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Foundations of Quantum Mechanics and General Relativity – Theory and Practice –Part II

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Abstract: One might wonder how two seemingly different subjects or theories, one Eastern (quantum mechanics) and the other Western (general relativity), can fit together.

- ***The Answer is that they have More Common Properties than Differences.***

- **Both live and operate in an infinite free space bounded by Dirichlet boundary conditions.**
- **Both can be studied via matrix mechanics in a 4D unit x-t space, inside a closed volume delimited by a closed area, proposed by the author as a control volume.**
- **The proposed definition of the force vector Fxy, Fxt, Fyz...etc. is similar for both.**
- **Most importantly, the geometry of both theories in x-y-z space follows the sawtooth shape, whether in 1D, 2D or 3D.**

Matrix models can be used to describe the relationships between the dynamics of classical/quantum systems and spacetime curvature information.

We therefore assume that the foundations of quantum mechanics and general relativity should be related in some way, since they both constitute a special case of studying the vacuum energy density within the same statistical theory of Cairo techniques.

- ***In Previous Articles, we have Stated that:***

Cairo Intelligence Techniques = Natural Intelligence = Artificial Intelligence in the strict sense = Unified Field Theory is a universal law of physics in the 4D unitary x-t space.

This outstanding paper reformulates the foundations of quantum physics and classical general relativity to fit the predefined control volume in the four-dimensional unitary x-t space and explains in more detail what the principles of quantum mechanics and general relativity are.

The current description of quantum physics and Einstein's theory of gravity is incomplete and even misleading.

General relativity and quantum mechanics are the newest sciences and should therefore be the most accurate, but unfortunately, the opposite is true.

The field of cosmic science, or the nature of the universe, as well as the subject of quantum physics, is so vast and confusing that its theoretical practitioners will always have to adopt new explanations from their own context to conform to the facts of recent discoveries.

Here we use the techniques of B-matrix mechanics applied to Cairo's statistical theory to define and establish what are called the second theory of quantum mechanics and the second theory of general relativity.

- ***In this Article, we Provide a Rigorous and Detailed Answer to Two of the Most Important Questions:***

- **Is the conceivable theory of quantum mechanics that of the classical Schrödinger equation of 1927, supplemented by Bohr's interpretation of the Ψ wave function, or that of the square of the Schrödinger equation solved by the strings of matrix mechanics B for Ψ squared, supplemented by the advanced strict artificial intelligence of the Cairo Techniques?**
- **Is gravity a virtual force induced by the curvature of space, or a real force causing this curvature?**

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Contrary to current expectations, the answer to these two questions, as derived from the application of the Cairo Techniques theory, of which they are a part, demonstrates the following:

- **The conceivable theory of quantum mechanics consists of describing the square of the Schrödinger equation as solved by the strings of the transition matrix B, supplemented by the advanced strict artificial intelligence of the Cairo Techniques.**
- **Contrary to Einstein's conclusion, gravity is a real force that induces curvature in space, and not the other way around.**

This suggests that the graviton should theoretically exist, but in cosmic space, not on Earth.

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I. INTRODUCTION

One might wonder how two apparently different subjects or theories, one Eastern (quantum mechanics) and the other Western (Einstein's general relativity), can fit together.

The answer is that they have more common properties than differences.

- Both live and operate in an infinite free space bounded by Dirichlet boundary conditions.
- Both can be studied by matrix mechanics in a 4D unit x-t space, inside a closed volume delimited by a closed area, proposed by the author as a control volume.
- The proposed definition of the force vector Fxy, Fxt, Fyz...etc. is similar for both.
- Most importantly, the geometry of both theories in x-y-z space follows the sawtooth shape, whether in 1D, 2D or 3D.

Matrix models can be used to describe the relationships between the dynamics of classical/quantum systems and spacetime curvature information.

We therefore assume that the foundations of quantum mechanics and general relativity should be related in some way, since they both constitute a special case of studying the vacuum energy density within the same statistical theory of Cairo techniques.

The author asserts that we must strictly apply the rule, or law, that all branches of science are nothing other than universal laws of physics.

This is perhaps the secret of the unprecedented success of the Cairo theory of techniques, in which all the universal laws of physics are grouped together in an intrinsic and elegant way.

The main error of Einstein's general relativity was to start from Riemann space, which is an incomplete and misleading space (it is not a universal law of physics), when it should have started from the statistical theory of Cairo techniques.

In this article, we focus on solving three important problems, mentioned in the title, that have emerged in recent decades [1,2].

- First, does quantum mechanics rely on the matrix method for solving the square of the Schrödinger PDE, rather than on the Schrödinger equation itself?

We assume that such a treatment would be remarkably efficient, robust, consistent, logical, and natural.

- Second, is gravity a real force that causes the curvature of space, or is the curvature of space the cause of this force?
- Is the formation and explosion of the Big Bang millions of years ago a fact?

We believe that the rigorous foundations of quantum mechanics should be based on the square of the Schrödinger equation describing Ψ^2 supplemented by advanced concrete artificial intelligence rather than on the Schrödinger equation itself supplemented by Bohr's interpretation of the wave function Ψ.

The mainstream of quantum mechanics described by the Schrödinger partial differential equation was born in 1927, a century ago, from the imagination of Bohr, Schrödinger, Heisenberg, Born among others to explain the line spectrum of the hydrogen atom but it was later extended to establish mathematical and physical rules or laws for the spatiotemporal evolution of subatomic quantum systems subjected to an external potential field.

