

PHYSICS & SPACE SCIENCE

Anti-
Graphene

Gravity and
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Highlights

The
Principles of
the Universe

Unified Mass
Theory of
Fermions

Discovering Thoughts, Inventing Future

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The Principles of the Universe

By Changming Wang

Abstract- This paper presents a unified framework—the *Principles of Matter, Space, and Time*—to explain the structure and behaviour of the universe through the concept of hierarchical unities. It proposes that all matter possesses mass and energy, organizing itself into nested *unities* through the interplay of potential-energy (E_p), sharing-energy (E_s), and excess-energy (E_e). The paper introduces unity force ($F_u = E_s + E_e$) as a generalization of inertia, encompassing both inertia-at-rest (as gravity or weight) through E_s and inertia-in-motion (as motion or heat) through E_e . Within this framework, gravity emerges not as spacetime curvature but as matter's active pull toward its unity centre, and matter moves only relative to its unity centre, eliminating the need for external reference frames and relativity. The paper further proposes that space and time are not physical entities but properties of matter: space is not preexisting but emerges from matter's three-dimensional movements, eliminating the notion of vacuum, and time is a series of heat transfers rather than a physical dimension. Consequently, spacetime is only a mathematical construct without physical reality.

Keywords: *matter, mass, energy, unity, unity force, gravity, inertia, space, time, universe.*

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The Principles of the Universe

Changming Wang

Abstract- This paper presents a unified framework—the *Principles of Matter, Space, and Time*—to explain the structure and behaviour of the universe through the concept of hierarchical unities. It proposes that all matter possesses mass and energy, organizing itself into nested *unities* through the interplay of potential-energy (E_p), sharing-energy (E_s), and excess-energy (E_e). The paper introduces unity force ($F_u = E_s + E_e$) as a generalization of inertia, encompassing both inertia-at-rest (as gravity or weight) through E_s and inertia-in-motion (as motion or heat) through E_e . Within this framework, gravity emerges not as spacetime curvature but as matter's active pull toward its unity centre, and matter moves only relative to its unity centre, eliminating the need for external reference frames and relativity. The paper further proposes that space and time are not physical entities but properties of matter: space is not preexisting but emerges from matter's three-dimensional movements, eliminating the notion of vacuum, and time is a series of heat transfers rather than a physical dimension. Consequently, spacetime is only a mathematical construct without physical reality. The paper argues that these principles govern atomic structure, planetary motion, galactic organization, and black hole formation, that the universe comprises only matter and its movements in three dimensions, experiences heat transfers, resulting in its evolution and revolution.

Keywords: matter, mass, energy, unity, unity force, gravity, inertia, space, time, universe.

I. INTRODUCTION

The universe is simple and beautiful, with simple and beautiful principles of matter, space, and time.

The universe comprises billions of beautiful galaxies. Each galaxy is centred on at least one black hole, circled with star systems. Each star system is centred on a beautiful star, circled with planets. Each planet is also the centre of its moons or rocks. The universe is hierarchically organized.^{[1][2][4]}

The hierarchical units are called unities (defined further in the *Principles of Matter*).

Inside the centre of stars and planets (nuclear fusion centres), unity force (also defined in the *Principles of Matter*) creates atomic nuclei, comprising each proton circled with a neutrino or an electron.^{[1][2][3][4][5]}

When moved out of the nuclear fusion centres, each created atomic nucleus becomes the centre of an atom, circled with electron unities. Each of the electron unity is centred on the electron, circled with a photon.^{[1][2][3][4][5]}

Therefore, the universe comprises nested unities.

In his first law of motion, Isaac Newton described inertia as the natural tendency of objects in motion to remain in motion and objects at rest to remain at rest, unless a force causes the velocity to change.^[6]

So, Newton had realised that inertia has two states: inertia at rest and inertia in motion, although their causes were unknown.

Through the following *Principles of Matter, Space and Time*, this paper explains inertia and the universe the way it is.

II. THE PRINCIPLES OF MATTER

Here are the Principles of Matter or Laws of Unity, updated from my original version:^{[1][2][3][4][5]}

1. *Matter* is any substance that has *mass* (m) and *energy*. Mass and energy are properties of matter, not physical entities. Matter's energy is scalar, not vector.
2. Matter shows its energy as *forces*. A *force* is a measurable vector that transfers energy.
3. Matter organises itself into hierarchical units, called *unities*, through its energies: matter retains its *potential-energy* (E_p) and *sharing-energy* (E_s) within a *unity* as a *unity member*, until it becomes a *free particle* with sufficient *excess-energy* ($E_e \geq E_s$) from external excess-energy (see *Figure 1: Matter*).

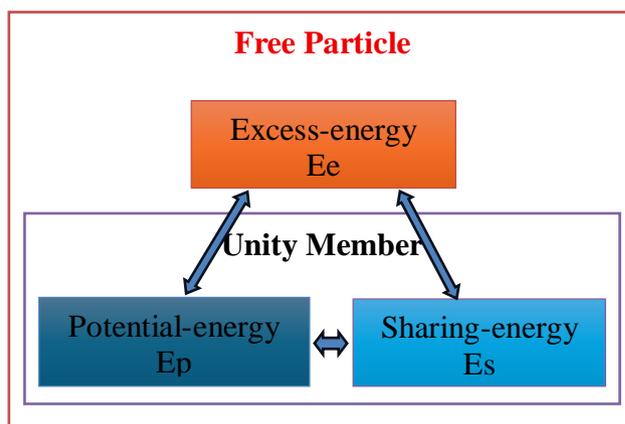


Figure 1: Matter

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4. Matter forms and maintains unity with its *unity force* or *inertia*:

$$F_u = E_s + E_e,$$

where E_s causes an active and constant pull, as *inertia-at-rest* or *gravity* (F) or *weight* (W), towards the unity centre ($E_s = F = W$); and E_e produces *inertia-in-motion* or *heat*, away from the external excess-energy.

4.1. Matter oscillates away with the excess-energy ($E_e \geq E_s$) as a free particle, transferring the E_e as inertia-in-motion or heat ($E_e \rightarrow E_e \rightarrow 0$)—such as light waves if the particle is a photon or a neutrino, or electron waves with magnetic effects if the particle is an electron—until returning or joining a unity ($E_e = 0$).

4.2. In the unity, $E_e = 0$, leaving only E_s in its unity force, matter orbits or gravitates to the unity centre, like an electron orbiting an atomic nucleus or a planet orbiting a star, showing as inertia-at-rest or gravity (F) or weight (W): $F_u = E_s = F = W$.

5. Matter does not show its potential-energy but converts its potential-energy between its sharing-energy and excess-energy (As shown in *Figure 1: Matter*). For example, when going up in an airplane, our weight is decreasing while our potential-energy is increasing ($E_s \rightarrow E_p$). At the same time, the plane's external excess-energy also increases our potential-energy ($E_e \rightarrow E_p$). When going even higher in a spacecraft, we become "weightless" (weighing less). When landing on the Moon or Earth, our potential-energy is decreasing while our weight is increasing ($E_p \rightarrow E_s$).
6. Breaking free a member with E_s from a unity requires sufficient external excess-energy ($E_e \geq E_s$), causing inertia-in-motions and heat transfers ($E_e \rightarrow E_e$), leading to new unities. The more energy is shared ($E_p \rightarrow E_s$, such as in a nuclear fusion), the tighter the formed unity (such as the produced nucleus unity), the more external excess-energy is required to break the unity, and vice versa (such as in beta decay).

Therefore:

1. Gravity or weight or inertia-at-rest is redefined as matter's active and constant pull towards its unity centre due to its sharing-energy.
2. Inertia is redefined and generalised as the unity force resulting from both sharing-energy (as inertia-at-rest or gravity or weight) and excess-energy (as inertia-in-motion or heat).

3. Matter moves relative to its unity centre, as its reference point, nullifying the base of the observational reference frame^[7] and relativity.

4. The Principles of Matter or Laws of Unity is governed by matter's unity force or inertia:

$$F_u = E_s + E_e, \text{ where,}$$

$E_s = F = W = mg$, where m is the mass of the matter, g is the acceleration by the E_s or F or W ,

$E_e = ma$, where m is the mass of the matter, a is the acceleration by the E_e .

Hence,

$F_u = mg + ma = m(g + a)$, cycling through the following states:

$a = 0$ (the matter is in its unity),

$a \geq g$ (the matter is out of the unity),

$a \rightarrow 0$ (the matter is returning or joining a unity).

III. THE PRINCIPLES OF SPACE

1. Matter moves in three dimensions, to form and maintain unity by its unity force: $F_u = E_s + E_e$, where E_s causes orbits or gravitation (or inertia-at-rest or weight) towards the unity centre; and E_e produces inertia-in-motion or heat away from the external excess-energy.
2. *Space* is the three dimensions of matter and its movements.
3. Matter's space is three-dimensional only.

Therefore:

1. Space is not preexisting. Space is wherever matter moves.
2. No vacuum exists in space. Matter shows its E_s as an active and constant pull towards its unity centre mediated or transferred by any member in between and shows its E_e as a direct push to other matter away from the external excess-energy.
3. In physics, mathematics is a necessary tool, can use more or fewer dimensions, but must conclude matter's three dimensions.

IV. THE PRINCIPLES OF TIME

1. A **time** is an event in which a free particle (as heat) bumps into a unity, transferring the heat.
2. *Time* is a series of heat transfers.

Therefore:

1. Matter experiences its own time, with or without changes in its composition or configuration due to the heat transfers.
2. A timer is matter or a device that experiences heat transfers regularly. For example:

- A clock or a watch experiences a heat transfer every second, or in a shorter interval.
 - Each part of the Earth experiences photonic heat from the sun regularly. Although the sun is transferring photonic heat all the time, the rotation and revolution of Earth make the Sun-Earth group a perfect timer, resulting in year, season, month, day, night, hour, to the divisions of a second.
3. Timers produce standardised time. We use timing systems based on timers to quantify and control heat transfers (as time), including photonic heat and electronic heat in lights and computers, plus atomic and molecular heat in engines and living organisms.
 4. As a series of heat transfers, time is accumulative, so that it only moves forward. For example, matter can move back to its original (old) position, while adding a new event of heat transfer (a time).
 5. Since it cannot move backward, time is not a dimension, as a dimension requires moving forward and backward (bi-directional movements).
 6. Spacetime^[8] is proposed as a mathematical model that combines the three dimensions of space and the one dimension of time into a single four-dimensional continuum. Since time is not a dimension, spacetime can only be a mathematical construct, not a physical reality.

V. CONCLUSION

1. Matter is any substance with mass and energy.
2. Matter organises itself into hierarchical units, called *unities*, through its energies: matter retains its *potential-energy* (E_p) and *sharing-energy* (E_s) within a *unity* as a *unity member*, until it becomes a *free particle* with sufficient *excess-energy* ($E_e \geq E_s$) from external excess-energy.
3. Matter forms and maintains unity with its *unity force* or *inertia*: $F_u = E_s + E_e$, where E_s causes an active and constant pull, as *inertia-at-rest* or *gravity* (F) or *weight* (W) towards the unity centre; and E_e produces *inertia-in-motion* or *heat* away from the external excess-energy.
4. That is, gravity or weight or inertia-at-rest is redefined as matter's active and constant pull towards its unity centre due to its sharing-energy.
5. Inertia is redefined and generalised as the unity force resulting from both sharing-energy (as inertia-at-rest or gravity or weight) and excess-energy (as inertia-in-motion or heat).
6. Matter converts its potential-energy between its sharing-energy and excess-energy; until and unless in a black hole, where matter converts its potential-energy completely into sharing-energy $E_p \rightarrow E_s$, so that $E_p = 0$, and sharing-energy becomes infinity: $E_s = W = F \rightarrow \infty$, producing infinite pull towards the centre, making the black hole into a physical singularity.^{[1][2]}
7. Matter moves relative to its unity centre, as its reference point, nullifying the base of the observational reference frame^[7] and relativity.
8. Matter moves to form and maintain unity by its unity force, in three dimensions.
9. *Space* is the three dimensions of matter and its movements.
10. Space is not preexisting.
11. No vacuum exists in space. Matter shows its E_s as an active and constant pull towards its unity centre mediated or transferred by any member in between and shows its E_e as a direct push to other matter away from the external excess-energy.
12. A **time** is an event in which a free particle (as heat) bumps into a unity, transferring the heat.
13. *Time* is a series of heat transfers.
14. Matter experiences its own time, with or without changes in its composition or configuration due to the heat transfers.
15. A timer is matter or a device that experiences heat transfers regularly. For example, the Sun-Earth group is a perfect timer, in which each part of the Earth experiences photonic heat from the sun regularly, resulting in year, season, month, day, night, hour, to the divisions of a second.
16. Timers produce standardised time. We use timing systems based on timers to quantify and control heat transfers (as time), including photonic heat and electronic heat in lights and computers, plus atomic and molecular heat in engines and living organisms.
17. As a series of heat transfers, time is accumulative, so that it only moves forward, not backward. As a dimension requires moving forward and backward (bi-directional movements), time is not a dimension.
18. As time is not a dimension, spacetime^[8] can only be a mathematical construct, not a physical reality.
19. Space and time are properties of matter, not physical entities.
20. The universe comprises only matter and its movements in three dimensions, experiences heat transfers, resulting in its evolution and revolution.

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Unraveling Phenomenological Misconceptions and Magnetism

By Stanislav Ordin

Russian Academy of Sciences

Abstract- A phenomenologically correct formulation of the problem is more than half the solution, since the resulting solution provides a rigorous description of the observed effects in the first approximation. Meanwhile, many modern theories describe basic effects using crude multiparameter models with corrections for the Landau smallness parameter. This is most clearly demonstrated in the purely relativistic effect of magnetism, which, it was assumed, is determined by a linear dependence on the charge velocity and, as a result, the description of which contains many phenomenological errors. This led not to an UNDERSTANDING of magnetism, but only to its formal mathematization, carried out in a non-rigorous manner. This led to the mathematical Physicists, without a proper analysis of the classical description of magnetism, "concluded" its quantum nature. Thus, by formally using Euler's equations without a proper physical analysis, magnetism was incorporated into Maxwell's equations. The resulting errors in its description were extended into both the Theory of Relativity and Quantum Mechanics itself.

Keywords: *contradictions and gaps in particular phenomenologies, orthogonal forces, imagination and reality.*

GJSFR-A Classification: LCC Code: QC760, 537.6, 78A25



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Unraveling Phenomenological Misconceptions and Magnetism

Stanislav Ordin

Abstract- A phenomenologically correct formulation of the problem is more than half the solution, since the resulting solution provides a rigorous description of the observed effects in the first approximation. Meanwhile, many modern theories describe basic effects using crude multiparameter models with corrections for the Landau smallness parameter. This is most clearly demonstrated in the purely relativistic effect of magnetism, which, it was assumed, is determined by a linear dependence on the charge velocity and, as a result, the description of which contains many phenomenological errors. This led not to an UNDERSTANDING of magnetism, but only to its formal mathematization, carried out in a non-rigorous manner. This led to the mathematical Physicists, without a proper analysis of the classical description of magnetism, "concluded" its quantum nature. Thus, by formally using Euler's equations without a proper physical analysis, magnetism was incorporated into Maxwell's equations. The resulting errors in its description were extended into both the Theory of Relativity and Quantum Mechanics itself.

Keywords: contradictions and gaps in particular phenomenologies, orthogonal forces, imagination and reality.

I. EPIGRAPH

"It is very difficult to look for a black cat in a dark room when there is no cat there."

Confucius.

Archimedes said: "Give me a Fulcrum, and I will move the whole world." But he didn't say he needed a rope strong enough to support the weight of the entire world. And such a "Rope" is the quintessence of human thought—Science. But a strong rope is woven from strong, solid threads, not from tangled felt. After all, a searchlight with a conventional incandescent lamp can only scan and diagnose objects a few kilometers away with "entangled" photons, whereas a laser beam "woven" from coherent, rather than entangled, photons has made it possible to diagnose—receive a reflected signal—from a corner reflector on the Moon. And this is only from Earth, whose atmosphere explodes when the beam is refocused.

But Science, by translating Mysticism and Miracles into a logically consistent Description of Effects, if it isn't itself lost, illuminates not just the cobblestones under the wheels on the road, but the Path to the Future!

But now Science itself is CONFUSED. Fragmentary, disjointed Descriptions of various Physical Effects, natural at the initial stage of Science's development, cannot serve as a "searchlight" into the Future. Moreover, the accumulation of contradictions in particular Descriptions results in Fundamental Problems. And the correct formulation of a Physical Problem is difficult and often takes much more time than the time it takes to present the found Solution to the Problem. And as I've noted many times, at the current intensive stage of scientific development, artisanal researchers usually don't bother with Fundamental Problems, but focus on Local Regularities, which are not INVARIANT and often contradict Fundamental Laws. Moreover, the NORMAL chain of Fundamental Science-Applied Science-Technology-Money has undergone an inversion, and Fundamental Science has found itself on the sidelines, acting as a backdrop.

So Fundamental Science survives by feigning gigantomania, such as the construction of the Large Hadron Collider and pompous statements like "humanity lacks 42 orders of magnitude in energy to test my theory." Even the accomplished theorist Richard Feynman stooped so low as to classify only Elementary Particle Physics as Fundamental Science. True, he wrote a book, "The Character of Physical Laws," as if to justify this. But "prominent" theorists tried to ignore it in order to continue constructing schizophrenic models mindlessly, unconcerned about their contradictions with the Basic Principles.

But without a Unified Phenomenology built on the foundation of Fundamental Laws and INVARIANTS, Physics, Production, Science in general, and Society as a whole found themselves like a traveler lost in a dense forest without a map. Wandering in search of Truth, sometimes in circles, led to a number of fundamental errors in the description of Nature and to the disunity of the phenomenologies of different sciences. And not only to the Aristotelian division into Physics and Non-Physics. Even in such strict Sciences as Mathematics and Physics, the disunity of Phenomenologies occurred even in their different sections (Fig. 1).

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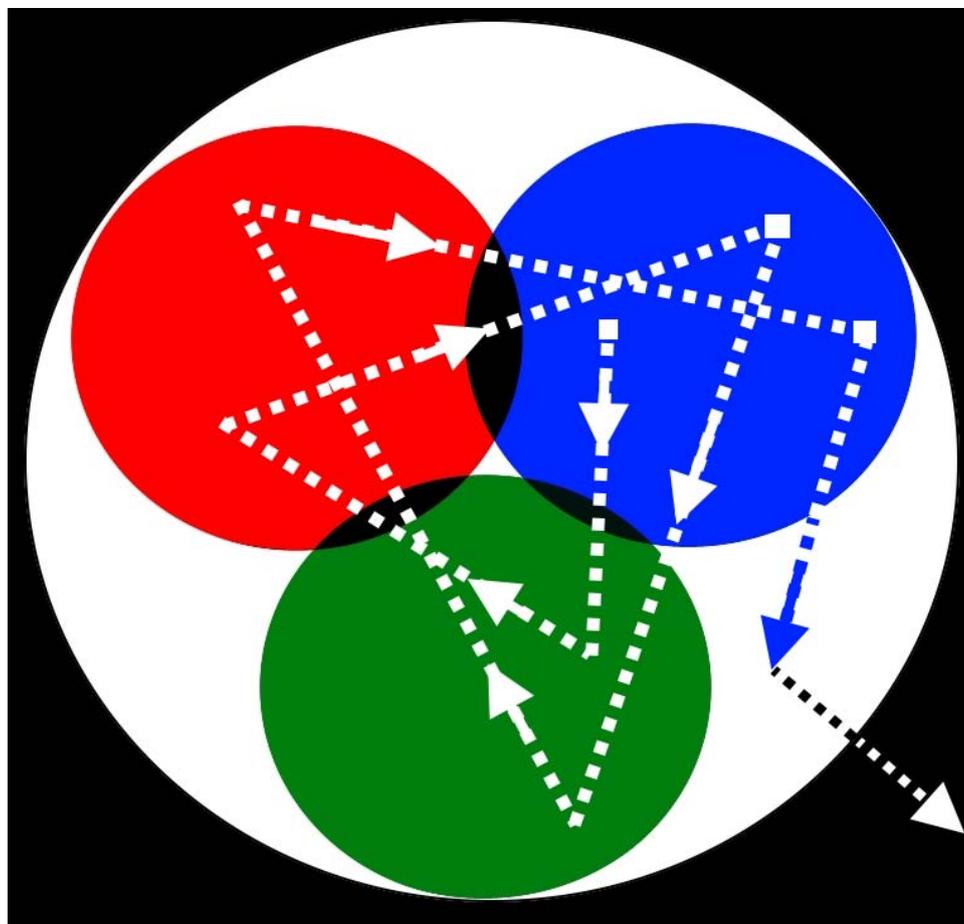


Fig. 1: Schematic representation in the form of colored circles of different Phenomenologies used to describe the Unified Phenomenology of Nature: intersections-contradictions are the dark fragments of the circles, phenomenological gaps are the white areas of the drawing, dotted lines are theories based on particular phenomenologies, the surrounding darkness is miracles and mysticism, filled, under the guise of Theories, by schizophrenic fantasies.

