

# Title: A discussion related to the existence of the entities of Space and Time

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**Abstract:** Humans need the entity of Space to perceive relative positions between objects. Humans also need the entities of Space and Time to calculate values that Humans attribute to Motions, such as Velocity or Acceleration. The entities of Space and Time are also the entities that compose the four-dimensional Interwoven Space/Time entity, introduced by Einstein's General Relativity theory, which provided an explanation of the *origin* of the attraction between Mass bodies.

However, although the notions of Space and Time, as Humans perceive these notions, do provide the significant explanation of the *origin* of the attraction between Mass bodies, via Einstein's General Relativity theory, the notions of Space and Time, as Humans perceive these notions, are not sufficient for providing explanations to additional similar unanswered questions, such as : what is the *origin* of the attraction or the repulsion between Electrically Charged bodies? Or, why the velocity of Light, measured by Humans, always results in a constant value and the maximum velocity that Humans can measure?

This paper presents the following prediction: Electric (or Magnetic) Fields are forms of Accelerations, like the Gravitational Field, which is already recognized as a form of Acceleration.

This prediction also leads to the following thesis: Changes and Movements are the result of Interactions between Energies, and the entities of Space and Time are not entities that exist.

The entities of Space and Time are notions (or entities), invented by Humans, because Humans need such notions to perceive Changes and Motions.

For some Interactions between Energies, which result in Changes or Motions, Humans can attribute, to these Interactions, attributes of Space and Time, which will assist in providing explanations to why these Changes or Motions are the result of these Energies Interactions.

However, this paper predicts, that different sets of Interactions between Energies, should be assigned *separate and independent* attributes of Space and Time, *different and independent* from the Space and the Time attributes, assigned to other sets of Interactions between Energies, to provide an explanation for the *origin* of motions which are yet unexplained, such as: what is the *origin* of the attraction or the repulsion between Electrically Charged bodies?

Because *different and independent* Space and Time attributes should be assigned to different sets of Interactions between Energies, then, Space and Time, as Humans perceive these notions, cannot exist, because the above implies, that there should be *multiple, independent* notions of Space, and *multiple, independent* notions of Time, and not just one universal Space entity, and just one universal Time entity, as Humans perceive the Space and the Time entities.

By abandoning the conclusion that the entities of Space and Time exist, and by concluding that Changes and Motions are only the results of Interactions between Energies, the *origin* of attraction or repulsion between Electrically Charged bodies can be explained, in addition to the explanation, already provided by Einstein's General Relativity theory, relating to the *origin* of the attraction between Mass bodies.

Also, by abandoning the conclusion that the entities of Space and Time exist, and by concluding that Changes and Motions are only the results of Interactions between Energies, a possible *partial, tentative* explanation might be also provided to the question: why the velocity of Light, measured by Humans, always results in a constant value and the maximum velocity that Humans can measure?

The prediction that the entities of Space and Time do not really exist sounds as an extraordinary, unbelievable, and out of line statement, at first. This is because, as presented above, the notions of Space and Time are crucial notions, which Humans need them, to perceive, understand and calculate Motions and Changes.

However, this paper also proposes a relatively simple experiment, which if implemented, and its results will be successful, as this paper predicts, this will either validate or disprove, what is presented in this paper.

## 1. Einstein's Space/Time concept explains the *Origin* of the Attraction between Masses

The issue of Mass bodies attraction was initially investigated by Newton. Newton's measurements concluded that two Mass bodies attract each other according to the Universal Gravitational Law, which is formulated as (1):

$$F = G \cdot (m_1 \cdot m_2) / r^2$$

Where G is the Gravitational Constant and is equal to  $6.674 \times 10^{-11} \text{ m}^3 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}$ ,  $m_1$  is the Mass magnitude of the first Mass body,  $m_2$  is the Mass magnitude of the second Mass body and r is the distant between the center of Masses of the two Mass bodies.

The Universal Gravitational Law presented above provides the amount of Force that attracts these two Mass bodies.

However, Newton could not provide a complete explanation relating to what causes this force, or what is exactly the *origin* of the attraction between Mass bodies.

Newton tried to explain the *origin* of the attraction force between Mass bodies by introducing the concept of the Gravitational Field.

