RESEARCH INTERESTS

IN

MATHEMATICAL, PHYSICAL, COMPUTATIONAL AND ENGINEERING SCIENCES

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INTRODUCTION

As an expert [3, 4], I have written a book [1], which conveys to the current research interest in building an energy-matter prototype as a *matter replicator* which further proves a grand unifying equation, GUT [1], discovering a new force unifying the remaining forces via a very short equation $E=T_ov$, where E is energy, T_o a *space-time pi-twist force* once its constant momentum p_o times v_o (of the growing twist) accumulates to form acceleration for more pi-twists, the v as velocity for a body in the formed vortex experiences the geometric space-time twist with a value of $T_o \approx 3.85 \times 10^{43}$ N.s (see Appendix, part II) explicating why the universe is expanding at that very point of the existential body i.e. a *pi-black hole* connecting our universe to another for *a new cosmological transformation* (*not a new big-bang just a cosmologically physical transformation* (*N*th) or see the book's succinct description at amazon.com [1].)

The book is called "**The Compulsory Force on *force* Principia: The Articulation *of* III Discoveries on GUT**" and ends with a new table of constants (see Appendix, part II), challenging the skeptics of the current problems in Physics, unifying the four fundamental forces on a sub-matter constituent (quite sub-atomic) against macro levels (quite cosmological). To this account, displaying a certain practical perspicacity on the observation for an Einsteinian, Galilean and Newtonian observer(s), shall verify my claim, which completely depends on the implementation of *a new energy-matter source*:

This new invention model replicates matter in a concatenated manner, emerging from a physically and geometrically growing population set of stable *black hole dots* (BHDs), Fig. IIX, under the influence of the unifying force of nature (*the Compulsory Force on force* [1]). This design is licensed (since 2007 [1]), to prove the legitimacy of my claims visible in this context. The fabrication of the device layers, is in form of harnessing the single excited *fermion* (e.g., a hot electron) in a combined chaotic EM field (highly quantum chaotic aligned with the dynamics of quantum chaology) for 26 dimensions (12 + 12 space-time non-Euclidean dimensions, relativistically, via 2 more condensed dimensions to manifest the new phenomenon in an energy-matter replication). The field confines and collapses the spherical volume of all chaotic patterns of the particle(s) into a superdense regular pattern (quite circular for an ultimate excitation of the electron or dimensional jump, Fig. I.iii). We practically harness the replicated matter in terms of capacitors storing energy accumulatively from these BHDs, on a nano-scale along the horizon of infinity i.e. the distance between the replicated matter, Fig. IIX (a crude representation of Fig. IV [1]). From here, we have a feasible (quite real) *matter replicator* for any *matter constituent* on a staggering economic scale for all mankind. These findings, the copyrighted designs, components and materials as well as simulation model and analysis for the ultimate expected outcome, are mainly reflected in the latter sections of the book [1].

INTEREST PARTICULARS

The following aspects of my work shall promote the book chapters for at least 9 to 11 peer-reviewed publications in particle and material physics, photonics, quantum gravity, mathematical, etc. journals, as currently being refined under my authorship and supervision:

1. Photonics and EM measurements: This involves quantitative measurements proportional to qualitative measurements, observing specific effects as classified from one phase of the experiment to another in a combinatorial manner: photoelectric effect with any other effect, noise, EM field, diffraction and particle behavior; wave filters, cancellers and their application; spectra analysis with relevant sensors/spectrometers, quantum wells, particle superposition and laser effects, capacitance, lenses (subject of filters, diffraction, etc.) and optics.

2. Power measurements, semiconductors, signal processing, emission and transmission analysis: standard electronics on resistors, switches, IC's as well as potential difference occurrences (voltages) distributed across the layers of the apparatus as electric current (Fig. I.i). The power consumption, IC performance, electrical testing, and componential setup of the micro and nano-chips or power array for the device is simulated and thereby tested [2].