Furthermore, within the single-color phenomenological disks shown in Fig. 1 there are also partially overlapping "sub-disks," so that the single-color disks themselves are in reality pockmarked and riddled with holes like a sieve, and the theories—the dotted lines within each disk—are not straight lines at all, but rather noise tracks. And the Particular Phenomenologies themselves are not circles, but rather diverse fragments in a kaleidoscope.

So, a complete modern phenomenological Description of Nature is more accurately depicted as a multicolored kaleidoscope with Particular Theories bouncing across its tiny fragments. Such an Eclectic Picture even has a symmetry that doesn't correspond to Nature, but rather to the shape of the fragments. Ultimately, instead of a Unified Description of Nature, we have intricate images reflecting the struggle between Chaos and Harmony in human Consciousness (Fig. 2).



Fig. 2: The random superposition of random kaleidoscope images gives only the illusion of “seeing” a Unified Picture of patterns in Nature

Thus, canonized, outdated Concepts imposed a Taboo on their elimination by professional scientists, and the "elimination" of the resulting "paradoxes" was shifted to amateurs.

But, paradoxically, a Taboo does not apply to the continuation of Particular Theories built on the basis of canonized Phenomenology, without expanding its generalization (into the white area of Fig. 1). Such Theories are already schizophrenic in themselves. But the Results obtained on their basis are used and perceived only because they follow (mindlessly) from the Formula, as "New" Concepts. And from such schizophrenic "Cubes" modern nonsense is constructed, whether in Cosmology or in the "Quantum" microcosm.

The crisis of Fundamental Science has reached such a degree that its various branches are now spoken of as distinct, independent worlds. This is how it is portrayed, both as an independent Classical Picture of the World, and as an independent Quantum Picture of the World, and also as an independent Picture of the World of Relativity. But Nature is ONE, and these "different" Pictures are nothing more than Theories attempting to describe one side of the Unified Physical Picture of the World. And there are also dozens of "Alternative Concepts" unrecognized by official science, one of which, "New Physics," already fills dozens of volumes.

But contrasting them with each other is as different as contrasting the Theory of Numbers and Sets with Differential and Integral Calculus in Mathematics.

And if we continue this contrast, we can contrast Physics with Mathematics, and Biology with Life and Medicine.

Consequently, we are now witnessing Conceptual Madness in theories. Meanwhile, theories have become mere decoration, while in practice, bare empiricism is used.

And I, having initially trained as a mathematician, personally experienced this, encountering the phenomenological problems in thermoelectricity, which even the highly-educated artisans of science no longer considered science – simply the rules for calculating thermoelectric devices, written by Ioffe and now immutable. I discovered them 40 years ago [1], but it took decades of precision experiments and scrupulous analysis to break down the wall erected by the classics between the associated effects and which artisans still rely on. Thus, thermoelectricity, from the time of the classic works of Onsager [2] and Ioffe [3] to the present day, uses in its phenomenology a pair of canonical forces: electrical – determined by the potential gradient and thermal – determined by the temperature gradient. And Thermoemission, which arose from Thermoelectricity based on the pioneering work of Andrei Ivanovich Anselm "Vacuum Thermolement" [4], phenomenologically departed from the pair of canonical thermodynamic Forces used in Thermoelectricity and uses its own Forces in its theories and calculations: Thermal - entropy production and Concentration -

concentration gradient [5]. The theory of the p-n junction [6] was generally built on a third pair of phenomenological Forces: Electrical and Concentration. So, when a transistor operates, the temperature gradients arising in it are not taken into account in the theory. This determined the limitations of all three of these "special" Theories, revealed during the analysis of contact phenomena. And the unification of these three Phenomenologies made it possible to go beyond the description of only diffuse processes [7, 8, 9] and describe the Physics of the Missing Scale, between Macroscopics and Quantum Theory - to describe NANO-Effects [10]. Other Phenomenological Fallacies exist and even regularly emerge in Solid State Physics, which have repeatedly led speculative scientists astray. As, most recently, with the same "Graphene," graphenologists used the concept of inert gases at ultra-low temperatures to describe refractory, heat-resistant graphite [11, 12]. Phenomenological Fallacies have also led Medicine, which is entirely built on the MEMORIZATION of Particular Laws, into the beautiful, but distant world of programming [13]. There is no Unified Functional Description of the Organism.

Whereas everything hinges on EVIDENCE. And without EVIDENCE, everything, including the officially recognized sections of Science, are nothing more than speculative fantasies that misrepresent Reality.

Numerous Phenomenological Fallacies have also entered into Modern Quantum Theory. Schrödinger's mathematical random walks on the Complex Plane, without understanding the MEANING of Imagination [14-19], led theoretical physicists to the conclusion that Modern Quantum Theory has resulted in a set of incoherent, schizophrenic fantasies, divorced from Reality, and in demand mainly by the tabloid press. After combing through the FOUNDATIONS of Quantization [20] – returning it to the Planck-Einstein Principles, I planned to quickly comb through the Foundations of the Theory of Relativity. But I discovered that its phenomenological wanderings are not at all a consequence of the Quantum Fallacies noted in my book, but a consequence of UNCERTAINTIES in the DEFINITION of Magnetism (which, naturally, also entered into Quantization). Thus, it turned out that the Magnetic Field, widely used in practice, does not even have a correct Definition. So, the REDEFINITION of the Magnetic Field itself has already resulted in a series of articles [21-23]. And this article on Magnetism is its continuation, but not the last. And yet, at present, Magnetic Force has found wide application, from effective microelements for storing information in hard drives to giant solenoids in Tokamaks, at the LHC. And in magnetic levitation trains. But in practice, they often encounter insurmountable "theoretical" Limitations and use purely Empirical Laws. And this is because in UNDERSTANDING Magnetic Force, Physics has still not advanced far from the mystical Force of the Tao

introduced by the ancient Chinese – it simply hides this MISUNDERSTANDING behind mathematical formulas and Quantization. [24]. As I've already mentioned, we're currently in an Intensive Stage of Scientific Development, and without Artificial Intelligence (AI), even mentally grasping the entire flow of scientific information has become extremely difficult, much less analyzing it deeply. But AI is fundamentally no solution, as "DIGITAL" only allows for approximate analog information processing, while "DEAD DIGITAL" fundamentally cannot go beyond the common knowledge. And whether modern humans will be able to teach AI CREATIVITY is unlikely. Moreover, as Elon Musk's Glokopedia, built with the help of Artificial Intelligence, shows, the center of gravity of AI "creativity" lies in the past, not in the groundbreaking pioneering works published in Open Access using Phenomenologies built on Fundamental Laws. Moreover, after looking through the "Magnetism" section of Glokopedia, I saw that the only additional "benefit" of AI so far is that it has dispassionately demonstrated that the canonized descriptions and theories of Magnetism by humans merely demonstrate "How to Think WRONG"[25-28]. Meanwhile, real mathematicians themselves have concluded that the crisis of Theoretical Physics stems from Mathematics itself, which has, by and large, departed from Geometry. Thus, Mathematics itself has become focused on the manipulation of Abstract Terms through formulas, and Mathematical Physics has evolved solely from this branch of Mathematics.

II. CONCLUSION

To further construct the Description of the Magnetic Field and correct the equations hastily copied by Maxwell from Heaviside, the senior telegraph operator, required a more careful analysis of the Relativity of Ampere's Law, as presented in the previous article. Laplace, with his Laplacian, which "came to hand" in Magnetism, proved to be simply a lucky find for introducing a formal abstract Mathematics without a deep UNDERSTANDING of the effects discovered. Phenomenologically, the situation in Magnetism is similar to that in Quantum Mechanics, where formal Vector Spaces and Matrices stretched the Imaginary Solutions of the Schrödinger Equation onto the Real, in which the physical Orthogonal (i.e., Imaginary) Term, determined by the Magnetic Field (i.e., Relativity), was omitted [29].

Phenomenology is nothing more than a CORRECT Description of an Effect, used to construct its Mathematics of First Approximation, i.e., a minimal set of equations that provide a CORRECT Description of Basic Experiments. In this regard, strictly speaking, there is no Phenomenology of Magnetism to date. It is a crude attempt to force the various manifestations of

Magnetism into a set of abstract formulas. Tellingly, when Hertz, during his demonstration of the transmission of electromagnetic oscillations over a distance, was asked to explain how electromagnetic waves are formed and behave, he replied, "Ask Maxwell for an explanation." But the problem is that Maxwell's canonized equations CORRECTLY (in first approximation) do not even describe the simplest (single) electromagnetic wave. In practice, even the simplest electromagnetic devices are calculated using empirical laws and introducing a host of adjustable parameters into the "Theory" of Magnetism. This theory, as shown in my previous works, was itself initially based on the Coulomb and Ampère equations, which ignore relativism.

But without a deeper UNDERSTANDING of Magnetism, the already achieved limits in both the generation and use of a Magnetic Field cannot be improved. Nor can a consistent and universally CLEAR Electrodynamics, Quantum Mechanics, and Theory of Relativity be constructed. To construct a Unified, consistent Phenomenology of Magnetism, we must start from the very beginning. Moreover, in addition to the previously identified fundamental contradictions in the Fundamentals of Magnetism, there is another fundamental assumption, included in the definition of the Lorentz Force: that the Ampère and Oersted Forces are equal in magnitude!

For a virtually new construction of the Phenomenology of Magnetism, the Real Connection of these Forces will be analyzed in future work.

But for a Complete Definition of the Magnetic Field it is necessary to eliminate the CONTRADICTION with the Curie theorem, which prohibits in principle its EXISTENCE.

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Gravity and Inertia

By Changming Wang

Abstract- This paper proposes the *Principles of Matter* or *Laws of Unity* as a unified framework for understanding gravity, inertia, and the formation of physical structures across all scales. In this model, matter organises into hierarchical unities through two intrinsic forms of energy: sharing-energy (E_s) and excess-energy (E_e). Together they cause the generalised inertia or unity force ($F_u = E_s + E_e$), in which E_s causes an active and constant pull toward a unity centre as inertia-at-rest or gravity or weight, and E_e produces inertia-in-motion or heat. This approach challenges the foundations of relativity by asserting that matter moves only relative to its unity centre. The paper applies the Principles of Matter to atomic structure, electricity, photonic behaviour, nuclear fusion, planetary motion, and galactic organisation, arguing that unity force or inertia is the single fundamental force underlying all natural forces. The model further explains galaxies as ultimate unities centred on black holes in which potential-energy fully converts to sharing-energy, producing infinite pull. A measurement method—the Breaking-point Excess-energy Method—is proposed to quantify inertia-at-rest (gravity) based on the minimum energy required to break a unity, with an optional empirical mass–distance equation for estimation. Overall, the Principles of Matter provide a cohesive reinterpretation of natural forces, energy transfer, and cosmic structure formation.

Keywords: *gravity, inertia, unity, unity force, weight, heat, electromagnetism, nuclear fusion, black hole, galaxy.*

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Abstract—This paper proposes the *Principles of Matter or Laws of Unity* as a unified framework for understanding gravity, inertia, and the formation of physical structures across all scales. In this model, matter organises into hierarchical unities through two intrinsic forms of energy: sharing-energy (E_s) and excess-energy (E_e). Together they cause the generalised inertia or unity force ($F_u = E_s + E_e$), in which E_s causes an active and constant pull toward a unity centre as inertia-at-rest or gravity or weight, and E_e produces inertia-in-motion or heat. This approach challenges the foundations of relativity by asserting that matter moves only relative to its unity centre. The paper applies the Principles of Matter to atomic structure, electricity, photonic behaviour, nuclear fusion, planetary motion, and galactic organisation, arguing that unity force or inertia is the single fundamental force underlying all natural forces. The model further explains galaxies as ultimate unities centred on black holes in which potential-energy fully converts to sharing-energy, producing infinite pull. A measurement method—the Breaking-point Excess-energy Method—is proposed to quantify inertia-at-rest (gravity) based on the minimum energy required to break a unity, with an optional empirical mass–distance equation for estimation. Overall, the Principles of Matter provide a cohesive reinterpretation of natural forces, energy transfer, and cosmic structure formation.

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I. INTRODUCTION

In 1666, Isaac Newton famously observed an apple falling from a tree, that inspired him to formulate the law of universal gravitation, which states that every particle attracts every other particle in the universe with a force F equal to G (the gravitational constant) multiplied by the product of the masses of the two particles (M_1 and M_2) and divided by the square of the distance R :

$$F = GM_1M_2/R^2,$$

where the gravitational force is also called gravity. But Newton acknowledged that how the force is propagated was unknown.^{[1][2]}

Then, in 1687, Isaac Newton published his three laws of motion. In the first law, Newton described inertia as the natural tendency of objects in motion to remain in motion and objects at rest to remain at rest, unless a force causes the velocity to change.^[3]

So, Newton had realised that inertia has two states: inertia at rest and inertia in motion. But the causes of them were also unknown.

More than two hundred years later, in 1915, Albert Einstein published the theory of general relativity, which explained gravity as a geometric spacetime curvature caused by mass and energy.^{[1][2]}

But three discrepancies in Einstein's theory exist:

1. Since it can only move forward and not backward, time is not a dimension, as a dimension requires moving forward and backward (bi-directional movements).
2. Spacetime^[4] is proposed as a mathematical model that combines the three dimensions of space and the one dimension of time into a single four-dimensional continuum. Since time is not a dimension, spacetime can only be a mathematical construct, not a physical reality.
3. The following *Principles of Matter* will nullify the base of the observational reference frame^[5] and relativity.

So, what causes the attraction between the apple and Earth? What causes gravity? And what causes inertia? The following *Principles of Matter* explains everything.

II. THE PRINCIPLES OF MATTER

Here are the Principles of Matter or Laws of Unity, updated from my original version:^{[6][7][8][9][10]}

1. *Matter* is any substance that has *mass* (m) and *energy*. Mass and energy are properties of matter, not physical entities. Matter's energy is scalar, not vector.
2. Matter shows its energy as *forces*. A *force* is a measurable vector that transfers energy.
3. Matter organises itself into hierarchical units, called *unities*, through its energies: matter retains its *potential-energy* (E_p) and *sharing-energy* (E_s) within a *unity* as a *unity member*, until it becomes a *free particle* with sufficient *excess-energy* ($E_e \geq E_s$) from external excess-energy (see *Figure 1: Matter*).

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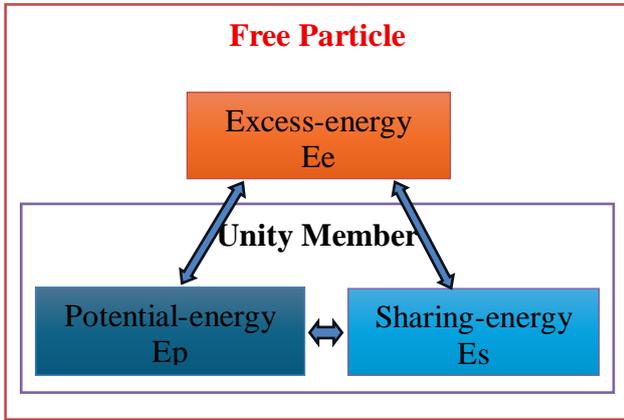


Figure 1: Matter

4. Matter forms and maintains unity with its *unity force* or *inertia*:

$$F_u = E_s + E_e,$$

where E_s causes an active and constant pull, as *inertia-at-rest* or *gravity* (F) or *weight* (W), towards the unity centre ($E_s = F = W$); and E_e produces *inertia-in-motion* or *heat*, away from the external excess-energy.

- 4.1. Matter oscillates away with the excess-energy ($E_e \geq E_s$) as a free particle, transferring the E_e as inertia-in-motion or heat ($E_e \rightarrow E_e \rightarrow 0$)—such as light waves if the particle is a photon or a neutrino, or electron waves with magnetic effects if the particle is an electron—until returning or joining a unity ($E_e = 0$).
- 4.2. In the unity, $E_e = 0$, leaving only E_s in its unity force, matter orbits or gravitates to the unity centre, like an electron orbiting an atomic nucleus or a planet orbiting a star, showing as *inertia-at-rest* or *gravity* (F) or *weight* (W): $F_u = E_s = F = W$.
5. Matter does not show its potential-energy but converts its potential-energy between its sharing-energy and excess-energy (As shown in *Figure 1: Matter*). For example, when going up in an airplane, our weight is decreasing while our potential-energy is increasing ($E_s \rightarrow E_p$). At the same time, the plane's external excess-energy also increases our potential-energy ($E_e \rightarrow E_p$). When going even higher in a spacecraft, we become "weightless" (weighing less). When landing on the Moon or Earth, our potential-energy is decreasing while our weight is increasing ($E_p \rightarrow E_s$).
6. Breaking free a member with E_s from a unity requires sufficient external excess-energy ($E_e \geq E_s$), causing inertia-in-motions and heat transfers ($E_e \rightarrow E_e$), leading to new unities. The more energy is shared ($E_p \rightarrow E_s$, such as in a

nuclear fusion), the tighter the formed unity (such as the produced nucleus unity), the more external excess-energy is required to break the unity, and vice versa (such as in beta decay).

Therefore:

1. Gravity or weight or inertia-at-rest is redefined as matter's active and constant pull towards its unity centre due to its sharing-energy.
2. Inertia is redefined and generalised as the unity force resulting from both sharing-energy (as inertia-at-rest or gravity or weight) and excess-energy (as inertia-in-motion or heat).
3. Matter moves relative to its unity centre, as its reference point, nullifying the base of the observational reference frame^[5] and relativity.
4. The Principles of Matter or Laws of Unity is governed by matter's unity force or inertia:

$F_u = E_s + E_e$, where,

$E_s = F = W = mg$, where m is the mass of the matter, g is the acceleration by the E_s or F or W ,

$E_e = ma$, where m is the mass of the matter, a is the acceleration by the E_e .

Hence,

$F_u = mg + ma = m(g + a)$, cycling through the following states:

$a = 0$ (the matter is in its unity),

$a \geq g$ (the matter is out of the unity),

$a \rightarrow 0$ (the matter is returning or joining a unity).

III. INERTIA-AT-REST OR GRAVITY OR WEIGHT FROM SHARING-ENERGY

In a unity, through its sharing-energy (E_s), each member pulls the unity centre actively and constantly, as *inertia-at-rest* or *gravity* (F) or *weight* (W): $E_s = F = W$, mediated or transferred by any member in between, so that each member is also a medium.

The speed of transfer would be close to light and electricity because the transfer media are mainly photons, neutrinos and electrons.

As proposed in my paper *The Photon and the Principles of Matter*^[6]: Created in nuclear fusion centres and moved out, those nuclei share energy with electron unities in their orbits, forming atom unities: $n(^2pve) + n(e\gamma)$, where atomic number $n \geq 2$, with the same number of protons (p) and electrons (e), but only half the number of photons (γ) and neutrinos (ν). The other half of photons and neutrinos are free particles as visible and invisible light in the universe. So, the universe is filled with free photons and neutrinos, although most neutrinos do not carry enough excess-energy to be

currently detectable. Therefore, there is no vacuum in the universe.

