Simplifying Physics Mathematics Research Methodology

Rajan Iyer

ABSTRACT

This expository physics research methodologies will not involve extensive literature surveys of currently employed practitioners' research methodologies. Rather a way or technique to simply a new approach to minimize paper trail, keeping algorithm gist while overriding cumbersome mathematical elaborations will be main theme of this article. However, this may provide a beneficial outlet to programmable algorithmic methods having a step by steps derivative applied quantitative physics modeling that has the power to pull out proof verifiable as well as measurable observables. Pure mathematicians then can apply these conjectures to a more rigorous, highly involved extensive proof processes protocol.

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The author realizes that it is beyond the scope of the current article to engage in extensive literature review surveys. However, relevant literature references have been listed to help the scientific readership to clarify key points. The author is ready to write sequel articles to clarify queries that will help to foster creativity important expositions, explanations, scientific norms, and shifting paradoxes. Philosophically as well as scientifically transforming present situations, the author will also then focus on factors of global importance. An Invitation requesting publications and, or presentations, the author will address these issues extensively.

Keywords: simplifying gage physics, logic of mind consciousness over matter, physics with technology of life, algorithmic gage theoretical physical mathematical modeling, observables, algebra functors, proof methodology, explaining paradox, puzzle, and problem situations analytically, micro to macro transform observations, signal/noise point matrix quantum astrophysical function functional operators switching systems, hod-PDP sub-quasi-monopole-particle circuit assembly energy generators. .

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I. INTRODUCTION

Historically, the author has been an experimental materials researcher in graduate and postdoctoral projects. The methodology adopted there had always been aimed at economical; however, essentially efficient innovative ways and techniques that will reduce operational costs while generating results that have scientifically significant outcomes. The trick was then applied fundamental properties to model experiments with a maximum simplicity approach. Designing experiments with observable identified critical parameters form the basis of successful observations, measurements, analysis, and usefully commercially relevant scientific results.

Theoretical Physics that the author has carried out involves fundamentally ansatz novel approaches to solve quantum, relativity, and classical physics, which have presented currently various resulting inconsistencies. Researching thoroughly physics literature, the author has been able to think deeply aloud the logic constituting the backbone of the physics. Coming up with Helmholtz decomposition of fields onto mechanical gradient and the vortex fields have been the pointer to the prime key to an

ansatz formalism, which had physical observables tangibly towards gaging to equivalent electromagnetic fields. The author has solved the problem of identifying the fundamental physical mechanism that generates energy universally in a perpetual, albeit dissipative, discontinuous manner. This work has been conducted by working with scientists worldwide. Various articles relating to this research have been recently published, after scientific peer-review process. These publications highlight a model of Pauli-Dirac-Planck circuit assembly operator. This operator presents a proposed mechanism of generating energy at subatomic to Planck quantum level, and functions as a clocking mechanism. It is an energy generator via action of the monopole-particle magneto-electric fields. Modifications of the original theoretical model provided a conjugation of Scalar Theory of Everything authored by scientist John Hodge in the form of hod-Plenum-PDP assemblies. Global physical-mathematical scientists O'Neill, Malaver, Zhang, Hodge, and Taylor were collaboratively co authoring with the author to come up with quantification of an Integrated Model. Such an Integrated Model incorporates mesoscopic observables to verify validity of the model. This extensive paper has been recently peer-reviewed and published by the prestigiously well-esteemed Canadian Journal of Pure and Applied Sciences.

Science, specific physics, has logic bases to rationalize qualitative versus quantitative argumentations with programmable situational computing values. To compare logic, we require at least a common property or parameter. An example will explore oft-stated quote ".... We can't compare apples and oranges....". To compare them, we will have to use their standard classification of groups, which in this case, they belong to the fruit classification. Another example is "Which one came first – egg or chicken?". In this example, we will have to have a common ingredient to compare, which is the carbon basis of life itself!! When we have examples with people, female and male, comparisons become murky. Only traits may have common comparisons like their offsprings or reproduction, which generally are female and male generations. Essentially, genetics and species classification of organisms come under the science of taxonomy, and that will have to be explored as such.

When the logic of classical, relativistic, and quantum physics are compared, they have inherent inconsistencies, amplified to the well-known general problem of vacuum or ultraviolet catastrophe. The author has logically identified quantum energy density metrics to be the common property or parameter. Presently the vacuum solutions point to key parameter of signal/noise density matrix to bring quantum physics within the same platform with general relativistic physics. The author has expatiated about it in the subsequent section of the current article.

II.   ARGUMENTATION, RESULTS, and DISCUSSIONS

2.1 Logic of Mind Over Matter Nature

Logicality, correct and valid reasoning in the study of logic,advances within the current article by exemplifications of a matrix – constant or a dynamic representation of the motion of objects. The conundrum is the extremum of a riddle or a mystery; paradox is an extremum of a puzzle. They form the dual sides of a matrix!!An example of a mystery is the above quoted classification of groups "Which one came first – egg or chicken?", versus the example of a paradox "Schrodinger's famous cat!!". One solution to the riddle solution is mentioned above is coming up with an identifying common ingredient, carbon; one of the solutions of a paradox such as "Schrodinger's cat" is in recognizing leakage quantum wave functions, occurring via the walls of the box; it will help to identify the life state of the cat!! We will have to overcome the measurement problem to achieve that with Schrodinger Equation in conjunction with the Heisenberg Uncertainty Principle!! *In deep philosophical sense, mathematics evanesces,by itself, set of belief systems borne out of logically explainable things, often known in terms of fuzzy logicality versus not-fault logicality!!*

(Consciousness)of)mind)over)matter)time)space)sense)

hdynamic　　constant

Matrix

operator　algorithm
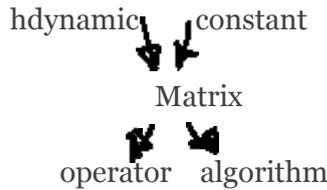
It may appear that consciousness ~ sense, time ~ sounds, light ~a vacuum (~ denotes association with), and space has associations with all!! In terms of PHYSICS, time+space has four dimensions, while sense may well represent the five dimensions altogether!! Hence, consciousness manifests wholesomeness of existence!!

2.2 Will technology help to simplify everyday life?

We know technology has active input coming via science as well as art. While many technological products such as apps, devices, structures, establishments, computers, and guidance systems have made our everyday tasks easier, perhaps they still have user-end complexities. The year 2022 may herald having simplifications applied technologically.

[What?]{Take trivial space out of the information timeline}

[Why?]{Clog and mess up working space otherwise}

[How?]{Justify typical relevance of that space specifically, significantly to keep or clean up}

Scientifically applying extreme value statistics projection operator matrix with "Proof Formalism…" Algorithm, that author derived must be a part of pure mathematics helping to simplify the wide range of tasks within applications. These are mentioned in the article listed below in Referential Literature as a first principle simplifying technique.

Metaphysical aspects with physical mathematics here may have philosophical implications with Hindu Mythology having "3$\tilde{\infty}$" {representing Omm….}, the primordial sound of the universe as central operator with "Brahma Saraswathi" flowering outwards, then "Lakshmi-Vishnu" and the Trinity Siva-Parthi, creating real universe!!

One-way logical understanding of consciousness might generate via thought, symmetrically conjugatively asanti-thought. Psychological aspects with physiology implied by the phrase "mind over matter", for example,typically reveals denouement reality. Physiological aspects with psychology, like minds reading themselves while engaging with other minds, perhaps tells us how entangled they can be!! One may envisage quantum decoherence or entanglement to guide physiological, psychological interactive processes!!

