Space-Time Nature might be used to bridge between the Quantum and the Classic Physics

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Abstract

From the dawn of civilization Humans struggled to understand and explain their environment.

The process of that struggle resulted in various branches of investigations and knowledge, which Humans denote as Science.

Because the Human mind, which created this Science, is by itself composed of components which might be the same components that the environment is also composed of, Humans might be bound to never being able to understand and explain ***completely*** this environment, which is also denoted as the Existence, because one cannot explain an issue, if that explanation relies on this same issue.

Nevertheless, Humans were still able to build a magnificent structure, of knowledge and explanations, which, as mentioned above, is denoted as Science which is still an ongoing endeavor, which continuously expands, reveals and explains more and more secrets embedded in the Existence.

However, the nowadays Physics, which is the branch of Science which specifically focuses on understanding and explaining the Existence, is still composed of branches which are not fully compatible.

One of these branches is the branch denoted as the Classic Physics, which focuses on understanding and explaining what is denoted as the Macroscopic Environment.

Another such branch is the branch denoted as the Quantum Physics, which focuses on understanding and explaining what is denoted as the Microscopic Environment.

And, as presented above, these two branches of Physics are not fully compatible, and Humans are still struggling, to expand the knowledge that might bridge the gap that still exists between these two branches of Physics.

Moreover, even the branch of the Classic Physics itself, still embeds branches which are also not fully compatible, as for example, the Gravity and the Electromagnetism, and more must be done to bridge the gap that exists also between these two branches, which both belong, as stated above, to the branch of the Classic Physics.

In the process of building the above-mentioned magnificent structure of Science, Humans detected in the Existence various components, and denoted these components as Entities, and used these Entities as the building blocks on which the Science of Physics was constructed.

Two such Entities are the Entity of Space and the Entity of Time, which together were interweaved into one Entity, denoted as Einstein's four-dimensional Interwoven Space-Time Entity, by the Relativity Theories of Einstein.

The branch of Classic Physics relates to the four-dimensional Interwoven Space-Time Entity as a real component, that really exists in the environment, or the Existence.

Moreover, the branch of Classic Physics states that the environment embeds just one ***single*** four-dimensional Interwoven Space-Time Entity which is a ***real*** component of the environment, that really exists in the environment.

However, this paper argues, that the branch of Quantum Physics, might also imply that the above-mentioned four-dimensional Interwoven Space-Time Entity might ***not be*** a component that really exists in the environment, or the Existence.

Moreover, this paper also argues, that although the nowadays branch of Classic Physics does state that the four-dimensional Interwoven Space-Time Entity is a real existing Entity, a ***contrary*** conclusion can be also derived, a conclusion that the four-dimensional Interwoven Space-Time Entity might ***not be*** a component that really exists in the environment, or the Existence, and that ***contrary*** conclusion can be also derived from arguments based ***only*** on the nowadays Classic Physics.

Thus, if it can be concluded that arguments based ***only*** on the Classic Physics might imply that the four-dimensional Interwoven Space-Time Entity ***does not really exists*** in the Existence, a conclusion which might be also in line, and compatible, with what the Quantum Physics also implies, then, by abandoning the conclusion that the four-dimensional Interwoven Space-Time Entity is a component that really exists in the environment, and by validating the assumption that the four-dimensional Interwoven Space-Time Entity might be only a facet or an attribute of another component of the Existence, which the Science of Physics denotes as Energy, this might provide also a lead for starting some bridging between the Classic Physics and the Quantum Physics, which, as already stated above, are still significantly incompatible.

1. Elaborations on the Entities of Space and Time in the context of the Classic Physics

Humans need the Entity of Space to perceive the relative positions between objects. Humans also need the Entities of Space and Time to calculate the values that Humans attribute to Changes and Motions, in the Existence, such as the Velocity or the Acceleration.

Thus, initially, Humans invented the notions of Space and Time, based on their feeling that these notions must be existing notions, which define the relative positions between objects, and the activities occurring in the environment which result in changes and motions.

Thus, initially, the Entities of Space and Time, in the context of the Classic Physics, were assumed to be entities that really exist in the Existence, but, initially, these Entities were also assumed as being two separate Entities.

However, after the introduction of Einstein's Relativity Theories, the Entities of Space and Time, in the context of the Classic Physics, were interweaved into one Entity, denoted as Einstein's four-dimensional Interwoven Space-Time, which also provided an explanation for the ***origin*** of the attraction between massive bodies.

Newton's Universal Gravitational Law,

$F = G\cdot(m_1\cdot m_2)/ r^2$ (1)

defined the magnitude of the force of the attraction between two massive bodies.

