Title: A discussion related to the uniqueness of the velocity of Light

Author: Moshe Segal[1*†‡]

Affiliations:

[1]Independent Researcher, no University affiliation.

About the author:

*Corresponding author Email: moshe_segal@yahoo.com

†Moshe Segal's address is: Ravutzky st. #78 Ra'anana ISRAEL 4322141

‡ Moshe has a B.Sc Graduated with distinction (Cum Laude) and a M.Sc in Electronics and Electrical Engineering from the Technion, Haifa, Israel.

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

The above demonstrates the uniqueness of the velocity of Light.

But 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 Mass body, ***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. Because it seems reasonable that the velocity of a Light beam measured by Humans, when the Light beam and the Human travel at opposite directions, should be bigger as compared to the velocity of a Light beam measured by Humans, when the Light beam and the Human travel on the same directions.

This paper provides a tentative explanation to the uniqueness related to the velocity of Light and to the severe peculiarity related to the velocity of Light that are presented above.

This explanation is based on a prediction that Space and Time, as Humans perceive these notions, do not really exit.

The author of this paper presented this prediction in an additional paper titled: "A discussion related to the existence of the entities of Space and Time" (12) which is referenced in this paper.

The details related to this prediction are also presented in this paper.

That referenced paper (12) also suggests an experiment, which if implemented, and its result will be successful, might provide validity, or disprove, the predictions presented in that referenced paper, and, as a result, also might provide validity, or disprove, what is presented in this paper.

1. Space and Time, as Humans perceive these entities, might be entities that do not really exit.

The author of this paper is the author of an additional paper titled: "A discussion related to the existence of the entities of Space and Time" (12) , which presented the following prediction:

Space and Time, as Humans perceive these entities, are entities that do not really exist.

The notions of Space and Time are crucial notions, which Humans need them, to perceive, understand and calculate Motions and Changes. Thus, that paper (12) argues that Humans invented these notions to be able to understand and calculate Motions and Changes.

The prediction presented above, that Space and Time, as Humans perceive these entities, are entities that do not really exist, is based on another prediction, also presented in that paper (12) , which is:

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

The following presents briefly, the arguments which are the basis of the prediction that Electric (or Magnetic) Fields are forms of Accelerations. The above-mentioned paper (12) provides a more detailed explanation:

Newton's Universal Gravitational Law $F = G\cdot(m_1\cdot m_2)/ r^2$ *(1)*, explained the magnitude of the Force of attraction between Mass bodies.

But Newton could not provide a complete explanation as relating to the ***origin*** of this Force.

Newton introduced the notion of the Gravitational Field
$g = G\cdot(m)/ r^2$ *(2)* for explaining the ***origin*** of this Force.

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

Einstein realized that Newton's Gravitational Field is a form of Acceleration.

This can be derived already from Newton's work:

Newton's Universal Gravitational Law *(1)*can be reformulated as

F=mg *(2)*, where g is Newton's Gravitational Field.

Then, from Newton's Second Law of Motion

F=ma *(4)* it can be concluded that g=a, which implies that g, Newton's Gravitational Field, is a form of Acceleration.

This led Einstein to introduce the concept of the Four-dimensional Interwoven Space/Time *(3)*which does explain the ***origin*** of the attraction Force between Mass bodies.

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 derivate 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.

Einstein's four-dimensional ***Interwoven Space/Time*** notion does succeed to explain the ***origin*** of the attraction between Mass bodies, as presented 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 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 presented 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 ***origin*** of the attraction or the repulsion between Electric Charges, which is still a mystery today, as presented in the following discussion:

Analogous to Newton's Universal Gravitational Law, which provides the force of attraction between Mass bodies, Coulomb's Law $F = Ke\cdot(q_1\cdot q_2)/r^2$ (5) provides the force of the attraction or the repulsion between 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 $F = G\cdot(m_1\cdot m_2)/ r^2$ and the ***structure*** of the Coulomb's Law $F = Ke\cdot(q_1\cdot q_2)/r^2$ 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, as Humans perceive these entities, 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 author of this paper is also the author of an additional paper titled: "Dark Energy and Electromagnetism" (13) which concludes, among other conclusions, that Electric Charges are also forms of Energy, like Mass is already recognized as a form of Energy, following the introduction of Einstein's Special Relativity Theory.