(PDP)circuit)mind)of)universe)protocol)operator)metrix?)

mind consciousness

————|————

|

type

|　　　　　|

I　　　　　II
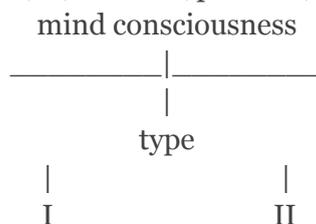
.["What?" "Why?" "How?"] {Many conditions must be satisfied to have life existing}. While a type I may be a guesser, a type II may be a thinker!!…. containment of mind over matter is vital!!

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2.3 Image of human outer consciousness!!

Type I with image switching having speed of light may have much sooner than type II with sound switching vibrations at the rate of sound. That is why a guesser beats out a thinker, probably!!

Hence, type I decision-makers will have about 10,000 times as fast as type II decision-makers to call out, like the stock market!! For example, a type I decision-maker or a guesser may take only one minute while type II decision-maker or a thinker may take almost a week to give out an answer!!Especially if a type I is a lucky guesser!!

ALGORITHMIC GAGE THEORETICAL PHYSICAL MODELING [Referential Citations Literature Shortlist 1-20] Rethinking Physics: General Quantum Gravity

$$\text{Equating broken telephone network information:} \quad \sum_{i=1}^{n} \sum_{j=1}^{m} \Gamma_{ij} = 1 \quad (1.1)$$

with Γ_{ij}: signal/noise ratio of i, j element of information transmission line matrix.Equation (1.1) is a constitutive equation quantifying how multiple matrices relates to one another. For example, in the case of entanglement versus decoherence based on critical Γ property, the Equation (1.1) conforms onto a unitarized principle of conservation of energy in the quantum relativity realm.

Point dynamics PHYSICS dissipative theory Iyer Markoulakis & Equation of gage discontinuity per Iyer O'Neill Malaver Hodge Zhang Taylor physical modeling

$$\mathbf{G}_g = \boldsymbol{\rho}_{PDP}(t_g) \, (<\boldsymbol{\Psi}_{\mu}(t_g)|\boldsymbol{\Psi}^{\mu}(t_g)>)^{-1} \quad_{GR} \quad (1.2)$$

In Equation (1.2), $\mathbf{G}_g$ represents the gage functional linking, $\boldsymbol{\rho}_{PDP}$ represents the Pauli-Dirac-Planck (PDP) quantum density matrix, $(<\boldsymbol{\Psi}_{\mu}(t_g)|\boldsymbol{\Psi}^{\mu}(t_g)>)$ represents the inner product matrix of wave functions under variable μ and t_g represents the gage time domain; $_{GR}$ represents the gage space field. Point to point information energy transmissions are possible with vortex gradient process; however, energy -> entropy with the conversion of potential energy to kinetic energy with such transmissions are possible with emergent temperature rises' transformations!! Rationalizing broken telephone network, Equation (1.1) and the functional Equation (1.2) is exemplified by an observable example of mesoscopic level of analogy to quantum aspects have been given in the Appendix III of the author's paper in Canadian Journal of Pure and Applied Sciences, coauthored by five other scientists. This demonstrable observable exemplifies with the case of ducks and the swans' population pattern swimming together in a lake; "bra-ket" product matrix values within the Equation (1.2) are given in Equation (2),characterizing row-column form, like it is in the esteemed Canadian Journal of Pure and Applied Sciences(CJPAS) article in Appendix II.

$$<\boldsymbol{\Psi}_{\mu}(t_g)|=<\boldsymbol{\Psi}_{d}(t_g)|=<\boldsymbol{\Psi}_{ducks}(t_g)|;|\boldsymbol{\Psi}^{\mu}(t_g)>=|\boldsymbol{\Psi}^{s}(t_g)>=|\boldsymbol{\Psi}^{swans}(t_g)> \quad (2)$$

because ducks are in a "row" and swans go in a direction "column" swimming together!! Note:ρ_{ds}represents population density pattern constituting ducks and swans, **Gg represents** functional having sound, light, and modon{known to transmit in water per article in the CJPAS journal} strings, $_{GR}$ represents gage fields typically{gradient, vortex} up and down pressure and temperature. Typically, gradient takes the real value in the form of the temperature and the pressure is the real value of the vortex fields. We can picture this with the following communication connection logic to language quipping: swans sense the ducks making scenes!!

Picturing algorithm expansion matrix equating

$$G_g = \rho_{ds}(t_g) \, (<\Psi_d(t_g)|\Psi^s(t_g)>)^{-1} \quad {}_{GR}$$

Having that the "ducks on a row": $<\Psi_{ducks}(t_g)| = (\Psi_{d1} \ \Psi_{d2})$, then column "swans on arrow": $|\Psi_{swans}(t_g)> =$

Gradient fields are the up/down temperature. Vortex fields have anticlockwise-clockwise pressure.

Quantum gage gravity and multiverse physics modeling theory Critical quantum signal/noise density matrix may explain Smartnews reference on double-slit experiment as particle/wave, whether sensor on/off, i. e. watching observer versus experimenter!!

Typical "ket" matrix for complex angular momentum with {off, on} switching modes, giving signal/noise "Γ" at any point "Γ_{point}" with [point] = {states and/or modes} Example here: Ψ^i: component wave-function imaginary, Ψ^ω: component wave-function angular momentum, Ψ_{off}&Ψ_{on} are component wave-functions of switches modes off&on, and $\Gamma_{i,off,on,\omega} \equiv \Gamma_{point}$, having [point] = {i, off, on, ω}variable gives following algorithm equation operationally [21]:

$$|\Psi i \ \Psi\omega>(\Psi_{off} \ \Psi_{on}) =>: :<= ([\{(\Gamma i, \, off, \, on, \, \omega)\}]) \tag{3}$$

Equation (3) will apply to momentum space sense. Algorithmically, with time space, we write:

$$|\Psi i \ \Psi^\omega>(\Psi_{real} \ \Psi_{proper}) =>: :<= ([\{(\Gamma i, \, \omega, \, proper, \, real)\}]) \tag{4}$$

Where {i, ω, proper, real} = [point]$_{warping}$ or $\Pi_{warping}$ since point-to-point multiplication proceeds magic square prime number factorization processes.Hence

$$\Pi_{warping} = [\Pi_{XYZ}], \text{ equivalent metrically operator} =>: :<= \ [\Gamma_{X'Y'Z'}] \, [\Gamma_{X''Y''Z''}] \, ... \tag{5}$$

With $[\Gamma_{XYZ}] =>: :<= \ [\Gamma_{X'Y'Z'}] \, [\Gamma_{X'' \, Y'' \, Z''}]$ ...., with $\{\Gamma_{X'Y'Z'}, \Gamma_{X''Y''Z''}\}> [\Gamma_{XYZ}]$, where $\Gamma \equiv$ signal/noise on XYZ coordinates with primes denoting differentiated coordinates [21]. We write, point in place general equation having "Γ_{point}" with [point]$\equiv$ {latitude, longitude} observable.

