

## Union-Dipole Theory, UDT

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### Abstract

The birth of a Theory of Everything (ToE), the Union-Dipole Theory (UDT), is discussed through the discovery of Union-Dipole Particle (UDP), the only building block of everything in Nature. This Particle consists of two, united, empty spheres, accentuating one another, each of **Planck Length** ( $1.618033989 \cdot 10^{-35}$  metre), within the Permeable Medium, which fills everything excepting the UDP spheres. UDP are perceived as the opposing charges via the motion of the surrounding Permeable Medium as an electric disturbance, which generates complementary magnetic disturbance, forcing the whole UDP to move within the Permeable Medium at **Maxell Speed of Light** ( $3.049922215 \cdot 10^8$  metre.sec<sup>-1</sup>). The UDP has finite, consistent and measurable physical properties, such as a charge and an equivalent mass that change by the quantisation process only, and all these properties are bounded between lowest and highest values. Discovery of these properties unlocks the door for all secrets and mysteries of Nature from the starting point to the end, unifying all Forces, including gravity, in one "**Electromagnetic Force**". The straightforward methodology of UDT is based on the fixed shape of the UDP, which holds hidden secrets of the Golden Ratio, **Planck Length** and a non-geometrical Time, showing that Nature has only two Constants everywhere; the **Planck Length** and **Maxell Speed of Light**. After verifying and accepting UDT, a new era of understanding in science and a comprehension of Nature will begin, and huge changes and impacts will follow. Nature is exclusively composed from joined spheres made of nothing visible and a Permeable Medium that has an effective disturbance acting through quantisation.

**Keywords:** Theory of Everything (ToE), Permeable Medium, Union Dipole Theory (UDT), Union Dipole Particle (UDP), Electromagnetism, Universe, Planck Units, Planck Length, Plank Constant, Golden Ratio, Time, Quantization, Maxwell Speed of Light, Gravity, Nature Forces.

### 1. Introduction

In this paper we draw your attention to the birth of a Theory of Everything (ToE) (Ellis, 1986), that is, a description of what we consider "the real world". Strictly speaking, "the real physical world", as "the real physical world" is only part of the story in this life. My theory, based on a discovery of the only building block particle from which everything is made, is called the "Union-Dipole Particle (UDP)". We have discerned many things about it's shape, size and physical properties. Identifying this particle with precision allows explanations for every mystery in Nature, such as the photon, the charge, magnetism, fields, duality, gravity, physical interactions, electron, mass, black holes, atomic structure, etc.

The Union-Dipole Theory (UDT) offers an extremely sound premise for the structure and organization of the whole Universe; it's Forces, it's visible matter, it's non-visible matter, the energy pervading it and every aspect of its presence. These realities result of just one simple particle and our objective in this presentation is to let anyone see how simple everything in Nature actually is and also explain how previously confusing experimental results can now be perfectly understood when the Nature and characteristic influence of this very simple fundamental building block are comprehended.

Attempts to isolate a theory which encompasses the unification of all known Forces in Nature as one single Force have been the top priority in particle physics for some time, and billions of dollars have been spent on these attempts. Incomplete communications and, therefore, unsuccessful networking among scientists has been a major obstacles to finding a "Theory of Everything". These unsolved problems and their resulting paradoxes have amplified the disconnects in the pure sciences, such as physics and cosmology.

My novel and expansive Theory is based on uncomplicated definitions and explains clearly all phenomena and observations in Nature. This Theory allows for predictions of new phenomena and also corrections to accommodate and embrace advancing topics which can be verified experimentally, and welcomes demonstrations that violate "The Conservation of Energy Law". My very simple Theory confirms that free-energy ("zero-point energy") devices can exist and will work perfectly anywhere on earth and are able to supply any required level of power, and do so with a zero pollution impact on the environment. Not only that, but these new devices will be cost-effective, durable and efficient, and this unlimited energy can be the main factor in producing a better lifestyle for people everywhere in the world.

The UDT resides on a straightforward and consistent mathematical and physical foundation from which accurate calculations and predictable results come. These results can be consistently replicated by any scientist or researcher using commonly available tools. This new perspective also provides an unambiguous understanding of Charge, Quantisation, Duality, Mass, Force, Magnetism, Gravity, Acceleration, Time, Speed, Motion and Energy, and also describes how these components interact with each other. The Theory indicates novel fundamentals for particle physics, chemistry and cosmology, fundamentals which can be implemented immediately in many research projects such as the Large Hadron Collider ("LHC") in CERN.

One of this Theory's many fruits is a broader and deeper appreciation for the Universe, its configuration, it's beginning and it's end. The flavours for a more complete understanding of some very important things, such as the mass-energy equivalence, Universal Constants, the Fine Structure Constant variation and Louis de Broglie's wave origin (De Broglie,1924) are also provided, and these and other aspects can be verified and discussed in detail by experts.

When confirmed and scientifically applied, this Theory will generate new directions of research in many areas, for example, the food and agriculture industries, the transportation industry, technology, communications, applied sciences, bio-sciences and medical science, earth science, cosmology, pollution control and environmental sciences. Simply, it introduces new physics and chemistry standards by avoiding any possible mysteries and limits the confusion of miscommunication. One of the major outcomes in the field of chemistry is a new atom theory, along with electron configurations that are totally different from the current dominating Bohr - quantum mechanical model (Bohr,1913). My model could create a real revolution in chemistry as we can now visualise the electron, quark, proton and neutron. Then we can go on to build any element in the three dimensional world.

The "Unified Field Theory" is occasionally called "The Theory of Everything" (abbreviated to "ToE"). This is the long-sought understanding, which encompasses an accurate description for our Universe and the subsequent movement of all matter and energy in Nature. Scientists hope for a Theory of Everything that will resolve past theories' contradictions and bring to light a single, universal comprehension of Nature; an understanding described by mathematical equations and models. Such a Theory would unlock doors for all the secrets of Nature and usher in an incredible era; for example, endless sources of free energy and Gravitational drives for vehicles and spaceships, thus opening up the entire galaxy for us to explore and learn, in addition, many other desirable things.

At the present time, physicists experience a number of problems. In physics, a “Field” refers to a region which is affected by a Force, such as electricity, magnetism or gravity. As you know, the brilliant Scottish mathematician and theoretical scientist James Clerk Maxwell wrote in 1861, [“On physical lines of force”], (Maxwell, 1861) and in 1865 [“A Dynamical Theory of the Electromagnetic Field”] (Maxwell, 1865). Oliver Heaviside reformulated these equations and they were then confirmed by Heinrich Hertz in 1887 (Hertz,1887). To a certain extent, Maxwell equations can describe almost every aspect of electromagnetism and that was the First “Field Theory”.

Albert Einstein's “General Theory of Relativity”, which deals with gravity, became the Second “Field Theory” (although it has not yet been verified). Einstein failed to prove that electromagnetism and gravity were different aspects of a single fundamental field. This issue got even cloudier when Quantum Theory became involved, as it made everything more complicated without actually solving many serious issues. In contrast, my **UDT** allows the exact speed of light in a zero-Gravitational field to be determined, and what I call the “**Maxwell Speed of Light**“, can be measured and verified experimentally using many different methods.

The Theory of Relativity (Pauli, 1981) explains Nature at the level of things which are big enough for us to see. Quantum Theory (Planck M. 1901-1908, Einstein, 1905, Rutherford, 1904-1933, Bohr, 1913, De Broglie, 1924, Bernstein, 2005, Heisenberg, 1925-1927, Schrödinger, 1926, Macrae, 1999, Dirac, 1928, Pauli, Wolfgang and Jung, 1955), on the other hand, attempt to explain the Nature and interactions of the microscopic, atomic and sub-atomic particles, which are too small to see. The **UDT** shows that time is not geometrical, although it can explain "Time Dilation" (Ashby,2003) based on electromagnetic field only.

It is obvious that the “Standard Model” Theory attempts to explain how Electromagnetism, the “Strong Nuclear Force” and the “Weak Nuclear Force” can be combined into one, single theory. However, Gravitation will not fit the “Standard Model” Theory equations (1970 to 1973) (Glashow, 1961; Weinberg, 1967; Kane, 1987; Bromley, 2000), that is zero-dimensional point particles (Arygres, 2001; Cooper *et al*, 1995; Junker, 1996). The **UDT** is different because it unifies all Forces via an electromagnetic effect of Nature based on the **UDP** characteristics.

A new Theory known as the “Superstring Theory” is currently receiving huge support. There is hope this concept might be the “Theory of Everything”. The M-Theory is an adaptation of the Superstring Theory, which was developed by Ed Witten of Princeton and Paul Townsend of Cambridge, proposes that all "particles" that make up matter and energy are comprised of strings, measuring at the **Planck Length** exists in an 11-dimensional universe to prevent tears in the "fabric" of space using the uncertainty principle. Some scientists hope the M-theory could turn out to be the “Unified Field Theory”, which was sought by Einstein for the last 40 years of his life. Such a theory would overcome the incompatible aspects of both Einstein's Theory of Relativity and the Quantum Theory, and then scientists would be able to understand Nature and express the behaviour of all the various forms of matter and energy. **UDT** mandates the physical existence of **UDP** has deterministic characteristics which never reach the zero or infinity values.

**UDT** presumes that reactions in Nature are due to a quantisation process, and result of **UDP** interactions with the field of Universal Medium.

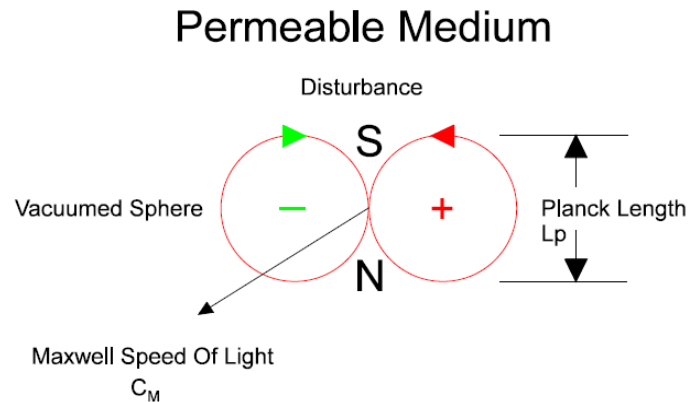
The birth of this Theory is based on the postulation that such elementary and unique dual particles with twin electrical and magnetic characteristics are in an omnipresent, spinning Universal Medium called the "Permeable Medium".

The current limitations of modern science are due to the countless deliberations in every field of science and this Theory needs huge collaborations to verify, implement and speed up the era of a new science that is, unquestionably, coming. The **UDT** as ToE should not be constrained by any relativities such as our existence on this tiny planet, the measuring tools and units which we use, the velocity of an observer, any mind products, etc. On the contrary, the **UDT** introduces a clear conceptual understanding of time, physical units and measurements, possible and impossible mathematical operations and definitive distinctions between man-made concepts and the unified physical reality of Nature.

In the next section, the postulates of **UDT** are meticulously explained, along with the characteristics of the **UDP**, Quantisation, Duality, Universal Constants and Planck Conditions, the source of the Golden Ratio, Building Blocks, Mass & Energy, Photon-Electron Interactions, Proton & Neutron anatomy, and precise determination of each of the Universal Constants found in the physical Universe.

## 2. The Fundamentals of the UDT

**Figure 1:** The Union-Dipole Particle UDP



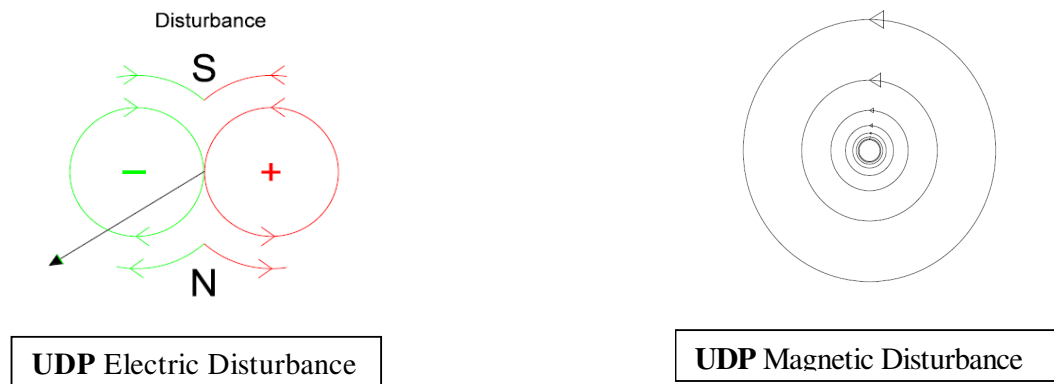
### 2.1. The Postulates

10. All visible, non-visible, observed, and non-observed matter and energy of any possible form in both the physical Universe and Nature, is produced by an interaction between Union-Dipole Particles (**UDPs**), which have a fixed number) and are the only fundamental building block in our Universe. A Union-Dipole Particle as shown in Figure 1 consists of two, united, infinitesimal rotating spheres accentuating one another, and are perceived as the opposing charges in the Permeable Medium. Every Union-Dipole Particle (**UDP**) has not only electric and magnetic fields, but also finite, consistent and measurable physical properties such as a charge and an equivalent mass.
11. A Permeable Medium cannot be observed directly, fills all of the Universe, encompasses the empty space between the Union-Dipole spheres of **Planck Length** diameter, and spins as a uniform cloud around the opposing, charged, spheres. The motion, or the disturbance caused by the spheres' Permeable Medium, creates the opposing electric charges, whereas the attraction interaction of this electric disturbance, or opposing charge field around the **UDP**, creates the secondary kind of perpendicular magnetic disturbance, or a magnetic field with two opposing poles as shown in Figure 2.
12. All Natural Forces, anywhere in the Universe, are both direct results of these electric and magnetic fields, or the vortices' potentials of **UDPs**, and these dipole effects on the **UDP**. The electric and magnetic fields are caused by a wave-like vortex disturbance in the Permeable Medium.
13. Each **UDP** has:
  - A fixed physical size composed from two adjusted, vacuumed spheres, each of **Planck Length** diameter.
  - A finite value of perceived positive and negative charges that have a lowest value no less than Planck's Constant and the highest value is no greater than the Planck Charge. Change in a charge occurs due to a perceived change of spin velocity in the surrounding Permeable Medium, and that change is quantised.
  - An apparent electric field.

- An apparent magnetic field.
- A perceived equivalent mass.
- A relative rotational speed of the Medium at the point of contact between the two spheres.
- A continuous displacement at a resonant, rotational, speed of the dual particle, which is always constant and equals the maximum speed called "**Maxwell Speed of Light**".

These values range from a non-zero lowest value equivalent to **Planck Constant**, to a highest value not to exceed the known **Planck's unit values**. These values vary on a quantum basis that is the smallest quantity of these physical properties after each complete cycle in the helical movement of the **UDP** when it exists in an electromagnetic field of a different strength. This quantisation process is either increasing or decreasing and any observed variation in Nature is quantised.

**Figure 2:** UDP and its related electric and magnetic disturbances in the Permeable Medium



## 2.2. The Permeable Medium (Space)

The 'Permeable Medium', like luminiferous aether, or ether (Newton,1704), is a uniform, simple, (not multipart) thing that fills the entire Universe and it has unique, indirectly measurable and dimensionally-independent characteristics. As shown in Figure 3, this motional (dynamic) Permeable Medium allows, at first, a finite number of equal, opposed vacuumed spheres of **Planck Length** with a field corresponding to **Planck's values**, which come from only the motion of the Permeable Medium at the Planck Frequency. Because these vacuum spheres are not removed, the number of **UDPs** always remain constant and, thus, are conserved.

The fixed shape of the vacuumed spheres for the **UDP** stands behind the main properties of matter - which are persistent and space occupational - whereas the wavelike properties come from the Permeable Medium, allowing the wave to be expanded and propagated through its own Nature. Meantime, the intensity of the spreading wave's effect in the Permeable Medium follows the Inverse Square Law because of the spherical shape and Nature of the **UDP**.

The apparent attraction between the two **UDP** spheres is due to the opposing motion or Permeable Medium disturbance, which in turn, causes an additional and quite different disturbance in the Permeable Medium around the two spheres, as shown in the above figures.

