What Do You Know About Quantum Mechanics? Part IV

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Abstract

"Ismail Abbas [1] proposes a reformulation of quantum mechanics and physics using Cairo techniques, bounded statistical systems, and novel mathematical frameworks to uncover hidden laws in classical and quantum physics.

Overview of Abbas's Approach

Ismail Abbas, a PhD lecturer at Cairo University, has developed a series of theoretical frameworks aimed at addressing perceived limitations in classical and quantum physics

. His work emphasizes that traditional mathematics has been used as a tool in physics but should not be assumed to generate new physical laws; instead, he argues that physics can reveal new mathematics through statistical and unitary approaches .

Key Concepts in Abbas's New Physics

1. Bounded Statistical Systems: Abbas introduces the concept of a bounded statistical system, defined as a closed control volume with Dirichlet boundary conditions. This framework is applied to both classical and quantum systems, providing constraints that help resolve paradoxes such as Schrödinger's cat by accounting for information loss in open systems .

2. Cairo Techniques: This is a 4D unitary numerical statistical method that Abbas uses to reformulate quantum mechanics. It involves transition chains and B-Transition Matrices to correct incomplete or misleading aspects of the Schrödinger equation, allowing for a more precise description of quantum energy distributions .

3. Reformulation of the Schrödinger Equation: Abbas proposes squaring the Schrödinger PDE to represent the quantum energy density as a real quantity, $\Psi^2 = \Psi \cdot \Psi^*$, which provides a clearer statistical interpretation of quantum states and energy distributions

.

4. Integration with General Relativity: His work also explores merging quantum mechanics with general relativity within bounded volumes, suggesting that electromagnetic and gravitational fields can be reformulated to align with quantum principles, potentially leading to a unified framework .

5. Discovery of Hidden Laws: Abbas claims that thousands of intrinsic laws and rules in physics, mathematics, and biochemistry remain undiscovered. His methods aim to systematically uncover these hidden patterns using statistical and unitary approaches .

Implications

Abbas's contributions are primarily theoretical and focus on providing a new mathematical and physical lens to understand quantum phenomena, energy distributions, and the interplay between classical and relativistic physics. His work challenges conventional assumptions and proposes alternative formulations that could refine or extend current models in physics.

In summary, Ismail Abbas's "new physics" revolves around bounded statistical systems, Cairo techniques, and reformulated quantum mechanics, aiming to reveal hidden laws and improve the precision of physical theories "

We all know that mathematics entered physics as a tool, but gradually it turned into the master of physics.

In the sense that, the majority of people think that mathematics can generate physics, when in fact it's the other way around.

However, we believe that the above statement is completely wrong, misleading and one of the basic roots of all evils.

This is the subject of the present article.

Un the other hand, most mathematicians argue that geometry which was always the rigorous base for physics and mathematics belong to mathematics since the time of the ancient Greek philosopher Plato, the physicist Galileo Galilei and even Archimedes which is not true.

The most striking example is the current belief that the non-comprehensible, and sometimes misleading classical Schrödinger equation in complex time space which describes the complex wave function Ψ, can continue creating and operating in the domain of quantum mathematics.

The classical Schrödinger equation with Bohr interpretation in 1927

It has many flaws, the least three of which is that he's not compatible with special relativity, it's not Pythagorean geometry, and real time is presented as an external scalar controller.

On the other hand, Ψ^2, which belongs to precise physical geometry, is more realistic and more efficient. The authors suggest that the classic Schrödinger PDE equation since 1927, which describes the complex wave function Ψ in the mathematical geometric space R^4, be replaced by its square SES, describing Ψ^2 = Ψ•Ψ* proposed by the authors in 2022 and defined in a closed control volume, which is the true physical geometric space or true nature behaviour.

Unexpectedly, this last formulation increases the amount of information and can be used to generate a new classical and quantum physics.

Once again This is the topic of this article.

The real answer to the article title question is that most people know nothing about the true quantum mechanics in a unified four-dimensional space-time, which is essential for describing classical and quantum physics, including those researchers who have been indoctrinated via Minkowski, Einstein and Schrodinger's ideas about R^4 space and whom we regard as the source of all evil.

We recall that In the three previous articles titled 'What Do You Know About Quantum Mechanics? – Parts One, Two, and Three' we presented, explained, and answered more than 15 important and pressing questions in the field of modern (or new) quantum physics — sometimes called 'Abbas physics' to set it apart.

In this article, we extend the same techniques from the new B and Q statistical transition matrix chains obtained from Cairo's techniques, called new physics, to introduce, explain, and answer the following ten questions, which are more complex and more advanced:

1-What are the fundamental forces in QM system?

2-What is time complexity?

3-How do waves interact with one another?

4-Is it true that diffusion in vacuum exist?

5-Is it time to replace the vector space with the matrix space?

6-Is it true that the physical information is not yet well defined?

7-Is it true that Bohr correspondence principle in QM is stolen?

8-Det(A) . det(B) = det(A.B) is this a universal law of physics?

9-Is the square of the Schrödinger partial differential equation quantized?

10-Why is it impossible for the nuclear power plant reactor to turn into an explosive nuclear bomb?

Finally, it is important to note that this article does not aim to diminish the significant contributions of great physicists and mathematicians such as Einstein, Schrödinger, Bohr, Heisenberg, Minkowski, Hilbert, Riemann, and others, but rather to address the most prominent shortcomings and limitations of their theories, where applicable.

Note: If you are not familiar with the universal laws of physics, please stop reading. This article is not intended for you.

I.A comprehensive introduction including theory and numerical results

"Ismail Abbas [1] proposes a reformulation of quantum mechanics and physics using Cairo techniques, bounded statistical systems, and novel mathematical frameworks to uncover hidden laws in classical and quantum physics.

Overview of Abbas's Approach

Ismail Abbas, a PhD lecturer at Cairo University, has developed a series of theoretical frameworks aimed at addressing perceived limitations in classical and quantum physics

His work emphasizes that traditional mathematics has been used as a tool in physics but should not be assumed to generate new physical laws; instead, he argues that physics

can reveal new mathematics and physical rule and laws through statistical and unitary space approaches .

Key Concepts in Abbas's New Physics

Bounded Statistical Systems:

Abbas introduces the concept of a bounded statistical system, defined as a closed control volume with Dirichlet boundary conditions [2,3.4,5,6].

This framework is applied to both classical and quantum systems, providing constraints that help resolve paradoxes such as Schrödinger's cat by accounting for information loss in open systems .

2. Cairo Techniques: This is a 4D unitary numerical statistical method that Abbas proposes to reformulate quantum mechanics. It involves transition chains and B-Transition Matrices to correct incomplete or misleading aspects of the Schrödinger equation, allowing for a more precise description of quantum energy distributions .