Equation (4) shows how momentum transfers between sense-space to time-space by switching signals that will carry information energy point to point. From Iyer Markoulakis's formalism, an issue is either a zero-point or a microblackhole [2]. Time will typically slow down at a black-hole entity with extreme gravity [https://profoundphysics.com/why-time-slows-down-near-a-blackhole].Mathematically interpreting the physics within the Equations (4) & (5) we can hypothesize that point-to-point inflation with multiplicative processes {magic square prime number factorization} induce a zero-point space having a proper time and a micro blackhole space having the real slow down time. Information energy flow happens, communicating switches' modular signals between zero-point to microblackhole. Thereby it would establish looping!!From the author's earlier publication articles [20, 21], we know that gravity oscillations occur because of signal/noise density matrix either multiplying/inflating or combining/compacting actively in comparison with the critical matrix. With Equations (4) & (5) demonstrating looping due to information flowing point-point between zero-point and microblackhole, one can together conceive of a loop gravity model, per physics literature, providing grand unifying theories within physics literature[https:// en.wikipedia.org/ wiki Loop_quantum_gravity].

Analysis of Equations (3) & (4) will give us more insights of the physics.We realize that while the Equation (3) characterizes momentum space sense, the Equation (4) characterizes time-space.Performing intersection operation, i.e., Equation (3) ∩ Equation (4), we get resultant: | Ψi Ψ^ω> =(momentum space-sense) ∩(time-space)≡ space ≡ $([\{(\Gamma i, off, on, \omega)\}])\cap([\{(\Gamma i, \omega, proper, real)\}])$(6) However, these are different categories. Mathematically, then a functor might characterize "space" aspects. Regarding the literature about functor algebra, one may write equivalent operations using properties of a functor [https://www.math3ma.com/blog/what-is-a-functor-part-1]. We apply this functor algebra to the Equation (6) to obtain the equivalent operations:

$$F(\Psi^i)F(f)\rightarrow F(\Psi^\omega)F(\Psi^i)\rightarrow F(f)F(\Psi^\omega) \qquad (7)$$

Therefore, we map functor algebra with Equation (7):

Map (1)

Defining $F(\Psi^i) = ([\{(\Gamma i)\}])$ & $F(\Psi^\omega) = ([\{(\Gamma\omega)\}])$, one may rewrite Map (1):

Map (2)

Map (2) will tell us that the point-to-point signal/noise "Γ" density matrix of each category will connect via functor F (f) operator having composable morphisms with an Infinitum multiverse vectorially adding as sense⊗time⊗space dimensions. Therefore, Ψ^i representing imaginary component of the wavefunctions link via f toΨ^ω representing component angular momentum of the wave functions to translate with the functor action F on $([\{(\Gamma i)\}])$ to $([\{(\Gamma \omega)\}])$. If zero-point $([\{(\Gamma i)\}])$ characterizes the gradient of field signal/noise density matrix, then $([\{(\Gamma \omega)\}])$represents rotation of field signal/noise density matrix. Hence, these essentially correlate to Helmholtz's decomposition of the field to the gradient and the rotational fields that Iyer Markoulakis's formalisms [2] quantify zero-point inflationary gradient fields versus microblackhole rotational vortex fields, as Helmholtz's decomposition of point fields.The point gradient vortex model [2] has dissipative properties [6]. Map (2) characterizes discontinuous properties, that the functor operator algebra of the point physics model emphasizes ultimately as gage physics.

Metaphysically, Equations (3) & (4) can be transformed by having i = consciousness of the mind = proper, ω = experience of the real = body. We transform the Equation (4) to:

$$|\Psi consciousness\ \Psi experience> \quad (\Psi_{body}, \Psi_{mind}) =>: :<=$$
$$([\{(\Gamma consciousness,\ experience,\ mind,\ body)\}]) \quad (8)$$

(hconscious, experience) ≡ [awareness]

Much like physics, metaphysics Equation (8) will tell us that each point can be either consciousness or experience of mind or body, although there are four possibilities. Like physics, metaphysical interpretation will say to us that there are two logical possibilities only, i. e., either human experience or mind consciousness with the body representing human existence in real nature in a geodesic environment!! The four aspects get fulfilled once we realize that there is type I & type II mind consciousness, schematically argued above. Extending to human experience, we may perceive kind of type I' or type II' body experience: possibly still or body meditative type II' states or body active or instinctive type I' states!! These are part of physical reality [22, 23].Summarizing these aspects with a simple schematic of how inorganics get coupled to organics are shown below. In this schematic, fibrational strings are borne out of superluminous plenum hod-PDP circuit assemblies [6] that can generate living structures. One may surmise that really the human experience naturally perceives space action timeline event sequences. Note that in this schematic, (material) represents "living" units likely with {sodium, potassium, phosphate, bicarbonate} compounds, and "modon"{known to transmit in water per article in the CJPAS journal} represents fibrational strings connecting "tubules".

"pulsations" like pressure waves (environment)

"modon strings" linking "tubules"

"tubules"

(material)

"pulsations" like pressure waves (environment)
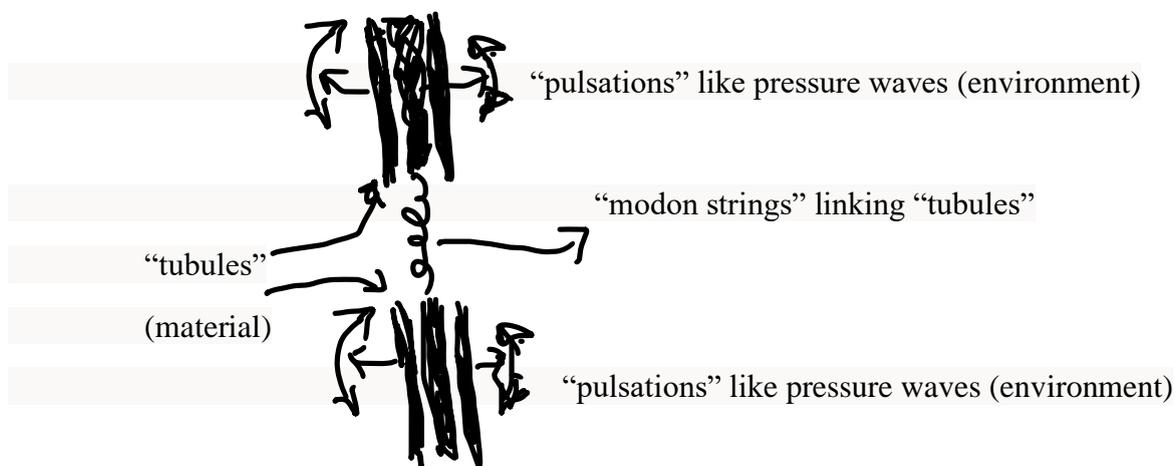
In this schematic scenario, one can hypothesize the following. Signal/noise "Γ" at any point is computable from the Equations (3) through (7). They signify origination of linking the point formalism to astrophysics [1-24] to get a simplified M [X] = [Y] M-theory like graphic matrix theory mapping astrophysical observed phenomena from gage metrics of the potential quantum wavefunctions, described above. We can write compactly these results as logicality algorithm.

$$\Psi_{mapping} = F(\Gamma_{point}) \text{ and } \varphi_{mapping} = G(\Psi_{mapping}) \dots \dots \quad \text{(AFAM.I)}$$

Acronym "AFAM" will mean "Algebra Functor Algorithm Mapping" that will help in computer programming!! (AFAM.I) is an equation that yields the following coordinate algebra formula.