At that time, and still today, classical physics and quantum mechanics in R^4 space (3D geometry with real time t as the external controller) failed to define wave mechanics as a whole, nor even the quantum wave function Ψ as a scalar, vector, or tensor.

Moreover, Schrödinger's PDE failed to define the entire domain of operation of quantum mechanics, i.e., which problems belong to quantum mechanics and which do not.

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Not to mention the 100% error in calculating the radius of the hydrogen atom, i.e. 0.5 angstroms instead of the correct value of 1 angstrom.

Over the past century, quantum mechanics has travelled a long, ambiguous, and confusing path, both in theory and practice, since its founding in 1927. This long journey has only made things worse, adding even more illogical and confusing properties to the entire field of quantum mechanics and in particular to the Ψ wavefunction, such as causality and Ψ wavefunction collapse.

Many attempts have been made over the last century to reform Schrödinger's PDE, but they have all been doomed to failure, the most notable attempts being to combine it with the theory of general relativity, but again all these attempts were in vain.

The revolutionary breakthrough came in 2020 [1,2,3] when the author introduced the numerical statistical theory called Cairo techniques with its resulting transition B-matrix chains.

Note that nowadays we know only two transition matrices, the well known Markov mathematical transition matrix and the proposed B-transition matrix resulting from the statistical theory of Cairo techniques.

The superiority of the transition matrix B over the Markov transition matrix M is evident since the matrix B leaves room for the boundary condition vector b and the source term vector S while the Markov matrix does not.

Also note that the Heisenberg matrix is neither transitional nor statistical.

➢ *The Essential Prerequisites for Studying the B-Transition Matrix Technique and the Cairo Techniques as a whole are:*

- Mastery of matrix operations and calculations.
- Mastery of algorithms and programming languages such as C++ and Fortran.
- A perfect knowledge and understanding of the universal laws of physics[4,5,6].

In the case of building new foundations of quantum mechanics, the breakthrough came when the author of this paper suggested replacing the Schrödinger PDE describing the complex wave function Ψ with the square of the Schrödinger PDE describing Ψ^2 = Ψ . Ψ* which is essentially real and represents the distribution of the quantum energy density U(x,y,z,t) in a closed control volume subject to Dirichlet boundary conditions [5,6,7].

Ψ^2 = Ψ . Ψ* in a 4-dimensional unitary xt space is needed to express the quantum energy density flux (U(x,y,z,t) = Ψ^2 (x,y,z,t)).

Therefore, we propose a new Schrödinger equation for Ψ^2, which should take the form of an energy density diffusion PDE, like that of heat conduction. This new equation for Ψ^2 should be complemented by the advanced artificial intelligence proposed by the author [8,9].

The numerical statistical theory called Cairo techniques is fundamentally Hamiltonian statistical matrix mechanics.

Fortunately, it is the square of the Schrödinger PDE and not the Schrödinger PDE itself that belongs to the matrix mechanics of Cairo techniques reducing the solution of the quantum problem to matrix calculations aided by the advanced artificial intelligence proposed by the author.

Nowadays, physical and quantum matrix mechanics are gradually coming back to the forefront of action in a strong and coherent way via B-matrix mechanics chains rather than classical PDEs, which is a logical and natural reform[10,11].

The other view of comparing the classical Schrödinger PDE of 1927 supplemented by the Bohr/Copenhagen interpretation to the matrix mechanics equivalence of the PDE proposed for Ψ^2 in 2020-2025 shows that we currently have two different or distinct theories of quantum mechanics: one belongs to classical PDEs, the other to matrix or tensor mechanics.

In order not to worry too much about the details of the introduction, let’s skip directly to Section II, Theory.

II. THEORY

In order to construct such a new theory, the author has posed four fundamental hypotheses or contributions:

The author's first contribution is the introduction and definition of the concept of a control volume V (in a unitary 4D x-t space) bounded by Dirichlet boundary conditions, previously unknown in classical or quantum physics.

The concept of this closed control volume, bounded by a closed surface subject to Dirichlet boundary conditions, is central to the description of classical and quantum physics and essentially replaces the concept of classical infinite space R^4, of limited utility.

The author adopts the definition of vector force F as the Laplacian of the energy density U,

Fxy = ∇^2 xy U,

Fxz = ∇^2 xz,

Fxt = ∇^2 xt U,

. . etc.

The author's third contribution introduces and defines the classical and quantum entanglement of the energy density present in quantum and classical systems, between

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the elements themselves and between the elements of the system and the walls of the system, as a universal law of physics.

The entanglement speed is limited to C, the speed of light.

This means that the entanglement speed can never be infinite, and that the supposedly spooky action at a distance is merely a phantasmagorical fantasy.

The fourth contribution of the author, which defines and introduces the theory of Cairo techniques, and thus the second theory of quantum mechanics and general relativity, is based on the hypothesis of the existence of a square relaxation transition matrix Bnxn (n is the number of free nodes not to be confused with the number of iterations or time steps N) for the time-dependent energy density field U(x,y,z,t), in classical and quantum physics such that:

U(x,y,z,t+dt)=B.U(x,y,z,t) + B^N . U(x,y,z,0)……...(1)

Equation 1 leads to the existence of a transfer matrix D(N) such that,

U(x,y,z,t+ Ndt)=B.U(x,y,z,t) + B^N . U(x,y,z,0)……...(2)

Which results in,

U(x,y,z,t)=D(N). (b+S) + B^N.IC……..(3)

Where,

U(x,y,z,Ndt) is the classical or quantum energy density at the free point or node x,y,z and at time t=Ndt, where N is the time integer for the number of jumps or iterations woven in the Cartesian axes x,y,z and dt is the time interval or time jump.