3. Reformulation of the Schrödinger Equation: Abbas proposes squaring the Schrödinger PDE to represent the quantum energy density as a real quantity, $\Psi^2 = \Psi \bullet \Psi^*$, which provides a clearer statistical interpretation of quantum states and energy distributions [7,8,9,10,11,12,13,14,15,16,17,18].

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4. Integration with General Relativity:

His work also explores merging quantum mechanics with general relativity within bounded volumes, suggesting that

electromagnetic and gravitational fields can be reformulated to align with quantum principles, potentially leading to a unified framework [27,28].

5. Discovery of Hidden Laws [5,19,21]:

Abbas claims that thousands of intrinsic laws and rules in physics, mathematics, and biochemistry remain undiscovered. His methods aim to systematically uncover these hidden patterns using statistical and unitary approaches .

Implications

Abbas's contributions are both theoretical and experimental [31,32,33] and focus on providing a new mathematical and physical lens to understand quantum phenomena, energy distributions, and the interplay between classical and relativistic physics. His work challenges conventional assumptions and proposes alternative formulations that could refine or extend current models in physics.

In summary

Ismail Abbas's "new physics" revolves around bounded statistical systems, Cairo techniques, and reformulated quantum mechanics, aiming to reveal hidden laws and improve the precision of physical theories "**[1].**

In other words, we all know that mathematics entered physics as a tool, but gradually it turned into the master of physics.

In the sense that, the majority of scientists think that mathematics can generate physics, when in fact it's the other way around.

This is once more, the subject of the present article.

Along the last century false attitude of many mathematicians argue that geometry (which was always the rigorous base for physics and mathematics) belong to mathematics not physics since the time of the ancient Greek philosopher Plato, the physicist Galileo Galilei and even Archimedes which is not true.

The most striking example is the current belief that the non-comprehensible, and sometimes misleading classical Schrödinger equation in complex time space which describes the complex wave function Ψ, can be created and continue operating in the domain of imaginary mathematics.

The classic Schrödinger equation with Bohr's 1927 interpretation has a lot of flaws, at least three: it's not compatible with special relativity, it's not Pythagorean geometry, and real time as it stands is an external scalar controller.

On the other hand, Ψ^2, which belongs to precise physical geometry, is more realistic and more efficient. The authors suggest that the classic Schrödinger PDE equation from 1927, which describes the complex wave function Ψ in the mathematical geometric space R^4, be replaced by its square SES, describing Ψ^2 = Ψ•Ψ* introduced by thw authors in 2022 [34] within a closed control volume, which resebles the true physical geometric space, and unexpectedly increases the amount of information and can be used to generate new classical and quantum physics.

Once again This is the topic of this article.

To get back to a real answer to the question in the article's title, most people know nothing about the true quantum mechanics in a unified

four-dimensional space-time, which is essential for describing classical and quantum physics, including researchers who have been indoctrinated with the ideas of Minkowski, Einstein, and Schrödinger about R^4 space, which we consider the source of all evil.

We recall that In the three previous articles titled 'What Do You Know About Quantum Mechanics? – Parts One, Two, and Three' we presented, explained, and answered more than 15 important and pressing questions in the field of modern (or new) quantum physics — sometimes called 'Abbas physics' to set it apart.

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9-Is the square of the Schrödinger partial differential equation quantized?

*10-Why is it impossible for the nuclear power plant reactor to turn into an explosive nuclear bomb?

All throgh this article we are going to answer the six starred questons where are the other four are well explained in the iintoduction part 1 and in the three previous srticoles 2,3,4.

Finally and again it is important to note that this article does not aim to diminish the significant contributions of great physicists and mathematicians such as Einstein, Schrödinger, Bohr, Heisenberg, Minkowski, Hilbert, Riemann, and others, but rather to address the most prominent shortcomings and limitations of their theories, where applicable.

Note: If you are not familiar with the universal laws of physics, please stop reading. This article is not intended for you.

Our choice is statistical mechanics.

Moreover, the statistical mechanics we chose isn't entirely new and has been successfully and effectively applied to many areas of classical and quantum physics as well as in applied mathematics and probability and statistics since 2020.

In other words,the authors statistical mechanics is based on statistical transition matrix chains (B-matrices chains), which have been precisely defined and efficiently working active since 2020 (2,3,4,10-13,19)

That is the reason behind our choice which is statistical mechanics based on the transition B-matrix chains resulting from Cairo techniques.

Note that today we know only two types of transition matrix chains, namely Markov transition matrix chains M and the proposed B-matrix chains where the superiority of the latter is evident [26].

Note also that the well known Heisenberg quantum transfer matrix is neither transition nor statistical matrix.

The far success of the B-matrix chains is partly due to exact definition of time t for the first time in history as satisfying the following physical and geometrical conditions [Note that we mean new geometrical physics not classical geometry in a sense]:

1- Satisfies the generalized time-dependent Pythagorean theory:

X^2 + y^2 + z^2 + C^2t^2 = hypotenuse^2 = constant... (1)

And not the catastrophic anti-Pythagorean definition of Einstein and Minkowski

X^2 + y^2 + z^2 - C^2t^2 = 0... (2)

However, since Einstein and Minkowski adopted the false concept of equation 2, it became the standard.

2- We define Time t as the fourth Cartizian axis which is not separate from the other three geometric axes x,y,z like a separate scalar controller, but is rather intertwined with the other three geometric axes and at the same time perpendicular to all of them.

3-Time is discrete not continuous, which means it is quantized and not continuous [25]

This discretization of time is moe general and replaces the Bohr quantization of angular momentum :

m v 2 Pi r = nh, n = 1, 2, 3, ... infinity.. . . (3)

4- The discretization of time is performed as [20,21,25,26].

t=Ndt where N is the number of iterations or time step and dt is the time jump.

This is the source for the expression for the transfer matrix D(N) after time Ndt as,

$D(n)= B + B^2 + B^3 + ... + B^N$ . . . (4)

Which reduced to,

D(N) = E(N)-I

Where I is the unit matrix nxn and,

E(N)= 1 / (I-B) for sufficiently large N.

Now, we define the quantum transition matrix Q as,

Q=SQRT (B) . . . (5)

And the transfer quantum transfer matrix,

D(Q) via the expression,

$D(Q)= Q + Q^2 + Q^3 + ... + Q^N$ . . . (6)

Which reduces to,

D(Q)= = 1 / (I-Q) when N is sufficiently large.

And what is even more surprising is that (19),

D(N) = SQRT (E(N)) in all cases .

It is worth noting that Equation (2.3,4,5,6) **unifies—in a sense—classical physics and quantum physics** and surprisingly general relativity as well.

The statistical transition B-matrix in 1D,2D,3D itself is uniquely and well defined inside the closed control volume with Dirichlet boundary conditions(may be called Abbas control volume for distinction) through the following 4 statistical conditions [14,15,18,19].

