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A Reality-Based Approach to the Unification of Sciences through Micro-Micro Domain Physics

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Abstract

Our understanding is shaped by our objective. If the goal is merely to reproduce atomic spectra, one may adopt a model without concern for its physical reality. However, if the objective is to explain atomic spectra while preserving common-sense reasoning and cause-and-effect logic, a different, more realistic view of atomic structure emerges. Such an approach promotes harmony among different sciences in their pursuit of nature's truth. The author is pursuing such a new unified science with a common basic assumption for different sciences. In this new concept, mass and space are the only basic physical constituents of the universe and its components in different domains. There exists mass-space interaction, thus, matter of any domain in any state is essentially a mass-space integral system. Any system of the universe has structure composed of matters of finer domain and the said system is also a constituent of higher domain where it takes part in the structural integrity of the system of the higher domain by the same mass-space interaction. In this way the entire universe remains integrated by mass-space interactions. Mass or space alone doesn't have a form but when mass and space are integrated by mass-space interaction, definite objects are formed having shape, size, dimensions, with definite ratio of mass and space. The universal mass-space interaction gives rise to the form-based/ system-based/ object-based interaction property of matter with involvement of geometry. The existence of matter in the macro domain (stars, planets, satellites and other objects observable to the naked eye) and in the micro domain (atoms, molecules and sub-atomic particles) is well known. However, we remain largely unaware of a finer "micro-micro" domain (one level below the micro domain). In a larger-scale unit system, the size and mass of smaller constituents become insignificant (≈ zero); atomic and sub-atomic particles are negligible in macro-scale units, and stars and planets are negligible in galactic-scale units. Likewise, in the micro domain scale, the size and mass of light particles become insignificant (≈ zero). Hence, in present understanding, light is often treated as a point particle without mass.

The present author considers galaxies as macro-macro domain objects and light particles as micro-micro domain objects. Galaxies are composed of stars, and stars and sub-stellar bodies are composed of atomic and sub-atomic particles. By analogy with the structure of celestial bodies, atomic and sub-atomic particles may be conceptualized as constituted of micro-micro domain particles. In any domain, bodies are ultimately constituted of mass and space; therefore, mass–space interaction is present in all domains. This basic, formless mass–space interaction is viewed as the unchangeable

supreme reality of nature (Brahman in the Vedic concept). While this formless interaction is universal, the form-based interaction properties vary from object to object.

Form-based properties arise from the formless interaction of mass and space together with geometrical parameters. Hence, properties such as density of mass, density of space, charge and charge potential, and energy and energy potential (energy level) are expected to exist in matter across all domains with comparable significance. It is therefore necessary to consider the mass–space structures in each domain and to express domain-specific properties in a universal language using common universal entities. Since structural and functional properties depend on mass, space, and geometry, similarities of structure across domains are inevitable.

A micro-micro structural perspective can enrich classical physics in addressing micro-domain phenomena. The author has published several articles introducing these concepts in different issues of this journal. A comprehensive unified science is feasible, but it requires changes in existing concepts of micro-domain physics.

Key words: *Unification of sciences, Reality based approach, Macro-macro domain, Micro-micro domain, Mass-space interaction, Formless matter, Form-based properties, Consciousness-based science, Particle-particle interaction, Particle-field interaction, Field-field interaction.*

Introduction

Some scientist feels ‘nature need not be as complicated as scientists have thought it to be and may be, nature is simple and we are yet to understand the same’ [1]. Thought alone, without strong desire and action cannot lead to success in understanding the simplicity of nature. The macro existences are directly observable hence no model of the object or event is required to speculate the reality. The spiritual science developed by yogic practice and deep perception coupled with higher consciousness is also a kind of direct experience of the reality of nature and here also, no model is required for realization of truth. Scientists prepare models of objects and events for understanding the reality in unseen micro domains. The unbiased conscious minds of scientists motivate them to make models in the light of reality, experienced in the macro domain. The reality-based atomic model (planetary atomic model) failed to explain the atomic spectra, hence scientists made additions and alterations in the planetary model of atom to justify the spectra of atoms, thus making deviations from reality. One may wonder, why the reality-based model failed to explain the spectra of atoms! In fact, the so-made atomic model (planetary atomic model) overlooked many features of the solar system; hence the reality-based model was incomplete. It is quite natural that an incomplete atomic model cannot justify the complete atomic phenomena.