We reiterate that we currently know of only two transition matrices:

The well-known mathematical statistical Markov matrix and the proposed statistical B transition matrix.

Clearly, the B matrix offers a significant improvement over the Markov matrix **M** because it takes into account boundary conditions and the source term, unlike the Markov matrix.

b is the vector of boundary conditions, arranged in the appropriate order, and S is the appropriate source/sink term, in appropriate units, placed at the main diagonal node Bii.

Clearly, D(N) is given by the finite sum of the matrix series,

D(N)=B+B^2+B^3+ . . . . +B^N……(4)

It should be noted that equations 1, 2,3 and 4 are not entirely new, but they have been used effectively over the past four years to solve almost all types of scientific problems in closed volumes controlled by Dirichlet boundary conditions.

- *These Problems Include:*

✓ The numerical solution of Laplace and Poisson PDEs;
✓ The numerical solution of the heat diffusion equation in the most general case;
✓ The numerical solution of time-dependent quantum mechanical problems in infinite free space under an arbitrary external potential;
✓ Numerical differentiation and integration;
✓ The numerical derivation of stationary statistical distributions, such as Gaussian or normal distributions.

Etc.

The five facts mentioned above lead to the following conclusion:

Cairo intelligence techniques = natural intelligence = artificial intelligence in the strict sense = unified field theory.

The statistical theory of Cairo techniques predicts the general solution of any time-dependent PDE as follows [2,3,4,5,6]:

f(x,y,z,t)=D(N).(b+S) + B^N.IC…….(5)

Where D(N) is the transfer function, defined by equation 4 above.D(N) = B+B^2+B^3+...+B^N

b is the vector of 1D, 2D and 3D boundary conditions, arranged in the appropriate order.

IC is the vector of initial conditions equal to U(x,y,z,0).

B is the well-defined transition matrix for the considered closed control volume.

Obviously,

$B \wedge 0 = I$

For a sufficiently large number of iterations N, it can be shown that equation 4 reduces to:

D(very large N)= [1/(I-B)-I]……...(6)

Which means that D(N) for N tends to infinity is the steady-state solution.

It is clear that the term,

B^N.IC tends to zero (for any arbitrary value of the state vector of the initial conditions IC) when N tends to infinity since the norm of the evolution matrix B is less than unity for all values of the entries of the principal diagonal element RO of [0,1].

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Note that Equations 1,2 implies Eq.3 and vice versa.

Here we can define another statistical transfer matrix E defined by:

$E=D+I$

OR,

E= 1/ (I-B)……..(7)

The question arises: can quantum mechanics be defined?

We assume that quantum mechanics is currently erroneously defined as follows[1]:

[When energy x and time or position x momentum are large compared to Planck's constant, quantum fluctuations are negligible and classical physics is a good approximation; when these products become comparable to Planck's constant, classical physics is no longer a good approximation and quantum effects must be taken into account.

The most practical method is then a matter of taste.]

In keeping with Niels Bohr's reckless words: "Anyone who claims to understand quantum mechanics is a liar."

And "Shut up and calculate!"

We believe that quantum mechanics should be redefined according to a larger number of conditions or constraints, not just one or two. Let's start with the first three:

Quantum mechanics transfer matrix must obey the sawtooth geometry in 1D, 2D, and 3D.

The entanglement of the transition matrix (between the elements of the quantum system and between the elements of the quantum system and the walls), expressed by the elements of the transition matrix.

The input elements of the quantum transition matrix must be composed of irrational numbers (e.g., square roots such as √2, √3, √5, √10, etc.).

The transfer matrix has a zero determinant and is invertible.

Note that the relationship between the classical physics transition matrix B and the quantum physics transition matrix Q is:

Q=√B……..(8)

Equation 8 explains why the properties of the quantum transition matrix Q have the form explained in 1, 2 and 3 above.

Therefore, for a simple solution to quantum mechanical problems in three consecutive steps, it is best to follow these steps:

- Discretize the 1D, 2D, or 3D quantum mechanical problem into n equidistant free nodes.
- Construct the stationary sawtooth transfer matrix D(N)nxn as the exterior product of two sawtooth vectors.
- Find the stationary transfer matrix D(N) for N sufficiently large by matrix-vector multiplication,

U (x,y,z, tends to infinity) = D(N). vector of discrete free nodes.

- *The Question Arises:*

If the Theory of Everything, or Unified Field Theory, known as the "Cairo Technique," has been known and published for over four years, why is it not generally accepted in the current scientific community?

- *The Answer is Simple and Lies Mainly in a Single Flaw in the Theory:*

It reveals the fatal errors of Niels Bohr that dominated science for more than a century.

This is why this theory does not appeal to the iron guardians of the classical Schrödinger equation of 1927.

But who are the iron guardians of the classical Schrödinger equation as interpreted by Niels Bohr, or more precisely, the iron guardians of Niels Bohr himself?

The term "iron guards of the Schrödinger equation" refers to a group of physicists and mathematicians who strongly defend the equation and its classic interpretations, often resisting any attempts to modify or challenge it, sometimes to the point of rejecting alternative perspectives or improvements. They are described as being dogmatic in their adherence to the equation and its established interpretations, sometimes hindering progress in quantum mechanics by dismissing new ideas or alternative approaches [Google search].

In other words, the iron guardians of the classical Schrödinger equation are those indoctrinated physicists and mathematicians who defend this incomplete and misleading equation until their last breath and who are, in reality, the iron guardians of the scientist Niels Bohr himself.