The entries B i, j comply with or are subject to the following 4conditions for 2 D situations:

i-B i, j = 1/4 for i adjacent to j .. and B i, j = 0 otherwise. This means that the prior probability is equal.

ii- B i, i = RO, i.e. the main diagonal is made up of constant inputs RO. For example in the heat diffusion equation, RO can take any value in the closed interval [0,1]while for Laplace and Poisson PDE, RO = 0.

That is to say that B is a null principal diagonal matrix which corresponds to the assumption of a null residue after each time step for all over the free nodes.

iii- B i, j = B j, i, for all i, j.The matrix B is double symmetrical to conform to the physical principle of detailed balance.

iv- The sum of B i, j = 1 for all the rows far from the borders and the sum B i, j <1 for all the rows connected to the borders meaning that the probability of the whole space = 1.

Obviously, the statistical matrix B is very different from the Laplacian mathematical matrix A and from the Markov transition matrix M.

The physical nature of B is clear and briefly explained above through conditions I to iv which support hypothesis 3.

The complexities related to determining the B matrix in classical physics and the Q matrix in quantum physics emerge from the process of pre-selecting the main diagonal elements (Bii or RO), since this arbitrary choice uniquely determines the nature of the problem and its physical characteristics.

For example:

i- Bii = 0 for mathematical and electromagnetic problems.

ii- Bii = 0.2 and 0.22 for the partial differential equation (PDE) governing heat diffusion in low-alloy steel and high-quality Egyptian aluminum, respectively. And so on.

We now return to the NEW properties and theorems derived from the statistical mechanics of quantum systems in the new physics—insights that could not have been reached via the classical Schrödinger equation (the partial differential equation) introduced in 1927.

A simple approach to understand the physics and mathematics inherent in the B-matrix chains and in the new physics as a whole, is the Cauchi-Riemann stress strain tensor:

the Cauchy Rieman stress-strain tensor in 3D geometric space xyz is expressed as,

Fxx Fxy Fxz

Fyx Fyy Fyz

Fzx Fzy Fzz

We call it matrix/tensor M1

And the strain tensor or space curvature curvature tensor (We call it matrix/tensor M2)

Then M1 x M2 =modulus of elasticity

What occurs here in new physics which comprises time as the forth dimension?

1-The first fantastic breakthrough here consists of transforming the Cauchy-Rieman stress tensor into an energy density tensor U(x,y,z,t) Jm-3 sec in the form of a Laplacian stress matrix:

∇^2xx ∇^2xy ∇^2xz ∇^2xt]U(x,y,z,t)

∇^2yx ∇^2yy ∇^2yz ∇^2yt]U(x,y,z,t)

∇^2zx ∇^2zy ∇^2zz ∇^2zt]U(x,y,z,t)

∇^2tx ∇^2ty ∇^2tz ∇^2tt]U(x,y,z,t)

We call it matrix stress tensor M3.

Where,

∇^2xx = d/d2 (partial) and ∇^2xy = d/d2(partial) x y and so on.

2- And the second fantastic breakthrough consists, in the same way, of transforming or generalizing Cauchy's 3D geometric deformation tensor into a 4D xyzt spacetime curvature, namely:

∇^2xx ∇^2xy ∇^2xz ∇^2xt

∇^2yx ∇^2yy ∇^2yz ∇^2yt

∇^2zx ∇^2zy ∇^2zz ∇^2zt

∇^2tx ∇^2ty ∇^2tz ∇^2tt

It's called the M4 tensor of spacetime curvature.

3-The third and greatest fantastic and consistent advance is to reasonably assume that **[2-32]:**

Energy density Stress Tensor M3 × Spacetime curvature tensor M4 = I ...(7)

Where I the identity matrix .

It should be noted that the statistical sequences of the 'B matrix' do not depend on the classical Schrödinger PDE (SE) formulated in 1927 or any other classical PDE, as if they had never existed.

Therefore, we proposed *replacing the classical Schrödinger equation (SE) with its quadratic form (SES) describing Ψ^2, where $\Psi^2 = \Psi \cdot \Psi^*$.*

It is also worth noting that the SES form aligns with the general physical law:

U(x, y, z, t) . Spacetime curvature = I . . . (7*)

Whereas Schrödinger partial differential equation SE itself does not satisfy this condition.

All analyses presented in this research paper—as well as in previous papers dating back to 2022—apply to the SES formulation, not to the conventional Schrödinger equation(SE).Thus, we disregard the

conventional Schrödinger equation (SE) as if it never existed, and restrict our selves to the SES formulation.

Note that SES implies,

1-Both statistical transition matrices, B and Q, must be simultaneously "double statistical," singular (meaning their determinants are zero), and meanwhile invertible.

2- Both statistical transfer matrices, D and D(Q), must be simultaneously "double statistical," singular, and invertible.

Statement (1,2) above appears contradictory, yet there is a justification for it, as follows:

The classical SE lives and operates in infinite void, which constitutes 99.9 % of our universe.

In fact, the vacuum is not a void in the true sense; rather, it is in reality a substance teeming with energy densities—whether potential or kinetic.

3- It follows that the flow of the energy density distribution in quantum mechanical system must be an inverse flow (negative diffusion);that is, it extends from the system's walls toward its internal centre of mass (CM).

4- It follows from conditions 1 ,2 and 3 that the energy density in quantum mechanical system must be geometrically triangular, as shown in Figures 1 , 2 and 3.

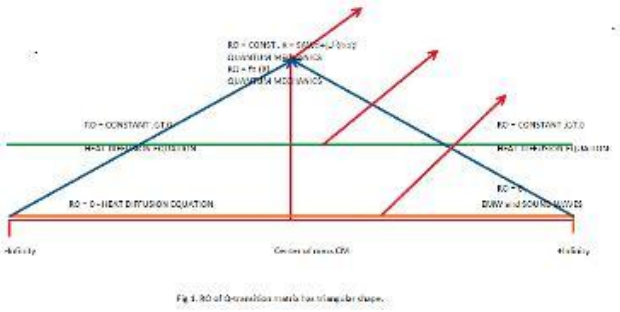

Figure 1: A one-dimensional quantum mechanical model consisting of n free nodes separated by equal distances;the triangulation is obvious.

