EQUATION OF EVERYTHING
Code Unlocked
MATHEMATICAL MODEL

'We live inside a mathematical equation'

Salahdin Daouairi
Program Director of Mathematical Contests, New York, NY
olympicsmath@gmail.com

Abstract: This discrete mathematical dynamical model for the theory of everything is based on a coded numerical equation that I unlocked. This numerical model puzzle which is the key to understanding the universe is beyond physics for interpreting physical laws of the universe. The equation will uncover the hidden secret of time and will also explain large important properties of the universe, it will describe the vortex ring model: a transformation of a hexagonal lattice related to a square lattice into a torus that represents the dynamical system of the particles and the space/time and will show how the system:
S= {Space/Time/Matter/Energy/Gravity/Electromagnetism} is homogeneous, connected and unified.
This mathematical model is an application and a special case of Langland Program that describes the dynamical system of a particular elliptic curve a "Modular knot"; it will define in quantum field theory the phenomena of quantum entanglement for a higher dimension. The system is based in a discrete quantum space with the concept of spinors and modular representation" Galois" through the theory of harmonic oscillator with the asymmetry properties to describe the system's phase transformations. The system is determined through two important mechanisms of singularity which rely on fixed point and periodicity.
The universe is generated through a super-computer that codes, decodes and corrects error codes: By introducing the notion of spin related to Hadamard operator known for its application in error correcting codes and quantum entanglement, integrated with Lie Algebra, embedded with Clifford graded Z2-Algebra for a non-commutative algebra to explain how gauge symmetry works and to describe the quantum circuit for the bosonic and fermionic fields through fields ramifications. Some important properties in the algorithm of strings, simplex theory, knot theory, graph theory and computer algorithms were also introduced to use in this discrete model to describe the system. The equation will divulge the hidden code of the mystery puzzle in Pascal's triangle which is the resource and the base of everything.
The equation will answer all unknown physical, biological, philosophical and spiritual questions! As a result, it will unlock the true nature of the universe, correct most fundamental theories of physics and will finally disclose the hidden bridge between quantum physics and the general relativity.

‘We live inside a mathematical equation’

1-Introduction

The universe! One of the deepest questions: how the universe was created and how was the system S= {*Space/Time/Matter/Energy/Gravity/Electromagnetism*} connected and unified?

1-1 Equation of Everything:

There exists a “tiny”, concise equation, as most scientists have predicted, which will connect all physical laws of the universe. This mathematical numerical puzzle model is the key to understanding the universe and reaches beyond traditional physics when attempting to explain the physical laws of the universe.. This powerful equation will provide the answers to some of the most mysterious questions that have ever been found: What is the nature of “Time”? How does it function? What are its properties? What are dark energy and dark matter? How speed of light was defined? Do we live in a simulated universe?

1-2 Equation Generality

To begin, I will be providing a step by step, detailed explanation that will outline the methods that were utilized to construct and prove my conjecture/equation. In this Theory which is a mixed of numerical and theoretical methods I based on simple known mathematical concepts and formulations to study my numerical system.

1-3 Discrete System

The answer is that the architecture of the universe and its quantum structure including biological systems from cells, chromosomes, genes, DNA, life& death, consciousness which all are system inside a system with one common equation based on the theory of entanglement through the dynamical of a trefoil knot an “elliptic curve” with the asymmetry properties; where the equation is based from the concept of discrete numbers, its structure and its dynamical system that develop from a simple form into a complex form (Fractal) such as “Combinatory Game Theory”. To understand the system we need to have a deep understanding of the parameters: numbers! Numbers are absolute abstract elements independent from space and time that function to define abstract and concrete things. To understand the behavior and dynamics of the system we need to analyze the number’s symmetrical concept, its flow “ramification”, decompositions “how it split” and its group representations in the field theory. Each number is defined with its algebraic, analytic and geometric identity. Numbers have a solid fundamental foundation and are considered as the primary mathematical and automata language of the universe and its atomics structure.

In discrete mathematics, discrete systems are characterized by integers, including rational numbers in contrast to continuous systems which require real numbers. Discrete mathematics is the study of mathematical entities with discrete structure, with the property that do not vary smoothly, dealing with integers, graphs, with countable set in the fields of combinatory theory, graph theory, operations research, number theory, theory of computation that includes the study of algorithms and its implementations.

2- Salahdin Daouairi’s Equation for the “Theory of Everything” is defined as:

Giving a set $M_{99} = \{1, 2, 3 \dots, 99\}$ embedded in a hyper-sphere S_{r^2} and let’s denote by $M(\rho_1, \rho_2, \rho_3, \rho_4, \rho_5, \rho_6, \rho_7)$ a point of S_{r^2} with $\rho_{1\le i\le 7}$ consecutive primes such that: $2 \le \rho_i < [r] - 6$ satisfying: $\sum_{i=1}^{7} \rho_i^2 = r^2$ where r is the Salahdin Daouairi’s radius of the hyper-sphere S_{r^2} with $r^2 = 666$.

Then a fortiori the dynamical system of M_{99} and S_{r^2} defines the equation of everything.

2-1 Descriptions:

In this paper I will be decoding the mystery of the number 666 which is related to the equation of everything! I will simply show that **$\boxed{M_{99}\text{ is a hexagonal torus of dimension 5}}$ which is Space/Time with Dim3/Dim2 embedded in a $\boxed{\text{hyper-sphere } S_{r^2} \text{ of dimension 6}}$** which is the extra dimensions discovered in String Theory and show how the system is connected!

Definitions of Lattice / Torus :

- **Lattice** is a discrete additive subgroup of $\mathbb{R}^n$.Example: The lattice $\xi = \{\omega_1 m + \omega_2 n \; with \; (n,m) \in \mathbb{Z}^2\}$ subgroup of $\mathbb{R}^2$**.** Every lattice generates an elliptic curve where $\omega_1$and ω_2 are simply periods.
- **Elliptic Curve** is an abelian variety, a smooth projective algebraic curve of genus one.
- **Torus** is an abelian group a surface generated from a circle revolving in 3Dim around an axis that does not intercept the circle; a torus also can be constructed by folding a lattice into a cylinder and joining its extremities

to form the shape of a torus $T^n \sim \mathbb{R}^n/\mathbb{Z}^n$. Note since $\mathbb{R}^2 \sim \mathbb{C}$, the 2- torus T^2 is isomorphic to $\mathbb{C}/\xi$.
There exists an isomorphism of group: $\varphi: \mathbb{C}/\xi \to \epsilon(\mathbb{C})$ ($\epsilon(\mathbb{C})$ Group of complex points of the elliptic curve)
Mathematically the equation will describe the dynamical of a hexagonal lattice in to a "torus" of 5 dimensions embedded in a Hyper-Sphere of 6 dimensions with radius $\boldsymbol{r^2 = 666}$.
We will be studying through an asymmetric transformation (Helix) the distribution (packing Spheres) and dynamical system of the primes, composites, palindromes and transpalindromes of a finite set of discrete numbers considered as 'spinors', mathematical entities to define the quantum space and its circuit. These entities represent the vertices of a lattice $x_{1\times1}, \dots\dots, x_{99\times99}$ which correspond to the set $M_{99} = \{1,2,3 \dots.,99\}$, where the edges represent the strings / loops. The dynamical of those vertices will describe circles through an oscillation harmonic and will map a hyper-sphere S_{666} with a radius $r^2 = 666$ through the point $M\ (2,3,5,7,11,13,17)$, while $2,3,5,7,11,13,17$ are consecutive primes elements of the set M_{99}. The dynamical of the lattice will be describing a torus which is embedded in the hyper-sphere S_{666} . The whole system is related to Pascal's triangle and will be evaluated upon its singularity and periodicity through modular representations.
Physically the interpretation can be seen a priori from a lattice field theory (Grid composed with cells and charged +/-), that interchange information with a phenomena of creation and annihilation +/_ . The dynamical of the particle charged + or - describes a cyclical helical electromagnetic wave a "vortex ring model" along a solenoid, through an asymmetrical transformation, that transports matter and energy. What we will be showing are: - Existence of multi-verse and particles charged +/- : Interaction through electromagnetism creates the dynamical of the multi-verse " concept of entanglement", while the dynamical of the multi-verse induces the gravity!

2-2 Projection Plan of the Distribution:

Definition of Transpalindrome and Palindrome Numbers:

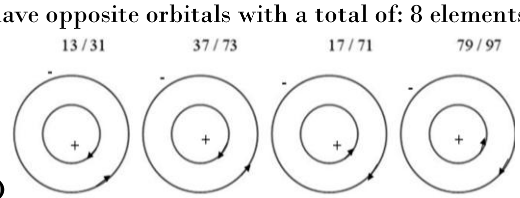
- A palindrome number is a 'symmetrical' number like 17271 that remains the same when its digits are reversed, and when the number and its reversed digits are not the same then these two numbers called simply transpalindrome numbers.

Properties: The set $M_{99} = \{1,2,3 \dots.,99\}$ of positive integers is structured from three important subfamilies:
- c_{omp} = composite numbers, p_r = prime numbers and number 1

$M_{99} = \{1,2,3 \dots.,99\}$ = {Transpalindromes, Palindromes}={1, Composites, Primes}

2-3 Palindromes and Transpalindromes Configuration of the set $\boldsymbol{M_{99} = \{1,2,3 \dots.,99\}}$

Let's denote the set of prime numbers of M_{99} by: $P_r = \{2,3,5,7,11,13, \dots\dots.97\}$ with 25 elements.
Set of composite numbers by $c_{omp} = \{4,6,8,9,10, \dots\dots,99\}$ with 73 elements
Set of palindrome numbers by: $\Delta_{ii} = \{ii, i \in \mathbb{N}\ and\ 1 \le i \le 9\} = \{11,22,33,44, \dots 99\}$ with 9 elements
And set of transpalindromes by: $\Delta_{ij,ji} = \{(ij,ji)/\ i \neq j \in \{0,1,..9\}\} = \{(1,10),(2,20), \dots\dots(89,98)\}$ with 90 elements.
Transpalindrome primes with mirror image prime have opposite orbitals with a total of: 8 elements



Transpalindrome Primes (Fig.1)

$\begin{cases} 13 \equiv 1[4] \\ 31 \equiv -1[4] \end{cases}$ $\begin{cases} 17 \equiv 1[4] \\ 71 \equiv -1[4] \end{cases}$ $\begin{cases} 37 \equiv 1[4] \\ 73 \equiv 1[4] \end{cases}$ 37 and 73 both split $\begin{cases} 79 \equiv -1[4] \\ 97 \equiv 1[4] \end{cases}$

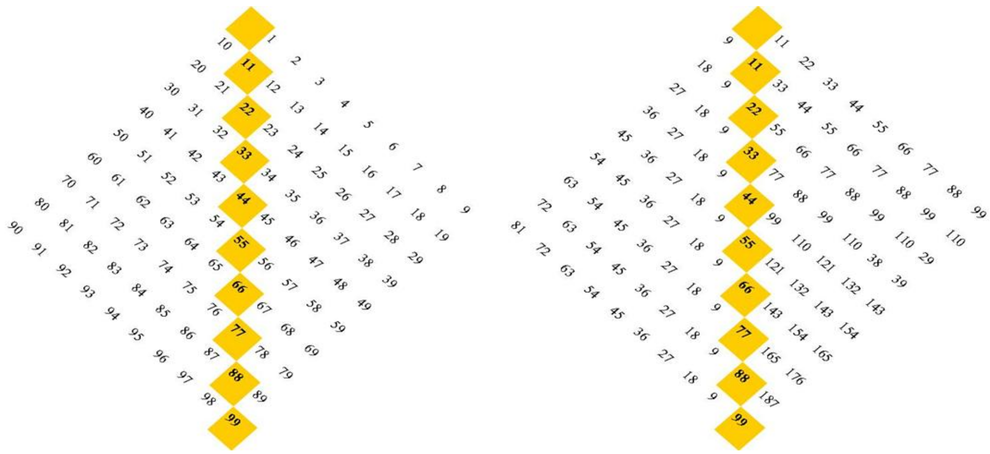
Thus only 31, 71 and 79 are Gaussian prime remain inert in $\mathbb{Z}[i]$.

Flow 5: Let's denote the flow relatively to n by $F_n = \{kn, k \in \mathbb{N}\ and\ 1 \le kn \le 99\}$, from the diagram (Fig.2)
We have: $F_9 \cap F_5 = LCM(9,5) = \{45\}$ And $F_{11} \cap F_5 = LCM(11,5) = \{55\}$ mean value of Δ_{ii}.
$\sum_{i=1}^{9} \Delta_{ii} = \mathbf{5 \times 9 \times 11} = LCM(9,5,11) = \{495\}$ **.**
Now let's find the pair of elements x and y of $\{1,2,3, \dots 9\}$ which verify: $x \pm y = 5$

5= 4+1→ $(1,4) \to 1^2 + 4^2 = 17$ oscillate circle of radius r denoted by $C_{r^2} = C_{17}$
=3+2→ $(2,3) \to 2^2 + 3^2 = 13$ oscillate circle C_{13}
=9 - 4→ $(4,9) \to 4^2 + 9^2 = 97$ oscillate circle C_{97}
=8 – 3→ $(3,8) \to 3^2 + 8^2 = 73$ oscillate circle C_{73}
=7 – 2→ $(2,7) \to 2^2 + 7^2 = 53$ oscillate circle C_{53}
=6 - 1→ $(1,6) \to 1^2 + 6^2 = 37$ oscillate circle C_{37}

As a result, a transpalindrome prime P_r and its prime partner $P_{r'}$ originate from the flow 5.

Flow F_5 corresponds to the generator that generates gravity. (Fig.2)



Flow9 **Flow11**

xy yx

$xy - yx \equiv 0[9]$ $xy + yx \equiv 0[11]$

2-4 Numerical Flow:

Giving the Matrix M=$\begin{pmatrix} 1 & 2 & 3 \\ 4 & \mathbf{5} & 6 \\ 7 & 8 & 9 \end{pmatrix}$. The matrix M is singular since Det M=0 (has infinity of solutions) with eigen-value equals zero. Prime/Super-Prime can be found by joining 1 to (3 and 7) and 7 to (9 and 3).

We can construct the transpalindrome numbers and their super-partners in M_{99}, by easily joining two elements of M. For this reason I will be doing a simple transformation of M to study M_{99}={1,2,3 … ,99}.

Let's denote M^t transpose of M. Then $M^t = \begin{pmatrix} 1 & 4 & 7 \\ 2 & 5 & 8 \\ 3 & 6 & 9 \end{pmatrix}$ If I align and combine the elements of M and $M^t$and since xy, yx, x and y are connected by the equation: $xy - yx = 9(x - y)$

1	2	3	4	5	6	7	8	9
1	4	7	2	5	8	3	6	9
11	24	37	42	55	68	73	86	99

The new matrix M'=$\begin{pmatrix} 11 & 24 & 37 \\ 42 & \mathbf{55} & 68 \\ 73 & 86 & 99 \end{pmatrix}$ leads to the following characteristics: 55 is a symmetry center and 37 located in the **third** column and **third** row! If we multiply the two transpalindrome numbers 24 and 42 by 3x37=111

24= 4x6 → 24x3x37=4x18x37=4x666 corresponds to $\zeta = 2664$

42=7x6 → 42x3x37=7x18x37=7x666 corresponds to $\xi = 4662$

while ζ *and* ξ are related to the code see later code of the equation..

2-5 Transformation of M to M':

Through the diagonals of M and M', let's denote by $I = [1,9]$ and $I' = [11,99]$ two closet sets of integers, we notice that the number 10 is missing to complete M_{99}. Or 10 is the mirror image of the number 1. In this transformation the diagonal $\Delta' = \{1, 5, 9\}$ of M and the diagonal $\Delta'' = \{11, 55, 99\}$ of M' are multiple of 5, 9 and 11.

2-6 Origin of the Gravity / Flow of 5, 9 and 11 in M_{99}={1, 2, 3 … , 99}:

55 is the mean value or the symmetric center of Δ_{ii}. The mean value of $\boldsymbol{M_{99}}$**={1, 2, 3 … , 99}** excluding the diagonal is $\frac{99}{2}$. To connect the matrix M to M', we need to complete the matrix M by adding 10 which is the super-partner of 1 to the diagonal through 11. To cover the new elements we need a square 4x4 matrix with number 11 on the diagonal: Since $11 = 10 + 1 = 9 + 2 = 8 + 3 = 7 + 4 = 6 + 5$ then $\boldsymbol{M_{4\times4}} = \begin{pmatrix} \mathbf{11} & \mathbf{1} & \mathbf{2} & \mathbf{3} \\ \mathbf{10} & ! & \mathbf{4} & \mathbf{5} \\ \mathbf{9} & \mathbf{7} & ! & ! \\ \mathbf{8} & \mathbf{6} & ! & ! \end{pmatrix}$

There are five empty positions in this matrix $\boldsymbol{M_{4\times4}}$, to have a continuity of the elements of M_{99}={1,2,3,..99}, the

numbers must oscillate back and forth automatically in harmonic motion.
Two major flows of 11 and 9 fill those gaps automatically under its connection with the flow 5 related to the flows 7 and 2. Flow 5, 7 and 2 are kind of transformers or generators.

$$\boldsymbol{F_9 \leftrightarrows F_5 \leftrightarrows F_2 \leftrightarrows F_7 \leftrightarrows F_{11}}$$

2-7 Dynamics of the Flows / Flow $\boldsymbol{F_5}$: This combination of backward and forward flows result in the oscillations of the following pairs $(1,4),(1,6),(2,7),(3,8),(9,4)$ and $(2,3)$ which oscillate respectively the circles: $C_{13}, C_{17}, C_{37}, C_{73}, C_{97}, C_{53}$ and it is just a consequence of the dynamical of the system through the field $\mathbb{Z}_5$
$\boldsymbol{F_9 \leftrightarrows F_5 \leftrightarrows F_2 \leftrightarrows F_7 \leftrightarrows F_{11}}$ →see circuit quantum path of the system
Harmonic Motion: the system is reversible

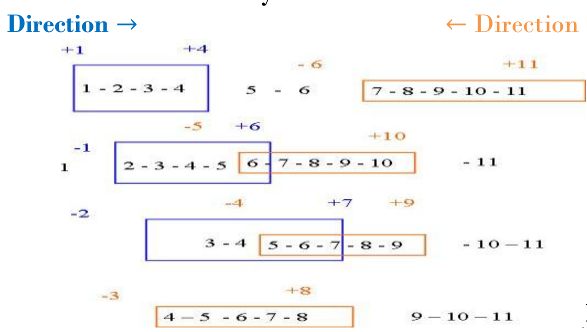
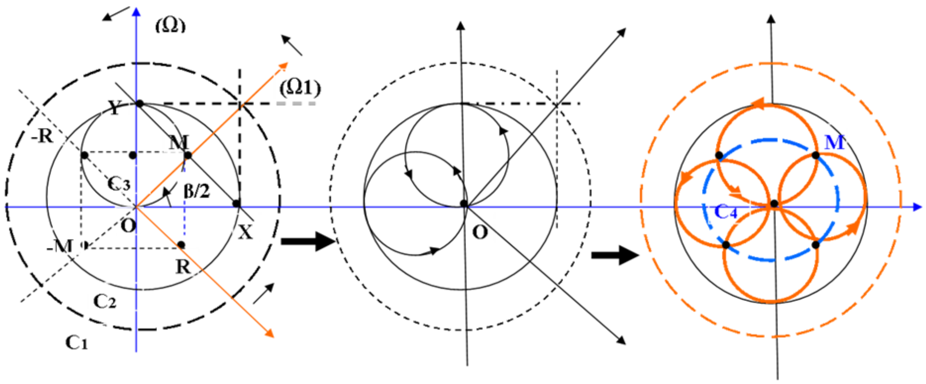