Newton stated that a Mass body creates a Gravitational Field around it, which generates the force presented in the Universal Gravitational Law.

However, Newton could not explain how any Field, including his Gravitational Field, can cause the attraction forces between bodies.

Newton's Gravitational Field is presented by the following equation (2):

$$g = G \cdot (m) / r^2$$

Where  $g$  is the Gravitational Field magnitude,  $G$  is the Gravitational Constant, which was already presented above in the Universal Gravitational Law,  $m$  is the Mass magnitude of the Mass body which creates this Gravitational Field  $g$  and  $r$  is the distance between the center of Mass of this Mass body, and the point in Space, where this Gravitational Field  $g$  is measured.

Thus, the Universal Gravitational Law can be reformulated as:

$$F = m \cdot g$$

Where  $m$  is the magnitude of the Mass body on which the Gravitational Field  $g$  exerts the force  $F$ .

However, as already stated above, the notion of a Field, does not provide a complete answer to the question: how can a Field generate the Forces that it is assumed to create?

Thus, the question:

what is the *origin* of the force presented by the Universal Gravitational Law? Remained an unanswered question, until the introduction of Einstein's General Relativity Theory (3).

Einstein succeeded to explain the *origin* of the attraction forces between Mass bodies by concluding that Newton's Gravitational Field is a form of Acceleration. That conclusion can be derived directly from Newton's work.

Newton's Second Law of Motion (4) states, that a force  $F$  exerted on a Mass body of Mass magnitude  $m$  obeys the following equation:

$$F = m \cdot a$$

Where  $a$  is the Acceleration that this Mass body of Mass magnitude  $m$  acquires because of the force  $F$  exerted on it.

However, the above already presented, that a Gravitational Field  $g$  exerted on a Mass body of Mass magnitude  $m$  also results in a force  $F$  exerted on this Mass body:

$$F = m \cdot g$$

Thus, from the above follows that:  $g = a$ .

Thus, the Gravitational Field must also be a form of Acceleration.

From the above, Einstein concluded that this could provide an explanation to the question: how Newton's Gravitational Field can generate the force  $F$  expressed by Newton's Universal Gravitational Law? Or, in other words, what is really the *origin* of the attraction force between Mass bodies?

Einstein's General Relativity Theory explains the *origin* of the attraction force between Mass bodies using the following argumentation:

Acceleration is the second derivative of Space as related to Time:

$$a = d^2s/dt^2$$

Where  $s$  is the Space point at which the Acceleration  $a$  is measured, and  $t$  is the Time moment at which the Acceleration  $a$  is measured.

Space is a three-dimensional entity, while Time is a one-dimensional entity.

From the above Einstein concluded that if it can be assumed, that Space and Time are not independent entities, and they are always *interweaved* into a four-dimensional construct, which replaces the three-dimensional Space entity, then, this four-dimensional Interwoven Space/Time entity already embeds an Acceleration at each point of it, because the second derivative of Space in relation to Time can be calculated at each point of it, because this four-dimensional Interwoven Space/Time entity already embeds the Space *and* the Time entities at each point of it.

Thus, Einstein concluded, that if a form of this four-dimensional Interwoven Space/Time entity can be assumed to be Newton's Gravitational Field, then, this Interwoven Space/Time entity, will exert an Acceleration, on any Mass body, residing in it, which is the Acceleration embedded in the point of this Interwoven Space/Time entity, where this Mass body resides.

## **2. Additional Implications as related to Einstein's Space/Time notion.**

Einstein's four-dimensional *Interwoven Space/Time* notion does succeed to explain the *origin* of the attraction between Mass bodies, as presented in the previous chapter, above. However, that notion embeds also an important additional implication.

By stating that the Space and the Time notions are *always* interweaved into one four-dimensional entity, this also implies that the Space and the Time notions, are not independent notions, as Humans perceive such notions.

Moreover, because Einstein's four-dimensional Interwoven Space/Time notion replaces the Newton's Gravitational Field, which should be recognized as a form of Energy, then, the Space and the Time notion, are not only not independent notions, but they are also just attributes (or facets) of a form of Energy.

In a speech, in the University of Leiden on May 5th, 1920, (6), Einstein claimed that the Ether should exist to provide physical properties to his Space/Time entity, which implies, that Einstein also agreed that his Space/Time Entity is a form of Energy.

