Global Journal of Science Frontier Research: a
Physics and Space Science
Volume 19 Issue 6 Version 1.0 Year 2019
Type : Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 2249-4626 & Print ISSN: 0975-5896

The 'Computational Unified Field Theory' (CUFT): Redefining Mass, Gravity & the Physical Universe

By Dr. Jehonathan Bentwich, Ph.D.

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GJSFR-A Classification: *FOR Code: 020109*

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I. Introduction

Twenty-first century Physics is in a state of a fundamental crisis stemming from the principle contradiction that exists between Relativity Theory (RT) and Quantum Mechanics (QM), and its inability to account for up to 85% of all mass and energy in the universe (e.g., termed" "dark-matter" and "dark-energy" – but which cannot be detected empirically). Interestingly, at the "heart" of this "Paradigmatic-Crisis" of 21st century Physics stands the unresolved enigma of "Gravity" (and "Mass") – which manifests in the principle inability to reconcile between RT's strict constraint set on the transmission of any signal (or information) across 'space-time' at a speed greater than the "speed of light", as opposed to QM's "quantum-entanglement" phenomenon indicating an "*instantaneous*" effect between "entangled particles"; This is due to Relativity's Energy-Mass Equivalence which seems to negate the possibility of any "massive object" (or particle) travelling at a speed greater than the 'speed of light'; Indeed, the "missing-link" in Physics is the current inability to connect Quantum Mechanics with Relativity's discovered Mass/Gravity's curvature of space-time; Likewise the enigma of "Gravity/Mass" is associated with the inability to detect "dark-matter" (and "dark-energy") which cannot be observed empirically, yet is assumed to explain the accelerated expansion of the physical universe;

Fortunately, one of the recently discovered leading candidate 'Theory of Everything' (TOE), entitled: the 'Computational Unified Field Theory' (CUFT) (Bentwich: 2012 a & b; 2013 a-c; 2015; 2016; 2017:a-k) seems to be able to resolve this apparent RT-QM theoretical inconsistency based on its new computational definition of "Mass" (as well as of 'time', 'space' and 'energy') – associated with the CUFT's discovery of a singular (higher-ordered) 'Universal Computational Principle' (UCP) which *simultaneously* computes every exhaustive spatial pixel in the universe , e.g., at any minimal time-point "c^2/h" = 1.45^{-42} sec' (comprising an extremely rapid series of 'Universal Frames', UF's). Due to this UCP's simultaneous computation of all exhaustive spatial pixels in the universe at every consecutive UF's, the CUFT advances a new 'A-Causal Computation' Paradigm which negates the very possibility of the existence of any "material-causal" physical relationships between any two (or more) exhaustive spatial pixels in the universe (at any single/multiple UF's): This is because if indeed, this UCP simultaneously computes all exhaustive spatial pixels comprising the entirety of the physical universe (at any single/multiple UF's) there cannot exist any "cause and effect" physical relationships between any two (or more) exhaustive spatial pixels (at any single/multiple UF's). This new CUFT 'ACC' Paradigm therefore negated RT's Einstein's Equations due to their assuming of a "cause and effect" physical relationship between certain 'massive objects' and their "causing" of a 'curvature of space-time' (and conversely the existence of a "causal" relationship between this 'curved space-time' and its determination of those 'massive objects' travelling pathways').

According to the CUFT new computational definition of "Mass", "Mass" is defined as an "object-consistent" measure computed by the UCP simultaneously for each exhaustive spatial pixel in the universe (across a given series of UF's); The key point is that this new UCP's computational definition of "Mass" (as well as of 'time', space' and 'energy) produces an alternative new conception of the "curvature of space-time" – which is not "caused" by any assumed "material-causal" physical relationships. To understand this new

Author: e-mail: drbentwich@gmail.com

'ACC' conception of the curvature of space-time, an outline of the UCP's computational definitions of the four physical features is given: the UCP simultaneously computes each of those four physical features based on the four possible combinations of its two 'Computational Dimensions' of 'Framework' (frame/object) and 'Consistency' (consistent/inconsistent) such that "mass" and "time" are computed by the UCP as the 'object' – 'consistent' vs. 'inconsistent' measures, whereas "space" and "energy" are computed as the UCP's 'frame' – 'consistent' vs. 'inconsistent' measures. Therefore, the ACC's alternative conception of the 'curvature of space-time' arises from its depiction of particular "high-mass, low energy" 'loci' characterized by the UCP's computation of a specific set of spatial pixels that possess "high object consistency" (e.g., high-mass) /"low frame inconsistency" (low energy) vs. other spatial-loci set of pixels characterized by "low object consistency" (low-mass) / "high frame inconsistency" (high energy); Hence, according to this new ACC Paradigm's conception, the apparent "curvature of space-time around "massive objects" arises not from any 'material-causal' physical interactions between such massive objects and space-time (i.e., which is negated by the ACC Paradigm), but rather arises from the mere appearance of those "high-mass, low-energy" 'spatial-loci' at a greater "object-consistency" across a series of UF's relative to appearance of "low-mass, high-energy" 'spatial-loci' across a given series of UF's. Therefore, instead of RT's Einstein's Equations assumption of a "material-causal" physical relationship between 'massive-objects' "causing" the 'curvature of space-time', the CUFT's new 'ACC Paradigms explains this apparent curvature of space-time as arising from the UCP simultaneous computation of all exhaustive spatial pixels in the universe through an extremely rapid series of UF's comprising differential 'high-mass/low-energy' vs. 'low-mass/high-energy' 'spatial loci'.