A macro system has many structural and functional aspects of reality. For example: the solar system has many aspects of reality such as 1) the solar system has a nucleus and an extra-nuclear structure comprising orbital planets; 2) the planets again have orbiting satellites; 3) the extra-nuclear space structure of sun, planets, satellites and asteroids contains space matter particles; 4) the planets are of different size having different mass and many more. Scientists attempted to make the planetary atomic model by considering only aspect-1 of the sun-planet system and ignored all other aspects. Despite the orbital planets in the solar system having different mass and size the electrons in the atomic model were considered identical. The presence of micro-domain space matter particles (atoms and molecules) in the extra-nuclear space structure of celestial bodies was not reflected in the planetary atomic model. It is absolutely necessary to consider the presence of finer particles (micro-micro domain particles such as, light particles) in the extra-nuclear space structure of the planetary atomic model. Hence, the planetary atomic model was not a complete model. When the incomplete planetary atomic model could not explain the spectra of atoms, the model was augmented mathematically by making unnatural hypotheses and axioms to explain the spectra of atoms which made deviations from the real atomic structure. No such hypotheses are found valid in other domains of nature for understanding the reality. If the planetary atomic model would have incorporated all structural features of solar system, then the atomic model could have been complete, in the light of reality and such a complete model could have explained all phenomena of atom in a natural manner and we would not have accepted the micro phenomena is different from macro phenomena. We have also accepted wave particle duality for light and electrons since the dual concept was needed to supplement the defective theory of light and the defective atomic model. According to this author, duality can never be the reality of nature; it is only a manmade concept to supplement the defective theory. Proper understanding of the micro-micro structure of light-particles (photon) and the fine micro-micro structure of vacuum medium has scope of understanding the different phenomena of light without entertaining duality. Similarly, the reality-based complete atomic model does not require the wave particle duality of electrons. Modern science has accepted many unnatural (impractical) concepts such as the existence of waves without a medium, angular momentum of the body without a torque transfer link, existence of mass-less particles, mass-less particles having momentum, etc. which doesn't appear comfortable to anyone. The micro domain science has accommodated many unrealistic assumptions for which science has deviated away from reality, thus keeping aside the commonsense knowledge and cause-to-effect analogy in micro domain physics. The reality based commonsense and the universal caused-to-effect analogy becomes misfit in micro domain physics due to unrealistic assumptions.

Discussion

Charge is a state property of matter

Charge without mass is not found in nature. Hence, the charge is a state property of matter. In present-day physics, **electric charge is a fundamental attribute**, not something built from smaller parts. Charge exists in a fundamental particle because the particle possesses an intrinsic, stable mode of interaction with space that manifests as electromagnetic attraction or repulsion. There is **no deeper internal structure** in the Standard Model that explains how charge is made; how charge exists; how algebraic addition is feasible for different types of charge; how the magnitude of charge is fixed; how charge is conserved. The fundamental particle carrying charge is considered as a point particle, hence there is no scope of understanding how charge appears from the structural features of charge bearing particles except assuming it to be an intrinsic property of matter.

In the new concept mass and space are the only basic constituents of the universe. There exists a mass-space interaction which gives rise to different form-based existences (objects). A definite object (mass-space integral system) has a definite ratio of mass and space which may be described as the extent of space holding per unit mass. If all matters in a locality have equilibrium space holding i.e. the space holding per unit of mass or mass content per unit of space is same for all matters, then they are neutral to one another. If a matter in a locality of neutral matters does not have equilibrium space holding then the said matter is an active matter in the local frame. The active matter may be termed as charged matter, where matter holding less space per unit of mass (mass rich matter) than its equilibrium value becomes positively charged and that holding more space per unit of mass (space rich matter) becomes negatively charged. The positive and negative charges correspond to different charge values in a relative scale because negative charge does not exist in the absolute scale. An equal amount of positive and negative charge neutralizes and makes neutral matter.

Neutralization of positive and negative charge is not feasible if the charges are of different types. On the other hand, justifying the attraction of dissimilar charge and repulsion of similar charge becomes a problem if the charges are of one type. The above controversy is required to be resolved. This author has shown elsewhere that charge is one type and charge interaction takes place only in a charge potential difference where justification of charge repulsion is not a problem in the new concept [2]. The zero charge potential of neutral matter is not zero in absolute scale. It is only the reference zero of the relative charge scale. Thus, a charge potential difference

exists between a charge particle and so-called neutral matter. Hence weaker charge interaction takes place between a charge particle and so-called neutral particle. However, much stronger charge interaction takes place between a positive charge and negative charge with higher charge potential difference. Every charge has a potential which refers to the degree of deficiency or surplus space holding per unit of matter with reference to the space holding of neutral matter per unit of mass. In the existing context we consider only charge value without a potential. The charge stored in a macro capacitor has both quantity of charge and the potential at which it is stored. Hence, every charge holding including the fundamental charge particle has a charge potential. In existing understanding only a fixed quantity of charge is assumed in fundamental particles without a reference to its potential. Hence, we failed to understand how two types of charges can be unified by relative charge potential value similar to temperature. The following paragraph explains how a negative charge becomes positive in a different frame of reference.