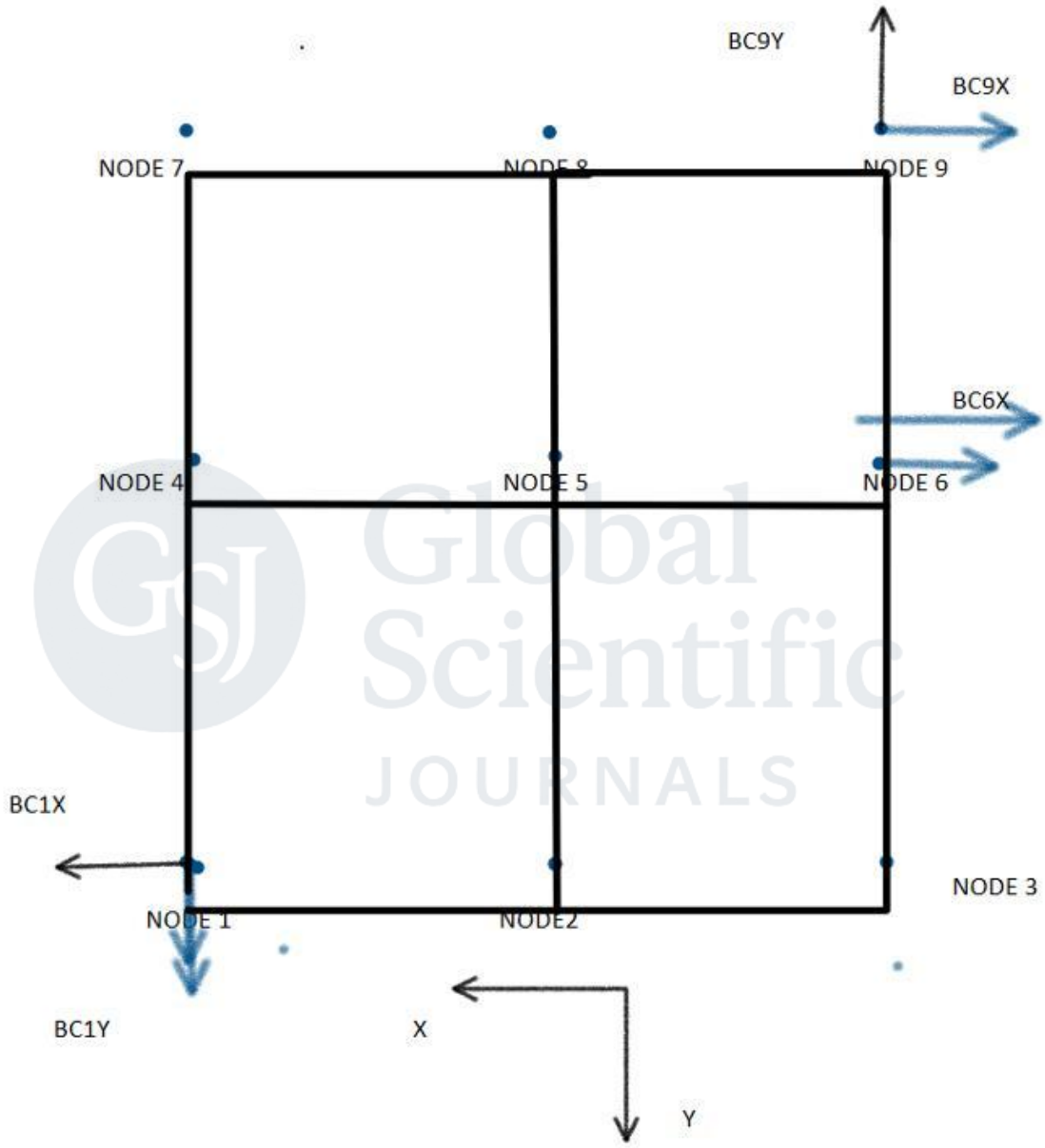

Figure 2: A 2D rectangle composed of equidistant 9 free nodes spaced at equal intervals in classical physics—without

triangulation.

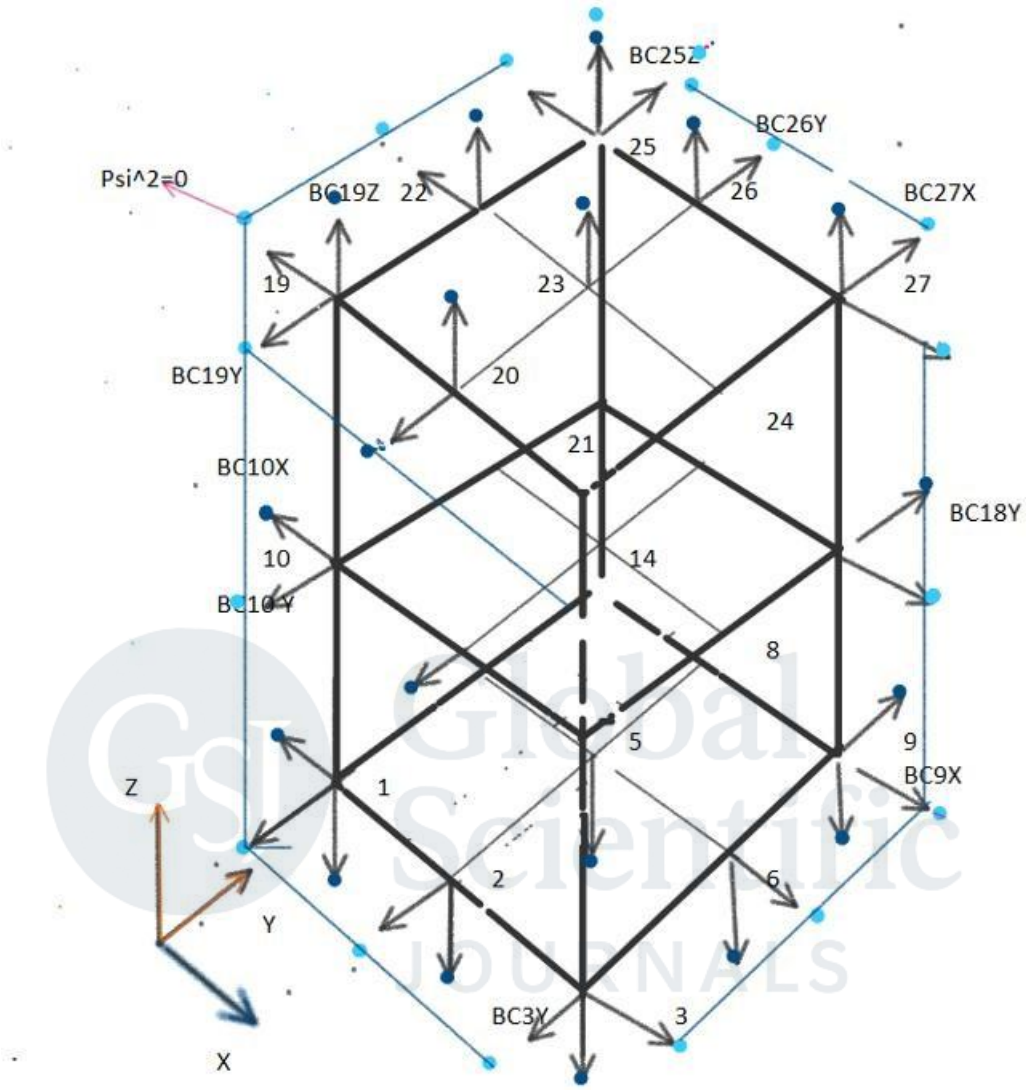

Fig. 3 -3D classical or quantum system-Triangularization process is shown here.