Thus, Einstein's four-dimensional Interwoven Space/Time notion also implies that the Space and the Time notions are not independent notions, are just attributes (or facets) of a form of Energy, which also implies that the Space and the Time notions, as Humans perceive such notions, do not really exist.

The statement that Space and Time do not really exist sounds as an extraordinary, unbelievable, and out of line statement, at first. This is because the notions of Space and Time are crucial notions, which Humans need them, to perceive, understand and calculate Motions and Changes. However, in view of the arguments above, if Space and Time cannot be considered any longer as independent entities, and if Space and Time are just embedded in a form of Energy (the Gravitational Field), the statement that Space and Time might not really exist does not sound so detached any more.

Moreover, the above actually indicates that what *does exist* are Energies which *Interact* with each other, and these *Interactions* cause, what Humans perceive as Motions and Changes. For example, the attraction (Motions) between Mass bodies is a result of the *Way* a form of Energy (the Gravitational Field) *Interacts* with another form of Energy (Mass bodies), which leads Humans to attribute attributes (or facets) of Space and Time to the Gravitational Field Energy.

The understanding that Space and Time might not really exist, and what causes Motions and Changes are the *Ways* Energies Interact with each other, is used to explain the attraction or the repulsion between Electric Charges, in the next chapter of this paper, which also results in a proposal for a simple unification of Gravitation and Electricity.

### 3. An explanation for the Attraction or Repulsion between Electric Charges.

Analogous to Newton's Universal Gravitational Law, which provides the force of attraction between Mass bodies, Coulomb's Law provides the force of the attraction or the repulsion between Electric Charges.

Coulomb's Law is presented by the following formula (5) :

$$F = Ke \cdot (q_1 \cdot q_2) / r^2$$

Where  $K_e$  represents the Coulomb's Constant and is equal to  $8.99 \times 10^9 \text{ N}\cdot\text{m}^2\cdot\text{C}^{-2}$ ,  $q_1$  is the amount of Electric Charge in the first Electric Charge,  $q_2$  is the amount of Electric Charge in the second Electric Charge and  $r$  is the distance between the center of Masses of the bodies that carry these two Electric Charges.

As in the case related to the attraction between Mass bodies, the *origin*, or the cause of Coulomb's Law is attributed to an Electric Field that each Electric Charge generates, which, as explained already, in relation to the attraction between Mass bodies, this cannot provide a complete explanation to the question: why Electric Charges attract or repel each other? It should be noticed that the *structure* of the Newton's Universal Gravitational Law and the *structure* of the Coulomb's Law are identical.

Thus, the following question might be asked:

Since the *structure* of the Newton's Universal Gravitational Law and the *structure* of the Coulomb's Law are identical, why the *origin* of the attraction between Mass bodies was resolved via Einstein's General Relativity Theory, and its concept of a four-dimensional Interwoven Space/Time entity, and the *origin* of the attraction or the repulsion forces between Electric Charges, is still a mystery?

The author of this paper published an additional paper (7) which predicts that Electric (or Magnetic) Fields are also forms of Accelerations, as Newton's Gravitational Field is already recognized as a form of Acceleration.

Based on that prediction, that paper (7) explains the *origin* of the attraction or the repulsion between Electrically Charged bodies like Einstein's General Relativity explains the *origin* of the attraction between Mass bodies.

That explanation is based on the understanding, presented above, that Space and Time do not really exist.

This enabled the prediction that there are two additional *separate* four-dimensional Interwoven Space/Time entities, in addition to Einstein's four-dimensional Interwoven Space/Time entity. One of these additional four-dimensional Interwoven Space/Time entity replaces the Electric (or Magnetic) Fields generated by the Positive Electric Charges. The second of these additional four-dimensional Interwoven Space/Time entity replaces the Electric (or Magnetic) Fields generated by the Negative Electric Charges. And thus, these three separate four-dimensional Interwoven Space/Time entities are all forms of Energies, and each of these three separate four-dimensional Interwoven Space/Time entities embeds its own separate Space and its own separate Time attributes (or facets).

The paper (7) provides detailed explanations of the above, which also results in a simple unification of Gravity and Electricity, because, if the materials presented in the paper (7) will be found valid, then, Gravity and Electricity operations are governed by exactly the same processes.