An x-particle having much lower absolute charge potential than that of conventional electrons becomes highly negatively charged. In a different charge relative scale, the conventional electrons would be found to carry positive charge where the x-particle in the same scale would be found to carry negative charge. Hence electrons can become a nucleus and form its extra-nuclear space structure with x-particles as its orbital particles. This is like the orbiting earth assuming the status of a nucleus where the moon is the orbital body.

The mathematical positive and negative charge characterizes only the magnitude of charge in a relative scale which is erroneously interpreted as two different types having different interactions such as dissimilar charge attracts and similar charge repeals. In reality, charge is only one type and charge interaction appears in a charge potential difference. The positively charged matter interacts with the negatively charged matter since there exists a less known potential difference. The positive and negative charges when combined, the product becomes neutral if the space holding per unit mass equal to that of neutral matter. Existence of charge without mass is not found in nature hence charge is only a state property of matter by virtue of its structural configuration of mass and space in finer domain. At present electrons are considered as point particles carrying fixed charge. The definition of electron refers to its external interaction pattern without discussing how charge appears in the point particle. All physical existences have a geometrical representation with dimension however small it may be. When you fail to conceptualize the dimensional features of a particle we make it a dimensionless point particle. Theoretically a point particle cannot hold any physical entity nor can have any associated property. A so-called point particle of any domain, in reality, has a structure which is revealed in finer domain scale. In the new concept the micro domain particles are constituted of micro-micro domain particles and not

constituted of finer micro domain particles [3]. This may be realized from the structure of a macro celestial body. A macro celestial body is constituted of micro particles (atoms) and not constituted of smaller celestial bodies (like asteroids). Hence, protons are realistically constituted of micro-micro domain particles and not constituted of quarks. The electron also constituted of micro-micro domain particles. The new mass-space structure of a particle having a nucleus and extra nuclear space structure is common to all centrally organized structures in different domains. Hence electrons and protons can have their structure and possess the structure base properties (charge potential and charge) which can be derived from mass-space configuration.

Significance of time

Time is not a physical entity. In a static universe time has no significance; however, time appears in a dynamic universe. Thus, a moving body has a dynamic state property (dynamism) that renders the significance of time. A more dynamic body takes less duration to reach the destination or complete a work function than the less dynamic body and vice versa. Hence, the dynamism ‘d’ of a body is inversely proportional to time ‘t’. Either ‘d’ or ‘t’ is enough for dynamics. The dynamic system and its dynamism (velocity) are observable but time is not observable hence time is fictitious. But we are used to the concept of time and there is no harm in using the same, however the real significance of time comes from dynamism [4]. The concept that time is a separate entity and it flows is not correct.

Understanding the significance of space time

According to the new concept, space itself is physical and compressible. Thus, physical space can have different space density (space content per unit volume). Space contains space-matter-particles in finer domains. The space matter particles remain suspended within space due to space-mass attraction. The number density of space matter particles is directly proportional to space density. Space with space matter particles forms the gaseous state of matter. The atmospheric air, hydrogen gas, oxygen gas etc. refers to space with atomic and molecular space matter particles. The name of a gas refers to the specific nature of the particles present in it. For example, hydrogen particles in a gaseous state form hydrogen gas, oxygen particles form oxygen gas, and free electrons in vacuum form electron gas. This author has anticipated that matter exists in micro-micro domain (one domain below micro domain). The micro-micro domain matter (light particles and the field forming particles) is yet to be accepted as matter with mass. In the space medium/vacuum medium the atomic and molecular particles are absent. However, in the new concept, space/vacuum contains micro-micro domain particles (light particles) as space matter particles. Thus, space or so-called vacuum can be logically called photon-gas/photonic-gas in the light of the nomenclature of hydrogen gas, nitrogen gas, electron gas etc. In any case, the photonic gas is

physical because space itself is physical in the new concept. Hence, in the new concept the motion of a gas is essentially the motion of the space medium with space matter particles like the motion of the liquid medium with suspended matter. Any physical medium can have independent motion or associative motion. The extra nuclear space structure (atmosphere) of the earth moves along with the earth in its orbital motion and rotate along with the rotation of the earth. Hence any space pocket within the extra-nuclear space structure of the earth has definite motion, thus having a dynamism or time as its state property. Because the velocity of the space medium within the extra-nuclear space structure of the earth varies spatially, it was possible to fuse space and time into a single frame. Thus, the physical significance of space-time refers to the moving space medium as the reality. The dynamics of the particle/body is influenced by the dynamic state of the space medium.