The motion of the Permeable Medium can be visualised as being a cloud vortex disturbance, or a wave-like cloud motion, with an intensity following the Inverse Square Law. To be exact, the vacuum spheres, by themselves, are motionless and do not have any kind of internal motion, and their simulated, man-made charges, represented as rays, are mistaken. In other words, the Permeable Medium moves around and holds these adjacent vacuum spheres. which are the basic building blocks of everything. Physically, there is nothing to be seen, and the entire physical structure of what we perceive of the visual Universe comes from nothing but these vacuumed, absolute spheres. Although, these spheres are motionless in relation to themselves, they are constantly engaged by, or swimming in,

the Permeable Medium at the **Maxwell Speed of Light** ( $C_M$ ). We can say it is a matter of a disturbed Medium that surrounds and restrains dual, empty, spheres of **Planck Length** moving at a maximum possible speed in Nature. We should make it very plain; the disturbance effect in the Permeable Medium transfers at a quite higher speed and follows the Inverse Square Law in Nature, whereas the **UDP** is limited to the **Maxwell Speed of Light**.

The displacement motion of these Union-Dipole's dual spheres, occurs due to the disturbance or vortex-like motion in the Permeable Medium, which motion can be seen, analysed and interpreted as a wave phenomenon. This wave can be described as a disturbance in the medium, or as an oscillation, which travels through the medium by transferring an effect, from one particle to another, or from one point in space to another, without causing any real or permanent displacement of the medium. Effects of **UDP** itself move at a constant speed everywhere in the Universe and this occurs at the **Maxwell Speed of Light**, whereas the effectual transfer speed of disturbance within the Permeable Medium is quite higher and could be unlimited. This transferring of an effect in Nature occurs either by the transfer of the electric and magnetic disturbances through the Permeable Medium, or by the transfer of the **UDP** itself, as it has and maintains its accompanying fields' effects during its non-stop journey. Disturbances of the Permeable Medium do not involve any displacement of the Permeable Medium itself at all.

The Permeable Medium is supporting everything in Nature via its conveyable motion encompassing the **UDPs**. This motion transfers within the Permeable Medium in a 3- dimensional radial path, fulfilling the Inverse Square Law. The **UDP** has the **Planck Length** value, which can be calculated very precisely from Nature's Constants, and its shape's features, displaying the Golden Ratio, appear in many of Nature's observed physical systems and yet no one, before now, could explain whence that irrational ratio comes.

First, the Permeable Medium allows transferring endless electromagnetic effects between regions of different disturbances, regardless of how far apart they are, and that's why the whole Universe is considered one system, even though it is big and expanding. Secondly: the Permeable Medium allows the transferring of the Union-Dipole from one point to another through wave-like means. In other words, the Permeable Medium does not move and only transfers disturbances, whereas the Union-Dipole, as a particle, is continuously moving at a speed that can be calculated very accurately by this Theory, as you will see.

### 3. Fundamental Concepts

#### 3.1. Planck Units and the Fundamental Constants Found in Nature

At the present time, most theoretical physicists are convinced that the role of the **Planck values** in ground-breaking Theory such as a ToE for the physical world, will become clear when (and if) there is a unified Theory of all fundamental interactions. This is what the **UDT** accomplishes, as it provides a completely consistent method, stating that the **Planck Length** is the smallest possible entity in Nature, and that it shapes, or frames every possible thing, leaving no room in science for any weirdness, inconsistencies, or mysterious voids.

Planck units, including **Planck Length**, can be calculated quite easily by examining the direct relationships between five universal constants, or by the dimensional analysis method, which is widely used in applied sciences. The length known as the **Planck Length** was specified by Max Planck and it is derived from the constants which are found everywhere in the universe due to the man-view of this planet. These include: the gravitational Constant ( $G$ ), Planck's Constant ( $h$ ), the speed of light in a vacuum ( $c$ ), Coulomb Constant ( $K_e = \frac{1}{4\pi\epsilon_0}$ ) and the Boltzmann Constant ( $K_B$ ). It can be shown below,

the values of five common universal constants with their related equations and the calculated Planck units (values), just that we haven't discovered their secrets yet.

The values of the five universal constants are in denary numbers:

(Fundamental Physical Constants from NIST; CODATA Value: Newtonian constant of gravitation"; "CODATA Value: Planck Constant over 2 pi; "CODATA Value: Boltzmann constant"; CODATA — Planck length; CODATA — Planck mass; CODATA — Planck time; CODATA — electric constant; CODATA — speed of light in vacuum; CODATA — Planck temperature, 2011).

**Table 1:** Values of Nature Constants measured on earth

Constant	Symbol	Dimension	Value in SI units with uncertainties
Speed of light in vacuum	<b>c</b>	$L T^{-1}$	$2.99792458 \times 10^8 \text{ m s}^{-1}$ (exact by definition of metre)
Gravitational constant	<b>G</b>	$L^3 M^{-1} T^{-2}$	$6.67384(80) \times 10^{-11} \text{ m}^3 \text{ kg}^{-1} \text{ s}^{-2}$
Reduced Planck Constant	$\hbar = h/2\pi$ where h is Planck Constant	$L^2 M T^{-1}$	$1.054571726(47) \times 10^{-34} \text{ J s}$
Coulomb constant	<b>Coulomb Constant</b> $= K_e = \frac{1}{4\pi \epsilon_0}$ $\epsilon_0$ is the permittivity of free space	$L^3 M T^{-2} Q^{-2}$	$8.9875517873681764 \times 10^9 \text{ kg m}^3 \text{ s}^{-2} \text{ C}^{-2}$
Boltzmann constant	$k_B$	$L^2 M T^{-2} \Theta^{-1}$	$1.3806488(13) \times 10^{-23} \text{ J/K}$

**Key:** L = length, M = mass, T = time, Q = electric charge,  $\Theta$  = temperature

We can extract from the above five constants other related equations as shown below, which can describe a starting point called "Planck Condition":

$$L_p = c \cdot t_p \tag{1}$$

$$f_p = \frac{m_p \cdot l_p}{t_p^2} = G \frac{m_p^2}{l_p^2} = \frac{1 \times q_p^2}{4\pi \cdot \epsilon_0 l_p^2} \tag{2}$$

$$E_p = \frac{m_p \cdot l_p^2}{t_p^2} = h \frac{1}{t_p} = K_B \cdot T_p \tag{3}$$

Where:

$L_p, t_p, E_p, m_p, f_p$  are Planck values (units) of Planck condition.

$L_p$  =length,  $t_p$ = time,  $E_p$  = energy,  $m_p$  = mass and  $f_p$  = force.

Solving above equations for the five unknowns results in a unique set of values for the five base Planck units in denary numbers as shown below:

**Table 2:** Base Planck units after solving above equations:

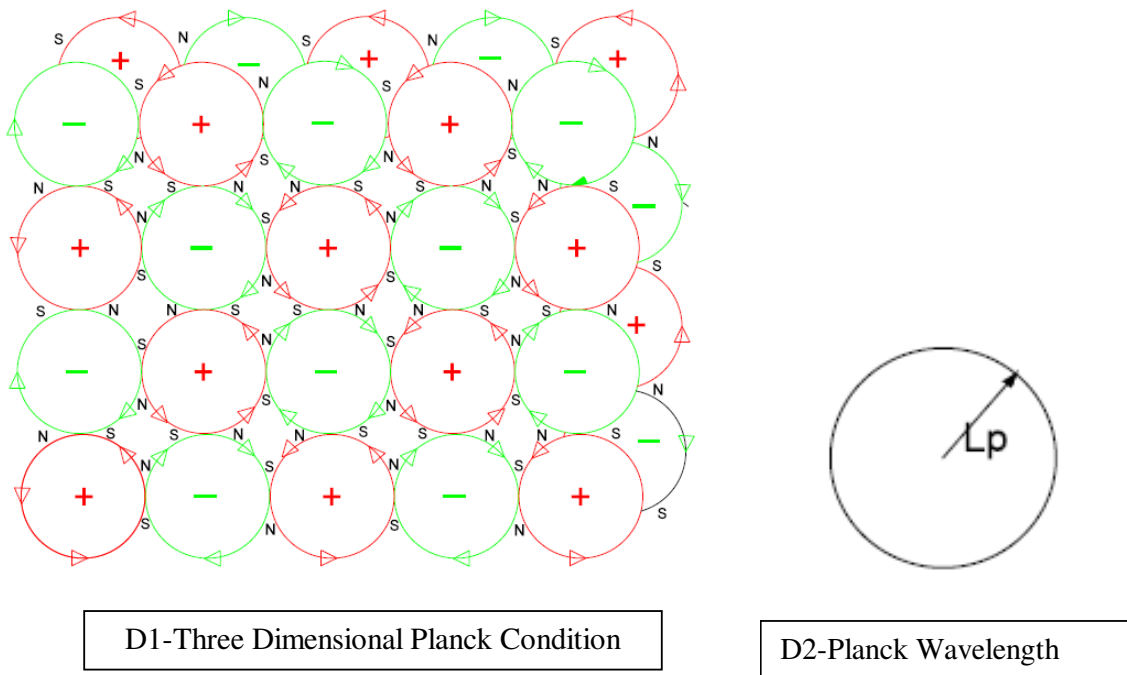
Name	Dimension	Expression	Value (SI units)
Planck length	Length (L)	$l_p = \sqrt{\frac{\hbar G}{c^3}}$	$1.616 199(97) \times 10^{-35} \text{ m}$
Planck mass	Mass (M)	$m_p = \sqrt{\frac{\hbar c}{G}}$	$2.176 51(13) \times 10^{-8} \text{ kg}$
Planck time	Time (T)	$t_p = \frac{L_p}{c} = \frac{\hbar}{m_p c^2} = \sqrt{\frac{\hbar G}{c^5}}$	$5.391 06(32) \times 10^{-44} \text{ s}$
Planck charge	Electric charge (Q)	$q_p = \sqrt{4 \pi \epsilon_0 \hbar c}$	$1.875 545 956(41) \times 10^{-18} \text{ C}$
Planck temperature	Temperature ( $\Theta$ )	$T_p = \frac{m_p c^2}{K_B} = \sqrt{\frac{\hbar c^5}{G K_B^2}}$	$1.416 833(85) \times 10^{32} \text{ K}$ K= Kelvin

The main five base Planck Units, as shown above, are one of the pillars of the **UDT** when it states that **UDPs** at the beginning were possessing **Planck values** (as shown in Figure 3) and once the

expansion of the Universe started, these particles had less values than Planck Units except the Length which remains Constant and defines the shape of the Union-Dipole Particle its self. Thus **Planck Length** is considered the only constant in Nature though, as we will see later, UDP moves continuously at the maximum constant speed of light. Although, the whole Universe, in reality, shows only one Constant, the **Planck Length** surrounded by the limited disturbances of Permeable Medium. We will see that these disturbances are in a rotational form around the absolute vacuum sphere of nothing visible, although it is not possible to reach the Permeable Medium, or contact it physically. This rotation is the cause for the charge, and the opposed rotation of the Permeable Medium around the dual particle causes another disturbance, which is manifest as the magnetic poles or magnetic field. As shown in the figures, the interaction between the electric and magnetic field affects on the dual particle moves it at the speed of light in the same way that was first introduced by Maxwell and is considered indisputable.

The now observed black holes are at Planck Condition and if a black hole is growing, it will then rejoin the whole Universe, repeating the same cycle which started everything. Union-Dipole Theory UDT establishes a novel idea that our Universe now has a real physical shell at **Planck Conditions**, and can be a base for a Theory it was all started by two giant black holes and everything was created from their collision. The Universe shell is seeing every night as a black background and expanding continuously. Accordingly, one day it will be ruptured. Then the whole Universe will collapse. I have the fundamental outlines for such concept and they introduce a better big-bang theory. I will gladly share this totally new Theory with top cosmologists around the world to replace current theories.

**Figure 3:** Planck Condition arrangement for the starting point of the Universe, black hole and the Universe Shell.



### 3.2. Electrostatic Charges

Inside the Union-Dipole Particle, physically, there is absolutely nothing tangible, though we can say it has perceived positive and negative charges due to the opposed motion of the Permeable Medium around each pole. In reality, positive and negative charges are the same, however, they show the distinguishable charge field direction. Due to the normal attraction tendency between the two motions of the Permeable Medium, the two vacuum spheres tie together and are considered to rotate opposingly, and continuously, though they do not have a physical shell or membrane. In fact, the



Permeable Medium spins, not the motionless spheres, although, relatively, we can say they rotate if we like. These perceived charges, due to the opposing motions, are effectual in a spherical direction that supports the Inverse Square Law of electrostatic charges, or Coulomb's Law, and the Permeable Medium (Space) controls the effect transfer via the electric constant  $\epsilon_0$  with respect to this Law.

They had created, for us, an imaginative explanation for a situation that never existed when they convinced us to assume that Positive has a relative potential from its charge, and a Negative charge, therefore, has a relative negative potential from its charge in the same manner. We imagined that positive charge has a radiation effect, while the negative charge has an absorption like effect, although some other theories might have introduced different, inconsistent views. In reality, the situation is different, and these effects are not mathematically composed as we have been instructed. The positive and negative electrostatic fields can be described as disturbed clouds of different potentials. Physicists imagined a mathematical model of infinite lines coming out perpendicularly from a positively charged surface to enter the negatively-charged surface. In reality, this is not the case and a mechanically straight-line does not exist in Nature at all. A line is a geometrical concept. Any possible observed changes in Nature occur only in the form of quantisation and, as such, can only be understood or described as a wave-like disturbance in a complete cycle.

Nature has always been and is an absolutely rigid sphere of nothing visible, spinning at the maximum possible speed. These rigidly shaped spheres are made of nothing physical and are surrounded by a non-composed Medium, spinning at a finite speed that can be varied in a quantised mode, acting only as a disturbance on the two **UDP** spheres' contact point.

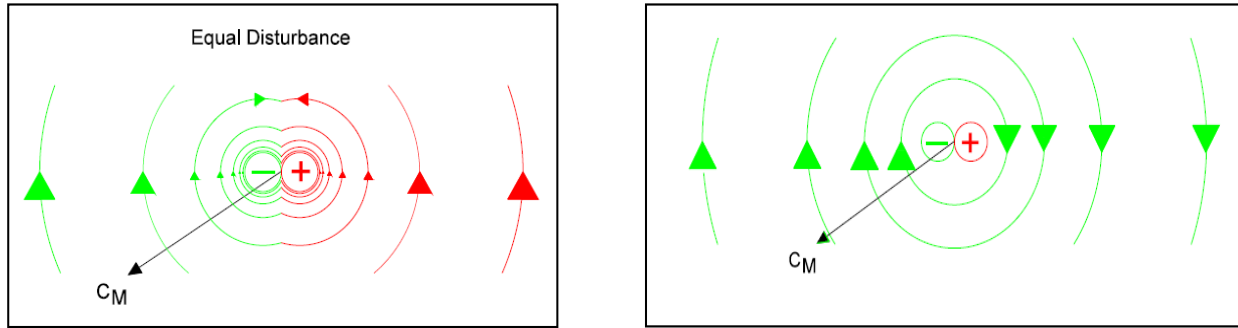
The perceived positive charge's field, coming from the perceived positive charge of the vacuum sphere, acts only upon its consort, the negative field of the negative charge. This positive and negative interaction stands as the well-known attraction phenomenon between opposed static charges. The two different electric disturbances of the Permeable Medium, indeed, merge. Meantime, similar charges show repulsion or eradication when the same electric disturbances indeed combine. We mistakenly accepted electric field lines that do not exist and cannot represent the reality, though they are correct mathematically. To conclude, electric fields neither merge, nor eradicate, and these phenomena only happen as a result of the wave-like disturbances on the Nature of the Permeable Medium.

A **UDT** of two equal speeds shows positive and negative charges are equal in their field strengths. A merger between the charges produces another disturbance in a form of south and north magnetic poles, and their magnetic field is shown in the above Figures.

Union-Dipole can show the effects of an electric monopole charge such as electron, positron and quarks when the speed of rotation in one side of the **UDP** varies from the other. Nature exposes all possible quantised charge values starting from a lowest possible charge value, equivalent to **Planck Constant**, up to the maximum possible value of **Planck Charge** units. Consequently, the constant charge of electrons is not constant everywhere; it is only constant in the earth's electromagnetic (Gravitational) field. Experimentation will verify the fact that a moving charged object shows less electrostatic charge when compared to its rest position charge.