Thus, like 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, like the above, the attraction or the repulsion between Electric Charges is a result of the ***Way*** a form of Energy (the Electric Field) ***Interacts*** with another form of Energy (Electric Charges), which leads Humans to attribute attributes (or facets) of Space and Time to the Energies embedded in the ***additional*** two four-dimensional Interwoven Space/Time entities presented in the paper (*7*) (or, in other words, to the Electric Fields Energies).

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 the same processes.

From what was already presented above the following can be stated:

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?

As presented above, the papers (*7*) and (12) present 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, as Humans perceive these entities, 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, as Humans perceive these entities, 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, as Humans perceive these entities, 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?

As already stated above, the prediction that the entities of Space and Time, as Humans perceive these entities, 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, papers (*7*) and (12) also propose 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 the papers (*7*) and (12) and, as a result, also might provide validity, or disprove, what is presented in this paper.

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

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*) .

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.

3. A tentative explanation to the uniqueness of the Light velocity which might also imply that the entity of Time does not exist.

Motions in the universe can be classified as presented below:

- The motions of Planets, which can be identified mainly as Mass bodies, are subjected to the laws of Gravitation as presented by Einstein's General Relativity Theory through its Gravitational Interwoven Space/Time concept.
- The motions of Electric Charges embedded in Electrically Charged bodies are subjected to the laws that governs the operations of Electric and Magnetic Fields, and as already presented, can be explained by proposing the two ***additional*** Interwoven Space/Time entities, as proposed by the paper (*7*).
- Apart from Mass bodies or Mass plus Electric Charges, two pure Energy entities travel in the universe, Electromagnetic and Gravitational Waves, both at the speed of Light, and as will be mentioned in a following section of this paper, these waves are also affected by the Interwoven Space/Time entities.

It was presented before, in this paper, that an additional paper titled: “Dark Energy and Electromagnetism” (13) by the author of this paper, concluded that Electric Charges are also just forms of Energies.

Thus, it can be concluded that the only distinct entity in the universe might be the entity of Energy, because Mass and Electric Charges are shown already, to be forms of Energies, and Space and Time, as Humans perceive these entities, might not really exist, and are replaced by the three ***separate*** Space and Time entities attributed to the three ***separate*** Interwoven Space/Time entities proposed by the paper (7), which are also just forms of Energies.

From the above also follows that the three Interwoven Space/Time entities are the Energies that usually govern the motions of all the above-mentioned Energy entities: Mass, Electric Charges and Electromagnetic or Gravitational Waves.

In addition to movements, caused by the three Interwoven Space/Time entities, as presented in this paper, Energies might start moving, or change their movement, because of other causes.

For example, when a moving Particle bumps into a non-moving Particle, the non-moving Particle starts moving, and the movement of the Particle that bumped into the non-moving Particle, acquires a change in its movement.

However, what was just described above, is just an ***instantaneous*** transfer of Energies between these two Particles (or these two Energies), and after this instantaneous transfer of Energies occurs, the ***non-instantaneous*** movements of these Particles are continued to be controlled only by the three Interwoven Space/Time entities, until some of these Particles undergo another ***instantaneous*** transfer of Energy.

As related to Mass or Electric Charges, humans don’t need to attribute, to these forms of Energies, any facets of Space or Time, because Mass or Electric Charge do not move, unless they interact with each other ***instantaneously*** which causes just an ***instantaneous*** Energy transfer, (as presented above), or interact with either one or more of the three Interwoven Space/Time Energy entities, mentioned above, to undergo ***non-instantaneous*** movements.

Thus, apart from the ***instantaneous*** transfer of Energies presented above, and because after this instantaneous transfer of Energies occur, the motions in the universe return to the state in which what governs these motions are the three Interwoven Space/Time entities, then, it can be established, that the three Interwoven Space/Time entities, are the Energies that usually governs the motions of all the Energy entities in the universe.

Then, the ability to measure the velocity value of a specific Energy movement by Humans, and the ability to compare reliably this measured velocity value, of this specific Energy movement, by Humans, to the value measured of any other velocity, is dependent on how this Energy ***interacts*** with the three Interwoven Space/Time entities (or any one of them).