Unification of Gravity and Electricity is an endeavor which the Science of Physics pursues for a long time, without significant success.

Unifications in Physics are significant steps forward because such unifications provide new insights, explanations to yet unanswered questions, and new predictions.

This paper argues, that if the notions (entities) of Space and Time, will be proven to be entities that do not exist, as this paper predicts, then, the fact that the endeavors to unify the Gravitation with Electricity were based on the conclusion that the entities of Space and Time do exist as a single Space entity and a single Time entity, might be the reason, that such endeavors were not yet successful.

#### **4. A tentative modification to Newton's Second Law of Motion.**

The prediction presented above, that Electric (or Magnetic) Fields are also forms of Accelerations also implies that the Acceleration between Electrically Charged bodies, attracted to, or repelled from each other, because of Coulomb's Law, is dependent mainly on the amount of the Electric Charge that these bodies carry and not on the Masses of these bodies, as Newton's Second Law of motion ( $F=ma$ ) states.

Electrically Charged bodies always embed Electric Charge *and* Mass. However, the Coulomb's Force is much more potent than the Gravitational Force. This can be demonstrated by the following:

The Gravitational Force between two 1-kg Mass Objects that are 1 meter apart is  $6.67 \cdot 10^{-11}$  (8) Newtons, while the Attraction or the Repulsion Force caused by the Coulomb's Law, between two 1 Coulomb Electrically Charged Bodies, held 1 meter apart, is  $9 \cdot 10^9$  (9) Newtons. The above clearly indicates that the Coulomb's Force might be more *potent*, as compared to the Gravitational Force, by a magnitude factor of  $1.35 \cdot 10^{20}$ !

Thus, if Electric (or Magnetic) Fields are also forms of Accelerations, the Acceleration between Electrically Charged bodies, attracted to, or repelled from each other, because of Coulomb's Law, should be dependent mainly on the amount of the Electric Charge that these bodies carry and not on the Masses of these bodies, as Newton's Second Law of motion states, which also implies that Newton's Second Law of motion should undergo a suitable modification, as is described in the paper (7) .

#### **5. An Experiment for Validating or Disproving that Electric Fields are also a form of Acceleration.**

The paper (7) also suggest a physical experiment that might prove or disprove the prediction that the Acceleration between Electrically Charged bodies, attracted to, or repelled from each other, because of Coulomb's Law, is dependent mainly on the amount of the Electric Charge that

these bodies carry and not on the Masses of these bodies, as Newton's Second Law of motion ( $F=ma$ ) states.

That experiment suggests letting two Electrically Charged bodies, at a specific distant  $L$  apart, being attracted to each other under Coulomb's Law.

In the first phase of the experiment the bodies should be of equal Mass magnitudes, embedding equal amounts of Electric Charges, each of a different polarity, to enable the attraction between the bodies under the Coulomb's Force.

The experiment should measure the time it takes for these bodies to collide.

Then, the experiment is repeated with two additional Electrically Charged bodies with the same amount of Electric Charge but with a much bigger Mass magnitude (for example, twice the Mass magnitude that the Electrically Charged bodies had in the first phase of the experiment).

Newton's Second Law of motion predicts that the time to collision, in that second phase of the experiment, would be different (bigger), because the Forces exerted on the bodies will be the same, as in the first phase of the experiment, because the Electric Charges are the same in both phases of the experiment, but the Masses of the bodies are bigger in the second phase of the experiment, which will result in a smaller Acceleration.

This paper, on the other hand, predicts that the time to collision in both phases of the experiment would be virtually the same, because this paper predicts that the Acceleration between Electrically Charged bodies, attracted to, or repelled from each other under the Coulomb's Law, is dependent mainly on the amount of the Electric Charge that these bodies carry and not on the Masses of these bodies, as Newton's Second Law of motion ( $F=ma$ ) states.

If the experiment will prove that the time to collision will be virtually the same, in both phases of the experiment, this will provide validity to what is presented in this paper.

## **6. A tentative explanation to the Light velocity which might also imply that the entity of Time does not exist.**

Light velocity, when measured by Humans, would always result in a constant value and the maximum possible velocity, a claim that was presented by Einstein's Special Relativity Theory as an axiom, without any proof.