For example, the electron, as shown in Figure 4, is made from a single Union-Dipole Particle of unequal charge, in view of the fact that its rotation of the negative side is more than that of the positive side. The electron has a net of spherical disturbance (cloud) in one direction and has its magnetic properties as well. That's why the electron can be seen as a single-charge sphere, and not a dual-charge particle, though it has and shows a magnetic dipole. Similarly, quarks of positive and negative charges, as the main building blocks of proton and neutron, are comparable to the Nature of an electron.

**Figure 4:** Unbalanced UDP of negative charge such as electron and its electric and magnetic disturbances.

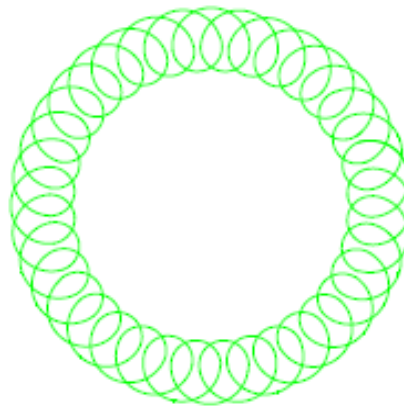


Opposed balanced Nature of the electric disturbance for **UDP**

Opposed unbalanced Nature of the electric disturbance for **UDP**

What Figure 4 does not show is the Nature of the unbalanced electric disturbance has an uneven distribution around the **UDP** on the positive sphere. This uneven region of disturbance causes a local helical motion, as shown below. On the other hand, the balanced electric disturbance makes the motion in a straight-line.

**Figure 5:** Unbalanced charged particle motion.

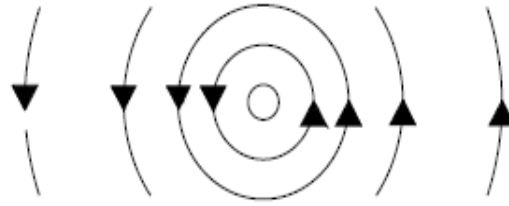


### 3.3. Union-Dipole Magnetism

At first, the motion in the Permeable Medium around the spheres of the **UDP** creates positive and negative vortices that can be perceived as north (N) and south (S) magnetic poles and, therefore, here-in lies the secret behind any dipole magnets in Nature. The meaning of vortex, as explained before, is a Permeable Medium disturbance that can be imagined to show concavity up and down the contact point between the **UDP's** two spheres, although the vortex is only for special functions, which exist only at the hollow part of the whirl. These two opposed vertices, or potentials up and down the contact point create the magnetic field, which originates any magnetic effect in Nature.

The relative rotating or whirling of vacuum spheres always creates two balanced vortex disturbances in the Permeable Medium, focused up and down the contact point, which is the reference point of the concavity (magnetic) phenomenon. Figure 6 shows in two dimensions the balanced magnetic disturbance, which is always perpendicular to the electric disturbance.

**Figure 6:** Magnetic field disturbance around the UDP, due to the interaction between the opposed electric disturbances for the two spheres of the UDP.



The north magnetic pole vortex is similar to a positive charge and has a potential effect to act only upon its consort, and merges with the south pole magnetic vortex. The perceived north field emerges with a perceived south field while similar fields abolish, or bring an end to each other, as shown by repulsion. Previously invented magnetic field lines do not exist in Nature, as mechanical lines are not similar to electric field lines, and both are purely invented mathematical tools that can only help visualize effects. A property of the Permeable Medium allows the perceived electric field to be cut off, or intercept the magnetic field because they are different types of disturbances. There are only two disturbances in the real physical world, based on the **UDT**. Fields of similar type show either merging (attraction), or abolishing (repulsion), and this is an observed fundamental of electromagnetism. These attractions, repulsions and their resultants are the unique forms that represent any Forces in Nature, including gravity.

It can be said that the perceived positive electric field charge merging into the perceived Union-Dipole's negative electric field charge causes magnetic dipole and magnetic field. Both the electric and magnetic fields cause the non-stop motion of the **UDP**'s constant speed, which is the maximum possible speed of light (**Maxwell Speed, or  $C_M$** ), as shown in Figures 1 and 2.  $C_M$  is a Universal Constant that can be verified experimentally and is higher than the current value, which represents the speed of light in earth's Gravitational field.

The identical participation of the electrostatic and magnetic fields produced from equal spheres explains perfectly why an electromagnetic wave, such as light, which is made of two balanced **UDPs**, shows equal electric and magnetic effects and also travels in a straight line though a balanced electromagnetic field.

The resulting effects of the interception between the two fields can be seen as either a Force, or momentum that acts perpendicularly on both the electric and magnetic fields in a region.

### 3.4. Union-Dipole and Unbalanced Charge

The same two spheres' relative speeds do not show any apparent charge difference at the contact point and are, therefore, neutral, though the surrounding Permeable Medium has such disturbances on both sides. Once that speed balance is broken by a quantised increase or decrease in only one sphere, then the overall charge for the **UDP** appears to reflect positive, or negative. Let us agree that the perceived counter-clockwise spin, shown in this plain paper, is described as positive charge, whereas the clockwise spin is described as a negative charge.

Accordingly, the electron of man-made negative charge is a single **UDP** that has and gives clockwise spin or disturbance in the Permeable Medium; meantime, the positive charge of its **UDP**, which is there and has the opposite effect, cannot be seen or observed.

As shown in Figure 4, an electron purely displays an unbalanced spherical disturbance, though it is made from **UDP**. In the same way, the proton, which is made from many Union-Dipole Particles (three quarks and photon), has an overall counter-clockwise spin, and displays an unbalanced, spherical disturbance effect. Quarks are unbalanced **UDPs** of the same disturbance pattern, as **UDP**'s are the building blocks for any matter.

The matter of our physical and visual world demonstrates these consistencies are due to the local rotational motion of the unbalanced **UDP** (Figure 5), as are the electron and its anti-matter; the positron, and the quarks and their anti-particles.

### 3.5. Union-Dipole and Quantisation

Every variation or change in Nature takes place as a result of a quantisation process on the **UDP** and are transferred in the form of the Permeable Medium's spin, regardless of how large or small that variation is.

Quantisation occurs when a **UDP** is exposed to different electric and/or magnetic fields. Simply, more exposure means variation continues until its electric and magnetic fields regain a resonant status with the surrounding disturbance.

Quantisation, results of the interaction between the **UDP** and its disturbed surroundings, and acts on the contact point of **UDP's** two spheres: One cycle of one wavelength period at the **Maxwell Speed of Light**. For the **UDP** to exist in a different field, there is a commensurate increase or decrease of a quanta variation in one sphere's speed. All other forms of quantisation in Nature occur with respect to the Permeable Medium quantisation speed.

Quantisation occurs in the form of a one to one speed change that both starts from and ends at the contact point between the two spheres. The time frame for quantization is equivalent to one wavelength's journey at the Speed of Light. The time frame for this change may vary in accordance to field strength and can also be observed as a change in the perceptible charge, or mass of the **UDP**. Shorter wavelength particles display more quantisation, and higher wavelength particles demonstrate less quantisation during the same period of exposure. In reality, Nature doesn't have or show continuous change. "Continuous change" is an imaginative tool. When actual Nature is seen as reality, it behaves in a quantised way, as a one to one exchange. This is a proper perspective that successfully describes Nature.

Quantisation means changing the spheres' of **UDP's** spinning. The spheres' contact point is conditional to the change in the field where quantisation exists, and the period for change is long enough for an integer's number of cycles.

Unbalanced **UDP**, such as electrons and quarks, quantise in such a way that their charges can change during the quantisation process. Because of an imbalance, only the low-speed sphere of the Dipole Particle changes its speed, whereas the high-speed sphere remains unchanged. In the same manner, the electron charge varies in differing field strengths and the higher field shows less net charge. Accordingly, any charged particle or object under acceleration must show less apparent charge, and vice versa under deceleration. For example, the electron or any charged particle at a higher altitude shows more charge in comparison to readings at the earth's surface. This is due to a differing Gravitational field strength, which is a definitive result of electric and magnetic fields in Nature. We can run many kinds of experiments to prove this, such as exposing a charged object to a high-motion level, then measuring the lesser value of its relational charge. All quarks are single, unbalanced, **UDPs** that always show change in their mass and charge when they experience different fields, acceleration or deceleration. The same is true for electrons and any other charged or uncharged particles. The fact unbalanced **UDPs** show a lesser charge under acceleration, explains very well the higher power required for those particles, such as electrons or protons, to be accelerated more and more in the particle smashers. It is definitely due to the lesser value of its relational charge during its path in the collider or accelerator, and that requires higher potentials to compensate for the weakness of the apparent charge for any further acceleration

### 3.6. Union-Dipole and Mass

**UDP** has a perceived mass, which can be used to distinguish its relative spheres' rotational speed from the spheres' contact point. This supports the fact that the **UDP** always occupies a fixed space and the referenced rotation is at a constant speed.

From the familiar properties of shape consistency, constant motion (**Maxwell Speed**) and quantisation, we can assume or use the term of mass to describe such.

Accordingly, everything in Nature has a mass, which changes due to the quantisation process. For example, the photon, which is made from two balanced charge **UDPs**, should have the same mass as a neutrino, which is made from one balanced **UDP**.

We can use this concept of mass to establish properties for any physical system, as long as it has **UDP**, and electric and magnetic fields, or their resultant Forces (effect). Gravity in an empty vacuumed system cannot be described to have mass.

**UDP** mass can be measured using a reduced mass concept which is both the effective inertial mass appearing in the two-body problem and also the relative acceleration of Newtonian mechanics. Each sphere of the **UDP** can be assumed to have mass if we treat it as a single body problem. Mass can then be calculated easily by using gravity and the Coulomb Law between two attracted spheres of equal masses and charges:

$$\text{Attraction Force} = \mathbf{f}_{\text{att}} = \mathbf{G} \frac{\mathbf{m}_s^2}{l_p^2} = \frac{\mathbf{1} \times \mathbf{q}_s^2}{4\pi\pi\epsilon_0 \cdot J_p^2} \quad (4)$$

$$m_s = \sqrt{\frac{K_e}{G}} q_s \quad (5)$$

Where is  $m_s$  the perceived mass of the sphere and  $q_s$  is the sphere's perceived charge.

**UDP** can be considered to have two types of mass: its inertial mass, which is a quantitative measure of its resistance to the change of its relative sphere's velocity (quantisation), and a reduced mass, where the mass of **UDP** is equal to half the mass of one sphere (in the case of a balanced Union Particle).

The Reduced mass ( $M_{\text{red}}$ ) is the effective inertial mass in the two-body problem of Newtonian mechanics. The two-body problem determines the motion of two point particles that interact only with each other, similar to my case with the **UDP**. Reduced mass is a quantity which allows the two-body problem to be solved as if it were a one-body problem. It should now be clear that the mass related to the Gravitational Force between any two objects is not the reduced mass. The reduced mass of **UDP** stands behind the kinetic energy change when either one of the sphere's speed is changed.

The reduced mass is always less than or equal to the mass of each body:

$$M_{\text{red}} \leq m_1, M_{\text{red}} \leq m_2 \quad (6)$$

and as the reciprocal additive property

$$\frac{1}{M_{\text{red}}} = \frac{1}{m_1} + \frac{1}{m_2}$$

$$M_{\text{red}} = \frac{m_1 m_2}{m_1 + m_2} = \frac{1}{2} m_s \quad (7)$$

That's why the change in the kinetic energy of an object of a mass ( $m$ ) and speed ( $v$ ) always equals to:

$$E_k = \frac{1}{2} m v^2 \quad (8)$$

$$E_{\text{Kinetic}} = \sum \text{change in } E_{\text{Union}} = \sum m_{\text{Union}} v^2 = \sum \frac{1}{2} m_s v^2 = \frac{1}{2} m v^2 \quad (9)$$

as

$$m_{\text{Union}} = M_{\text{red}} = \frac{1}{2} m_s \quad (10)$$

The **UDP** has another type of mass, called Gravitational mass, and this is equal to the summation of its spheres' masses. This mass is seen in Nature as a quantitative measure and is proportional to the magnitude of the Gravitational Forces which are either exerted or experienced by an object when interacting with a second object as a resultant disturbance in the Permeable Medium.

### 3.7. Union-Dipole and Mass–Energy Equivalence

The mass–energy equivalence is the concept for when the mass of a body or system is a measure of its energy content via the very famous relation:

$$\mathbf{E} = \mathbf{m}\mathbf{c}^2 \quad (11)$$

UDT states that the mass variation is quantised and the UDP spins continuously at the **Maxwell**

#### Speed of Light ( $C_M$ ).

From above equations (8-11):

$$E_{total} = \sum E_{Union} = \sum \frac{1}{2} m_{union} c^2 = \sum \frac{1}{4} m_s c^2 = \frac{1}{4} \sum m_s c^2 = \frac{1}{4} \mathbf{m}\mathbf{c}^2 \quad (12)$$

Whereas, UDP's kinetic speed is always Constant and is equal to  $c$  or  $C_M$ ,

The new Mass-energy equivalence equation, according to UDT, will therefore be:

$$\mathbf{E} = \frac{1}{4} \mathbf{m}\mathbf{c}^2 \quad (13)$$

Accordingly, this result differs from the very famous rendition of  $\mathbf{E} = \mathbf{m}\mathbf{c}^2$ , which is only valid at Planck Condition, where each sphere is in contact with four moving spheres at the **Maxwell Speed of Light**, as shown in Figure 3.

### 3.8. Union-Dipole and some Related Properties and Definitions

Union-Dipole Particle, the building unit of the Universe, demonstrates influence upon electric and magnetic fields that can be considered to have positive and negative potentials in the forms of vortices. To avoid any misunderstanding, the positive and negative potentials refer to the direction of motion, or the spin disturbance within the Permeable Medium. They are perpendicular to each other at any point in space, where they are subject to be tested or observed. The resultant effect from both of them is a Force, which acts upon the contact point between the two spheres of the UDP in the form of either an acceleration or deceleration. Unbalanced changes in spin lead to an equivalent quantised change in the frequency or wavelength of the whole, dual particle, spinning at the **Maxwell Speed of Light**.

These potentials are not directed in straight lines because straight lines do not reflect the reality of Nature. The real effects are similar to a cloud, and follow the Inverse Square Law. Experimentally, we can imagine the spin of these potentials in a region of space. Nature does not, however, isolate the very famous mathematical tool of a point.

These endless cloudy shape potentials of similar types (either electric or magnetic) are only attracted or repelled, and follow the Inverse Square Law. A perceived positive charge source (pole) is similar to a perceived north magnetic source (pole). Both of these charges have imagined, man-made, characteristics differing from Nature's reality. Replacing these perceptions of positive, negative, and north, south potentials with images corresponding to the direction of their spins, generates a very stable foundation for a new realm where scientific math and subsequent calculations will rapidly advance both knowledge and application in a real, tangible sense. Every science and technology will explode with sound roots in quantisation and UDT. It is the time for the big change, we have to differentiate between pure imagination and pure science, and pure stagnation and pure advancement.

Electric or electrostatic fields never interact with the magnetic field through the Permeable Medium, as all perceptible interactions transpire at the contact point between the Union-Dipole Particle's two spheres, and these interactions cause a gyroscopic motion in the dual particles. This interaction gives the particles a constant helical motion equal to the maximum possible Speed of Light. The Speed of Light in a vacuum is not the right phrase because the term "vacuum", which is related here to the speed of light, is vague and doesn't tell us whether "vacuum" means zero electromagnetic (Gravitational) field, or not. Sometimes Nature shows a very high gravitation field even though the region is under a vacuumed condition from any included matter.

The Union Particle moves constantly at the **Maxwell Speed of Light**. This speed will be calculated very precisely from the **Planck Length**, and this speed is the secret of any wave behaviour

in Nature. This new calculation for speed is a little higher than what has been called the speed of light in a vacuum because our measurements are affected by the Gravitational (electromagnetic) field of the earth. To differentiate we refer to the Union Particle's spinning speed as the "**Maxwell Speed of Light**". This **Maxwell Speed** is the limit for any and every motion, particle or object in visible Nature. The field effect in Nature is electric, magnetic, or both (Gravitational), and has an immediate interaction through the Permeable Medium, which is faster than the Maxwell Speed. The Force of a field effect also transfers faster than the Maxwell Speed.