Fig.3)

3-Geometrical Representation of Spinors related to the Mean Value and Radius (Fig.4):
Spinors Definition:
Spinors are mathematical entities that can be defined as geometrical objects to expand the notion of the vector space under rotation, the notion of spinors have more advantage in the super-symmetry theory in contrast to tensors which are used in the symmetry theory.
Defined by: $\rightarrow \beta + \alpha$ $with$ $S(\beta + \alpha) = MS(\alpha)$, where the operator M is the matrix that transforms the angular momentum under the rotation: $M = \begin{pmatrix} cos\frac{\beta}{2} & -sin\frac{\beta}{2} \\ sin\frac{\beta}{2} & cos\frac{\beta}{2} \end{pmatrix} \rightarrow S(\alpha + 2\pi) = -S(\alpha)$

Let's denote by $r{:}\begin{pmatrix} X \\ Y \end{pmatrix}$ $with$ $X^2 + Y^2 = r^2$. The orbital of X and Y relatively to their radius and mean value is defined by: $M = \frac{X+Y}{2}$ and $R = \frac{X-Y}{2} \rightarrow X = M + R$ and $Y = M - R$ and by $r'{:}\begin{pmatrix} M \\ R \end{pmatrix}$ $with$ $(M^2 + R^2) = r'^2$
Then since $X^2 + Y^2 = 2(M^2 + R^2) \rightarrow r' = \frac{r}{\sqrt{2}}$
When X moves toward the fixed position Y, Y moves then toward the fixed position of (-X) and the point M moves toward Y then to O. While (-R) moves toward (-X) then O, describing the small second circle $C3$. M replaces then the position of (-R). Transformation consists of computing $cos\frac{\beta}{2}$ and $sin\frac{\beta}{2}$, with OMY and OXM (isosceles triangles). But now if you consider the rotation of the two orthonormal reperes Ω1 and Ω then M is always on the circle C4. M and R are integers when: $X \pm Y \equiv 0[2]$ that when X and Y have the same parity, which will lead us in the future to introduce the bosonic and firmionic fields with the notion of commutation in the $\mathbb{Z}_2$ Algebra. Eventually the period is reached when X describes 2 full circles or 720^0. We have then the 4 following transformations: $\begin{pmatrix} M \\ R \end{pmatrix} \rightarrow \begin{pmatrix} M \\ -R \end{pmatrix}, \begin{pmatrix} -R \\ -M \end{pmatrix}, \begin{pmatrix} -M \\ R \end{pmatrix}, \begin{pmatrix} R \\ M \end{pmatrix}$. For reason of symmetry, let's denote then by: σ_1 and σ_2 the 2 matrices of transformation of $\begin{pmatrix} M \\ R \end{pmatrix}$.
Since $\begin{pmatrix} -R \\ -M \end{pmatrix} = -\begin{pmatrix} R \\ M \end{pmatrix}$; $\begin{pmatrix} M \\ -R \end{pmatrix} = -\begin{pmatrix} -M \\ R \end{pmatrix}$; $\begin{pmatrix} M \\ -R \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}\begin{pmatrix} M \\ R \end{pmatrix} = \sigma_2\begin{pmatrix} M \\ R \end{pmatrix}$ and $\begin{pmatrix} R \\ M \end{pmatrix} = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}\begin{pmatrix} M \\ R \end{pmatrix} = \sigma_1\begin{pmatrix} M \\ R \end{pmatrix}$.
We recognize here the Pauli matrices: $\sigma_1 = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$ and $\sigma_2 = \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$ And the relation: Pauli / Hadamard: $H = \frac{1}{\sqrt{2}}\begin{pmatrix} 1 & 1 \\ 1 & -1 \end{pmatrix} = \frac{1}{\sqrt{2}}(\sigma_1 + \sigma_2)$ $where$ $HH^* = I$ unitair with row vectors orthogonal
The Hadamard's matrix is a well known transformation used in wide applications such as quantum circuits, transmission, signal processing systems and error correcting codes. With polynomial characteristic:
$x^2 - Tr(H)x + detH = x^2 - 2 = 0$ with values $x = \pm\sqrt{2}$ relative to a square lattice $\mathbb{Z} \pm i\mathbb{Z}$



(Fig.4)

3-1 Hadamard Iterative and Recursive Matrix H:

Let's denote by M_n, R_n an iterative sequence of mean value respectively radius of M and R,

Where $\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 1 & 1 \\ 1 & -1 \end{pmatrix}\begin{pmatrix} M \\ R \end{pmatrix}$ and $\begin{pmatrix} M \\ R \end{pmatrix} = \begin{pmatrix} 1 & 1 \\ 1 & -1 \end{pmatrix}\begin{pmatrix} M_1 \\ R_1 \end{pmatrix}$ with $H = \frac{1}{\sqrt{2}}\begin{pmatrix} 1 & 1 \\ 1 & -1 \end{pmatrix}$

Then: $\begin{pmatrix} M \\ R \end{pmatrix} = \begin{pmatrix} 1 & 1 \\ 1 & -1 \end{pmatrix}^2 \begin{pmatrix} M_2 \\ R_2 \end{pmatrix} = 2I\begin{pmatrix} M_2 \\ R_2 \end{pmatrix} = 2\begin{pmatrix} 1 & 1 \\ 1 & -1 \end{pmatrix}\begin{pmatrix} M_3 \\ R_3 \end{pmatrix} = 2^2\begin{pmatrix} M_4 \\ R_4 \end{pmatrix}$

Thus if $n = 2p \rightarrow \begin{pmatrix} M \\ R \end{pmatrix} = 2^p\begin{pmatrix} M_{2p} \\ R_{2p} \end{pmatrix}$ and if $n = 2p+1 \rightarrow \begin{pmatrix} M \\ R \end{pmatrix} = 2^p\sqrt{2}\, H\begin{pmatrix} M_{2p+1} \\ R_{2p+1} \end{pmatrix} = 2^p\,(\sigma_1 + \sigma_2)\begin{pmatrix} M_{2p+1} \\ R_{2p+1} \end{pmatrix}$

We have then: $\sigma_1\begin{pmatrix} X \\ Y \end{pmatrix} = \begin{pmatrix} Y \\ X \end{pmatrix}$ transforms $XY \rightarrow YX$ and $\sigma_2\begin{pmatrix} X \\ Y \end{pmatrix} = \begin{pmatrix} X \\ -Y \end{pmatrix}$ transforms $XY \rightarrow X(-Y)$

We need now to evaluate the relation between 2^n and the transformation XY/YX.

3-2 Structure of the Transpalindrome Numbers and their Flow:

Consider now the bracket functions defined by: $[g(x,y)]_- = xy - yx = 2R$ and $[g(x,y)]_+ = xy + yx = 2M$, where R and M is respectively radius and mean value of xy, yx and also the spinor's components.

With $[g(x,y)]_{/\pm} = xy \pm yx$ and $M^2 + R^2 = r'^2 = \frac{1}{2}((xy)^2 + (yx)^2) = \frac{1}{2}(r)^2 \rightarrow \begin{pmatrix} xy \\ yx \end{pmatrix} = \begin{pmatrix} 1 & 1 \\ 1 & -1 \end{pmatrix}\begin{pmatrix} M \\ R \end{pmatrix} = \sqrt{2}\mathrm{H}\begin{pmatrix} M \\ R \end{pmatrix}$

Note for $(xy, yx) = (1, i) \rightarrow \begin{pmatrix} xy \\ yx \end{pmatrix} = \begin{pmatrix} 1 & 1 \\ 1 & -1 \end{pmatrix}\begin{pmatrix} M \\ R \end{pmatrix} \rightarrow (M,R) = \frac{(1\pm i)}{2} \rightarrow \frac{\varphi}{2} = \frac{\pi}{4}$

Introducing the concept of modular representation over ring and field, integrated with the Lie Bracket embedded with Clifford Algebra giving by $[g(x,y)]_{/\pm} = [xy]_{/\pm}$ in the following ring and fields:

$\mathbb{Z}/_{9\mathbb{Z}} = \mathbb{Z}/_{3^2\mathbb{Z}}$, $\mathbb{Z}/_{11\mathbb{Z}}$ $\mathbb{Z}/_{7\mathbb{Z}}, \mathbb{Z}/_{5\mathbb{Z}}$ and $\mathbb{Z}/_{2\mathbb{Z}}$

- In the field $\mathbb{Z}/_{11\mathbb{Z}}$ and ring $\mathbb{Z}/_{9\mathbb{Z}}$:

Since $xy - yx = (y + 10x) - (x + 10y) = 9(x - y)$
$\equiv 0[9] \rightarrow xy$ and yx commute in ring $\mathbb{Z}/_{9\mathbb{Z}}$

And $xy + yx = (y + 10x) + (x + 10y) = 11(x + y)$
$\equiv 0[11] \rightarrow xy$ and yx anti-commute in the Field $\mathbb{Z}/_{11\mathbb{Z}}$

- In the field $\mathbb{Z}/_{2\mathbb{Z}}$:

Then the notion of the $\mathbb{Z}_2$-graded Algebra for the commutator implies:

$$[xy]_{gr} = xy \pm yx \rightarrow [xy]_{gr}\colon \begin{cases} xy = yx \ \ commute\ when\ x\ and\ y\ same\ parity \\ xy = -yx\ anticommute\ when\ x\ and\ y\ different\ parity \end{cases}$$
$$[xy]_- \equiv y - x[2]$$

Are orthogonal and obey Hadamard's transformation. $[xy]_+ \equiv x + y[2]$ Commute if (x: even and y: even)or (x:odd and y:odd), which means the super-commutator obeys the Super Jacobi identity.

- In the field $\mathbb{Z}/_{7\mathbb{Z}}$:

$[xy]_- \equiv 2(x - y)[7]$ and $[xy]_+ = 11(x + y) \equiv 4(x + y)[7]$

xy, yx **commute in those fields if $x = y$ and anti-commute if $x = -y$**

- In the field $\mathbb{Z}/_{5\mathbb{Z}}$:

$[xy]_- \equiv y - x[5]$ and $[xy]_+ \equiv x + y[5]$ are orthogonal and obey Hadamard's transformation.

Have as solution in the field $\mathbb{Z}/_{5\mathbb{Z}}$ the pairs: (1,4), (1,6), (2,7), (3,8),(9,4) and (2,3) in which oscillate respectively the circles: $C_{13}, C_{17}, C_{37}, C_{73}, C_{97}, C_{53}$ by the relation $\forall\,(x,y), x^2 + y^2 = (x + iy)(x - iy) = r^2 \rightarrow C_{r^2}$ with r^2 a prime that split relatively to $\mathbb{Z}[i]$. Those circles have important property since the primes 13, 17, 37 and 79 are the only primes in the set $M_n = \{1,2,3, \ldots \ldots, 99\}$ with super-partner " inverse image" a prime.

Interpretation Physic: $P_r/P_{r'}$ (Prime / Prime image) generates the gravity G, while when the magnetic dipole is neutral (absence of charges) the gravity is very important. The universe is closed and interchanges matter through the axis through the black-holes induced by gravity. Where the axis represents the backbone chain that bonds and holds the multi-verse represented by " Dark matter ". (See **9-6 Dark Matter** properties).

3-3 Quadratic Equation:

Let's denote such equation by $F(X,Y) = X^2 + Y^2 = r^2$

Since our elements are integers, then r^2 corresponds to either 1, a composite or a prime!

In case of a prime: $F(X,Y) = X^2 + Y^2 = (X+iY)(X-iY) = r^2$ known by Gaussian integers, elements of $\mathbb{Z}[i]$, that describes the splitting of primes in Galois Extension.

When $r^2 \equiv 1[4]$ then it splits into two different factors and when $r^2 \equiv -1[4]$ it remains inert (Gaussian prime number). In case r^2 equals to 1 then we have the circle unity.

Flows of $\mathbb{Z}/_{11\mathbb{Z}}$, $\mathbb{Z}/_{9\mathbb{Z}}$, $\mathbb{Z}/_{7\mathbb{Z}}$, $\mathbb{Z}/_{5\mathbb{Z}}$, $\mathbb{Z}/_{2\mathbb{Z}}$ related to Gravity:

We should resolve the **quadratic equation** relatively to **Gravity G** represented by **G=37:**

$$\forall\, x, y\;\; xy \pm yx \equiv x \pm y[p]\; with\;\; p = 2, 5, 7, 9, 11\;\; then\; the\; quadratic\;\; x^2 + y^2 \equiv 0(37).$$

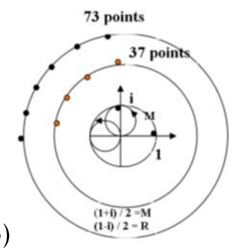
Resolution:

$\boldsymbol{x^2 + y^2 \equiv 0(37)}$ **has as solution** $\boldsymbol{x^2 + y^2 = 0,\; 37\; 0r\; 74}$

- **Case:** $\boldsymbol{x^2 + y^2 = 0}$. With $\boldsymbol{y^2} = 1 \to (x,y) = (\pm i, \pm 1)$ or $i^n =< i >= \{i, -1, -i, 1\}$

With period equals to 4. Known by U(1), the circle group unity, the multiplicative group of all complex numbers with absolute value 1, used to represent bosonic symmetries.

In the complex set / $z = x + iy$ *the module* $\left|\frac{x}{r}\right|^2 + \left|\frac{y}{r}\right|^2 = 1$ *and the points* $\pm\frac{x}{r}$ and $\pm\frac{y}{r}$ are the 4 points that intercepts the lines $x = \pm y$ and the circle unity. From $\frac{1}{r^2}(x^2 + y^2) = 1 \to we$ recognize here the inverse square law of physics related to intensity, force, quantity and potential which is proportional to the inverse square of the distance in such phenomenal physics from sound, radiation, magnetism, electric and also in the Newton's force of gravity.



(Fig.5)

The spin of a discrete number has the same properties as the spin of a particle, related to the quadratic equation $\boldsymbol{X^2 + Y^2 = r^2}$: the expected value in probability theory coincide with the notion of the mean value for discrete numbers. These formulations are considered to be useful to determine Time's properties, gravity's phenomena and quantum circuit path.

3-4 Timer or Counter:

This property of circle unity shows the vector unit, spans through a square lattice with a total span equals to $4 \times 18 = 72$ and each span is equal to $\frac{1}{2}$ then $4 \times \frac{1}{2} = 2$ which characterizes the span of the graviton with a total of $4 \times \frac{1}{2} \times 72 = 144$. The continuity of its span, results in a state without equilibrium which proves the continuity of the particle's vibration, due to the orbital periodic of the graviton, by Bertrand's theorem, the force, $F(r) = -k/r^2$ is the only possible central force field with stable closed orbits. The graviton is the counter for the atomic clock: When the circle 73 moves from one of its point to another, the circle 37 moves with one turn, when the circle 73 maps all the 73 points (there is 72 equidistant paths), then the circle 37 made $37 \times 72\; turns = 2664$. While the circle unity spins $4 \times 36 = 72$ (that when the circle 37 maps the 37 points, with 36 equidistant paths), i describes 18 circles which represent the 18 primes and for each prime it describes 4 turns relatively to the square lattice then its period orbital total equals to 72.

Note: total number of primes excluding 2,3,5,7,11,13,17 is equal to 18 primes left in $M_{99} = \{1,2,3, \dots .99\}$

While $144 = 60 + 60 + 24 = 2^6 + 2^6 + 2^4$ related to time and energy level "See distribution of primes and code "

Conclusion: the graviton is the counter of Time. The graviton is related to the circle unity U(1) phase of transformation which is the counter that describes the orbital period of the multi-verse.

The gravity results from the space/time curvature, while (1,6) are elements that create the gravity, we notice 1 is related to time and 6 is related to space (See **10-1 Dynamical System of the Multi-verse**).

Case: $x^2 + y^2 = 37$ while 1, 6 are radius respectively mean value of (5, 7).
Indeed $\binom{7}{5} = \begin{pmatrix} 1 & 1 \\ 1 & -1 \end{pmatrix}\binom{6}{1} = \sqrt{2}\mathrm{H}\binom{6}{1}$ with $\mathrm{H}=\frac{1}{\sqrt{2}}\begin{pmatrix} 1 & 1 \\ 1 & -1 \end{pmatrix}$ Hadamard Matrix.
Then $(x, y) = (6, 1) \to 6 + 1 \equiv 0[7\ ]$, in $\mathbb{Z}/_{7\mathbb{Z}}$ and $6 - 1 \equiv 0[5]$ in $\mathbb{Z}/_{5\mathbb{Z}}$

- Case: $x^2 + y^2 = 74$ **its solution is related to** $\mathbb{Z}/_{2\mathbb{Z}}$ since $7 \pm 5 \equiv 0[2]$.

Note 74 represents the wormhole, once you pass 73 then you are no more in the event horizon
$(1,6) \to (10,60)$ Super-partner or $1^2 + 6^2 = 37$ represents the gravity, while $10^2 + 60^2 = 100 \times 37$ and
$2664 + 4662 + 74 = 2\ (10^2 + 60^2) = 2 \times 100 \times 37 \equiv 74[666]$.
Conclusion: Image of a black hole is the wormhole.

The notion of congruence modulo p is a very important concept that describes the flows of particles related to the gravity $G = 37$. To filter my system, I have to stick with gravity properties since it is the generator and the connector of the universe through dark matter.

4-Quantum Circuit: Let's denote the flows of the ring $\mathbb{Z}/_{9\mathbb{Z}}$ and fields $\mathbb{Z}/_{11\mathbb{Z}}$, $\mathbb{Z}/_{7\mathbb{Z}}, \mathbb{Z}/_{5\mathbb{Z}}, \mathbb{Z}/_{2\mathbb{Z}}$
by $F_{11}, F_9, F_7, F_5, F_2$, which are kind of transformers or generators or just logical gates.

