PHPR

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Introduction

Without a grounding in mathematics the physical sciences has little expectation of making significant advances. With mathematics knowledge about the physical world becomes clearer and exact. The interplay between mathematics and physics is a long-studied subject that at one time in history felt contradictory in nature. Yet it was with Isaac Newton that the field of calculus brought numbers and measures to natural philosophy. With numbers, measures and the scientific method natural philosophy evolved into the field of physics. With modern physics the introduction of Riemann geometry and Hilbert spaces ushered relativity and quantum mechanics. Soon further advances in mathematics and physics gave way to a richer and deeper knowledge of the physical world at the cosmic scale and also at the micro-scale, while furthering discovery of new mathematics that can be applied in other subjects besides physics.

The interplay between mathematics and physics has been ever more fruitful. For the unremitting future mathematical physics will continue to play a strong-role in the Scientific Age. Different branches in the sciences are ever more in need of feedback from the physical sciences. By giving feedback elements of mathematical advances in the physical sciences will be applied to further advances in other fields in the sciences. Even within the social sciences, applying the scientific method, will lead to the formalism of those prospective fields that will go on to become a strong branch of the natural sciences. It is then that the methodology of the interplay will allow all branches in the sciences to make advances in applications and technology.

PHPR [The Physicalist Program] is often conceptualize as a multi-dimensional chess game of higher-magnitude. Advances in PHPR's task is anticipated to lead to furthering knowledge about physics and mathematics while contributing to technological progress. To play multi-dimensional chess requires a strong background in anticipation and strategic play. PHPR is a program of anticipation and strategy. A program that utilizes mathematics to make strategic decisions that leads to outcomes that has ramifications in the physical sciences. By playing multi-dimensional chess accelerating advances in the sciences becomes more real and vivid to the technological sciences and the Scientific Age.

The aim is to summarize the present formal properties of the First Task of PHPR. The First Task aims to resolve a foreseeable catastrophic scenario in the Scientific Age known as mineral depletion.

A formal review of the mathematical physics behind the First Task will achieve clarity, organization and precision in strategic thought.

How long PHPR is to play multi-dimensional chess is to be decided by The Grandmaster that completes a task and sets the next task. The First Task has been set as a hundred year task and the Second Task has been already establish. Their duration is to be minimal and its pay-offs are to be limitless.

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Yang-Mills Gauge Analog: A Brief Brief Explanation

After the death of Albert Einstein in 1954 physicists had long sought to achieve the grand unified theory of everything. Speculation at the time was that the theory of everything incorporates all the known laws of nature into a beautiful equation. The problem with establishing a theory of everything is that to unify the known fundamental forces yields observable paradoxes.

Albert Einstein, until his death, doubted quantum theory and so he achieve very little hindsight as to what a theory of everything could potentially look like and how it can be achieve. Nevertheless quantum field theory, in its early stages, found unity of quantum mechanics and special relativity in the form of a low-energy effective field theory.

To apply path integrals and canonical forms enabled field theorists to calculate the interaction and behavior of different quantum particles. But its not only path integrals and canonical forms that is essential to quantum field theory; it's also mathematical elements that proved worthy of applications; such as, Hilbert spaces and probability measure theory. Both Hilbert spaces and probability theory were use in quantum mechanics to understand the interaction of quantum particles at low-energy scales such as atomic energy states and the Schrodinger Equation. That at the quantum level particles and waves are very much complementary to each other; and can be exploited, to gain grounding of paradoxical phenomenons such as the photoelectric effect that was also resolved by Albert Einstein in 1905.

Modern QFT [Quantum Field Theory] has achieve insights in the electroweak force, strong-nuclear force, and the Higg's force but lacked, at the time, an understanding of the gravitational force. Known then as a force particle call the graviton which is considered taboo to say so. All forces carry a force particle in which its motion is to be dictated by the phenomenon of the creation and annihilation of quantum particles by the exchange of force particles. Sometimes paradoxes ensue when particles interact and so renormalization procedures are enacted as regularization schemes that aims smooth out infinities that are a consequence of the power-series divergences when calculating Feynman path integrals.