But Newton could not provide a satisfactory explanation to what is the ***origin*** of this attraction force, or what causes this attraction.

By introducing the concept of the four-dimensional Interwoven Space-Time Einstein succeeded to explain the ***origin*** of this attraction force, by actually converting it from a force into the geometry represented by that four-dimensional Interwoven Space-Time Entity.

Because the concept of the four-dimensional Interwoven Space-Time already embeds in it both, the Space and the Time Entities, then, each point in that four-dimensional Interwoven Space-Time Entity embeds also the velocity and the acceleration embedded in that point of that four-dimensional Interwoven Space-Time Entity, because acceleration is defined as the second derivative of Space in relation to Time.

And because the Newtonian branch of the Classic Physics already recognized the Gravity ***also*** as a form of acceleration, and also because, as presented above, the four-dimensional Interwoven Space-Time already embeds in it an acceleration at each point of it, then, this enabled Einstein's General Relativity Theory to explain the ***origin*** of the attraction between massive bodies, by introducing the concept of the four-dimensional Interwoven Space-Time.

In the nowadays Science of Classic Physics, Einstein's Relativity theories are the leading acceptable theories of the Classic Physics.

The four-dimensional Interwoven Space-Time concept is the foundational backbone of the two most successful and experimentally verified theories in the mainstream Classic Physics: Special Relativity Theory (SRT) and General Relativity Theory (GRT) (2).

The standard confirmed view, which is the established, tested and practical realm of the current mainstream Classic Physics, is that the Universe, or the Existence, embeds a ***single*** four-

dimensional Interwoven Space-Time manifold, which consists of three spatial dimensions (x, y, z) and one temporal dimension (t), unified into a single geometric Entity.

That model accurately predicts and describes Gravity, the orbits of planets, the bending of Light around massive bodies, time-dilation, and the propagation of Gravitational Waves, all of which have been experimentally confirmed.

Thus, for all practical macroscopic phenomena, and for the vast majority of Physics (including the Standard Model of Particle Physics which operates on this background), the Universe, or the Existence, is treated as a ***single*** four-dimensional Space-Time with a ***single*** geometry.

But, as already presented above, in this paper, the Gravity and the Electromagnetism branches of the nowadays Classic Physics are not fully compatible.

An example of that incompatibility between the Gravity and the Electromagnetism is the fact that despite the explanation that Einstein's General Relativity Theory already provided to the ***origin*** of the attraction between massive bodies, the ***origin*** of the attraction or the repulsion between Electrically Charged bodies is still a mystery.

However, the author of this paper published several additional papers, which argue that similarly to Gravity, which is already accepted and recognized by the branch of the Classic Physics as a form of acceleration, the Electric and the Magnetic Fields that compose the Electromagnetism, should be also recognized as a form of acceleration.

The nowadays branch of the Classic Physics do not accept the above, and do not recognize the Electric and the Magnetic Fields as a form of acceleration.

But from the fact that the ***structure*** of the Coulomb's Law,

$F = Ke \cdot (q_1 \cdot q_2)/r^2$ (3)

is identical to the ***structure*** of the Newton's Universal Gravitational Law,

$F = G \cdot (m_1 \cdot m_2)/ r^2$ (1)

the additional papers just mentioned above argue, that the Electric and the Magnetic Fields should be also recognized as a form of acceleration, similarly to why Gravity is already recognized as a form of acceleration.

One of the above-mentioned additional papers is:

"Implications if the Electric Field will be recognized as a form of Acceleration." (4).

Following is a short elaboration, that appears also in the above-mentioned paper (4) to why the Electric and the Magnetic Fields should be also recognized as a form of acceleration

That paper (4) argues that the acceleration attributed to Gravity might be also obvious from analyzing ***only*** the Newton's Universal Gravitational Law, $F = G \cdot (m_1 \cdot m_2)/ r^2$.

Because, during the attraction process between massive bodies the Force F in $F = G \cdot (m_1 \cdot m_2)/ r^2$ is dependent only on the distance r between these massive bodies, since G is a constant and the Mass magnitudes of the massive bodies also do not change, assuming that the velocities in the

attraction process are negligible in comparison to the velocity of Light, implying that the Mass increase with velocity, implied from Einstein's Special Relativity Theory, is also negligible.

Thus, during the attraction process, the force F continuously increases, as the distance r between the bodies continuously decreases.

Since this Force F is what causes the attraction between the massive bodies, the fact that during this attraction process the Force F continuously increases, this should imply, that during the attraction process, the velocities of the attracting massive bodies also continuously increase, which implies that during the attraction process, the massive bodies are also accelerating towards each other.