Since $xy + yx \equiv 0[p]$ corresponds to $p = 11, 7, and\ 2 \leftarrow$ Fermions (anti-commute)
And $xy - yx \equiv 0[p]$ corresponds to $p = 9, 5, and\ 2 \leftarrow$ Bosons (commute)
We have then the following diagram of the flows for the system: $F_9 \leftrightarrows F_5 \leftrightarrows F_2 \leftrightarrows F_7 \leftrightarrows F_{11}$

It follows that the resulting block gates for input and output are equal

$$11 - 7 = 9 - 5\ .$$

In quantum circuits, Hadamard gates are represented by:

$$x \mid 0 > +y \mid 1 > \to x\frac{\mid 0 > + \mid 1 >}{\sqrt{2}} + y\frac{\mid 0 > - \mid 1 >}{\sqrt{2}}$$

The transformation $F_9 \leftrightarrows F_5 \leftrightarrows F_2 \leftrightarrows F_7 \leftrightarrows F_{11}$ is reversible with harmonic motion, due to the orbital periodic of the particles. Since it is a flow of particles we can then introduce the notion of quantum circuit in which a computation is a sequence of quantum gates with a reversible transformation, that imply the inverse quantum Fourier transform. If we consider the qubits of the **input** equal to $n = 9 - 5 = 4$ and for the **output** the qubits equal to $m = 11 - 7 = 4$ and the qubits for the logical gates K = 2 in the middle, then the resulting circuit operates with: $n + m - k = 4 + 4 - 2 = 6$ **qubits with block length** $n = 2^r = 2^6$, and a **message length equals to:** $r = 6$, with a minimum distance that correspond to $d = 2^5$. This linear code over a binary alphabet $[n, r, d]_2$ is a subspace of dim 6 of length 64 generated through the reversible transformation of fields
$F_{3^2} \leftrightarrows F_5 \leftrightarrows F_2 \leftrightarrows F_7 \leftrightarrows F_{11}$. For a 6 qubits reversible gates data in the space $\{0,1\}^6$ which consists of $2^6 = 64$ strings of 0 and 1, the input and output each consists of $2^4 = 16$. This transformation results from a transmission of 16 strings into 64 strings . The architecture of the universe is based on a quantum circuit path reversible consisting of a transmission of 16 strings into 64 strings for the automata language, those strings are represented by vertices and edges in graph theory. See (Fig.6)
This transformation is a consequence of the Hadamard's matrix order since: $H_1 = 1$

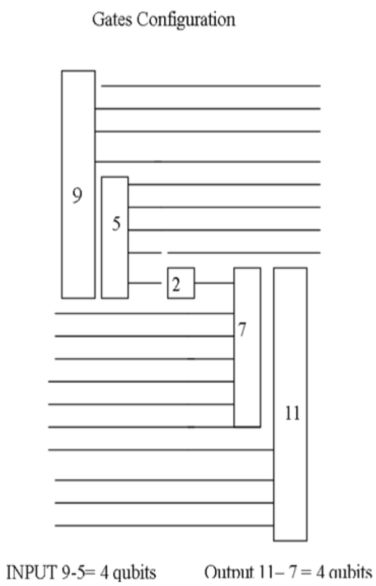
$$H_2 = \begin{pmatrix} 1 & 1 \\ 1 & -1 \end{pmatrix} \quad H_4 = \begin{pmatrix} H_2 & H_2 \\ H_2 & -H_2 \end{pmatrix} = \begin{pmatrix} 1 & 1 & 1 & 1 \\ 1 & -1 & 1 & -1 \\ 1 & 1 & -1 & -1 \\ 1 & -1 & -1 & 1 \end{pmatrix} \text{with 16 elements and } H_8 = \begin{pmatrix} H_4 & H_4 \\ H_4 & -H_4 \end{pmatrix} \text{ with 64 elements.}$$

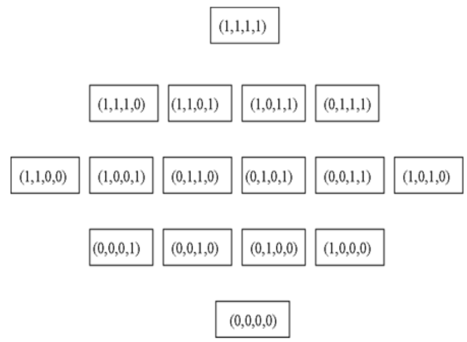
Numerically this transformation describes the path of the composite and the prime numbers relatively to their super-partners "Mirror image"! (See Knot Theory below) Since in the set $M_n = \{1,2, \dots 99\}$ the total number of:
- P_r/C_{om} (primes/composites) = 16/16 ; - $C_{om}/C_{om'}$ (composites /composites) = 24 /24.

Then for each reversible path we have: $16 + 24 + 24 = 64$ in total. While inside the system the:
- $P_r/P_{r'}$ (primes/primes) generates the gravity, the particles will commute or anti-commute to form the axis: $\Delta_{ii} = \{11, 22, \dots 99\}$ (Kernel).

4-1 Gates / Wormholes:

This map is connected to Pascal's Triangle by: $T_{n-1} = \frac{n(n-1)}{2}$ number of gates (Hadamard and controlled phase gates), though for $n = 6$ it corresponds to $T_5 = 15$ gates (total of **wormholes** in the multi-verse) This property coincide exactly with the total of 15 composites orbiting around the 7 primes coordinates of the point $M(2,3,5,7,11,13,17)$ of the sphere S_{666} (**10-1 Dynamical System of the Multi-verse**).
Conclusion: The architecture of the universe is based from a quantum data information circuit with the resulting path of 6 qubits for the automate language. The universe is generated from a super-computer: That codes, decodes and corrects code errors through the Hadamard operator. Do we live in a real simulated life?





(Fig.6) (4th line in Pascal's triangle 1+4+6+4+1=2^4)

4-2 Quantum Harmonic Oscillations:

The Schrödinger Equation for quantum Harmonic Oscillations is $a\ \Psi_n$ wave function related to Pascal's Triangle: since Ψ_n is connected to Hermite Polynomials $\boldsymbol{H_n}$by the relation:

$\boldsymbol{\Psi_n(x) = K_n . H_n(\beta x)}$. Where $\boldsymbol{K_n} = \sqrt{\frac{1}{2^n \times n!}} . ((\boldsymbol{m.\omega})/(\boldsymbol{\pi}.\hbar))^{\frac{1}{4}} . \boldsymbol{e}^{\frac{-m.\omega x^2}{2\hbar}}$ **and** $\boldsymbol{\beta} = \sqrt{\frac{\boldsymbol{m.\omega}}{\hbar}}$

$\boldsymbol{H_0}$	1							
$\boldsymbol{H_1}$		$2x$						
$\boldsymbol{H_2}$	$-2^1 \times 1$		$+2^2x^2$					
$\boldsymbol{H_3}$		$-2^2 \times 3x$		$+2^3x^3$				
$\boldsymbol{H_4}$	$2^2 \times 3$		$-2^3 \times 6x^2$		$+2^4x^4$			
$\boldsymbol{H_5}$		$2^3.15x$		$-2^4 \times 10x^3$		$+2^5x^5$		
$\boldsymbol{H_6}$	$-2^3 \times 15$		$+2^4.45x^2$		$-2^5 \times 15x^4$		$+2^6x^6$	

We notice that the coefficients of the Hermite polynomial H_n are related to $\boldsymbol{E_n} = 2^n$ and $\boldsymbol{T_n} = \frac{\boldsymbol{n(n+1)}}{\boldsymbol{2}}$

Although we know from Pascal's triangle the power 2^n is giving from the binomial theorem, since:

$2^n = (1+1)^n = \sum_{k=0}^{n} \binom{n}{k} 1^k 1^{n-k} = \sum_{k=0}^{n} \binom{n}{k}$, and by giving a discrete number p, we have: $(p + (1-p)) = 1$

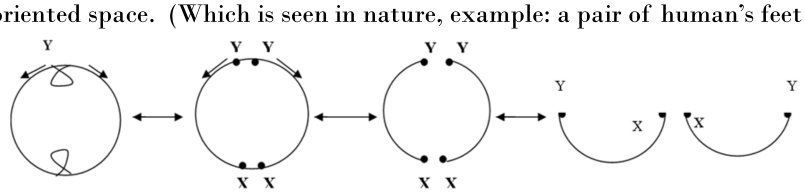
with $P(n,k) = \frac{\binom{n}{k}}{2^n}$, then: $((p + (1-p))^n = \sum_{k=0}^{n} \binom{n}{k} p^k (1-p)^{n-k} = \sum_{k=0}^{n} \mathrm{P(n,k)} = 1 = \sum \mathrm{P_r}\,(\mathrm{X})$

Related to a discrete probability distribution of a random variable X, characterized by a probability mass function, also known by the normalization condition for a wave function $\Psi(n,k)$.

Where$|\Psi(n,k)|^2 = \mathrm{P(n,k)}$ and $\Psi(n,k) = \sqrt{\mathrm{P(n,k)}} e^{i\alpha(n,k)} = \frac{\binom{n}{k}^{\frac{1}{2}}}{2^{\frac{n}{2}}} e^{i\alpha(n,k)}$

5- Strings with the Concept of Parity or Chiral Symmetry and Spiral of Fibonacci :

Giving two elements X and Y orbiting with an oscillation harmonic describing the following algorithm YXXY, XYYX, related to the quadratic equation $X^2 + Y^2 = F(X,Y)$ with the asymmetry property, defined in an oriented space. (Which is seen in nature, example: a pair of human's feet or hands)



(Fig.7)

We recognize this finite sequence as a string concatenation of alphabets X, Y with length 4.

For this regular language or expression, let's define the product by composing letters of the string: Our string

then has the form of: $XYYX$ ... The alphabets orbit with an oscillation harmonic following the regular language $E_1 \cup E_2$ which is a combination of the two disjoints regular expressions $E_1$and E_2, with a monoid structure, where the union is represented by +, the concatenation by the product and by using the Kleene's Star closure operation for this algorithm of strings, where z^*defined by $z^* = 1 + z + z^2 + z^3 \dots\dots + z^n = \sum_0^\infty z^n = (1-z)^{-1}$ over a disc unity [3]. Then we have the equation $z^* = 1 + z.z^*$ (I).
Where its fixed point is solution of the Alexander polynomial which is a Trefoil Knot.
Or $(X/YY)^*$ corresponds $(z/z^2)^*$ that yield to $(z+z^2)^*$ and by replacing z by $F = z + z^2$ *in the equation* (I)
$F^* = 1 + F.F^* = 1 + (z+z^2)F^*$ Yields to: $F^* = (1-(z+z^2))^{-1}$ *or* $\frac{1}{1-(z+z^2)} = 1 + (z+z^2) + (z+z^2)^2 \dots = \sum_0^\infty f_n z^n$
By the method of comparing the coefficients of z^n.
$\frac{1}{1-(z+z^2)} = \sum_{i=0}^\infty c_n z^n$ Maclaurin series with undetermined coefficients c_n
The generating function for f_n (Fibonacci sequence): $F^* = f(z) = \frac{1}{1-(z+z^2)} = \sum_0^\infty f_n z^n \to f_n = c_n$
The convergence radius of this series then is equal to: $R = lim_{n\to\infty}\left|\frac{C_n}{C_{n+1}}\right| = \varphi = \frac{1+\sqrt{5}}{2}$ Golden Ratio

5-1 String Concatenation:

Let's denote by $S = \{X, Y\}$ and by $F_1 = X$, $F_2 = Y$ and $F_3 = Z$ with $F_n = F_{n-1}F_{n-2}$
And by $f_1 = 1$, $f_2 = 1$ and $f_n = f_{n-1} + f_{n-2}$ we have then:

		f_n
F_1	X	1
F_2	Y	1
F_3	$F_2F_1 = Z = YX$	2
F_4	$F_3F_2 = YXY$	3
F_5	$F_4F_3 = YXYZ = YXYYX$	5
F_6	$F_5F_4 = YXYYXYXY$	8

Note: $F_6 = YXYYXYXY$ *since* $Z = YX$ then $F_6 = ZYZZY \to z/z^2$

5-2 Equation of this dynamical system:

$f_1 = 1$, $f_2 = 1$ and $f_n = f_{n-1} + f_{n-2}$ Fibonacci sequence.
Let's denote $x_n = \begin{pmatrix} f_{n-1} \\ f_n \end{pmatrix}$ →and $J = \begin{pmatrix} 0 & 1 \\ 1 & 1 \end{pmatrix}$ then $x_{n+1} = Jx_n$ (operator J) → $x_n = J^n x_1$
The characteristic Equation: $det\begin{pmatrix} -\tau & 1 \\ 1 & 1-\tau \end{pmatrix} = det\begin{pmatrix} a(\tau) & b(\tau) \\ c(\tau) & d(\tau) \end{pmatrix} = 0 \to \tau^2 - \tau - 1 = 0$
Note $F = \left\{c(\tau), a(\tau), \frac{b(\tau)}{a(\tau)}, d(\tau), \frac{b(\tau)}{d(\tau)}, \frac{a(\tau)}{d(\tau)}, \frac{d(\tau)}{a(\tau)}\right\} = \left\{1, -\tau, \frac{1}{-\tau}, 1-\tau, \frac{1}{1-\tau}, \frac{-\tau}{1-\tau}, \frac{1-\tau}{-\tau}\right\}$ with matrix respectively:
$\begin{pmatrix} 0 & 1 \\ 0 & 1 \end{pmatrix}, \begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}, \begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}, \begin{pmatrix} -1 & 1 \\ 0 & 1 \end{pmatrix}, \begin{pmatrix} 0 & 1 \\ -1 & 1 \end{pmatrix}, \begin{pmatrix} -1 & 0 \\ -1 & 1 \end{pmatrix}, \begin{pmatrix} -1 & 1 \\ -1 & 0 \end{pmatrix}$
Thus only: $\frac{b(\tau)}{a(\tau)} = \frac{1}{-\tau}$; $\frac{b(\tau)}{d(\tau)} = \frac{1}{1-\tau}$ inverse of $\frac{d(\tau)}{a(\tau)} = \frac{1-\tau}{-\tau}$are modular since its determinants equal to 1.
Eigen-values then are: $\tau_{1,2} = \frac{1}{2}(1 \pm \sqrt{5})$ and Eigenvectors $V_{1,2} = \begin{pmatrix} 1 \\ \tau_{1,2} \end{pmatrix}$
If $x_1 = \alpha V_1 + \beta V_2$, with the initial data: $\alpha = -\beta = \frac{1}{\tau_1 - \tau_2} = \frac{1}{\sqrt{5}}$ Then $\alpha{\tau_1}^n V_1 + \beta {\tau_2}^n V_2 = x_n$

$\to \boldsymbol{x_n = \frac{1}{\sqrt{5}}({\tau_1}^n - {\tau_2}^n) = \frac{1}{2^n\sqrt{5}}\left((1+\sqrt{5})^n - (1-\sqrt{5})^n\right)}$ **Solution of** $y'' - y' - 1 = 0$

Let's denote by $M = \frac{1+\sqrt{5}}{2}$ and $R = \frac{1-\sqrt{5}}{2}$ then $f_n = \frac{1}{M-R}((M)^n - (R)^n)$, we retrieve then the Hadamard Transformation by:→ $\begin{pmatrix} M \\ R \end{pmatrix} = \frac{1}{2}\begin{pmatrix} 1 & 1 \\ 1 & -1 \end{pmatrix}\begin{pmatrix} x \\ y \end{pmatrix} = \frac{1}{\sqrt{2}} H \begin{pmatrix} x \\ y \end{pmatrix}$ with $(x, y) = (1, \sqrt{5})$, that generates $\mathbb{Z}[1+\sqrt{5}]$
Note the equation $\tau^2 - \tau - 1 = 0$ has solution in $\mathbb{Z} \backslash_{p\mathbb{Z}}$ with p prime, only if: $\Delta = 5$ is a square → $p \equiv 1,4[5]$.
Then the smallest prime verify that is $p = 11$.

5-3 Generating functions related to Pascal's Triangle:

We will be studying three important generating functions for the following sequences: Expanding powers of 2, Triangular numbers and Fibonacci numbers.

- **For function generating Fibonacci numbers:**

Let' denote by: $f(z) = \frac{1}{1-(z+z^2)} = \frac{A}{1-\alpha z} - \frac{B}{1-\beta Z}$ then: $A, B = \frac{1 \pm \sqrt{5}}{2\sqrt{5}}$ and $\alpha, \beta = \frac{1 \pm \sqrt{5}}{2}$ while $\frac{A}{1-\alpha z} = A\sum_0^\infty \alpha^n z^n$
$f(z) = \frac{1}{1-(z+z^2)} = \frac{1}{\sqrt{5}}\sum_0^\infty (\left(\frac{1+\sqrt{5}}{2}\right)^n - \left(\frac{1-\sqrt{5}}{2}\right)^n) z^n = \sum_0^\infty f_n z^n$ where f_n Fibonacci sequence.

- **For function generating Triangular numbers:**

Let's denote by $u_n = 1 + 2 \ldots + n$ *and* $f(z) = \sum_0^\infty u_n z^n$the generating function of u_n. Then $u_n = u_{n-1} + n$ imply:
$\sum_0^\infty u_n z^{n-1} = \sum_0^\infty u_{n-1} z^{n-1} + \sum_0^\infty n z^{n-1}$Lead to: $\frac{f(z)}{z} = f(z) + \sum_0^\infty (z^n)' = f(z) + \left(\frac{1}{1-z}\right)' = f(z) + \frac{1}{(1-z)^2}$
Then: $f(z) = \frac{z}{(1-z)^3} = \sum_0^\infty u_n z^n$