As already presented in this paper, by attributing ***separate*** Space and Time attributes to the three ***separate*** four-dimensional Interwoven Space/Time entities presented in the paper (7), Humans are able to understand, the ***origins*** of motions related to Mass bodies or Electrically Charged bodies, and reliably established the velocities or accelerations existing in these motions.

However, Light (or Gravitational Waves) are special, as will be elaborated in the following:

Light velocity is unique because when Humans measure the velocity of Light, this measurement always results in a constant value and the maximum possible velocity that Humans can measure, a claim that was also presented by Einstein's Special Relativity Theory as an axiom, without any proof.

Also, as already presented before in this paper, 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.

This paper provides a tentative explanation to the above which can be presented 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 a Space and a 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 can 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 a Space and a Time attribute 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.

Humans can also 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 can 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 Space and 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 the 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 Gravitational Interwoven Space/Time entity, and the attribute of Space, that Humans attribute to the Energy embedded in Einstein's Gravitational 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 Gravitational 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 Gravitational 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 Gravitational 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, that Humans attribute to Einstein's Gravitational Interwoven Space/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 Gravitational 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 Gravitational Interwoven Space/Time entity), is significantly different as compared to the ***Interaction*** between the Energies embedded in Mass bodies and the Energy embedded in Einstein's Gravitational 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 Gravitational Interwoven Space/Time entity).

The above might also imply that Humans ***are not able*** to achieve a reliable measurement of the velocity of a Light beam, because the first derivate of what Humans perceive as Space in relation to Time might be ***impossible to establish***, in measurements of the 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 the Light velocity executed by Humans, this might also provide a ***tentative explanation*** to why the measurements of the Light velocity by Humans, always result in a ***constant value***.

This might also provide a tentative explanation to the severe peculiarity presented above in measurements of the Light velocity by Humans.

Because the severe peculiarity in measurements of the 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.

But if measurements of the Light velocity by Humans ***always*** result in a ***constant value***, the ***expected increase***, in the measured Light velocity, presented in the scenario described above, ***cannot occur***, which does provide a tentative explanation to the severe peculiarity presented above in measurements of the Light velocity by Humans.

And this ***constant value*** must also be the maximum velocity value that Humans can measure, because of the following argumentation:

Humans use means which measure the values of the attribute of Space and the values of the attribute of Time, that Humans append to Einstein's Gravitational Interwoven Space/Time entity, and Humans also utilize such means when Humans measure the velocity of a Light Beam.

Thus, the result of such measures should provide also reasonable results to what Humans perceive as the first derivative of Space as related to Time (v_x=dx/dt), because these measurements utilize the means, mentioned above, which measure the values of the attribute of Space and the values of the attribute of Time, that Humans append to Einstein's Gravitational Interwoven Space/Time entity.

Then, if the ***constant value*** in measurements of the Light velocity executed by Humans ***is not*** the maximum velocity value that Humans can measure, then, the ***expected increase*** mentioned above ***should exist***, because, as mentioned above, these measurements were conducted with means that comply with reasonable results also regarding to the first derivative of Space as related to Time (v_x=dx/dt).

Thus, since the ***expected increase*** mentioned above ***does not occur***, this implies that the ***constant value*** in measurements of the Light velocity executed by Humans, must be the maximum velocity value that Humans can measure.

Thus, only if measurements of the Light velocity by Humans always result in a ***constant value***, and this ***constant value*** also happen to be the maximum velocity value measurement that Humans can achieve, the ***expected increase***, mentioned above, cannot occur, which also provides, a complete explanation to the severe peculiarity in measurements of a Light beam velocity by Humans, mentioned above.

4. Summary and Conclusions

This paper addresses the Uniqueness relating to the velocity of Light, which is manifested in the statement presented by Einstein's Special Relativity Theory, which state, that Light velocity, when measured by Humans, would always result in a constant value and the maximum possible velocity.

This claim was presented by Einstein's Special Relativity Theory as an axiom, without any proof.

This paper also presents a severe peculiarity in the measurements of Light velocity by Humans, which is manifested by the fact that the velocity and the direction of the motion of a Human spectator, who measures the velocity of a Light beam, ***does not affect at all*** the result of this measurement.

This paper provides a tentative explanation to this Uniqueness and peculiarity, based on a prediction that the entities of Space and Time, as Humans perceive these entities, do not really exist.

That prediction is based on 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, as Humans perceive these entities, 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.