For example:

a) *The Pull between the Moon and Earth*

Earth and everything around it, including the Moon, is a unity. The unity centre is the centre of Earth.

The Moon transfers its sharing-energy as an active and constant pull (as inertia-at-rest or gravity or weight) through the photons and neutrinos (visible and invisible light), the electrons (electronic fields), and the air, to the surface of Earth then to the centre of Earth. When the pull transfers to the surface of Earth, the surface water gets pulled, first by the Moon actively, then by Earth reactively, causing tidal waves. Although everything in the path gets pulled while transferring the sharing-energy (including the air particles, causing wind), the tidal waves are more spectacular and easier to observe.

The calculation of the pull (inertia-at-rest or gravity or weight) should be simple.

In the equilibrium of the Earth unity, the pull of the inertia-at-rest or gravity (F) or weight (W) of the Moon equals the push of Earth's excess-energy transfer to the Moon (Ee_m):

$$F = W = Ee_m$$

b) *A Star System*

In a star system, each planet orbits its star, pulling as inertia-at-rest or gravity (F) or weight (W) towards its star. The orbit is the path where $Ee = 0$, leaving Es in its unity force or inertia as its orbiting equilibrium:

$$Fu = Es = F = W.$$

To stress again, the planets orbiting their star are only inertia-at-rest, not inertia-in-motion. That is, our Earth orbits the sun in a state of inertia-at-rest. Only an extraterrestrial rock with sufficient excess-energy to knock our Earth off its orbit can cause our Earth to be inertia-in-motion. Then, that would be the end of the Earth as we know it, if we still exist at all.

So, it is simple to calculate the inertia-at-rest or gravity (F) or weight (W) of each unity member towards its unity centre. For example:

In the equilibrium of the sun unity, the active and constant pull of gravity (F) or weight (W) of Earth unity (including Earth and its Moon) towards the sun equals the constant push from the sun's excess-energy (including sunlight) to the Earth unity—the Third Rock (Ee_3):

$$F = W = Ee_3$$

c) *A Spacecraft*

While landed on Earth, the spacecraft pulls the centre of Earth as its inertia-at-rest or gravity or weight (besides being a medium of the atmospheric pressure).

The inertia-at-rest or gravity (F) or weight (W) of the spacecraft in Earth unity is even simpler to calculate, as it can be measured directly:

$$F = W$$

When launched successfully into an orbit of Earth like a new moon, the spacecraft is still in Earth unity with a weight loss (instead of weightless). The lost weight is the lost sharing-energy with Earth that has been converted to its potential-energy ($Es \rightarrow Ep$). That is, the spacecraft now has more potential-energy and less sharing-energy with Earth, hence less weight or gravity or inertia-at-rest.

When landing on the Moon (the new unity centre), the spacecraft is losing potential-energy and gaining weight (gravity or inertia-at-rest) with the Moon ($Ep \rightarrow Es$). When landed on the Moon, the spacecraft becomes part of the Moon, a member of the Moon unity, weighing more, but still much lighter than on Earth because of less energy sharing with the Moon on the Moon surface (and much less atmospheric pressure).

Again, the gravity (F_m) or weight (W_m) or inertia-at-rest of the spacecraft in the Moon unity can be directly measured:

$$F_m = W_m$$

After flying out of the Moon unity, in outer space in the Solar System, the spacecraft still has a weight (gravity or inertia-at-rest), to the sun, the new unity centre, except when the spacecraft gets too close to another planet (another unity centre).

IV. INERTIA-IN-MOTION OR HEAT FROM EXCESS-ENERGY

When provided with sufficient excess-energy ($Ee \geq Es$), a member with Es becomes a free particle ($Es + Ee$) with inertia-in-motion or heat and transfers the heat to other particles ($Ee \rightarrow Ee$), causing subsequent heat transfers (radiation). After transferring all the excess-energy ($Ee = 0$), the particle returns or joins a unity, becoming a member with Es , showing inertia-at-rest or gravity or weight. This process shows partly how unity is maintained—by transferring out the excess-energy.

a) *Electronic Heat*

Electronic heat (electricity) is the heat of free electrons. To be precise, electronic heat is free electrons transferring their excess-energy as inertia-in-motion. Therefore, "electric charge" is a misconception.

In an atom unity, electrons share energy (E_s) with their nucleus by orbiting and pulling, as inertia-at-rest or gravity or weight.

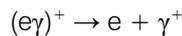
The outermost electrons of different elements have different easiness to break free of their nuclei, determining the conductivity of the elements. Metal elements are generally good conductors, as the outermost electrons of metal elements are fewer (1 to 3) and further from the nuclei, hence sharing less energy with the nuclei, and easier to break free.

Sufficient external excess-energy ($E_e \geq E_s$), like electronic forces, can break free those outermost electrons from the atom unities of a conductor, align and energise them, producing an electronic field (currently called “electric field”—another misconception, as “electric charge” is a misconception), forming stronger electron waves with magnetic effects, and simultaneously cause them to flow as inertia-in-motion or heat, along the potential difference as electronic currents (electricity)^{[6][8]}.

Magnetic effects result from stronger electron waves aligning weaker ones through excess-energy transfer ($E_e \rightarrow E_e$): the electrons with stronger excess-energy bump the electrons with weaker excess-energy into the same direction and energy level. In the electronic field, the aligned electrons all repel in the same direction to one end, causing the opposite end of the electronic field attracting, forming a continuous electronic flow, out from the repelling end and into the attracting end.

Therefore, there are no such things as magnetism, magnetic fields, or magnetic waves.

Electricity is the synchronised excess-energy of the electronic currents, in which each electron unity ($e\gamma$)⁺ transfers its excess-energy to an electronic device or to its bonded photon, causing light γ ⁺:



Free electrons ($e\gamma$)⁺ breaking free their energy-sharing photons with sufficient excess-energy, causing photon waves as light, is called electronism.

Therefore, “electromagnetism” is another misconception, besides there being no “magnetism”.

The least or breaking-point excess-energy (E_{e_1}) an electron requires to break free of its nucleus equals its sharing-energy (E_s) or gravity (F) or weight (W) to its nucleus—the **Breaking-point Excess-energy Method**:

$$E_{e_1} = E_s = F = W.$$

b) Photonic Heat

Photonic heat (light) is the heat of free photons. To be precise, photonic heat is free photons transferring their excess-energy as inertia-in-motion.

A photon (γ) tends to share energy (E_s) with an electron (e) as an electron unity ($e\gamma$), where the photon

orbits (pulls) its electron as inertia-at-rest or gravity or weight.

A photon with sufficient excess-energy ($E_e \geq E_s$) oscillates away as a free photon, leaving the external excess-energy as waves. The stronger of the excess-energy, the higher frequency (f) of the waves, with the causal-effect equation:

$$E_e = hf, \text{ where } h \text{ is the Planck constant}^{[11]}.$$

The least excess-energy (E_{e_1}) a photon requires to break free of its electron equals its sharing-energy (E_s) or gravity (F) or weight (W) to its electron:

$$E_{e_1} = E_s = F = W.$$

Even visible light (e.g. part of sunlight) is invisible until the free photons bump into other matter, transferring their excess-energy ($E_e \rightarrow E_e$), causing more inertia-in-motion if the excess-energy is sufficient ($E_e \geq E_s$), while the photons themselves get deflected with lesser excess-energy ($E_e \rightarrow 0$) or absorbed ($E_e = 0$) by electrons that lost their photons previously.

Whatever we see is the last excess-energy transfer of the free photons before they are deflected and strike our retina. Our retina can only detect the energy transfers in a certain energy range, outside which our eyes cannot even detect the energy transfers, for example, of gamma rays, X-rays, or radio waves.

c) Atomic and Molecular Heat

Atomic and molecular heat is free gas or liquid particles transferring their excess-energy as inertia-in-motion.

For example:

- The free air particles of the wind transfer their excess-energy as inertia-in-motion to our body, changing our body temperature.
- The synchronised free and hot air particles from a combustion chamber transfer their excess-energy as inertia-in-motion to the engine.
- The free water molecules in a flowing river transfer their excess-energy as inertia-in-motion to turbines connected to generators, producing electricity.

Again, the inertia-at-rest or gravity (F) or weight (W) of an atom or a molecule in Earth unity can be measured by the Breaking-point Excess-energy Method:

$$E_{e_1} = E_s = F = W.$$

d) Returning or Joining Unities

After transferring all their excess-energy, those free particles return or join their own unities:

- An electron returns or joins an atom unity that lost an electron previously, pulling again as inertia-at-rest or gravity or weight.
- A photon returns or joins an electron that lost its photon previously: $\gamma + e \rightarrow e\gamma$.
- A neutrino returns or joins a proton that lost its neutrino previously: $\nu + p \rightarrow p\nu$.
- A gas or liquid particle falls closer to the centre of Earth, or another planet it belongs to.

V. UNITY FORCE AS INERTIA

Unity force or inertia: $F_u = E_s + E_e$, is matter's intrinsic tendency to form and maintain unity, where E_s causes an active and constant pull, as inertia-at-rest or gravity (F) or weight (W) towards the unity centre; and E_e produces inertia-in-motion or heat away from the external excess-energy.

That is, unity force or inertia is a two-way action that includes inertia-at-rest or gravity or weight, and inertia-in-motion or heat.

For example:

a) Human Activity

We and everything around us share energy (E_s) with Earth as weight or gravity or inertia-at-rest. Our every activity, like walking, running, jumping, and working, adds sufficient excess-energy ($E_e \geq E_s$) to the weight (E_s) to move it, causing inertia-in-motions and heat transfers ($E_e \rightarrow E_e$), leading to new unities.

A recent measurement of my weight (W) or gravity (F) to Earth showed:

$$W = F = 58 \text{ kg.}$$

So, I must have lost some weight recently (was 60 kg previously checked), which makes my activities a little bit easier, unless what I lost was mainly muscle, which would reduce my ability to produce excess-energy.

b) A Dust

Breaking the inertia-at-rest or gravity or weight of a dust on my table requires sufficient external excess-energy ($E_e \geq E_s$), like a blow of air particles that transfer the excess-energy to the dust ($E_e \rightarrow E_e$), causing it to fly away with inertia-in-motion. Then, the dust transfers its excess-energy to other air particles ($E_e \rightarrow E_e$), causing more inertia-in-motion as heat, while sharing more energy with Earth, hence more weight (gravity), but lost that much potential-energy: $E_p \rightarrow E_s = F = W$, and falls to the ground (closer to the centre of Earth) to form a new unity ($E_e = 0$).

Again, the inertia-at-rest or gravity (F) or weight (W) of the dust can be measured directly:

$$F = W$$

c) Nuclear Fusion

In a nuclear fusion centre, which is also a unity centre, the base unities ($p\nu$ and $e\gamma$) have been so dense and hot that they have become more energy sharing ($E_p \rightarrow E_s$) and have started nuclear fusion, forming helium-4 nucleus unities: $2(^2p\nu e)$, with tighter gravity and inertia-at-rest, while transferring high-energy photons, neutrinos and electrons as excess-energy and inertia-in-motion ($E_s \rightarrow E_e$). Then, these energised particles bump into outside particles, transferring their excess-energy ($E_e \rightarrow E_e$), causing subsequent inertia-in-motion as heat (radiation)^{[6][7][8][9][10]}. So, the whole nuclear fusion process has this energy flow: $E_p \rightarrow E_s \rightarrow E_e \rightarrow E_e$.

The Breaking-point Excess-energy Method can be used to measure the pulling force (inertia-at-rest or gravity or weight) of a member in a formed nucleus unity:

$$E_{e1} = E_s = F = W,$$

as discussed in the next section.

VI. MEASURING THE PULLING FORCE (INERTIA-AT-REST OR GRAVITY OR WEIGHT)

As stated in the Principles of Matter, breaking free a member with E_s from a unity requires sufficient external excess-energy: $E_e \geq E_s$, so that the Breaking-point Excess-energy Method is the fundamental way to measure the pulling force (inertia-at-rest or gravity or weight) of the member:

$$E_{e1} = E_s = F = W.$$

For example:

1. Direct measurement: the scale or balance is the tool to break the pull towards the Earth centre from the matter being measured, with the breaking-point excess-energy when balanced and steady.
2. The excess-energy pushing from the sun to the Earth unity is the least excess-energy to break the pull from the Earth unity. The same goes with Earth to the Moon. Or a nucleus to an electron. Or an electron to a photon.
3. In a beta decay, external excess-energy breaks free a member from the unstable nucleus unity naturally, while in a nuclear fission, induced external excess-energy breaks free a member from the unstable nucleus unity artificially.
4. To break free a member from a stable nucleus unity, artificial collision methods, like a particle collider may have to be used (although the Large Hadron Collider is an overkill and irrelevant).

If, for some reason or some situation, the Breaking-point Excess-energy Method is unavailable, how about an empirical equation, using masses and distance to estimate gravity like Newton did?

Well, yes, except the gravity has been redefined, so that the equation would be different:

$$F = PM_1M_2/R,$$

where F is the pulling force (inertia-at-rest or gravity or weight), P is the pulling constant, M_1 is the mass of the member being measured, M_2 is the mass of the whole unity excluding M_1 , R is the distance between the two centres.

Since the result should be a weight measure, like kg, the masses should be in kg, the R should be in meter (m), so that the P should be in m/kg.

As an empirical equation, it needs lots of empirical data to estimate the pulling constant P , and it needs estimations of the two masses and the distance between them.

VII. UNITY FORCE OR INERTIA AS THE FUNDAMENTAL FORCE UNDERLYING ALL NATURAL FORCES

1. As stated in the Nuclear Fusion section before, nuclear fusion is the unity force or inertia in action, creating nucleus unities so that every two protons (p) share energy with one neutrino (ν) and one electron (e) as $n(^2p\nu e)$, where atomic number $n \geq 2$. In a nucleus unity, electrons and neutrinos are energy sharing agents, orbiting protons to share and distribute energy. Thus, unity force or inertia replaces strong force and quantum chromodynamics.^{[6][7][8][9][10]}
2. Beta decay is also unity force or inertia in action: sufficient external excess-energy ($E_e \geq E_s$) breaks free a neutrino and an electron (electron emission) or just a neutrino (electron capture) from an unstable nucleus unity, leading to inertia-in-motion and radiation ($E_e \rightarrow E_e$), and a more energy-sharing and hence more stable nucleus unity. Thus, unity force or inertia also replaces weak force.^{[6][7][8][9][10]}
3. Electromagnetism is free electrons ($e\gamma$)⁺ showing magnetic effects while transferring their excess-energy as photon waves: $(e\gamma)^+ \rightarrow e + \gamma^+$. Therefore, "electromagnetism" is a misconception, and should be called electronism, as stated in the Electronic Heat section before.
4. Gravity or weight results from matter's sharing-energy E_s , which is part of the unity force or inertia: $F_u = E_s + E_e$.

Therefore, unity force or inertia is the single fundamental force underlying all natural forces.

VIII. UNITY FORCE OR INERTIA IN THE FORMATION OF THE UNIVERSE

Most nuclear fusion centres with excess-energy-releasing (inertia-in-motion) form stars and planets. The rest, extra-large fusion centres with inner cores unable to release excess-energy as a repelling force, form black holes.^{[6][8][9][10]}

In a black hole, matter converts its potential-energy completely into sharing-energy $E_p \rightarrow E_s$, so that $E_p = 0$, and sharing-energy becomes infinity: $E_s = F_u = F \rightarrow \infty$, producing infinite pull towards the centre, making the black hole into a physical singularity.

Every galaxy is a unity, the ultimate unity with its ultimate unity force or inertia, with at least one black hole as the unity centre. If two or more black holes exist in one galaxy, they are close enough to attract each other and will eventually merge into one.^{[6][7]}

Unity force or inertia (its sharing-energy E_s showing as gravity) forms the hierarchical structure of each galaxy, making the black hole as its unity centre. Under a galaxy, each star is the unity centre of a star system. Under the star system, each planet is the unity centre of its moons. Then, each atomic nucleus is the unity centre of an atom. Inside the nucleus, every proton is a unity centre. Outside the nucleus, each electron is the unity centre of an electron unity ($e\gamma$).^{[6][7][9]}

In almost all the nested unity levels, the sublevel unities or members pull their unity centres actively, as mentioned before. Except at the galaxy level, each unity centre (the black hole) is the active pulling force, keeping the star systems from moving away, and keeping the galaxy unity in dynamic equilibrium. The difference may come from this reason: black holes are the only unity centres that only pull energy in, without pushing energy out.

The large-scale structures (the groups of galaxies) originate from the expansion of the universe from the Big Bang: the distribution of matter was random and uneven, although the universe on larger scales is relatively uniform.^[9]

IX. CONCLUSION

1. Matter organises itself into hierarchical units, called *unities*, through its energies: matter retains its *potential-energy* (E_p) and *sharing-energy* (E_s) within a *unity* as a *unity member*, until it becomes a *free particle* with sufficient *excess-energy* ($E_e \geq E_s$) from external excess-energy.
2. Matter forms and maintains unity with its *unity force* or *inertia*: $F_u = E_s + E_e$, where E_s causes an active and constant pull, as *inertia-at-rest* or *gravity* (F) or *weight* (W) towards the unity centre, and E_e produces *inertia-in-motion* or *heat* away from the external excess-energy.

3. That is, gravity or weight or inertia-at-rest is redefined as matter's active and constant pull towards its unity centre due to its sharing-energy.
4. Inertia is redefined and generalised as the unity force resulting from both sharing-energy (as inertia-at-rest or gravity or weight) and excess-energy (as inertia-in-motion or heat).
5. Matter moves relative to its unity centre, as its reference point, nullifying the base of the observational reference frame^[5] and relativity.
6. In a unity, through its sharing-energy (E_s), each member pulls the unity centre actively and constantly, as inertia-at-rest or gravity (F) or weight (W), mediated or transferred by any member in between, so that each member is also a medium.
7. When provided with sufficient excess-energy ($E_e \geq E_s$), a member with E_s becomes a free particle ($E_s + E_e$) with inertia-in-motion or heat and transfers the heat to other particles ($E_e \rightarrow E_e$), causing subsequent heat transfers (radiation). After transferring all the excess-energy ($E_e = 0$), the particle returns or joins a unity, becoming a member with E_s , showing inertia-at-rest or gravity or weight. This process shows partly how unity is maintained—by transferring out the excess-energy.
8. For example, electronic heat is free electrons transferring their excess-energy as inertia-in-motion. Therefore, “electric charge” is a misconception.
9. Magnetic effects result from stronger electron waves aligning weaker ones through excess-energy transfer ($E_e \rightarrow E_e$): the electrons with stronger excess-energy bump the electrons with weaker excess-energy into the same direction and energy level. In the electronic field (currently called “electric field”—another misconception, as “electric charge” is a misconception), the aligned electrons all repel in the same direction to one end, causing the opposite end of the electronic field attracting, forming a continuous electronic flow, out from the repelling end and into the attracting end.
10. There are no such things as magnetism, magnetic fields, or magnetic waves.
11. Electromagnetism is free electrons ($e\gamma$)⁺ showing magnetic effects while transferring their excess-energy as photon waves: $(e\gamma)^+ \rightarrow e + \gamma^+$. Therefore, “electromagnetism” is another misconception, besides there being no “magnetism”.
12. Even visible light (e.g. part of sunlight) is invisible until the free photons bump into other matter, transferring their excess-energy ($E_e \rightarrow E_e$), causing more inertia-in-motion if the excess-energy is sufficient ($E_e \geq E_s$), while the photons themselves get deflected with lesser excess-energy ($E_e \rightarrow 0$) or absorbed ($E_e = 0$) by electrons that lost their photons previously.
13. Most nuclear fusion centres with excess-energy-releasing (inertia-in-motion) form stars and planets. The rest, extra-large fusion centres with inner cores unable to transfer out excess-energy as a repelling force, form black holes.
14. Every galaxy is a unity, the ultimate unity with its ultimate unity force or inertia, with at least one black hole as the unity centre. If two or more black holes exist in one galaxy, they are close enough to attract each other and will eventually merge into one.
15. Unity force or inertia forms the hierarchical structure of each galaxy, making the black hole as its unity centre. Under a galaxy, each star is the unity centre of a star system. Under the star system, each planet is the unity centre of its moons. Then, each atomic nucleus is the unity centre of an atom. Inside the nucleus, every proton is a unity centre. Outside the nucleus, each electron is the unity centre of an electron unity ($e\gamma$).
16. In almost all the nested unity levels, the sublevel unities or members pull their unity centres actively. Except at the galaxy level, each unity centre (the black hole) is the active pulling force. The difference may come from this reason: black holes are the only unity centres that only pull energy in, without pushing energy out.
17. Breaking free a member with E_s from a unity requires sufficient external excess-energy: $E_e \geq E_s$, so that the *Breaking-point Excess-energy Method* is the fundamental way to measure the pulling force (inertia-at-rest or gravity or weight) of the member: $E_{e1} = E_s = F = W$.
18. Optionally, an empirical mass-distance equation can be used to estimate the gravity or weight or inertia-at-rest:
$$F = PM_1M_2/R,$$
 where F is the pulling force (gravity or weight or inertia-at-rest), P is the pulling constant, M_1 is the mass of the member being measured, M_2 is the mass of the whole unity excluding M_1 , R is the distance between the two centres.
19. Unity force or inertia is the single fundamental force underlying all natural forces.