Indeed, this CUFT's new 'A-Causal Computation' (ACC) Paradigm offers Physics an entirely new conception of the origin- "dissolution" (in-between any two consecutive UF's), sustenance and evolution of the universe – not as "caused" by an initial (first UF's) 'Big-Bang' nuclear explosion (which is negated through the abovementioned ACC principle negation of any "material-causal" physical relationship/s at any UF's), but rather as "evolved" based on the UCP's consecutive computation of all exhaustive spatial pixels comprising the entire physical universe; Hence, this new ACC Paradigm also discarded the existence of the (hypothetical) "dark-matter" (and "dark-energy") as "causing" the empirically observed accelerated expansion of the physical universe, instead postulating that this accelerated expansion of the physical universe arises from the UCP's accelerated increase in the additional number of spatial pixels computed by the UCP for each consecutive UF's. Indeed, the complete metamorphosis in 21st century Physics' conception of the physical universe is brought about by the CUFT's ACC Paradigm's additional 'Computational Invariance Principle' (CIP) theoretical postulate of the CUFT: According to this CIP since the four basic physical feature of 'space', time', 'energy' and 'mass' exist only "transiently" – during each consecutive UF (as solely produced by the UCP), but "dissolve" 'in-between' any two consecutive UF's, whereas the UCP exists constantly both "during" each consecutive UF's as well as solely exists (without the presence of the physical universe) 'in-between' any two UF's; therefore those four physical features comprising every exhaustive spatial pixel in the universe may only be considered "phenomenal" and "transient" – whereas this singular UCP is regarded as "constant" and "real"… Therefore, according to this CUFT's 'CIP' theoretical postulate, "Mass" (as well as the other three physical features) may only be regarded as "phenomenal" and "transient", whereas the singular UCP which continuously computes- "dissolves"- re-computes- and evolves every exhaustive spatial pixels' "mass" ('space', 'time' and 'energy') may only be regarded as "permanent" and "constant". We thus obtain an entirely new conception of the physical universe (and its four comprising physical features) as solely computed- "dissolved"- re-computed- and evolved- by the singular UCP which exists both "during" its computation of each consecutive UF's as well as solely exists (without the presence of the universe) 'in-between' any two UF's.

Finally, this new CUFT's ACC Paradigm fully unifies and integrates "mass" with the other three basic physical features, as well as between RT and QM – within a singular Universal Computational Formula (UCF), regarding :

Universal Computational Formula (Ucf):

$$UF\{a..z\}: \left\{ \frac{c^2}{h} \right\}_{Px\{1..n\}} = \frac{s}{t} \cdot \frac{e}{m} \quad ,$$

wherein the 'Universal Computational Principle' (,) computes each consecutive Universal Frame/s (UF{a..z}) at the rate of "c^2/h"=1.45^{-42} sec' all four physical features of 'space', 'time', 'energy' and 'mass' in an integrated manner such that for each exhaustive spatial pixel (Px{1…n}) comprising each (consecutive) UF the UCP yields an integrative relationship of s/t * e/m. Apart from this (new) 'Universal Computational Formula's complete integration of these four basic physical features of 'space', 'time', 'energy' and 'mass', it also replicates- integrates- and transcends- both quantum and relativistic aspects, as can be seen from the two "Relativistic" and "Quantum" Formats of this singular Universal Computational Formula:

Relativistic Format: $e * \frac{s}{t} = m * \frac{c^2}{h}$

Quantum Format: $t * \underline{m} * \underline{c^2} = s * e * h$

Initial empirical validation for the CUFT's new 'ACC' Paradigm was obtained based on one of its particular 'Critical Predictions' (differentiating it from those of both RT and QM) postulating that based on the CUFT's computational definition of "Mass" as an 'object-consistent' measure, a relatively "more massive" particle (such as the 'Muon') would be measured as more "spatially-consistent" than a "less massive" particle ('electron') across a series of UF's which was empirically validated through the 'Proton-Radius Puzzle' findings. (Bernauer & Pohl, 2014).

Therefore, it may be deduced that the CUFT's new 'ACC' Paradigm offers a potentially satisfactory 'TOE' which can replicate- integrate- and indeed transcend- RT's and QM's description of the physical universe – i.e., through the CUFT's ACC Paradigm's new computational definition of Gravity/Mass, which therefore opens significant new horizons for the further development of 21st century Theoretical Physics.