The prediction that the entities of Space and Time, as Humans perceive these entities, 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.

Based on the prediction, presented in this paper, that Space and Time, as Humans perceive these entities, do not exist, and motions in the Universe are only the result of how ***Energies Interact***, this paper concludes, that the motion of Light is also a result of how Light ***Interacts*** with the Energy embedded in Einstein's four-dimensional Interwoven Space/Time entity.

However, this paper predicts that the Interaction between Light and Einstein's four-dimensional Interwoven Space/Time entity is ***significantly different*** from the way Mass bodies Interact with Einstein's four-dimensional Interwoven Space/Time entity.

Because the velocity of moving Mass bodies can be reliably established by Humans, but the velocity of Light cannot be reliably established by Humans, because measurements of Light velocities by Humans always embed the severe peculiarity presented above, which is manifested by the fact that the velocity and the direction of the motion of a Human spectator, who measures the velocity of a Light beam, ***does not affect at all*** the result of this measurement.

Thus, based on the prediction that the Time entity might not exist, this paper concludes that the Time entity, which Humans attribute to Einstein's four-dimensional Interwoven Space/Time entity, might not be affecting the Interaction between Light and Einstein's four-dimensional Interwoven Space/Time entity.

This paper concludes that the attribution of the Time entity was a successful attribution to the Energy embedded in Einstein's four-dimensional Interwoven Space/Time entity, for explaining Mass bodies motions.

But this paper predicts that the attribution of the Time entity to Einstein's four-dimensional Interwoven Space/Time entity, for arriving at the explanation of how Light moves, might be less successful, because this paper concludes, based on the prediction that the Time entity might not exist, that the first derivate of Space in relation to Time, in measurements of Light velocity, cannot be established by Humans.

Based on the above, this paper presents a tentative explanation to the uniqueness and peculiarity of measurements of Light velocity by Humans.

But this tentative explanation also implies that Humans are ***not able*** to achieve a reliable measurement of the velocity of Light, which points to an ***intrinsic severe disability*** that Humans might have.

However, as presented above, if the experiment proposed in this paper will be implemented, and its results will be successful, this might either provide validity to what was presented in this paper or disprove it.

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.

References

(*1*). Newton's Law of Universal Gravitation. Wikipedia.
https://en.wikipedia.org/wiki/Newton%27s_law_of_universal_gravitation

(*2*). Gravitational Field formula
Gravitational Field Formula: Concept, Important Formulas, Examples (toppr.com)

(*3*). Einstein's Theory of General Relativity. Space.com site.
https://www.space.com/17661-theory-general-relativity.html

(*4*). Newton's Laws of Motion. Wikipedia.
https://en.wikipedia.org/wiki/Newton%27s_laws_of_motion

(*5*). Coulomb's Law, Wikipedia. https://en.wikipedia.org/wiki/Coulomb%27s_law

(*6*). Einstein: Ether and Relativity. http://mathshistory.st-andrews.ac.uk/Extras/Einstein_ether.html

(*7*). A New Theory Expands Einstein's General Relativity Theory to Include Both Electric Charge and Mass Entities. Moshe Segal, Theoretical Physics Letters (PTL). That paper is under PTL copyright and consent form, signed by the author Moshe Segal with PTL. https://2edd239a-21aa-41cc-a45e-84832f36b982.filesusr.com/ugd/04176b_5399eb07c7334d9d965cc3685558dea1.pdf

(*8*). Mass Attraction Forces. ER. services. University Physics Volume 1. Newton's Law of Universal (lumenlearning.com)

(*9*). Attraction Force Between Charges 1 meter Apart. The Physics Classroom. Physics Tutorial: Coulomb's Law (physicsclassroom.com)

(10) Kepler's Laws and Newton's Laws. mtholyoke.edu. http://www.pas.rochester.edu/~blackman/ast104/newtonkepler.html

(11) The Science: Orbital Mechanics. earthobservatory.nasa.gov. https://earthobservatory.nasa.gov/features/OrbitsHistory/page2.php

(12) A discussion related to the existence of the entities of Space and Time, Moshe Segal. 10.2139/ssrn.4332823

(13) Dark Energy and Electromagnetism. Moshe Segal http://dx.doi.org/10.2139/ssrn.4276153 or 10.33140/JEEE.02.01.06