Formless and formless interaction and existence of matter in finer domain

Mass and space are the **only basic constituents** of the universe and all its components in different domains [5]. Hence **different forms (objects, systems) of the universe in different domains are composed of the same basic formless constituents (mass and space) of the universe with a common instinct of mass-space interactions that maintains the integrity of different components of the universe and the universe as a whole.** Even though the basic formless mass–space interaction remains the same for all events of nature in all domains, the form-based interactions of different particles, bodies and fields in different domains vary due to variations in the densities of mass and space integrated within the particle, body, or space-medium. While describing the object-based properties of any local object or event in any domain, we formulate a domain-based language involving local terminology, where the universal link is often ignored. This has promoted different domain-based sciences, such as macro-domain science and micro-domain science. All existences and events are real and natural with universal link where all models are artificial and studied in isolation without a boundary condition. For example, the lack of boundary conditions in the existing atomic model delinks the atoms from the rest of the universe. A model can be close to reality only if its assumptions are realistic and the boundary conditions are considered. An assumption becomes realistic only if it is feasible in real terms.

Realization of structural and functional uniformity in different domains

Mass and space are the basic constituents of the universe and its components in different domains [5] and charge is an active property of matter in a non-equilibrium

state of mass-space association [2]. Hence mass, space and charge are uniformly present in all domains of nature and we need to identify them for understanding the uniformity of nature. In relative charge scale the charge potential may become zero but in absolute scale it has absolute charge potential. Hence, charge exists in neutral matter on an absolute scale. The charge property of matter being a function of mass-space association, other forms of charge (non-electric charge) is feasible in matters of other domains. The evaluation of the non-electric charge state of finer domain matter is not feasible from their response to electric charge interaction. The domain-based understanding of nature masks the universal reality of nature. The domain free universal understanding is feasible by exploring the symmetry in the structure of matter in different domains. The cause of quantum phenomena in the micro domain and the cause of formation of fields in space lies with the science of micro-micro domain. Hence the unnatural complex micro domain physics can be simplified by exploring the reality in finer domains. Commonsense knowledge is natural (not acquired through models) and the cause-to-effect analogy is the most general inquiry for knowing the reality at every juncture, hence commonsense should have retained its stand in the microdomain physics. The above change of concept helps to achieve the objective of unification of sciences i.e. understanding the different aspects of nature in different domains without violating the uniformity of nature. All hurdles would disappear if we move with nature (do not violate the norms of nature). The comprehensive understanding of nature through unification of sciences becomes feasible if one is open to changes in the established concept of science.

Perception to new micro-micro domain matter helps classical physics in understanding micro phenomena

Vedic science has the insight into the basic reality of nature which is revealed from the significance of Brahman and defines Brahman as the supreme unchanging reality that pervades the universe and beyond. The term beyond universe can have two types of interpretation, 1) beyond the boundary of the physical structure of the universe; 2) finer domains beyond the known domains of the physical universe. The latter refers to the existence of matter in finer domains below micro domain, say micro-micro domain and below (spiritual domain). For a unified understanding of materials science and spiritual science, the spiritual science can be interpreted as the science of matter in micro-micro domain and below, where the matter value of these particles is non-detectable by the scientific instruments meant for characterization of micro particles. Modern science unduly considers them as massless particles without rest existence. This implies, matter exists in finer domains below the so-called lowest limit of matter in the micro domain. The matter value of micro-micro domain particles and below is not verifiable in science. But, the interactions of these fine particles in our brain system produces consciousness of mind. The consciousness-

based science is considered as the non-materials science, commonly abbreviated as spiritual science'. No such classification (materials science and spiritual science) exists in nature; they are only manmade.

Matter (mass-space integral system) can have different densities of mass and space in different forms (objects) in different domains where the form-based interaction (particle-particle interaction, field-particle interaction and field-field interaction) involving matters of different domains exhibit different strength and range of interaction. **Despite the variation of form-based interactions in different domains the basic formless interaction of mass and space remains as the supreme unchanging reality of nature.** Hence, similarity of structures and features of systems comprising mass and space in different domains is inevitable. This author has anticipated the common general feature of mass-space structure of centrally organized systems in all domains of nature. Vedas, Vedanta and Bhagavat Geeta also describe the complete similarity between microcosm and macrocosm implying similarity of structure and feature of systems in all domains of nature. We also notice similarities of structure among the galactic system, solar system, planet system and asteroid system in having nucleus, extra-nuclear structure and presence of space matter particles in the extra-nuclear structure. Even after the discovery of the nucleus of an atom, the atomic structure could not be modelled properly by replicating all structural features of the solar system mainly because many solar features were not known then. Thus, the vital extra-nuclear space structure with space matter particles could not be included in the atomic model due to lack of perception of the physical nature of space and the presence of space matter particles in the extra-nuclear space structure of celestial bodies. As on today, the matter value of light particles and some other field forming particles are considered mass-less without rest existence. The present knowledge of extra-nuclear structure formed only by electron configuration is incomplete without the space structure with space matter particles (light particles). To supplement the incomplete atomic model, different unrealistic mathematical axioms were made to explain the spectra of only a few atoms. Thus, the mathematical atomic model deviated away from the real structure of the atom having similarity with the structural features of solar system. Further the assumptions made in developing the atomic model fouls with commonsense knowledge and the model-based theory overlooks the vital cause-to-effect analogy. The reality-based atomic model should not face any problem in entertaining the commonsense knowledge and in applying cause-to-effect analogy for explaining the spectra of atoms and other atomic phenomena. Because, the functionality of commonsense is natural.