Triangularization process appears in Quantum mechanical system which lives and operates in infinite vacuum where the boundary conditions at infinity must be bounded to zero.

In other words, in Quantum mechanical system which lives and operates in infinite vacuum where the boundary conditions at infinity must be bounded to zero, both Its transition matrix B and

transfer matrix D determinents must be equal to zero and meanwhile invertible.

The question arises how and why?

The answer is simple:

The 2D transition matrix represents a solution to the following system of simultaneous homogeneous linear algebraic equations:

a11 x1 + a12 x1 + a13 x1 + ... = 0
a21 x2 + a22 x2 + a23 x3 + ... = 0
. . . . . .
an1 x1 + an2 x2 + an3 x3 + ... = 0
It is obvious that the above-mentioned system of homogeneous linear equations has a solution if and only if the determinant of the matrix:
a11 a12 a13
…. . . . .
an1 an2 ann ...
equals zero.
This is what was to be proved.,

Another question arises:

What is required to master the statistical theory of B-matrix chains—or any other equivalent statistical theory [Abbas and Professor S. Guorgeva p[34,35].

1-Comprehensive knowledge and understanding of universal classical and quantum laws and rules of physics[2-7,21,22,34,35].

2-Improved knowledge and understanding of how to construct correct and efficient software algorithms using current programming languages, such as Fortran and C++ [21,22,25,26,27,34,35].

3-Mastery of matrix algebra operations, such as calculating eigenvalues and eigenvectors, as well as matrix multiplication, addition, inversion, and others[29,30].

We present the following 10 question-and-answer pairs to better illustrate or clarify the nature and properties of QM:

*1-What are the fundamental forces in QM system?

2-What is time complexity?

3-How do waves interact with one another?

*4-Is it true that diffusion in vacuum exist?

5-Is it time to replace the vector space with the matrix space?

*6-Is it true that the physical information is not yet well defined?

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*8-Det(A) . det(B) = det(A.B) is this a universal law of physics?

9-Is the square of the Schrödinger partial differential equation quantized?

*10-Why is it impossible for the nuclear power plant reactor to turn into an explosive nuclear bomb?

Moreover we finally explain through unitary 4D xt figures and shapes how we can increase the amount of information.

To avoid getting bogged down in the introduction, let's move directly to the second section,

II-Theory and Numerical Applications

Q1-

1-What are the fundamental forces in QM system?

A1-

In accordance with Koga [31] we assume the following:

The fundamental forces or potentials V in QM system particle i are the following three [31]:

1- Force on QM system particle from internal field produced by the nearby particles themselves F1.

2- Force on QM system particle from external field applied on walls or Dirichlet Boundary conditions Vext or F2.

3-Force on QM system particle resulting from interacting with all other particles F3.

We assume that:

F1 equals 1/n . . . (8)

where n is the total number of QM particles inside the 4D unitary xyzt closed number or number of free nodes in the control volume.

F2 is defined by the applied external field Vext or boundary conditions on walls which follows normally inverse square law,

F2 = Const / r^2 . . . . . (9)

where r is the distance from the center of mass CM.

F3 =0 . . . . (10)

F3 statistically sums up to zero,

The quantum transition matrix Q defined as

Q=SQRT(B)

when B is a singular matrix and hence its apparently seems that the quantum transition matrix Q exists but hard to be found.

However, there is a geniuos approach to compute rigorously all the elements of the quantum transition matrix Q using the relations:

V=V1+V2 . . . . (11)

in the vacuum space for QM,

Where:

V1=Constant1 proportional to1/n

V2= Constant2 . Energy density U(x,y,z,t)

V2 (x,y,z,t) is proportional to U(x,y,z,t).

Here is the expression for 1D quantum transition matrix Qi,j 19x19 for the case of 19 free nodes.

Q i,j 19x19=

1/2-(1/19+1/81)/2 1/19+1/81 1/2-(1/19+1/81)/2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

0 1/2-(1/19+1/64)/2 1/19+1/64 1/2-(1/19+1/64)/2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

0 0 1/2-(1/19+1/49)/2 1/19+1/49 1/2-(1/19+1/49)/2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

0 0 0 1/2-(1/19+1/36)/2 1/19+1/36 1/2-(1/19+1/36)/2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

0 0 0 0 1/2-(1/19+1/25)/2 1/19+1/25 1/2-(1/19+1/25)/2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

0 0 0 0 0 1/2-
(1/19+1/16)/2 1/19+1/16 1/2-(1/19+1/16)/2 0 0
0 0 0 0 0 0 0
0 0

0 0 0 0 0 0 1/2-
(1/19+1/9)/2 1/19+1/9 1/2-(1/19+1/9)/2 0 0
0 0 0 0 0 0 0
0

0 0 0 0 0 0
0 1/2-(1/19+1/4)/2 1/19+1/4 1/2-(1/19+1/4)/2 0
0 0 0 0 0 0 0
0

0 0 0 0 0 0
0 0 1/2-(1/19+1/1)/2 1/19+1/1 1/2-(1/19+1/1)/2
0 0 0 0 0 0 0
0

0 0 0 0 0 0
0 0 0 1/2-(1/19+1/4)/2 1/19+1/4 1/2-
(1/19+1/4)/2 0 0 0 0 0
0 0

0 0 0 0 0 0
0 0 0 0 1/2-(1/19+1/9)/2 1/19+1/9
1/2-(1/19+1/9)/2 0 0 0 0
0 0

0 0 0 0 0 0
0 0 0 0 0 1/2-(1/19+1/16)/2
1/19+1/16 1/2-(1/19+1/16)/2 0 0 0
0 0

0 0 0 0 0 0
0 0 0 0 0 0 1/2-

(1/19+1/25)/2 1/19+1/25 1/2-(1/19+1/25)/2 0
0 0 0

0 0 0 0 0 0
0 0 0 0 0 0 0 1/2-
(1/19+1/36)/2 1/19+1/36 1/2-(1/19+1/36)/2 0
0 0

0 0 0 0 0 0
0 0 0 0 0 0 0
0 1/2-(1/19+1/49)/2 1/19+1/49 1/2-(1/19+1/49)/2 0
0

0 0 0 0 0 0
0 0 0 0 0 0 0
0 0 1/2-(1/19+1/64)/2 1/19+1/64 1/2-(1/19+1/64)/2
0

0 0 0 0 0 0
0 0 0 0 0 0 0
0 0 0 1/2-(1/19+1/81)/2 1/19+1/81 1/2-
(1/19+1/81)/2

0 0 0 0 0 0
0 0 0 0 0 0 0
0 0 0 0 1/2-(1/19+1/100)/2
1/19+1/100

Note that:

1-the matrix Q 19x19 is singular and mean while invertible.