3. Heisenberg's Uncertainty Principle (HUP), for the specific particle subsiding in one of the field's space-time layers, confronted with other incoming particles in the field's area for a confined measurement of position (relative to velocity). For this measurement, we conduct a formal uncertainty analysis via probability distributions conforming to the completeness of asymmetric waves presence matched to a geometric completeness on their circular positions.

4. Einstein's SR, GR, and my relativity as pi-swirl twists relativity or parallel relativity (PR) [1].

5. Partial Differential Analysis, relative to my inner-integrals positioned to their outer-integrals forming 26 dimensions representing the combined magnetic field (a selective static sphere or **SSS** with a 26 dimensional space-time spherical volume) for the colliding particles in acceleration (recall #3)

6. Quantum Chaology (e.g., [3]) to study the measurements of the particle within the combined field relative to the "probable matter replication" outside the field. My hypothesis would be the **SSS-BHD Hypotheses: 1-** *Benefiting a high particle population from a chaos of collided particles in the combined field is observable along the axis of the SSS field's outside horizon.* **2-** *The size of the field is proportional to the confinement of the collision in a selected space and time warped on a nano-scale, with a combination of particle confrontation, HUP and relativity before warp on a larger scale i.e. the field's points of eccentricity –ε and +ε > nano measurements.* (Summary extract, Appendix III [1])

7. Electromagnetism, Laplacian matrices, flow and fluid density analysis upon different states of matter: Maxwell's equations in use to compute the active spatial and temporal vectors of the combined field where particles and their interacting forces subsist in or congruent to the geometric spatial limits of the field (Fig. I.i)

8. Cosmic relativity: mainly for massive bodies related to the fundamental concepts of *pi-swirl twists relativity* miniaturized into the nano-scale experiment (the device fabrication metric) upon the forces plus the energy-matter dynamics (physics) of the design.

Targeted audience

In general, those whom their interests lie within the fields of Classical and Quantum Physics, Photonics, Astrophysics, Mathematical, Material and Particle Physics, as well as Computational Physics for mathematical modeling and simulation methods, data collation and analysis in terms of computational and engineering results focused on the energy generations and saving factors against any loss denoting the economical and performance bounds of the experiment. The funding and/or endorsement on the patented and copyrighted solution and/or invention of this idea, further governs all the rights supportedly licensed, contracted and/or retained between the endorsers, co-authors and the senior author/inventor/licensee of the idea (Copyright Act No. 98 of 1978).

References

[1] Alipour, P. B. (2009). The Compulsory Force on *force* Principia: The Articulation *of* III Discoveries on GUT (Grand Volume), or see: http://www.amazon.com/dp/1438238657 and

. License No.: TXU001347562, including its demo software package (PhiBAl's Demo …) is a Copyrighted © and Registered ® years (1998-2007), License No.:TXU001347596; PAU003133514, Library of Congress, Washington D.C., USA.

[2] Kirkup L, *Experimental Methods: an introduction to the analysis and presentation of data* (Australia: John Wiley and Sons Press, 1994)

[3] Berry, M. (2003) *Quantum Chaology* , Quantum: *a guide for the perplexed,* by Jim Al-Khalili (Physics Department, University of Bristol Physics)

[4] Alipour, P. B. (Scientific Award, 2009). Qualified as a "Top Referee" from *the Proceedings of Royal Society A: a Mathematical, Physical and Engineering Sciences Journal, UK*.

[5] Alipour, P. B. (1978-2011). *Curriculum Vitae*, last update, April, 2011.

