actually do not touch or attract each other anymore but sort of "hover" around each other. Static electricity has a very similar effect.

3.2.5.2.3 Static Electricity's Effect on Masses

Static electricity can produce a hovering effect over certain objects. For instance, a rubber balloon charged enough with static electricity can hover slightly over object, and follow them in an attractive-like method similar to how planets in orbital rotation of each other move together throughout the universe.

3.2.5.3 Equations

3.2.5.3.1 Gravity [13]

Newton's Universal Law of Gravitation: $F = \frac{Gm_1m_2}{r^2}$

3.2.5.3.2 Static Electricity 0

Coulomb's Law of Electric Force: $F_{\text{elect}} = k * Q_1 * \frac{Q_2}{d^2}$

4 CONCLUSION

The premise that gravity and static electricity are connected has been pondered by many scientists the world over. Many have speculated on what theorems may exist to tie the two together: everything from high school teachers pondering mathematical problems for their classes, to adults who think there is much more to the equation than what seems fit. My observation has been that there has been a loose, albeit undeniable link between the two. Although not yet proven to be true to exist, I still believe that there may be a loose strand of plausibility that the two are – in fact – related on a higher plane of existence or dimension than what our eyes and see and minds can conceive, now. My hope is that this exploration gets us closer to an answer, and as they say: there are no hidden worlds, just ones that are yet to be discovered.

5 ADDENDUM

5.1 Coulomb's Law of Electric Force

The website "the Physics Classroom" 0 describes Coulomb's Law as: "A charged object can exert an attractive or repulsive force on other charged objects in its vicinity. The amount of force follows a rather predictable pattern which is dependent upon the amount of charge present on the two objects and the distance of separation.

Coulomb's law of electric force expresses the relationship in the form of the following equation:

$$F_{\text{elect}} = k * Q_1 * \frac{Q_2}{d^2}$$

where F_{elect} represents the magnitude of the electric force (in Newtons), Q_1 and Q_2 represent the quantity of charge (in Coulombs) on objects 1 and 2, and d represents the separation distance between the objects' centers (in meters). The symbol k represents a constant of proportionality known as Coulomb's constant and has the value of $9.0 * 10^9 * N * \frac{m^2}{C^2}$.

6 REFERENCES

- [1] w1z4rd, "What's the difference between static electricity and gravity?", The Science Forum, <http://www.thescienceforum.com/earth-sciences/2461-whats-difference-between-static-electricity-gravity.html>. Jul. 2005.
- [2] Dr. Paul Tiskus, Chair, Department of Educational Studies, Feinstein School of Education and Human Development, "Forces Within the Atom", Rhode Island College, http://www.ric.edu/faculty/ptiskus/atomic_force. Oct. 2003.
- [3] Gengyun Li, "What is the Electron Spin?", ElectronicSpin.org, <http://www.electrons핀.org>. Sept. 2003.
- [4] Tom Henderson, "Static Electricity", the Physics Classroom, <http://www.physicsclassroom.com/calcpad/estatics>. 2016.
- [5] Christine Sutton, Research Associate, Department of Nuclear Physics, "Unified Field Theory", Encyclopedia Britannica, University of Oxford, <https://www.britannica.com/science/unified-field-theory>. 2016.
- [6] Steven Weinberg, "Dreams of a Final Theory: The Scientist's Search for the Ultimate Laws of Nature", Knopf Doubleday Publishing Group, ISBN 978-0-307-78786-6.
- [7] GlassRockets, "Theory of everything vs unified field theory vs grand unified theory?", Reddit, https://www.reddit.com/r/AskPhysics/comments/3kquxu/theory_of_everything_vs_unified_field_theory_vs. Sept. 2015.
- [8] Lee Smolin, "Loop Quantum Gravity: Lee Smolin", Edge, <https://www.edge.org/conversation/lee-smolin-loop-quantum-gravity-lee-smolin>. Feb. 2003.
- [9] Alex Dominguez, "Speed of Light No Longer the Limit", ABC News, <http://abcnews.go.com/Technology/story?id=120095>. Jul. 2000.
- [10] Inductiveload, NASA - self-made, information by NASA. Based off of File:EM_Spectrum3-new.jpg by NASA. The butterfly icon is from the P icon set, P biology.svg. The humans are from the Pioneer plaque, Human.svg. The buildings are the Petronas towers and the Empire State Buildings, both from Skyscrapercompare.svg, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=2974242>. Oct. 2007.
- [11] Theodore Garland, Jr., Professor, Department of Biology, "The Scientific Method as an ongoing process", University of

California Riverside,
http://idea.ucr.edu/documents/flash/scientific_method/story.htm. Mar. 2015.

- [12] Bob Pflugfelder, "Make a Levitating Orb", Science Bob, <https://sciencebob.com/make-a-levitating-orb>. Nov. 2015.
- [13] Jean Tate, "Gravity Equation", Universe Today, <http://www.universetoday.com/56157/gravity-equation>. Dec. 2015.
- [14] Tom Henderson, "Static Electricity", the Physics Classroom, <http://www.physicsclassroom.com/calcpad/estatics>. 2016.