They know that sooner or later, the classical Schrödinger equation, as interpreted by Bohr, is inherently incomplete, misleading, and confusing, and that it will sooner or later disappear. But they also know that they will disappear with it.

For over a century, they have tirelessly defended Bohr's incomplete and misleading interpretation of Schrödinger's partial differential equation in 1927, viewing it as the tragedy of science in modern history.

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When discussing the role of the iron guardians of Schrödinger's classical partial differential equation and its interpretation by the Bohr/Copenhagen Conference, one might expect many of them to rush to defend Niels Bohr himself and deny any negative role he may *have played.*

They use every means at their disposal and constantly attempt to rewrite history to suit themselves.

[The West is losing the battle of quantum mechanics.]

In order not to worry too much about the details of the theory, let us go directly to Section III Applications and Numerical Results.

III. APPLICATIONS AND NUMERICAL RESULTS

This section of applications and numerical results will be presented in the form of few questions and answers covering few of the persistent and resistant topics in quantum mechanics and general relativity for the sake of convenience and clarity.

➢ *Q1 Can you Define Quantum Mechanics?*

- **A1*

The current mathematical definition of quantum mechanics is as follows:

The current quantum mechanical world definition of a system is established when its mathematical expression explicitly involves Planck's constant h.

We all conclude that this definition is incomplete and confusing in determining which problems fall within the scope of quantum mechanics and which do not [1].

This mathematical definition contains only one condition or constraint.

- *"If Planck's Constant h Appears Explicitly in an Equation, then it is a Quantum Situation."*

We believe that quantum mechanics should be redefined according to a larger number of conditions or constraints, not just one or two. Let's start with the first three:

✓ Quantum mechanics transfer matrix Q must obey the sawtooth geometry in 1D, 2D, and 3D.
✓ The entanglement of the transition matrix Qij (between the elements of the quantum system and between the elements of the quantum system and the walls), expressed by the elements of the transition matrix.

The input elements of the quantum transition matrix Qij must consist of irrational numbers (e.g., square roots such as √2, √3, √5, √10, etc.).

✓ The quantum transition/transfer matrix Q must have a zero determinant and must at the same time be invertible.

As shown in Figures 1,2.

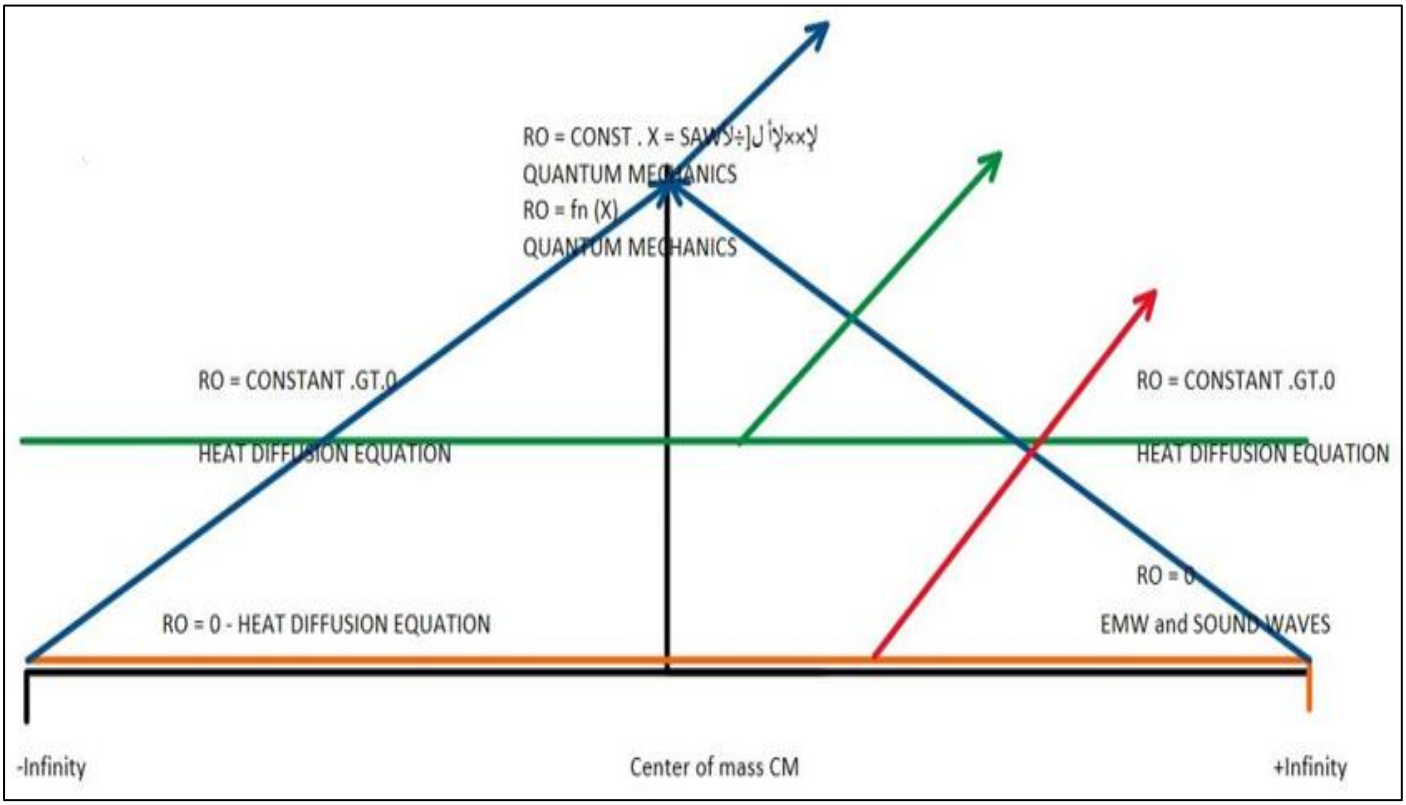

Fig 1 The RO of the Transition Matrix Q in a One-Dimensional Configuration has a Triangular Shape.