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Anti-Graphene

By Stanislav Ordin

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Abstract- The dirty graphene wave has swept across the entire scientific world. And it has once again confirmed that quasi-scientific speculations without taking into account the Fundamental Laws only lead to huge waste of effort and resources. But this wave was able to arise because it was not out of nowhere. Nobel laureates, who were in a hurry to get money, simply stated what was, in principle, expected, but from the prevailing erroneous Model of Graphite. And, thus, with their ignorant "proofs" they led the research of thin graphite layers down the wrong path. The analysis carried out in this article, using the example of the SIMPLE Graphite Material and its ultra-thin layers in a congruent matrix of boron nitride, shows how it is possible to create a whole class of fundamentally new, real materials. The ideal correct structure of thin layers of rhombohedral graphite, down to mono atomically thin, can be obtained not for a freely suspended (on sticky tape) film and not due to Van der Waals forces, as graphenologists claim, but in a congruent matrix - a crystal of rhombohedral boron nitride. And a radical improvement in the properties of materials can be obtained on the basis of truly unusual properties of such graphite layers with an undamaged surface, and in no way on the basis of a graphene model that does not correspond to the real material.

Keywords: *van der waals forces, chemical bond, translational invariance, graphene, real characteristics of materials.*

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Anti-Graphene

Stanislav Ordin

Abstract- The dirty graphene wave has swept across the entire scientific world. And it has once again confirmed that quasi-scientific speculations without taking into account the Fundamental Laws only lead to huge waste of effort and resources. But this wave was able to arise because it was not out of nowhere. Nobel laureates, who were in a hurry to get money, simply stated what was, in principle, expected, but from the prevailing erroneous Model of Graphite. And, thus, with their ignorant "proofs" they led the research of thin graphite layers down the wrong path. The analysis carried out in this article, using the example of the SIMPLE Graphite Material and its ultra-thin layers in a congruent matrix of boron nitride, shows how it is possible to create a whole class of fundamentally new, real materials. The ideal correct structure of thin layers of rhombohedral graphite, down to monoatomically thin, can be obtained not for a freely suspended (on sticky tape) film and not due to Van der Waals forces, as graphenologists claim, but in a congruent matrix - a crystal of rhombohedral boron nitride. And a radical improvement in the properties of materials can be obtained on the basis of truly unusual properties of such graphite layers with an undamaged surface, and in no way on the basis of a graphene model that does not correspond to the real material.

Keywords: *van der waals forces, chemical bond, translational invariance, graphene, real characteristics of materials.*

I. PREAMBLE

I feel guilty that the dirty graphene wave arose at all.

On the one hand, during half a century of work at the Academy of Sciences, I saw its degeneration and that illiterate careerists were climbing into Russian academics, who supported the nomination of also illiterate Russian specialists in adhesive tape for the Nobel Prize.

On the other hand, our employee, being the author of a handbook on graphite and nitrides published in Springer, did not even bother to look into the scientific journal of our institute, where our article with Sharupin, correcting the models of graphite and boron nitride, had long been published, but inserted an ancient, meaningless article (as the authors themselves wrote in the conclusion). So the general public had ideas about graphite from the beginning of the last century, which prompted graphenologists to childish fantasies.

And on the third hand, the energetic rogue, the late director of our very own Ioffe Institute, Zhores Alferov, set an example for other rogues of how to promote any nonsense for a Nobel Prize.

I have already written a lot about the fact that graphene was the name for speculations on graphite that are far from science in my popular science articles on the website of the Nanotechnology Society of Russia [1,2]. And in Wikipedia, in the article on Van der Waals forces, I also wrote that these forces, introduced for crystals formed from deeply cooled inert gases, cannot in any way be used to describe refractory crystals and for the model of a single-atom film. But graphene speculations did not arise out of nowhere - graphite, a well-known layered mineral, has been studied for a long time and at length. And it was these studies, believing that it is the monoatomic layers that slide in graphite, that Pauling used to construct a model of flat electron (σ) orbitals that connect carbon atoms in graphite layers into hexagons [3]. Pauling, as a chemist, could not ignore the fact that the carbon atom has 4 valence electrons and introduced an additional π -orbitals, which he assumed also connect (weakly, slipperily - blurred throughout the layer) the hexagons of different layers. But this crude model did not take into account the spatial distribution of interlayer bonds and their localization on carbon atoms. This created the illusion of their uniform distribution throughout the layer, which led to a purely theoretical misconception that the bonds between atomic layers are formed due to van der Waals forces [4]. At the same time, the compilation works of Dreselhaus [5] also did a disservice to the science of graphite.

These abstract ideas about graphite, contradicting both the known relatively small anisotropy of the Debye temperature and the fact that graphite crystals do not break at 3000 degrees, based on the primitive idea of the sliding of graphite layers (in reality, graphite flakes slide, not monoatomic layers in them) formed both the theoretical models of graphite energy bands and the drawn, free-hanging and in a vacuum monoatomic layers of graphite, called graphene. Although it is clearly visible, even in the example of a balloon, that without external support the film will shrink. It was also already known that pieces of graphite monoatomic film shrink into a ball, called fullerene. Landau's theorem also speaks about this, proving that purely one-dimensional and two-dimensional objects in a free state cannot exist. Unlike dreamers with sticky tape, we, together with B.N. Sharupin [6], who created boron nitride for the first time in the world, studied graphite pyrocrystals with different degrees of ordering of the crystal lattice. In this case, it was verified that up to pressures of 60 kBar, liquid metals do not penetrate

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between monoatomic layers - the liquid metal enters only defects between graphite flakes. An increase in electrical conductivity along the C axis was also discovered with a high degree of ordering of graphite crystals (Fig. 1), when graphite passes from the

hexagonal phase with disordered interlayer bonds and with a translation period along the C axis equal to twice the interatomic distance into the rhombohedral phase with a strict translation period along the C axis equal to three times the interplanar distance.

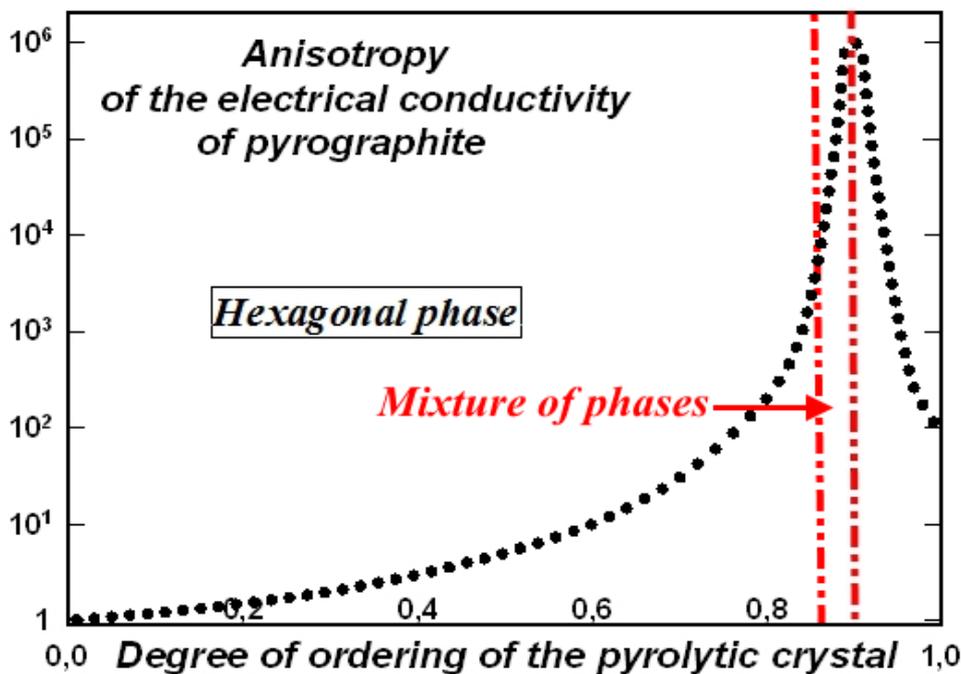


Fig. 1: Reduction of the anisotropy of electrical conductivity of graphite pyrocrystals during the transition from the hexagonal phase to the rhombohedral phase due to an increase in electrical conductivity across the monoatomic layers of graphite

In this case, the degree of ordering of the crystal lattice in Fig. 1 was determined, as described earlier, by the blurring of the translation parameters, both in the plane of the hexagons and along the C axis. In parallel to graphite, pyrocrystals of its dielectric analogue, boron nitride, created by B.N. Sharupin, were studied [7]. As studies have shown, a decrease in anisotropy at a very high degree of ordering of pyrocrystals is associated not only with the ordering of their microstructure, but with the order-disorder

transition in the distribution of interlayer bonds in the crystal lattice [8]. The transition from chaotically distributed interlayer bonds to strictly ordered ones determines, both in graphite and in boron nitride, the phase transition from the hexagonal phase, with a period of translation of monoatomic layers along the C axis equal to twice the interatomic distance, to the highly ordered rhombohedral phase with a period of translation of monoatomic layers equal to three times the interatomic distance (Fig. 2).

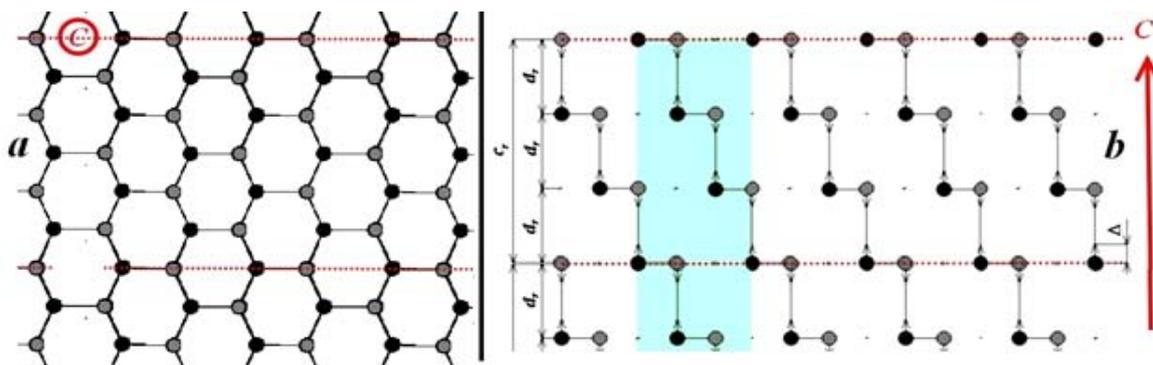


Fig. 2: Model of the crystal lattice of highly ordered rhombohedral boron nitride: a - plane perpendicular to the C axis, b - plane parallel to the C axis

At the same time, since the crystal lattice of boron nitride contains a dipole, its characteristic lattice vibrations are IR-active and the reflection spectra of boron nitride crystals clearly demonstrate strongly

damped lattice oscillators in the hexagonal phase in reflection and weakly damped lattice vibrations in the rhombohedral phase in the region of the same frequencies (Fig. 3).

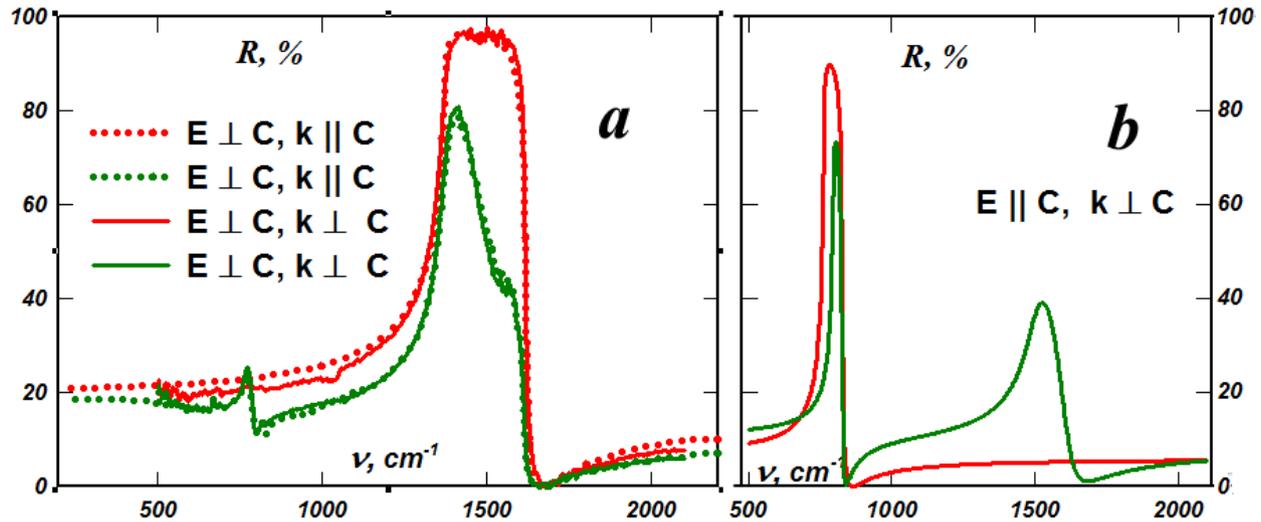


Fig. 3: Lattice oscillators in the polarization reflection spectra of rhombohedral (red curves) and hexagonal^{al} (green curves) boron nitride

In highly ordered rhombohedral boron nitride, weakly damped lattice oscillators are observed. In this case, for each polarization of IR radiation, only one, corresponding to ion oscillations in the plane of the hexagons (Fig. 2a) and ion oscillations along the C axis - perpendicular to the plane of the hexagons (Fig. 2b). And since the low-frequency edge of the oscillator corresponds to a transverse phonon and determines the rigidity of the bond between atoms in the crystal lattice, Fig. 2 shows that the interlayer bond is only one and a half times weaker than the intralayer bond, which is in full agreement with the anisotropy of the Debye temperature. But, as was shown earlier, in the rhombohedral crystal lattice, there is one interlayer bond per intralayer bond. Therefore, the rigidity of the boron nitride crystal along the C axis is only 4.5 times less than its rigidity perpendicular to the C axis, and not 1000 times, as follows from the Van der Waals forces [8].

The presence of a dipole in the boron nitride crystal lattice makes its oscillations IR-active and determines the width of the oscillator - its high-frequency edge corresponds to a longitudinal phonon that exists only in the boron nitride crystal, but the transverse phonons in the rhombohedral phases of boron nitride and graphite are close in frequency. In this case, graphite in the rhombohedral phase becomes a semi-metal with noticeable intrinsic electrical conductivity along the C axis, which, with an insignificant increase in electrical conductivity along the graphite layers, determines the drop in the anisotropy of its electrical conductivity.

The obtained absorption spectra of pyrographites (Fig. 4a) are well described by the additive contributions of two processes: $\alpha \sim (E - (\Delta E_1 + E_{\text{ph}}))^2$, with the characteristic frequency $(\Delta E_1 + E_{\text{ph}})/h = -640 \text{ cm}^{-1}$, where E_{ph} is the phonon frequency, and direct allowed transitions: $\alpha \sim (E - \Delta E_2)^{1/2}$, with $\Delta E_2/h = +1000 \text{ cm}^{-1}$. Considering that the maximum phonon frequency for graphite is about 1400 cm^{-1} , the obtained values of the edges of inter band transitions correspond to a band structure with a direct gap near the Fermi level of about 0.125 eV and with an indirect anisotropic overlap of 0.25 eV (Fig. 4b). From the above analysis it follows that with a decrease in the degree of disordering of pyrographites, the direct energy gap decreases, and the overlap of the bands increases [9].

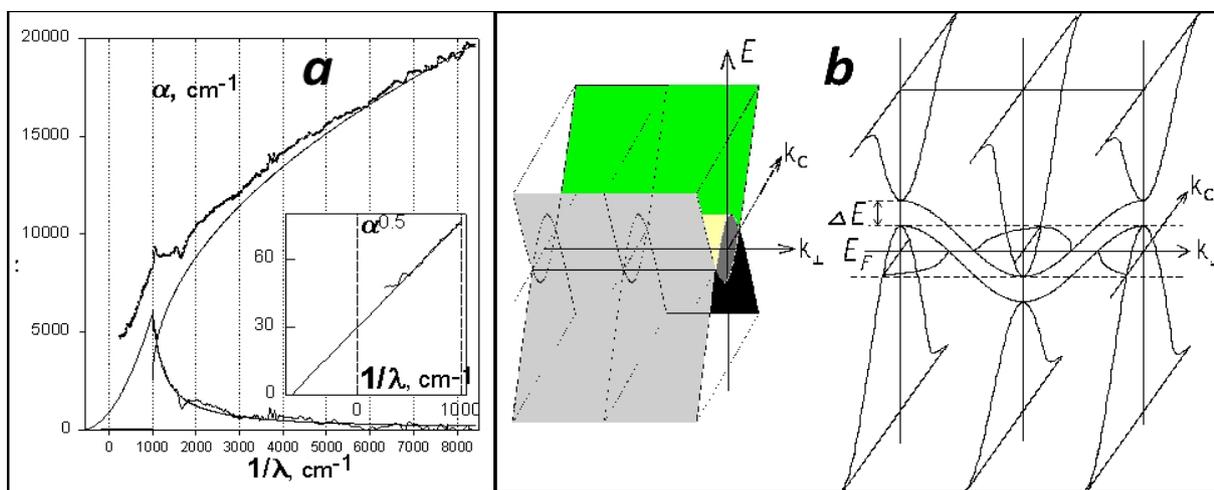


Fig. 4: Absorption spectrum of a film of finely dispersed pyrolytic graphite-pyroc carbon (a) and a model of the band structure of graphite (b)

The presented zone model (Fig. 4b) shows that to the normal, relatively small semi-metallic (zone) electrical conductivity of graphite (ordered) along the C axis, in the direction perpendicular to the C axis - in the plane of the hexagons, due to the minimal gap between the allowed zones by momentum, there is an addition in the form of "acoustic" electrical conductivity. And this large "acoustic" addition to the electrical conductivity at very low temperatures has a small "opening threshold" (minimum voltage) corresponding to the momentum gap between the allowed states, and with increasing temperature - a large increase in electrical conductivity. This is in good agreement in a wide temperature range with the anisotropy of the temperature dependence of the electrical conductivity of graphite, which manifests itself for the plane of hexagons in its purely semiconductor growth up to 800 C and in its metallic decline at a higher temperature (Fig. 5, above). Although, as experiments on high-temperature annealing of highly ordered rhombohedral nitride samples have shown, during annealing there is a phase transition to the hexagonal phase and a characteristic change in the lattice oscillators (Fig. 3). The electrical conductivity along the C axis demonstrates a continuous exponential growth with increasing temperature (Fig. 5, below), which is determined, in full accordance with the model of the band structure of graphite presented in Fig. 4, by the increasing contribution of phonons to indirect transitions.