Since the Gravitational Field is what causes the Force F, and thus, is actually the cause of the attraction between the massive bodies which, as concluded above, are accelerating towards each other, it should be concluded that the Gravitational Field is a form of acceleration.

And, as already stated above, this conclusion is the result from an analysis done ***only*** on the Newton's Universal Gravitational Law, $F = G\cdot(m_1\cdot m_2)/ r^2$.

However, the analysis presented just above, which was done only on the Newton's Universal Gravitational Law, $F = G\cdot(m_1\cdot m_2)/ r^2$, reveals more than what was presented above.

Since the Gravitational Field strength itself, presented by the equation: $g = G\cdot m/ r^2$, also continuously increases during the attraction process, as the distance r between the bodies continuously decreases, then, the Gravitational Field strength, which is the cause of the attraction between the massive bodies, is not only a form of acceleration, it is a form of acceleration which increases continuously, during the attraction process between the massive bodies.

As already presented before in this paper, the nowadays Science of Physics, does not recognize the Electric or the Magnetic Fields as being also a form of acceleration, as the Gravitational Field is already recognized as a form of acceleration.

But, similarly to what was presented, that Newton's Gravitational Field is a form of acceleration, which can be derived ***only*** from analyzing the Newton's Universal Gravitational Law, $F = G\cdot(m_1\cdot m_2)/ r^2$, similar arguments might apply also to the claim, that the Electric or the Magnetic Fields might also be concluded to be a form of acceleration, only by analyzing the Coulomb's Law,

$F = Ke\cdot(q_1\cdot q_2)/r^2$ (3)

Analogous to Newton’s Universal Gravitational Law, which provides the Force of attraction between massive bodies, Coulomb’s Law provides the Force of the attraction or the repulsion between Electric Charges.

Because the ***structure*** of the Newton’s Universal Gravitational Law and the ***structure*** of the Coulomb’s Law are ***identical***, then, as already stated above, similarly to the arguments presented above, that Gravity can be recognized as a form of Acceleration ***only*** by analyzing the Newton's

Universal Gravitational Law, similar arguments apply, which imply, that the Electric or the Magnetic Fields should be also recognized as a form of acceleration, only from analyzing the Coulomb's Law.

These arguments are:

During the attraction or the repulsion process between the Electrically Charges bodies the Force F in $F = Ke \cdot (q_1 \cdot q_2)/r^2$ is dependent only on the distance r between these Electrically Charged bodies, since Ke is a constant and the Electric Charges magnitudes embedded in the Electrically Charged bodies also do not change.

Thus, during the attraction or the repulsion process, the force F continuously increases or decreases, as the distance r between the Electric Charges continuously decreases or increases (depending if the Electric Charges attract or repel each other).

Since this Force F, presented by the Coulomb's Law, is what causes the attraction or the repulsion between the Electrically Charged bodies, the fact that during this attraction or repulsion process the Force F continuously increases or decreases, (depending if the Electric Charges attract or repel each other), this should imply, that during the attraction or the repulsion process, the velocities of the attracting or repelling Electrically Charged bodies also continuously increase or decrease, which implies that during the attraction or the repulsion process, the Electrically Charged bodies are also accelerating towards each other, or decelerating from each other.

Since the Electric Fields involved in the above-described process are the cause of the force F and thus, also the cause of the attraction or the repulsion between the Electrically Charged bodies which, as concluded above, are accelerating towards each other, or decelerating from each other, it should be concluded that these Electric Fields are also a form of acceleration or deceleration (depending if the Electrically Charged bodies attract or repel each other).

And this conclusion is the result from an analysis done ***only*** on the Coulomb's Law, $F = Ke \cdot (q_1 \cdot q_2)/r^2$, as presented above.

However, the above presented analysis, which was done only on the Coulomb's Law, $F = Ke \cdot (q_1 \cdot q_2)/r^2$, reveals more than what was presented above.

Since the Electric Field strength involved, presented by the equation: $e = Ke \cdot q/r^2$, also continuously increases or decreases during the attraction or the repulsion process, as the distance r between the Electrically Charged bodies continuously decreases or increases, then, the Electric Field strength, which is the cause of the attraction or the repulsion between the Electrically Charged bodies, is not only a form of acceleration or deceleration, the Electric Field strength is a form of acceleration or deceleration which increases continuously, during the attraction or the repulsion process between the Electrically Charged bodies.

But since the Coulomb's Law ***does not*** contain any Mass component in its equation, it is reasonable to conclude that the above-described acceleration or deceleration property, derived from an analysis performed ***only*** on the Coulomb's Law, is caused ***only*** by the Electric Field

created by the Electric Charges embedded in the Electrically Charged bodies presented in the Coulomb's Laws, which implies that the Electric Field is also a form of acceleration.