point formalism multiverse

space

information missing mapping
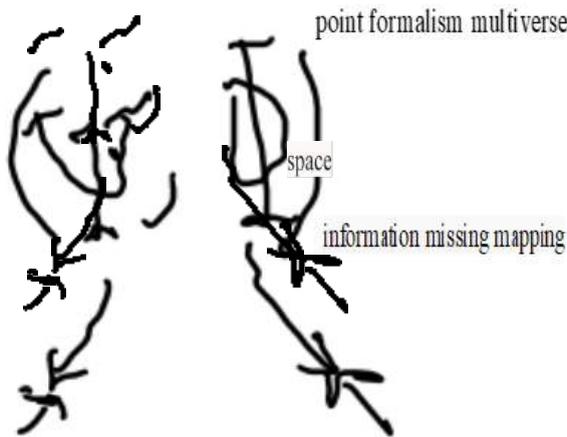
quantum wavefunction   astrophysics gage metrics potential

This Coordinate algebra formula can possibly quantify H. G. Well's "Time Machine" to represent a "worldline" hinting really "tomorrow" like wavefunction-potential coordinate of space-time-sense. They merge quantum to astrophysics to enable gage metrics mapping.

time_sense

space
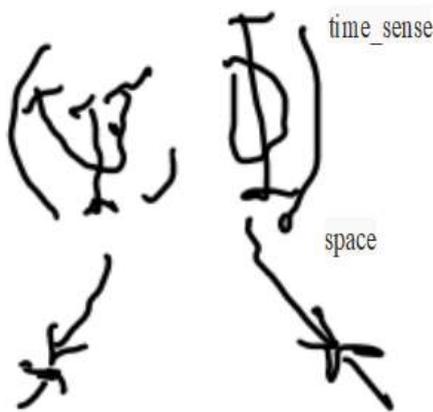
quantum wavefunction   astrophysics gage metrics potential

This type algorithmic mapping will help towards Physical Sciences Algorithm IT Programming.

$$\text{gradient, vortex} \quad => : <= \quad \left(g_\mu \right) \left(\cdots \mu_{\nu\nu} \cdots \right)$$

With g_μ gage photons like $\Psi_{gradient}$, while $\mu_{\nu\nu}$ phonons are like Ψ_{vortex}, forming point density matrix equivalent to point signal/noise Γ gradient vortex [21] and Equations (3) & (4). Gage photons arise from gradient uncertainty point physics, while phonons arise out of vortex uncertainty point physics. Note that gage function g is with the functor μ, which is linked by the functional ν representing the

modon{known to transmit in water per article in the CJPAS journal} strings. Like SUSY $\mu_{\nu\nu}$ equivalently is symmetric with ν. However, asymmetry is generated by hod-PDP Plenum mechanistic aspects [6]. Hence $\mu_{\nu\nu} => : <= \mu_{\nu\nu}$. Aspects thus ensure antiparticle particle asymmetry to create an observable universe!!The ν modon strings phonon-photon versus the ν'modon{known to transmit in water per article in the CJPAS journal}strings photon-phonon have asymmetric relationships!! These conjectures will have eventual proofs, theoretical mathematically and experimental practically with verifications, exemplifying earth interstellar observable cosmic microwave background radiations!!

$\Pi_{differential\ matrix}$: If $[\Gamma] < [\Gamma cr]$, then it will differentiate or split-separate onto multiple phases matrices, where $[\Gamma]$ is a critical signal/noise density matrix, gage unitarized, especially for point [20]. In vacuum, this process will create zero-point matrices since the vacuum will keep absorbing signals making $[\Gamma] < [\Gamma cr]$, thereby keep generating a $\Pi_{differential\ matrix}$. On the contrary within a nebula, this process will create microblackholes by having higher noise levels thereby making $[\Gamma] < [\Gamma cr]$, causing zero-point matrices gradient fields generations repeatedly.

Analysis, like above, will yield resultant g_μ gage photons like $\Psi_{gradient}$, while $\mu_{\nu\nu}$ phonons are like Ψ_{vortex}, forming point density matrix equivalent to point signal/noise Γ gradient vortex. Γ point gradient vortex will generate electron-positron and, or monopole particle pairs to create PDP circuit assemblages, stabilizer at the quantum level to perpetual generators of energy, and then conversion of energy to matter particles [2, 6, 20, 21]. Accretions of the point particles to quantum particles will be enabled and enhanced by having $[\Gamma] > [\Gamma cr]$. Thus, multiple phases matrices mix, combine or synthesize into more complex forms. One primordial aspect example will be not only the creation of electron-positron pairs out of the above schema at the central standard observable zone but also originating quarks and the gravitons from these primordial particles with photon mediating. Fermions and the bosons hence can be hypothesized to form from their primordial dark counterparts. These counterparts are conceivable as particle and antiparticle dark-fermions and dark-bosons.They form manifesting theory of algebra functor linking by a functional the gage function units, per operator algebra matrix protocol quantifying Physical Sciences, discussed above.

We have thus so far discussed possible process mechanisms by which primordial particles,and their particle spectra may be created primarily from a universal vacuum and a nebula. The criteria of signal/noise density matrix explained above defines $\Pi_{differential-matrix}$ versus $\Pi_{accretion-matrix}$, with gradient and the vortex action fields of point matrix [2-6, 10, 11, 20, 21] deciding operational process genesis parameters!! Step-by-step algorithmic formalisms have been originally derived from the pure mathematics of logical protocol matrices and the pure physics of observations. Foregoing discussions have brought out possibility of how real universes may originate from the asymmetry of particle and antiparticle. We have also discussed briefly about modon{known to transmit in water per article in the

London Journal of Research in Science: Natural and Formal

CJPAS journal}strings and they can asymmetrically interlink gage photons with phonons. One point of caution also will become evident from perfectly non assumptive derivations able to generate observables that were demonstrated by a possible physical observation in mesoscopic level {per Appendix III of the CJPAS paper}. This will hint at parity while comparing throughput and output with input. We would expect that they would shift asymmetrically, i. e. indicating a possible mismatch or incommensurability underlining what physicists are facing as measurement problem. This may be manifesting also as paradoxes of well-known double-slit experimental measurements of light interference patterns. Altogether, they may appear as CPT problem, i.e., charge, parity, time reversal situations making it difficult for physical scientists to interpret theory with experimental measurements. However, these ideally derived algorithms will cross-check the results of observation measurements versus observables to correct for inconsistencies. As brought out clearly in the derivation of observables [6], the g_μ metrics of the gage photons are like $\Psi_{gradient}$, and the μ_{vv} metrics of the phonons are like Ψ_{vortex}. These parameters are obtainable from signal/noise density matrix. It is quite pertinent to note from a practical standpoint, usually the only measurable parameter in astrophysical observable signal matrix. Therefore, Γ representing the signal/noise gradient vortex density matrices probably will be ideal variable to be analyzed by fundamental micro-macro matrix physical algorithm [4, 7]. We should also, however, note that computation of inverse matrices is involved for evaluating gage action fields [6]. We may be lucky in considering 2x2 product matrices, for which inverses can be easily evaluated. Hence the 2x2 algorithmic matrices {emphasized per Appendix III of the CJPAS paper} are amenable to perfect analyses of operational process parameters, such as temperature and pressure variables that are in conjunction with photon-phonon gage physics. These mesoscopic observable gaging fields characterize Equation of motion of observable objects responding to environmental stimuli. Partial differential equations obtained from point physics [2] are transcendental in even most straightforward cases of problem-solving with attractive and repulsive force fields [25] to translate equation of motion objects equivalently. These processes are paramount to the grand unification efforts within the physics characterizing natural quantum astrophysics. The approach that the author has undertaken working with the international scientific community's eminent coauthors will help towards achieving that goal. Presently discontinuous physics has been advanced progressively to relate various functor aspects with spatial existence of matter, physical reality, and mind consciousness awareness!! These may point to multiverse possibility of theorizing coexistence of dark energy, dark matter, and compounding with real observable universal matter [12. 19, 24]. Appendix Database at the end of this paper article briefly outlines scenarios per the above scheme of PDP, particle, antiparticle, dark-particle, and dark-antiparticle game theory. Typically, tic tac chess game perpetual-motion-machine types of situations have been schematically depicted there. In the background hod-Plenum progenitor Infinitum superluminous aether-type medium implies to provide underlying support base like grounds [6]. Mathematically only gage differential, and typically no higher-order differentials are possible due to discontinuous physics [22].