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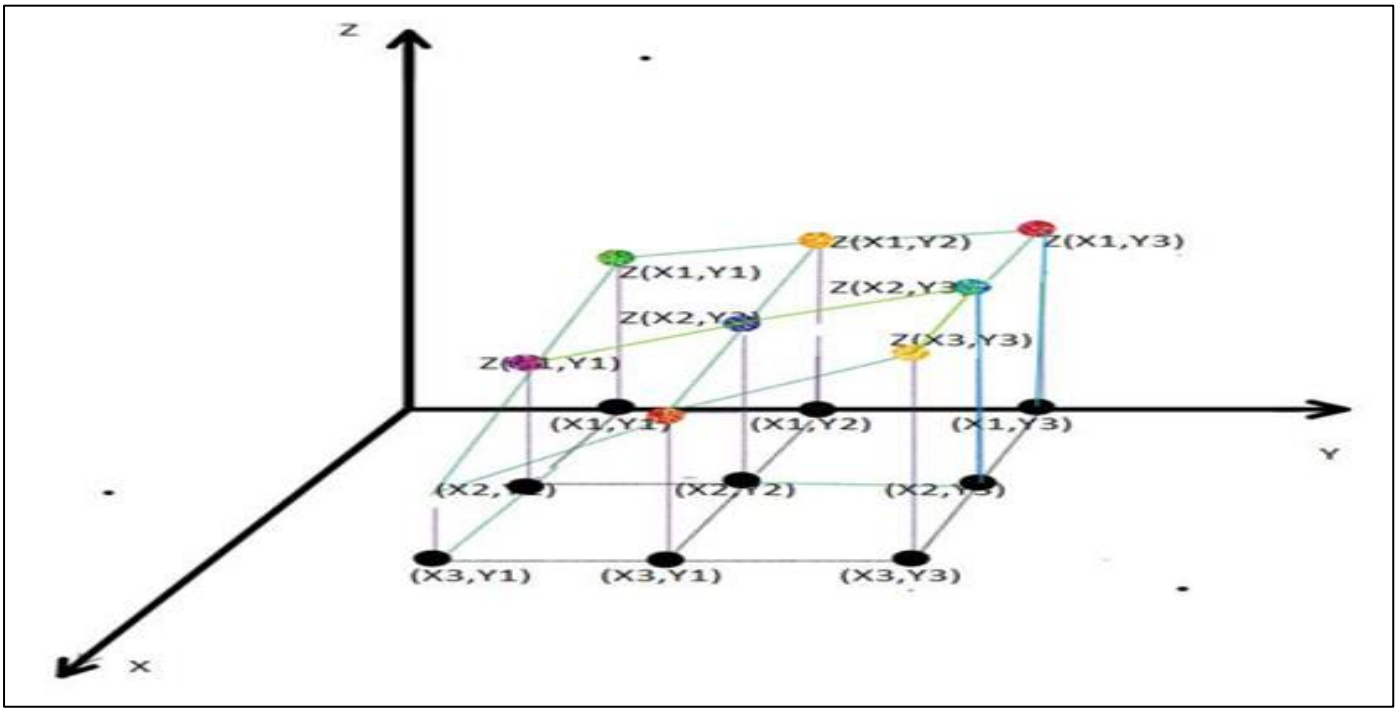

Fig 2 The RO of the Transition Matrix Q in a Two-Dimensional Configuration has a Triangular Shape.

➢ *Q2 What is an Illustrative Example of 3D Geometric Shape Resolution using the Cairo Techniques Statistical Method?*

- **A2*

Let us consider the more complicated case of the 3D rectangular configuration with 27 free nodes u1, u2, ..u27 along with their Dirichlet boundary conditions BC as shown in Figure 3 below.