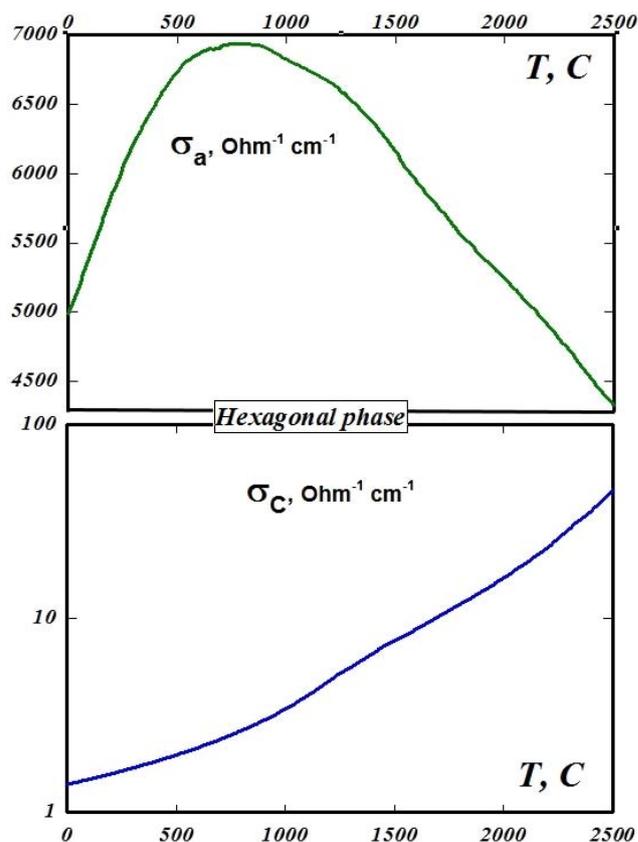


Fig. 5: Temperature dependences of the specific electrical conductivity of ordered hexagonal graphite in the plane of the hexagons (a - from above) and along the C axis (from below)

Since the crystalline structures of graphite and boron nitride are similar, it seemed possible to grow graphite layers in boron nitride and boron nitride layers in graphite. Samples of graphite with boron nitride were

analyzed for the purpose of obtaining composite thermoelectric material, but in the obtained non-order composite samples, only the diffusion thermoelectric mechanism operates and the thermoelectric figure of merit, in accordance with the theory of flow in composites, did not increase significantly compared to the low thermoelectric figure of merit of pure graphite.

But since the parameters of the crystal lattices of the rhombohedral phases of boron nitride and graphite are very close, the highly ordered boron nitride of the rhombohedral phase is an ideal environment (support) for the existence of atomic-thick graphite layers. Boris Nikolaevich Sharupin grew crystals of highly ordered boron nitride containing very thin graphite layers [9, 10]. The samples were slightly cloudy when viewed through the light, since the thinnest graphite layers in boron nitride were in the form of millimeter-diameter spots. Individual thin layers of graphite naturally transmitted visible light, but since the real part of the permittivity of graphite is much greater than its imaginary part, then in aggregate, due to the

interference of reflections of the thinnest layers of graphite, they give a mirror metallic reflection of visible light from the plane of the crystal, perpendicular to the C axis and practically did not reflect visible light from the plane parallel to the C axis - they were completely black for any polarization (Fig. 6). This led to a gigantic spatial dispersion in the visible region of the spectrum. As shown in Fig. 6, in the IR range, the lattice peaks of reflection of boron nitride with graphite inclusions with polarization perpendicular to the C axis are practically independent of the orientation of the wave vector (curves 4 and 5). And the anomalously large "silver" reflection in the visible range of the spectrum of boron nitride samples with graphite inclusions from the plane perpendicular to the C axis (Fig. 6, curve 4) and, thus, the giant spatial dispersion (Fig. 6, curve 5) are associated with a powerful diffraction maximum of reflection in the ultraviolet region of the spectrum, which, in frequency, corresponds to local plasma oscillations in graphite patches with a diameter of about 50 nm.

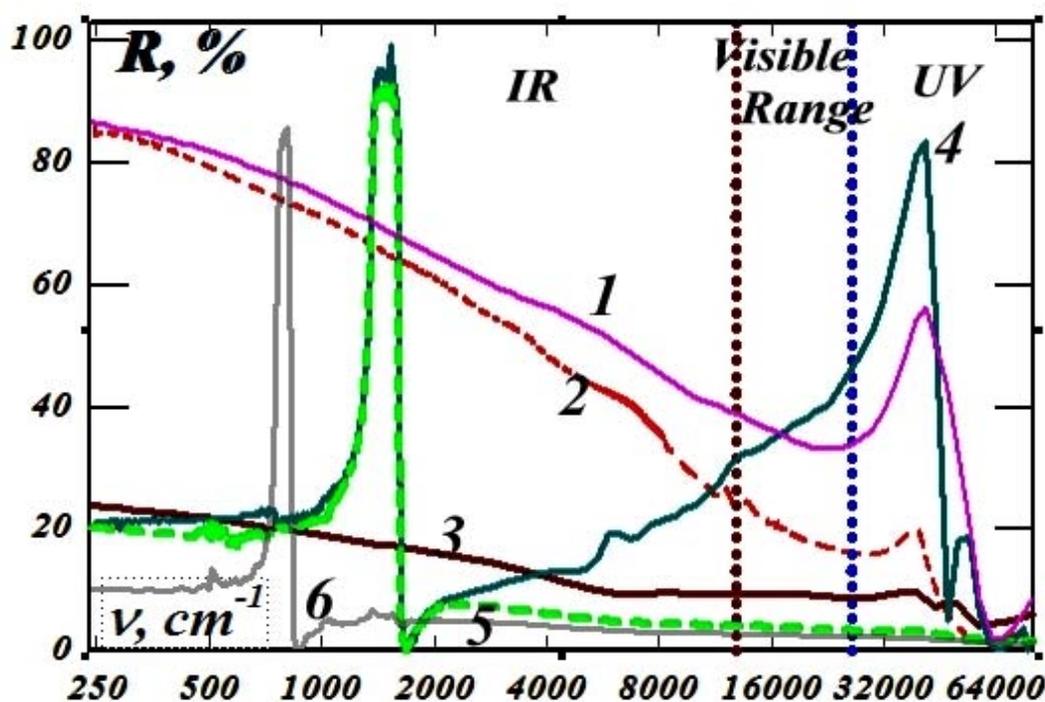


Fig. 6: Polarization spectra of reflection from different faces of highly ordered graphite pyrocrystals and highly ordered boron nitride pyrocrystals with embedded thin graphite layers:

- 1 - graphite, $E \perp C$, $k \parallel C$, 2 - graphite, $E \perp C$, $k \perp C$, graphite, 3 - graphite, $E \parallel C$, $k \perp C$,
4 - BN, $E \perp C$, $k \parallel C$, 5 - BN, $E \perp C$, $k \perp C$, 6 - BN, $E \parallel C$, $k \perp C$.

So, millimeter spots of graphite embedded in boron nitride consist of smaller nanoflakes of antigraphene - rhombohedral graphite with a minimum thickness equal to three times the interatomic distance. The large (approaching 100%) height of the diffraction

reflection peak indicates a very high electron mobility along the graphite layer in the spot. Such a giant spatial dispersion was first discovered in the IR region in disproportionate quasicrystals of higher manganese silicide [11]. But boron nitride samples with graphite

interlayers clearly demonstrated it in visible light: with polarization of the electric vector perpendicular to the C axis, a specular "silver" reflection from the plane of the crystal perpendicular to the C axis and complete non-reflection of visible light with the same polarization from a plane parallel to the C axis. This allowed us to understand that giant spatial dispersion cannot be described by the Landau smallness parameter and that these observed giant effects are described by models that are borderline between optical and radio engineering - waveguide models. And these models describe, taking into account the scale of the embedded graphite spots in boron nitride and the gigantic spatial dispersion of boron nitride with graphite.

In addition, a relatively small but significant spatial dispersion is also observed in samples of highly ordered graphite (Fig. 4, curves 1 and 2) and also with the manifestation of a characteristic peak of ultraviolet reflection. Previously, it was associated with interband transitions in graphite, which is very strange with a semi-metallic overlap of energy bands. But judging by the spectra given, the graphite layers themselves consist of tightly folded 50 nano-flakes of antigraphene, electrically and mechanically contacting along the boundaries and

forming packets of graphite layers with thicknesses of about 200 nm.

II. CONCLUSION

Thus, the two-sided crystalline support of thin graphite layers by the crystal lattice of rhombohedral boron nitride congruent to graphite allows obtaining unusual, but real characteristics of ultra-thin layers of rhombohedral graphite - antigraphene. With one-sided application of graphite on crystals of rhombohedral boron nitride, even on the surface perpendicular to the C axis, resulted in amorphous graphite films. That is, the break of interlayer bonds and one free surface of graphite is sufficient for the amorphization of the graphite film. Naturally, one can expect even greater amorphization of thin graphite films grown on other substrates that are poorly matched in crystal structure.

APPENDIX

Highly ordered pyrocrystals of boron nitride with embedded thin layers of graphite were subjected to ultra-high pressure by explosion in a high-pressure chamber and thus transferred to the cubic phase (Fig. 7a).

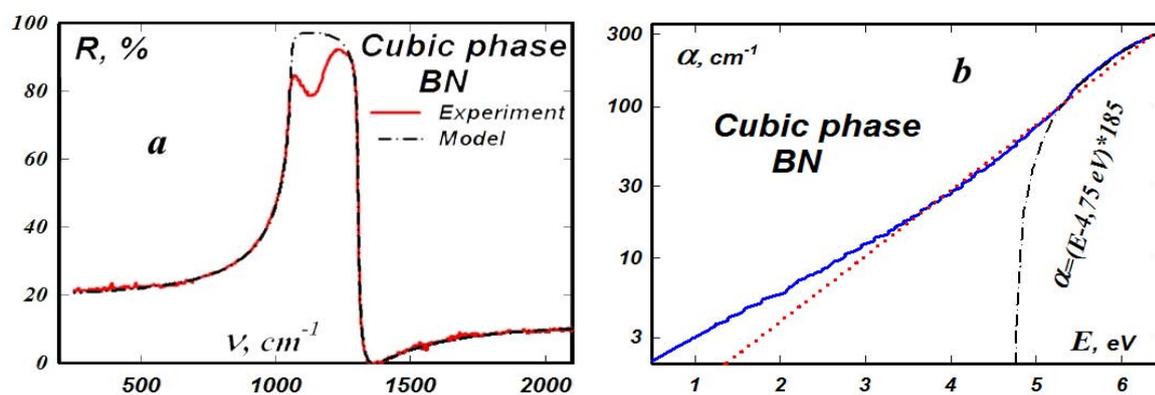


Fig. 7: Characteristic lattice oscillator of cubic boron nitride (a) and the spectrum of its absorption coefficient (b)

Uniformly weakly doped with carbon, greenish transparent crystals were obtained, the absorption spectrum of which corresponded to interband transitions with a band gap width of approximately 4.75 eV (Fig. 7b). The crystals had very high hardness and strength. Their wear resistance was almost an order of magnitude greater than that of diamond.

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The Zeroth of Generation Zh of Fermion, A Unified Mass Theory of Twelve Elementary Fermions

By ShaoXu Ren

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Abstract- *This paper postulates:* The existence of The Zeroth of Generation Zh of Fermion. Zh comprises four Zero-Mass particles ($\Psi(0) = (\alpha(0), \beta(0), \gamma(0), \delta(0))$). Particle $\Psi(0)$ could offer the guidance to accomplish a unified mass theory of twelve elementary fermions in particle physics.

Keywords: *The Zeroth Generation Zth, Zero-Mass particle ($\alpha(0), \beta(0), \gamma(0), \delta(0)$), Non-Zero-Mass particle (Dirac Particle), Mass Principle, Identical Particle, Pauli Exclusion Principle, Colorized Quantum Number, Function- $\mathbf{Q}(\omega, \xi)$, Function- $\xi(\omega)$, Table 0, ScalarProduct-Mass Equation, Charge-Transition.*

GJSFR-A Classification: *LCC: QC794.6, 539.7, 81V05*



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INTRODUCTION

The Zeroth Generation Zth of Fermion is presented in the column " **Zeroth** " of **Table 0** in page 12 in this paper.

" **Zeroth** " is comprised of four particles $\alpha(0), \beta(0), \gamma(0), \delta(0)$, that all with Zero-Mass in vertical direction, BUT with four different electric charges $0e, -e, -\frac{1}{3}e, +\frac{2}{3}e$ in horizontal direction respectively.

Particle mass $M(\omega)$ could be found out by Table 0 and ScalarProduct-Mass Equation, expression (0.26)

Base on particles $\alpha(0), \beta(0), \gamma(0), \delta(0)$, the masses of neutral leptons ν_e, ν_μ, ν_τ , charged leptons e^-, μ^-, τ^- , charged quarks d, s, b and u, c, t could be understood by A Unified Mass Theory respectively (see **Part A, Part B, Part C, Part D**) respectively.

There are some curious digital correlations among $\alpha(0), \beta(0), \gamma(0), \delta(0)$, due to Charge-Transition in page 11.

Following are the outline of searching for: From Zero-Mass particle ($\alpha(0), \beta(0), \gamma(0), \delta(0)$) to Non-Zero-Mass particle (Dirac Particle) of Standard Model SM.

- **Mass Principle:**

Particle mass M is proportional to Scalar Product \mathbf{Q}^2 of Electric Charge \mathbf{Q} of the particle. [1]

Particle Mass $M(\omega)$ results from Color Scalar Product CSP $\mathbf{Q}^2(\omega)$ of Electric Charge Color Operator $\mathbf{Q}(\omega)$ of particle ω

$$M(\omega) = \mathbf{Q}^2(\omega) M(e^-) \tag{0.1}$$

Where $\mathbf{Q}^2(\omega)$ is mass ground state of particle ω , or mass vacuum state of particle ω . Scaling Factor, $M(e^-) = 0.511 \text{ Mev}$.

- Basing on **Mass Principle** (0.1), we could obtain two equivalent tables, Table 1 and Table 2, of particle mass $M(\omega)$ and color scalar product $\mathbf{Q}^2(\omega)$ of particle ω below

Example of $\omega = up\ quark$

$$M(u) = \mathbf{Q}^2(u) M(e^-) \tag{0.2}$$

or

$$\mathbf{Q}^2(u) = \frac{2.3}{0.511} = 4.500\ 978\ 4736 \tag{0.3}$$

Example of $\omega = Neutrino\ v_e$

$$M(v_e) = \mathbf{Q}^2(v_e) M(e^-) \tag{0.4}$$

$$\mathbf{Q}^2(v_e) = \frac{0.000\ 003\ 9139}{0.511} = 0.000\ 002 \tag{0.5}$$

or



Table 1: Mass of particle ω

Ground State	1st	2nd	3rd
Mass <i>Mev</i>			
u	c	t	
2.3	1280	173000	
d	s	b	
4.8	95	4700	
e	μ	τ	
0.511	105.7	1777	
ν_e	ν_μ	ν_τ	
0.000 002	0.190	18.2	

\Rightarrow

Table 2: Color Scalar Product $\mathbf{Q}^2(\omega)$ of particle ω

Ground State	1st	2nd	3rd
CSP $\mathbf{Q}^2(\omega)$			
$+\frac{2}{3}e$	$\mathbf{Q}^2(u)$	$\mathbf{Q}^2(c)$	$\mathbf{Q}^2(t)$
	4.500 978 4736	2504.892 367 9061	338551.859 099 8043
$-\frac{1}{3}e$	$\mathbf{Q}^2(d)$	$\mathbf{Q}^2(s)$	$\mathbf{Q}^2(b)$
	9.393 346 3796	185.909 980 4305	9197.651 663 4051
$-e$	$\mathbf{Q}^2(e)$	$\mathbf{Q}^2(\mu)$	$\mathbf{Q}^2(\tau)$
	1.000 000 0000	206.849 315 0685	3477.495 107 6321
$0e$	$\mathbf{Q}^2(\nu_e)$	$\mathbf{Q}^2(\nu_\mu)$	$\mathbf{Q}^2(\nu_\tau)$
	0.000 003 9139	0.371 819 9609	35.616 438 3562
$Q(\omega)$			

In paper [1], we decomposed the Color Scalar Product $\mathbf{Q}^2(\omega)$ of particle ω in Table 2, by color presentation $\mathbf{Q}(\omega)$ of the particle ω , into a three dimensional color vector picture, below

$$\mathbf{Q}^2(\omega) \Rightarrow \mathbf{Q}(\omega) = (\mathbf{Q}\omega_R, \mathbf{Q}\omega_G, \mathbf{Q}\omega_B) \tag{00}$$

Examples of (00) shown below:

Elementary Fermion Observed Mass Spectrum (Ground State)

- Color of quarks

$$\mathbf{Q}(t) = (+238.206\ 321\ 5198, \quad +238.206\ 321\ 5198, \quad -474.412\ 643\ 0396) \quad (00.1)$$

$$\mathbf{Q}(c) = (+21.093\ 605\ 7202, \quad +21.093\ 605\ 7202, \quad -40.187\ 211\ 4404) \quad (00.2)$$

$$\mathbf{Q}(u) = (+1.393\ 262\ 0539, \quad +1.393\ 262\ 0539, \quad -0.786\ 524\ 1078) \quad (00.3)$$

$$\mathbf{Q}(d) = (-1.562\ 154\ 7908, \quad -1.562\ 154\ 7908, \quad +2.124\ 309\ 5816) \quad (00.4)$$

$$\mathbf{Q}(s) = (-5.894\ 757\ 7177, \quad -5.894\ 757\ 7177, \quad +10.789\ 515\ 4354) \quad (00.5)$$

$$\mathbf{Q}(b) = (-39.485\ 426\ 3597, \quad -39.485\ 426\ 3597, \quad +77.970\ 852\ 7194) \quad (00.6)$$

- Color of leptons

$$\mathbf{Q}(v_\tau) = (+2.436\ 405\ 7666, \quad +2.436\ 405\ 7666, \quad -4.872\ 811\ 5332) \quad (00.7)$$

$$\mathbf{Q}(v_\mu) = (+0.248\ 937\ 7301, \quad +0.248\ 937\ 7301, \quad -0.497\ 875\ 4602) \quad (00.8)$$

$$\mathbf{Q}(v_e) = (+0.000\ 807\ 6578, \quad +0.000\ 807\ 6578, \quad -0.001\ 615\ 3156) \quad (00.9)$$

$$\mathbf{Q}(e^-) = (-1.000\ 000\ 0000, \quad -1.000\ 000\ 0000, \quad -1.000\ 000\ 0000) + i \left(\frac{\pm 1}{\sqrt{3}}, \frac{\pm 1}{\sqrt{3}}, \frac{\mp 2}{\sqrt{3}} \right) \quad (00.10)$$

$$\mathbf{Q}(\mu^-) = (-6.828\ 797\ 9759, \quad -6.828\ 797\ 9759, \quad +10.657\ 595\ 9518) \quad (00.11)$$

$$\mathbf{Q}(\tau^-) = (-25.064\ 133\ 4342, \quad -25.064\ 133\ 4342, \quad +47.128\ 266\ 8684) \quad (00.12)$$

Calculating the scalar products of the above expressions, then gain following results which are just what listed in Table 2.