Value of Commonsense

Human perceptions through sense organs and consciousness of mind are natural. We do not have to make any assumption or make any model to perceive

objects and events of nature. Thus, commonsense knowledge reveals only the truths of nature. On the other hand, science makes many unnatural assumptions in developing models to understand the reality in the micro domain. Hence, the primary requirement of any scientific theory is that it should not foul with the commonsense knowledge and consciousness-based science. If it does so then the concerned theory is a deviation from reality.

Invisible Causes for Micro Events

In the interconnected universe, any object or event has a beginning and an end (birth and death). The end of an event gives rise to new events where the death of an event is a precursor to the birth of a new event. Thus, no object or event starts or ends without a cause. The events appear during transformation of local background from one state to another due to distant interaction. For example, a local background of moist air creates water droplets within it when its temperature is lowered by radiation exchange with distant bodies. If we do not understand the micro phenomena of condensation in an unseen domain then we would fail to find the cause of the appearance of water droplets. In such a situation we would assume it as a quantum phenomenon and look for quantum assumptions and theory. Since we understand the structural transformation in the micro domain, we do not have to make quantum assumptions for the condensation of water droplets. We however fail to understand the cause of many events in the unseen micro domain including the precipitation of matter from mass-less high energy particles. If the event and its cause take place in perceivable domains then there is no difficulty in conceptualizing the cause to effect analogy. If the cause of a perceivable event remains in unperceivable finer domain, then we would not be able to identify the cause of the event since we are ignorant about the finer domain. The existence of matter in the micro-micro domain has not yet been admitted in science and the light particles and many hypothetical particles are considered mass-less without having rest existence. We cannot pursue understanding of reality if we ignore the interconnected realities in finer domains. The conceptualized atomic structure progressively diverged from physical reality as atomic phenomena were explained through an incomplete, domain-limited model. This divergence distorted our understanding of micro-domain behaviour, because the electrons in the accepted atomic model additionally proxy the less-known interactions of the micro–micro domain particles, where mass–space interaction exists in a finer and more fundamental form. To compensate for this structural incompleteness, unrealistic mathematical axioms were introduced within mathematical physics, operating as formal tools that manipulate the model to reproduce experimental results without faithfully representing the underlying physical reality. In such an operation commonsense loses its stand. The incomplete understanding of nature by ignoring the reality of finer domains also fails to entertain the cause-to-effect analogy in micro domain physics. It is absolutely necessary to recognize the micro-

micro domain particles of matter and their interactions to enable classical physics to deal with the micro domain physics. This opens up a new vision of harmony among sciences.

Micro-micro domain physics bridging the causal gap in quantum theory

Nothing appears abruptly or disappears abruptly in this universe. Objects and events appear when they are evolved from the space medium and disappear when they merge into the space medium. Thus, understanding the cause of appearance and disappearance of objects and events lies with the understanding of the structure and the structural changes of the space medium that associate birth and death of objects and events. The cause of condensation of a macro particle from atomic gas and the cause of sublimation of the macro particle in atomic gas is understood conceptually from the change of state of matter by the interplay of atoms. But it is difficult to realise the causal understanding of quantum objects and events in space or vacuum without structure. In the new concept, matter exists in micro-micro domains such as the light particles and different field forming particles and finding the matter value (mass) of such particles is beyond the scope of modern science. Thus, condensation of micro particles and sublimation of micro-particles in a photon gas (photonic gas) occurs due to the interplay of photons (light particles) in photonic gas. The mass of micro-micro domain particles is yet to be established hence we cannot analyse the birth and death of micro particles in the classical manner discussed above. In such a situation we have no option except making quantum assumptions with a rider that the quantum assumptions are not questionable. Because we have no answer with us as we are unaware of micro-micro domain physics. Again, commonsense knowledge is the outcome of different experiences of natural events. Hence, any man-made theory on aspects of nature can be considered close to reality if the same does not foul with the experiences of commonsense or consciousness. This argument is nullified for quantum physics since they consider science to be beyond ordinary commonsense. Thus, unification of macro domain science and micro domain science does not appear feasible. A still broader unification of different sciences (material science and spiritual science) is unthinkable at present.