APPENDIX

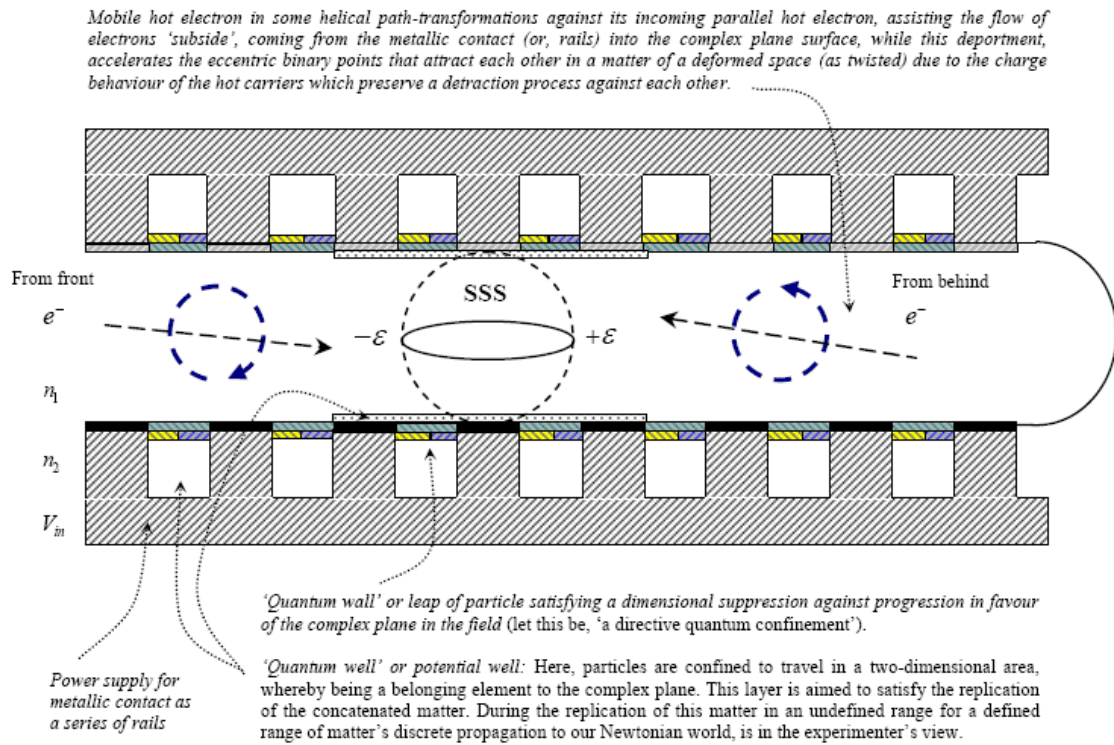## I. The base of the SSS-BHDs apparatus design

Mobile hot electron in some helical path-transformations against its incoming parallel hot electron, assisting the flow of electrons 'subside', coming from the metallic contact (or, rails) into the complex plane surface, while this deportment, accelerates the eccentric binary points that attract each other in a matter of a deformed space (as twisted) due to the charge behaviour of the hot carriers which preserve a detraction process against each other.

From front

e^-

n_1

n_2

V_{in}

SSS

$-\varepsilon$ $+\varepsilon$

From behind

e^-

'Quantum wall' or leap of particle satisfying a dimensional suppression against progression in favour of the complex plane in the field (let this be, 'a directive quantum confinement').

Power supply for metallic contact as a series of rails

'Quantum well' or potential well: Here, particles are confined to travel in a two-dimensional area, whereby being a belonging element to the complex plane. This layer is aimed to satisfy the replication of the concatenated matter. During the replication of this matter in an undefined range for a defined range of matter's discrete propagation to our Newtonian world, is in the experimenter's view.

Fig. I.i. Here is an illustration of a sequential molecular surface and cavity's core in a two-dimensional plan on **Fig. IV.**, § **II**'s construction from the **singled theory**. The current diagram's anatomy is a basic one, however, this diagram explains the importance of the role of collimators, and thus, the experiment's cavity system for its componential basic material installation, environment and quantum confinement, for at most, fundamentally, establishing two eccentric polar points $+\varepsilon$ and $-\varepsilon$ (refer to, the singled theory's details on figures; Figs. B.1 and B.2). Design and description: Copyright © *2007 P. B. Alipour.* All rights reserved.