$$\begin{pmatrix} \hat{\varepsilon}_{r,\mu v} & \hat{\varepsilon}_g^{\mu v} \\ \hat{\varepsilon}_{g,\mu v} & \hat{\varepsilon}_r^{\mu v} \end{pmatrix}$$

gaged to the gradient field, quantum density, and the wave functions of point matrix [2], may be rewritten as a point vortex gradient field Dirac matrix, that is signal/noise gradient vortex matrix, equivalently, given in the form of a sketch here.

$$\begin{pmatrix} \varepsilon_{gradient} \\ \vdots \end{pmatrix} \left(\cdots \Psi_{vortex} \cdots \right)$$

$$\Gamma_{gradient,\ vortex} \quad =>::<= \quad \begin{pmatrix} \vdots \\ \partial_\mu \\ \vdots \end{pmatrix} \left(\cdots \mu_{vv} \cdots \right)$$

Time in the matrix extended form can be obtained from the" Γ" factor and the gravity Π_{gg} metrics to give a 2x2 matrix of the form

$$\begin{pmatrix} \hat{t}_{pr,\mu\nu} & \hat{t}_g^{\mu\nu} \\ \hat{t}_{l,\mu\nu} & \hat{t}_r^{\mu\nu} \end{pmatrix}$$

Note that $\hat{t}_{pr,\mu\nu}$ represents proper time, $\hat{t}_r^{\mu\nu}$ represents real-time, $\hat{t}_g^{\mu\nu}$ represents global time, and $\hat{t}_{l,\mu\nu}$ represents time at local level. You may refer to event timeline explanation in the *"Referential Citations Literature Shortlist"* section below.

Algorithmic derivation potential gaging wavefunction-potential coordinate algebra: (Ψ, φ)

Gaging (Ψ, φ) with algebra [6] gives g[(Ψ, φ)] ≡ (Ψ,   ), having g[Ψ] ≡ Ψ, since wavefunctions already in the form of unitary gage!! and that g[scalar potential] is a gaging field because field byproper physics original logical definition is a differential space potential.

(Ψ,   ) essentially means: = f(Ψ), which is valid for dissipative hod-PDP circuit [6] that has a clocking function; however, one hod-PDP assembly is a functor to another hod-PDP assembly linked by algebra functional like G [3-7] in the Equation (1). Functor aspects are vital to quantifying discontinuous physics!!

Four vector matrix form physics

$$\begin{pmatrix} \dot{\varepsilon}_{gr} \\ \cdot \end{pmatrix} (.\psi_\omega.) =>::<= (.\ \Gamma_{\omega,gr}\ .)$$

or rewriting this will mean that (. $\Gamma_{\omega,gr}$.) associates with

$$(.\ \Gamma_{\omega,gr}\ .) =>::<= \begin{pmatrix} \dot{\varepsilon}_{gr} \\ \cdot \end{pmatrix} (.\psi_\omega.).$$

Practically, only signal/noise astrophysics are measurable observations, that is pointed out above. This relationship of "$\Gamma_{\omega,gr}$" matrix to split matrix form of "ket-bra" product matrices of "ε_{gr}" and "ψ_ω" are ideal to be transformed to gage spatial fields gradient and the rotational wavefunctions matrices. Typically, gradient gage spatial electromagnetic fields are convertible toward having switching fields with mode {0, off, on}, so that

$$\begin{pmatrix} \cdot \\ \varepsilon_{gr} \\ \cdot \end{pmatrix}$$

matrix will appear as [ ]{0, off, on} form or as numerical matrix:

$$\begin{pmatrix} 0 \\ \emptyset \\ 1 \\ \phi \end{pmatrix}$$

. In this "ket" four-column matrix "0" would refer to zero fields, "$\emptyset$" would refer to neither {off} or {on} fields, "1" would refer to {on} fields, and "ϕ" would refer to both {off} and {on} fields. These are perhaps physics, reminiscent of modern quantum physics, characterizing entangled quantum fields.

Rotational vortex matrix (. ψ_ω .)is a matrix representation of rotational sense wavefunctions, designated as[Ψ] matrix. Then, sense is classified to be {clockwise, anticlockwise, positive, negative}. Symbolically, they can be written in the form of a matrix such as

$$\left(\psi_\subset, \ \psi_\supset, \ \psi_+\psi_- \right).$$

Based on these notations, we may write signal/noise matrix to fields-wavefunction gage unitarized matrices equation to be in the form of signal/noise matrix with rotational "ω" and the gradient "gr" subscripted notations. Therefore,

$$(. \ \Gamma_{\omega,gr} \ .) => : : <= \begin{pmatrix} 0 \\ \emptyset \\ 1 \\ \phi \end{pmatrix} (\psi_\subset, \ \psi_\supset, \ \psi_+\psi_-) \tag{I}$$

We note that we can figure out the 4x4 four vector-matrix form of quaternion algebra with $\phi \equiv i$.

Algorithm (I) is a four vector-matrix form of 4x4 quaternion matrix physical mathematics. This has the power to quantify Γ representing critical signal/noise density matrix and ρ representing flavor density matrix of mass M in the string-metrics, described elsewhere [20] in the sections "Critical (Γ, ρ) matrix electromagnetic gravity keying parametrically" from "Gage time gage space fields probability signal matrix". Algorithm (I) when used per formulations [20] in conjunction with field-matter metrics will help to facilitate transformations among observables, observations, and measurements that are achieved by experimental or natural methods. These are widely applicable then to astrophysics and quantum physics parameters of potential and the wave functions that may be operating at mesoscopic or other normal physics levels!!

Gage's cursory look of the Algorithm (I) and the Equation (1) will tell us that while electromagnetic force appears as signal profile field matrix, gravitational force appears as density matrix time-space manifesting flavor with mass factor and both together in string-metrics [3, 4, 10]. Practically achieving with typically observations measurements having spectral density alongside intensities signal profiling will be then part of experimental physics.

The above-explained 4x4 quaternion matrix physical mathematics characterizing gaging fields and the wave functions would be incorporating detailed elements of micro-macro mathematics. Among them space, charge, and complex fields of astrophysical to quantum electromagnetic and gravity fields will be involved that may be in a state of entanglement or decoherence. They may involve either or both wave function possibly in quaternion forms. Because of their physics being algorithmically quantified, they are amenable to applied quantum computations that are operationally programmable.

III. SUMMARY

The author has achieved here a brief overview of formalisms within more than ten peer-reviewed published paper articles. Once we recognize that subject areas of classical, quantum, and astrophysics are exceptionally huge, it will become clear why it is impossible to write in gist and understand essence of this subject area in a simple review paper. However, the author has attempted to highlight salient features to make it easier for engineering scientists and technologists to take gist out of all these and apply them intelligently to meaningful products.