It should be also emphasized that the velocity of Light also presents a severe peculiarity, which is presented as follows:

When a moving Human spectator measures the velocity value of any tangible substance, for example, the velocity of a moving Mass body, the velocity, and the direction of motion of this spectator, relative to the velocity and the direction of motion of this tangible substance, *does affect* the measured velocity value of this Mass body, by this Human spectator.

But, when a moving Human spectator, measures the velocity value of a Light beam, the velocity, and the direction of motion of this spectator, relative to the direction of motion of this Light beam, **does not affect at all**, the measured velocity value of this Light beam, by this Human spectator, which always results in a constant Light velocity value, which is also the maximum velocity value that Humans can measure.

This should be regarded as a severe peculiarity, in any velocity value measurements of Light beams, by Humans, which must be also explained.

That tentative explanation is as follows:

Humans are used to perceive any velocity only by using the terms Time and Space, because velocity is perceived (and calculated) by humans as the first derivative of Space as related to Time ( $v_x=dx/dt$ ).

Thus, velocity values, measured by Humans, can be considered as reliable velocity values only if each of these velocities is **affected** by **both**, the **Space**, **and** the **Time** entities, as Humans perceive these entities.

If the statement, presented in this paper, that motions are only the result of Energies Interactions, is found to be a valid statement, (by a successful implementation of the experiment proposed in this paper), then, for Humans to be able to calculate reliably the velocity of a moving object, Humans must be able to do the following:

1. Conclude what are the Energies Interactions which cause this object movement.
2. Conclude which of these Energies should be attributed with the Space and the Time attributes, which Humans need to perceive, understand and calculate motions.
3. Explain the movement of this object based on the above two conclusions, by also concluding that **both** the Space **and** the Time attributes, mentioned above, affect this object movement.

For example, Humans can explain the **origin** of the movements related to the attraction between Mass bodies, and calculate reliably the velocities (and accelerations) in such movements, based on the explanation provided by the four-dimensional Interwoven Space/Time concept, introduced by Einstein's General Relativity theory, because:

1. Humans conclude that the Energies Interaction involved in these movements are the Interaction between the Energy embedded in Einstein's four-dimensional Interwoven Space/Time entity (or, expressing that in other words: the Energy embedded in Newton's Gravitational Field), which Interacts with the Energy embedded in the attracted (moving) Mass object.
2. Humans can conclude to attribute the Space and the Time attributes to the Energy embedded in Einstein's four-dimensional Interwoven Space/Time entity.
3. Humans can conclude that in the attraction movements between Mass bodies, **both** the Space **and** the Time attributes, attributed to the Energy embedded in Einstein's four-dimensional Interwoven Space/Time entity, affect these movements, which enable

Humans to understand the *origin* of these movements and arrive at a reliable measurement of the velocities (and accelerations) that occur in these movements.

Also, Humans can explain and understand the *origin* of the movements related to the attraction or the repulsion between Electrically Charged bodies, and calculate reliably the velocities (and accelerations) in such movements, based on the additional two four-dimensional Interwoven Space/Time, entities, introduced in the paper (7), as already presented in this paper, because:

1. Humans conclude that the Energies Interaction involved in these movements are the Interaction between the Energies embedded in the additional two four-dimensional Interwoven Space/Time entities, introduced in the paper (7), (or, expressing that in other words: the Energies embedded in the Electric Fields), which Interact with the Energy embedded in the attracted or repelled (moving) Electrically Charged objects.
2. Humans can conclude to attribute the Space and the Time attributes to the Energies embedded in the additional two four-dimensional Interwoven Space/Time entities. However, it should be emphasized again, that the Space and the Time attributes, attributed in this paper, to the Energies embedded in the Electric Fields, (via the two additional Interwoven Space/Time concepts presented in the paper (7)) are *separate and different* from the Space and the Time attributes attributed to the Energies embedded in the Gravitation Fields (via Einstein's Interwoven Space/Time concept), which implies that *all* Space and Time attributes do not really exist, and are just attributes, attributed by Humans to forms of Energies, to enable Humans to perceive, understand and calculate the movements of bodies.
3. Humans can conclude, as presented in this paper, that in the attraction or repulsion movements between Electrically Charged bodies, *both* the Space *and* the Time attributes, attributed to the Energies embedded in the additional two four-dimensional Interwoven Space/Time entities, affect these movements, which enable Humans to understand the *origin* of these movements and arrive at a reliable measurement of the velocities (and accelerations) that occur in these movements.