Forces in Nature, of any form, cannot transfer from one point to another through anything more than electric and magnetic fields, and any apparent Force is a direct result of these two fields' interactions, including gravity. Forces, are not transferred in physical lines.

When like disturbances of same spin, such as positive - positive, or north - north interact, they show strengthening and their new field has the summation of the two disturbances at their region of interaction. Vice-versa, when opposing disturbances of different spins such as positive - negative, or north - south interact, they show weakening and their new field has the resultant difference between the two fields at their region of interaction. This interactional behavior of the Permeable Medium's disturbance explains clearly the superposition.

**UDT** states that an observed Force is defined as any effect that causes an object to experience a certain quantisation due to the disturbances' change of the field in the Permeable Medium. In other words, a Force can cause an object with mass to change its velocity, i.e., to accelerate or decelerate, or a flexible object to deform. Force can also be described as a push or a pull.

Newton's Second Law states that the net Force acting upon an object is equal to the rate at which its momentum changes with time.

$$\mathbf{F} = \mathbf{ma} \quad (14)$$

Whereas, **UDT** shows that any object under quantisation never shows a constant mass.

**FORCE** is any measurable effect in the form of a push or pull and results from a variation in the electric and magnetic disturbance of the Permeable Medium. These effects are always and only perpendicular to the disturbance.

**POINT** is the location, between the two spheres of the **UDP**, where the effects of the Force act. This location in space is moving at Maxwell Speed, creating a helical or circular path.

**STRAIGHT LINES** do not physically exist in Nature and Forces never transfer in straight lines. Accordingly, careful steps should be considered when we observe action for Nature using fundamental geometry.

**MASS** of an object is a man-made measurement for an amount of the disturbance in the Permeable Medium that surrounds the **UDPs** of that object, and can be identified as a measurable property.

**ENERGY** can be described as the measurable amount of electric and /or magnetic disturbance in the Permeable Medium of a region or system. Energy distribution in any system is not constant or homogeneous because the **UDP** moves and the Universe is under continuous change.

**WORK** is the measurable energy related to displacement of an object under quantisation process.

**PRESSURE** in a system is the average concentration of energy per volume that has effects on its surroundings.

**CHARGE** is the perceived measurable electric disturbance in the Permeable Medium.

**ELECTRON CHARGE** is a standard measured amount of an electric disturbance in the Permeable Medium of the unbalanced **UDP**. An Electron in the electromagnetic (Gravitational) field of earth may vary.

**ELECTRIC CURRENT** is the outward electron flow of the electric disturbance, resulting from a Permeable Medium influence.

**GRAVITY FORCE** is a resultant pull between two objects and is due to the interaction between their electric and magnetic disturbances, or spins in the Permeable Medium, at that imaginary point in space.

**POTENTIAL** is the disturbance intensity of the Permeable Medium in a region.

**ELECTRIC POTENTIAL** is the electric disturbance intensity of the Permeable Medium in a region. Accordingly, the **VOLTAGE** is a man-made concept that represents disturbance intensity of the Permeable Medium in a region, relative to a standard electric disturbance of a certain spin (charge).

### 3.9. The Inverse Square Law

A Force between two fields, whether magnetic, electric or Gravitational, is directly proportional to the product of their perceived magnitudes and inversely proportional to the square of the real distance between them.

As an object gets further away, the field's influence decreases because of the increased area it affects. The Inverse Square Law is the physical law stating that a specific physical quantity, such as a Force of attraction, or an electric field intensity, or a magnetic field intensity, or a sound intensity (sound power per unit area, which are also inversely proportional to the square of the distance from the source of that physical quantity). In equation form:

Specified physical quantity (Intensity) **Force**  $\propto \frac{1}{d^2}$  (where d = the distance from the source).

In physics, for example, the Inverse Square Law usually applies when some Force, energy, or other quantity is radially transferred outward into three-dimensional space, from a point, a tiny sphere, or a source. In view of the fact that the surface area of a sphere grows at  $4\pi r^2$ , which is proportional to the square of the radius, as the emitted radiation of the wave-like energy in the Permeable Medium gets farther from the source. This emission is dispersed over an area that is increasing in proportion to the square of the distance from the source, so its intensity is decreased accordingly. Without doubt, the magnetic, electric and gravity fields are inversely proportional to the square of the distance from their source.

**UDT** states that the Inverse Square Law in Nature comes only from the effects of electric and/or magnetic fields of the Union Particles. The spherical shape of a Union sphere is the propagation point over a spherical area, which increases in proportion to the square of the distance from that source. Simply, the concept of point radiation that physicists use, is a man-made math tool and does not exist in Nature.

### 3.10. UDP and Gravity

Gravity between any two objects is an attraction Force due to the pull interaction between both the electric and magnetic fields of at least two objects, and this Force is normally perpendicular to both fields. When two objects join Gravitationally, their new field will be strengthened.

The Gravitational field is composed of electric and magnetic fields, and their effect is in a spherical shape, which follows the Inverse Square Law.

What we called "Gravitational field", can be imagined as a multi-layer cloud of composed electromagnetic grid wrapping any object, and its influence follows the Inverse Square Law. When that composed field meets another field, their electric and magnetic fields merge, creating a new pattern of such alternating electromagnetic arrangement. The strengthened electromagnetic grid field pulls the electromagnetic fields of each of them. This pulling Force transfers via the Permeable Medium and its effects reach and influence each **UDP**.

The Gravitational Force between any two objects is a resultant Force between the electric and magnetic fields of the two objects. This observed Force or pulling effect is always perpendicular to those two fields, from the imaginary centre point of observation.

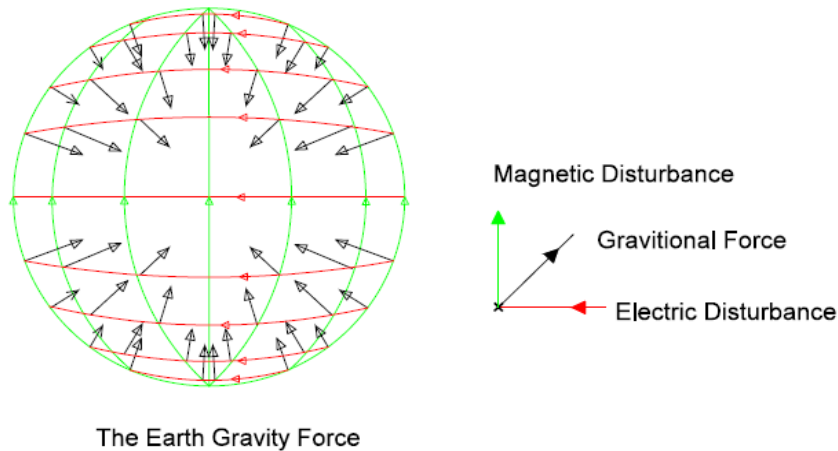
Any object with an electric or magnetic field also demonstrates interaction effects with a surrounding field. When these interactions exist in higher potential fields, a Gravitational Force travels from the low-field region to the higher-field region, i.e. objects falling to the earth. However, when this Force exists in a much weaker field, it rotates around the second object creating a surrounding field, i.e. satellites orbiting earth. Such observable facts occur because Force doesn't transfer in straight lines and is subjected to either electric and magnetic effects, or components within the falling object itself. The two composed components create a new Force that acts against the Gravitational Force, such that the falling object floats and rotates. Closer distances between these two objects means a higher



rotational speed's effect on the smaller one. This perspective of Force transfer and its components explain any rotation in Nature.

Figure 7 Explains how we can describe the gravity of earth.

**Figure 7:** The Gravity Force of Earth as an "Electromagnetism Fabric"



To more clearly understand gravity at a subatomic level, we have to unlock the anatomy of the main building blocks of matter; The Electron, Proton, Neutron, Neutrino and Photon. All these aspects are discussed in detail when we introduce the new atomic model, which differs from the problematic Bohr or cloud models claims for the electrons of an atom are orbiting outside the nucleus.

### 3.11. Union-Dipole and Gyroscopic Motion Model

Any gyroscopic motion in Nature comes from the intersection between electric and magnetic fields on the contact point between the two Union-Dipole Particle spheres.

As shown in the figures, the intersecting relation and directions of electric and magnetic fields' gyroscopic Forces are centred at the contact point, and this is also the epicentre for the helical motion.

The gyroscopic behaviour comes from the electric and magnetic fields' interaction, which is centred at the contact point between the two vacuum spheres of the Union-Dipole Particle. This fundamental gyroscopic motion of Force explains any such phenomena in Nature, including Gravity. The direction of the resulting perpendicular gyroscopic Forces further explain fundamentals of the right-hand and left-hand rules and also encompass the spinning of a charge in a magnetic field. These fundamental characteristics are Nature's foundational principles for electromagnetism. We should realise that any Union Particle shows both electric and magnetic fields. These fields are affected by other resultant fields, precipitated by other regional Unions, and are also acting in accordance with the Inverse Square Law.

### 3.12. Maxwell's Equations and the Speed of Light

Although many scientists might not acknowledge the validity of the geometry and quantum world math being used, or even accept a necessity for a better alternative after verifying my entire Theory's premise, UDT unlocks Nature's secrets in such way that the applied sciences' mathematicians can introduce simpler approaches for a more accurate portrayal of how Nature and the entire Universe act in a concert of precise harmony.

James Clerk Maxwell first introduced twelve equations that were later reduced to four, partial, differential equations. The four equations, in concert with the Lorentz Force Law, illustrate electric and magnetic Field Theory. These mathematical equations are vector functions of electric and magnetic

fields. The curl and divergence of the four equations are purely mathematical operations, and are in direct relation to the charge and current sources.

The four equations are commonly known as Gauss's Law. In the first equation, divergence of an electric field is related to a function of charge density. This equation describes the electric field between the **UDP's** two charges, meantime the unbalanced **UDPs** are the cause of this observable fact, wherever and whenever it exists, due to a related electrical disturbance transfer in the Permeable Medium.

In Gauss's Second magnetic Law, divergence of a magnetic field is equal to 0 (a closed loop). The zero value for a divergent magnetic field means that there are no point sources of magnetic field, which act in accordance with **UDP's** magnetic field. These stated characteristics prove **UDP's** magnetic field sustains the functionality of the Second equation. Gauss's Law describes the magnetic disturbance of the Permeable Medium!

Faraday's Third Law, the equation of induction, establishes a closed loop of electric field (E) lines exist when a magnetic field varies with time. It is well observed that any change in the magnetic field of a coiled wire causes an induced voltage (emf) in the coil. This Law is the basis for electric generators, inductors and transformers. The reason we observe this fact is because the conducting wire has free electrons, which are actually unbalanced **UDPs** that effectively carry and transfer the Force to its components. It isn't possible to isolate the observed magnetic and electric effects from each other. **UDT** shows clearly that any electric and magnetic effects, interactions or phenomenon are directly associated with disturbances in the Permeable Medium. The Nature of electron orientation inside matter enables the transfer of electric and magnetic disturbances within the matter from one region to another.

There are many states and forms of matter that transfer the electric and magnetic disturbances; metal, nonmetal, ionic and plasma. After the verification of **UDT**, a new mathematical model should introduce a simpler and broader understanding for all the variant electromagnetic states. It is not unreasonable to expect great contributions, coming from many brave mathematicians around the world, soon after the publishing of my Theory.

Balanced **UDP**, such as the photon and neutrino, show only and always two equivalent surrounded disturbances; the two-spin electric and the one-spin magnetic. Their Force, or pushing (effect), is a form of momentum reflective of their interaction at the local contact point between the two spheres of the **UDPs'**. Balanced **UDP** moves helically at the **Maxwell Speed**, whereas its straight-line displacement speed is below this value as long as it exists in an electromagnetic field. Unbalanced **UDP**, such as electrons or quarks, show only and always two, non-equivalent surrounded disturbances; the higher electric of one spin and the other, a less, magnetic spin. Their Force or push effect is produced from the interaction between the two spheres. Unbalanced **UDP** moves helically at the Maxwell Speed, whereas its circular closed displacement speed is below this value. Again, I expect a magnetic mathematical model for this that will describe all the possible motions of the balanced and unbalanced **UDPs**.

And, with Ampere's Fourth Law - Maxwell's correction, we find a closed loop of magnetic field (B) lines exist in the presence of a current and time varying electric field (a curl of the magnetic field).

**UDP's** Nature of Dipolarity reflects all kinds of motions and speeds in Nature, though the Union Particle has a maximum Speed of Light (Maxwell Speed), which had been solved before by using valid Maxwell equations. We can use the below relation to calculate the Constant **Maxwell Speed** of **UDP**:

It is significant to mention that, although the above laws were principally established by others before Maxwell's effort, his work with Ampere on the Fourth equation is significant because it enabled Maxwell to derive the electromagnetic radiation equation, which establishes light as an electromagnetic radiation.

Maxwell's equations and Lorentz Force Law proposed transformations, making the equations invariant of the direction of use, and were significant in the approval of symmetry between electricity and magnetism. **UDP** also complies with this symmetry.

$$\frac{\mathbf{E}}{\mathbf{B}} = \frac{\mathbf{E}_{\max}}{\mathbf{B}_{\max}} = \frac{1}{\sqrt{\mu_0 \epsilon_0}} \equiv C_M \text{ (Maxwell Speed of Light)} \quad (15)$$

Maxwell's equations were supposed to only be relevant in a test frame within the luminiferous ether as a transport for radiation (similar to Permeable Medium). This was verified by Edward Morley and Albert Michelson in 1887 (Michelson and Morley, 1887), and the equations were exposed to be outside the presumed test frame. In reply to this surprising experimental result, Hendrik Lorentz proposed a transformation, which made the equations invariant of directional use. Subsequently, a major dilemma in physics began.

Einstein constructed the transformation equations of Lorentz to expand the special Theory of Relativity, which we know is based on Lorentz factor. The main dilemma of this theory was the time dilation paradox. **UDT** states clearly that time is not geometrical and its application in this manner serves no reasonable purpose. In my next paper, I will introduce the **Absolutism Motion Law (AML)**, and it will cover motion laws, mass variation, radiation and decay.

It is confirmed, then, that the solution to Maxwell's equations demonstrate electromagnetic wave behavior when electric and magnetic fields propagate through a zero electromagnetic field effect (or vacuum) at the **Maxwell Speed of Light**. The current value for the speed of light in vacuum seems to be constant only because it is measured in the earth's Constant Gravitational field. This value is below the **Maxwell Speed** of the single **UDP**. The **Maxwell Speed** is directly derived from the Theory and can be verified or observed anywhere in the Universe.

The Union-Dipole Particle of electric and magnetic fields has a helical motion (wave function) at the Speed of Light in a vacuum, and these facts further validate the synchronous Nature of Maxwell's equation and **UDT**.

Previously, no one has explained where the Nature wave's behavior originates. With **UDT**, we identify both the Constant **UDP**'s shape and motion at the **Maxwell Speed** as the source of this mysterious phenomenon.

## 4. UDT Pillars

### 4.1. The Union-Dipole Shape

The general description for the **UDP** was covered earlier in this presentation and its possible movements are illustrated in the above figures.

The Nature of the **UDP**'s shape and Permeable Medium disturbances stand behind matter persistency, space-occupancy, and perceived energy in any possible form. Any observable variations in Nature are based on results of the deterministic causality, and extend influence on a **UDP**'s shape, the quantised disturbance surrounding the **UDPs**, subsequent transfers via the Permeable Medium, and follow the Inverse Square Law, which all sustain the dimensional Nature of the **UDP**.

### 4.2. The UDT and Planck Length

Nature has quantisation and shows ratio. We can feel, observe and measure either the Force or effect resulting of the interactions caused by Permeable Medium disturbances.

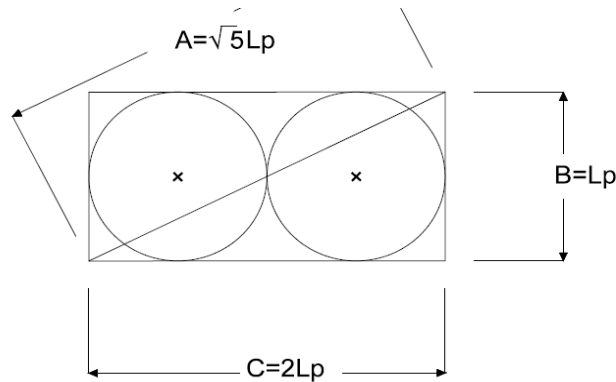
Valid and applicable math enables us to describe Nature Universally, whereas the non-applied math approach is not able to unify the entire system. The Denary system we use today, for example, fails to describe whole ratios, and invokes recurring and irrational numbers that are meaningless when applied Universally to Nature. In this imaginatively flawed process, an inconsistent mathematics can be used, but we would be best served using applicable math's which have a consistent and broad unity in describing Nature.