- **For function generating $v_n = 2^n$:**

The generating function of v_n corresponds simply to: $\frac{1}{1-2z} = \sum_0^\infty 2^n z^n$
Those generating functions show an interesting relation relatively to the function $f(z) = \frac{1}{1-z}$.
Or for $z = i$, $f(i) = \frac{1}{1-i} = \frac{1+i}{2}$ and its conjugate is $\overline{f(\iota)} = \frac{1-i}{2} = f(-i)$ Mean and Radius of $(1, i)$ related to $U(1)$.
By using Hadamard matrix H: $\begin{pmatrix} \boldsymbol{f(i)} \\ \boldsymbol{f(-i)} \end{pmatrix} = \frac{1}{2}\begin{pmatrix} 1 & 1 \\ 1 & -1 \end{pmatrix}\begin{pmatrix} 1 \\ i \end{pmatrix} = \frac{1}{\sqrt{2}} H \begin{pmatrix} 1 \\ i \end{pmatrix}$ (Related to square lattice $\mathbb{Z} + i\mathbb{Z}$)
Although the function $f(z) = \frac{1}{1-z}$ involves the mobius transformation with the property to generate inverse circles (loops and strings) and preserves angles of the form:$z \to f(z) = \frac{az+b}{cz+d}$. Where $\begin{pmatrix} a & b \\ c & d \end{pmatrix} = \begin{pmatrix} 0 & 1 \\ -1 & 1 \end{pmatrix}$.
While $det \begin{pmatrix} a & b \\ c & d \end{pmatrix} = ad - bc = 1$. Transformation that corresponds to the special linear group SL (2, $\mathbb{R}$), a simple real Lie group defined by: $SL(2, \mathbb{R}) = \left\{\begin{pmatrix} a & b \\ c & d \end{pmatrix} \setminus a, b, c, d \in \mathbb{R} \text{ and } ad - bc = 1\right\}$. [6]
This transformation also corresponds to the modular group $\Gamma$of lineaire transformations of the upper half of the complex plane: $\mathbb{H} = \{x + iy \text{ with } y > 0, \text{and } x, y \in \mathbb{R}\}$ used in the hyperbolic geometry, which is known by Poincare half plane model in non Euclidean geometry for the curved metric. The modular group is isomorphic to the projective special linear group PSL (2, $\mathbb{Z}$), while the modular group PSL (2, $\mathbb{Z}$) $\sim$ SL (2,$\mathbb{Z}$)$\sim Sp(2, \mathbb{Z})$ and $SL(2, \mathbb{Z}) = \left\{\begin{pmatrix} 0 & 1 \\ -1 & 1 \end{pmatrix} \setminus \text{with } detM = 1\right\}$ a holomorphic function.
symplectic group. Let's denote by:$\begin{cases} \pi(z) = -z \ (reflexion); \quad T(z) = z + 1 \ (translation); \quad S(z) = \frac{1}{z} \ (inverse\ map) \\ \pi o T(z) = 1 - z \,; So\pi(z) = -\frac{1}{z}; \ SoTO\ \pi(z) = \frac{1}{1-z} \end{cases}$
Then $SoTo\pi(z) = S(-z + 1) = \frac{1}{1-z} = f(z)$ and $\pi oToS(z) = -\frac{z+1}{z} = f(z)^{-1}$ while $\pi oSoTo\pi(z) = -\frac{1}{1-z}$
With the following matrices: $M_\pi = \begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$; $M_T = \begin{pmatrix} 1 & 1 \\ 0 & 1 \end{pmatrix}$; $M_S = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$ $\pi\,; To\pi\,; S$ *and* $So\pi$ are involutive while $f^3 = id$ with solutions located on a hexagonal lattice points of an even polynomial $P(z) = z^6 - 1 = 0$ then M_T cyclic if $\begin{pmatrix} 1 & 1 \\ 0 & 1 \end{pmatrix}^n = \begin{pmatrix} 1 & n \\ 0 & 1 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ if $n \equiv 0[6]$ relatively to the cyclotomic field for the splitting field of the cyclotomic polynomial P, the Galois extension of the field of rational numbers $[\mathbb{Q}(\xi_6){:}\,\mathbb{Q}]$ we have then $T^6(z) = z + 6 \equiv z[6]$ which is a translation .
Let's denote $f(z) = z' = \frac{1}{1-z} \to z' - zz' = 1 \ \to z' = zz' + 1$ Equation (I) used in algorithm of Strings.
$z + \frac{1}{z} = 1$ Equation (II) (from the fixed point) related to Alexander polynomial $\Delta(z) = z + \frac{1}{z} - 1$ [2] for the trefoil knot, we could simply study the dynamical system of this irreducible map relatively to an elliptic curve over a finite field F_p. The fixed point: $f(z) = z \to z = \frac{1}{2} \pm \frac{\sqrt{3}}{2} = e^{\pm i\frac{\pi}{3}}$ and $|z| = 1$ defines the group cyclic of order 6. Solutions of the polynomial: $g(z) = z^6 - 1 = 0$ are points of a hexagram, or each points of this hexagonal lattice have 5 roots, which yields to a total of 6 vertices ×5=30 roots, the product $\mathbb{Z}_5 \times \mathbb{Z}_6$ corresponds to the icosahydral group. The dynamical of the vertices is related then to $\mathbb{Z}_5$ and $U(1)$.
Since g is even and $g(z) = (z^3 + 1)(z^3 - 1)$ and for symmetry reason we simply study the function:
$(z^3 - 1) = (z - 1)(z^2 + z + 1)$ or $(z^3 + 1) = (z + 1)(z^2 - z + 1)$, the polynomial $(z^2 - z + 1)$ is irreducible.
The eigen-values of an element M of $SL(2, \mathbb{R})$ verify the characteristic polynomial: $\lambda^2 - tr(M)\lambda + 1 = 0$ where $|Tr(M)| = 1 < 2$, M is then a rotation, "Elliptic Curve" while λ is the fixed point, and by using the generators S and ST we have $S^2 = I$ *and* $(ST)^3 = I$. The representation of the modular group Γ of this transformation is then isomorphic to $\approx \langle S, T \text{ with } S^2 = I\,, T^2 = I \text{ and } (ST)^3 = I\rangle$, product of two cyclic groups Z_2 *and* Z_3.
While its dynamical is represented by the product: $Z_2 \times Z_3 \times Z_5$ and $U(1)$ where $Z_2, Z_3 and\ Z_5$ are centers of $SU(2), SU(3)$ *and* $SU(5)$.

5-4 Dynamical System of the Curve/ Hexagram & Fibonacci Spiral

Let's introduce a symmetrical map g with π rotation "reflexion" through Euler formulate: $e^{i\pi}$+1=0
Defined by $g(t) = -t$. Since $e^{i\pi}, e^{i\frac{\pi}{3}}, e^{i\frac{2\pi}{3}}$ are solutions of $(z^3 + 1) = (z + 1)(z^2 - z + 1) = 0$
The 3 maps are involutives: $s^2 = I$, $T^2 = I$ and $g^2 = I$ define loops Consider $h(z) = goSoT(z) = g\left(\frac{1}{1-z}\right) = -\frac{1}{1-z}$

Then $h^2(z) = -\frac{1-z}{2-z}$, $h^3(z) = -\frac{2-z}{3-2z}$ per iteration $h^n(z) = -\frac{f_n - f_{n-1}z}{f_{n+1}-f_n z}$ $with\ f_0 = 0, f_1 = f_2 = 1; f_{n+1} = f_n + f_{n-1}$

The condition h is involutive with $h^0(z) = z$ leads to: $\rightarrow h^2(z) = -\frac{1-z}{2-z} = z \rightarrow z^2 - z - 1 = 0$

Or the iteration converges toward the fixed point: $h^n(z) = -\frac{f_n - f_{n-1}z}{f_{n+1}-f_n z} = h^0(z) = z \rightarrow z^2 - z - 1 = 0$

Converges toward the Golden Ratio $\varphi = \frac{1+\sqrt{5}}{2}$.

Conclusion: The dynamical of the points of the elliptic curve describe a spiral of Fibonacci.

Note: with $g(z) = \frac{f_{n-1}z + f_n}{f_n z + f_{n+1}}$ with $M_g = \begin{pmatrix} f_{n-1} & f_n \\ f_n & f_{n+1} \end{pmatrix}$ we have $detM_g = detM_{h^n} = (-\mathbf{1})^{\boldsymbol{n}}$ from **Cassini's identity**, modular if n even. Though $n = 2p$, is related to $\mathbb{Z}_2$, and since every matrix in the modular group defines a modular knot, then the iteration define a succession of knot and unknot.

Example: $\begin{pmatrix} 1 & 1 \\ 1 & 2 \end{pmatrix}; \begin{pmatrix} 2 & 3 \\ 5 & 8 \end{pmatrix}; \ldots.. \begin{pmatrix} f_{2p} & f_{2p+1} \\ f_{2p+1} & f_{2p+2} \end{pmatrix}$ are modular knots. In his paper Etienne Ghyes did mention those modular knots and Lorentz Knots, except he did not realize that are related to Fibonacci sequence where the determinant is related to Cassini's identity "Link of Knots"[7]. The matrix $\beta_n = \begin{pmatrix} f_{n-1} & f_n \\ f_{n+1} & f_{n+2} \end{pmatrix}$ has also the same properties since$f_{n-1}f_{n+2} - f_n f_{n+1} = (-1)^n$.

The reflexion group is spherical of finite type since$\frac{1}{2} + \frac{1}{3} + \frac{1}{5} > 1$. It describes the rotational triangle group (2, 3, 5) and corresponds to the icosahedral group. This transformation defines a tessellation of the hyperbolic plane by hyperbolic triangles.

6- System's Symmetry:

We notice our system's symmetry is determined by a combination of group's symmetry:

Denoted by: U(1), $Z_2 \times Z_3$ center of $SU(2) \times SU(3)$, Z_5 is generated through $A5$ alternating group of the Hemi-icosahydron determined by the double cover of the 5-simplex through the rotational triangle group (2,3,5) seen before (see generating function). The center of SU(6) is isomorphs to the cyclic group $\mathbb{Z}/_{6\mathbb{Z}}$ which isomorphs $to\ \mathbb{Z}/_{2\mathbb{Z}} \times \mathbb{Z}/_{3\mathbb{Z}}$.

From those following important equations in our system:

- $(1, i) \rightarrow$ Correspond to the group unity U(1) that generates Time through electromagnetism.
- $1^2 + 6^2 = (6+i)(6-i) \equiv 0[37]$.

Where (1,6) are components of gravity defined by flow $5 \approx \mathbb{Z}/_{5\mathbb{Z}}$, which is determined by the components $(1, \sqrt{5}) \rightarrow 1^2 + \sqrt{5}^2 = (1+\sqrt{5})(1-\sqrt{5}) = 2 \times 3 = C_6 \equiv 0[6]$, where 2 splits and 3 stays inert.

Flow 5 generates the dynamical system of the multi-verse. The string of superposed universes with the property of entanglement" describes a spiral of Fibonacci that induces the gravity through harmonic oscillations. Note: $\mathbb{Z}\left[\frac{1+\sqrt{5}}{2}\right]$ is finitely generated Abelian (a $\mathbb{Z}$-module), since $\varphi = \frac{1+\sqrt{5}}{2}$ is an algebraic integer of degree 2 over $\mathbb{Q}$ solution of the polynomial $x^2 - x - 1$, $\mathbb{Z}[\varphi]$ is a sub-ring of the quadratic field $\mathbb{Q}(\sqrt{5})$, the unique non trivial Galois automorphism of the real quadratic field $\mathbb{Q}(\varphi) = \mathbb{Q}(\sqrt{5}) + \mathbb{Q}_\varphi$. The extension $\mathbb{Q}(\varphi)$ is a quadratic field of rational numbers that corresponds to the cyclotomic field. This ring defines also a 5 fold rotational symmetry group used in Penrose tiling relatively to the group cyclic Z_5 with angle 72°, of order 60 that corresponds to an icosahydron isomorphic to alternating group $\boldsymbol{A5}$.

Or we know: The only star numbers for the set $M_{99} = \{1,2,3,\ldots,99\}$ are: 1, 13, 37 and 73 with the form: $6n(n-1) + 1 \equiv 1[6]$, where $2^2 + 3^2 = 13$ and $1^2 + 6^2 = 37$ we have also: $3^2 + (2^3)^2 = 73$ and $1^2 + \sqrt{5}^2 = 6$

Equation related to: $U(1), Z_2, Z_3\ and\ Z_5$.

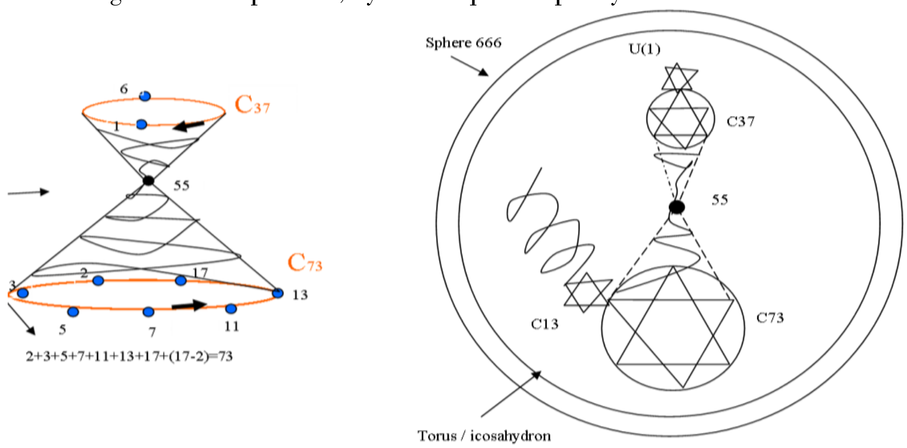
Those four connected 5-simplex polytopes" Star numbers" or Hemi-icosahedron through a rotation (a double cover) generate the dynamical of Space/Time which map an icosahedron with order 60, determined by 5 groups of rotation: identity, $\frac{2\pi}{3}, \frac{2\pi}{5}, \frac{4\pi}{5}\ and\ \pi$ with 5 conjugacy classes. Or the Galois group of the field extensions: $\mathbb{Q}\left(e^{\frac{2\pi i}{n}}\right)/_{\mathbb{Q}}$ for n=2 ,3 and 5 is isomorphic to the multiplicative group of units of the rings:$\mathbb{Z}_{/n\mathbb{Z}}$, with n=2, 3, 5

6-1 The icosahedrons /the Cube and the Golden Ratio:

Let's denote by $(\pm a, \pm a, \pm a)$ the coordinate of the vertices of a cube circumscribed to an icosahydron, then the coordinates of the vertices of the inscribed isocahydron in a cartesian coordinate system are giving by: $(\pm a, \pm b, 0), (0, \pm a, \pm b), (\pm b, 0, \pm a)$, with: $\frac{b}{a} = \varphi - 1$ (where φ is the Golden Ratio)

For $a = 1\ and\ b = \varphi$ the coordinates are: $(\pm 1, \pm\varphi, 0), (0, \pm 1, \pm\varphi), (\pm\varphi, 0, \pm 1)$ [4]

By using the Welsh bound method for an optimal equiangular line packing based on 5-dimensional simplex, "in our case 6 lines" through the inner product, by a 6x6 square input symmetric matrix M called "conference



(Fig.8)

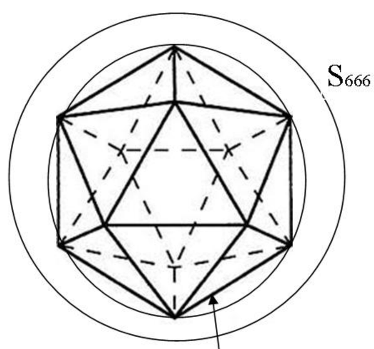
matrix" with trace equals zero.

This matrix has an interesting form; all rows are orthogonal with norms equal $\sqrt{5}$, a combination of Pauli matrices σ_1 , σ_2 and Hadamard matrix H. Let's denote by + number +1 and by – number -1

$$M=\begin{pmatrix}0&+&+&+&+&+\\+&0&+&-&-&+\\+&+&0&+&-&-\\+&-&+&0&+&-\\+&-&-&+&0&+\\+&+&-&-&+&0\end{pmatrix}=\begin{pmatrix}\sigma_1&\sqrt{2}H&\sqrt{2}\sigma_2H\\\sqrt{2}H&\sigma_1&-\sqrt{2}\sigma_2H\\\sqrt{2}\sigma_1H&-\sqrt{2}\sigma_1H&\sigma_1\end{pmatrix}=\begin{pmatrix}\sigma_1&\sqrt{2}(H)^T&\sqrt{2}(\sigma_1H)^T\\\sqrt{2}H&\sigma_1&-\sqrt{2}(\sigma_1H)^T\\\sqrt{2}\sigma_1H&-\sqrt{2}\sigma_1H&\sigma_1\end{pmatrix}$$

Since: $(\sigma_1H)^T=\sigma_2H$ and $(H)^T=H$. Where $M^2=5I\equiv0[5]$ with Eigen-values equal $\sqrt{5}$ *and* $-\sqrt{5}$, and $\ker(M+\sqrt{5}I)$ *is of dim*3. All lines intersecting pairwise at a common acute angle $arccos\frac{1}{\sqrt{5}}$, with the coordinates of its vertices related to the golden ratio. [5]

Note: The volume of an icosahedron occupies less volume of a circumscribed sphere comparative to a dodecahedron. As a result! Less energy is used for an icosahedron shape than a dodecahedron.



(Fig.9)

Conclusion: we deduct then: the general group symmetric that keeps the system invariant is generated from a combination of the following group's symmetry:

- $U(1)$, $SU(2)$, $SU(3)$ *and* $A5$ the alternating group. The standard model then is included!

Note the order of:

- $SU(2)\times A5=3\times60=180$
- $SU(3)\times A5=8\times60=480$
- $U(1)\times Z_2\times Z_3=6$ (Z_2 *and* Z_3 are respectively centers of $SU(2)$ *and* $SU(3)$)

By adding those orders: $180+480+6=666$

And the order of $A5+SU(2)+SU(3)+U(1)=60+3+8+1=72$

Interpretation: The Space is related to Hexagonal lattice which maps an icosahedron while Time is related to a square lattice that maps a cube, (see for more details in **9- the dynamical system of Time)**.

6-2 Biological Interpretation:

This dynamical and geometrical shape is seen also in the icosahedron geometrical shape of the viruses and dynamical of the DNA along the torus through the icosahydron.

6-3 Numerical Periods of Powers and Pascal's Triangle congruence modulo 9:

The reason to study the power of the numbers is to determine periodicity and uniformity to reduce the system. The notion of cardinality is also important to describe the state level of the system and its dimension.

Each composite number c is a product of a finite prime numbers p_k with power a_k $\quad C = \prod_{k=1}^{n} p_k^{a_k}$

Let's denote by $\boldsymbol{J} = \{\mathbf{1,2,3,4,5,6,7,8,9}\} = \{\mathbf{1,2,3,2^2,5,2\times 3,7,2^3,3^2}\}$

δ_i for $1 \le i \le 3$ using the modular arithmetic modulo 9:

$\delta_1 = \{1,4,7\}$ $\quad \delta_2 = \{2,5,8\}$, $\quad \delta_3 = \{3,6,9\}$ 3 special groups with n integer/ n ≥ 0 the powers of the elements of $1^n = \{1\}$ converges toward 1(fixed point).

2^n=$\{\mathbf{1,2,4,8,7,5},1,2,4,8,7,5..\}$ and $5^n = \{\mathbf{1,5,7,8,4,2},1,5,7,8,4,2..\}$ of period $P = 6 \rightarrow \theta = \frac{2\pi}{6} = \frac{\pi}{3}$

$3^n = \{1,3,9,9 \dots,9\}$, $\quad 6^n = \{1,6,9,9,\dots.9\}$ and $9^n = \{1,9,9 \dots\dots 9\}$ Converge toward 9.

$4^n = \{\mathbf{1,4,7},1,4,7,\dots..\}$ and $7^n = \{\mathbf{1,7,4},1,7,4 \dots\dots\}$ Periodic with period $P = 3 \rightarrow \theta = \frac{2\pi}{3}$

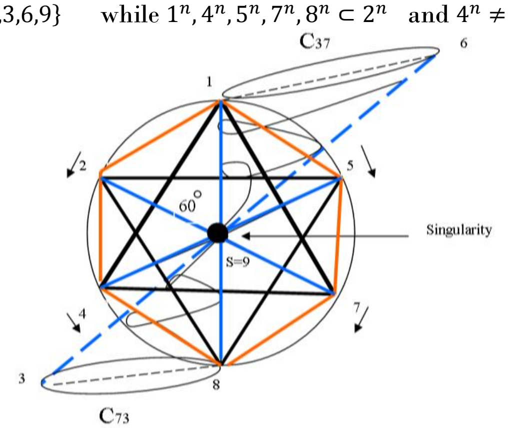
$8^n = \{\mathbf{1,8},1,8 \dots\dots\}$ Periodic with period $P = 2 \rightarrow \theta = \frac{2\pi}{2} = \pi$. Then the: $LCM\ (2,3,6) = 6$

If we project the elements of each set on a circle, we notice that:

The powers of 2 and 5 belong to δ_2 and are equal but they orbit in opposite direction, while the power of 4 and 7 belong to δ_1 and are equal also but orbit in opposite direction.

Harmonic Motion: The powers of the numbers orbit with a harmonic oscillation.

$2^{n\rightarrow} \equiv 5^{n\leftarrow}$ and $4^{n\rightarrow} \equiv 7^{n\leftarrow}$ also $2 \equiv -7[9]\ while\ 5 \equiv -4[9]$. The powers of 3 and 6 intercept at the point 9: $3^n \cap 6^n$=9^n $\quad 3^n \cup 6^n = \{1,3,6,9\}$ $\quad$ while $1^n, 4^n, 5^n, 7^n, 8^n \subset 2^n$ and $4^n \neq 8^n$



(Fig.10)

We can resume those powers in two groups: Let's denote those groups by:

$\boldsymbol{T_n} = 3^n \cup 6^n = \{1,3,6,9\}\ and\ \boldsymbol{E_n} = 2^n$=$\{\mathbf{1,2,4,8,7,5}\}$ and let's evaluate $\boldsymbol{E_n} = 2^n, and\ \boldsymbol{T_n} = \{1,3,6,9\}$

Note $\boldsymbol{E_n} = 2^n, and\ \boldsymbol{T_n} = \{1,3,6,9\}$ are simply powers of Triangular numbers and powers of 2 modulo 9 of the Pascal's Triangle. The powers of numbers 2,4,8,7,5 are harmonic and for those numbers 3,6,9 are non harmonic since it vanish toward the singularity. While 1 is the fixed point. Time degenerates near singularity.