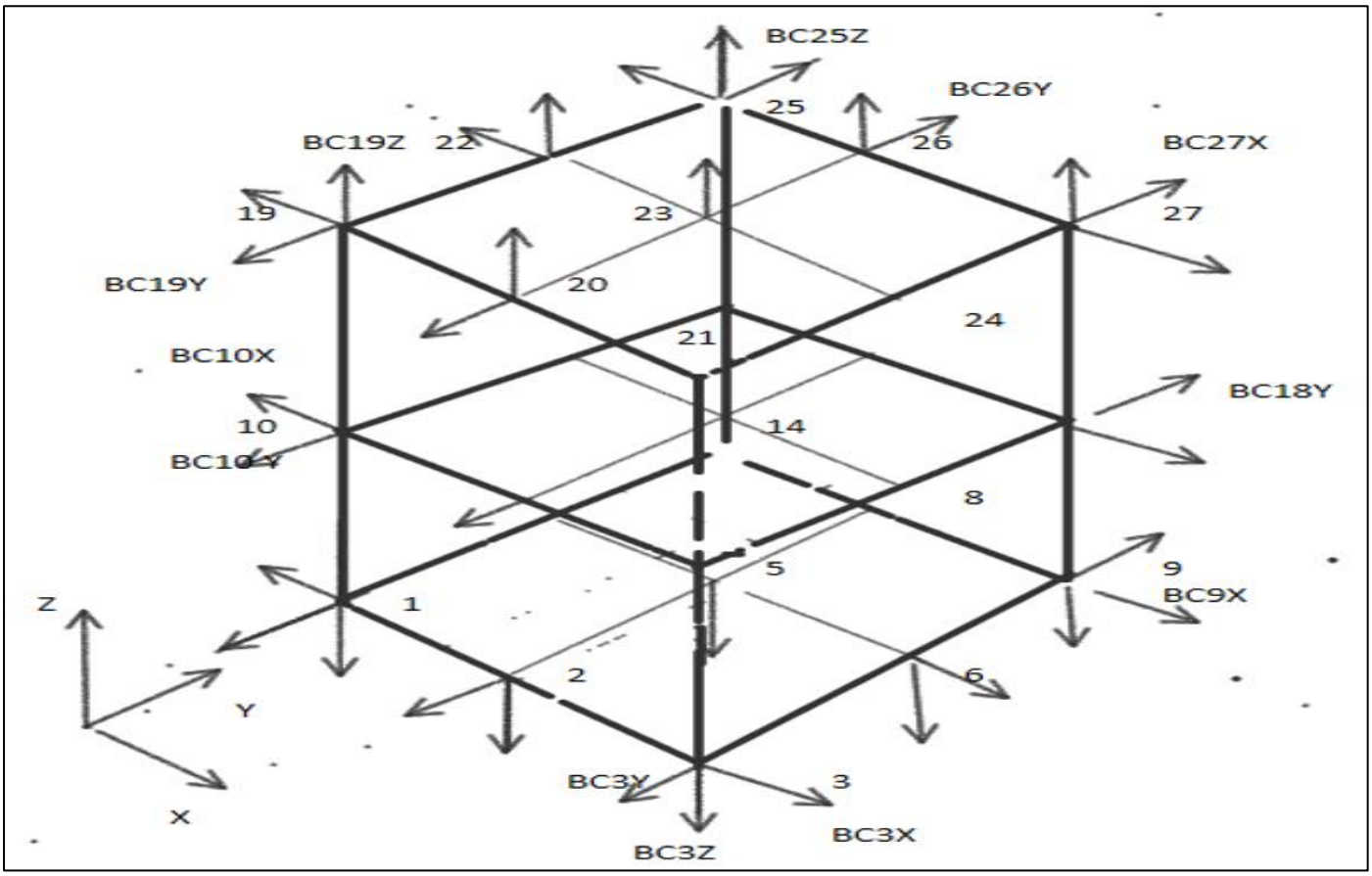

Fig 3 3D Rectanguloid with 27 Free Nodes and 52 Dirichlet BC.

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The 27 free nodes with their corresponding 52 Dirichlet BCs {reduced to 27 BCs via the condition BC(i) = BCx(i) + BCy(i) + BCz(i)} are ranked and numbered in the appropriate order.

We are satisfied with the numerical results for the sum of the first 17 terms of Equation 5 (which are considered sufficiently large and accurate). The power series for N = 17 in Equation 5 approximately represents the 729-element transfer matrix D(27x27) when RO is appropriately chosen as RO = 0.

- *It is Given by:*

(Line 1*).1128447438095463 0.22416939960385207 4.7703661606647074E-002 0.22416939960385207 9.5407323213294148E-002 2.8801418200600892E-002 4.7703661606647074E-002 2.8801418200600892E-002 1.1974366207141429E-002 0.22416939960385207 9.5407323213294148E-002 2.8801418200600892E-002 9.5407323213294148E-002 5.7602836401201785E-002 2.3948732414282858E-002 2.8801418200600892E-002 2.3948732414282858E-002 9.9040277491440065E-003 4.7703661606647074E-002 2.8801418200600892E-002 1.1974366207141429E-002 2.8801418200600892E-002 2.3948732414282858E-002 9.9040277491440065E-003 1.1974366207141429E-002 9.9040277491440065E-003 5.6568526415503584E-003 TOTAL=.. 2.5882354670029599

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➢ *We Note that:*

- For RO = 0, the weak heat equation DF, the Poisson or Laplace stationary state solution PDE is directly obtained from the relation,

* u = E (b + S)……(9)

S is the source / sink term vector in equivalent units.

The term of evolution in time of the vector of initial conditions B ^ N *U (0) tends to zero for any large N for all values of RO ∈[0,1].*

- When terms b and S in Equation 9 are both equal to zero, the spatio-temporal evolution of any initial condition vector U(x,y,z,t) tends to a sawtooth shape for all values of RO ∈ [0,1], with its maximum centered at the midpoint or center of mass CM.

➢ *Q3 Is it True that Einstein's Theory of General Relativity is able to Solve the Bohr Hydrogen Atom ?*

- *A3*
  This is the heart of the title and the whole article.

✓ *The Answer on Google is:*

No, Einstein's theory of general relativity does not solve the Bohr model of the hydrogen atom. The Bohr model is a model of quantum mechanics, while general relativity is a theory of gravity. They describe different aspects of physics and are not directly interchangeable.

✓ *But the Real Answer is Yes.*

The author proved in 1923 [10,11,12] that Einstein's special theory is nothing other than the universal Lorentz law of physics in x-t space.

Once again, Einstein's general theory of relativity is nothing other than the universal Lorentz law of physics in the four-dimensional unitary space x, y, z-t.

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Both of these theories are simply expressions of the conservation or constancy of spacetime in free fall [1,11,12,13,14].

It should be noted that this particular question and its answer should not overshadow the achievements of our giant professor; the most important and rarely mentioned is his prediction of the laser equation in 1917, fifty years before its realization.