¼ of a Euclidean space-time plane with a value of 0.27275 ms *involved in a warping operation to perform 'matter occupancy of a non-Euclidean space-time complex plane'*, Ref. [17.vii]

Warp region against the combined field's binary poles conserving the emission of helical paths
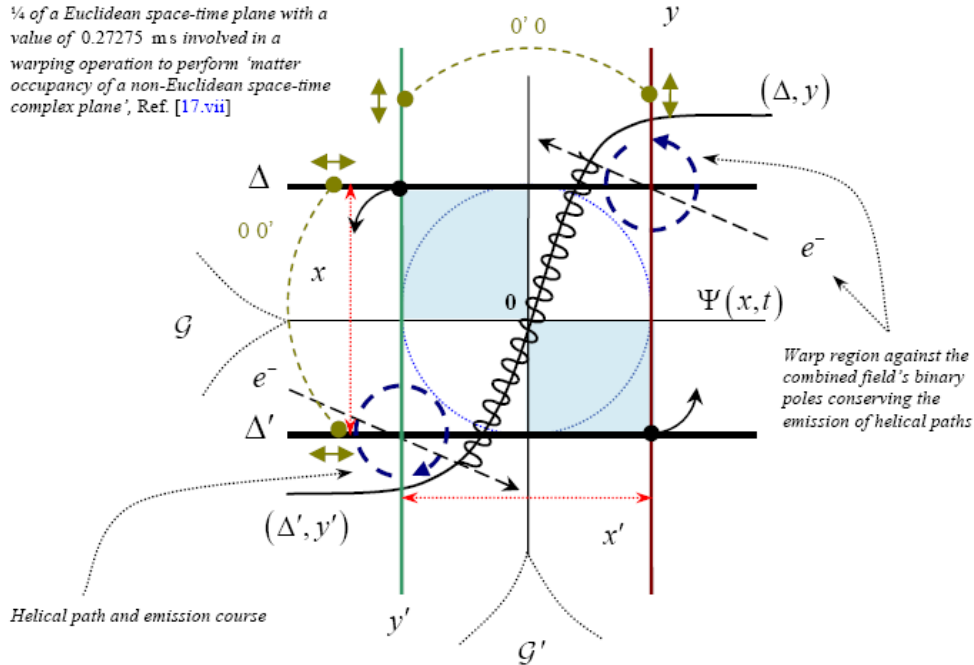
Helical path and emission course