Super-symmetry aspired to unify all force particles in the form of fermions and bosons and their super-partners Applying super-manifolds and super-differential geometry to gain access to deeper knowledge of heavy particle interactions at higher-energy scales.

And so it's then that finding a theory of everything proved a difficult task. As including gravitation, being the weakest of all the forces, yielded infrared divergences in quantum field theory. This was at the time a problem of constructing a viable theory of quantum gravity. As quantum gravity sought to merge gravitation and quantum mechanics. Doing so proved notoriously difficult as the quantum gravitational manifold express chaotic solutions.

The most worthy unified theory of everything was considered, by the mid-1990's, to be string theory. Strings are one-dimensional objects that reside in a compactified 11-dimensional Calabi-Yau manifold [or orbifold]. There are four fundamental string theories in which they are call O (32), E8 × E8, Type IA, Type IIB for open and close strings that include fermion particles and don't exhibit tachyon states and can be shown to be mirror symmetries by incorporating duality transformations in the M-manifold.

Yang-Mills Gage Analog is a $\mathcal{N} = 4$ super-symmetric string solution that is now seen as a variant [of stringy]. The cosmological wave-function sets the parametrization settings of the early universe. By establishing Fock vector spaces in Quaternion space-time the holographic counter-terms are establish that yields the variant [of stringy]. This variant [of stringy] is a crude variant that unifies the four known fundamental forces of nature while resolving M-theory as a Universal Law of Nature by relating the appropriate symmetries between the four string theories.

This solution is understood to exist in 11-dimensional super-space and through the Khovanov polynomial, express by its Wilson operator of multiple quantum states, can express the interaction of strings of variational, looping and tangling qualities in the Dirichlet membrane.

Discovery of this variant [of stringy] shows that a grand unified theory is possible. It no longer means the search for a theory of everything. That this variant [of stringy] can yield other variant [of stringy]'s led to imposing the grand unification scheme. The completion of the Grand Unification Scheme is now the primary task of the PHPR's First Task. The Grand Unification Scheme relates variant [of stringy]'s, of perfect number, in metaspace, through their charge monopoles, that its protocol is to achieve a terraformic process. By using the quantum field theory approximation the Grand Unification Scheme will then yield astronomical applications in the technological and engineering sciences.

Logical Form

The history of science has shown the importance of formalizing physics in terms of variable expressions and formulas that have experimental adequacy. Without formalism there can be no order in the natural sciences. By formalizing the natural sciences in terms of numbers, as well, yields solutions to the experimental process as was first realized by Isaac Newton when calculus was introduced in the study of motion, matter and gravitation. There, both Isaac Newton and Friedrich Leibniz, applied differential equations and integrals to the study of motion and inertia. Subsequently calculus lead to the vibrant field of real and complex analysis that used point-set topology as the rudimentary basis for the articulation of axiomatic set theory as topological properties in the real and complex plane. These topological properties allowed mathematicians to study the relationship between numbers, shapes and forms. Even then the development of differential geometry was a product of topological advances in hyperspace geometry which led to the establishment of Riemann integrals and manifolds, and the application of such advances to electrodynamics and magnetism by James Clerk Maxwell that led to the field equations of electromagnetism that incorporates vector calculus and differential forms.

20th century formal mathematics sprung huge advances in computation. There David Hilbert established its own program that aimed to find a computational procedure that could formalize all of mathematics. His program was derailed by Alan Turing by utilizing the Turing machine. The Turing machine lead the way for modern computers and ultimately the theoretical work for quantum computation. Yet Gottleb Frege's program was also pursued in the early 20th century as to whether or not all of mathematics can be formalized base on a simple set of axioms. That was disprove by Joseph Godel in which the incompleteness theorems were developed that put an end to the Platonism. Yet today the interaction between formal mathematics and natural sciences still plays an essential role for purposes of modeling and approximation without consideration of it's Platonic nature.