Let's denote then by $z = e^{i\theta}$ with $\theta = \frac{2\pi}{6} = \frac{\pi}{3}$ then $z^n = e^{in\theta}$with $n = 1,2,\dots.,6$ lead to the following values: $\pm e^{i\pi}$, $\pm e^{i\frac{\pi}{3}}, \pm e^{i\frac{2\pi}{3}}$ the fixed points seen before of the modular form: $\frac{az+b}{cz+d} = \frac{1}{1-z}$ are solutions of the cubic equation: $z^6 - 1 = 0$. Those points are points of a Torus, with complex representation: $M(x,y)\ /\ z = x + iy$

For reason of symmetry the system is reduced to $\mathbb{Z}_3$ although our system is defined in $\mathbb{Z}/3^2\mathbb{Z}$. Thus the powers of numbers 3, 6 and 9 vanish and degenerate away toward singularity generated by $\mathbb{Z}_5$ over the field $\mathbb{Z}_3$ and $\mathbb{Z}_2$ due to the numerical equation: $8 - 3 = 6 - 1 \equiv 0[5]$ and the quadratic equations: $8^2 + 3^2 = 73$ and $6^2 + 1^2 = 37$ (See the properties of 37 and 73 in $(\mathbf{8-1})$).

With $|z| = 1$ modular form over disc unity, we have then: $x^2 + y^2 = 1$.

Then the system:

$$\begin{cases} x^2 + y^2 = 1 \\ y = x^3 - 1\ when\ y = 0\ ;\ x = 1 \end{cases}$$

Generated from the polynomial: $P(z) = z^3 - 1$. Let's denote by $P(z) = Q(x) + iL(y)$

Then the equation defined by: $Q(x) = L(y)$ with $Q(x) = x^3 - 1\ and\ L(y) = y$

Leads to the cubic form: $x^3 - 1 = y$ then $x^3 - x^2 - y^2 = y$

Or simply by: $\begin{cases} y = \frac{1}{1-x} \\ x^2 + y^2 = 1 \end{cases}$ where: $y^2 = 1 - x^2 = (1-x)(1+x) = \frac{1}{y}(1+x) \rightarrow y^3 = 1 + x = x^2 + y^2 + x$

Which yields to the elliptic curve: $y^3 - y^2 = x^2 + x$ symmetric of the elliptic curve: $\boldsymbol{x^3 - x^2 = y^2 + y}$

That yields to the famous elliptic curve (cubic equation): $\boldsymbol{x^3 - x^2 = y^2 + y}$ related to the Eichler's generating function: $P(x) = \prod_{i=1}^{n}(1 - x^i)^2(1 - x^{11i})^2$where the number of solutions over a finite field is related to the coefficients of x^i.

Parametric System: by changing the variable x over the disc unity

$\begin{cases} x(t) = 1 - t \ for\ 0 < x < 1\ with\ 0 < t < 1 \\ y(t) = \frac{1}{t} \end{cases}$ Thus $\begin{cases} x(-t) = 1 + t \ for\ 0 < x < 1\ with\ 0 < t < 1 \\ y(-t) = \frac{-1}{t} \end{cases}$

The very known modular form for its fundamental domain and its cusps, the strings xy and yx are homotopic and the function is homeomorphic and tend to form a trefoil knot since $f^3(x) = x$

f is analytic thus $f\left(\frac{1}{1-z}\right) = (1-z)^k f(z)$ then $f(1+z) = f(z) and\ f\left(\frac{-1}{z}\right) = z^k f(z)$ modular form with weight k that have the property of an automorphic form. This analytical function has the expansion to infinite: $f(z) = \sum_n^\infty \beta_n e^{i2\pi nz}$ where z is in the upper half plane, indicate the extension of Galois representation to Analysis "waveform" for a harmonic motion.

6-4 Equation of Strings in Knot Theory / Conway Polynomial

Orbital of primes, composites and palindromes! There exist 3 representation types of transpalidrome numbers for the set M_{99}={1,2,3 …,99}.

-Primes with their super-partners primes P/P, are the type non decomposable.

$P_r/P_{r'}$={(13,31), (17,71), (37,73), (79,97)} with 4/4 elements of M_{99}.

-Primes with their super-partners composites P_r/C_{com} = 16/16 elements.

-Composites with their super-partners composites $C_{om}/C_{om'}$ = 24/24 elements and remaining numbers are 1, 10, 11 and palindrome numbers 22,33 … . ,99 with a total of 11 elements.

Let's consider a modular map seen before, which maps a point z to z' by: $z \rightarrow f(z) = \frac{1}{1-z} = z'$

f is a symmetric transformation $f(z) = z$ fixed point corresponds to $z + \frac{1}{z} = 1$ $for\ z = e^{i\frac{\pi}{3}n}\ with\ n = 1,2,3$ and f involutive when $z + \frac{1}{z} = 1$. f is a diffeomorphism that maps z to z'through a trefoil knot. [2]

Since Alexander polynomial for a trefoil knot is defined by $\Delta(z) = z + \frac{1}{z} - 1$ simply $\nabla(z) = z^2 + 1 = z$ fixed point for a trefoil Conway polynomial. In general the trefoil knots and Alexander knot are connected.

The two strings zz' and $z'z$ are chiral symmetric and intercept to form a closed string.

Three possibilities of interception: 0 knot, 1 knot, or a link of n knots.

- 0 knot which corresponds to $P_r/P_{r'}$ (prime/prime) where zz' and $z'z$ have their greatest common factor equal to 1, GCF$(zz', z'z) = 1$ and are not decomposable in $\mathbb{Z}$. In this case we have two closed strings with opposite directions with shapes of circles.

- For a link with 1 knot which corresponds to P_r/C_{com} (Prime/Composite), the Greatest Common Factor equals to 1, GCF$(zz', z'z) = 1$ and only $z'z$ is decomposable, this case corresponds to the composites orbiting around the primes with opposite direction to it.

- For the third possibility we will consider a **torus link** $(\boldsymbol{n}, \boldsymbol{2})$ formed from the 2 strings intercepting n times ($\boldsymbol{n} = \boldsymbol{6}$ **smallest period of the sequences** (See (7-2)) which corresponds to $C_{om}/C_{om'}$ (composite/composite), for this reason, let's introduce the **Conway Polynomial** and show how it is related also to Pascal's Triangle, where the 2 strings are twisted 6 times with characteristic 2(modulo 2 with n odd or even), then: $\nabla(P_{2n}) and\ \nabla(P_{2n+1})$ either it's a link or a knot, by definition the Conway polynomial is giving by the equation:[1]

$$\nabla(P_n) = \nabla(P_{n-2}) + z\nabla(P_{n-1})\ for\ n \geq 3$$

	$\sum coefficients$						F_n
$\nabla(P_1)$	1						1
$\nabla(P_2)$		1z					1
$\nabla(P_3)$	1		$1z^2$				2
$\nabla(P_4)$		2z		$1z^3$			3
$\nabla(P_5)$	1		$3z^2$		$1z^4$		5
$\nabla(P_6)$		3z		$4z^3$		$1z^5$	8

We recognize the Pascal's triangle patterns, where Fibonacci numbers represent the sum of the coefficients of the polynomials for z =1. Since for n =6 the polynomial is of deg 5, the Space then is of dimension 5, which coincide also with 5-Simplex dimension.
The composites/composites "$C_{om}/C_{om'}$ = 24/24" elements of M_{99} have the property of longitudinal orbit along the torus that describes a spiral of Fibonacci trajectory.
Since the torus links P_n depends on the parity of n, knot or unknot with:

$$\nabla(P_{2n})_{z=1} = \sum_{i=0}^{n-1} \binom{n+i}{2i+1} \; and \; \nabla(P_{2n+1})_{z=1} = \sum_{i=0}^{n} \binom{n+i}{2i}$$

Introducing the Fibonacci sequence: $F_n \; with \; F_n = F_{n-1} + F_{n-2} \; and \; F_1 = 1 \; and \; F_2 = 1$
Where: $\nabla(P_1)_{z=1} = 1$, $\nabla(P_2)_{z=1} = 1$ and the relation $\nabla(P_n)_{z=1} = F_n$ and with the formula: $\binom{n}{k} = \binom{n-1}{k} + \binom{n-1}{k-1}$
Since (n-1) and (n-2) are consecutive with different parity ! leads to: $\nabla(P_{2n})_{z=1} = F_{2n}$ and $\nabla(P_{2n+1})_{z=1} = F_{2n+1}$
Interpretation: The notion of parity (odd or even) is an indication of the commutation and the anti-commutation of the bosons and fermions over the Super Algebra $\mathbb{Z}_2$. While the particles $C_{om}/C_{om'}$ (long range) including the axis Δ_{ii} "Kernel" describe the longitudinal orbital, and the particles $P_r/P_{r'}$ and P_r/C_{com} (Short range) describe the latitudinal orbital, thus the longitudinal and the latitudinal orbits define the geometrical shape of the Space/Time, which is a twisted torus (Solenoid) that describes a spiral of Fibonacci trajectory which converges into the golden ratio $\varphi = \frac{1+\sqrt{5}}{2}$.

7- Physical Interpretation of the Sequences in Pascal's Triangle:

Let's prove the following properties:

$- T_n = \frac{n(n+1)}{2}$ represents dynamical function of Time
$- E_n = 2^n$ represents total configuration of energy states for the n elements Since $1 + 2^0 + 2^1 + 2^2 \dots \dots + 2^{n-1} = 2^n$ Related to **H**adamard code that defines the quantum circuit of the universe, by using binary system for 2 digits 0 and 1 called bits or qubits for a quantum data information circuit that generates the universe.
$- M_n = \{1,2,3 \dots . n\}$ set of primes and composites also a set of a particle and its super-partner where:
$*$ P_r set of primes represents the energy level $*$ C_{omp} set of composites represents particles configurations
$- F_n$ represents dynamical function of the Space $F_{n+2} = F_{n+1} + F_n \; with \; F_0 = F_1 = 1$

7-1 Configuration Electronic and Pascal's Triangle:

An electron configuration is the arrangement of electrons around nucleus, it consists of numbers and letters that indicate the energy level 1,2,…and the orbital s, p, d,….while the proton configuration describes also the orbital on the nucleus.

Energy Level	Maximum number of electrons	Maximum number of proton
n	$2n^2 = 2\sum_1^n 2p - 1 \quad (2\sum odds)$	$n(n+1) = 2T_n$

Note: $T_n{}^2 + T_{n-1}{}^2 = T_{n^2}$ and $F_n{}^2 + F_{n-1}{}^2 = F_{2n}$
The configuration:1s2s2p3s3p4s3d4p5s…….(is also related to Pascal's Triangle along the diagonal $\boldsymbol{F_n}$ **)**

1s				
2s	2p			
3s	3p	3d		
4s	4p	4d	4e	
5s	5p	5d	5e	5f

7-2 Period of the System / Period of the Sequences in base modulo 9 :

$- \boldsymbol{T_n} = \{\mathbf{1,3,6,1,6,3,1,9,9}, 1,3,6,1,6,3,1,9,9, \dots \dots\}$ **Periodic oscillation**
The projection on the circle of numbers 1,3,6,1,6,3,1,9,9 results in the orbital with reverse oscillations 1,3,6,1 then back to 6,3,1 with harmonic motion. Period of T_n : $P_{T_n} = 9$
$- \boldsymbol{E_n} = 2^n = \{\mathbf{1,2,4,8,7,5}, 1,2,4,8,7,5\}$ **Periodic oscillation**. Period of $E_n = 2^n$ equals $P_{E_n} = 6$
$- \boldsymbol{F_n} = \{\mathbf{1,1,2,3,5,8,4,3,7,1,8,9,8,8,7,6,4,1,5,6,2,8,1,9}, 1,1,2,3 \dots \dots\}$ Period of $F_n \; equals \; P_{F_n} = 24$
The sequence $\boldsymbol{F_n}$ has reverse oscillation: orbiting {(1,8), (3,6),9} with respect to the three groups $\delta_1 = \{1,4,7\}$, $\delta_2 = \{2,5,8\}$, $\delta_3 = \{3,6,9\}$ $\mathbf{1}, 1, \mathbf{2}, 3, \mathbf{5}, 8, \mathbf{4}, 3, \mathbf{7}, 1, \mathbf{8}, 9 \longrightarrow$ 12 numbers and $9, \mathbf{1}, 8, \mathbf{2}, 6, \mathbf{5}, 1, \mathbf{4}, 6, \mathbf{7}, 8, \mathbf{8} \longleftarrow$ 12 numbers

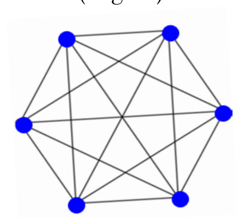
The period common of the three sequences : equals to the **LCM** Least Common Multiple of their Periods:
$\boldsymbol{P = LCM(6,9,24) = 72}$ with $\boldsymbol{n = 6}$ the smallest period ($P_{E_n} = 6$)

7-3 Simplex Polytope:

Geometric Interpretation of the Pascal's Triangle for n=6 : In geometry a Simplex is a generalization of the

notion of triangle and Tetrahedron to arbitrary dimension. An N-Simplex is an N dimensional Polytope which is the convex hull of its n+ 1 vertex. We can interpret the Pascal's Triangle simply by a succession of N simplex which is the process of constructing a N- Simplex from a (N-1)-Simplex by adding a new vertex to the exterior of the (N-1)-Simplex and joining it to all vertices of the (N-1)-Simplex. [1]
In five-dimensional geometry, a 5-simplex is a self-dual regular 5-polytope, the symmetric group S_6. It has 6 vertices, 15 edges, 20 triangle faces, 15 tetrahedral cells, and 6 pentatope facets. It is a 5 dimensional polytope which is the dim of space/time that coincide with A_5.

(Fig.11)



A_5	Coxeter Dynkin	vertices	Edges	Triangle	Tetrahedral	Pentatope	$2^{5+1}-1$
5- Simplex	◉-•-•-•-•	6	15	20	15	6	63
Pascal's Triangle for n=6	1	6	15	20	15	6	1

7-4 Positioning Pascal's Triangle to Determine the Symmetry of the System Modulo 9 :

(Fig.12)

$$\boldsymbol{T_{2n}}^{\circlearrowleft}\ \boldsymbol{M_{2n+1}}^{\circlearrowleft}\ \Delta_1\ \boldsymbol{M_{2n}}^{\circlearrowleft}\ \boldsymbol{T_{2n+1}}^{\circlearrowleft}$$

Odd position 1 Even position

1 + 1

1+↓ ② + [1]

1+[3]+**3** + 1

1+↓ ④ + [⑥] + ④ + 1

1+5+ 1+ [1]+**5** + 1

1+↓ ⑥ + [⑥] + ② + ⑥ + ⑥ + 1

This method of evens and odds separation is very important in the electrons and protons configuration, since the sequence of odds is connected to the squares by: $\sum_1^n 2k-1=n^2$ (see configuration for electrons and protons) and triangular numbers to maximum number of proton..By separating Pascal's Triangle with odd numbers one side and even numbers to the other side: we notice that Δ_1 is the axis of the system, where M_n is orbiting around Δ_1, by joining M_{2n+1} to M_{2n} , and T_n orbiting around M_n and Δ_1 (Helix) by joining T_{2n} to T_{2n+1}.
F_n Corresponds to a helicoidally trajectory by joining each point of the axis to its oblique diagonals (Fig.12)
[ ]: locate Triangular Numbers and ⊙: locate the finite closet string with repeated algorithm: 2664-4662-6642..

7-5 Divine Code 6642/ Key to the Equation:

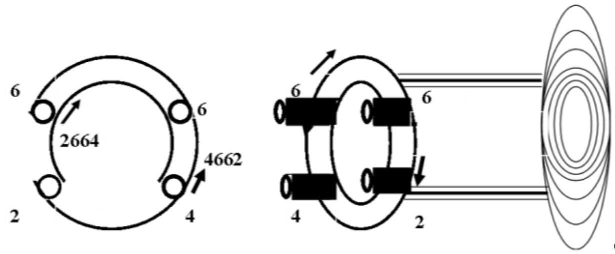
Mathematically this Divine Code found in the repeated following algorithm of the string in the Pascal's Triangle 6642 – 4662 and2664 (Fig.13&14) that has the representation of a harmonic oscillation between the two transpalindrome numbers 2664 and 4662. Let's project the numbers 6 – 6 – 4 – 2 in a circle; the **Code** is to rotate the **Key** anticlockwise from 6 to 2 to map the two transpalindrome numbers 2664 and 4662. 2664 ≤ 4662, 2664 rotates in the opposite direction of 4662 *(harmonic motion) and as a quantity* 2664 is including in 4662. This hypothesis leads to the following representation: (See Fig.16&17)

Key to the Equation, Development of 2664 and 4662:

4662 = 7× 666
<u>2664 = 4× 666</u>
7326 = 11×666

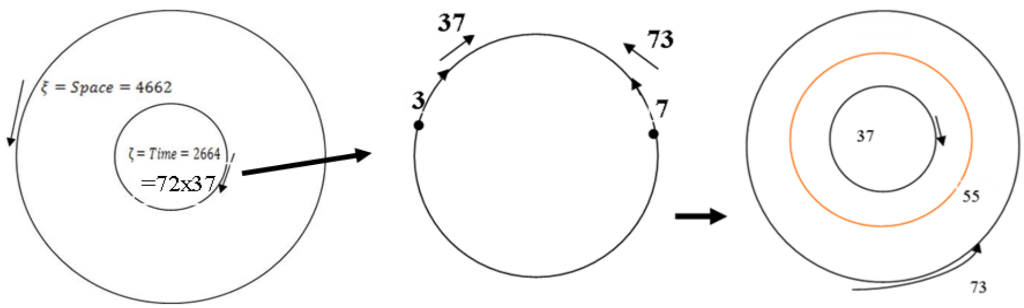
By adding the two numbers:

$$4662\ +\ 2664\ =\ 11\times 666\ \rightarrow\ equation\ I$$
$$=\ 7326\ \rightarrow\ equation\ II$$



Code & Key (Fig.13)

Interpretations of the two Transpalindrome Numbers 2664 and 4662:



(Fig.14)

$4662 = 7 \times 666$ while $2664 = 4 \times 666 = 72 \times 37$ and $666 = 18 \times 37$

Interpretations of the two equations:

- the equation I: The Mean Value A of 4662 and 2664 belongs to the diagonal Δ_{ii} (A is a multiple of 11) A $\epsilon\ \Delta_{ii}=\{11, 22, 33, \dots\}$, 4662 and 2664 have the same axis of orbital.
- The equation II: 73 and 26 are just the total number respectively of the composite numbers and the prime numbers including number 1 in the set $M_{99} = \{1,2,3,4,5,6 \dots, 99\}$

The Greatest Common Factor of 2664 and 4662 is equal to 666, GCF(2664 ,4662) = 666.
73 composites represent 73 vertices with a total of 72 edges, (1,6) oscillate the circle $C_{r^2} = C_{37}$.
For each composite move the circle C_{37} describes a turn, with a period then of 37×72 correspond to:
$4 \times \pi \times r^2 = 4 \times \pi \times 666$ Surface of the sphere of radius r denoted by S_{666}.