As shown earlier, **Planck Length** comes from very simple mathematical relationships between a few constants measured by man; the speed of light in a vacuum, **Planck Constant**, Coulomb Constant, Gravitational Constant and Boltzmann Constant.

The current value of **Planck Length** ( $L_p$ ) in Denary system is  **$1.616199 \times 10^{-35}$**  metre.

Figure 8, below, shows how the **UDP** includes the Golden Ratio (Phi  $\Phi$ ), which is equal to the irrational number ( **$1.618033989$** ) or  **$(1 + \sqrt{5})/2$** .

**Figure 8: The UDP Hides The Golden Ratio**



$$\text{Golden Ratio} = \Phi = \frac{B + A}{C} = \frac{L_p + \sqrt{5}L_p}{2L_p} = \frac{1 + \sqrt{5}}{2} = 1.618033989 \quad (16)$$

$\Phi$  is an irrational number which has a unique mathematical characteristic:

The reciprocal number is a number, or quantity, related to another by the fact that, when multiplied together, their product is one. The reciprocal number of  $\Phi$  ( $1/\Phi$ ) =  **$0.618033989$** .

Phi is the only number whose square is greater than itself by one, and is expressed mathematically as:

$$\Phi^2 = \Phi + 1 = 2.618033989$$

Phi is also the only number whose reciprocal is less than itself by one, and is expressed mathematically as:

$$1/\Phi = \Phi - 1 = 0.618033989$$

The **UDT** states that any physical or existing length in any of the possible forms observed in Nature should be a multiple of the **Planck Length**. A true value for the dimensions of any such physical object follows this relation:

$$\text{Any length in Nature} = n \times L_p, n = 1,2,3, \quad (17)$$

The above "  $n$  " is an integer that fulfils the relation.

This fact is a very fundamental part of Nature and **UDT**. This concept allows many essential corrections in measurements using applied mathematics and puts an end to unnecessary energies expended on large computations of large numbers, constant's measurement variation and accurate unit values. The physical world of Nature does not endure these calculations and Nature cannot be distorted to be in harmony with chaotic definitions of inconsistent mathematical uncertainty.

It is not useful at this time to elaborate on science's mathematic failures or their consequences, but I sincerely believe many scientists and mathematicians contributions will accelerate my Theory, soon after they catch the vision.

The Phi ( $\Phi$ ) or the Golden Ratio, which appears clearly in the **UDT's** shape, establishes more common sense relations and a simpler synchronization between mathematics and Nature. **UDP** is the only possible cause for the appearance of the Golden Ratio observed from cell to galaxy in Nature.

**Planck Length** is a deterministic physical length and, as the only absolute Constant in Nature with its physical shape based on **UDP**, every observed element in Nature can be analyzed and explained. The quantisation process reflects multiple, or quanta of that exact **UDT** Constant, while the Golden Ratio is another face of this Constant and, when combined with its shape, these characteristics are clearly apparent in **UDP**.

When datum of Nature observations are based on the smallest possible length (**Planck Length**), uncertainties can be entirely avoided, and Nature then be observed in its true form with Universal determinisms everywhere.

$L_p = 1.616199 \times 10^{-35}$  metre (from the relations of the physical Constants on earth) According to one aspect of this Theory, the **UDP** should follow and reflect the Golden Ratio in its measurements.

$$L_p = \Phi \times 10^{-x} \quad (18)$$

The above relation shows how the **Planck Length**  $L_p$  can be measured by dividing the Golden Ratio by any length unit, such as metre or feet, as long as any observed length comes in a multiple of that smallest possible length. This relation will easily be seen as the indices and ratio's lost link when applying the simpler mathematics.

The value for the true **Planck Length** can then be calculated exactly from the **Planck Length**, extracted from the physical Constants and verified to be equal only to:

$$L_p = \Phi \times 10^{-35} M = 1.618033989 \times 10^{-35} M \quad (19)$$

The simple calculus operation above is the most important fundamental of my Theory, and by it we find a pure relationship between the ratio concept of measurements, and this lowest possible Constant Length is not only astonishingly accurate, but we will come to see that it exists everywhere in the Universe.

This modified length can be called a "**Planck Length**", or "Suppressive Constant" because it shows that this length represents the suppressed (empty) region of space, where the Universe started to have observed objects.

### 4.3. UDT and the New Length Unit

Now, imagine that we construct a longer new length unit, a "new metre"  $M_{\text{new}}$ , whose length is:

$$M_{\text{new}} = \Phi M = 1.618033989 M \quad (20)$$

Where M is our currently used metre.

$$M_{\text{new}} = 10^{35} L_p \text{ (an exact measuring Unit)} \quad (21)$$

and

$$L_p = 1.618033989 \times 10^{-35} \text{ metre}$$

Using such a Constant Length unit eases our life with the highest absolute accuracy. It introduces a method for very easy calculations using indices which speed up system performance and related treatment processes.

As a result, the corrected value of the **Planck Length** based on Golden Ratio and its value in the denary system was obvious to be different from the one we calculated with the Nature Constants as we have shown at the beginning of the paper.

Using dimensionless measurement and denary mathematics, **Planck Length** can be seen as

$$L_p = 1.618033989.1 \text{ (denary ratio of one } M_{\text{new}} \text{ unit)} \quad (22)$$

And the **Planck Length's** physical reality of  $1.618033989 \times 10^{-35}$  metre everywhere in the Universe. Using the proposed new Metre, as explained above, we get:

$$L_p = 10^{-35} \text{ New Metre, or New Metre} = 10^{35} L_p$$

$$\text{Whereas } L_p = 1.618033989 \times 10^{-35} \text{ current metre}$$

The above transformation step replaces any standard measurement units now used. I expect an immediate worldwide acceptance to replace our current metre with my new metre of Nature to overcome slow operations, though it might take a longer time to be utilised in everyday fields.

Then, only by using the true **Planck Length**, a most fundamental Constant, we can find any physical Constant in Nature, as you will see in the next sections.

#### 4.4. The UDT and Time Concept

UDT states that "Suppressive Constant", or the verified **Planck Length**, is the only true physical base for measuring everything in Nature. Time is a man-made tool that is only useful to describe motion. For example, man's perception of time cannot be woven with Geometry, or seamlessly connected with Nature to build a Universal fabric.

At first, an agreed quantity or magnitude of time is required to acquire a measurement for velocity. Also, it may be thought that the idea of time is related to the idea of velocity. Velocity is the measurement of a change in position of one object relative to the position of another standard object, such as a wall clock or an atomic one. We always compare an unknown movement when measuring a velocity for a certain object with the movement of a standard clock. The concept of time is well explained by Miles Mathis in his paper " A Revaluation of Time " (Mathis, Miles).

The first proposal for measuring time mechanically was through a uniform movement of the sun to make a solar day, which now has a very accurate sub-unit "the second" by fine-tuning it using the atomic frequency of cesium.

Indeed, measuring a fixed uniform movement through a fixed distance gives time a consistent unit. Accordingly, we can create any time unit if we can observe a uniform movement of an object for a measured distance, i.e. watching the minute arm of a wall clock when it rotates from number twelve, passing all its other numbers and, then, back to its start. We can likewise look to the minute as a distance measurement, imagining it as a constant period or interval to measure and register movement. A period of time is a tool invented by our minds to help us describe or measure the movement of another object in a differing reference.

My Theory states that time is a man-made tool used to measure velocity or describe motion. Time, as a physical unit, should have a constant value that we agree on. It is not, by itself, a phenomena of Nature.

It cannot be changed, though we can change the time mathematically to solve or simplify motion related applications. Simply, time is not geometrical and the geometric theory of time is completely inadequate. **UDT** introduces the first novel time concept after 100 years of chaos, and following numerous failings of Newtonian and Einsteinian Theories.

I can conclude the following:

Time is a tool with a constant unit, or an invented physical unit based on a relative measurement of distance, where there is a uniform movement. This tool can be used to measure the velocity or speed of an object in such way that changes or differences are described as comparatively relative motion. Time can be considered, therefore, a measurement of relative movement. Velocity is a relative measurement for a distance traveled per unit of time. Time is a distance.

Therefore:

Time is not geometrical, and cannot be associated with geometry.

$$Velocity = \frac{Distance}{Time} = \frac{Distance}{Invented Distance} (unitless scale) \quad (23)$$

Everything in Nature is a product of **Planck Length** quantization and can be measured by length only if we like. As I have shown above, any possible length in Nature is a multiple or a compound of **Planck Length**. We can determine any distance in a uniform-movement system to be "the relative time". The optimal uniform-movement system is the system of consistent circular movement. In the case of a uniform circular movement, such as the movement in the **UDP** at **Maxwell Speed**, any one cycle distance could be used as a unit of time. This profound hypothesis actually assists in determining the **Maxwell Speed of Light**.

#### 4.5. Measurement of Maxwell Speed of Light from the UDT

At Planck Condition, the local uniform circular wavelength (Figure 3) of **UDP** equals two **Planck Lengths** ( $2 L_p$ ) diameter and it moves at the **Maxwell Speed of Light**, as explained before.

Always and everywhere, there are two full cycles of rotational period for the spheres corresponding to one cycle of rotational period for the balanced **UDP** its self. Accordingly, this uniform motion of each sphere of the **UDP** can be used here as both a time unit and to also find the Constant Speed of Light (Maxwell Speed).

For each two units of time, wherein the **UDP** spheres' complete their rotation (or one cycle), the amount of measured time is equivalent to exactly one cycle of their motion at the **Maxwell Speed of Light**. This means that the higher **UDP** wavelength is the slower motion of its spheres. At Planck Conditions, both spheres' speeds are equivalent to the **Maxwell Speed**. These are the high and low of the **UDP's** range of incremental speeds.

Now, let me assume the one time unit is based on the motion of the spheres.

Therefore,

$$\text{Maxwell Velocity} = C_M = \frac{\text{distance}}{\text{time}} = \frac{\text{distance}}{\text{distance}} = \frac{\text{distance of one cycle of sphere at } C_M}{\text{one unit of time (distance) at } C_M}$$

$$\frac{\pi D}{1} = \frac{\pi L_p}{1} = \pi \times 1.618033989 = 5.083203692 \quad (24)$$

A dimensionless Unit based on the decimal system we use.

This value represents a dimensionless unit, though it has a decimal number that comes from a multiplication ratio of two Constants,  $\pi$  and **Planck Length**.

We can get the same results from any **UDP** spinning at **Maxwell Speed**:

$$\text{Maxwell Velocity} = C_M = \frac{\text{distance}}{\text{time}} = \frac{\text{distance}}{\text{distance}} = \frac{\text{distance of one cycle at } C_M}{\text{one unit of time (distance) at } C_M} = \frac{\pi D}{2 \times 1} = (\pi \times 2 \times L_p)$$

$$\pi \times 1.618033989 = 5.083203692 \quad (25)$$

This value is also a dimensionless Unit and decimal. We get the exact same result from any **UDP** spinning at **Maxwell Speed**, whereas its sphere velocity decreases in the same quantised ratio.

For example, let me assume that the radius of the circular movement for **UDP** is 100  $L_p$ , **Maxwell Speed** will be:

$$C_M = \frac{\pi D}{100 \times 2 \times 1} = \frac{\pi \times 2 \times 100 L_p}{100 \times 2} = \pi \times 1.618033989 \quad (26)$$

To convert this calculation of the **Maxwell Speed of Light** from denary or base 10 decimal system to our regular base 60 time system, we should notice that:

100 parts of Decimal Time (Denary) = 60 parts of Regular Time (Normal)

To convert above value of Maxwell Velocity from decimal scale to regular scale we have to multiply it by the factor of (60/100).

$$C_M = 5.083203692 \times 0.6 = 3.049922215 \quad (27)$$

This value represents a dimensionless unit which is based on a regular time system.

And this amount of dimensionless unit in reality can have any multiple integer value of this number.

**The Maxwell Speed (modified) =  $C_M = 3.049922215 \times 10^x \text{ metre. Sec}^{-1}$**

to find the value of (x),

We measured the speed of light on earth based on a regular system to be exact:

$$c = 2.99792458 \times 10^8 \text{ metre. Sec}^{-1}$$

Accordingly, as  $x = 8$

**The Maxwell Speed (modified) =  $C_M = 3.049922215 \times 10^8 \text{ metre. s}^{-1}$**

**UDT** is the first Theory in physics to isolate and calculate the exact Speed of Light as a Constant in Nature after calculating the exact value of **Planck Length**. These values are easily verified.

I now have two of Nature Constants; real **Planck Length** and the **Maxwell Speed of Light**, and they are consistent, all around us and throughout the Universe. I invite scientists to apply such verification. We will see in the coming sections how any other Constant in Nature, based on only these two Constants, can be measured very easily and accurately.

#### 4.6. The UDT and Quantisation Concept

At first, **UDT** unlocks the secret of the observed quantisation by showing its physical reality. We then explain the Universal mechanical precision of this phenomena in Nature. As one of the vacuumed spheres' speed rotation increases or decreases one revolution per cycle, this same period of time corresponds to one full cycle change in the form of frequency and wavelength for the Union Particle's continuous motion at **Maxwell Speed**. At less than Planck Condition, the speed of the rotation of the vacuumed spheres is less than **Maxwell Speed**. At Planck Condition, there is no quantisation process, whereas the wavelength equals  $2L_p$  and all the spheres are in resonance at maximum speed and Planck Frequency. In quantisation, each two full cycles of increase or decrease in the spheres' speed generates an increase or decrease of one Unit in the frequency or wavelength of **UDP**, rotating helically at  $C_M$ .

In quantisation, the two full cycles' increase or decrease in the spheres' speed represent electric and magnetic disturbances that are perpendicular to each other and that's why each two full cycles in the spheres' speed correspond with one unit change in the **UDP** electromagnetic wavelength.

Unequal or unbalanced **UDPs**, such as electron or quarks, show quantisation on the sphere that has less motion. Increasing the motion of the Permeable Medium on the less motion sphere causes less perceived charge, whereas, decreasing it shows higher charge. All unbalanced **UDPs** have the same anti-particles, except they spin in an opposite direction.

Here, I would like to confirm that quarks of less charge always have more mass and this verified observation complies with **UDT**. Moreover, these high-mass quarks exist normally inside the protons and neutrons under a very high electromagnetic field and they decay once this field changes, similar to what happens during smashing baryons (protons), and the new field is the earth field so that the positive-charge quark will decay to positron and the negative-charge quark will decay to electron. The decay time for a quark is the required period that a quark, as unbalanced **UDP**, takes to decrease the speed of its low spin sphere, till reaching the condition of the electron, or its anti-particle the positron, spin.

We are all quite sure of quantum mechanics validity as a phenomenon, when we verify Max Planck's achievement and prove the energy quantisation concept. We might not agree on the mathematical tools that were used in quantum related sciences and or the physical explanations of many quantum terms and ideas, such as losing entanglement, spooky Forces, virtual particles, borrowing from the vacuum, and similar schist that have accumulated over the years. A quantisation process is at the heart of **UDT** and all quantum sciences can be reviewed accordingly.

Quantum sciences' names may serve to both remind us of many mysteries and how the scientists involved failed to explain the quantisation phenomenon scientifically, as they used the spooky mathematics of uncertainty, relativity, Bohr and Standard Model Theories. Those models' complicated chaos persisted because no one had deciphered the smallest possible picture in Nature, like unto the deterministic **UDP**.

Max Planck was the first who presented a quantum hypothesis, and it was used successfully to unravel other problems that could not be explained classically. The main outcome from his verified theory was that the world could no longer be viewed as a continuous entity - rather, it was seen to be quantised - though no one till now could decipher or explain how quantisation physically occurs.