However, the process of the measurement of the velocity of Light by Humans is different.

Einstein's General Relativity Theory predicted, and that prediction was supported later by observations, that Light which pass near a star is bended according to the Space bending that this star Mass induces by its Gravitational Interwoven Space/Time entity.

However, the velocity of this Light remains the same constant velocity attributed to the speed of Light.

This should imply that the movement of Light is also affected by the Interaction between the Energy embedded in the Light beams with the Energy embedded in Einstein's Interwoven Space/Time entity, and the attribute of Space, that Hymans attribute to the Energy embedded in Einstein's Interwoven Space/Time entity does explain the above-described Light bending when Light passes near a star.

However, because the measurement of the velocity of a Light beam, always result in the severe peculiarity described above, in which that measurement, is ***not affected at all***, by the velocity or the direction of the movement, of the spectator which measures that velocity, this should imply, that the attribute of Time that Humans attribute to the Energy embedded in Einstein's Interwoven Space/Time entity ***is not sufficient*** to achieve a reliable measure of the velocity of Light, by Humans.

Thus, because, on one hand, the Time attribute, attributed by Humans to the Energy embedded in Einstein's Interwoven Space/Time entity, ***does result*** in reliable measurements of the velocities and accelerations embedded in the attraction movements between Mass bodies, and, on the other hand, the same Time attribute, attributed by Humans to the Energy embedded in Einstein's Interwoven Space/Time entity, ***is not sufficient***, to enable Humans, to achieve a reliable measurement of the velocity of Light, this should further support the prediction, presented in this paper, that the Time entity does not exist, and should be viewed only as an attribute, that Humans might append to certain forms of Energies, to assist Humans in perceiving, understanding and calculating certain motions in the Universe.

Because the Time attribute, attributed by Humans to the Energy embedded in Einstein's Interwoven Space/Time entity, ***is not sufficient***, to enable Humans, to achieve a reliable measurement of the velocity of Light, this should imply that the Interaction between the Energy embedded in a Light beam and the Energy embedded in Newton's Gravitation Field (or the Einstein's Interwoven Space/Time entity), is significantly different than the Interaction between the Energies embedded in Mass bodies and the Energy embedded in Einstein's Interwoven Space/Time entity, which might imply that what Humans perceive as the Time entity does not affect at all the Interaction between the Energy embedded in a Light beam and the Energy embedded in Newton's Gravitation Field (or the Einstein's Interwoven Space/Time entity).

The above might also imply that Humans ***are not able*** to achieve a reliable measure of Light, because the first derivate of what Humans perceive as Space in relation to Time cannot be established, in measurements of Light velocity executed by Humans.

Thus, if what Humans perceive as the first derivate of Space in relation to Time might be impossible to be established in measurements of Light velocity executed by Humans, this might also provide a tentative explanation to why the measurements of Light velocity by Humans, always result in a ***constant value***.

And this might also tentatively explain why this constant value is the maximum velocity that Humans can measure, as presented below:

If any measure of the Light velocity by Humans must always result in a constant value, then, this might also imply that the velocity of Light cannot be reliably measured by humans, which might also imply that the velocity of Light as measured by Humans, cannot result in a velocity value which can be reliably compared to any other velocity, for example, to any velocity of a moving Particle in the Universe.

However, if the measured velocity value of Light by humans, will result in a velocity value which is bigger as compared to a specific set of velocities in the Universe, but is also smaller as

compared to another set of velocities in the Universe, this should imply that this measured velocity value of Light by humans, is a reliable measurement, because its comparison with other velocity values in the Universe, results in what seems to be, a reasonable comparison.

Thus, as stated above, if the measured velocity value of Light by humans, cannot result in a velocity value which can be reliably compared to any other velocity, then, this measured velocity value of Light by humans, cannot be bigger as compared to a set of velocities in the Universe, and smaller as compared to another set of velocities in the Universe.