7-6 Representation of Triangular Numbers:

For $n \geq 1$, T_n = $\frac{n(n+1)}{2} = 1 + 2 + 3 \dots. +$n. Geometrically T_n represents the total number of tours: when the n^{th}circle turns 1 time the 1^{st}circle turns n times, with an arithmetic progression equals to 1 tour between two successive circles.

Special Triangular Numbers and notion of Cardinality:

In the set $M_n = \{1,2,3, \dots \dots, 99\}$ we have 25 primes, 73 composites and number 1. The Special Triangular Numbers correspond to the orbital of the 25 prime numbers and the 73 composite numbers. Card P(primes) = 25 and Card C(composites) = 73. If we enumerate the set of primes $P = \{2,3,5,7,11,13 \dots \dots, 97\}$ by $P_{25} = \{1,2,..25\}$**.**
The same for composite numbers $C = \{4,6,8,9 \dots . .98\}$ *by* $C_{73} = \{1,2,3 \dots \dots . .73\}$. From the property of the cardinality there exists a bijection between the set P and P_{25} respectively between C and C_{73}.
The primes and composites represented as objects or mathematical entities.

With $\begin{cases} 666 = 18 \times 37 \\ 4 \times 666 = 72 \times 37 \\ 288 = 4 \times 72 \end{cases}$

Very important numerical equations: $T_{99} = \sum_{i=0}^{99} i = 4662 + \mathbf{288} = 7 \times 666 + 288 \equiv 7 \times 666[72]$

$$T_{73} = \sum_{i=0}^{73} i = 2664 + \mathbf{37} = 4 \times 666 + 37 \equiv 37[72] \text{ And } T_{73} \equiv 0[37]$$

$$\text{And } T_{25} = \sum_{i=0}^{25} i = \mathbf{288 + 37}$$

$$\text{Then } T_{73} - T_{25} \equiv 0[72]$$

$T_{99} + T_{73} - T_{25} = 11 \times 666 \equiv 0[666]$ *Or* $666 = 2^2 + 3^2 + 5^2 + 7^2 + 11^2 + 13^2 + 17^2$ Equation of a Hyper-Sphere, with radius $r = \sqrt{666}$, and $[r]$ =$[\sqrt{666}]$ = 25. The points 2,3,5,7,11,13,17 are seven consecutive primes and are coordinates of a point $M(2,3,5,7,11,13,17)$ of the hyper-sphere $S_{r^2} = S_{666}$ “Sphere 666”

Conclusion: The dynamical of the primes and composites is related to the Hyper-Sphere S_{666}.

While the primes and composites are orbiting, they are mapping S_{666} through the point M.

Interpretation: My system is based from the following parameters:

$\xi = 4662$, $\zeta = 2664$, $M_{99} = \{1,2 \ldots,99\}$, $\Delta_{ii} = \{11,22,..,99\}$, $P = primes$, $G = 37$

$C = Composites$, $Q = 288$, $S_{666} = Sphere\ 666$ E_n and T_n with $0 \leq n \leq 99$

7-7 Physical System:

Let's denote by:

$\xi = 4662 = 7 \times 666 \rightarrow$ represents space (Multi-verse)

$\zeta = 2664 = 4 \times 666 = 37 \times 72 \rightarrow$ represents time

$Q = 288 \rightarrow$ represents dark matter.

$M_{99} \rightarrow$ represents the elements of the table periodic.

$E_n = 2^n \rightarrow$ represents the energy state levels.

$G = 37 \rightarrow$ represents the gravity with the components (1,6)

$W = 74 \rightarrow$ represents the whormhole

8- Configuration Numeric / Root System "using modular Concept related to the quadratic equation":

Due to the interesting properties of the sets $\delta_1, \delta_2, \delta_3$ we will be then developing $\delta_1, \delta_2, \delta_3$ with more interpretations: In this etude I will be determining the path of each element in the lattice.

The order of the three groups is well known as the 3x3 matrix $M_{a_{ij}}$ with $a_{ij} \in (1,2,3 \ldots,9)$

$$M_{a_{ij}} = \begin{pmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{pmatrix} = \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix} = (\delta_1 \quad \delta_2 \quad \delta_3)$$

Det $M_{a_{ij}} = 0 \rightarrow M_{a_{ij}}$ is singular, not invertible (infinity of solutions), with eigen-value equals 0.

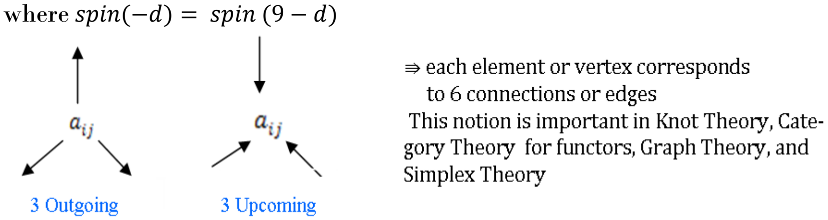
By applying non singular linear transformation the base that generates the lattice is of rank 2.

Let's denote spin+d by a symmetrical transformation of the module relatively to a quadratic equation, defined by $spin \pm d = \frac{x \pm y}{2}$ where x and y elements of $\{1,2,3,..,9\}$ and $x \pm y$ element also of $\{1,2,3,..,9\}$. The space is considered a quantum Space (It's a Hilbert space; the space is defined in a district system over a field $\mathbb{Z}/_{p\mathbb{Z}}$, where the space is measurable). Each number is considered as an object with a space position a_{ij} and with the coordinates in the space i and j. Each element a_{ij} of δ_i with $1 \leq i \leq 3$ is connected to δ_{i+1} per **spin±1** or **Spin±4**. And each element a_{ij} of δ_i is connected to the other element $a_{i+1,j}$ of δ_i per **spin±3**.

Example: We get the following representation: $\begin{pmatrix} \delta_1 & \delta_2 \\ 1 \rightarrow & 2 \\ \downarrow 4 & \searrow 5 \end{pmatrix}$

Giving two integers positives x, y of $\mathrm{I} = \{1,2,3,..,9\}$ $then$: $spin \pm d = \frac{x \pm y}{2} \in \left\{\frac{\pm 1}{2}, \pm 1, \frac{\pm 3}{2}, \pm 2, \frac{\pm 5}{2}, \pm 3, \frac{\pm 7}{2}, \pm 4\right\}$

where $spin(-d) = spin\ (9 - d)$



(Fig.15)

The spin+4 is a linear combination of the spin+1 and spin+3.

The spin's paths of the elements describe a hexagonal Lattice for the group acting which is related to the root system of one of the symmetric groups.

For the **opposite direction: Spin+6, spin+8, spin+5**

Example: We get the inverse following representation $\begin{pmatrix} \delta_1 & \delta_2 \\ 1 \nwarrow & 2 \\ 4 & \leftarrow 5 \uparrow \end{pmatrix}$

Note:

$(Spin + 6) + (spin + 8) = (spin + 5)$ $\rightarrow$ since $6 + 8 = 14 \equiv 5[9]$

$(Spin + 1) + (spin + 3) = (spin + 4)$ and $4^2 + 5^2 = 41$

$6^2 + 1^2 = \mathbf{37}$ And $8^2 + 3^2 = \mathbf{73}$ **(Spin related to a quadratic equation).**

Then the mean value of the transpalindromes 37 and 73 is: $\frac{73+37}{2} = 41 + 14 = 55$.

The spin+1 and spin+6 describe the gravity. Spin+1 is related to the phase transformation U (1).

Note: 55 is also the mean value of $\Delta_{ii}=\{11,22,33,\dots\dots 99\}$. The last group of spins remaining: **Spin+2, Spin+7, Spin+9**. We can resume those spins in the following diagram, giving a number N of the matrix M.

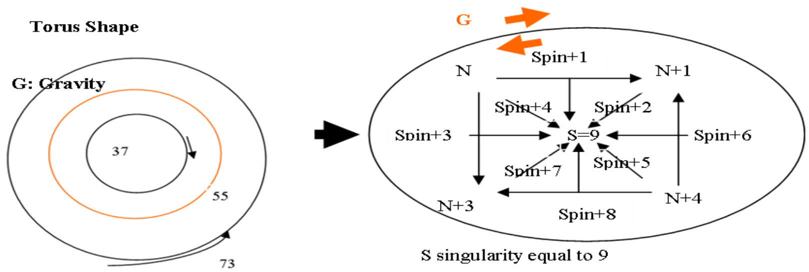
The powers of $2^{n\rightarrow} \equiv 5^{n\leftarrow}$ Orbit with harmonic motion (See: **6-3 Numerical Periods of Powers of $\delta_1, \boldsymbol{\delta_2}, \boldsymbol{\delta_3}$**)

And $2 \equiv -7[9]$ *while* $5 \equiv -4[9] \rightarrow 4^{n\rightarrow} \equiv 7^{n\leftarrow}$

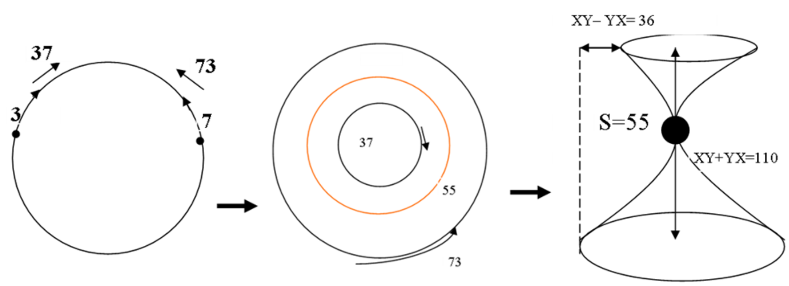
This combination of spins results from a simple (helix) transformation that transforms a lattice into a cylinder (curved space of dim2). Since the lattice is periodic (modulo 9), then by joining its extremity, the cylinder is then transformed into a torus. The configuration numeric for the elements of $M_{a_{ij}}$ is related to Cartan Algebra for the group acting.

8-1 Mathematical Notion of Event Horizon, and Singularity interpreted from Strings:

The numbers YX=37 and XY=73 are among important numbers in the system, I will be then showing the numbers 37 and 73 are the Event Horizon for black holes, simply represented by the letter G: Gravity, while the number 55 there mean value is the singularity; the question is how the gravity and electromagnetism function in the universe?



(Fig.16)



(Fig.17)

First I will be describing the properties of those numbers:

- 37 is a Cuban prime, a centered hexagonal number in the form of: $p = \frac{x^3-y^3}{x-y}$ with $x = y + 1$ *and* $y > 0$

  For $y = 1$ then $p = \frac{x^3-1}{x-1} = x^2 + x + 1$
- 37 and 73 result from a rotation determined by spin+6 and spin+1.
- 37 and 73 are asymmetric with opposite directions (oscillate with harmonic motion) and their mean value equals to 55. (37 *converges* $\rightarrow$ $M = 55 \leftarrow$ *converges* 73)
- As a mass/quantity, $37 \leq 73$ *then* $37 \subset 73$. As a result, the mechanism of attraction from law of gravity is induced.
- As a charge 37 and 73 have opposite charges $+/-$. And as a result, the mechanism of attraction from law of electromagnetism is induced for a magnetic dipole.
- Mathematically 37 and 73 are primes, two closed strings indecomposable, that split in $\mathbb{Z}[i]$ with 0 knot, invariant under rotation and are of short range that spin continuously.

Are there more Spins for $\boldsymbol{a_{ij}}$? Since the **Singularity** corresponds to spin+9, then the spins are integers modulo 9, all roots are $\equiv 0[9]$, though we can proceed with the following spin's representation:

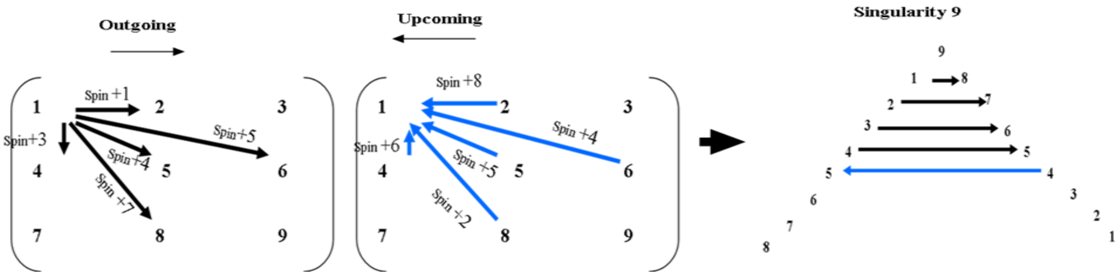
$9 = 8 + 1 = 7 + 2 = 6 + 3 = 5 + 4 = 4 + 5 = 3 + 6 = 2 + 7 = 1 + 8$ (commutative/reversible)

Conclusion: Each number has 5 roots that form a base of rank 5. This lattice $\boldsymbol{M_{99}}$ **=$\{1, 2, 3 \dots, 99\}$ has then: $99 \times 5 = 495$ roots or edges $495 \equiv 0[5], \equiv 0[9], \equiv 0[11]$**

To determine the reduced total number of roots for the system, we need to find the smallest period of its sequences related to the system, and that when $n = 6$, **"See below the period of the sequences for the system".**

- This gives us the total of roots equals to $R = 5 \times 6 = 30$ roots, or we now the total roots for the

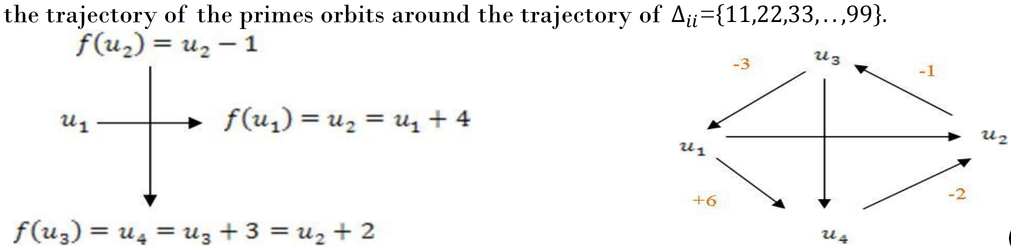
group symmetric A_{n-1} is equals to $n \times (n-1)$ then 30 roots in our system correspond to the group symmetric $A_{6-1} = A_5$, or dim $A_5 = 5$. Each number has 5 roots that form a base of rank 5.
Conclusion: The rank for the basis of the set $\boldsymbol{M_{99}} = \{\mathbf{1, 2, 3 \ldots, 99}\}$ **is equal to 5.**
Let's denote by $\boldsymbol{B} = \{\boldsymbol{v_1, v_2, v_3, v_4, v_5,}\}$ of rank 5 a set of vectors that span $\boldsymbol{M_{99}}$. $\boldsymbol{M_{99}} = \boldsymbol{span}\,(\boldsymbol{B})$. **Then:** $\boldsymbol{M_{99}} = \boldsymbol{span}(\{\boldsymbol{v_1, v_2, v_3, v_4, v_5}\})$, and **Dimension of our Space/Time** = dim $A_5 = 5$ the 5 simplex polytope
(Fig.18)



8-2 Orbital of Primes, Composites and Palindromes:
To prove the orbital of the composites around the primes and palindromes, we need first to locate the primes of M_{99}, for this reason we need to find a sequence or a function that maps all the 25 primes!
Since each element a_{ij} of δ_i for $1 \le i \le 3$ is connected to δ_{i+1} per **spin+1** or **Spin+4** and each element a_{ij} of δ_i is connected to the other element a_{i+1j} of δ_i per **spin+3.**
We have 4= 1+3 and with respect to the orientation we would follow this path: 4 + (-1) = 3
Anti-clockwise: based on the circles C_{13} *and* C_{37} (See Fig.26). Since the pairs (1, 6) and (2, 3) generates those circles. The opposite modules verify well: $(-3)^2 + (-2)^2 = 13$ and $(6)^2 + (-1)^2 = 37$ related to the flow F_5.
Let's then define the following sequences defined by: $u_1 = 1, 2, 3$ *and* 6 composites of the perfect number 6.
$f(u_1) = u_2 = u_1 + 4$; $f(u_2) = u_3 = u_2 - 1$; $f(u_3) = u_4 = u_3 + 3 = u_2 + 2$

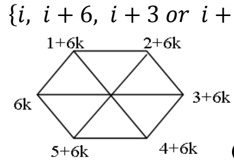
8-2-1 The Salahdin Daouairi's Conjecture:
Show for $u_1 = 1$ the function f maps all the primes p, *with* $p > 3$.
Definid by: $f(u_1) = u_2 = u_1 + 4$; $f(u_2) = u_3 = u_2 - 1$; $f(u_3) = u_4 = u_3 + 3$

Notice: 1, 13, 37 and73 are the only star numbers of M_{99} with the form: $6n(n-1) + 1$.
We have $u_4 \equiv u_1[6]$ or $u_1 = 1, 2, 3, 6$. The diagonal of the sequences is in the form of 6k, 6k+1, 6k+2 and 6k+3.
With the value $u_1 = 1$, the sequence or the function maps all the primes (5,7,11,..97) of M_{99}. See **Fig.21**
Connection of the Sequences:
It shows that when we connect the 4 sequences, the trajectory of the composites spins around the primes and the trajectory of the primes orbits around the trajectory of Δ_{ii}={11,22,33,..,99}.



(Fig.19)

And when we project our sequences to the infinite and by using modulo 99 we get the following "See (Fig.21)"transformations: which yield to a twisted torus orbital each number reconnect with its mirror image.
$3 + 6k$ reconnect with $6k$; $4 + 6k$ reconnect with $1 + 6k$; $5 + 6k$ reconnect with $2 + 6k$
Or $A_i = i + 6k$ for $1 \le i \le 6$ represent the vertices of an hexagram, with period equals to 3 relatively to the polynomial $P(z) = z^6 - 1$
Since: in base modulo 9 we have $i + 6k = \{i,\ i + 6,\ i + 3\ or\ \ i + 9\}\ for\ k = 0,1,2,3$



(Fig.20)

(Fig.21)

2+6k Even	1+6k Odd	6k Even	5+6k Odd	4+6k Even	3+6k Odd
					3
				4	9
			5	10	15
	1	6	11	16	21
2	7	12	17	22	27
8	13	18	23	28	33
14	19	24	29	34	39
20	25	30	35	40	45
26	31	36	41	46	51
32	37	42	47	52	57
38	43	48	53	58	63
44	49	54	59	64	69
50	55	60	65	70	75
56	61	66	71	76	81
62	67	72	77	82	87
68	73	78	83	88	93
74	79	84	89	94	99
80	85	90	95	1	6
86	91	96	2	7	12
92	97	3	8	13	
98	4	9	14		
5	10	15			
11					

8-3 Composites Configuration: Shell / Electrons →(Prime / Composites)

The Set $M_n = \{1,2,3,\dots\dots,99\}$ corresponds to 25 primes, 73 composites and number 1.