Planck quantisation means that thermal oscillators produce only "packets" of radiant energy, which exist in an integer form of satisfying this formula:

$$E_n = nhf, \text{ for } n = 1,2,3,\dots \text{ Planck's Hypothesis} \quad (28)$$

$$h = 6.63 \times 10^{-34} \text{ J}\cdot\text{s} \text{ Planck's Constant}$$

The smallest "chunk" of energy, called a quantum of energy, is given by  $E_q = hf = 6.63 \times 10^{-34} \text{ J}$

This means only certain values occur and there is no continuous deflection (increasing or decreasing) in Nature.

Today, the quantum picture of the world is at odds with our common sense view of physical objects. These conflicts have been exacerbated because we cannot uniquely define "particle" and "wave", nor how the quantisation occurs. In quantum sciences, an object can be described only by mathematical functions, which are indeed measures of probability; where as **UDT** describes any object



deterministically and very accurately, distinguishing "wave" as a disturbance in the Permeable Medium, and "particle" as two adjoined spheres comprised of **Planck Length** multiples diameter each.

Quantisation is a physical process appearing between the **UDPs** due to the change of the surrounding electric and magnetic fields these particle may whirl or spin in.

We showed earlier that the **UDP** has a helical (helix) movement at Maxwell Speed, and has equivalent electric and magnetic fields acting on the contact point between the two vacuumed spheres. This contact point is where the quantisation process starts and ends.

This Universe ratio, between the electric and magnetic fields, represents the constancy of speed at the Maxwell Limit, independent from other variables such as wavelength, frequency of the wave, or variations in the surrounding electromagnetic fields due to the quantisation process.

Quantisation occurs due to the effect of the Permeable Medium spinning and surrounding the vacuumed spheres at a higher or lower rate. This difference affects the frequency of the **UDP's** spin, which can increase or decrease in registered steps.

Increasing or decreasing the vacuumed spheres' spin frequency by two-timed units corresponds to only a one unit of increase or decrease for the frequency of **UDP**. This makes a one quantum Unit (dimensionless) decrease or increase in the relative speed of vacuumed spheres. This can be expressed as a change of one quantum in the perceived charge of the sphere, or a one quantum change of its energy, or one quantum change of its mass, or one quantum change of its velocity. Quantisation occurs only if the exposure time is more than the reciprocal number of its frequency. This might be understood as a perceived quantised concept for time itself, even though time is an invented tool that can describe relational motion. In this case, the lowest possible value of time in Nature is the reciprocal number of Planck Frequency.

This perspective of quantisation is based on the "time is constant" concept, though quantisation is actually a time dependent process. One quantum means one interval of time that is required for one full spin of the **UDP** at **Maxwell Speed**, which is equivalent to the time for two spins of the Permeable Medium around the spheres when this particle exists in a different field. The quantum time for any **UDP** is an integer multiple of the lowest possible quantum time at Planck Condition.

Quantisation does not occur if the **UDP** stays for less time than its quantum time in a different electromagnetic field. The required quantisation time for high frequency **UDP** is less than that of low frequency.

One quantum is a dimensionless constant like **Planck Length**, or the **Maxwell Speed**. The one quantum in our energy unit (J) is equal to **Planck Constant**. One quantum represents the lowest possible energy, or the corresponding pretended mass that is carried by the **UDP**.

When the perceived charge and its spheres' electric field disturbance is increased one quantum, for example, the created magnetic field has another type, or form of disturbance that will be increased one quantum as well, and the resultant effect of the electric and magnetic fields of the Particle, as a Force or a perceived momentum, are increased one quantum as well. Accordingly the helical motion's wavelength will decrease by one quantum as well. Reducing this wavelength can be described according to this relation:

$$\frac{\lambda}{C_M} = \frac{L_p}{V} = \frac{1}{\text{frequency}} = \text{constant time for each wavelength} \quad (29)$$

Where the V is the relative imaginary mathematical speed of the spin in the Permeable Medium or,

$$\frac{C_M}{L_p} = f_p = \frac{1}{\text{time}} = \text{frequency} \quad (30)$$

Where  $\lambda (\lambda = \pi D, D = \text{diameter})$  is wavelength of the **UDP**. This relation shows how the time concept appears to be constant physically and is quantised where its lowest possible value is the Planck time, even though time is clearly a man-made tool.

Verified Planck time based on verified **Planck Length** could be used as a standard minimum time unit in Nature, replacing any time unit used by us. Any time unit chosen is simply a multiple of Planck time.

Accordingly, the zero-time concept or status doesn't exist in Nature, and the big-bang theory's hypothetical case for the time between zero and Planck time simply does not exist. Generally, we can

say that the history of the Universe started from the first expansion event at Planck Condition, and there is no lost chain of events missing between the zero time and Planck time.

At Planck Condition, for example, the Permeable Medium spins around the spheres at the maximum possible **Maxwell Speed**, and each sphere has four moving contact points with other surrounding **UDPs**, therefore,  $\mathbf{V} = \mathbf{C}_M$  and  $\mathbf{L}_p = \lambda$ .

At Planck Condition, as with the starting point of the Universe, black holes, and the Universe shell, the wavelength of the motion is purely circular and the  $E = mc^2$  relation is valid. In my next paper I will explain in more detail about how the Universe started, expands and its future. In a few words, the Universe started when two giant black holes popped up in the Permeable Medium at Planck Condition with an opposite spin, and collided. The current Universe has a shell at Planck Condition. The Universe will collapse once its shell is ruptured. Our Universe's shell is continuously absorbing any **UDP** in a form of photon or neutrino. After the Universe collapse, the whole Universe will end in two giant black holes, the same manner in which it started. Simply, **UDT** doesn't support or sustain the concept of singularity.

Quantisation can be either acceleration or deceleration and the quantum value is equal to a one quantum change that starts and ends in the contact point between the vacuumed spheres in the form of speed or frequency changes, though it can also be treated as a perceived charge or mass for those spheres and their **UDP**.

Acceleration progression is taking place when the **UDP** locates in a stronger electromagnetic field, such that the perceived charge of the balanced spheres or the less-motion one increases. In a weaker field, deceleration occurs since its perceived charge's mass decreases. Charge and Mass are not, however, authentic physical properties. Nature is exclusively composed from joined spheres and a Permeable Medium that has an effective disturbance acting through quantisation.

When an object is subject to acceleration by the action of an external Force, it gains quanta of energy, charges, magnetism, frequency and mass because the applied Force creates a disturbance. Any applied Force of any form in Nature is, indeed, an electric or magnetic (or electromagnetic) disturbance change. This applied Force makes a new level of disturbance in the Permeable Medium, such that time is required to react before reaching equilibrium, or no more acceleration. Simply, any Force is an electromagnetic disturbance that can generate more extended disturbances in the same manner as when current transfers in a conductor. Disturbance is created via **UDP**'s work as carriers. The Force is an observed phenomenon that can transfer through any **UDP**, interacting with the quantised disturbance change, and transferring it from one region to another. This system of transfer is like unto applying a Force on an enclosed fluid, and the applied Force is transferred to all parts of the system. The quantised frequency or wavelength disturbance change is plainly manifest and, therefore, can be measured in the **UDP**.

Under an accelerating condition, the wavelength of an object's particles will be decreased, and the frequency increases, while, with an object under deceleration, the reverse happens as the rotational speed of the spheres will be decreased in a quantised mode, which means the wavelength of its particles will be increased so that the object expands. The amount of quanta is determined by the time of the external Force's effect. Indeed, when we multiply Force by time we get the term "momentum change", and that is equal to its mass, multiplied by its velocity. Any object subject to quantisation cannot have Universal physical properties such as mass, volume and temperature.

Quantisation process is dimensionless by itself and these packets are considered equal to integer multiples of **Planck Length**. This explains the physical meaning of Planck Universe and also sustains the fact that Nature cannot offer quantisation changes differing from one **Planck Length**.

I explained earlier in my presentation how **Planck Length** is the minimum possible length in Nature and is also the only Constant. I proceeded to demonstrate that we can then find any other Constants and proceed to unlock other consistent secrets in Nature.

I think you are aware of both **Planck Length**, and why it is dimensionless. Meantime, we can measure **Planck Length** by any unit length. Moreover, I elaborated how we can accurately fine-tune our metre to have exactly  $(10^{35})$  **Planck Lengths**, making our metre shorter. Calculations are easier and carry more meaning when we measure with Nature and the Golden Ratio.

Quantisation only occurs when the **UDP** is influenced by the physical effects of a differing, unbalancing electromagnetic Permeable Medium. In this state, its physical properties will go up or go down, and the following changes can be seen:

In case of gaining a quantum (accelerating), the Union-Dipole charge increases one quantum of a dimensionless unit because:

The frequency of the vacuumed spheres increases two units, whereas the frequency of the **UDP** increases one unit. Its wavelength ( $\lambda$ ) decreases by two **Planck Length** units or its frequency ( $f$  or  $\omega$ ) increases one unit. As a result, its energy ( $E_q$ ) and mass ( $m_q$ ), man-made observations of physical properties, increase accordingly because they are, indeed, other perceived forms of its charge, though the charge itself can be considered a perceived property as well. All above properties will be affected inversely when losing a quantum. The current **Planck Constant** represents the lowest possible quantised energy in the earth field and the amount of quantum energy is equivalent to **Planck Constant** ( $h$ ) therefore:

Quantum Energy = Planck Constant( $h$ ) =  $6.62606957(29) \times 10^{-34}$  J, or  $=1.054571726 \times 10^{-34}$  J because:

$$h = \frac{h}{2\pi} \text{ (reduced Planck Length, that is well-matched with angular frequency)}$$

Note that  $\pi$  is a ratio in a form of denary system and  $h$  is an observed measured value.

#### 4.6.1. Calculating Accurate Planck Constant ( $h$ ) from UDP Theory

From above relation, eq. 30:  $\frac{C_M}{\lambda} = \frac{V}{L_p} = \frac{1}{\text{time}} = \text{frequency}$

At Planck Condition:

$$\frac{C_M}{L_p} = f_p = \frac{1}{\text{time}} = \text{Planck frequency} \quad (31)$$

At quantisation process, one quantum of dimensionless properties are all equal one (1).

$E_q = m_q = q_q = \text{one dimensionless quantum}$ ,

therefore we can write:

$$E_q = \frac{C_M}{L_p} = f = \frac{1}{\text{time}} = \text{frequency of one cycle} = 1.0 \text{ (dimensionless)} \quad (32)$$

**Planck Constant** Units are J.s and I will convert, below, the dimensionless value of one quantum energy ( $E_q$ ) to the regular system, matching J.s Units, where J is in denary (base 10) system and s in Sexagesimal (base 60) system:

$$E_q \text{ (in regular time)} \equiv \frac{C_M}{L_p} = \text{one cycle} = 2\pi \frac{10}{60} = 1.047197551 \quad (33)$$

Note: The  $2\pi$  term converts the wavelength from a diameter to a circumference or ratio concept in the number world. In reality, the above figure represents how we can make one quantum well-matched with **Planck Constant** Units. Number 10 is the decimal (denary) for metre, joule, kilogram conversion factor and the 60 represents the second unit in the Sexagesimal (base 60) system because **Planck Constant** unit is J.s.

Comparing the dimensionless figure above with experimental quantum value known as

**Planck Constant that equals  $= 1.05457172610^{-34}$  J.s**

Therefore, the correct value for **Planck Constant**,  $h$ -bar ( $h$ ) based on Planck Condition is:

**$1.047197551 \times 10^{-34}$  J.S**

Note that the above figure is valid at zero external electromagnetic field. Earth has an electromagnetic field which affects experiments, meantime the earth field itself shows variation from one place to another on earth.

**4.7. Some of UDT Outcomes**

From these three Universal Constants; **Planck Length**, **Maxwell Speed** and **Planck Constant**, we can calculate other Constants at Planck Conditions as follows:

$$C_M = \frac{1}{\sqrt{\epsilon_0 \cdot \mu_0}}$$

$\epsilon_0$  = Space Permittivity (electric constant of space)

$$= 8.55485413810^{-12} \text{ A}^2 \cdot \text{S}^4 \cdot \text{Kg}^{-1} \cdot \text{m}^{-3} \text{ (F.m}^{-1}\text{)}.$$

$\mu_0$  Space Permeability (magnetic constant of space)

$$= 4 \times \pi \times 10^{-7} \text{ N.A}^{-2}$$

$$\text{Coulomb Constant} = K_e = \frac{1}{4\pi\epsilon_0}$$

$$= 9.302025524 \times 10^9 \text{ Kg.m}^3 \cdot \text{A}^{-2} \cdot \text{S}^{-4}$$

$$q_p = \sqrt{4\pi\epsilon_0 \hbar C_M} = 1.852976531 \times 10^{-18} \text{ Coulomb}$$

**Table 3:** Some of corrected Constants values at the Planck Condition.

	UDT Value	Current experimental value according to the National Institute of Standards and Technology (NIST)
Planck Length	$L_p = 1.618033989 \times 10^{-35} \text{ m}$	$L_p = 1.616199 \times 10^{-35} \text{ m}$
Speed of Light	$C_M = 3.049922215 \times 10^8 \text{ m.s}^{-1}$ (Maxwell Speed)	$C = 2.99792458 \times 10^8 \text{ m.s}^{-1}$
Planck Constant	$\hbar = 1.047197551 \times 10^{-34} \text{ J.S}$ $h = 6.579736266 \times 10^{-34} \text{ J.S}$	$\hbar = 1.054571726 \times 10^{-34} \text{ J.S}$ $h = 6.626069574 \times 10^{-34} \text{ J.S}$
Planck Frequency( $\omega_p$ )	$\omega_p = 1.884955593 \times 10^{43} \text{ S}^{-1}$	$\omega_p = 1.85487 \times 10^{43} \text{ S}^{-1}$
Planck Frequency( $f_p$ )	$f_p = 3 \times 10^{42} \text{ S}^{-1}$	$f_p = 2.95211 \times 10^{42} \text{ S}^{-1}$
Planck Charge( $q_p$ )	$q_p = 1.852976531 \times 10^{-18} \text{ C}$	$q_p = 1.875545956 \times 10^{-18} \text{ C}$
Planck Mass( $m_p$ )	$m_p = 2.122033313 \times 10^{-8} \text{ Kg}$	$m_p = 2.17651 \times 10^{-8} \text{ Kg}$

From the following relations among common Constants, we can treat the **UDP** to find the real value of some Constants, such as the Universal Gravitational Constant (G), in that we have measured its value experimentally on earth, where earth field has non-zero Gravitational field, as we know.

The attraction Force between the two **UDP** vacuumed spheres is purely an electrostatic Force, and can be treated as a pure Gravitational Force under ideal condition of no external effect because any electromagnetic influence will have an effect on the electric and magnetic fields of the **UDP** before reaching the contact point between the two spheres.

Therefore:

$$E_p = m_p \cdot C_M^2 = \hbar \times \omega_p = \frac{K_e q_p^2}{L_p} = \frac{G M_p^2}{L_p} = \text{Energy of UDP at Planck Condition}$$

Solving simply, above equations give that:

$$G = \frac{L_p^2 C_M^3}{\hbar} = \frac{K_e Q_p^2}{M_p^2} = 7.092722507 \times 10^{-11} \text{ m}^3 \cdot \text{Kg}^{-1} \cdot \text{S}^{-2}$$

Whereas the measured value in earth is less  $6.67384 \times 10^{-11} \text{ m}^3 \text{kg}^{-1} \text{S}^{-2}$ . The second value shows less magnitude because we ran the experiment on earth, and such experimental objects are under the effect of the earth's Gravitational field, which makes the net attraction less. **UDT** can also correct other Constants.