Up to now, we see: Due to Mass Principle, twelve fermions are attached their "math masses" below

$$Q^2(t) = 338,551.859\,099\,9027 = \frac{173,000.000\,000\,0017}{0.511} \tag{00.13}$$

$$Q^2(c) = 2,504.892\,367\,8975 = \frac{1,280.000\,000\,0041}{0.511} \tag{00.14}$$

$$Q^2(u) = 4.500\,978\,4756 = \frac{2.300\,000\,0001}{0.511} \tag{00.15}$$

$$Q^2(d) = 9.393\,346\,3803 = \frac{4.799\,999\,9998}{0.511} \tag{00.16}$$

$$Q^2(s) = 185.909\,980\,4292 = \frac{95.000\,000\,0005}{0.511} \tag{00.17}$$

$$Q^2(b) = 9,197.651\,663\,3893 = \frac{4,700.000\,000\,0000}{0.511} \tag{00.18}$$

$$Q^2(\nu_\tau) = 35.616\,438\,3571 = \frac{18.200\,000\,0005}{0.511} \tag{00.19}$$

$$Q^2(\nu_\mu) = 0.371\,819\,9609 = \frac{0.190}{0.511} \tag{00.20}$$

$$Q^2(\nu_e) = 0.000\,003\,9138 = \frac{0.000\,002}{0.511} \tag{00.21}$$

$$Q^2(e^-) = 1.000\,000\,0000 = \frac{0.511\,000\,0000}{0.511} \tag{00.22}$$

$$Q^2(\mu^-) = 206.849\,315\,0632 = \frac{105.699\,999\,9973}{0.511} \tag{00.23}$$

$$Q^2(\tau^-) = 3,477.495\,107\,6339 = \frac{1,777.000\,000\,0009}{0.511} \tag{00.24}$$



- Long time to staring at the odd digital numbers of the twelve mass-particles in table 1, table 2 and the above-mentioned (00.13), (00.14), ..., ..., (00.23), (00.24), we wonder what's the relationship between them? Who is their ancestor?

Are there a math formula that could describe their ties of blood?

We raise question, We need imagination.

- This paper introduces The Zeroth Generation Zh of Fermion, which consists of four particles $\alpha(0), \beta(0), \gamma(0), \delta(0)$ that all with Zero-Mass, AND then combining the Zeroth generation with the first, second, third generations (table1, table2) of SM Standard Model extend to a new larger picture, *four generations fermion, Table 0*.

Particles of Table 0 are labelled by the two characteristic, Function- $\mathbf{Q}(\omega, \xi)$ and Function- $\xi(\omega)$. (see following). We receive epiphanies from Table 0 on the way to accomplish a unified mass theory with Zero-Mass and Non-Zero-Mass.

Logical routing constructing Table 0

Beside mass, we take notice of charge $Q(\omega)$. Charge $Q(\omega)$ of particle ω is the other characteristic observational quantity in Table 2. In the horizontal direction, there are four groups of fermion. Each of the four groups comprises three charged fermions all with the same charge $Q(\omega)$, which are two groups of lepton with charge $0e$ & $-e$ and two groups of quark with charge $-\frac{1}{3}e$ & $+\frac{2}{3}e$.

■ Now fermion particles that with the same charge are attributed to *IDENTICAL PARTICLES*.

Example of $\omega = \text{Leptons } e^-, \mu^-, \tau^-$ are attributed to be the three identical particles that with the same charge $-e$, although their masses are completely different.

Especially of $\omega = \text{Neutrinos } \nu_e, \nu_\mu, \nu_\tau$ are attributed to be the Three Identical Dirac Particles that with the same charge $0e$, Rather than to be three different Dirac fermion particles, each one possesses its own mass.

■ Due to **Pauli Exclusion Principle**:

When fermion particles in Table 2 with the same charge state Q , they are positioned in the same row, each of these fermions should be distinguished by different quantum numbers. Function $-Q(\omega, \xi)$ and Function $\xi(\omega)$ are selected as the candidates for quantum number below

◆ Further-A , in order to describe the mass behavior of particles ω in Table 2, we construct a complex charge expression (0.6) below

$$Q(\omega, \xi) + i \xi(\omega) \tag{0.6}$$

The charge values of Color Function $-Q(\omega, \xi)$ and the charge values of Color Function $\xi(\omega)$ are respectively below

$$Q(\omega, \xi) = 0e, -e, -\frac{1}{3}e, +\frac{2}{3}e \tag{0.7}$$

$$\xi(\omega) = 0e \tag{0.8}$$

◆ Further-B , in order to describe the mass behavior of particles ω of four generations of fermion (Table 0), Table 3 is presented below

Table 3: Function-**Q** and Function- ξ of particle ω

		<i>0th</i>	 	<i>1st</i>	<i>2nd</i>	<i>3rd</i>		
Ψ	$\mathbf{Q}(\Psi(0), \xi)$	$\xi(\Psi(0))$	 	$\xi(\omega_1)$	$\xi(\omega_2)$	$\xi(\omega_3)$		
δ	$\mathbf{Q}(\delta(0), \xi)$	$\xi(\delta(0))$	 	$\xi(u)$	$\xi(c)$	$\xi(t)$	 	$\xi(q^+) + \frac{2}{3} e$
γ	$\mathbf{Q}(\gamma(0), \xi)$	$\xi(\gamma(0))$	 	$\xi(d)$	$\xi(s)$	$\xi(b)$	 	$\xi(q^-) - \frac{1}{3} e$
β	$\mathbf{Q}(\beta(0), \xi)$	$\xi(\beta(0))$	 	$\xi(e^-)$	$\xi(\mu^-)$	$\xi(\tau^-)$	 	$\xi(l^-) - e$
α	$\mathbf{Q}(\alpha(0), \xi)$	$\xi(\alpha(0))$	 	$\xi(\nu_e)$	$\xi(\nu_\mu)$	$\xi(\nu_\tau)$	 	$\xi(\nu^0) 0e$
	Function- $\mathbf{Q}(\Psi(0), \xi)$	Function- $\xi(\omega_0)$	 	Function- $\xi(\omega_1)$	Function- $\xi(\omega_2)$	Function- $\xi(\omega_3)$	 	Function- $\xi(\omega) Q(\omega)$
		$\omega_0 = \Psi(0)$						

Notice: Function-**Q** and Function- ξ of Zero-Mass particles all are labelled by $\Psi(0)$ (0.11)

$$\mathbf{Q}(\Psi(0), \xi) = \mathbf{Q}(\alpha(0), \xi), \mathbf{Q}(\beta(0), \xi), \mathbf{Q}(\gamma(0), \xi), \mathbf{Q}(\delta(0), \xi) \tag{0.9}$$

$$\xi(\Psi(0), \xi) = \xi(\alpha(0)), \xi(\beta(0)), \xi(\gamma(0)), \xi(\delta(0)) \tag{0.10}$$

$$\Psi(0) = \alpha(0), \beta(0), \gamma(0), \delta(0) \tag{0.11}$$

Function-**Q** and Function- ξ of Non-Zero-Mass particles are labelled by $\Psi(0)$ and by $\xi(\omega)$ respectively



In Table3, particle identity is distinguished by Function- $\mathbf{Q}(\omega, \xi)$ and Function- $\xi(\omega)$, which are the color representations in three-dimension color space of quantum number that called *Colorized Quantum Number, CQN*. CQN is not a C-number as usual we encounter.

Basing on Table 3 and Functional Array (0.12) below, Table 0 is established.

$$(\mathbf{Q}(\omega, \xi), \xi(\omega)) \tag{0.12}$$

Expression (0.12) is Quantum Characteristic of Table 0, which is used to deal with particle classification of particle ω , we see: due to Pauli Exclusion Principle, each of sixteen fermions in Table 0 occupies different Functional Array $(\mathbf{Q}(\omega, \xi), \xi(\omega))$.

Carefully notice the pairings of particle and anti-particle following

$$\bullet \mathbf{0} \quad \mathbf{Q}(\alpha(0), \xi) = (+236.539\ 654\ 85315, \quad +238.539\ 654\ 85315, \quad -475.079\ 309\ 70630) \tag{1.1}$$

$$\bullet \mathbf{0} \quad \mathbf{Q}(\bar{\alpha}(0), \xi) = (+238.539\ 654\ 85315, \quad +236.539\ 654\ 85315 \quad -475.079\ 309\ 70630) \tag{1.2}$$

$$\bullet \mathbf{0} \quad \mathbf{Q}(\beta(0), \xi) = (+236.539\ 654\ 85315, \quad +238.539\ 654\ 85315, \quad -478.079\ 309\ 70630) \tag{2.1}$$

$$\bullet \mathbf{0} \quad \mathbf{Q}(\bar{\beta}(0), \xi) = (+238.539\ 654\ 85315, \quad +236.539\ 654\ 85315 \quad -472.079\ 309\ 70630) \tag{2.2}$$

$$\bullet \mathbf{0} \quad \mathbf{Q}(\gamma(0), \xi) = (+236.539\ 654\ 85315, \quad +238.539\ 654\ 85315, \quad -476.079\ 309\ 70630) \tag{3.1}$$

$$\bullet \mathbf{0} \quad \mathbf{Q}(\bar{\gamma}(0), \xi) = (+238.539\ 654\ 85315, \quad +236.539\ 654\ 85315 \quad -474.079\ 309\ 70630) \tag{3.2}$$

$$\bullet \mathbf{0} \quad \mathbf{Q}(\delta(0), \xi) = (+236.539\ 654\ 85315, \quad +238.539\ 654\ 85315, \quad -473.079\ 309\ 70630) \tag{4.1}$$

$$\bullet \mathbf{0} \quad \mathbf{Q}(\bar{\delta}(0), \xi) = (+238.539\ 654\ 85315, \quad +236.539\ 654\ 85315 \quad -477.079\ 309\ 70630) \tag{4.2}$$

The sum of the above pairings are given below

$$\mathbf{Q}(\alpha(0), \xi) + \mathbf{Q}(\bar{\alpha}(0), \xi) = \mathbf{Q}(\beta(0), \xi) + \mathbf{Q}(\bar{\beta}(0), \xi) = \mathbf{Q}(\gamma(0), \xi) + \mathbf{Q}(\bar{\gamma}(0), \xi) = \mathbf{Q}(\delta(0), \xi) + \mathbf{Q}(\bar{\delta}(0), \xi) \quad (0.13)$$

$$= (+475.079\ 309\ 70630, \quad +475.079\ 309\ 70630, \quad -950.158\ 619\ 41260) = \mathbf{Q}(\Pi) \quad (0.14)$$

We see: the scalar product of (0.14) is just the mass of Heaven Particle [2]

$$\mathbf{Q}^2(\Pi) = 1354,202.103\ 066\ 0877 = \frac{691997.274\ 666\ 7708}{0.511} = \frac{M(\Pi)}{0.511} \quad (0.15)$$

The relationship between four Function- $\mathbf{Q}(\omega, \xi)$ of $\alpha(0)$, $\beta(0)$, $\gamma(0)$, $\delta(0)$ of Zeroth Generation of Fermion Zth in Table 0 are given by Charge-Transition expressions following

$$\mathbf{Q}(\beta(0), \xi) = \mathbf{Q}(\alpha(0), \xi) + (0, \quad 0, \quad -3) \quad (0.16)$$

$$\mathbf{Q}(\bar{\beta}(0), \xi) = \mathbf{Q}(\bar{\alpha}(0), \xi) + (0, \quad 0, \quad +3) \quad (0.17)$$

$$\mathbf{Q}(\gamma(0), \xi) = \mathbf{Q}(\alpha(0), \xi) + (0, \quad 0, \quad -1) \quad (0.18)$$

$$\mathbf{Q}(\bar{\gamma}(0), \xi) = \mathbf{Q}(\bar{\alpha}(0), \xi) + (0, \quad 0, \quad +1) \quad (0.19)$$

$$\mathbf{Q}(\delta(0), \xi) = \mathbf{Q}(\alpha(0), \xi) + (0, \quad 0, \quad +2) \quad (0.20)$$

$$\mathbf{Q}(\bar{\delta}(0), \xi) = \mathbf{Q}(\bar{\alpha}(0), \xi) + (0, \quad 0, \quad -2) \quad (0.21)$$

Table 0: Zeroth Generation of Fermion Zth and the Color Representation of Fermions of Standard Model, SM

	Zeroth 0		1st 1	2nd 2	3rd 3		Charge
Charged Quark	$\delta(0)$ $(\mathbf{Q}(\delta(0), \xi), \xi(\delta(0)))$		u $(\mathbf{Q}(\delta(0), \xi), \xi(u))$	c $(\mathbf{Q}(\delta(0), \xi), \xi(c))$	t $(\mathbf{Q}(\delta(0), \xi), \xi(t))$		$+\frac{2}{3}e$
Charged Quark	$\gamma(0)$ $(\mathbf{Q}(\gamma(0), \xi), \xi(\gamma(0)))$		d $(\mathbf{Q}(\gamma(0), \xi), \xi(d))$	s $(\mathbf{Q}(\gamma(0), \xi), \xi(s))$	b $(\mathbf{Q}(\gamma(0), \xi), \xi(b))$		$-\frac{1}{3}e$
Charged Lepton	$\beta(0)$ $(\mathbf{Q}(\beta(0), \xi), \xi(\beta(0)))$		e $(\mathbf{Q}(\beta(0), \xi), \xi(e^-))$	μ $(\mathbf{Q}(\beta(0), \xi), \xi(\mu^-))$	τ $(\mathbf{Q}(\beta(0), \xi), \xi(\tau^-))$		$-e$
Neutral Lepton	$\alpha(0)$ $(\mathbf{Q}(\alpha(0), \xi), \xi(\alpha(0)))$		ν_e $(\mathbf{Q}(\alpha(0), \xi), \xi(\nu_e))$	ν_μ $(\mathbf{Q}(\alpha(0), \xi), \xi(\nu_\mu))$	ν_τ $(\mathbf{Q}(\alpha(0), \xi), \xi(\nu_\tau))$		$0e$
Mass Type	Zero-Mass		Non-Zero-Mass	Non-Zero-Mass	Non-Zero-Mass		$Q(\omega)$

- The color scalar product of complex charge expression (0.6) is given by (0.22)

$$\mathbf{Q}(\omega, \xi) + i \xi(\omega) \tag{0.6}$$

$$\mathbf{Q}^2(\omega, \xi) - \xi^2(\omega) + i [\mathbf{Q}(\omega, \xi), \xi(\omega)]_+ \tag{0.22}$$

IF

$$[\mathbf{Q}(\omega, \xi), \xi(\omega)]_- = 0 \tag{0.23}$$

THEN (0.22) turns to an operator $\mathbf{Q}^2(\omega, \xi)$

$$\mathbf{Q}^2(\omega, \xi) \equiv \mathbf{Q}^2(\omega, \xi) - \xi^2(\omega) + 2i \mathbf{Q}(\omega, \xi) \cdot \xi(\omega) \tag{0.24}$$

(0.25) called as **ScalarProduct-Mass Equation**, that could be used to deal with complex mass $M(\omega)$ of particle ω .

$$\mathbf{Q}^2(\omega, \xi) = \frac{M(\omega)}{M(e^-)} \tag{0.25}$$

The **Real ScalarProduct-Mass Equation** of (0.24) is (0.26), that consists of the real part of (0.24) and Ground State $\mathbf{Q}^2(\omega)$ (0.1) of particle ω

$$\mathbf{Q}^2(\omega, \xi) - \xi^2(\omega) = \mathbf{Q}^2(\omega) = \frac{M(\omega)}{M(e^-)} \tag{0.26}$$

- Particle mass $M(\omega)$ could be found out by putting Function- \mathbf{Q} and Function- ξ of particle ω of Table 0 into equation (0.26). Next four parts we will use (0.26) to dedicate and analyse the unified mass theory of four types of charged fermions in Table 0

Part A Unified mass theory of three Dirac Neutrinos ν_e, ν_μ, ν_τ ($\bar{\nu}_e, \bar{\nu}_\mu, \bar{\nu}_\tau$).

◆ From Table 1 and Table 2, we extract neutrinos $\omega = \nu$ to obtain Table 4 below

Table 4: Mass $M(\nu)$ and Color Scalar Product $\mathbf{Q}^2(\nu)$ of neutrinos ν

Ground State	1st	2nd	3rd
	ν_e	ν_μ	ν_τ
<i>Mev</i>	0.000 002	0.190	18.2
	$\mathbf{Q}^2(\nu_e), \mathbf{Q}^2(\bar{\nu}_e)$	$\mathbf{Q}^2(\nu_\mu), \mathbf{Q}^2(\bar{\nu}_\mu)$	$\mathbf{Q}^2(\nu_\tau), \mathbf{Q}^2(\bar{\nu}_\tau)$
\mathbf{Q}^2	0.000 003 9139	0.371 819 9609	35.616 438 3562

What's the relationship between the above three Dirac Neutrinos ν_e, ν_μ, ν_τ ($\bar{\nu}_e, \bar{\nu}_\mu, \bar{\nu}_\tau$) ?

◆ From Table 0, We extract $\omega = \alpha(0), \nu_e, \nu_\mu, \nu_\tau$ to obtain Table 5 below, and search for masses of ω following

Table 5: Mass $M(\nu)$ and Color Scalar Product $\mathbf{Q}^2(\nu)$ of neutrinos ν

Neutral Lepton	0th	1st	2nd	3rd	
	$\alpha(0)$	ν_e	ν_μ	ν_τ	$0e$
	$(\mathbf{Q}(\alpha(0), \xi), \xi(\alpha(0)))$	$(\mathbf{Q}(\alpha(0), \xi), \xi(\nu_e))$	$(\mathbf{Q}(\alpha(0), \xi), \xi(\nu_\mu))$	$(\mathbf{Q}(\alpha(0), \xi), \xi(\nu_\tau))$	$Q(\omega)$
	0	1	2	3	

- Giving detailed values of Function-Q of particle $\alpha(0)$ and anti-particle $\bar{\alpha}(0)$ below

• **0** $Q(\alpha(0), \xi) = (+236.539\ 654\ 85315, \quad +238.539\ 654\ 85315, \quad -475.079\ 309\ 70630)$ (1.1)

• **0** $Q(\bar{\alpha}(0), \xi) = (+238.539\ 654\ 85315, \quad +236.539\ 654\ 85315 \quad -475.079\ 309\ 70630)$ (1.2)

The charges of $\alpha(0)$ and $\bar{\alpha}(0)$ are zero

• **0** $Q(\alpha(0), \xi) = \frac{1}{3} (+236.539\ 654\ 85315 \quad + \quad 238.539\ 654\ 85315 \quad - \quad 475.079\ 309\ 70630) = 0e$ (1.3)

• **0** $Q(\bar{\alpha}(0), \xi) = \frac{1}{3} (+238.539\ 654\ 85315 \quad + \quad 236.539\ 654\ 85315 \quad - \quad 475.079\ 309\ 70630) = 0e$ (1.4)

AND below

- Giving detailed values of Function- $\xi(\omega)$ of particles $\nu_e, \nu_\mu, \nu_\tau (\bar{\nu}_e, \bar{\nu}_\mu, \bar{\nu}_\tau)$ below

$$\xi = (\quad \xi_1, \quad \xi_2 \quad \xi_3 \quad) \tag{1.5}$$

• **3** $\xi(\nu_\tau) = \xi(\bar{\nu}_\tau) = (+237.527\ 861\ 28795, \quad +237.527\ 861\ 28795, \quad -475.055\ 722\ 57590)$ (1.8)

• **2** $\xi(\nu_\mu) = \xi(\bar{\nu}_\mu) = (+237.540\ 226\ 04833, \quad +237.540\ 226\ 04833, \quad -475.080\ 452\ 09666)$ (1.7)

• **1** $\xi(\nu_e) = \xi(\bar{\nu}_e) = (+237.540\ 356\ 48798, \quad +237.540\ 356\ 48798, \quad -475.080\ 712\ 97596)$ (1.6)

The charges of Function- $\xi(\omega)$ of particles $\nu_e \bar{\nu}_e, \nu_\mu \bar{\nu}_\mu, \nu_\tau \bar{\nu}_\tau$ are zero

$$\xi = \frac{1}{3} (\xi_1 + \xi_2 + \xi_3) = 0 \tag{1.9}$$

Expressions of the color scalar products of the above **0, 1, 2, 3** are given below

$$\bullet \mathbf{3} \quad \xi^2(v_\tau) = \xi^2(\bar{v}_\tau) = 338,516.909\,328\,1656 \quad (1.13)$$

$$\bullet \mathbf{2} \quad \xi^2(v_\mu) = \xi^2(\bar{v}_\mu) = 338,552.153\,946\,5609 \quad (1.12)$$

$$\bullet \mathbf{1} \quad \xi^2(v_e) = \xi^2(\bar{v}_e) = 338,552.525\,762\,6079 \quad (1.11)$$

$$\bullet \mathbf{0} \quad \mathbf{Q}^2(\alpha(0), \xi) = \mathbf{Q}^2(\bar{\alpha}(0), \xi) = 338,552.525\,766\,5218 \quad (1.10)$$