7 consecutive prime's coordinates of the point $M(2,3,5,7,11,13,17) \in S_{666}$, then the 18 remaining primes left are orbiting inside S_{666}. By decomposing the remaining number of the primes into three: $18 = 6+6+6$

The 73 composites = 72 composites + Number 6

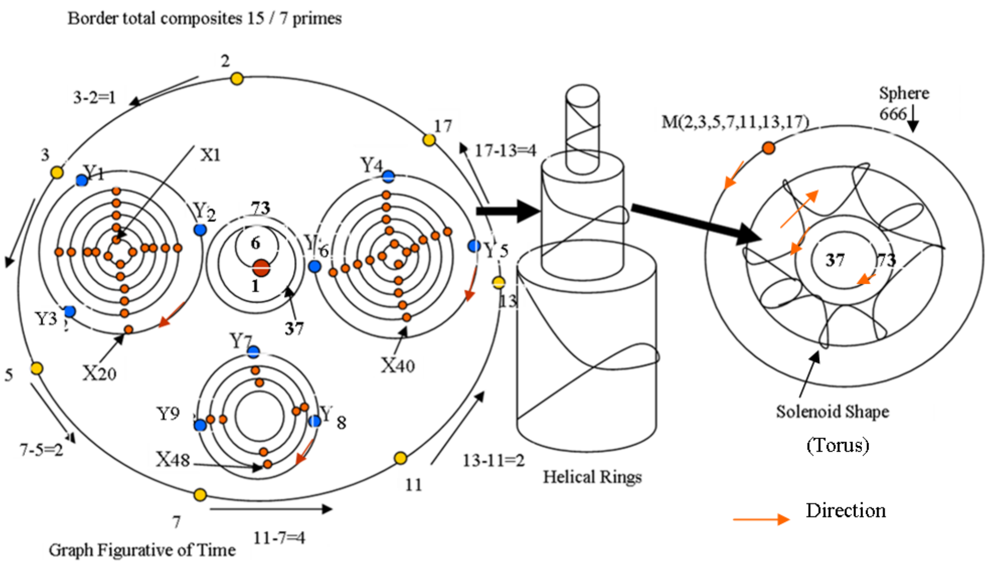
= 24x3 composites + Number 6

Now each group of 6 primes corresponds to 24 composites, and the remaining number 6 which it will combine with the number 1, therefore the pair (1, 6) oscillates to form the circle C_{37}. If you draw a **Tetrahedral** and place in its base for each of its three vertices the correspondent pair of 6/24 which correspond to the number of primes respectively number of composites, then place in the middle of the tetrahedral the **number 6,** and connect it to the upper vertex (number1). Number1 and number 6 are connected.

Simplification (Fig.23):

Since in the middle we have operated through a circle with radius r with r^2=37 including inside its super-partner the circle with radius R, with $R^2 = 73$ (2 primes in the middle).

Then one of the vertices of the previous triangle must have only 4 primes in stay of 6 primes.



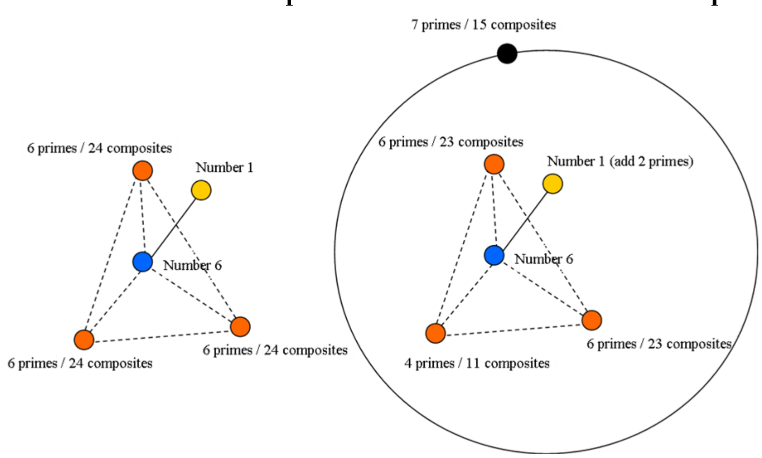
(Fig.22)

So now our **prime distributions are**: **2 − 6 − 6 − 4** See (Fig.22)
From the equation: $2^2 + 3^2 + 5^2 + 7^2 + 11^2 + 13^2 + 17^2 = 666$. We have: $\sum_{i=1}^{7} \rho_i = 58$; $\sum_{i=0}^{7} \rho_{i+1} - \rho_i = 15$
With total: $\sum_{i=1}^{7} \rho_i + \sum_{i=0}^{7} \rho_{i+1} - \rho_i = 15 + 58 = 73$. As a result the points 2,3,5,7,11,13,17 are on the circle c_{73} with the direction opposite to the circle c_{37}. the point M (2,3,5,7,11,13,17) of the sphere S_{666} rotates with the same direction of the sphere S_{666} . And by using the notion of packing spheres, those 7 primes related to the point M are connected to 15 composites, while the rest of 58 composites are connected to the 18 primes.

Interpretation:

From those equations we deduct that the number of composite numbers at the bounded area of c_{73} are 15 composites and the number of composite numbers along the torus and the circle c_{37} are 58 composites, which means 15 composite numbers orbiting around 7 prime numbers: 7/15 and 58 composites orbiting around the 18 remaining primes inside the torus 18/58.

Distribution of the 58 composite numbers in the torus inside the sphere S_{666}:



(Fig.23)

Let's denote by (primes= shells) and (composites=electrons) orbiting around shells.
From the property 4: Each element a_{ij} of δ_i for $1 \le i \le 3$ is connected to δ_{i+1} per **spin+1**, **Spin+4**. And each element a_{ij} of δ_i is connected to the other element a_{i+1j} of δ_i per **spin+3**: in the order (1, 4, and 3) → (1 composite, 4 composites, 3 composites).

- The two Shells 37 and 73 correspond to the pair (1, 6)
- The first 6 primes/shells, each shell corresponds to **4 composites,** while the last shell corresponds to **3 composites**. With total composites [$5 \times 4 + 3 = 23$] composites
- The second 6 primes with similar distribution, for a total also of 23 composites.

- The last 4 primes remaining will correspond to$[58 - 23 - 23 - 1 = 11\,]$.
Shell1 corresponds to 4 composites, 2nd Shell corresponds to 4 composites and 3rd shell corresponds to 0 composites, while the 4th Shell corresponds to 3 composites.

Conclusion: Composites Configuration is then**:**
(Primes / Composite) : $(7,15)\,,(2\,,1)\,,(6\,,23)\,,(6\,,23)\,,(4\,,11)$
Total: $\rightarrow (7+2+6,+6+4\,,\ 15+1+23+23+11) = (\mathbf{25}\,,\ \mathbf{73})$

9- Dynamical System of Time:

Let's introduce the operator S for the discrete system:

$$\boldsymbol{\xi} \times \boldsymbol{\zeta} \rightarrow \boldsymbol{\xi}$$
$$(x,t) \rightarrow S_t x = \boldsymbol{T^n x}$$

n, x, t are discrete numbers

With parameters (Primes, Composites, Palindromes) = (P, C, Δ_{ii})

Let's denote by x_i and x_{i+1} consecutive elements of $M_{99} = \{1,2,3, \dots \dots 99\}$

We have $x_{i+1}x_i - x_i x_{i+1} = 9(x_{i+1} - x_i)$ in the form of $\partial z = \omega \partial t$ equation that represents respectively: Distance, Speed and Time.

Let' define by: $T^n x_i = \sum_{i=1}^{n} x_i$ and by $x_i(t_i) = t_i = i$ so $T^n x_i = \frac{n(n+1)}{2} = T_n$ Triangular number

$\frac{x_{i+1}-x_i}{t_{i+1}-t_i} = 1 = tg\varphi$, where $\varphi = \frac{\pi}{4}$ related to the square lattice $\mathbb{Z} \pm i\mathbb{Z}$ while the vector field v_i related to $U(1)$.

Time is related to the square lattice. When the pair (1, 6) oscillates 72 times, which corresponds to 72 composites that orbit around the primes, we have then:

$$\sum_{i=1}^{72}(x_{i+1}x_i - x_i x_{i+1}) = 9\sum_{1}^{72}(x_{i+1} - x_i) = 9 \times 72 = 666 - 18 = 666 - (6+6+6)$$
$$= S_{666} - S_{18} \rightarrow \text{Equation of a Torus}$$

The two spheres have the same angular momentum, since 666=18x37.

Also we have: $T^{73}x_i = T_{73} = 2664 + 37 \equiv 0[37] \rightarrow \xi = 2664 = T^{73}x_i - 37$ that proves $\boldsymbol{\zeta}$ is related to time and 72 is the period.

9-1 Configuration of Prime ≡ Shell (Energy Level) and Composite ≡ Electron (Particles)

-2 shells in the middle represented by numbers: 37 and 73 with 1 composite number 6 and number 1 (the shell 37 represents the generator).
-2 groups of 6 primes ≡ 6 shells each. The first 5 shells of each group correspond to 4 composites per shell which is equivalent to electrons / shell. And the last shell of each of those 2 groups corresponds to 3 composites. Each Group of 6 primes corresponds then to $4 \times 5\ +\ 3 = 23$ composites
- The third group with a total of 4 shells: the first and second shell with 4 composites, the third has 0 shells and the last one has 3 composites. This group with 4 primes corresponds to $4 \times 2 + 3 = 11$ composites

Notice: the case of Prime/Prime: when a prime contains composites then its super-partner contains 0 composites. The last shell of each group orbits in the opposite direction to the other shells.

9-2 Arithmetic Progression / Triangular numbers:

- For the first group: Let's denote by: x_i the composites, for the first 5 shells with $1 \le i \le 20$ *and* y_i palindromes with $1 \le i \le 3$ where y_iLocated on the 6^{th} Shell has opposite direction to the 5 shells then when the counter 37 maps one tour, the first element x_1 moves toward x_2 and again with another turn of the shell 37, x_2 moves to x_3, this operation continue till x_{20}. Each time y_1 moves to y_3 the composite x_1 moves to x_{20} three times **See (Fig.22)**. We have then the arithmetic progression: with the condition $x_0 = 0$ *and* $y_0 = 0$

$$\boxed{\sum_{1}^{3}(y_i - y_{i-1}) = 3\sum_{1}^{20}(x_i - x_{i-1}) = 3 \times 20 = 60\ seconds = 4(1+2+3+4+5)}$$

- Apply the same method for the second group of 6 shells:

$$\boxed{\sum_{4}^{6}(y_i - y_{i-1}) = 3\sum_{21}^{40}(x_i - x_{i-1}) = 3 \times 20 = 60\ minutes = 4(1+2+3+4+5)}$$

- Let's apply the same method also for the third Group of 4 shells:

$$\boxed{\sum_{7}^{9}(y_i - y_{i-1}) = 3\sum_{41}^{48}(x_i - x_{i-1}) = 3 \times 8 = 24\ hours = 4(1+2+3)}$$

9-3 Time:

Group1 with 6 Shells: $4\sum_{i=1}^{5} i = 4(1+2+3+4+5) = 60$ sec

corresponds also to $(4\times 5)\times 3 = 60sec$

Group 2 with 6 Shells: $4\sum_{i=1}^{5} i = 4(1+2+3+4+5) = 60$ mn

corresponds also to $(4\times 5)\times 3 = 60mn$

Group 3 with 4 Shells: $4\sum_{i=1}^{3} i = 4(1+2+3) = 24hr$

corresponds also to $(4\times 2)\times 3 = 24hr$

With the same method for month and year using the 7 primes coordinates of the point M that maps the sphere S_{666} with the correspondents 15 composites.

9-4 Origin of Time:

The generator of Time which is the circle C_{37} corresponds for each tour to a move of a composite number, which maps a unity of time. C_{37} corresponds to the oscillation of (1, 6) / $1^2+6^2 = (6+i)(6-i) = 37 \rightarrow (1,6,37)$ are component of G (Gravity), Time is connected to Gravity. Time depends on the Gravity and Gravity governs the Time. While the circle unity spins $4\times 1/2\ \times 36 = 72$ (that when the circle 37 maps the 37 points, with 36 equidistant paths). Since 72 represents the number of composites in the set, which is equals to the period orbital. **The** graviton is the counter of Time, thus Time is generated by the Gravity.

Chemical Interpretation: (1, 6) corresponds to (Hydrogen, Carbone) that generates Time.

Conclusion:

Time Machine is generated from the hydrocarbon.

9-5 Speed of Light:

Corollary: Giving a set $M_{99} = \{1,2,3\ldots,99\}$ embedded in a hyper-sphere S_{r^2} and let's denote by $M(\rho_1,\rho_2,\rho_3,\rho_4,\rho_5,\rho_6,\rho_7)$ a point of S_{r^2} with $\rho_{1\le i\le 7}$ consecutive primes such that: $2 \le \rho_i < [r]-6$ satisfying: $\sum_{i=1}^{7}\rho_i^2 = r^2$ where r is the Salahdin Daouairi's radius of the hyper-sphere S_{r^2} with $r^2 = 666$.

Then the maximum speed for the first element of M_{99} to reach the last element of M_{99} defines the Speed of light.

92 vertices x_1 *to* x_{92} correspond to 91 edges | **The remaining 7 primes x_{93} *to* x_{99} coordinate of M point of S_{666}**

$x_1 \rightarrow x_2 \rightarrow \cdots \rightarrow x_{92}$ **orbit with opposite direction to** $x_{93} \rightarrow x_{94} \rightarrow \cdots \rightarrow x_{99}$ **and** S_{666}

Let's denote by $M_{99} = \{1,2,3\ldots,99\}$ the string of x_i elements of M_n where $i \le 99$.

We already know the elements 2,3,5,7,11,13,17, coordinates of the point M of the sphere S_{666} orbit in the opposite direction of the remaining numbers of M_{99} (with total 92 numbers).

The maximum speed for the first element of M_{99} to reach the last element of M_{99} is then determined by the maximum distance traveled from $x_1 \rightarrow x_{92}$ with a minimum length of time which corresponds to:

$t = 5\times 1\ sec$ (Consider 1second for each of the 5 groups represented in the figure.22)

The maximum distance traveled is reached when all the 18 circles are equals with the highest radius! Or the radius of each of the circles is less than to the one of the Sphere by $r_i \le \frac{R}{2}$, where R is the radius of the Sphere S_{666}. Then the perimeter maximum of each circle equals $2\pi\frac{R}{2}$. There are 92 vertices inside the sphere (with 91 edges or paths) and 7 vertices are coordinates of the point M of the sphere with 7 paths, each path corresponds to 18 circles turns. While the 7 vertices (primes) orbit with the sphere, the 18 circles will describe 18x 7 turns.

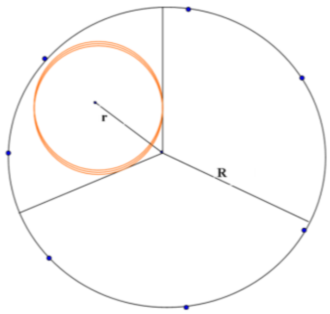
Conclusion:

The distance maximum equals to: $x = 7\times 18\times 2\pi\frac{R}{2}\times 91$ with $\pi \approx \frac{22}{7}$

The time minimum corresponds to: $t = 5\times 1\ second$ (5 groups: sec, mn, hr, day, and week)

Then the speed maximum corresponds to that of an electron :

$$c = \frac{x}{t} = \frac{7\times 18\times 2\times \frac{22}{7}\times\sqrt{666}\times 91}{2\times 5} = 185996 \approx speed\ of\ light\ 186000\ miles/secon$$



(Fig.24)

Conclusion:

The distance maximum equals to: $x = 7 \times 18 \times 2\pi \frac{R}{2} \times 91$ with $\pi \approx \frac{22}{7}$

The time minimum corresponds to: $t = 5 \times 1\ second$ (5 groups: sec, mn, hr, day, and week)

Then the speed maximum corresponds to that of an electron :

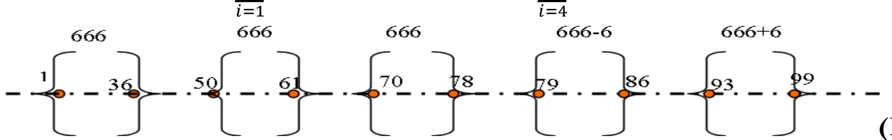
$$c = \frac{x}{t} = \frac{7 \times 18 \times 2 \times \frac{22}{7} \times \sqrt{666} \times 91}{2 \times 5} = 185996 \approx speed\ of\ light\ 186000\ miles/secon$$

9-6 Dark Matter / Multi-verse:

From the following sequences:

$\sum_{i=1}^{36} i = 666$ $\sum_{i=50}^{61} i = 666$ $\sum_{i=70}^{78} i = 666$ $\sum_{79}^{86} i = 666 - 6$ $\sum_{93}^{99} i = 666 + 6$

$$or \sum_{i=1}^{36} i = 666 = (1 + 2 + 3) + \sum_{i=4}^{36} i = 6 + (666 - 6) \text{ which is} \rightarrow [1,3] \cup [4,36]$$



(Fig.25)

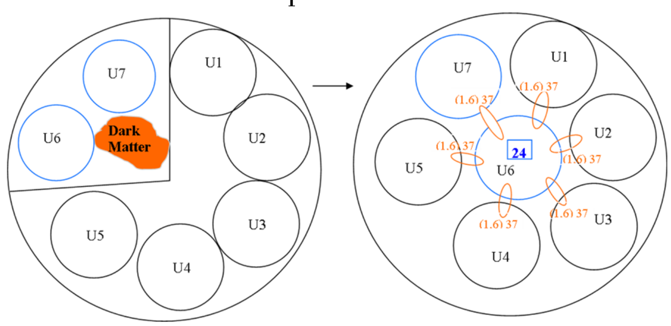
Then $(3 - 1) + (36 - 4) + (61 - 50) + (78 - 70) + (86 - 79) + (99 - 93) = 66 \rightarrow 66\%$

And $(1 - 0) + (4 - 3) + (50 - 36) + (70 - 61) + (79 - 78) + (93 - 86) = 33 \rightarrow 33\%$

Or from the following sum: $\sum_{i=1}^{99} i = 7 \times 666 + 288$

we have the difference: $\sum_{i=1}^{99} i - \left(\sum_{i=1}^{36} \boldsymbol{i} + \sum_{i=50}^{61} \boldsymbol{i} + \sum_{i=70}^{78} \boldsymbol{i} + \sum_{79}^{86} \boldsymbol{i} + \sum_{93}^{99} \boldsymbol{i}\right) = \mathbf{2 \times 666 + 288}$

Let's denote by: $666, 666 - 6$ and $666 + 6$ the three type of universes. Then the equation shows that 5 universes already formed, and a pair of paralleled universe is under construction (inflation), among the pair is our universe which is under expansion. The total of universes then is 7.



(Fig.26)

If we denote by $S = 666 \pm x\ where\ x \in f = \{0, \pm 6\}$, it shows the universes are charged +/- , which introduces the phenomena of electromagnetic between universes. The element 6 is the only composite number that reacts with the graviton related to the circle unity, then the element 6 could be the neutrino, the weakly interacting massive particle (WIMP) related to the weak force. (1,10) are transpalindromes with different parity relative to fermionic field and (6,60) are transpalindromes with same parity relative to the bosonic field.

(1,6) →is the super-partner image of $(10, 60)$ or we know $1^2 + 6^2 = 37 = G$

While 37 and 73 represent the event horizon relatively to the singularity 55, and 74 the wormhole.