2-Q * F(r)=F(r)

For almost all expressions of vector state whether linear, or Cx 0r Cx^2 or Cx^3 . . etc

Which means that,

i-If F(r) vector V=(1,1,, ... ,1,1)T

Then, Q*V==(1,1,, ... ,1,1)T

ii-If F(r) vector follows inverse square law as in the case of first ten stationary states of Hydrogen atom,

V=

[17/125 68/405 17/80 68/245 17/45 68/125
17/20 68/45 17/5 68/5 17/5 68/45 17/20
68/125 17/45 68/245 17/80 68/405
17/125]T

The output result at vector for the first ten stationary states is exactly the same,

Which is H-Atom.

[17/125 68/405 17/80 68/245 17/45 68/125
17/20 68/45 17/5 68/5 17/5 68/45 17/20
68/125 17/45 68/245 17/80 68/405
17/125]T

iii- If the vector V is complex= exp(ix),

V=

[e^1i ,e^2I,e^3i,e^4i,e^5i,e^6i,e^7i,e*8i,e^9i,e*10i,e^9i,e^10i,e^8i
e^7*i, e*6i,e^5*i e^4*ie^3*ie^2*ie^1*i] T

The output result is the same complex vector,

[e^1i ,e^2I,e^3i,e^4i,e^5i,e^6i,e^7i,e*8i,e^9i,e*10i,e^9i,e^10i,e^8i
e^7*i, e*6i,e^5*i e^4*ie^3*ie^2*ie^1*i] T

Q4-

Is it true that diffusion in vacuum exist?

A4-

Yes it is true that diffusion in vacuum exist and can be calculated theoretically and measured experimentally.

The diffusion in free space is the origin of the Big Bang creating our universe millions or billions of years ago and still creating other universes up to this time.

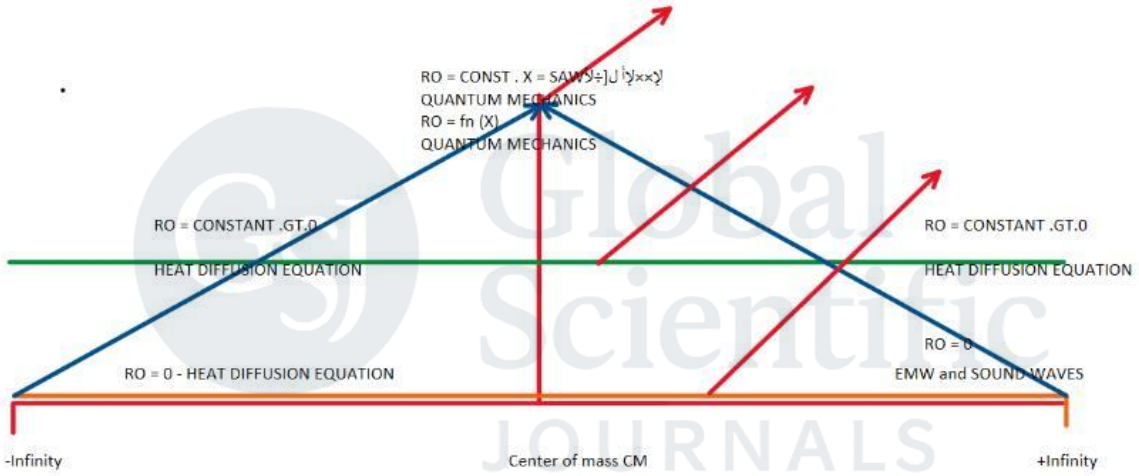

Fig 1. RO of Q-transition matrix has triangular shape.

Fig.5 energy densiyty diffusion in vacuum and Big Bang

Q6-

Is it true that the physical information is not yet well defined?

A6-

To our knowledge there is no commonly accepted definition of the amount of physical information, and most people are referring the amount of information to the previous writings which is neither true nor physical.

The amount of physical information is conserved inside any control closed volume bounded by Dirichlet conditions which is a universal law in physics impossible to break. That is why the authors proposes a rigorous definition for the physical volume density of information field H(x,y,z,t).

Furthermore, this information field H(x,y,z,t) exist everywhere in our universal space and transfer with the velocity of light C. Additionally, this information field H(x,y,z,t) is conserved and is the commanding field. In other word no diffusion of any kind of other fields (EM, Heat, Sund. .etc.) cannot occur without the permission of the proposed information field H(x,y,z,t).

Q 8-

Det(A) . det(B) = det(A.B) is this a universal law of physics?

A8-

Yes it is always true.

We assume the fact that,

det(A) . det(B) = det(A.B) . . . (1)i

s a universal law of physics that has no mathematical proof.

To our knowledge, ell attempts of mathematicians to prove the above statement or physical law continues without cession during the last century and up to date have failed.

The question arises:

did we get any serious results.

The relation to det(AB)=\det(A)\det(B), has not been, by itself, a well-posed universal question in mathematics. Yes, there are very

serious established results, but no universal multiplicativity theorem of the proposed physical kind. It is a mathematically precise boundary-condition problem proving that every physically admissible anomaly is a removable deriving multiplicativity from independent physical principles. Which means that the proposed universal physical determinant is well-defined and agrees with established determinants in controlled limits and lastly, producing a new experimentally distinguishable consequence. That's obvious and it is what's required. Anything materially weaker may still be a serious theorem, but it would not establish universal determinant multiplicativity as a physical law (1).

Consequently no one can answer the related question: When does det[A+B] = det[A] + det[B]? , , ,(2)

Which is also a serious question but unfortunately mathematicians use its fictitious proof of 1 to prof the second identity 2 :

Det (AB)=Det(A).Dt (B) . . . (2)

We believe that both identities 1 & 2 belong to physics as physical laws and neither of them has a mathematical proof...

Q10

Why is it impossible for the nuclear power plant reactor to turn into an explosive nuclear bomb?

A10

If both work on the same principle of operation: chain reaction of the interactive fission U 235. The bombardment of Uranium-235 by fast neutrons produces a chain reaction fission accompanied with an enormous thermal energy in addition to beta and gamma radiation .The most likely fission products are Sr 94 amu and Xe 140 amu plus

two fast neutrons. The reaction is therefore a chain reaction and almost instantaneous.

Then why not?

The nuclear explosive bomb and the nuclear reactor operate on the same operating principle: chain reaction of the interactive fission U 235. The bombardment of uranium 235 by fast neutrons produces a fission by chain reaction accompanied by an enormous thermal energy in addition to beta and gamma radiation.

The most likely fission products are Sr 94 amu and Xe 140 amu plus two fast neutrons. The reaction is therefore a chain reaction and almost instantaneous. The annihilation of mass in this reaction is 0.215 amu transformed into 200 Mev of energy according to Einstein's formula E = dm.c ^ 2. One kilogram of U 235 can produce approximately 7.2 x 10 ^ 13 joules "1.72 x 10 ^ 13 calories", which is equivalent to the heat produced by the combustion of 1800 tons of coal or Mazot. This is the main advantage of nuclear power plants.