**Table 4:** Some important values that we need regularly

	UDT Value	Current experimental value according to the National Institute of Standards and Technology (NIST)
Maxwell Speed of Light ( $C_M$ or $C$ )	$C_M = 3.049922215 \times 10^8 \text{ m.s}^{-1}$ Anywhere in Universe	$C = 2.99792458 \times 10^8 \text{ m.s}^{-1}$ Speed of light in vacuum which is considered to be constant and a limit speed in universe. Science is under force to accept this value.
Planck Constant ( $\hbar$ or $h$ )	$\hbar = 1.047197551 \times 10^{-34} \text{ J.S}$ $h = 6.579736266 \times 10^{-34} \text{ J.S}$ In zero electromagnetic field effect(UDP)	$\hbar = 1.054571726 \times 10^{-34} \text{ J.S}$ $h = 6.626069574 \times 10^{-34} \text{ J.S}$ in earth experiment based on a constant electron charge (e)
Space Permittivity Electric constant of vacuum( $\epsilon_0$ )	$\epsilon_0 = 8.554854138 \times 10^{-12} \text{ F.m}^{-1}$ In zero electromagnetic field effect (UDP)	$\epsilon_0 = 8.854 187 817 \times 10^{-12} \text{ F.m}^{-1}$ Based on the constant speed of light in vacuum(experiment of 1983)
Coulomb Constant ( $K_e$ )	$K_e = 9.30202552 \times 10^9 \text{ Kg.m}^3.\text{A}^{-2}.\text{S}^{-4}$ In a zero electromagnetic field (UDP)	$K_e = 8.98755178 \times 10^9 \text{ Kg.m}^3.\text{A}^{-2}.\text{S}^{-4}$ Based on the constant speed of light in vacuum(experiment of 1983)
Gravitational Constant (G)	$G = 7.0927225 \times 10^{-11} \text{ m}^3 \text{ Kg}^{-1}.\text{S}^{-2}$ In zero electromagnetic field effect (UDP)	$G = 6.67384 \times 10^{-11} \text{ m}^3 \text{ Kg}^{-1}.\text{S}^{-2}$ In earth through many non consistent experiments.
Boltzmann Constant( $K_B$ )	$K_B = 1.3888888 \times 10^{-23} \text{ J.K}^{-1}$ in zero electromagnetic field effect (UDP)	$K_B = 1.3806488 \times 10^{-23} \text{ J.K}^{-1}$ In earth based on a constant charge of electron (e)
Electron Charge(e)	$e = 1.618033989 \times 10^{-19} \text{ C}$ In zero electromagnetic field effect	$e = 1.602176565 \times 10^{-19} \text{ C}$ Is fixed and based on the assumption of constant speed of light in vacuum (experiment of 1983)
Avogadro Constant( $N_A$ )	$N_A = 6.18033989 \times 10^{23} \text{ mol}^{-1}$ In zero electromagnetic field effect	$N_A = 6.02214129 \times 10^{23} \text{ mol}^{-1}$ In earth based on a constant charge of electron (e)
Fine Structure Constant ( $\alpha$ ) $\alpha = \frac{K_e \cdot e^2}{\hbar \cdot C}$	$\alpha = 7.62492264 \times 10^{-3}$ $\alpha = \frac{1}{131.1488716}$ in zero electromagnetic field effect	$\alpha = 7.2973525698 \times 10^{-3}$ $\alpha = \frac{1}{137.0359967}$ in earth depending upon the four constants on earth. <b><math>\alpha</math> is not a Nature constant at all</b>

From the above results, we can now explain inconsistencies of the Fine Structure Constant in space, and that is considered one of the current problems in modern physics.

UDT can easily be tested by creating different manipulated electromagnetic fields in earth or space, then measuring the property that is the subject of the test, such as electron charge.

#### 4.8. UDP's Highest and Lowest Possible Values

Although man invented many measurable properties that have sensible values to describe states of a physical system in Nature, UDT States that Nature has one Constant, the **Planck Length**, and all other Constants are another form of this Constant, with respect due to the quantisation process.

I have avoided using any sophisticated mathematics in my paper, simply because scientists have mistakenly used sophistication on many crucial occasions. We did not distinguish clearly, yet, how mathematical theories can be valid for physics before validation of the theories themselves. You agree with me, in that I should avoid using something that I don't trust fully, or it is also under suspicion to you.

I had been taught in mathematics to consider the infinity and zero in operations as pure mathematical definitions, regardless of their physical existence, whereas, UDT dictates harmony with Nature and does not, therefore, contain these definitions.

UDT states that the vacuumed spheres never vanish and their dimensionless quantised values cannot ever be either zero or infinity, and there are always lowest values that can be derived and calculated easily from the **Planck Constant**. Mathematical infinity is not useful in applied physics because Nature does not have an infinite limit. UDT is based on the fact Planck Units are the limits.

I cannot now fully resolve how to design an applied mathematics which avoids the usage of both zero and infinity. I hereby request mathematicians to do so.

I can, however, give them some useful keys to start with. One is that the rate of change in Nature equals 1.0 or its multiples without any fractions. The second is to extract the descriptive information I have given in this presentation about **UDP**, and use it to solve any calculus problem related to Nature from now on, without infinite series or limits, as long as it has deterministic boundaries. I have shown also that acceleration occurs due to quantisation, which means it is not an instantaneous process. Once we learn to treat time properly, we will eliminate most scientists' headaches.

From the following relations, we calculate the lowest possible physical units for **UDP**:

**Quantum Energy** =  $\hbar = M_u \cdot C_M^2 = h \cdot f_U = \hbar \cdot \omega_U$ , **u subscript designates UDP**

$$Q_{US} = \sqrt{\frac{G}{K_e}} \cdot M_{us}, \text{us subscript designates Union Sphere} \tag{34}$$

Accordingly, lowest and highest Nature values are shown in the table below:

**Table 5:** Lowest and Highest possible limits in Nature.

The Man-Made Physical Property	Planck Units(Values) The Maximum Possible Limit within the UDP	Lowest Possible Values Within the UDP
Energy (E) J	$E_p = 1.973920803 \times 10^9$	$E_L = 1.04719751 \times 10^{-34}$
Mass (M) Kg	$M_p = 2.122033313 \times 10^{-8}$	$M_L = 1.41688875 \times 10^{-50}$
Charge (q) C	$q_p = 1.852976531 \times 10^{-18}$	$q_L = 1.237238635 \times 10^{-60}$
Frequency (f), normal $S^{-1}$	$f_p = 3 \times 10^{42}$	$f_L = 3 \times 10^{-27}$
Frequency ( $\omega$ ), angular $S^{-1}$	$\omega_p = 1.884955593 \times 10^{43}$	$\omega_L = 1.884955593 \times 10^{-26}$
Temperature K	$T_p = 1.421223888 \times 10^{32}$ $E_p = h \cdot f_p = \hbar \cdot \omega_p = K_B \cdot T_p$	Lowest Measureable Temperature in Nature $T_L = 7.539826897 \times 10^{-12}$ $E_L = \hbar = K_B \cdot T_L = \text{one quantum}$

### 5. UDP and the Anatomy of all Subatomic Particles

We have many perceived names and explanations for what we have been told to expect, observe and analyse, without being able to touch the reality, which actually resides at the ending point of the vision scientists have painted. My Theory states that the ending point of everything is the **UDP** itself. Our current understanding of Nature is full of mystery, simply because we have no accurate elemental vision from which we can even begin to assemble the pieces of the Nature puzzle. This fact makes it impossible to have any reasonable comprehension concerning larger spheres in Nature, let alone the Universe. This false state of security does not enhance our journey because it fails to touch the reality of "**Planck Length**" in Nature.

UDT provides an easy visualization to everything and can solve any mystery in the quantum world from beginning to end. UDT states that the ending point of everything is the **UDP** itself. In view of that, all known particles can be well explained, as we will demonstrate.

#### 5.1. Starting Point of Universe

Physically, it is easier said than done to give good reason for two balanced **UDP**'s popping up in definite amounts, grouped in two gigantic massive spheres similar to two black holes in the Permeable

Medium, whirling at Planck Frequency. As the smaller sphere was drawn by an attracting Force, it entered the second, making a partial mix and then started to combine, causing a huge pressure, and the repulsion expanded and pushed the outer part of the second sphere till it extended enough, totally enclosing the first sphere, and making an outer shell or cover that still exists at Planck Condition.

The second period of Universe formation was the quark age, when most of the **UDPs** at Planck Condition were converted to quarks and high frequency photons. These quarks have very high frequency and show low perceived charge. The current observed dark matter could have been left behind from this age and causes cosmic microwave background radiation (CMBR), and we will discuss this topic in my next paper. In general, the frequency of an outlet radiation from any object is inversely proportionate with its density.

The third period was the proton age, when-some of the dense quarks converted to protons and electrons, and the Universe expanded more and more, and photons had longer wavelengths.

The fourth period was the hydrogen age, when hydrogen formed, followed by helium and then the rest of the story for making other elements. This does not differ much from the current theories.

According to this brief overview for the stages of Universe formation, I will leave it to cosmologists to modify the incomplete Big-Bang theory. I am ready to share with them a well-built Theory based on the **UDT**.

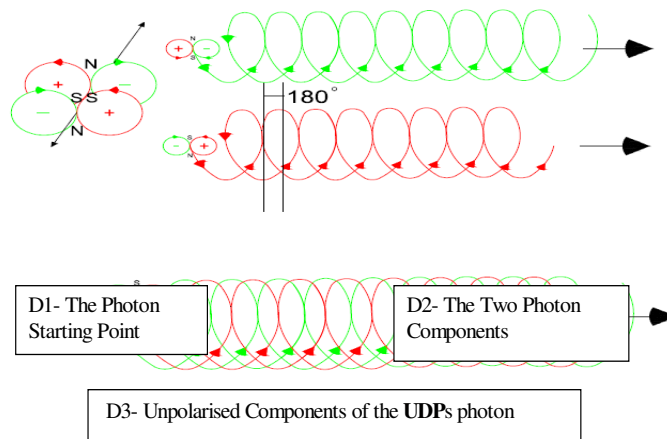
### 5.2. The Photon

No one, yet, has visualised the reality of the photon, which is without doubt the most mysterious thing. Even though we know much about it through mathematical theories, wide field applications and observations. **UDT** unlocks this secret of Nature when it confirms its duality as both a wave and a particle, made from two balanced **UDPs**.

Figure 9 illustrates the photon. At first, two **UDPs** at Planck Condition are released (D1- Photon Starting Point). The photon left its circular motion at Planck Condition and propagated in a straight line. Any propagating photon consists of two **UDPs** (D2- The Two Photon Components) of the same wavelength, moving helically at  $C_M$ , whereas their propagating speed is less than when in a strong electromagnetic potential, and it gains **Maxell Speed** at zero electromagnetic potential.

Indeed, there is 180 degrees span between these two **UDPs** of the same spin. Figure 9, D3 illustrates the two unpolarised components of the **UDPs** photon. By polarisation, we can extract one lone **UDP** that has the same wavelength.

**Figure 9:** Photon's origin at Planck Condition and its two UDPs



After unlocking the physical nature of the photon, we can study and analyse all kinds of interactions between the unbalanced **UDPs** (quarks and electrons) and photons, and between photons themselves such as reflection, refraction, diffraction, interference, superposition, absorption, dispersion and any specific based applications or observations.

We expect unlimited efforts in many directions of countless application will start soon after validation of this Theory, specifically after knowing the reality of the photon.

### 5.3. The Neutrino

Neutrinos are single **UDPs** that represent the final destiny of photons in Nature. Neutrinos have a low variable mass. Their Nature is of their high wavelengths and the variation of electromagnetic strength when their masses are measured.

When a photon of two balanced **UDPs** interacts with another balanced or unbalanced **UDP** in Nature, it normally decays to a single **UDP** that can be called neutrino. This explains the high number of neutrinos in Nature.

A neutrino has the same characteristics of a balanced-charge **UDP**, and doesn't show quantisation easily because of its high wavelength. The lowest possible mass of a neutrino is the lowest possible mass of **UDP**, which was shown above and equals:

$$M_L = 1.41688875 \cdot 10^{-50} \text{ Kg}$$

Neutrinos continuously find their way to black holes, or contribute to the Universe's expanding, Planck Condition outer shell. Indeed, the neutrino's job, after the Universe shell absorbs them, is to sustain rupture avoidance, which leads to the Universe collapse and the start of a new cycle.

My calculation for the longest possible wavelength in Nature may also describe the critical diameter of the Universe, above which the expansion of the Universe will reduce its shell thickness till it comes apart.

From previously notes, "the lowest possible values in Nature", the longest wavelength can be calculated from the corresponding frequency:

$$\text{Lowest Frequency } (\omega) = 1.884955593 \cdot 10^{-26}$$

This value corresponds exactly:

$$\text{Longest Wavelength} = 1.618033989 \cdot 10^{34} \text{ metre}$$

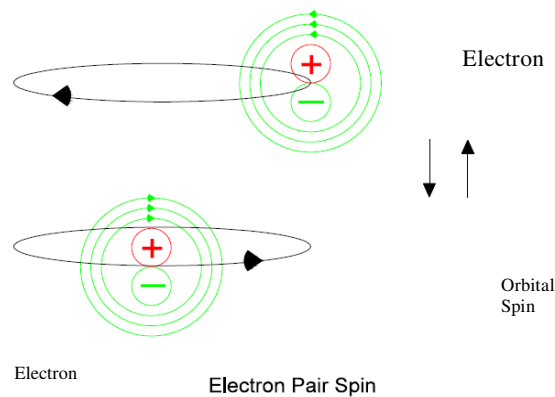
And this is considered to be the Universe's critical diameter.

### 5.4. Quarks and Electron

Outside their permanent place of high disturbances inside protons and neutrons, the quarks will be transformed, decay to electrons, or to its anti-particle "positron" and, vice versa, the electron and positron can be reversed to quarks in high acceleration (disturbance) regions.

**UDT** states there is a possibility of making protons when we accelerate positrons and then collide them with an accelerated electron in the presence of high frequency photons. In this collision we should note that the positron to electron ratio should be 2:1, and the case will be reversed when we would like to create the anti-proton particle.

**Figure 8:** Electron-Electron Pair Attraction





In Figure 8, the electron pair consists of two electrons of different spins, creating an internal attraction Force between the two electrons due to the opposed electric disturbance. The spin angle between the two electrons is  $\pi / 2$  and consistently maintains the same attraction Force at all times. Sustaining the same wavelength of the pair stands behind making covalent or ionic chemical bonds. In metals, the delocalised (or free) electrons are bonding with the positive ions in layers of the metal atoms. The flexible metallic bond is caused by the nature of the attraction Force between electron and positive electric disturbances (ions). This kind of partial freedom for the electrons of a conductor allows the motion of electrons when the conductor exists in an electric disturbance gradient (voltage), meantime providing reasonable definition to the electric current that is, as a rule, considered to be the flow of positive charge directed from plus to minus. In reality, when an electron moves, it shows less charge, which means that there will be real positive potential (charge) flow opposed to the electron motion.

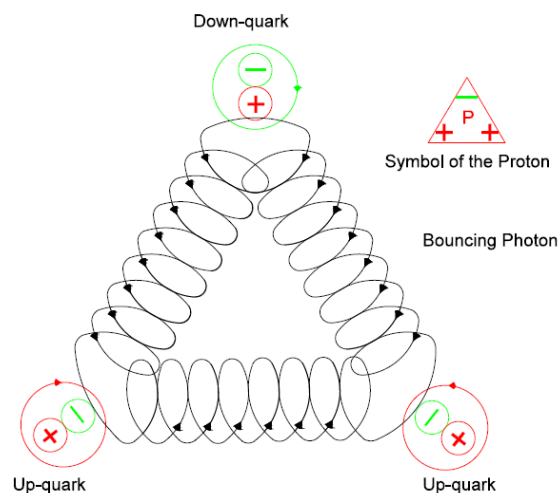
What is neither shown in Figure 4 nor in Figure 8 is that the Nature of the unbalanced electric disturbance has an uneven distribution around the **UDP** on the positive sphere. This uneven region of disturbance causes, beside the local helical motion, a dense disturbance region that plays a major role in both the pair attraction and in the migration of free electrons to the metal's surface when there is an electric current present. This uneven disturbance also explains why charging a spherical surface with electrons demonstrates a uniform electron distribution and the charge seems to have a radiating effect.

The chance of attraction between two free electrons is very low due the nature of its uneven electric disturbance's distribution, contrarily, the repulsion governs the situation between free electrons. The attraction between two electrons requires a uniform opposing spin, which is not available when two free electrons interact. Failing to make such attraction will obviously lead to repulsion.

## 5.5. The Proton

Inside the proton, two similar quarks (up quarks) demonstrate very strong attraction because of their uniform motion in differing spins, same as the electron pair that results in an augmented electric disturbance and are synergistically attracted with the down quark, which rotates in the same direction with the resultant electric disturbance of the two up quarks, as shown in Figure 9, and demonstrates the proton structure or anatomy.