Thus, the only possible velocity values remaining for a measured velocity value of Light by humans, might be either a zero-velocity value, or the maximum velocity value.

Because, as stated above, a Light beam is still detected by humans as moving, then, a zero-velocity value cannot be the result of a measured velocity value of a Light beam by humans.

Thus, the *only* possible measured velocity value of a Light beam by humans, under all circumstances, *must* result in a constant velocity value which is the maximum attainable velocity value, of any moving substance.

However, an additional, and even more significant, explanation to why the velocity of Light, as measured by Humans, is the maximum velocity that Humans can measure, which also results from the fact that such a measurement always concludes in a constant value, might be the following:

The severe peculiarity in measurements of Light velocity by Humans is manifested in the fact that Humans cannot detect an increase in the Light velocity when the direction of travel of the measured Light beam and the direction of travel of the Human spectator, are opposite to one another, as compared to the measured Light velocity when both, the measured Light and the Human spectator, travel on the same direction.

If measurements of Light velocity by Humans always result in the maximum velocity that Humans can achieve, this might explain what was just presented, relating to the severe peculiarity in measurements of Light velocity by Humans, because, if measurements of Light velocity by Humans always result in the maximum velocity that Humans can achieve, the expected increase, in the measured Light velocity, presented in the scenario described above, cannot occur.

But the reason that the expected increase, in the measured Light velocity, presented in the scenario described above, cannot occur, might also be because, the measured Light velocity must always end up in a constant value.

## **7. Summary and Conclusions**

This paper addresses the following unanswered question:

Since the *structure* of the Newton's Universal Gravitational Law and the *structure* of the Coulomb's Law are identical, why the *origin* of the attraction between Mass bodies was resolved via Einstein's General Relativity Theory, and its concept of a four-dimensional Interwoven Space/Time entity, and the *origin* of the attraction or the repulsion forces between Electric Charges, is still a mystery?

This paper predicts that Electric (or Magnetic) Fields are forms of Accelerations, like the Gravitational Field, which is already recognized as a form of Acceleration.

The prediction that Electric (or Magnetic) Fields are also forms of Acceleration resulted in another prediction: Changes and Motions are the results of how Energies Interact, and Space and Time are not entities which exist.

Space and Time are notions invented by Humans because Humans needed these notions for perceiving Changes and Motions and these notions are required to calculate values that Humans attribute to Motions such as Velocities or Accelerations.

Based on the above, the paper provides an explanation to the *origin* of the attraction or the repulsion between Electrically Charged bodies, in addition to the explanation already provided by Einstein's General Relativity theory, to the *origin* of the attraction between Mass bodies.

This also provides a simple unification of Gravity and Electricity.

The prediction that the entities of Space and Time do not really exist sounds as an extraordinary, unbelievable, and out of line statement, at first. This is because, as presented above, the notions of Space and Time are crucial notions, which Humans need them, to perceive, understand and calculate Motions and Changes.

However, this paper also proposes a relatively simple experiment, which if implemented, and its results will be successful, as this paper predicts, this will either validate or disprove, what is presented in this paper.

This experiment is based on the conclusion that if Electric (or Magnetic) Fields are forms of Acceleration, then the Acceleration in the attraction or repulsion between two Electrically Charged bodies, under Coulomb's Law, is dependent mainly on the amount of the Electric Charge that these bodies carry and not on their Mass magnitudes, as Newton's second Law of motion states.

This paper assumes that Newton's Second Law of motion was never checked to see if it complies with the Acceleration in scenarios of attraction or repulsion between Electrically Charged bodies.

Instead, this paper assumes that Newton developed his Second Law of motion based on the trajectories existing in the Solar System (10) , (11) , (12) . Newton used these trajectories to prove that his laws are valid, by showing that his laws of motion forecasted these trajectories.

Thus, this paper predicts that Newton's Second Law of motion is valid only for very massive bodies (such as planets) or uncharged bodies, and for Electrically Charged bodies Newton's Second Law of motion should undergo a suitable modification.

The experiment proposed by this paper is relatively simple to implement, but still requires means and funds which are beyond the reach of the author of this paper, thus, the author of this paper hopes, that this paper will bring about the execution of this experiment, and, hopefully, the validation of what is presented in this paper.

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