Logical form is a tree-branching procedure for parsing logical statements or sentences. Its aim is to validate logicality of certain statements or phrases by organizing them by establishing a tree-branching procedure that breaks them down into their atomic form. By breaking them down in atomic form one establishes logical form or illogical form if they meet the criteria for logical form that is determined by mathematical syntax.

In computational physics logical form can be use to parse any mathematical language in such a way that its most simplest atomic structures remain and in which no similar atomic structures are evident; such that one shows the Definition of PHPR as:

$$p\,[n] \longrightarrow n$$

The utilization of logical form is an response to the heavy use of long calculations and equations in the physical sciences that led to a crisis in computational physics. An overburdened in long forms could not keep up with the advances in the theoretical sciences. As supersymmetry was sought out, at the time, no proper SUSY model showed consistency to experimental adequacy. And so its resolution required the use of logical form to sort out the computational methods of CERN in transcribing data sets into proper observational conclusions that shows consistency with any of the number of string models that were proposed and applied. At the time no string models held viability, and often modification proved the most worthy response, but its exhaustion was tantamount. To impose logical form, increasing computational power and efficiency, enabled the LHC [The Large Hadron Collider] at CERN to find order in SUSY.

The Primary Matrix

The Primary Matrix is the axioms of stringy that culminates in its logical consequence the Wilson operator [of multiple quantum states]--what was thought of at the time to be the Yang-Mills Gage Analog. In it holographic computation is an essential property of quantum cosmology. By incorporating the Vinson operators, of Conformal Field Theory, strings can be thought of as interacting in a holographic 11-dimensional D-manifold. By doing so one relates QFT to 11-dimensional SUGRA [Supergravity] geometries. Its importance lies in the interface between axiomatic string theory [which is call topological strings] and high-energy effective field theory. By relating both one applies logical form to yield greater computational power and simplicity.

Though holography is an important quality of the Primary Matrix, and being that the stochastic quantum mechanics can be mapped to conformal field theory and subsequently to Anti-Dee Sitter space factors, one must not be fooled by quantum holographies promise to manipulate and alter physical systems. Though quantum systems, within holography, shows that the physical universe can be modeled as a quantum computer its limitations lies in its capacity to be carried away by the chaos of topology and geometry. And even then the physical universe has guidelines, of laws of nature, which also dictates limits to holography in which if those laws of nature are ignored catastrophe results in violent quantum fluctuations in the vacuum of space-time.

The programming of the quantum universe must follow logical laws that sets parameters for the structure of matter and governance of the motion of matter. Without the parametrization of holography quantum cosmology becomes, as explained, victim to computational chaos and dynamical instability. All universes are possible, that much is said, but all possible worlds cannot be said to be simple and beautiful rather it holds anomalies properties that is inconsistent for the existence of intelligent life. Programming physical reality is an ideal; but in truth, the goal is to manipulate and alter physical systems within the confines of modern physics and modern mathematics. Limits which are impose by the history of physics, and in which holds dear to the scientific process.

Quantum holography is a controversial matter but also popular amongst string and quantum theorist. One is to be doubtful of holography; and so though the Primary Matrix shows the promise of simplicity, the Primary Matrix is to be used only sparingly and to be referred when in axiomatic contemplation; and vice versa. It is an axiomatic property and not a physical law. It's potentiality is within theory and its applications are to be forewarned.