Significance of lowest limit of matter

The galactic system is composed of stars which are one domain down the domain of the galaxy. Similarly, the stellar systems are composed of atomic particles which are one domain down the domain of the solar system. Thus, it is natural to think that the micro atomic system is composed of micro-micro domain particles (light particles) and the light particle (photon) is composed of micro-photons. The hierarchy of

existence of the entire range of domains of nature and their terminus in either direction (higher and lower limits) cannot be ascertained from the scientific study of any intermediate domain of nature. This is something like the case that a person working at mid-stream of a river cannot decide nor be able to speculate the origin (starting point) and the terminal point (end point) of the river (where it joins the sea or another river). Hence, for normal analysis of events in any domain it may be enough if one considers the physical interactions involving particles/bodies of one domain above and one domain below the domain under investigation. At present the lower limit of existence of matter is decided by the lower limit of scientific measurement or by hypothesis supporting a theory. Rationally, science should not have made any comment on existence or non-existence of matter below the scientific dictation limit. The present lowest limit of matter is subject to change with identification of matter value in so-called mass-less particles. For example, the unobservable entities under ordinary microscope are clearly noticed under electron-microscope; due to high resolution power, hence observation in one domain scale is not enough to draw conclusion on mass-less existence.

Similarity of structure and features in different domain

Atomic systems, star systems, planet systems, asteroid systems, galactic systems are known to have similarity in respect of nucleus and extra-nuclear structure. Once upon a time the atom was considered to be a structure-less hard ball but subsequently the structure became known. Even today the subatomic particles, light particles and different field forming particles are considered structure-less. The main hurdle in conceptualizing the structure of these particles is the lack of knowledge of finer constituents that would go to build the structure. If matter exists in finer and finer domains and we skip their existence due to our limitation in identifying them then we would deviate away from reality. In view of the above, one can anticipate the existence of structure of all particles and bodies. Further, the structures of centrally organized systems in different domains can be generalized in having nucleus and extra-nuclear space structure containing space matter particles and orbital bodies/particles. Again, the particle system of any domain goes to build the system of higher domain having similarity of structure and features. It is interesting to note that matter at any stage can become a nucleus or an orbital body/particle or a space matter particle or even a radiation particle in different reference systems. For example, the earth is the nucleus body for the earth-moon system and the same earth is an orbital body in the sun-planet system; and the earth can become a space matter particle in the extra-nuclear space structure of galaxy without a notable mass in galactic mass unit (GMU). The atomic particles with nucleus and extra nuclear space structure become the space matter particles in the extra-nuclear space structure of a celestial body. Analysing the structure and features of the solar system we notice the nucleus and orbital bodies belong to the

macro domain, the space matter particles belong to the micro domain and the solar radiation particles belong to micro-micro domain. The observable solar features can be generalized for systems in other domains. Study of the solar system reveals that the space matter particles are one domain down the domain of the nucleus and the radiation particles are two domains down the domain size of the nucleus. This analogy helps us to understand the nature of radiation from atomic nucleus and galactic nucleus [6].

The electrons too have a range of sizes like the planets of the solar system and have different charge states like the nuclei of atoms. The atomic particles in the present concept are considered to have nucleus and extra-nuclear electronic structure. But in the new concept, the extra-nuclear structure has a space density structure containing space matter particles (photons) and orbital electrons. The space matter particles organize charge shell features within the space structure having discrete energy levels in peaks of shells. The atomic particles become space matter particles in the extra-nuclear space structure of a celestial body (one domain-up scale). Thus, a micro particle (atomic nucleus) that assumes the status of a nucleus in the micro domain becomes a space matter particle in a macro celestial body system and again becomes a radiation particle in the galactic domain [6], [7]. The nucleus of any arbitrary domain D_o assume the status of space matter particles in domain D_1 which is one domain up from D_o and becomes radiation particle in domain D_2 which is two domains up from D_o. Similarly, in atomic particles, the light particles (photons) are the space matter particles in the extra-nuclear space structure of atoms and the less-known micro photons are the radiation particles of the atomic nucleus [7]. Hence, any particle can become a nucleus, space matter particle or a radiation particle thereby assuming different status in different domains. Any particle/body in any domain constitutes the basic entities of mass and space and can exhibit the form-based properties. However, due to drastic drop of size from one domain to the next lower domain the magnitudes of mass, space, charge and the dimensions of shape and size become zero in respective scales of the larger domain. Hence, for realization of values of a system in the lower domain, different domain-specific scales are required to be established. For example, the mass of an atom though zero in the solar mass unit but has definite value in the atomic mass unit [6], [3]. It is essential to formulate new scales for different entities of each and every domain to realize their values. This new philosophy helps to realize the uniform presence of mass, space & dynamism/time; structure, features & property; charge, energy & their levels; interaction of system with surrounding etc.