The additional papers mentioned above also propose experiments, which if implemented, and their results will be successful, then, this might provide additional validity to the assumption, presented in these additional papers, that the Electric and the Magnetic Fields should be also recognized as a form of acceleration, ***contrary*** to what the nowadays Science of Classic Physics states, that the Electric and the Magnetic Fields are not a form of acceleration.

Thus, similarly to Einstein's General Relativity Theory, which explained the ***origin*** of the attraction between massive bodies, based on the recognition that Gravity is a form of acceleration, the above-mentioned additional papers present the assumption, that the ***origin*** of the attraction or the repulsion between Electrically Charged bodies can be explained based on the assumption that the Electric and the Magnetic Fields should be also recognized as a form of acceleration, and this also might provide a significant lead for the Unification between the Gravity and the Electromagnetism, which nowadays are still considered as incompatible branches of the nowadays Classic Physics.

And, similarly to how Einstein's General Relativity Theory explain the ***origin*** of the attraction between massive bodies, by actually converting it from a force into the geometry represented by Einstein's four-dimensional Interwoven Space-Time Entity, the above-mentioned additional papers explain the ***origin*** of the attraction or the repulsion between Electrically Charged bodies also by actually converting these attractions or repulsions from forces, into a geometry represented by a form of a four-dimensional Interwoven Space-Time Entity.

However, if the assumption presented above, that the Electric and the Magnetic Fields should be also recognized as a form of acceleration, would be also validated via a suitably proposed experiments, then, additional arguments can be provided, which might also imply, that Einstein's four-dimensional Interwoven Space-Time Entity is not really a real Entity which really exists in the Existence.

These additional arguments are:

If it can be argued that the acceleration in a scenario of two oppositely charged Electrically Charged bodies which attract each other, does not fully comply with Newton's Second Law F=ma, then, this might also lead to the conclusion that Einstein's four-dimensional Interwoven Space-Time might not be an entity that really exist, because of the following:

Although Einstein's GRT does convert the description of Gravity from a force into the geometry presented by Einstein's four-dimensional Interwoven Space-Time Entity, the Classic Physics still also uses forces, for measuring the amount of force existing in the attraction between two massive bodies, which is presented by Newton's Universal Gravitational Law, $F = G\cdot(m_1\cdot m_2)/ r^2$ (1).

It should be also noted that Newton's Universal Gravitational Law, or in other words, Gravity, also ***complies fully*** with Newton's Second Law, F=ma, because from the Gravitational Field

strength equation, $g = G \cdot m / r^2$, follows, that the Newton's Universal Gravitational Law, $F = G \cdot (m_1 \cdot m_2) / r^2$ (1), can be represented also as F=mg.

And because, as already presented before, in this paper, that the Gravitational Field strength, g is already recognized as a form of acceleration, a, then, as stated above, this also implies, that Newton's Universal Gravitational Law, or in other word, Gravity, also ***complies fully*** with Newton's Second Law F=ma.

Einstein's GRT also agrees, that the acceleration induced on any massive body by an external force exerted on this massive body, also always complies with Newton's Second Law, F=ma.

Thus, in a scenario of two Electrically Charged bodies which are attracted to each other or repelled from each other, Einstein's GRT and the nowadays Classic Physics state, that the acceleration, or the deceleration, of these Electrically Charged bodies still complies with Newton's Second Law equation, F=ma, because this is also a scenario in which an external force is exerted on massive bodies, even though, these massive bodies are also electrically charged.

Thus, in all the above scenarios, either the scenario of Gravity, or any scenario of an external force exerted on massive bodies, including the scenario of two Electrically Charged bodies which are attracted to each other or repelled from each other, the GRT and the nowadays Classic Physics agree that the acceleration, or the deceleration, ***always*** complies with Newton's Second Law F=ma.

Thus, the fact that in all the above presented scenarios, the acceleration fully complies with Newton's Second Law, F=ma, this might also justify the GRT assumption, that this acceleration should be ***attributed*** to a single Space-Time entity, which does really exist and is the single Space-Time existing in the Universe, which is also denoted as Einstein's four-dimensional Interwoven Space-Time Entity.

But, if it can be argued, that in a scenario of two oppositely Charged Electrically Charged bodies which are attracted to each other, the acceleration of these Electrically Charged bodies ***does not*** fully comply with the equation F=ma, then, this might also imply that Einstein's four-dimensional Interwoven Space-Time Entity ***is not*** an Entity that really exists in the Existence.