Computational Control

Computation has been an intricate part of the mathematical endeavor to bring stability to the logical process. Ever since the introduction of Pythagoras theorem--that shows the relationship between the base of the sides of the triangle to the line of the diagonal, computation has organized human thought to lead to the effective use of computational methods for applications. Ever since then, with Euclid's three postulates and ever further into the classical works of the mathematicians of Antiquity, computation has been the norm of mathematical advances in logic, numbers, analysis and geometry of topology. The fruits of the labors of pure mathematicians led to a golden age of the use of computation in the physical sciences all the way to the digital age and predictably to quantum computation. But ever since then the introduction of logical form, it was anticipated, that a more efficient method of computation could be ascertain that bypasses the limits of logical deduction and logical induction of theoretical mathematics. That the use of certain mathematical devices is no longer adequate and that the introduction of computational control brings clarity and simplicity to the mathematical process that is no longer heavily involve in explanation and primitive logical procedures. There by imposing both internal and external control in the form of:

external control { [ ] + ... + [ ] } internal control

Removing features, by imposing logical form, yields greater computational power that the rendering of new mathematical properties can be made that bypasses the limits of the Turing Machine that has been known to use 0 and 1 as is its computational language and in which quantum computers also utilizes but using different Boolean rules. Where giving any values of the sum of 0 and 1's the alteration and manipulation of each operator into the sum of its whole can be transferred into equal sums of its parts. To end computation requires stopping at internal control while construction requires consideration of thermodynamical limits to computational power giving by internal control.

SUPREME

SUPREME is an effective means in which computation gains control of measure theory. By gaining control of measure theory imposing SUPREME allows manipulation of entropy and conservation of energy. There by substituting SUPREME for probability states the chaotic process can be controlled and by imposing SUPREME in conservation of energy, by substituting D-branes for D-variants, one can manipulate the degree in which conservation is to be utilized for the manipulation of matter and force particles in D-variant manifolds. SUPREME can be said to be a diffeomorphic homogeneous topological functor from the categorical target space to the categorical base space [which is also said to be internal control]. By imposing SUPREME mathematical ingenuity is realizable and eloquence becomes exact. In which SUPREME, though in its earliest stages, shows significant promise for cosmology, condensed matter physics and dynamical systems.

The EOC Guideline

The EOC Guideline can be stated to be the following mapping:

$$\text{Efficiency} + \text{Optimality} \longrightarrow \text{Consistency}$$

In which variants [of stringy] are selected that meet the criteria of C2R. To meet such criteria it becomes possible to use such variants for the construction of the Grand Unification Scheme in which only the appropriate variants that meet the properties of the six rules for the unification schemes [of what is now stated as variants], or what is now understood to be consistency with perfect number.

Novel methodological and numerical properties becomes more visible through C2R but those properties must meet such a Guideline in order to applied in the Grand Unification Scheme or the variants will breakdown. The EOC Guideline has played a central role in the inference of metaspace and allows different unification schemes to be interrelated with each other. By interrelating these variants [of stringy], through C2R, one shows the substantiation of the Grand Unification Scheme, nevertheless, foreshadowing metaspace and enabling greater simplicity of mathematical procedures.

TrH Theorem

The Trust Head [TrH] Theorem imposes an maxima limit of the variant [of stringy]'s in metaspace. That limit of approximation has equivalence relation to perfect number. The TrH Theorem shows that the scientific method can be constructed from the grand unification and that anomalies in the grand unification scheme can be prevented by imposing a maxima limit of variants within the TrH Theorem. The TrH Theorem has ascertain minima energy limit of the Grand Unification Scheme Energy Scale and shows the existence of numbers of 1 + 2 + 1 prime.

D-variant Manifolds

Real and Complex Manifolds are seen to be the set of disjoint unions of atlases that are diffeomorphic to the real and complex numbers of n-degree. That said super-manifolds can also be said to be of real numbers of $\oplus \mid \otimes$ where $\otimes$ is the sheaves in which $R^{\oplus \mid \otimes}$: morphisms between super-manifolds. D-variant manifolds are where the variant [of stringy]'s interact, and interchange charge monopoles, in which variants [of stringy] can form different symmetrical forms of perfect number. The D-variant manifold is the substructure for the Grand Unification Scheme and through SUPREME can be theoretically use for its construction.