1-The speed of the reaction is what distinguishes the explosive reaction of atomic bombs from the normal combustion reaction of nuclear reactors. For an explosion to occur, the reaction rate or the release of thermal energy must occur very quickly causing a very large pressure difference upstream and downstream of the resulting shock wave, otherwise no explosion will occur.

2-The objective of the nuclear bomb is to release an energy of about 8 x 10 ^ 13 joules, equivalent to 20,000 tons of highly explosive TNT, in about 20 seconds, while the power capacity of the reactor of the nuclear power plant can release the thermal from zero (emergency stop) to full station power, say 1000 MW (10 ^ 9 Joules per second).

3-The reaction rate in nuclear reactors is kept at a low level by using natural uranium composed of 0.74% U 235, 0.006% U 234 and 0.993 U 238 or enriching uranium 235 at a concentration limited to 3-5%.

In addition, the U fuel is distributed over THOUSANDS of fuel rods over the entire large volume of the reactor core which is the opposite geometry of the nuclear bomb. The rest of the reactor core is mainly inert U 238, mixed with graphite or any other suitable moderator, which absorbs most of the neutrons from the reaction causing the transformation of U 238 to Pu 239.

*It should also be mentioned that Pu 239 is much more expensive than natural uranium where here we have a unique case where the price of fuel is absolutely negative. The reactor also uses movable Cd or boron alloy control rods for penetrate vertically into the core and absorb any desired amount of neutrons.

- In order to increase safety, the reactor core is contained inside a thick steel vessel surrounded by a concrete container reinforced with steel rods 1 to 2 meters thick, in the shape of a 'hemisphere.

-Conversely, in modern atomic bombs, the reaction is reinforced by a concentration of U-235 or Pu 239 enriched or fertilized to more than 90% with a mass of about 20-30 Kg, contained in the correct geometry, at inside a relatively small container equipped with explosive sources emitting fast neutrons. In addition, the material and design of the walls reflect the neutrons that escape inside the reaction.

** Even in the event of accidents or occurrences such as the shutdown of the control rods, an earthquake hitting the reactor, a series of cooling water pump failures, all causing excessive heating, the nuclear reactor CORE of a nuclear power plant can crack, break down, melt, but never explodes.

- This is why the Chernobyl reactor did not explode and cannot become like a nuclear bomb. It's really impossible, but it just melted and collapsed due to the overheating and swelling of its core.

Thanks to our distinguished readers and contributors this question/answer is diffused.

The nuclear explosive bomb and the nuclear reactor operate on the same operating principle: chain reaction of the interactive fission U 235. The bombardment of uranium 235 by fast neutrons produces a fission by chain reaction accompanied by an enormous thermal energy in addition to beta and gamma radiation.

The most likely fission products are Sr 94 amu and Xe 140 amu plus two fast neutrons. The reaction is therefore a chain reaction and almost instantaneous. The annihilation of mass in this reaction is 0.215 amu transformed into 200 Mev of energy according to Einstein's formula E = dm.c ^ 2. One kilogram of U 235 can produce approximately 7.2 x 10 ^ 13 joules "1.72 x 10 ^ 13 calories", which is equivalent to the heat produced by the combustion of 1800 tons of coal or Mazot. This is the main advantage of nuclear power plants.

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- Conversely, in modern atomic bombs, the reaction is reinforced by a concentration of U-235 or Pu 239 enriched or fertilized to more than 90% with in the form of 15-20 cm diameter-sphere and its mass is about 20-30 Kg, constructed in the correct geometry, and enclosed inside a steel container of one ton.

The relatively small container is equipped with explosive tnt plus sources emitting fast neutrons. In addition, the material and design of the walls should reflect the stray neutrons that escape outside the reaction.

** Even in the event of accidents or occurrences such as the shutdown of the control rods, an earthquake hitting the reactor, a series of cooling water pump failures, all causing excessive heating, the nuclear reactor CORE of a nuclear power plant can crack, break down, melt, but never explodes.

- This is why the Chernobyl reactor did not explode and cannot become like a nuclear bomb. It's really impossible, but it just melted and collapsed due to the overheating and swelling of its core.

The question arises:

What is the relation between nuclear bomb or equivalently nuclkear reactor and the B ior Q matrix chains?

The answer from that chains is that the reaction rate follows the exponential equation e^ λ*t where λ* is function of volume (or mass) of uranium as well as its concentration.

For concentration of U235(or Pl238) of 95%,the volume required is sphere or 15 cm or 15 Kg weight enclosed in one ton iron shield while for concentration of U235 of 20% as in the case of Iran future bomb you need sphere or some meters diameter corresponding to tens of tons weight which is impractical.

Only a huge train can transfer it.

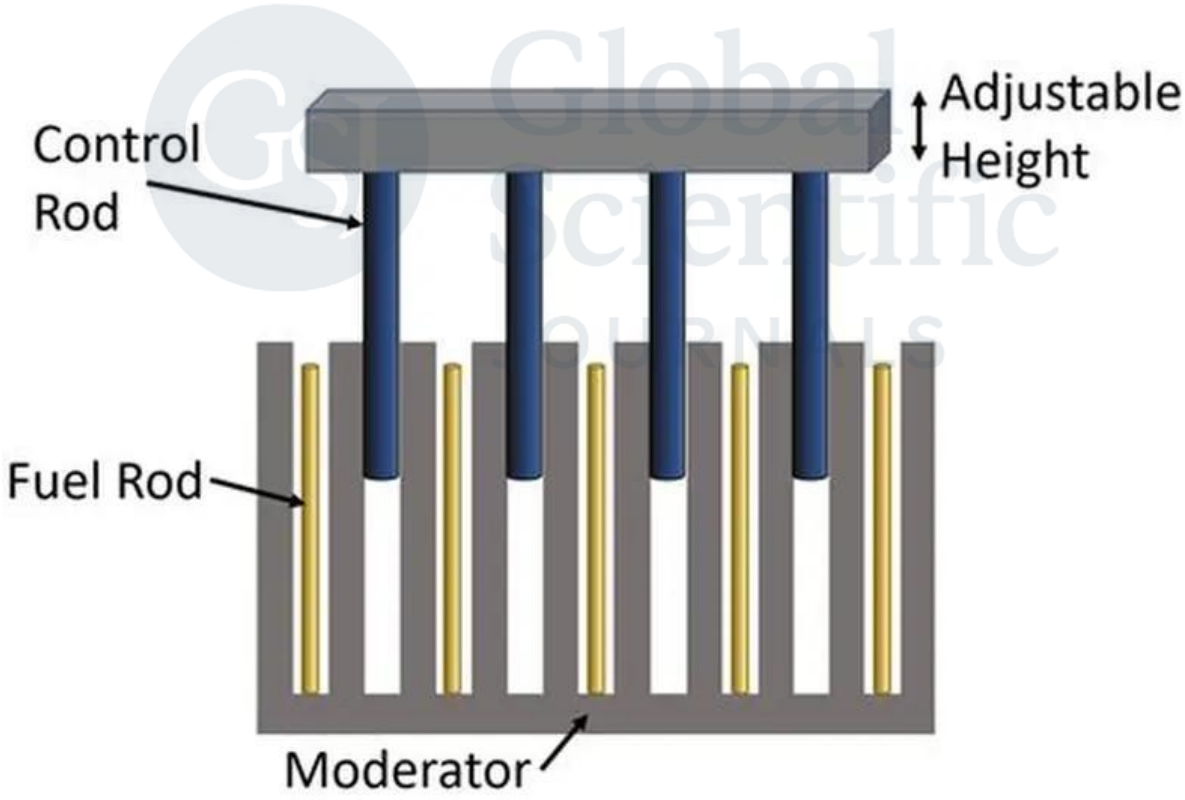

Fig 6.Fuel rods with control system in a nuclear reactor plant.