Because, if in a scenario of two oppositely Charged Electrically Charged bodies which are attracted to each other, the acceleration of these Electrically Charged bodies ***does not*** fully comply with the equation F=ma, which implies that ***not in all*** the above scenarios, the acceleration complies with the equation F=ma, then, it might be reasonable to assume, that this acceleration ***should not*** be attributed to a single Space-Time entity, as GRT states.

Instead, it might be reseanable to assume that this acceleration, and thus, also the Space-Time to which this acceleration belongs, should be attributed to the specific Energy that induced this acceleration, and thus, this acceleration, and thus, also the Space-Time to which this acceleration belongs, should be viewed only as an attribute, attributed to that Energy, or as a facet of that Energy.

The above also implies, that the Universe embeds not just one single Space-Time entity, as GRT assumes.

Instead, the above implies that the Universe embeds multiple, separate and independent Space-Time attributes, each attributed to a separate Energy form.

For example, Einstein's four-dimensional Interwoven Space-Time should be viewed as an attribute attributed to the Energy embedded in Gravity, and a separate, different and independent four-dimensional Interwoven Space-Time, should be attributed to the Energy embedded in the Electromagnetism.

Thus, the above also implies that all the above presented separate Space-Time attributes, are not really entities that really exist. They should be viewed only as attributes, or mathematical tools, used to understand the interactions between forms of Energy, and used to calculate elements related to changes or movements, resulting from the interactions between forms of Energy, such as velocities or accelerations.

Thus, since, as presented above, the assumption that Einstein's four dimensional Interwoven Space-Time might not be an entity that really exists does rely on the possibility that in a scenario of two oppositely charged Electrically Charged bodies which attract each other, the acceleration does not fully complies with Newton's Second Law, F=ma, then, following are several arguments which might imply that in a scenario of two oppositely Charged Electrically Charged bodies which are attracted to each other, the acceleration of these Electrically Charged bodies might not fully comply with the equation F=ma.

As already presented above, the above presented assumption that the Electric and the Magnetic Fields might be also recognized as a form of acceleration was derived from an analysis done only on the Coulomb's Law, which does not contain any Mass components in it, which might indicate, that the cause of that derived acceleration is ***only*** the Electric Field.

Moreover, as indicated in the above-mentioned paper (4), the Electric Field is significantly more potent as compared to Gravity, by a factor of more than 10^{20}, which might further support the assumption that the acceleration in the scenario of two oppositely Charged Electrically Charged bodies which are attracted to each other, might deviate from the equation F=ma.

Still moreover, in the above scenario the Electric Field increases as the distance between the bodies decreases, which implies that the system is self-amplifying.

And, in addition to the system being a self-amplifying system, as presented above, the speed of the propagation of the Electromagnetic Field is finite because it is bounded by the speed of light, and this should provide further additional support to the assumption that in that scenario the acceleration of the accelerating Electrically Charged bodies might deviate from F=ma, because of the following:

Because in the attraction process between two oppositely Charged Electrically Charged bodies which are attracted to each other, the Electric Field, which causes this attraction process also continuously changes, and this change propagates at a finite velocity, which is the speed of light, then, the position of each body, presented in the equation which describes its movement through Time, is not the position of the body at the moment when the force was applied on it, because the force which is applied on each body relates to the body's ***retarded position*** (or its past position).

Thus, the equation describing the motion of the Electrically Charged bodies described above is not a simple ODE (ordinary differential equation) but a delayed-differential equation.

Thus, in addition to the system being self-amplifying, the fact that the equation describing it is a delayed-differential equation, this leads to significant implications such as instabilities and possible multiple effective solutions.

And, in addition to what was just presented above, since in the scenario of two oppositely Charged Electrically Charged bodies which are attracted to each other the bodies accelerate, and accelerating Electrically Charged particles also emit Electromagnetic Waves, then, this also does introduce additional significant complications.

Thus, from what was just presented above follows, that the conclusion provided by the Classic Physics theory, which concludes that in the above presented scenario, the acceleration should comply with F=ma, this conclusion, presented by the Classic Physics, might be already ***internally strained***, which might imply that in such a self-amplifying plus a delayed system, tiny differences in the initial conditions might result in different results.

Thus, the above might provide possible support to the assumption that in the above presented scenario, the acceleration might deviate from F=ma, which, from what was also presented above, might also support the assumption that Einstein's four-dimensional Interwoven Space-Time Entity, might not be a real Entity that really exists in the Existence.

As already presented before, in this paper, the above-mentioned additional papers do propose also suitable experiments.