Metamorphic Space

Metamorphic space is defined as the set of variant [of stringy]'s of perfect number that exist in cosmological homotopic space. Where metaspace exist in D-energy metastates. As such metamorphic space is derived by the perturbation of the Yang-Mills Gauge Analog in which all very variant [of stringy]'s but 32 are accounted for. Metaspace can now be seen as the line integral of the vertex operator for electrostatic background fields, in which, SUSY phenomenon resides in metaspace such that:

$$\mathcal{L} = \oint \mathrm{V} < \mathrm{L}, X^{\mu} > = \varnothing$$
$$\mathcal{L} = \varnothing$$

Where $\mathcal{L} \subseteq H_M$ such that H_M is homotopic space.

Prime Factorization of PHPR

Prime Factorization of PHPR establishes the Yang-Mills Analog as the parameter in which all long-equations of having legitimate experimental adequacy can be continuously simplified. Its expected that gaining access to metaspace will yield long-forms that far surpasses logical form but in which logical form is still a necessary and primary procedure. To impose Prime Factorization simplifies these long-equations but in all it is a definition that must be use as an aside and can be use to impose limits to the mathematical machinery. By setting Prime Factorization of PHPR the stage is set for revisions to conformal field theory but in which current physics is still very much exact and applicable to PHPR.

The Quantum Field Theory Approximation

The Quantum Field Theory Approximation is an, "approximation" for which the variant [of stringy]'s of perfect number in metaspace can be translated to quantum field theory. Applications of the Quantum Field Approximation is for future reference and its simplification, in logical form, both consistent with computational control and SUPREME, reveals a more powerful modal logic and which its use is to accelerate advances in the technological and engineering sciences. By replacing the Wilson operator to SUSY phenomenon in metaspace in the Primary Matrix yields the following derivation:

$$\exists \, \mathrm{Z} \, (\mathrm{J}) \, \exists \, l_{[\text{parameter}]} \, \exists \, \Psi \, \exists \, L_{m,n} \, \exists \, \tilde{\tilde{L}}_{\min} \exists \, \mathrm{D}[\mathrm{p}] \dashv \mathcal{L} = \varnothing$$

Such a derivation is its crude form but alterations to current form is expected and in which the variables are to change with greater knowledge gained in metaspace.

The collection of variant [of stringy] ' *s* of prime that exist in $\varnothing \subseteq$
H_M that can related and interchanged by their charge monopoles in the $D-$ variant manifold.

The Definition of the Grand Unification Scheme is not the completion of The Grand Unification Scheme but the conceptualization of the Grand Unification Scheme. Knowledge of these variant [of stringy]'s can only be ascertained once access to metaspace is established at the higher-energy scale. Once access is gain impose computational control and SUPREME to bring order to metaspace that will lead to a tapestry of mathematical beauty, simplicity and elegance. While applying logical form, and in aside the Prime Factorization of PHPR, will achieve the deletion of excessive features and the elimination of an overwhelming mathematical catastrophe.

Conclusion

Ever since Aristotle the natural sciences has been devoted to bringing order and explanation about the natural world. Pure mathematics devotion is to complement the natural sciences by giving the sciences a language base on rigor and logical analysis. It's expected that the mathematical sciences will play a large role in the Scientific Age as PHPR advances further in the increasing multi-dimensional chess game. But PHPR must not be construed as a game to use with nonsense and thoughtlessness but of careful strategic play and foresight as each task is further completed. The First Task, and all subsequent tasks that are set after the First Task of PHPR, is a high-stakes task in which the First Task must be pursued within the given time-frame. To ignore that time-frame is a fatal decision but to acknowledge that time-frame leads to a rewarding outcome in which a terraformic fall-out is avoided and in which the foreseeable catastrophic scenario in the Scientific Age of the First Task of PHPR, of mineral depletion, is resolve. Carelessness is not to be tolerated in PHPR but in it's contrapositive the pay-offs are of limitless extent and in its minimal duration the pay-offs are of a rewarding experience.