Finally making subtraction, using **ScalarProduct-Mass Equation** (0.26): The masses of three neutral Dirac leptons v_e, v_μ, v_τ ($\bar{v}_e, \bar{v}_\mu, \bar{v}_\tau$) are obtained by using a common color scalar product $\mathbf{Q}^2(\alpha(0), \xi)$ of Function-**Q** of particle $\alpha(0)$ and color scalar product $\xi^2(v_e), \xi^2(v_\mu), \xi^2(v_\tau)$ ($\xi^2(\bar{v}_e), \xi^2(\bar{v}_\mu), \xi^2(\bar{v}_\tau)$) of Function- ξ of particles v_e, v_μ, v_τ ($\bar{v}_e, \bar{v}_\mu, \bar{v}_\tau$), their own. Yieldng

$$\begin{aligned} \bullet \mathbf{3} \quad \mathbf{Q}^2(\alpha(0), \xi) - \xi^2(v_\tau) &= \mathbf{Q}^2(\bar{\alpha}(0), \xi) - \xi^2(\bar{v}_\tau) \\ &= 338,552.525\,766\,5218 - 338,516.909\,328\,1656 = 35.616\,438\,3562 = \frac{18.200\,000\,0000}{0.511} \end{aligned} \quad (1.16)$$

$$\begin{aligned} \bullet \mathbf{2} \quad \mathbf{Q}^2(\alpha(0), \xi) - \xi^2(v_\mu) &= \mathbf{Q}^2(\bar{\alpha}(0), \xi) - \xi^2(\bar{v}_\mu) \\ &= 338,552.525\,766\,5218 - 338,552.153\,946\,5609 = 0.371\,819\,9609 = \frac{0.190\,000\,0000}{0.511} \end{aligned} \quad (1.15)$$

$$\begin{aligned} \bullet \mathbf{1} \quad \mathbf{Q}^2(\alpha(0), \xi) - \xi^2(v_e) &= \mathbf{Q}^2(\bar{\alpha}(0), \xi) - \xi^2(\bar{v}_e) \\ &= 338,552.525\,766\,5218 - 338,552.525\,762\,6079 = 0.000\,003\,9139 = \frac{0.000\,002\,0000}{0.511} \end{aligned} \quad (1.14)$$

Just like each of three Dirac neutrinos v_e, v_μ, v_τ ($\bar{v}_e, \bar{v}_\mu, \bar{v}_\tau$) are attached their Function- ξ , $\xi(v_e), \xi(v_\mu), \xi(v_\tau)$ ($\xi(\bar{v}_e), \xi(\bar{v}_\mu), \xi(\bar{v}_\tau)$); particle $\alpha(0)$ or ($\bar{\alpha}(0)$) is attached a Function- ξ of its own, $\xi(\alpha(0))$ and $\xi(\bar{\alpha}(0))$ (1.17) (1.18) too. below

Part B Unified mass theory of three Dirac Charged Leptons $e^-, \mu^-, \tau^- (e^+, \mu^+, \tau^+)$.

◆ From Table 1 and Table 2, we extract charged leptons $\omega = l^-$ to obtain Table 6 below

Table 6: Mass $M(l^-)$ and Color Scalar Product $Q^2(l^-)$ of charged leptons l^-

Ground State	1st	2nd	3rd
	e^-	μ^-	τ^-
<i>Mev</i>	0. 511 000	105. 700	1777. 000
	$Q^2(e^-), Q^2(e^+)$	$Q^2(\mu^-), Q^2(\mu^+)$	$Q^2(\tau^-), Q^2(\tau^+)$
Q^2	1. 000 000 0000	206. 849 315 0685	3477. 495 107 6321

What's the relationship between the above three Dirac charged leptons $e^-, \mu^-, \tau^- (e^+, \mu^+, \tau^+)$?

◆ From Table 0, We extract $\omega = \beta(0), e^-, \mu^-, \tau^-$ to obtain Table 7 below, and search for masses of ω following

Table 7: Mass $M(l^-)$ and Color Scalar Product $Q^2(l^-)$ of charged leptons l^-

Neutral Lepton	0th	1st	2nd	3rd	
	$\beta(0)$	e^-	μ^-	τ^-	$-e$
	$(Q(\beta(0), \xi), \xi(\beta(0)))$	$(Q(\beta(0), \xi), \xi(e^-))$	$(Q(\beta(0), \xi), \xi(\mu^-))$	$(Q(\beta(0), \xi), \xi(\tau^-))$	$Q(\omega)$
	0	1	2	3	

- Giving detailed values of Function-Q of particle $\beta(0)$ and anti-particle $\bar{\beta}(0)$ below

• 0 $Q(\beta(0), \xi) = (+236.539\ 654\ 85315, \quad +238.539\ 654\ 85315, \quad -478.079\ 309\ 70630)$ (2.1)

• 0 $Q(\bar{\beta}(0), \xi) = (+238.539\ 654\ 85315, \quad +236.539\ 654\ 85315, \quad -472.079\ 309\ 70630)$ (2.2)

The charges of $\beta(0)$ and $\bar{\beta}(0)$ are $-e$ and $+e$

• 0 $Q(\beta(0), \xi) = \frac{1}{3} (+236.539\ 654\ 85315 + 238.539\ 654\ 85315 - 478.079\ 309\ 70630) = -e$ (2.3)

• 0 $Q(\bar{\beta}(0), \xi) = \frac{1}{3} (+238.539\ 654\ 85315 + 236.539\ 654\ 85315 - 472.079\ 309\ 70630) = +e$ (2.4)

AND below

- Giving detailed values of Function- $\xi(\omega)$ of particles $e^-, \mu^-, \tau^- (e^+, \mu^+, \tau^+)$ below

$\xi \quad (\quad \xi_1, \quad \xi_2 \quad \xi_3 \quad)$ (2.5)

• 3 $\xi(\tau^-) = (+237.323\ 445\ 434400, \quad +237.323\ 445\ 434400, \quad -474.646\ 890\ 868800)$ (2.8)

• 3 $\xi(\tau^+) = (+231.744\ 670\ 848706, \quad +231.744\ 670\ 848706, \quad -463.489\ 341\ 697412)$ (2.8̃)

• 2 $\xi(\mu^-) = (+238.469\ 128\ 788085, \quad +238.469\ 128\ 788085, \quad -476.938\ 257\ 576170)$ (2.7)

• 2 $\xi(\mu^+) = (+236.468\ 532\ 294544, \quad +236.468\ 532\ 294544, \quad -472.937\ 064\ 589088)$ (2.7̃)

• 1 $\xi(e^-) = (+238.541\ 052\ 240755, \quad +238.541\ 052\ 240755, \quad -477.082\ 104\ 481510)$ (2.6)

• 1 $\xi(e^+) = (+236.541\ 064\ 055935, \quad +236.541\ 064\ 055935, \quad -473.082\ 128\ 111870)$ (2.6̃)

The charges of Function- $\xi(\omega)$ of particles $e^-, \mu^-, \tau^- (e^+, \mu^+, \tau^+)$ are zero

$\xi = \frac{1}{3} (\xi_1 + \xi_2 + \xi_3) = 0$ (2.9)

Expressions of the color scalar products of the above **0, 1, 2, 3** are given below

• **3** $\xi^2(\tau^-) = 337,934.506\ 517\ 1276$ (2.13)

• **3** $\xi^2(\tau^+) = 322,233.554\ 800\ 6506$ (2.13̃)

• **2** $\xi^2(\mu^-) = 341,205.152\ 309\ 6898$ (2.12)

• **2** $\xi^2(\mu^+) = 335,504.200\ 593\ 2148$ (2.12̃)

• **1** $\xi^2(e^-) = 341,411.001\ 624\ 7596$ (2.11)

• **1** $\xi^2(e^+) = 335,710.049\ 908\ 2840$ (2.11̃)

• **0** $\mathbf{Q}^2(\beta(0), \xi) = 341,412.001\ 624\ 7596$ (2.10)

• **0** $\mathbf{Q}^2(\bar{\beta}(0), \xi) = 335,711.049\ 908\ 2840$ (2.10̃)



Finally making subtraction, using **ScalarProduct-Mass Equation** (0.26): The masses of three Dirac charged leptons e^-, μ^-, τ^- (e^+, μ^+, τ^+) are obtained by using a common color scalar product $\mathbf{Q}^2(\beta(0), \xi)$ of Function-Q of particle $\beta(0)$ and color scalar product $\xi^2(e^-), \xi^2(\mu^-), \xi^2(\tau^-)$ ($\xi^2(e^+), \xi^2(\mu^+), \xi^2(\tau^+)$) of Function- ξ of particles e^-, μ^-, τ^- (e^+, μ^+, τ^+), their own. Yieldng

$$\bullet \mathbf{3} \quad \mathbf{Q}^2(\beta(0), \xi) - \xi^2(\tau^-) = 341,412.001\ 624\ 7596 - 337,934.506\ 517\ 1276 = 3477.495\ 107\ 6320 = \frac{1,777.000\ 000\ 0009}{0.511} \quad (2.16)$$

$$\bullet \mathbf{3} \quad \mathbf{Q}^2(\bar{\beta}(0), \xi) - \xi^2(\tau^+) = 335,711.049\ 908\ 2840 - 322,233.554\ 800\ 6506 = 3477.495\ 107\ 6334 = \frac{1,777.000\ 000\ 0007}{0.511} \quad (2.\tilde{16})$$

$$\bullet \mathbf{2} \quad \mathbf{Q}^2(\beta(0), \xi) - \xi^2(\mu^-) = 341,412.001\ 624\ 7596 - 341,205.152\ 309\ 6898 = 206.849\ 315\ 0698 = \frac{105.700\ 000\ 0007}{0.511} \quad (2.15)$$

$$\bullet \mathbf{2} \quad \mathbf{Q}^2(\bar{\beta}(0), \xi) - \xi^2(\mu^+) = 335,711.049\ 908\ 2840 - 335,504.200\ 593\ 2148 = 206.849\ 315\ 0692 = \frac{105.700\ 000\ 0004}{0.511} \quad (2.\tilde{15})$$

$$\bullet \mathbf{1} \quad \mathbf{Q}^2(\beta(0), \xi) - \xi^2(e^-) = 341,412.001\ 624\ 7596 - 341,411.001\ 624\ 7596 = 1.000\ 000\ 0000 = \frac{0.511\ 000\ 0000}{0.511} \quad (2.14)$$

$$\bullet \mathbf{1} \quad \mathbf{Q}^2(\bar{\beta}(0), \xi) - \xi^2(e^+) = 335,711.049\ 908\ 2840 - 335,710.049\ 908\ 2840 = 1.000\ 000\ 0000 = \frac{0.511\ 000\ 0000}{0.511} \quad (2.\tilde{14})$$

Just like each of three Dirac charged leptons e^-, μ^-, τ^- (e^+, μ^+, τ^+) are attached their Function- ξ , $\xi(e^-), \xi(\mu^-), \xi(\tau^-)$ ($\xi(e^+), \xi(\mu^+), \xi(\tau^+)$); particle $\beta(0)$ or ($\bar{\beta}(0)$) is attached a Function- ξ of its own, (2.17) (2.18) too below

$$\bullet \mathbf{0} \quad \xi(\beta(0)) = (+238.541\ 401\ 5863770, \ +238.541\ 401\ 5863770, \ -477.082\ 803\ 1727540) \quad (2.17)$$

$$\bullet \mathbf{0} \quad \xi(\bar{\beta}(0)) = (+236.541\ 416\ 3553197, \ +236.541\ 416\ 3553197, \ -473.082\ 832\ 7106394) \quad (2.18)$$

The color scalar product of (2.17) and (2.18) are given as

$$\bullet \mathbf{0} \quad \xi^2(\beta(0)) = 341,412.001\ 624\ 7592 \quad (2.19)$$

$$\bullet \mathbf{0} \quad \xi^2(\bar{\beta}(0)) = 335,711.049\ 908\ 2842 \quad (2.1\tilde{9})$$

Again using (2.10) and (2.1\tilde{0})

$$\bullet \mathbf{0} \quad \mathbf{Q}^2(\beta(0), \xi) = 341,412.001\ 624\ 7596 \quad (2.10)$$

$$\bullet \mathbf{0} \quad \mathbf{Q}^2(\bar{\beta}(0), \xi) = 335,711.049\ 908\ 2840 \quad (2.1\tilde{0})$$

Base on **ScalarProduct-Mass Equation** (0.26), using the above results (2.19) (2.1\tilde{9}) and (2.10) (1.1\tilde{0}), then having the masses of particle $\beta(0)$ $\bar{\beta}(0)$ below

$$\bullet \mathbf{0} \quad \mathbf{Q}^2(\beta(0), \xi) - \xi^2(\beta(0)) = 341,412.001\ 624\ 7596 - 341,412.001\ 624\ 7592 = +0.000\ 000\ 0004 = \frac{0.000\ 000\ 0002}{0.511} \approx 0 \quad (2.20)$$

$$\bullet \mathbf{0} \quad \mathbf{Q}^2(\bar{\beta}(0), \xi) - \xi^2(\bar{\beta}(0)) = 335,711.049\ 908\ 2840 - 335,711.049\ 908\ 2842 = -0.000\ 000\ 0002 = \frac{0.000\ 000\ 0001}{0.511} \approx 0 \quad (2.21)$$

We see particles $\beta(0)$ $\bar{\beta}(0)$ are zero-mass particles.

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Part C Unified mass theory of three Dirac Charged Quarks $d, s, b (\bar{d}, \bar{s}, \bar{b})$.

◆ From Table 1 and Table 2, we extract charged quarks $\omega = q^-$ to obtain Table 8 below

Table 8: Mass $M(q^-)$ and Color Scalar Product $\mathbf{Q}^2(q^-)$ of charged quarks q^-

Ground State	1st	2nd	3rd
	d	s	b
<i>Mev</i>	4.8	95.0	4700.0
	$\mathbf{Q}^2(d), \mathbf{Q}^2(\bar{d})$	$\mathbf{Q}^2(s), \mathbf{Q}^2(\bar{s})$	$\mathbf{Q}^2(b), \mathbf{Q}^2(\bar{b})$
\mathbf{Q}^2	9.393 346 3796	185.909 980 4305	9197.651 663 4051

What's the relationship between the above three Dirac charged quarks $d, s, b (\bar{d}, \bar{s}, \bar{b})$?

◆ From Table 0, We extract $\omega = \gamma(0), d, s, b$ to obtain Table 9 below, and search for masses of ω following

Table 9: Mass $M(q^-)$ and Color Scalar Product $\mathbf{Q}^2(q^-)$ of charged quarks q^-

Neutral Lepton	0th	1st	2nd	3rd	
	$\gamma(0)$	d	s	b	$-\frac{1}{3}e$
	$(\mathbf{Q}(\gamma(0), \xi), \xi(\gamma(0)))$	$(\mathbf{Q}(\gamma(0), \xi), \xi(d))$	$(\mathbf{Q}(\gamma(0), \xi), \xi(s))$	$(\mathbf{Q}(\gamma(0), \xi), \xi(b))$	$Q(\omega)$
	0	1	2	3	

- Giving detailed values of Function- \mathbf{Q} of particle $\gamma(0)$ and anti-particle $\bar{\gamma}(0)$ below

• 0 $Q(\gamma(0), \xi) = (+236.539\ 654\ 85315, +238.539\ 654\ 85315, -476.079\ 309\ 70630)$ (3.1)

• 0 $Q(\bar{\gamma}(0), \xi) = (+238.539\ 654\ 85315, +236.539\ 654\ 85315, -474.079\ 309\ 70630)$ (3.2)

The charges of $\gamma(0)$ and $\bar{\gamma}(0)$ are $-\frac{1}{3}e$ and $+\frac{1}{3}e$

• 0 $Q(\gamma(0), \xi) = \frac{1}{3} (+236.539\ 654\ 85315 + 238.539\ 654\ 85315 - 476.079\ 309\ 70630) = -\frac{1}{3}e$ (3.3)

• 0 $Q(\bar{\gamma}(0), \xi) = \frac{1}{3} (+238.539\ 654\ 85315 + 236.539\ 654\ 85315 - 474.079\ 309\ 70630) = +\frac{1}{3}e$ (3.4)

AND below

- Giving detailed values of Function- $\xi(\omega)$ of particles $d, s, b (\bar{d}, \bar{s}, \bar{b})$ below

$$\xi \quad (\quad \xi_1, \quad \xi_2 \quad \xi_3 \quad) \quad (3.5)$$

• 3 $\xi(b) = (+234.629\ 506\ 78411, +234.629\ 506\ 78411, -469.259\ 013\ 56822)$ (3.8)

• 3 $\xi(\bar{b}) = (+233.953\ 597\ 77950, +233.953\ 597\ 77950, -467.907\ 195\ 55900)$ (3.8̃)

• 2 $\xi(s) = (+237.808\ 667\ 63202, +237.808\ 667\ 63202, -475.617\ 335\ 26404)$ (3.7)

• 2 $\xi(\bar{s}) = (+237.141\ 820\ 14380, +237.141\ 820\ 14380, -474.283\ 640\ 28760)$ (3.7̃)

• 1 $\xi(d) = (+237.870\ 514\ 86035, +237.870\ 514\ 86035, -475.741\ 029\ 72070)$ (3.6)

• 1 $\xi(\bar{d}) = (+237.203\ 841\ 24234, +237.203\ 841\ 24234, -474.407\ 682\ 48468)$ (3.6̃)

The charges of Function- $\xi(\omega)$ of particles $d, s, b (\bar{d}, \bar{s}, \bar{b})$ are zero

$$\xi = \frac{1}{3} (\xi_1 + \xi_2 + \xi_3) = 0 \quad (3.9)$$



Expressions of the color scalar products of the above **0, 1, 2, 3** are given below

$$\bullet \mathbf{3} \quad \xi^2(b) = 330,306.032\ 722\ 5282 \quad (3.13)$$

$$\bullet \mathbf{3} \quad \xi^2(\bar{b}) = 328,405.715\ 483\ 8326 \quad (3.1\tilde{3})$$

$$\bullet \mathbf{2} \quad \xi^2(s) = 339,317.774\ 405\ 4996 \quad (3.12)$$

$$\bullet \mathbf{2} \quad \xi^2(\bar{s}) = 337,417.457\ 166\ 6864 \quad (3.1\tilde{2})$$

$$\bullet \mathbf{1} \quad \xi^2(d) = 339,494.291\ 039\ 5680 \quad (3.11)$$

$$\bullet \mathbf{1} \quad \xi^2(\bar{d}) = 337,593.973\ 800\ 7272 \quad (3.1\tilde{1})$$

$$\bullet \mathbf{0} \quad \mathbf{Q}^2(\gamma(0), \xi) = 339,503.684\ 385\ 9344 \quad (3.10)$$

$$\bullet \mathbf{0} \quad \mathbf{Q}^2(\bar{\gamma}(0), \xi) = 337,603.367\ 147\ 1092 \quad (3.1\tilde{0})$$



Finally making subtraction, using **ScalarProduct-Mass Equation** (0.26): The masses of three Dirac charged quarks d, s, b ($\bar{d}, \bar{s}, \bar{b}$) are obtained by using a common color scalar product $\mathbf{Q}^2(\gamma(0), \xi)$ of Function- \mathbf{Q} of particle $\gamma(0)$ and color scalar product $\xi^2(d), \xi^2(s), \xi^2(b)$ ($\xi^2(\bar{d}), \xi^2(\bar{s}), \xi^2(\bar{b})$) of Function- ξ of particles d, s, b ($\bar{d}, \bar{s}, \bar{b}$), their own. Yieldng

$$\bullet \mathbf{3} \quad \mathbf{Q}^2(\gamma(0), \xi) - \xi^2(b) = 339,503.684\ 385\ 9344 - 330,306.032\ 722\ 5282 = 9197.651\ 663\ 4062 = \frac{4700.000\ 000\ 0006}{0.511} \quad (3.16)$$

$$\bullet \mathbf{3} \quad \mathbf{Q}^2(\bar{\gamma}(0), \xi) - \xi^2(\bar{b}) = 337,603.367\ 147\ 1092 - 328,405.715\ 483\ 8326 = 9197.651\ 663\ 2766 = \frac{4699.999\ 999\ 9343}{0.511} \quad (3.1\tilde{6})$$

$$\bullet \mathbf{2} \quad \mathbf{Q}^2(\gamma(0), \xi) - \xi^2(s) = 339,503.684\ 385\ 9344 - 339,317.774\ 405\ 4996 = 185.909\ 980\ 4348 = \frac{95.000\ 000\ 0022}{0.511} \quad (3.15)$$

$$\bullet \mathbf{2} \quad \mathbf{Q}^2(\bar{\gamma}(0), \xi) - \xi^2(\bar{s}) = 337,603.367\ 147\ 1092 - 337,417.457\ 166\ 6864 = 185.909\ 980\ 4228 = \frac{94.999\ 999\ 9961}{0.511} \quad (3.1\tilde{5})$$

$$\bullet \mathbf{1} \quad \mathbf{Q}^2(\gamma(0), \xi) - \xi^2(d) = 339,503.684\ 385\ 9344 - 339,494.291\ 039\ 5680 = 9.393\ 346\ 3664 = \frac{4.799\ 999\ 9932}{0.511} \quad (3.14)$$

$$\bullet \mathbf{1} \quad \mathbf{Q}^2(\bar{\gamma}(0), \xi) - \xi^2(\bar{d}) = 337,603.367\ 147\ 1092 - 337,593.973\ 800\ 7272 = 9.393\ 346\ 3820 = \frac{4.800\ 000\ 0012}{0.511} \quad (3.1\tilde{4})$$

Just like each of three Dirac charged quarks d, s, b ($\bar{d}, \bar{s}, \bar{b}$) are attached their Function- ξ , $\xi(d), \xi(s), \xi(b)$ ($\xi(\bar{d}), \xi(\bar{s}), \xi(\bar{b})$); particle $\gamma(0)$ or ($\bar{\gamma}(0)$) is attached a Function- ξ of its own, $\xi(\gamma(0))$ and $\xi(\bar{\gamma}(0))$ (3.17) (3.18) too below

Part D Unified mass theory of three Dirac Charged Quarks $u, c, t (\bar{u}, \bar{c}, \bar{t})$.