It is an earnest effort by the author to elucidate a novel approach to demystify the mathematical complexity of modern physics. Perhaps, the most important point the author would like to shed light on is that discontinuous physics will have to be considered as a serious problem-solving alternative to tackle inconsistencies of quantum physics versus general theory astrophysics. The author has convincingly provided physical reasoning to prove the validity of a rigorous argumentation with discontinuous mathematics having algorithmic graphics, accomplished by gauge physical-mathematical ansatz quantifications.

These algorithmic graphics will be ideal for applying to artificial intelligence machine learning programming that require advancement of syntaxes suitable for quantum computing.

Once these approaches are accepted by experts within Science, Technology, Engineering, Mathematics, andArtistic Management, it is then possible to move further from grueling physics. This will enhance development of productive Apps, AI, and automation IT, that will help to eliminate general human mistakes and errors normally occurring in the design and manufacturing processes.

Simplifying Physics Mathematics Research Methodology

getting recognized for evolving into astrophysics formalisms. The author would like to extend his profoundly high appreciation to his coauthoring project physicists John Hodge, Wenzhong Zhang, Emory Taylor, and other participating scientists for their highly engaging fruitful debates and discussions. Especially, the author would always be indebted to many upcoming progressive outstanding journals promoting publications with excellent peer-reviews of our papers' articles. These appear essentially in the "*Referential Citations Literature Shortlist*" presented here, although the list is only a sampling!!

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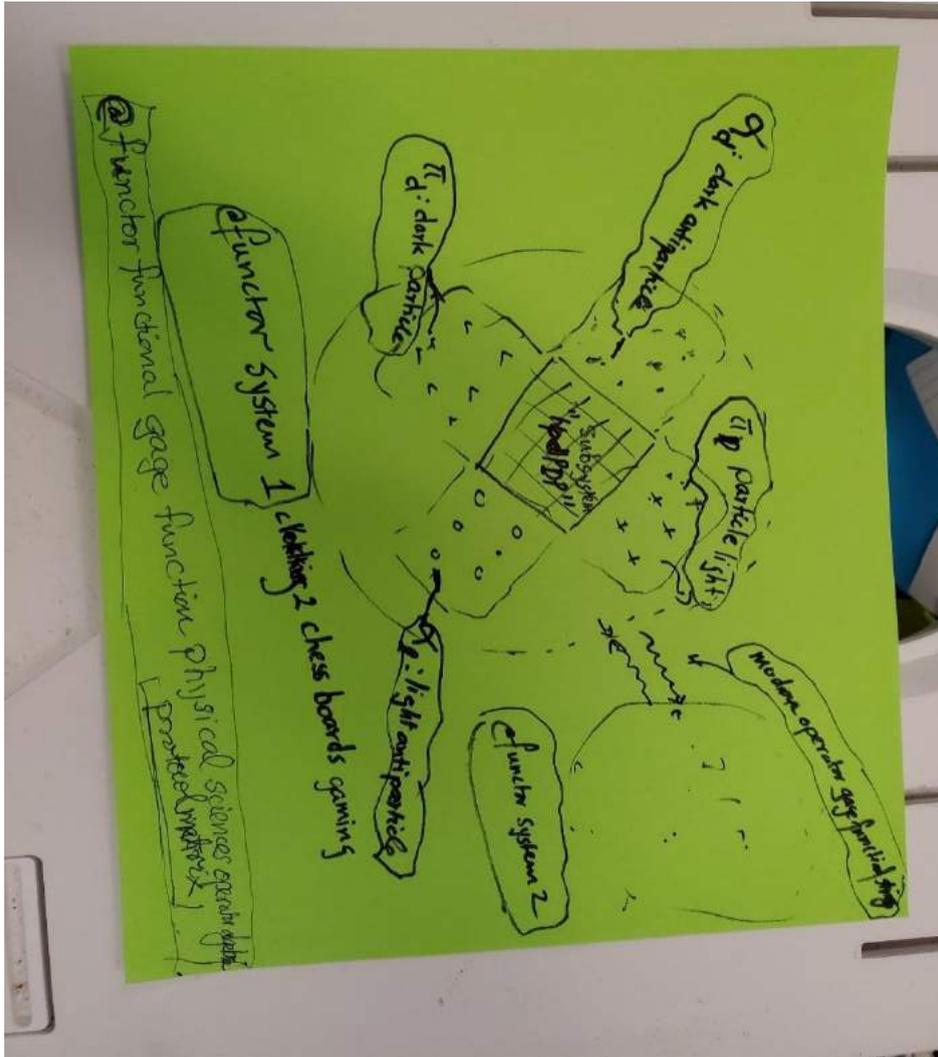
Sketch of scenarios per the article's scheme of PDP, particle, antiparticle, dark-particle, and dark-antiparticle game theory, depicting tic tac chess game perpetual-motion-machine situations. In the background hod-Plenum progenitor Infinitum superluminous aether-type medium implies to provide underlying support base like grounds [6].

PDP progenitor possible mechanism involves dark-bosons and dark-fermions with their antiparticle forms, playing chess tic-tac games shown schematically above. Resultant will appear on the standard zone, which can be guessed to have an observable universe. Regular particle-antiparticle interactions go on; hence, antiparticle particle asymmetry is achievable with hod-PDP circuit mechanism assemblage [5, 6]. Perhaps otherwise, the "CPT" problem prevails, per physics literature. We write a logic algorithm for the formation of gage photons with the phonons that can possibly form in the observable universe {common central standard zone per schema above}, noting that they follow mathematics of the point gradient vortex action fields with their partial differential equations [2, 20, 21].

About gauge algebra functor linked by a functional to function physical Sciences operators

Typical top quark decaying bottom quark [26], playing this scenario game physics dark particle-antiparticle matter would create light phased observable counterparts at the standard zone. They would seem like two chiral antiparallel tops, perhaps asymmetrical, to form a horn-torus electron {Emmanouil Markoulakis's electron model topologically}. Such phenomena have importances top quarks that may be key to know or sense the dark-matter [Sabine Crépé-Renaudin (2018). Dark matter search with the top quarks. Laboratoire de Physique Subatomique et de Cosmologie, Grenoble France.

DM, SUSY, top quark. https://cds.cern.ch/record/2632461/files/ATL-PHYS-SLIDE-2018-551.pdf.]. This knowhow would play key role in understanding antimatter matter action with energy [SmartNews article "Tiny Collapsed Star Unleashed a Gargantuan Beam of Matter and Antimatter Reversing Einstein's E = mc^2" https://share.smartnews.com/91tQ8].

0- and 0+ zero-point fluctuations may have relationship to the fine structure constant??!! Area of the absolute vacuum matrix and the string-metrics gage zero matrices = approx. 137??!!