The Cairo Techniques proof of Einstein's general theory of relativity is not complicated but a bit lengthy.

- ✓ In the statistical theory of Cairo techniques, the Einstein stress tensor vector F in unitary 4D xt space is expressed as the Laplacian of energy density,

Fxx **F**xy **F**xz **F**xt
Fyx **F**yy **F**yz **F**yt
Fzx **F**zy **F**zz **F**zt
Ftx **F**ty **F**tz **F**tt

Where Fii is the constraint force and Fij is the shear force considered negligible in vacuum.

- ✓ The statistical theory of Cairo techniques expresses the above force terms in matrix notation as follows:

∇^2xx ∇^2xy ∇^2xz ∇^2xt
∇^2yx ∇^2yy ∇^2yz ∇^2yt
∇^2zx ∇^2zy ∇^2zz ∇^2zt
∇^2tx ∇^2ty ∇^2tz ∇^2tt

We have,

∇2xx ∇2xy ∇2xz ∇2xt
∇2yx ∇2yy ∇2yz ∇2yt
∇2zx ∇2zy ∇2zz ∇2zt
∇2tx ∇2ty ∇2tz ∇2tt
We call it the B-marix.

X

Cxx Cxy Cxz Czt
Cyx Cyy Cyz C yt
Czx Czy Czz C zt

Ctx Cty Ctz C tt……(10)

(We call it the curvature matrix C.)

This is a great start.

= n I (unit matrix)……(11)

n=1,2,3 ,. . . ., infinity

Where

∇2zx U= Fxy=d2/dzdx)partial , ∇2ty U=Fty = d2/dtdy)partial, ∇2tt= Ftt =d2/dtdt)partial and ∇2zz = Fzz=d2/dzdz) partial . . . . etc

Equation 3 is a great start because it is a generalization and replacement of Bohr's hypothesis on the quantization of angular momentum,

m v 2 π r = nh (in normal convention) .

Furthermore, equations 3 and 4 apply both to gravitational curvature near the surface of the Sun and inside the hydrogen atom, whereas Einstein's theory of general relativity does not.

The secret to the unprecedented success of the Cairo theory of techniques lies in the fact that all the universal laws of physics are inherently and elegantly grouped within it.

The main error of Einstein's general relativity was to start from Riemann space, which is an incomplete and misleading space (it is not a universal law of physics), when it should have started from the statistical theory of Cairo techniques (Equation 3).

- ✓ The secret to solving tensor equation 3 rigorously and simply lies in the symmetry of the curvature matrix and the fact that in free fall,

U(t)=U(0)exp- λ*t

Therefore,

∇2tt U= λ*^2 U……..(12)

Where λ* is given by [11],

λ* = Log [(1+RO)/(1-RO)]

With RO = zero for vacuum.

Which means that λ* = Log 2 = 0.693

- ✓ The mass of the Sun is 1.989 × 10^30 kg, its radius is 696,340 km and the universal gravitational constant G is 6.67430 × 10^{-11} $m^3 \cdot kg^{-1} \cdot s^{-2}$. If we substitute the above values into equations 3 and 4, we obtain the curvature of space near the Sun's surface:

C = 1E-9 m^-1

This is the same value obtained by Einstein in 1916.

Similarly, for the hydrogen atom,

V = -e/4 π ε0 r

Where ε0 is equal to (1/36 π) E-9 Farad m^-1.

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If we substitute the above values into equations 3 and 4, we obtain the quantized energy levels of the hydrogen atom:

- 13.4 ev, -13.4 /4ev, -13.4/9 ev, etc. for a curvature r of 1, 4, or 9 angstroms.

The above values are identical to those obtained by Bohr in 1905.

➢ *The Question Arises:*

How can we know if Einstein's 1915 theory of general relativity is true and the one proposed by its author in 2020 is false, or vice versa?

- *The Answer is Simple:*

The proposed theory of general relativity predicts a quantization of the curvature of space around the Sun, unlike Einstein's theory of general relativity.

This test can be performed experimentally using spacecraft and space laboratories measuring the curvature of space around the Sun.

➢ *Q4 Can the statistical theory of Cairo techniques explain the formation and explosion of Big Bang?*

- *A4*

The positive answer to this question has been explained in detail in reference 12,13.