Fig. I.iii. A top view of warping surfaces and helical emission course of particles in 'combined magnetic fields' with eccentric poles as Heisenberg's uncertainty principle-dependant, whilst the non-relativistic situation (Newtonian), is approached in action. This is done by establishing $\gamma = 1$ from SR for the circular area 'if and only if', the initiation of time and space event occurrences in terms of xt for the co-involved gap functions, and thus, takes place for each co-involved charge in conservation to the fields against the co-occurring warp, in this case, an electron. Design and description: Copyright © *2007 P. B. Alipour. All rights reserved.*
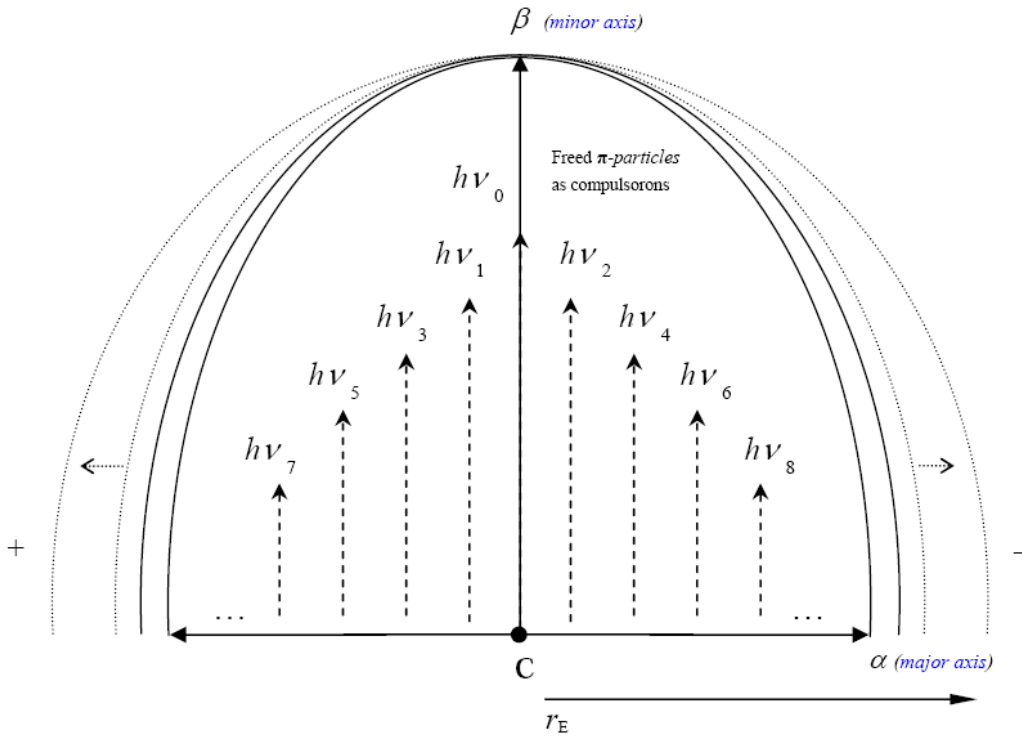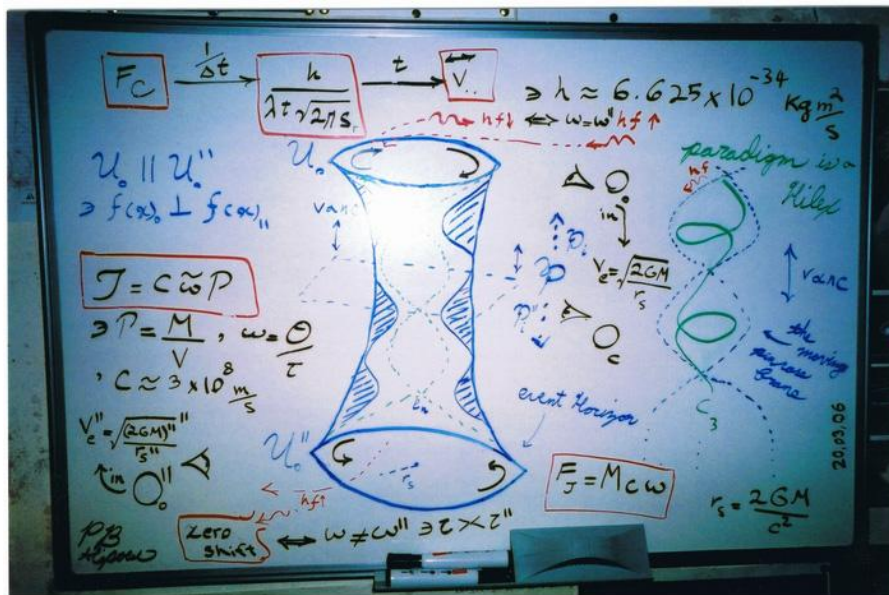

Fig. IIX. Top view of Bielectrofrequency distribution based on the Hz C^2, after its occurrence in advance, at point C (*the source of the bielectrofrequent phenomenon*) in favour of α-distance for the distributing compulsorons, successively and progressively in population growth vs. population termination point (or, *shear time*).

For other figures pointed out in the descriptions, as well as other parts, or the book on amazon.com [1], please request or correspond with the author for its full description, specifications, design/sub-design, calculations and presentation(s), examining the possible merits for its physical components' fabrication-base as given in its instrumental and structural specifications.