**Figure 9: The Proton**



It is well known that the proton is the most stable composed particle, and it does not decay at all. **UDT** states there is a huge electromagnetic attraction Force among the three unbalanced **UDPs**, which comprise the proton. A very high frequency photon made from two **UDPs** of the same frequency bounce continuously to prevent the structure from collapsing due to the alternating attraction Force between these three quarks. This attraction Force between the two positive **UDP**'s (two up quarks) is

similar to the Force present when two electrons of different spins attract each other. The other attraction Force is between those positive **UDP**s resultant Forces and the negative one (down quark).

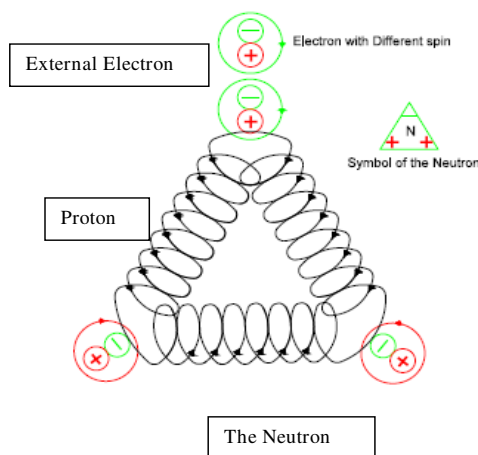
At the centre of the triangle shape, we can visualise a centre point of mass or gravity for the proton. Furthermore, the triangle arrangement of a proton's constituents and their non-stop, unvarying motion, give an apparent spherical nature to the proton's shape, though it's surface is not fully uniformly electromagnetic. When protons exist at higher electromagnetic fields, and as such at higher speeds, the electric charge or disturbance decreases, whereas the magnetic disturbance increases.

The strong nuclear Force is not, indeed, a Force differing from the electromagnetic. Accordingly, the theoretical physicists and scientists should re-evaluate their views about Nature's Forces and verify that **UDT** unifies all Forces in one.

## 5.6. The Neutron

Current theories suggest, mistakenly, that the neutron is made from one up-quark and two down-quarks whereas **UDT** states that the neutron is made from a proton and electron, as shown in Figure 10 below:

**Figure 10:** The Neutron Anatomy



An electron of high energy at the top of the drawing spins opposingly to the down quark, making a pair and is, meantime, interacting with an excess positive electric disturbance that results as a net positive charge, or uneven electric disturbance and then ceases.

**UDT**'s model easily explains the mistaken phrase "weak nuclear Force", first purposed by Italian physicist Enrico Fermi in 1934. The structure of **UDT** unlocks the secret of this "weak nuclear Force" and excludes it by unifying it with other Forces of Nature into one Force; the "Electromagnetic Force".

## 6. UDT and the Atomic Structure

Science uses an atom model proposed 100 years ago, and declares each atom is made up of protons, neutrons and electrons. All elements of atoms consist of empty space between the tiny nucleus that contains protons and neutrons and the electron shell, where the electrons spin around a nucleus.

The theoretical scientists' believe successive ionisation energies provide strong evidence for the presence of shells and the number of electrons in each shell, meantime quantum numbers are used to describe the electrons in atoms. A larger principal quantum number ( $n$ ) means the further the shell is from the nucleus, the higher energy level.

The science of today is based on Bohr model and quantum fundamentals that propose the trapped electrons in an atom are due to the electrostatic Force of attraction in the nucleus. Moving electrons about the nucleus is only allowed in "orbits" or "shells" surrounding the nucleus. An electron near the nucleus has less energy than an electron in a more distant shell. The major mistake of using

energy levels happened as a consequence of the reality there was no strong theory that could, at least, explain the reality of the claimed energy and mass. What we know about energy is very broad and based on some definitions and agreements we made. Moreover, and unfortunately, energy cannot be defined or seen as one independent concept; The most sad part seen in today's science is that we don't have a real definition for the mass concept, although we use it everywhere. **UDT** resolves these issues and it's time for a change.

**UDT** presents a totally different picture that will change the entire fundamental premise of our views for the atomic structure, and the positive impacts in physics, chemistry and the biosciences will be more than huge.

In this vein, I will put forward fundamentals that can be considered the stones or pillars for my perceptions of atomic structure. Meantime, I expect positive interactions and contributions from scientists and researchers, whose insights and revisions are critical for any success.

### 6.1. The General Picture of the Union-Dipole Atomic Structure

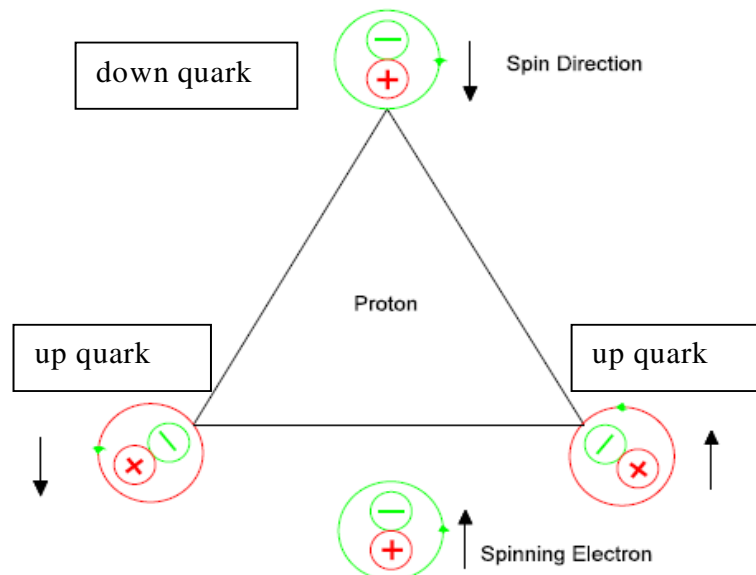
Union-Dipole Atomic Structure (**UDAS**) is based on the fact that electrons of the atom exist within or among protons and neutrons, excluding totally a tiny nucleus from the picture. That means **UDT** provides a different interpretation and explanation to the work of Ernest Rutherford in 1910, when he introduced his Atomic Theory, based on the concept of a central nucleus. Rutherford's Theory was expanded by the work of Niels Bohr in 1913, who added the concept of electrons orbiting in differing energy levels. **UDAS** will drastically change our perspective of chemistry because it presents a clear vision for not only the physical structure of each element in Nature, but is also a consistent foundation to interpret how each of these elements react with other elements. As a result of these clarities, the impacts will be enormous in the lives of everyone on this planet. It is possible to predict the full picture of any matter constituents entirely.

**UDAS** is firmly based on a comprehension of the anatomy of electron, quarks, photon, proton and neutron and their interactions electromagnetically as it is shown in this paper.

### 6.2. The Proton-Electron Interaction

The electron interacts with the proton as described in Figure 11

**Figure 11:** Proton- Electron Interaction

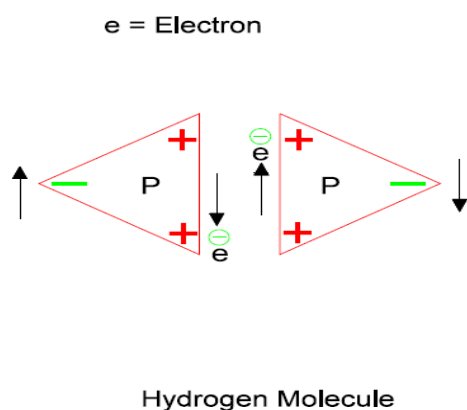


Proton - electron interaction is the foundation reaction in Nature for all kinds of elements and matter formation, and this fundamental interaction is indeed a hydrogen atom.

A strong negative electric disturbance of the electron interacts, or merges, with the opposed spin of the resultant positive electric disturbance of the proton. Although Figure 11 shows spin directions of the up and down quarks, these spins are, in fact, changing continuously so that the electron cannot become stable. On the contrary, this configuration is very active, and that's why finding a hydrogen mono atom in Nature is almost impossible.

Figure 12 shows the diatomic structure of a hydrogen molecule, where the two free electrons spin oppositely, powerfully linking the two atoms. Moreover, the magnetic field of each atom attracts the other, as does the electric field, with Gravity Force between the two atoms.

**Figure 12:** Diatomic Hydrogen Molecule

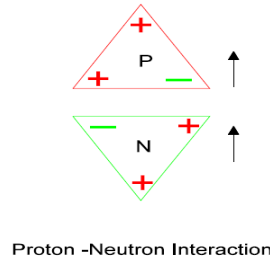


The electron pair bonds the two protons of the two atoms, as they exist in-between. This deterministic picture of a hydrogen atom and molecule is different from Bohr model and considered a basic component in **UDAS**. This arrangement between proton and proton inside the atom avoids any repulsion; on the contrary, it creates a strong attraction in the same manner as the electron pair. **UDT** easily moves us beyond any need for a Strong Nuclear Force to explain and overcome the electrostatic repulsion Force. On the other hand, **UDT** justifies that the situation can only be explained by a strong electromagnetic Force, or "Gravitational Force" if you would prefer.

You will see that most electrons in elements exist in pairs that are tying the protons and their positive potentials are dying away. Accordingly, a good electrical conductor, for example, has atoms where some of their in-between electrons are free, so they can convey current. In general, a good conductors' atoms show more free electrons that can achieve many other jobs, such as better heat conduction, more light reflection and certain other metallic properties. Nature shows no preference if all the electron pairs in Bohr model have a very partial job in the strong atomic structure and illustrates a fluffing agent mainly.

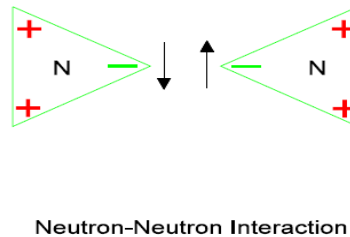
### 6.3. The Proton-Neutron Interaction

The other basic subatomic interaction that **UDAS** is based on is a proton - neutron coming together in such a union that it is the key reason for the extrapolating formation process of all elements and their isotopes coming from the hydrogen atom during the evolution of matter. As shown in Figure13, the electromagnetic interaction between proton and neutron is caused by the internal quark's position when (down quark plus) - (up quark minus) from proton side ties with (up quark minus) - (down quark plus) of the neutron side, such that a continuous attraction Force will be evolved. The other similar side of a proton has the same prospective to be tied with another neutron and lead to the isotope formation wherein stable isotopes have a higher number of neutrons than protons.

**Figure 13: Proton-Neutron Interaction**

#### 6.4. The Neutron-Neutron Interaction

Another important aspect of the **UDAS** perspective is the possible attraction effect between neutron - neutron, which comes from their hidden electrons appearing nearby the negative down quark side. This orientation is important to make the structure of an atom more stable.

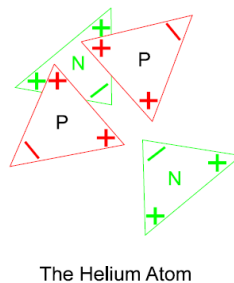
**Figure 14: Neutron- Neutron Interaction**

Studying elements' abundance on earth, air and moon, it will be an unfathomable help to have a clearer picture of elements and the possibility of creating highly demanded elements.

A major role of neutron - neutron structure is inside the helium atom, which is the starting point towards depicting all other elements.

#### 6.5. The Helium Atom

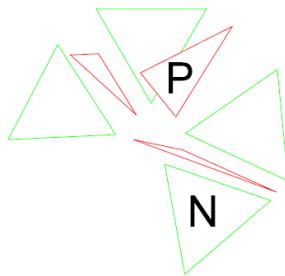
The satiable helium atom is made of two protons with two internal electrons, similar to a hydrogen molecule, and each proton is linked with a neutron. Moreover, the two protons are showing an attraction Force, such that the helium atom has not only the lowest neutral electromagnetic effect, but also the lowest boiling point.

**Figure 15: The Helium Atom**

Elements of minimal electromagnetic variance, such as Nobel Gases, also have a lower boiling point. The more abundant elements, which have a higher electromagnetic variance, can be studied in more depth to verify **UDAS** and also find an exact physical description of each atom in Nature.

## 6.6. The Lithium Atom

**Figure 16:** The Lithium Atom



## 6.7. The Other Elements

The atomic structure of every element can be predicted in a similar way to helium atom, where the nature of proton - proton couple, or pair via its accompanying electrons is the main key. The Nobel Elements that have a well distributed and connected protons via electrons similar to helium atom, although they have a higher number of protons and neutrons.

The most stable and strong attraction Force between proton pairs, via their related electron pairs, exists in Noble elements, where each noble element can be considered as a starting point or stage to show the physical nature of the elements between.

Making full description of each element in Nature is not only possible, but can be done within a short time, soon after the verification of this Theory.

Once all electrons of an atom are situated between protons, these elements are non-metals whereas in metals, some of these electrons exist outside the protons premises in a form of free electrons.

Making use of the great available chemical properties of an element will definitely help us to put proper emphasis on the atomic structure of that element.

I am fully opened to work with specialists to produce the atomic structure of elements.

## 7. Summary and Concluding Remarks

The driving force behind this ground-breaking Theory was a physical necessity to make scientific approaches and methodologies easier and better. Using my limited human mental capacity and the modern tools available, I have merged actual concepts of Nature and eliminated major failings of prior works. I am willing to hear others' critiques in any form at any level, meantime I believe that perfection is an ultimate impossibility.

Indisputable, valid Nature constants relations provide us with Planck units, and certainly represent the starting point of the Universe.

**UDT** is mainly based on the existence of the Aether, which I call the Permeable Medium, which has and allows a deterministic, ultimate disturbance around vacuumed spheres made of nothing visible.

Based on my postulates that defined well the shape of the only building block's dual particle, I soon found the Golden Ratio's secret of was hidden in this shape, and I was then able to corrected the **Planck Length**.

Union-Dipole Theory (**UDT**) presents the discovery of an eternal truth about the only building block in the Universe. This dual particle, or building block, is called the "Union-Dipole Particle", or **UDP**.

**UDP** is two empty spheres, containing nothing visible, surrounded by an ever-present Permeable Medium, which fills the entirety of space. The source, or cause of any perceived observation or understanding all events in Nature must be perceived as a direct result from any disturbance of the Permeable Medium.

At the starting point of our Universe, a certain number of **UDPs** popped up in the Permeable Medium, spinning opposingly around each other at Planck Frequency, which decreased after

expansion. The Universe has a Shell that is thinning and will rupture one day, causing an entire collapse of the Universe, such that Nature might start another cycle.

The opposing electrical disturbance around the two spheres of the **UDP** creates attraction between the two spheres, meantime creating another perpendicular magnetic disturbance. The resultant effect of the only two possible disturbances on the contact point between the two spheres causes a non-stop, helical motion of the two spheres at the **Maxwell Speed of Light**.

**UDPs** number in Nature is conserved, though the energy is defined as an amount of disturbance in a region or a system that can not be conserved.

**UDP** has lowest and highest perceived properties, that are limited by **Planck Constant** and **Planck Condition**.

Matter and dark matter are made from balanced and unbalanced **UDPs**, where balanced **UDPs**, such as photons, or neutrinos, propagate straightforward and the unbalanced particles, such as quarks and electrons, propagate locally in a closed loop, due to the uneven electrical disturbance around the **UDP**.

Mass, like other properties, is perceived and can be defined as a perceived property of **UDP**, existing in a certain disturbance.

Quantisation is at the heart of any observed change in Nature, and occurs when **UDP** is subjected to differing disturbances. One quantum of increase or decrease is equivalent to two spins around the spheres of the **UDP**, or one wavelength of its motion at **Maxwell Speed**.

One of the keys to my precise calculation for the only Constant in Nature is due to the shape of **UDP**, which contains and unlocks secrets of the Golden Ratio. The second key was my understanding of Time, and how a comprehension of related, uniform, motion appears in the **UDP**. Time cannot be, therefore, geometrical.

Anti-matter simply represents the case when unbalanced **UDP** has a reversed orientation; i.e. the positive sphere replaces the negative one.

The only real Constant in Nature is the corrected **Planck Length**, which is equal to **1.6180330989 10<sup>35</sup>** metre. With this Constant we can then find the second real Constant, which is **Maxwell Speed of Light** (**3.049922216 x 10<sup>8</sup>** metre per second), and there is a perfect symmetry to Nature.

Nature is exclusively composed from joined spheres made of nothing visible and a Permeable Medium that has an effective disturbance acting through quantisation.

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