The paper "Tentative Additional Explanations to Why Electric Charges Attract and Repel Each Other" (5), proposes an experiment that focuses only on providing validity to the assumption that the Electric and the Magnetic Fields should be also recognized as a form of acceleration, and thus, this experiment cannot be used to also provide validity to the assumption that Einstein's four-dimensional Interwoven Space-Time Entity, might not be a real Entity that really exists in the Existence.

But, the paper "Implications if the Electric Field will be recognized as a form of Acceleration." (4), which was already mentioned before, in this paper, proposes an experiment that might provide validity to both, to the assumption that the Electric and the Magnetic Fields should be also recognized as a form of acceleration, and also to the assumption that Einstein's four-dimensional Interwoven Space-Time Entity, might not be a real Entity that really exists in the Existence, because this experiment intends to test if in a scenario of two oppositely Charged Electrically Charged bodies which are attracted to each other, the acceleration might deviate from the equation F=ma.

This if that experiment, proposed in that paper (4), will be implemented, and its implementation will turn out to be successful, such that it will provide validity to the assumption, that in a scenario of two oppositely Charged Electrically Charged bodies which are attracted to each other, the acceleration might deviate from the equation F=ma, then, this will also provide validity to the assumption that Einstein's four-dimensional Interwoven Space-Time Entity, might not be a

real Entity that really exists in the Existence, and this validity will be provided from arguments which are based ***only*** on the nowadays Classic Physics.

2. Elaborations on the Entities of Space and Time in the context of the Quantum Physics

As presented in the previous chapter, of this paper, the nowadays Classic Physics states that the Existence, or the Universe, is treated as a ***single*** four-dimensional Interwoven Space-Time with a ***single*** geometry.

But, in the previous chapter, of this paper, arguments were also provided that might imply that this four-dimensional Interwoven Space-Time with a ***single*** geometry, presented by the Classic Physics, might not be an Entity that really exists, and these arguments are based ***only*** the Classic Physics.

Also, in the previous chapter, of this paper, an experiment proposed in additional papers, mentioned in this paper, was also referred to, which might provide validity to the arguments that this four-dimensional Interwoven Space-Time with a ***single*** geometry, presented by the Classic Physics, might ***not be*** an Entity that really exists.

In this chapter, of this paper, the assumption that this four-dimensional Interwoven Space-Time with a ***single*** geometry might ***not be*** an Entity that really exists, is shown to be supported also by an additional branch of the nowadays Physics, the branch of Quantum Physics, which, as also presented already, in this paper, that nowadays Quantum Physics branch, is not fully compatible with the nowadays Classic Physics branch.

Modern Quantum computers provide physical validity to the Superposition phenomena, presented by the Quantum Physics, by demonstrating that Qubits, which are the basic components of these Quantum computers, do exhibit Quantum Superposition.

These Qubits exhibit that a single particle can exist in multiple states simultaneously. And, these separate states, that this single particle exists in simultaneously, are directly related to Space and Time.

In Quantum Physics a "state" is a description of a particle's properties, and these particle properties frequently include its Position (where it is) and its momentum (how it's moving through Time).

When a particle is in superposition, it can be in a "spatial superposition", meaning it is literally in ***two different Locations at the same Time***.

However, it is still just one particle described by a single "waveform" that spreads across those two spots.

Thus, the difference between the Classic Physics view and the Quantum Physics view is as follows:

In the Classic Physics view a particle exists in point A.

In the Quantum Physics view a particle is a "cloud" of probability that can peak at point A ***and*** at point B ***simultaneously***.

Examples of particles that do exist simultaneously in more than one location, which is a phenomenon that is also verified and validated via Qubits in quantum computer, are:

Photons. In a photonic Qubit, a ***single photon*** can travel down two or more different paths at the ***same Time***. A detector in path A clicks and detects that this ***single photon*** traveled in path A, and another, separate detector in path B also clicks, and detects that this ***single photon*** traveled also in path B.

Or Electrons. In the famous Double-Slit Experiment, a ***single Electron*** is fired at two slits and interferes with itself, proving that this **single Electron** traveled through both paths ***simultaneously***.

Or neutrons. Neutron are frequently used in interferometry experiments to test Gravity and Quantum Mechanics by sending a ***single neutron*** along two ***different paths***.

Or even whole atoms. Researchers use "atom interferometry" to put whole atoms (like Rubidium or Cesium) into superposition. They have successfully separated a ***single atom*** into ***two locations*** centimeters apart, before bringing it back together.

Or even Molecules. Quantum spatial superposition is not limited to "point" particles. Large molecules, such as C60 "Buckyballs" (60 carbon atoms shaped like a soccer ball) and even larger organic molecules containing thousands of atoms, have been placed in Quantum spatial superposition.