II. The newcomer table of constants as calculated [1], where $\mathcal{C}$ in the table is the Compulsory Force on *force* notation (chapter 4 onwards of the book [1] discusses the force with relevant calculations, illustrations and formulae). The expansion of our universe is due to the awesome strength of the force deforming the ultimate space-time planes in an accumulated manner (a stack of space-time discs) from the pi-black hole on a cosmic scale, dragging all distant and non-distant bodies into it, relativistically. All steps of geometric and physical transformations, hypotheses, etc. commence with Chapter 1 and the specifics i.e. the particle dynamics, their classification and force equations, in Chapter 3, all being prepared and deemed to get published in 3 to 4 papers).

~ Some Newcomer Units & Classical Unit Conversions ~

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Length

Name of unit	Symbol / *	Definition	Relation to SI units
metre (SI base unit)	m; x	$\equiv$ 1 m	= 1 m
ångström	Å	= 0.1 nm	$\equiv 1 \times 10{-}10$ m
bohr, atomic unit of length	a0	$\equiv$ Bohr radius of hydrogen	$\approx 5.29\ 177\ 208\ 59 \times 10{-}11 \pm 3.6 \times 10{-}20$ m

Area

Name of unit	Symbol / *	Definition	Relation to SI units
square metre (SI unit)	m² ; A	$\equiv$ 1 m $\times$ 1 m	= 1 m²

€ Length (Warped vs. Non-Warped Function)

Name of unit	Symbol / *	Definition	Relation to SI units
fixed space-time plane; metre second (SI mix units)	ms; dt	$\equiv$ 1 space-time planar sides $\equiv$ 1 m $\times$ 1 s	= 1 ms
Compulsory Force on *force* contracted length	ms; $C\sigma$; $€\sigma$	$\equiv$ 1 space-time planar warp / compelled mass unit equilibrium	= 0.978452 m $\approx$ 1 m $\ll$1.091 ms
warped unit (2π-warped)	ms; $2\pi Cm^o$; $€\{m^o\}_\pi$	$\equiv$ 1 compelled mass unit $\times 2\pi$	= 1.71376 ms
matter-constituent principle unit (2π-occupied)	ms; $4Cm^o$; $€\{m^o\}$	$\equiv$ 1 compelled mass unit $\times$ 1 full valance $\equiv$ 1 compelled mass unit $\times$ 4	= 1.091010404 ms
matter-constituent principle unit (non-warped)	ms; Cm^o ; $€\{m^o\}_F$	$\equiv$ 1 compelled mass unit $\times$ ¼ full valance $\equiv$ 1 Compulsory Force on *force* principle unit	= 0.272752601 ms $\approx$ 0.272752601 kg m² N^{-1}s^{-1}

Force & Compulsoron Force

Name of unit	Symbol / *	Definition	Relation to SI units
newton (SI unit)	N; F	$\equiv$ kg ms^{-2}	= 1 N
compulsoron force	N; F_c	$\equiv$ amount of populated energy fluxes / deformed spatial measurement	base unit = 1.17483$\times 10^{-29}$ N ; force average = 2.504$\times 10^{-7}$ N
force of cosmological constant	N; F_Λ	$\equiv$ speed of light exponent 4 / 1 full valance of gravitational constant (G)	= 3.0262$\times 10^{43}$ N

Momentum & Geometric π-Twist (π-Torque Factor)

Name of unit	Symbol / *	Definition	Relation to SI units
momentum (SI unit)	N.s; p	$\equiv$ kg ms^{-1}	= 1 N.s
π-twist geometric constant	N.s; $\mathcal{J}_o$	$\equiv$ commencer of regular π-twist $\equiv$ kg ms^{-1}	= 3.85578106$\times 10^{43}$ N.s

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* Symbol of unit comes first and separated with a semicolon ' ; ' from the unit's origin of definition, which deals with a special notation e.g. for length usually x, velocity v, energy E and etc. (*pay attention to them being printed in italic or coloured in* blue)