For understanding the basic norm of the universe which is the cause of different forms, form-based properties and events in different domains, the awareness of interconnectedness of the systems of the universe is essential. For studying any specific system in the interconnected universe, we need to isolate the system from the

rest of the universe with a boundary condition that represents the interaction links with the background. The background extends to the universe through the interconnected universal link. The boundary condition is missing in the present atomic model therefore the model does not correspond to the reality of nature. The present atomic model remains invariant in size and property in different space-time conditions even though the atom is considered highly elastic. Due to lack of understanding of the basic norm of the universe modern science grows in an isolated manner with domain-specific understanding of micro domain physics. Subsequently the domain specific assumptions of micro domain physics stand in the way of the unification of sciences. Hence the domain specific assumptions are required to be generalized for a unified understanding of different sciences.

The present atomic model considers the presence of nucleus and extra-nuclear structure where the extra-nuclear structure is formed by the orbital electrons alone. Complete similarity between microcosm and macrocosm is a vital doctrine of Veda, Vedanta and Bhagavat Geeta which imply, there exists a total similarity of structure and feature between solar-system and atomic-system. This ensures the presence of space matter particles of micro-micro domain which corresponds to light particles in neutral and photonic charge states. The photonic charge particles in the extra nuclear space structure of atoms form polarized charge-shells and sub-shells at discrete distances similar to the formation of charge-shells and sub-shells in the extra-nuclear space structure of the earth [8]. The photonic charge potential structure resembles the shape of a spherical standing wave having maxima and minima. The charge field at charge potential maxima and minima on the shell structure is zero as there is no potential gradient. If the atomic structure is excited externally then light particles from peaks of shells and sub-shells are released giving rise to the spectra of atoms. We find the orbital electrons and space matter particles in atomic structure have different specific roles to play in exhibiting different atomic phenomena. If the space matter particles in the atomic structure are unknowingly ignored then we are left with the orbital electrons only where the justification of atomic spectra becomes a problem. The orbital electrons in the existing atomic model being the only constituent of the extra-nuclear structure was theoretically empowered by domain specific hypotheses to explain the spectra of atoms. Thus, the electronic structure unknowingly played the additional representation of the less known fine structure composed of micro-micro domain space matter particles (light particles) in the atomic model. No doubt, this is a big intelligent approach to understand the spectra of atoms from the incomplete atomic model. However, it conflicts with reality-based commonsense knowledge. Even the cause to effect analogy which is the primary basis of understanding the events of nature was not considered valid in the atomic domain. The un-natural introduced in formulating the atomic model proliferated in micro domain physics claiming a different stand, thus making disagreement with macro domain physics, Vedic science and Spiritual science. The unrealistic

assumptions made in micro domain physics need to be reviewed properly for realizing the existing harmony among different sciences.

Electron has mass and charge therefore; it has existence and placement in atomic structure. The electrons in atomic structure remain in a bound state; therefore, have their charge interaction within the atomic system. When the electron is freed from an atom, we notice the charge activity of free electrons. The light particles (photons) are now found to have mass in photonic mass units [3] and have charge in photonic charge units [2], [9]. Hence, rightfully, light particles have placement in atomic structure. But, the mass of light particles in atomic mass units being zero, modern science fails to identify the matter value of light particles. Hence, scientists record only the existence of electrons in the extra-nuclear structure of atoms and develop different hypothetical atomic models. But in reality, the micro-micro domain particles are housed in the extra-nuclear space structure as space matter particles and they form shell features in the extra-nuclear space structure which has a definite role to play. The orbital electrons also have their specific role in atomic structure. When the atom is externally excited sufficiently, some of the electrons are knocked out from their stable orbit and appear as free electrons. Likewise, the light particles are also released from the structure of atoms and the same appear as free light particles in different photonic charge states with different energy levels. This reality cannot be described in the straightforward manner from the present atomic model since the light particles (photons) are non-existent in the atomic model. Hence the release of photons from atomic structure is attempted to justify some kind of hypothetical activity of electrons as nothing else exists in the extra-nuclear structure in the atomic model. The cause of release of photons from atomic structure is attributed to the orbital electrons where it is presumed that electrons create photons while jumping to orbits of lower energy states and absorbs photons while jumping to orbit of higher energy states. We never see a planet jumping from one orbit to the other in releasing or absorbing energy. Further, the mechanism of creation and annihilation of photons is a much more complex phenomenon than its natural release from its existence in the structure of atoms. The process of release of existing photons from atomic structure is straightforward, rational and realistic; however, there is a little thrill in such a description. Any story becomes more interesting when it associates some strange phenomena. Magic is more thrilling than observing natural happenings. Nature is otherwise simple but the simple interaction of mass and space in a complex mass-space structure becomes complex. However, any complex phenomenon is a mere integration of different simple phenomena of nature. The complex form-based objective reality can be explored to understand the basic formless supreme reality of nature compatible with the significance of **Brahma** described in Vedas and also told by Lord Krishna as described in Bhagavat Geeta. Thus, any physical event of nature can be justified by following the reality of nature without introducing any unrealistic assumption. The unrealistic assumptions are needed only for the partially understood reality. Mass is