In conclusion, the Iran nuclear bomb is merely a propaganda.

Thanks to our distinguished readers and contributors this question/answer is repeated.

The four questions, Q2 and Q3.Q5 and Q9 are well explained and answered in the introduction and previous articles (2,3,4), so there's no need to repeat them.

Now we finally explain through few unitary 4D xt figures and shapes how we can increase the amount of information.

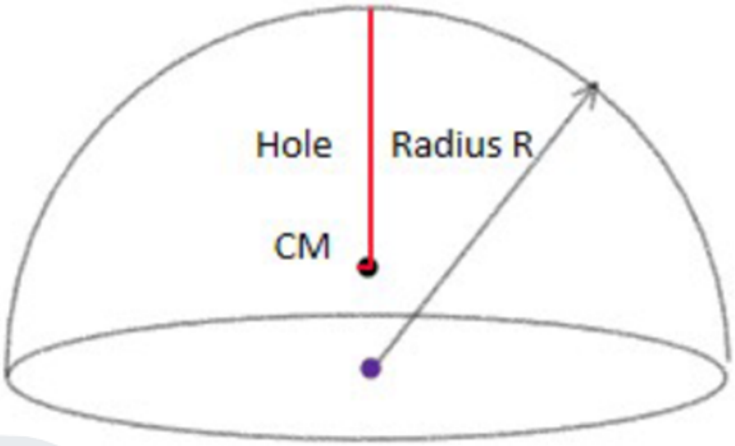

Fig 6-A regular hemisphere.

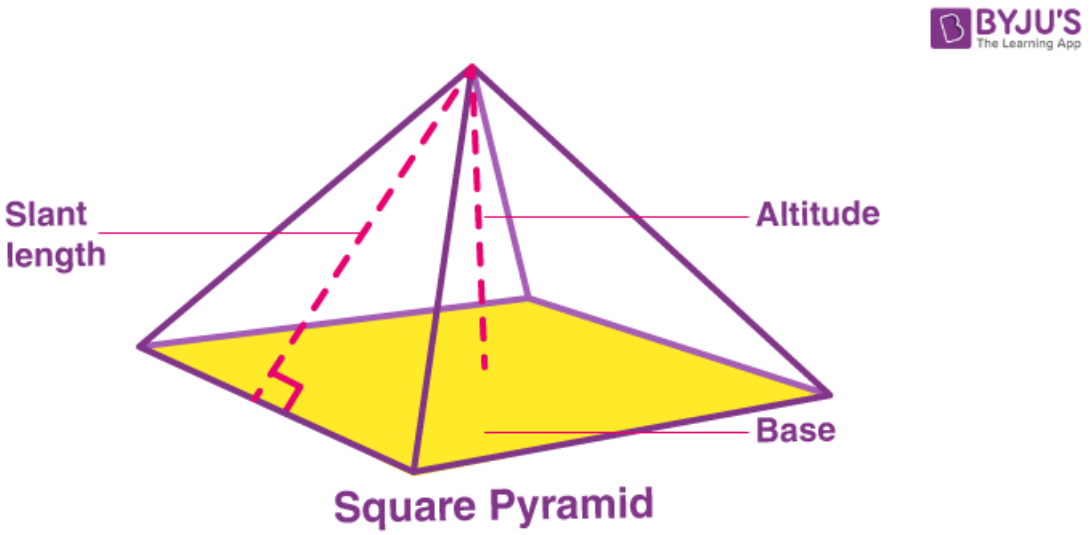

Fig 6 –B regular pyramid with square base.

What is magic here is that these 3D objects can work as Light wave amplifier and or sound wave amplifier [3].

The first requirement is polishing and plating the intenal walls with bright metals of reflectivity 99% or more.

The second requirement is drilling bigger hole say one mm dameter at the middle and another tyny hole say 0.1 mm diameter at the vertex.

The third requirement is to evacuate the inside of these shapes to a high vacuum level.

Prediction is that a ray of light wave(or sound wave) entering at the bigger hole will emerge from the tiny one amplified approximately 100 times [3].

ConclusionIn

In this article, we presented, analyzed, and answered in brief 10 important and urgent questions:

1-What are the fundamental forces in QM system?

2-What is time complexity?

3-How do waves interact with one another?

4-Is it true that diffusion in vacuum exist?

5-Is it time to replace the vector space with the matrix space?

6-Is it true that the physical information is not yet well defined?

7-Is it true that Bohr correspondence principle in QM is stolen?

8-Det(A) . det(B) = det(A.B) is this a universal law of physics?

9-Is the square of the Schrödinger partial differential equation quantized?

10-Why is it impossible for the nuclear power plant reactor to turn into an explosive nuclear bomb?

In addition we present few geometrical figures or shapes that can work as light(or sound) intensity amplifier in the unitary 4D xt space.

The numerical results of generating new mathematical and quantum mechanical rules and formulas or theorems are remarkably accurate to six digits which suggests that applied mathematics is merely a branch of physics and that modern geometry belongs to physics not to classical mathematics.

Finally, it is important to note again that this article does not aim to diminish the significant contributions of great physicists and mathematicians such as Einstein, Schrödinger, Heisenberg, Minkowski, Hilbert, Riemann, and others, but rather to address the most prominent shortcomings and limitations of their theories, where applicable.

Aknowledgement

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An experience that was both enjoyable and rewarding until he later became a professor and head of the Department of Basic Sciences, which comprises experimental and theoretical physics aswell as pure mathematics.

During this long experience. He went to the Atomic and Nuclear Physics Center in Toulouse, France, where he earned his doctorate and worked as a professor at ULP and UPS Universitas, as well as a research director at CNRS in France.

The last experience, as with the first, was an opportunity to collaborate with the best leaders and the latest scientific knowledge.

It is worth noting that the authors use their own Fortran language Algorithm similar to those in references 38-41.

No Python or MATLAB is needed.

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An Efficient Replacement for Schrödinger's Partial Differential Equation

Ismail Abbas

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