Rider of the pure mathematics of bracket operator mathematics
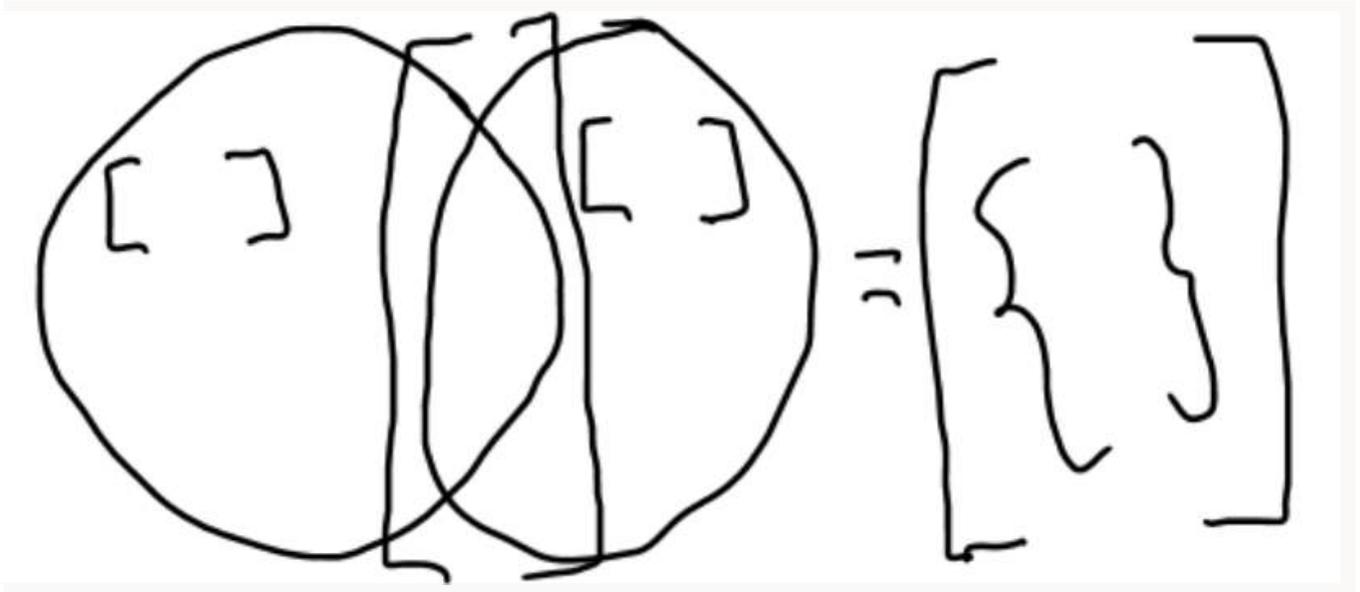
Proof: if { }: set and [ ]: matrix, then [{ }]: matrix contains set;
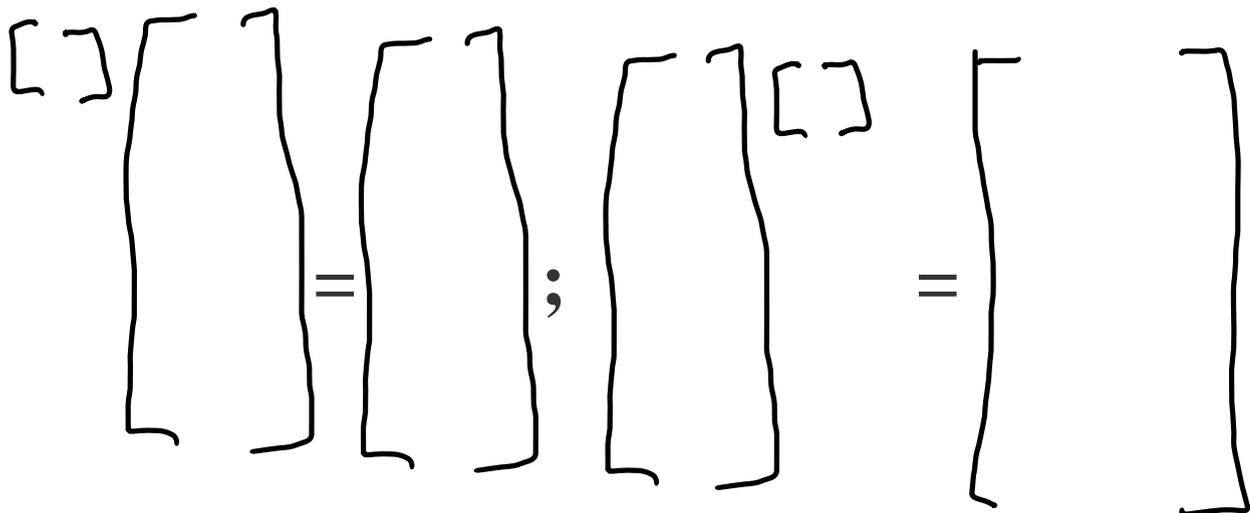
where,
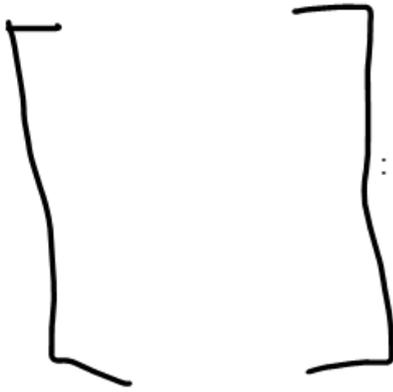
: a density matrix having sets of & .
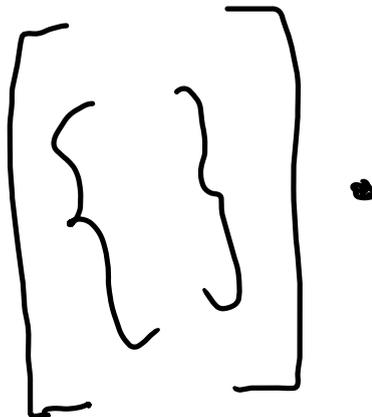
Therefore,

 $\Rightarrow :: \Leftarrow$
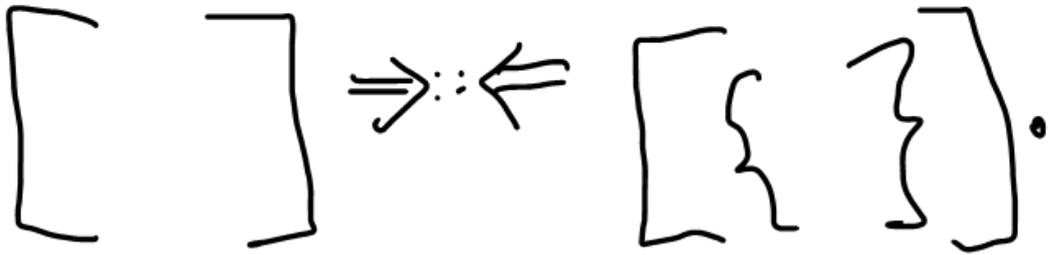
Since
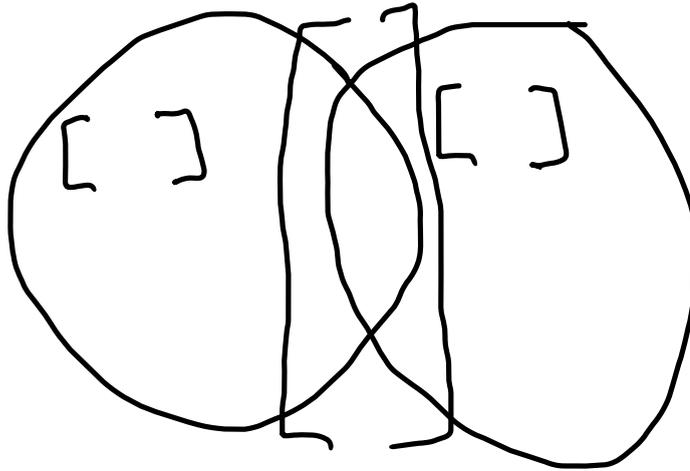
Satisfies all the

above definitions having matrix operations with sets within matrix, it is equivalent to

Hence the proof of symbolisms above!! This above proof of the rider of the pure mathematics of bracket operator mathematics would be applicable to situations that involve Venn diagram sets to matrix sets!! Linking logic to language is thus possible!! One such application may be in having symbolic knowledge of the reason of the *Metrix protocol* with closure by removing trivial {matrices, sets} with cancel matrix with quantified mathematical logic per argument derived above.