◆ From Table 1 and Table 2, we extract charged quarks $\omega = q^+$ to obtain Table 10 below

Table 10: Mass $M(q^+)$ and Color Scalar Product $Q^2(q^+)$ of charged quarks q^+

Ground State	1st	2nd	3rd
	u	c	t
<i>Mev</i>	2.3	1280.0	173000.0
	$Q^2(u), Q^2(\bar{u})$	$Q^2(c), Q^2(\bar{c})$	$Q^2(t), Q^2(\bar{t})$
Q^2	4.500 978 4736	2504.892 367 9061	338551.859 099 8043

What's the relationship between the above three Dirac charged quarks $u, c, t (\bar{u}, \bar{c}, \bar{t})$?

◆ From Table 0, We extract $\omega = \delta(0), u, c, t$ to obtain Table 11 below, and search for masses of ω following

Table 11: Mass $M(q^+)$ and Color Scalar Product $Q^2(q^+)$ of charged quarks q^+

Neutral Lepton	0th	1st	2nd	3rd	
	$\delta(0)$	u	c	t	$+\frac{2}{3}e$
	$(Q(\delta(0), \xi), \xi(\delta(0)))$	$(Q(\delta(0), \xi), \xi(u))$	$(Q(\delta(0), \xi), \xi(c))$	$(Q(\delta(0), \xi), \xi(t))$	$Q(\omega)$
	0	1	2	3	

- Giving detailed values of Function-Q of particle $\delta(0)$ and anti-particle $\bar{\delta}(0)$ below

• 0 $\mathbf{Q}(\delta(0), \xi) = (+236.539\ 654\ 85315, +238.539\ 654\ 85315, -473.079\ 309\ 70630)$ (4.1)

• 0 $\mathbf{Q}(\bar{\delta}(0), \xi) = (+238.539\ 654\ 85315, +236.539\ 654\ 85315, -477.079\ 309\ 70630)$ (4.2)

The charges of $\delta(0)$ and $\bar{\delta}(0)$ are $+\frac{2}{3}e$ and $-\frac{2}{3}e$

• 0 $Q(\delta(0), \xi) = \frac{1}{3} (+236.539\ 654\ 85315 + 238.539\ 654\ 85315 - 473.079\ 309\ 70630) = +\frac{2}{3}e$ (4.3)

• 0 $Q(\bar{\delta}(0), \xi) = \frac{1}{3} (+238.539\ 654\ 85315 + 236.539\ 654\ 85315 - 477.079\ 309\ 70630) = -\frac{2}{3}e$ (4.4)

AND below

- Giving detailed values of Function- $\xi(\omega)$ of particles $u, c, t (\bar{u}, \bar{c}, \bar{t})$ below

$$\xi = (\xi_1, \xi_2, \xi_3) \tag{4.5}$$

• 3 $\xi(t) = (+0.000\ 000\ 0000, +0.000\ 000\ 0000, -0.000\ 000\ 0000)$ (4.8)

• 3 $\xi(\bar{t}) = (+18.040\ 896\ 8753, +18.040\ 896\ 8753, -36.081\ 793\ 7506)$ (4.8̃)

• 2 $\xi(c) = (+236.008\ 183\ 4791, +236.008\ 183\ 4791, -472.016\ 366\ 9582)$ (4.7)

• 2 $\xi(\bar{c}) = (+237.346\ 375\ 0486, +237.346\ 375\ 0486, -474.692\ 750\ 0972)$ (4.7̃)

• 1 $\xi(u) = (+236.889\ 414\ 2155, +236.889\ 414\ 2155, -473.778\ 828\ 4310)$ (4.6)

• 1 $\xi(\bar{u}) = (+238.222\ 655\ 6123, +238.222\ 655\ 6123, -476.445\ 311\ 2246)$ (4.6̃)

The charges of Function- $\xi(\omega)$ of particles $u, c, t (\bar{u}, \bar{c}, \bar{t})$ are zero

$$\xi = \frac{1}{3} (\xi_1 + \xi_2 + \xi_3) = 0 \tag{4.9}$$

Expressions of the color scalar products of the above **0, 1, 2, 3** are given below

• **3** $\xi^2(t) = 0.000\ 000\ 0000$ (4.13)

• **3** $\xi^2(\tilde{t}) = 1952.843\ 760\ 3962$ (4.13̃)

• **2** $\xi^2(c) = 334199.176\ 014\ 6441$ (4.12)

• **2** $\xi^2(\bar{c}) = 337999.810\ 492\ 2944$ (4.12̃)

• **1** $\xi^2(u) = 336699.567\ 404\ 0766$ (4.11)

• **1** $\xi^2(\bar{u}) = 340500.201\ 881\ 7269$ (4.11̃)

• **0** $\mathbf{Q}^2(\delta(0), \xi) = 336,704.068\ 382\ 5502$ (4.10)

• **0** $\mathbf{Q}^2(\bar{\delta}(0), \xi) = 340,504.702\ 860\ 2005$ (4.10̃)



Finally making subtraction, using **ScalarProduct-Mass Equation (0.26)**: The masses of three Dirac charged quarks u, c, t ($\bar{u}, \bar{c}, \bar{t}$) are obtained by using a common color scalar product $\mathbf{Q}^2(\delta(0), \xi)$ of Function- \mathbf{Q} of particle $\delta(0)$ and color scalar product $\xi^2(u), \xi^2(c), \xi^2(t)$ ($\xi^2(\bar{u}), \xi^2(\bar{c}), \xi^2(\bar{t})$) of Function- ξ of particles u, c, t ($\bar{u}, \bar{c}, \bar{t}$), their own. Yieldng

$$\bullet \mathbf{3} \quad \mathbf{Q}^2(\delta(0), \xi) - \xi^2(t) = 336,704.068\,382\,5502 - 0.000\,000\,0000 = 336,704.068\,382\,5502 = \frac{172055.778\,943\,4832}{0.511} \quad (4.16)$$

$$\bullet \mathbf{3} \quad \mathbf{Q}^2(\bar{\delta}(0), \xi) - \xi^2(\bar{t}) = 340,504.702\,860\,2005 - 1,952.843\,760\,3962 = 338,551.859\,099\,8043 = \frac{173000.000\,000\,0000}{0.511} \quad (4.1\tilde{6})$$

$$\bullet \mathbf{2} \quad \mathbf{Q}^2(\delta(0), \xi) - \xi^2(c) = 336,704.068\,382\,5502 - 334,199.176\,014\,6441 = 2,504.892\,367\,9061 = \frac{1280.000\,000\,0000}{0.511} \quad (4.15)$$

$$\bullet \mathbf{2} \quad \mathbf{Q}^2(\bar{\delta}(0), \xi) - \xi^2(\bar{c}) = 340,504.702\,860\,2005 - 337,999.810\,492\,2944 = 2,504.892\,367\,9061 = \frac{1280.000\,000\,0000}{0.511} \quad (4.1\tilde{5})$$

$$\bullet \mathbf{1} \quad \mathbf{Q}^2(\delta(0), \xi) - \xi^2(u) = 336,704.068\,382\,5502 - 336,699.567\,404\,0766 = 4.500\,978\,4736 = \frac{2.3\,000\,000\,0000}{0.511} \quad (4.14)$$

$$\bullet \mathbf{1} \quad \mathbf{Q}^2(\bar{\delta}(0), \xi) - \xi^2(\bar{u}) = 340,504.702\,860\,2005 - 340,500.201\,881\,7269 = 4.500\,978\,4736 = \frac{2.3\,000\,000\,0000}{0.511} \quad (4.1\tilde{4})$$

Just like each of three Dirac charged quarks u, c, t ($\bar{u}, \bar{c}, \bar{t}$) are attached their Function- ξ , $\xi(u), \xi(c), \xi(t)$ ($\xi(\bar{u}), \xi(\bar{c}), \xi(\bar{t})$); particle $\delta(0)$ or ($\bar{\delta}(0)$) is attached a Function- ξ of its own, $\xi(\delta(0))$ and $\xi(\bar{\delta}(0))$ (4.17) (4.18) too below

$$\bullet \mathbf{0} \quad \xi(\delta(0)) = (+237.873\ 805\ 614775, \quad +237.873\ 805\ 614775, \quad -475.747\ 611\ 229550) \quad (4.17)$$

$$\bullet \mathbf{0} \quad \xi(\bar{\delta}(0)) = (+237.207\ 141\ 245477, \quad +237.207\ 141\ 245477, \quad -474.414\ 282\ 490954) \quad (4.18)$$

The color scalar product of (4.17) and (4.18) are given as

$$\bullet \mathbf{0} \quad \xi^2(\delta(0)) = 336,704.068\ 382\ 5512 \quad (4.19)$$

$$\bullet \mathbf{0} \quad \xi^2(\bar{\delta}(0)) = 340,504.702\ 860\ 1998 \quad (4.\widetilde{19})$$

Again using (3.10) and (3. $\widetilde{10}$)

$$\bullet \mathbf{0} \quad \mathbf{Q}^2(\gamma(0), \xi) = 336,704.068\ 382\ 5502 \quad (4.10)$$

$$\bullet \mathbf{0} \quad \mathbf{Q}^2(\bar{\gamma}(0), \xi) = 340,504.702\ 860\ 2005 \quad (4.\widetilde{10})$$

Base on **ScalarProduct-Mass Equation** (0.26), using the above results (4.19) (4. $\widetilde{19}$) and (4.10) (4. $\widetilde{10}$), then having the masses of particle $\delta(0)$ $\bar{\delta}(0)$ below

$$\bullet \mathbf{0} \quad \mathbf{Q}^2(\delta(0), \xi) - \xi^2(\delta(0)) = 336,704.068\ 382\ 5502 - 336,704.068\ 382\ 5512 = -0.000\ 000\ 0010 = \frac{-0.000\ 000\ 0002}{M(e^-)} \approx 0 \quad (4.20)$$

$$\bullet \mathbf{0} \quad \mathbf{Q}^2(\bar{\delta}(0), \xi) - \xi^2(\bar{\delta}(0)) = 340,504.702\ 860\ 2005 - 340,504.702\ 860\ 1998 = +0.000\ 000\ 0007 = \frac{-0.000\ 000\ 0014}{M(e^-)} \approx 0 \quad (4.21)$$

We see particles $\delta(0)$ $\bar{\delta}(0)$ are zero-mass particles.

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DISCUSSION AND FORUM [3], [4], [5], [6], [7], [8], [9]

■ The essential of Mass Principle in fact is the charge interaction, the process of origin of particle's mass, the process of from " Non-Mass State " to " Mass State ".

Mass Principle carries Mass Genes and results in Non-Zero-Mass particle, Dirac Particles of Standard Model.

In Standard Model of Gauge Field, all the fermions are massless particles. The masses of fermions are given by Higgs mechanism:

We could use Higgs doublet Φ and Higgs field $h(x)$, which are related to the excitations of vacuum associated with the Higgs boson, to discuss the mass origin of particles in SM.

Then we rely on the "single mass term" of Higgs particle to attach "mass effect" to create mass terms for the massless fermions in SM supported by Gauge Theory. Actually, all what people have done is a process of from a mass term to many mass terms, that is, From Something to Everything. We can't stop thinking how the mass of Higgs particle came from ?

Higgs particle is something, an experimental value collided at CERN (LHC; ATLAS, CMS), it is a great victory in particle physics. By the way, the expression (0.15) may imply the origin of the mass of boson Higgs particle H, strictly speaking [2], boson heaven particle Π ?

■ Base on Part A, B, C, D, the family members $\alpha(0)$, $\beta(0)$, $\gamma(0)$, $\delta(0)$ of The Zeroth Generation Zth of Fermion could explain the ties of blood of Dirac Particles: NOT ONLY could attach mass to the twelve fermions as Mass Principle does in paragraph **Introduction**, BUT ALSO, at the same time, could offer a unified mass description of fermion that with the same charge Q .

Particles $\alpha(0)$, $\beta(0)$, $\gamma(0)$, $\delta(0)$ are zero-mass particles, zero-mass means nothing like all empties, they are nothing at all, to our surprise, they could offer "mass effect". This phenomena impacts our knowledge of physical world: To our surprise, we could from empty masses of Zero-Mass particles $\alpha(0)$, $\beta(0)$, $\gamma(0)$, $\delta(0)$, From Nothing to Everything to construct a real object world.

Are the Zero-Mass particles ($\alpha(0)$, $\beta(0)$, $\gamma(0)$, $\delta(0)$), physical particles, or Math particles ?

They are massless particles, they motion at light speed, we have never observed charged fermion particles that motion at light speed, As for neutral fermion, a little bit of difference: Majorana Neutrino Particle at light speed, so $\alpha(0)$ may be Majorana Particle, may be a physical particle.

If Majorana Particle, or neutral lepton $\alpha(0)$ existed objectively, the symmetrical patterns of Zh generation in Table 0, would by means of Charge-Transition (0.16) (0.17), (0.18) (0.19), (0.20) (0.21) to lead the charged leptons $\beta(0)$, $\gamma(0)$, $\delta(0)$ to be existed objectively too !?

■ Fermion particles that with the same charge are attributed to *IDENTICAL PARTICLES*. ??

" Especially of $\omega = \text{Neutrinos } \nu_e, \nu_\mu, \nu_\tau$ are attributed to be the Three Identical Dirac Particles that with the same charge $0e$, Rather than to be three different Dirac fermion particles, each one possesses its own mass. " ?

Base on Pauli Exclusion Principle, elementary fermions are catalogued under Table 0 by using two functions, Function- $\mathbf{Q}(\omega, \xi)$ and Function- $\xi(\omega)$, Which seems to be two more beautiful colorful quantum numbers, rather than by using one lonely mass variate $m(\omega)$.

Of Course, " IDENTICAL PARTICLES " is not the Prerequisite Condition for Table 0

The observational phenomena of neutrinos possessing mass, of Non-Zero-Mass particles, are explained by Neutrino Flavor Oscillations. Unlucky, this oscillation theory could not give the absolute values of neutrinos, less than a unified mass theory of the three neutrino masses.

BUT, In contrast with the expressions (1.14),(1.15),(1.16) (**Part A**), the masses of ν_e, ν_μ, ν_τ ($\bar{\nu}_e, \bar{\nu}_\mu, \bar{\nu}_\tau$) could " by means of From Nothing to Everything", be obtained directly, by a viod Zero-Mass particle $\alpha(0)$! of The Zeroth of Generation Zh of Fermion, this paper titled.

A graceful theory always is founded on an unacceptable, utterly absurd presupposition.

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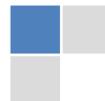
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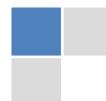
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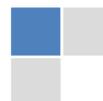
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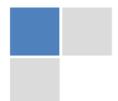
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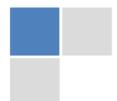
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13. Use good grammar: Always use good grammar and words that will have a positive impact on the evaluator; use of good vocabulary does not mean using tough words which the evaluator has to find in a dictionary. Do not fragment sentences. Eliminate one-word sentences. Do not ever use a big word when a smaller one would suffice.

Verbs have to be in agreement with their subjects. In a research paper, do not start sentences with conjunctions or finish them with prepositions. When writing formally, it is advisable to never split an infinitive because someone will (wrongly) complain. Avoid clichés like a disease. Always shun irritating alliteration. Use language which is simple and straightforward. Put together a neat summary.

14. Arrangement of information: Each section of the main body should start with an opening sentence, and there should be a changeover at the end of the section. Give only valid and powerful arguments for your topic. You may also maintain your arguments with records.

15. Never start at the last minute: Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

16. Multitasking in research is not good: Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

17. Never copy others' work: Never copy others' work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

18. Go to seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.

19. Refresh your mind after intervals: Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.



20. Think technically: Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.

21. Adding unnecessary information: Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

22. Report concluded results: Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

23. Upon conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium through which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

INFORMAL GUIDELINES OF RESEARCH PAPER WRITING

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

Final points:

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

The introduction: This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

The discussion section:

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear: Adhere to recommended page limits.



Mistakes to avoid:

- Insertion of a title at the foot of a page with subsequent text on the next page.
- Separating a table, chart, or figure—confine each to a single page.
- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.
- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

Title page:

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract: This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

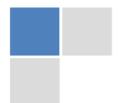
- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.



The following approach can create a valuable beginning:

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.

Approach:

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

Materials may be reported in part of a section or else they may be recognized along with your measures.

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

Approach:

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.



Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.

Content:

- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

What to stay away from:

- Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

Approach:

As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

Figures and tables:

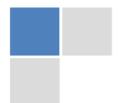
If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

Discussion:

The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."



Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

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BY GLOBAL JOURNALS

Please note that following table is only a Grading of "Paper Compilation" and not on "Performed/Stated Research" whose grading solely depends on Individual Assigned Peer Reviewer and Editorial Board Member. These can be available only on request and after decision of Paper. This report will be the property of Global Journals.

Topics	Grades		
	A-B	C-D	E-F
<i>Abstract</i>	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
<i>Introduction</i>	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
<i>Methods and Procedures</i>	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
<i>Result</i>	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
<i>Discussion</i>	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
<i>References</i>	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring



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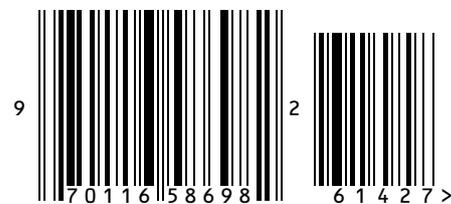
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