the carrier of charge and energy. Measurement of mass of particles in finer domains has limitations. One can be sure of the mass of a particle if the particle has the mass above the lower limit of the mass measuring instrument. If the mass of a photon falls below the lower limit of mass evaluation, then one is likely to consider it to be massless. If the mass evaluation instrument fails to record the mass of a photon one cannot be sure whether the photon carries mass or not. It is not proper to declare the mass of a photon to be zero particularly when we cannot evaluate the mass of micro particles.

For understanding any event of nature, we require both qualitative and quantitative aspects of the event. In macro-domain the qualitative aspect of understanding the event is distinct from observation, hence only the quantitative analysis becomes the subject of science. But understanding events in an unseen domain requires conceptualizing the model of the event for qualitative understanding which is later subjected to quantitative analysis to justify the model. The easiest way to conceptualize the model of unseen objects and events is by assuming similarity of structure and features of systems in observable domain assuming uniformity of nature. However, care must be taken to implant all details of the macro structure and features in modelling systems in unseen micro domains so that the assumptions become realistic. The uniformity of nature is a primary concern in the Vedic philosophy where the similarity between microcosm and macrocosm is given utmost importance. The model made following the uniformity of nature remains close to reality of nature and the model is expected to satisfy the quantitative analysis. If all structural and functional features of the macro system are not reflected in the model then the model remains incomplete. The incomplete model cannot satisfy the expected result of a complete model. For example, consider a macro system with two structural components A and B. Now while modelling a similar system in an unseen micro domain if one considers the similarity of the ‘A’ component only of the macro system for the micro system then the model would be incomplete since he has ignored the ‘B’ component. The real structure of micro particles exhibits the functional properties of both ‘A’ and ‘B’ for external interaction. The defective model would justify only the functional properties of ‘A’ and fail to justify the functional property of ‘B’. The right approach in such a situation is to improve the incomplete model by incorporating the component ‘B’ in the model. On the contrary, one can as well assume the incomplete model is complete in structure and feature, then he attempts to justify the external interaction property of the system from his model. This is a difficult task since the external interaction property of A & B is required to obtain from A alone. Thus, A has to be empowered by many unnatural hypotheses to provide justification for the functional properties of A and B. In other words, A has to additionally proxy B since B is not present in the model. In the process A assumes a different reality as A’. The structure and feature A’ being unreal requires many more hypotheses to justify the reality. In this model making race he who is capable of producing quantitative

results from his imaginary model, shadowing the reality, becomes successful in giving recognition to the defective model as reality.

The present science made several assumptions to explain the external interaction property of the atomic system, **no matter**- if the assumptions are realistic or not; whether nature remains invariant or plays diplomacy in different domains; if it honours or does not honour the commonsense knowledge; whether it violates the vital cause-to-effect analogy or not. One may wonder how the model ignoring many realities still justifies the external interaction property of atoms! The atomic model was developed by backward integration from the spectral result (atomic property) which required many unrealistic hypotheses to supplement the model which violated the uniformity of nature in different domains. However, it is absolutely necessary to perfect our understanding of the solar system before attempting to make the solar atomic model. It is for this reason the author has made a serious study on the solar system before attempting to make the atomic model.

Conclusion

The paper presents a reality-based unified understanding of nature by considering mass and space as the only fundamental constituents of the universe, with mass–space interaction as the supreme and unchanging reality. Charge, energy, force, and time emerge as state-property of matter (mass–space integral system) across different domains. The apparent mismatch between micro and macro-domain physics arises from unrealistic modelling of atomic structure. The reality-based planetary atomic model could have considered micro-micro domain space matter particles in the extra nuclear space structure of atom for understanding the spectra of atom. The mathematical physics though successful but introduces physically unrealistic assumptions that break commonsense and causal continuity. Recognizing the structural and functional similarity of centrally organized systems across domains restores cause-to-effect reasoning, removes artificial dualities, and enables a common conceptual language applicable to all sciences. Even though it's difficult to change long-accepted scientific beliefs, we *can* build a single, consistent framework that connects modern science with Vedic and spiritual perspectives if we start from more realistic basic assumptions, apply boundary conditions, and accept that matter may exist in even finer "micro-micro" domain. The reality-based science can match the deep underlying **unity and consistency** of nature.

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