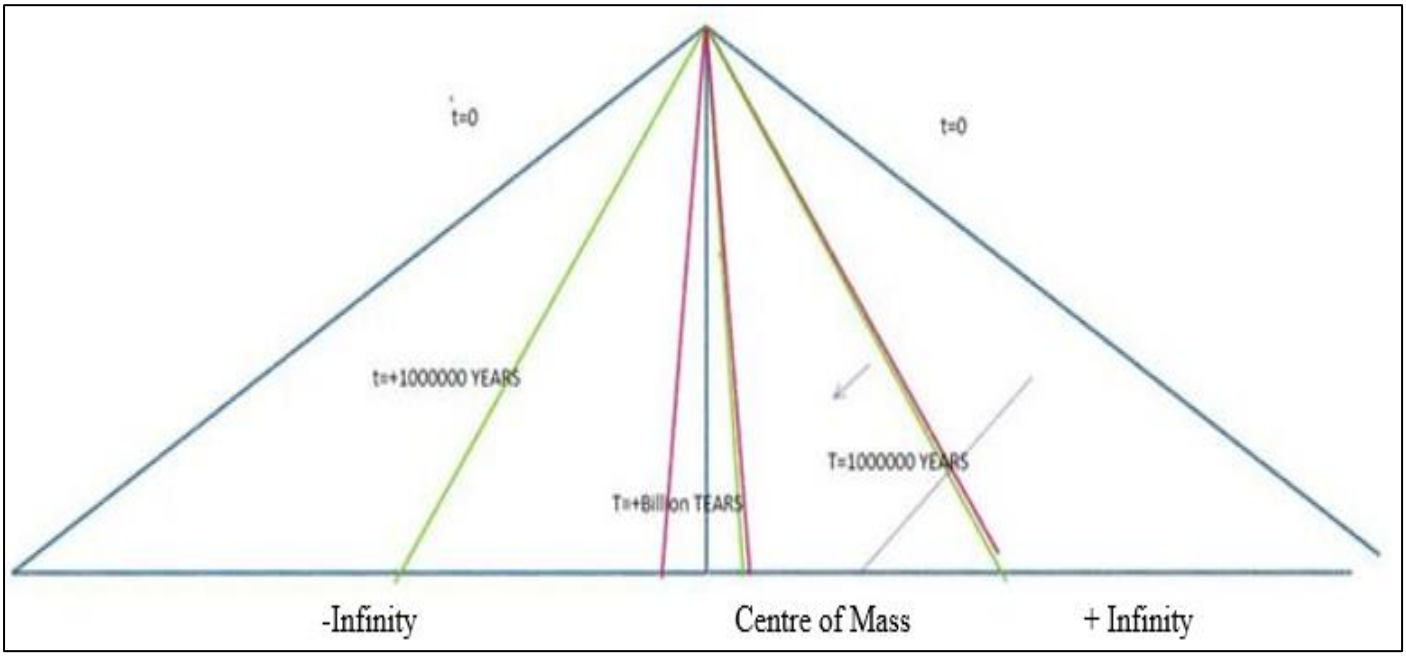

Fig 4 Concentration of Space Cosmic Energy at the Center of Mas in Millions of Years.

The entanglement of energy density in quantum mechanics and classical physics creates a force towards the center of mass CM as shown in Fig.4.

Before the Big Bang, there existed infinite free spaceand time that constituted a unitary, four-dimensional void.This problem belongs to the Q matrix chains of quantum mechanics[he truth is that combining quantum mechanics andvacuum dynamics with the concept of strong and weak forcesleads to the best explanation of the Big Bang.The fact that the formation and explosion of the Bang can be explained via the theory of Cairo techniques combined with short-range weak and strong forces is explained in Fig.4.

Just like the weak force, the strong force only acts whensubatomic particles or energy density are extremely close toeach other. They must be somewhereGenerally, the ratio of strong force to weak force undernormal circumstances is 1:1 × 10 − 6. In other words,normally the strong force is one million times stronger thanthe weak force.The probability of both forces appearing or lastingshould also be 1/1 million. Accordingly, Figure 4 explains the occurrence and duration of the Big Bang over millions or billions of years.

This combination shows that the formation and explosion of the Big Bang takes millions or even billions of years and is an inevitable ultimate formation and explosion of infinite free space

IV. CONCLUSION

The dependence on Schrodinger time-dependent classical PDE with Bohr interpretation is retreating while the solution of quantum physical problems, sometimes called the second theory of quantum mechanics is gradually returning to the forefront of action in a strong and coherent manner.

This is the required reform and modern foundation for quantum mechanics.

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➢ *In this Article, we Focus on Four Main Unanswered Questions:*

- Is quantum mechanics the Schrödinger partial differential equation or its square?
- Should the resolution of energy density in a quantum system follow the sawtooth model?
- Is there a connection between quantum mechanics and Einstein's theory of general relativity?
- Are the formation and explosion of the Big Bang established facts?

We propose to replace the classic PDE proposed by Shchrodinger in 1927 with its square complimented by the advanced concrete artificial intelligence ,sometimes called the second theory of quantum mechanics, which is fair and logic.

This unitary 4D xt space affords transfer matrix and explain its striking physical and statistical properties as well as the principles underlying its derivation.

Numerical results of the temporal evolution of thermal energy or EM voltage via the statistical method of Cairo techniques are presented for the case of 3D setup showing the stability, precision and speed of the proposed non-classical 4D statistical method.

The results validate the fact that we live in the 4D world and that the 4D numerical method is superior to the 3D one.

- Is the conceivable theory of quantum mechanics that of the classical Schrödinger equation of 1927, supplemented by Bohr's interpretation of the Ψ wave function, or that of the square of the Schrödinger equation solved by the strings of matrix mechanics B for Ψ squared, supplemented by the advanced strict artificial intelligence of the Cairo Techniques?
- Is gravity a virtual force induced by the curvature of space, or a real force causing this curvature?

Contrary to current expectations, the answer to these two questions, as derived from the application of the Cairo Techniques theory, of which they are a part, demonstrates the following:

- The conceivable theory of quantum mechanics consists of describing the square of the Schrödinger equation as solved by the strings of the transition matrix B, supplemented by the advanced strict artificial intelligence of the Cairo Techniques.
- Contrary to Einstein's conclusion, gravity is a real force that induces curvature in space, and not the other way around.

This suggests that the graviton should theoretically exist, but in cosmic space, not on Earth.

Finally The proposed theory of general relativity predicts a quantization of the curvature of space around the Sun, unlike Einstein's theory of general relativity.

This test can be performed experimentally using spacecraft and space laboratories measuring the curvature of space around the Sun.

NB. The author uses his own double precision algorithm, such as that of references 17,18,19..

No ready-to-use Python or MATLAB algorithms are needed.

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