From what was just presented above, it should be obvious that the Quantum Physics refers very differently to the concept of Space, as compared to how the GRT and the nowadays Classic Physics refers to the concept of Space.

In GRT and the nowadays Classic Physics an object can only be in one point in Space at one Time.

However, in Quantum Physics the spatial superposition phenomenon shows that a single entity is ***non-local***. This means the object's "identity" is not tied to a single coordinate in Space.

For example, to the photon, path A and path B are not two separate places it has to choose between; they are simply two components of its single existence.

There is a growing theory in modern Physics (often called "It from Qubit") which argues that entanglement and superposition actually creates Space.

If two points are connected via quantum states (like the photon's two paths), they are "near" each other in the quantum web. In this view, Space is just a map of how quantum information is

shared. If the photon can be in both paths, it's because, at a fundamental level, those "two" locations are part of the same quantum event.

Thus, Quantum spatial superposition phenomenon does challenge our classical view of Space as a rigid stage, and suggests that our classical intuition is incomplete, and Space might be a "secondary" or "emergent" property of objects, rather than a fundamental one.

Space might not be a fundamental "fabric", as the GRT and the nowadays Classics Physics assume, instead, Space might be built from the connections (entanglement and superposition) between particles. If two particles are deeply linked, the "distance" between them is almost a secondary detail.

Quantum spatial superposition proves that the Universe is ***non-local***, meaning that properties are not strictly tied to one location.

Thus, from what was just presented above, Space in the context of the Quantum Physics is not an Entity that really exists in the way that the GRT and the nowadays Classic Physics assumes that Space exists. Space in the context of the Quantum Physics might be just an attribute, or facet, that describes the state of a particle, entity or object.

In Quantum Physics, Space is not necessarily a "container" that things sit in. It is often treated only as set of coordinates within a particle's waveform.

Moreover, in Quantum Physics, when a particle is in two places at once, it isn't "traveling" between them. It simply has a state that describes a non-zero probability of being found at coordinate A ***and*** coordinate B ***simultaneously***. In this view, "where" is just one of many properties, like spin or charge, rather than a physical reality.

Thus, the Quantum Physics presents the question:

Is Space the foundation of everything, or is it just a convenient map our brains use to track Quantum States?

In the Quantum Physics view, Space can be seen as just another property (like color or spin) rather than a physical container. If a particle is in two places at once, it proves that the particle isn't "trapped" by a specific coordinate. Instead, Position is just a value in its mathematical description, and thus, in the Quantum Physics view Space might be just an attribute.

Just as a Qubit can have an attribute of "Spin Up" and "Spin Down" at the same Time, it can also have the attribute of "Position A" and "Position B" at the same Time. In this sense, "where" is just a label sticked on the particle's state.

And from the above presented Quantum Physics views, many physicists believe that Space doesn't actually exists in its own. They argue that Space is emergent, meaning it's a high-level "illusion", created by the way Quantum particles are linked (entangled) with each other.

Thus, if there were no particles and no relationships between them, then, there would be no "Space".

From all the above it might be concluded, that the Quantum Physics branch of Physics, does actually agree that Einstein's four-dimensional Interwoven Space-Time with a ***single*** geometry which the Classic Physics presents as a real Entity, which really exists in the Existence, might be an Entity that ***do not*** really exists in the Existence.

And as already presented before in this paper, additional papers, by the author of this paper, which some of them were already referred to, in this paper, present the assumption, based ***only*** on arguments from the Classic Physics, that Space and Time, and thus also Einstein's four-dimensional Interwoven Space-Time ***are not*** Entities that really exist in the Existence, and should be viewed only as attributes or facets of certain forms of Energy.

For example, Einstein's four-dimensional Interwoven Space-Time should be viewed only as a facet or attribute, attributed to the Energy embedded in the Gravitational Field, and the Energy embedded in the Electromagnetic Fields should be attributed to ***separate*** attributes of Space and Time, or, to a separate attribute of a four-dimensional Interwoven Space-Time attribute, ***separate, different and independent*** from Einstein's four-dimensional Interwoven Space-Time attribute, attributed to the Energy embedded in Gravity.

And if the above view will be validated, via the experiments proposed in these additional papers, by the author of this paper, then, because the above relies on arguments based ***only*** on the Classic Physics, and because the above also complies, and is compatible, with what the Quantum Physic might imply, as already presented in this chapter, of this paper, then, this might provide also a lead to bridge between the Classic Physics and the Quantum Physics, which today are still largely incompatible.

3. Summary and Conclusions

The nowadays Science of Physics, still contains branches which are highly incompatible.

One of these branches is the branch denoted as the Classic Physics, which focuses on understanding and explaining what is denoted as the Macroscopic Environment.