Example 1: [matrix]{simulating} ><video><" texting" ......communicating......

$$\left[\left\{ \text{"¿profits"} \right\} \right] = \textbf{video}$$
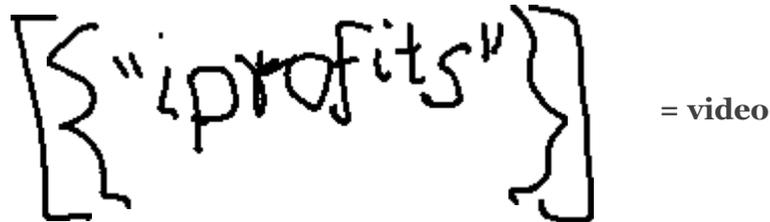
{picture of the future} = communicating............
Audio image video texting communication may be applicable to IT Metrix protocol

Example 2: mathematically $[\{0\}]=0$ trivial solution since $[\{0\}]\neq 0$, though $0=0$ to similarly, $[\{g[0]\}]\neq 0$, though $g[0]=0$, per algebraic gage physical mathematical theory author has derived elsewhere. Besides, $[\{g[0]\}]\neq[\{0\}]$ in types of physics vacuum!!

General solution proof of bracket matrix operator Lagrangian and Hamiltonian algebra:
Let
Point Lagrangian $L_{relativity,point} = p_{relativity}^2/2m - \varphi_{relativity,point}$
Point Hamiltonian $H_{quantum,point} = p_{quantum}^2/2m + \varphi_{quantum,point}$
If code matrix, $\mathbf{C}[X] = [Y]$, then for example, $[X]$ = matter mass matrix, m, $[Y]$ = matter momentum matrix, p, and $\mathbf{C} \equiv c$, speed of light, these based on signal/noise density critical matrix explained above, $p_{relativity} = m_{relativity}c$; $p_{quantum} = h\,k_{quantum}$. Hence,
$L_{relativity,point} = m_{relativity}c^2/2 - \varphi_{relativity,point}$
$H_{quantum,point} = h^2\,k_{quantum}^2/2m_{quantum} + \varphi_{quantum,point}$
Identification of the problem $\{\varphi, m\}$

Zero-point energy quantum versus relativity must confront {vacuum, ultraviolet} catastrophe. To achieve that, a different approach in terms of the point physics has been achieved already by the author working with coauthoring international scientists, listed @ "Referential Citations Literature Shortlist".

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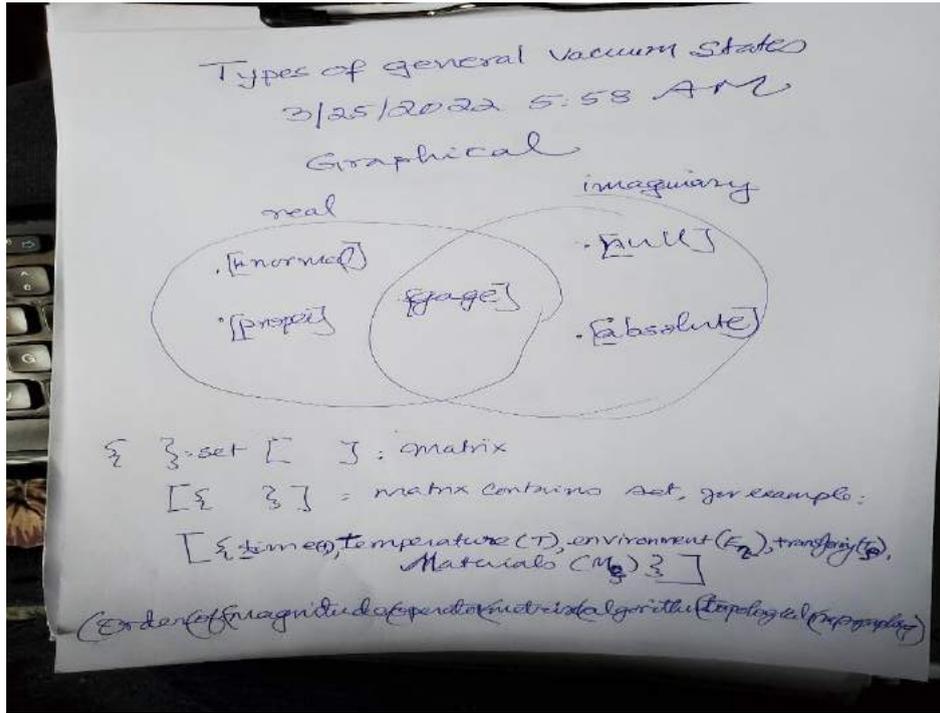
Gage zero-point fluctuations absolute zero vacuum matrix switching with zero metrics gage string-metrics matrix entropic vacuum essentially.
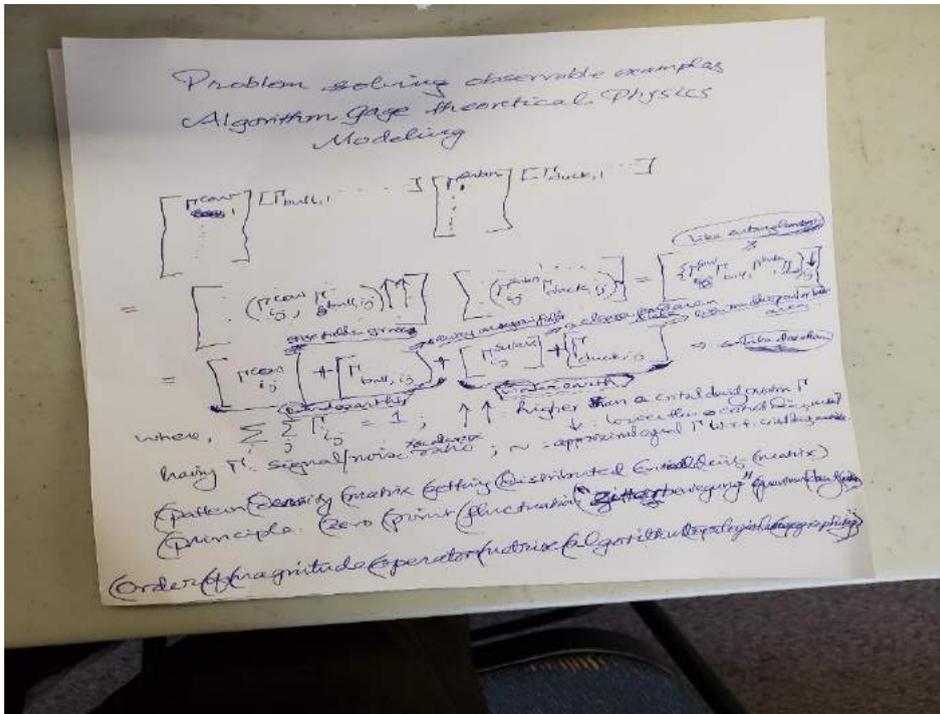
Proof observations are verifying the PDP circuit assembly physics with mechanism observables. Order magnitude gets acceptable towards verifying dark matter energy entity experimentally.