Another such branch is the branch denoted as the Quantum Physics, which focuses on understanding and explaining what is denoted as the Microscopic Environment.

Moreover, even the branch of the Classic Physics itself, still embeds branches which are also not fully compatible, as for example, the Gravity and the Electromagnetism.

This paper presents that the Classic Physics might be misleading in how it presents the Entities of Space and Time, and thus, by correcting how the Classic Physics presents the Entities of Space and Time, a lead for bridging the gap between the Gravity and the Electromagnetism inside the Classic Physics might be provided.

And, this might also provide a lead for bridging the gap between the Classic Physics and the Quantum Physics.

The standard confirmed view, which is the established, tested and practical realm of the current mainstream Classic Physics, is that the universe embeds a ***single*** four-dimensional Interwoven Space-Time manifold, which consists of three spatial dimensions (x, y, z) and one temporal dimension (t), unified into a single geometric Entity.

However, this paper refers to additional papers, by the author of this paper, which present arguments, based ***only*** on the Classic Physics, which imply that the above mentioned four-dimensional Interwoven Space-Time manifold, does not really exist in the Existence.

These additional papers present that this ***single*** four-dimensional Interwoven Space-Time concept, presented by the nowadays Classic Physics, should be replaced with ***multiple*** four-dimensional Interwoven Space-Time concepts, and each such four-dimensional Interwoven Space-Time concept should be viewed only as a facet or an attribute of a certain form of Energy.

For example, Einstein's four-dimensional Interwoven Space-Time should be viewed only as a facet or an attribute, attributed to the Energy embedded in the Gravitational Field, and the Energy embedded in the Electromagnetic Fields should be attributed to ***separate*** attributes of Space and Time, or, a separate attribute of a four-dimensional Interwoven Space-Time attribute, ***separate, different and independent*** from Einstein's four-dimensional Interwoven Space-Time attribute, attributed to the Energy embedded in Gravity.

And, by replacing the ***single*** four-dimensional Interwoven Space-Time concept, with the above mentioned ***multiple*** four-dimensional Interwoven Space-Time concepts, which should be viewed only as facets of certain forms of Energy, these additional papers present an explanation for the ***origin*** of the attraction or the repulsion between Electrically Charged bodies, an issue which is still a mystery today.

And this might also provide a lead for bridging the gap between the Gravity and the Electromagnetism, which as already stated above, are still incompatible branches of the Classic Physics.

These additional papers mentioned above also propose experiments, which if implemented, and their results will be successful, might provide validity to the above-mentioned argument, that the above mentioned four-dimensional Interwoven Space-Time manifold, presented by the nowadays Classic Physics, does not really exist in the Existence.

In addition to the above, this paper presents arguments that the branch of Quantum Physics might also comply with the assumption, that the above mentioned four-dimensional Interwoven Space-Time manifold, presented by the nowadays Classic Physics, does not really exist in the Existence.

Thus, because the arguments provided in this paper are based ***only*** on the Classic Physics, on one hand, and, on the other hand, these arguments might be in line and compatible with what the Quantum Physics also implies, then, if the above can be also validated via the proposed experiments, presented in the additional papers mentioned above, which are based on arguments that belong ***only to the Classic Physics***, then, this might provide also a lead to start the bridging between the Classic Physics and the Quantum Physics.

Because the above proposes that if it can be proved, via experiments based ***only on the Classic Physics***, that different forces (Energies) operate on fundamentally different "stages", this might

finally explain why these different forces (Energies) don't play well together in our current math, presented, on one hand via the GRT and the nowadays Classic Physics, and on the other hand, by the Quantum Physics.

This "separate stages" suggestion, which attributes a different Space-Time attribute to different forms of Energy, might be a major bridge for linking the Classical and the Quantum worlds of Physics.

Because, unlike the Classic Physics, which tries to force everything into one "stage", by introducing the real, existing, and single Einstein's Interwoven Space-Time concept, if each form of Energy is actually a separate Space-Time entity, it might not be necessary to try and "unify" all these Energy forms into one single fabric.

Instead, it might be reasonable to look in how these separate Space-Times attributes, each attributed to a different form of Energy, interact.

This might also explain the Quantum spatial superposition phenomenon not as a "weird" behavior.

Instead, this might explain the Quantum spatial superposition phenomenon as the natural state of an object that hasn't yet "synced up" its private Space-Time with what the GTR and the nowadays Classic Physics assume as Einstein's four-dimensional Interwoven Space-Time, which the GTR and the nowadays Classic Physics also assume it to be the Gravitational Space-Time of the macroscopic world.

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