We have : $10^2 + 60^2 = 100 \times 37\ and\ 2664 + 4662 + 74 = 2 \times 100 \times 37$

Space + Time + wormhole= twice ($10^2 + 60^2$) the double flux cone.

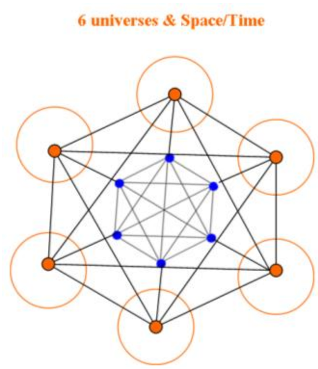
Conclusion: Image of a black hole is the wormhole.

Or from the 2 following equations: $\boldsymbol{Q = 288 = ((1+6)+37)6+24}$ And $\boldsymbol{T_{25} = \sum_{i=0}^{25} i = 288 + 37 \rightarrow 288}$
The number 288 represents Dark Matter Q, and $(1, 6)$ are the components of gravity $G = 37$,
The equation shows that dark matter provides the elements 1 and 6 to hold the gravity, without dark matter, gravity will collapse, although universes are connected through the gravity. The dark matter generates matter through the axis which is the backbone of the multi-verse that controls the space/time and provides also the first elements to create our universe. As a result, those equations describe a deep relation and show the connection between "Time & Gravity", "Dark Matter & Space" and "Dark Matter & Gravity", see **(7-7 Physical System)**. Note the number **24** represents the **First Element**, see (**9-8 First Element**).

9-7 Dimension: 6 Universes and Space/Time

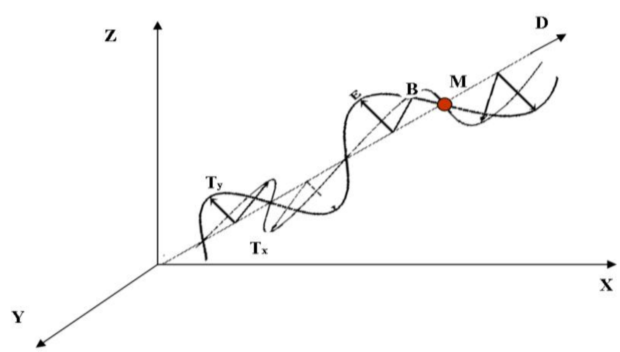
Corollary: Giving a set $M_{99} = \{1, 2, 3 \dots, 99\}$ embedded in a hyper-sphere S_{r^2} and let's denote by $M(\rho_1, \rho_2, \rho_3, \rho_4, \rho_5, \rho_6, \rho_7)$ a point of S_{r^2} with $\rho_{1 \le i \le 7}$ consecutive primes such that: $2 \le \rho_i < [r] - 6$ satisfying: $\sum_{i=1}^{7} \rho_i^2 = r^2$ where r is the Salahdin Daouairi's radius of the hyper-sphere S_{r^2} with $r^2 = 666$.
Then the dynamical of the system M_{99} and S_{r^2} defines the Dim of the Multi-verse which is 11, dim U = 11.

It shows that the dimension of the hyper-Sphere 666 equals to: $\mathrm{Dim} S_{r^2} = 6$, or the orbital of the elements of M_{99} bounded by the hyper-Sphere S_{r^2} define an extra of dimensions which is our curved Space / Time. Our Space/Time corresponds to a 5-Simplex polytope, then: $Dim\ Space/Time = 5$
→ The total dimension of the Multi-verse is equal to: Dim U=5+6=11.
This proves the extra 6 dimensions in the string theory, which add up from the extra universes that govern the Dark energy.



(Fig.27)

While dim of time $DimT = 2$, Time with its screw dynamical, curls around the space, and travel sideways. For a point M travelling a long a line D, time defines a double helix spiral around D.
Since D is a curved line due to the rotation of the multi-verse, then space/time defines curvature, the helical curvature of the time is induced though electromagnetism and space curvature.



(Fig.28)

9-8 **First Elements:**
I have to study the origin of the elements through the reaction:
$\sum_{i=37}^{49} \boldsymbol{i} + \sum_{i=62}^{69} \boldsymbol{i} + \sum_{i=87}^{92} \boldsymbol{i} \rightarrow = 2 \times 666 + 288$
For each of this sequence the composite numbers are:
$\sum_{i=37}^{49} \boldsymbol{i} \rightarrow \mathbf{49, 48, 46, 45, 44, 42, 40, 39, 38}$
$49 = \mathbf{7^2}$, $48 = \mathbf{2^3} \times 6$, $46 = 23 \times 2$, $45 = 5 \times \mathbf{3^2}$ $44 = \mathbf{2^2} \times 11$

$42 = 7 \times 6$; $40 = \mathbf{2^3} \times 5$; $39 = 13 \times 3$; $38 = 19 \times 2$

$\sum_{i=62}^{69} \boldsymbol{i} \rightarrow \mathbf{63, 64, 65, 66, 69} \rightarrow 63 = 7 \times \mathbf{3^2}$ $64 = \mathbf{2^6}$ $65 = 13 \times 5$ $66 = 6 \times 11$ $69 = 3 \times 23$

$\sum_{i=87}^{92} \boldsymbol{i} \rightarrow \mathbf{87, 88, 90, 91, 92} \rightarrow 87 = 29 \times 3$ $88 = \mathbf{2^3} \times 11$ $90 = \mathbf{3} \times 6 \times 5$ $91 = 13 \times 7$ $92 = \mathbf{2^2} \times 23$

Since 1 and 6 are the predominant numbers and since 6= 2x3 we will be eliminating then 3^i.

The decomposition of the composites into power primes leads to classify the first primes:

The primes which are in powers are: $1,\ \mathbf{2^2}, 2^3, \mathbf{2^4}, \mathbf{2^6}, \mathbf{3^2}, \mathbf{7^2} \rightarrow \mathbf{1, 2, 6, 7}, 2^3$

Since the powers of 3 and 6 intercept at the point 9: $3^n \cap 6^n = 9^n$ $3^n \cup 6^n = \{1,3,6,9\}$

$6^n = \{1;\ 2 \times 3;\ 9\}$

$1^n, 4^n, 5^n, 7^n, 8^n \subset 2^n$ with $4^n \neq 8^n$ and $8^n = \{1; 2 \times 4\}$

$8 = 4 \times 2$ eliminate 4 and 6= 3x2 eliminate 3

Conclusion: the first elements are (1,2,6,7,and 8) which correspond respectively to the following particles of the periodic table: **Hydrogen**, **Helium**, **Carbone**, **Nitrogen**, and **Oxygen**.

Those 5 elements are connected from the formulas:

$\prod_{i=1}^{5} \boldsymbol{E_i} = \mathbf{1 \times 2 \times 6 \times 7 \times 8 = 666 + 6}$

$\sum_{i=1}^{5} \boldsymbol{E_i} = \mathbf{1 + 2 + 6 + 7 + 8 = 24 = 6 + 6 + 6 + 6}$

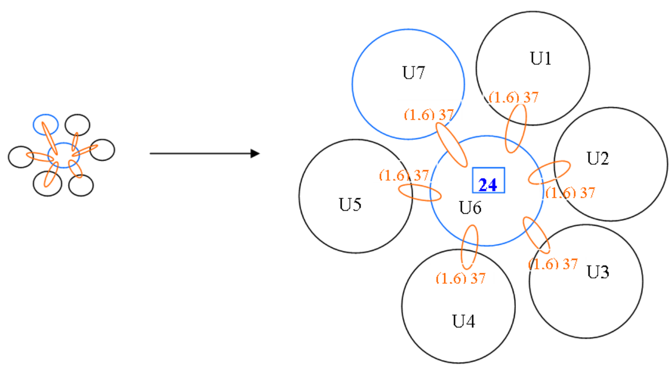
If we consider the reaction between the elements:

Initial State I⟶ Final State II $\{1,2,6,7,8\} \longrightarrow \prod_{i=1}^{5} \boldsymbol{E_i}$

Then the difference between the States is:

$\prod_{i=1}^{5} \boldsymbol{E_i} - \sum_{i=1}^{5} \boldsymbol{E_i} = \boldsymbol{\partial S} = \mathbf{666 - (6+6+6)} = \boldsymbol{S_{666} - S_{18}}$ **Equation of Torus: (Space/ Time)** Space and Time are made from Matter (first elements).

9-9 Big Bang Before and After:



(Fig.29)

From the previous formulas of numerical equations, we can give detailed explanations on how the system or the Multi-verse was formed! Well in the beginning it starts with dark matter, since it provides first elements, controls the gravity, which through it, generates time, connects the multi-universe, forms our universe through the first elements and generates matter through the axis which is the backbone of the multi-verse. Thus the singularity 55 of the black hole belongs to the axis Δ_{ii}.

From the equation: Dark Matter $= Q = 288 = (1 + 6 + 37) \times 6 + 24$ through the components $((1,6), 37)$

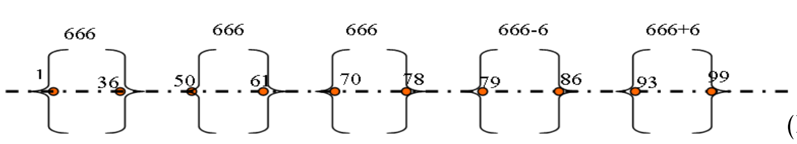
Dark Matter ⟶ First Elements + Gravity ⟶Space / Time

Time won't exist if there is no gravity, and gravity won't exist if there is no dark matter.

The first elements responsible for the Big Bang were continuously vibrating, with a harmonic oscillation, if they were stable, it won't be any reaction, means the time existed with the existence of the particles, among those particles the Graviton which is the counter. Since Dark Matter $= Q = 288 = 1 \times 2^3 \times 6^2 \rightarrow$ Dark Matter originates from first elements 1, 2 and 6 (Hydrogen, Helium and Carbone).

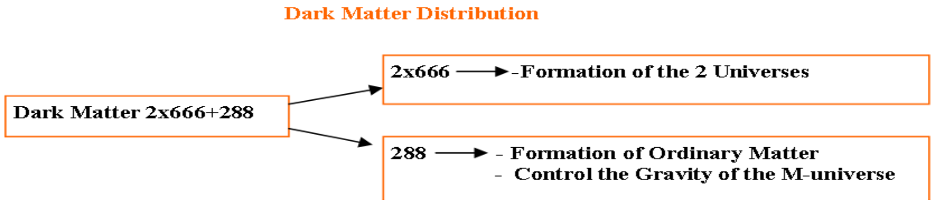
10- Inventory of the Multi-verse:

From this string we can deduct that the Dark Energy represents the 5 universes surrounding a pair of paralleled universe which is under expansion (inflation), among this pair is our universe.

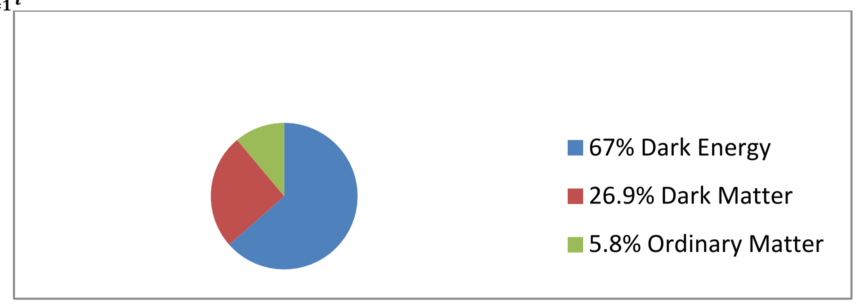


(Fig.30)

From this string we can deduct that the Dark Energy represents the 5 universes surrounding a pair of paralleled universe which is under expansion (inflation), among this pair is our universe.
From this string we can view the inventory proportion of the total of the Multi-verse :
Our homogenous system is formed from a total of matter $\sum_{i=1}^{99} i = 4950$ which represents 99%.
The Dark Energy (See below dark energy property) is represented by the 5 universes with a total matter proportion: $666 \times 5 = 3330$. The percentage then is equal to: $\frac{666\times5}{\sum_{i=1}^{99} i} = \mathbf{0.672 \rightarrow 67.2\%}$ **(Dark Energy).**



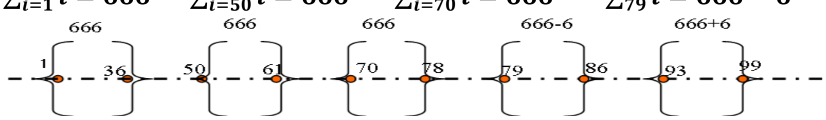
Dark matter exists everywhere in our universe, connects universes through gravity and provides ordinary matter to form our universe, with a total matter proportion: $666 \times 2 = 3330$
The percentage then equals to: $\frac{666\times2}{\sum_{i=1}^{99} i} = \mathbf{0.269 \rightarrow 26.9\%}$ **(Dark Matter).**
Then the proportion of dark matter equals to 288, responsible for providing ordinary matter with a percentage equals to: $\frac{288}{\sum_{i=1}^{99} i} = \mathbf{0.058 \rightarrow 5.8\%}$ **(Ordinary Matter).**



(Fig.31)

10-1 Dynamical System of the Multi-verse:

$\sum_{i=1}^{36} \boldsymbol{i} = \mathbf{666} \quad \sum_{i=50}^{61} \boldsymbol{i} = \mathbf{666} \quad \sum_{i=70}^{78} \boldsymbol{i} = \mathbf{666} \quad \sum_{79}^{86} \boldsymbol{i} = \mathbf{666 - 6} \quad \sum_{93}^{99} \boldsymbol{i} = \mathbf{666 + 6}$



$\sum_{i=1}^{99} i = \left(\sum_{i=1}^{36} \boldsymbol{i} + \sum_{i=50}^{61} \boldsymbol{i} + \sum_{i=70}^{78} \boldsymbol{i} + \sum_{79}^{86} \boldsymbol{i} + \sum_{93}^{99} \boldsymbol{i}\right) + \mathbf{2 \times 666 + 288}$
$\rightarrow \sum_{i=1}^{99} i = \left(6 + \sum_{i=4}^{36} \boldsymbol{i} + \sum_{i=50}^{61} \boldsymbol{i} + \sum_{i=70}^{78} \boldsymbol{i} + \sum_{79}^{86} \boldsymbol{i} + \sum_{93}^{99} \boldsymbol{i}\right) + \mathbf{2 \times 666 + 288}$
$\rightarrow \sum_{i=1}^{99} i = (6 + \mathbf{(666 - 6)} + \mathbf{(666)} + \mathbf{(666)} + \mathbf{(666 - 6)} + \mathbf{(666 + 6)} + \mathbf{2 \times 666 + 288}$
Or $\mathbf{2 \times 666 = (666 + 6) + (666 - 6)}$**. Let's denote by:** $\boldsymbol{a} = \mathbf{666 - 6}$, $\boldsymbol{b} = \mathbf{666}$, $\boldsymbol{c} = \mathbf{666 + 6}$
Then: $\sum_{i=1}^{99} i = 6 + a + b + b + a + c + c + a + 288$
If we denote by S the string of the 7 universes: $S = a + b + b + a + c + c + a$ [3]
We recognize this finite sequence as a string concatenation of alphabets a, b and c with length 7, for this regular language or expression lets define the product by composing letters of the string: Our string then has the form of: $abbacc$, which shows the alphabets orbit with an oscillation harmonic, (**See 5-chiral symmetry**).
Following the regular language $E_1 \cup E_2$ which is a combination of the two disjoints regular expressions $E_1 and\ E_2$, with a monoid structure, where the union is represented by +, the concatenation by the product and by using the Kleene's Star closure operation for this algorithm of string, where z^*defined by $z^* = 1 + z + z^2 + z^3 \ldots\ldots + z^n = \sum_0^\infty z^n = (1-z)^{-1}$ from the equation (I): $z^* = 1 + z.z^*$ then:
$(X/YY)^*$ *corresponds to* $(z/z^2)^*$ *that yield to* $(z + z^2)^*$.
And by replacing z by $F = z + z^2$ *in the equation* (I), $F^* = 1 + F.F^* = 1 + (z + z^2)F^*$
Yields to: $F^* = (1 - (z + z^2))^{-1}$ *or* $\frac{1}{1-(z+z^2)} = 1 + (z + z^2) + (z + z^2)^2 \ldots = \sum_0^\infty f_n z^n$
By the method of comparing the coefficients of z^n.
$\frac{1}{1-(z+z^2)} = \sum_{i=0}^\infty c_n z^n$ a Maclaurin series with undetermined coefficients c_n. The generating function for f_n

(Fibonacci sequence): $F^* = f(z) = \frac{1}{1-(z+z^2)} = \sum_0^\infty f_n z^n \rightarrow f_n = c_n$

The convergence radius of this series then is equal to: $R = lim_{n\to\infty}\left|\frac{C_n}{C_{n+1}}\right| = \varphi = \frac{1+\sqrt{5}}{2}$ Golden Ratio

Let's denote: $by\ S = \{a, b, c\}\ and\ by\ F_1 = a,\ F_2 = b\ and\ F_3 = c\ with\ F_n = F_{n-1}F_{n-2}$

And by $f_1 = 1\ ,\ f_2 = 1\ and\ f_n = f_{n-1} + f_{n-2}\ the\ fibonacci\ sequence$

We have then:

		f_n
F_1	a	1
F_2	b	1
F_3	$F_2F_1 = c = ba$	2
F_4	$F_3F_2 = bab$	3
F_5	$F_4F_3 = babc = babba$	5
F_6	$F_5F_4 = babbabab$	8

Note: $F_6 = babbabab\ since\ c = ba\ then\ F_6 = cbccb \rightarrow z/z^2$

Equation of this dynamical system:

$f_1 = 1\ ,\quad f_2 = 1\ and\ f_n = f_{n-1} + f_{n-2}\ the\ fibonacci\ sequence$

Let's denote $x_n = \begin{pmatrix} f_{n-1} \\ f_n \end{pmatrix}$ $and\ J = \begin{pmatrix} 0 & 1 \\ 1 & 1 \end{pmatrix}$ $then\ x_{n+1} = Jx_n(Operator\ J) \rightarrow x_n = J^n x_1$

The characteristic Equation: $det\begin{pmatrix} -\tau & 1 \\ 1 & 1-\tau \end{pmatrix} = 0\ \rightarrow \tau^2 - \tau - 1 = 0$

Eigen-value then are: $\tau_{1,2} = \frac{1}{2}(1 \pm \sqrt{5})$ and Eigenvectors $V_{1,2} = \begin{pmatrix} 1 \\ \tau_{1,2} \end{pmatrix}$

If $x_1 = \alpha V_1 + \beta V_2$ and with the initial data: $\alpha = -\beta = \frac{1}{\tau_1 - \tau_2} = \frac{1}{\sqrt{5}}$

then $\alpha {\tau_1}^n V_1 + \beta {\tau_2}^n V_2 = x_n$

$\rightarrow\ \boldsymbol{x_n = \frac{1}{\sqrt{5}}({\tau_1}^n - {\tau_2}^n) = \frac{1}{\sqrt{5}}\left((1+\sqrt{5})^n + (1-\sqrt{5})^n\right)}$ **solution of** $y'' - y' - 1 = 0$

Let's denote by $M = \frac{1+\sqrt{5}}{2}\ and\ R = \frac{1-\sqrt{5}}{2}$ then $f_n = \frac{1}{M-R}((M)^n + (R)^n)$

We retrieve then again the Hadamard Transformation by:

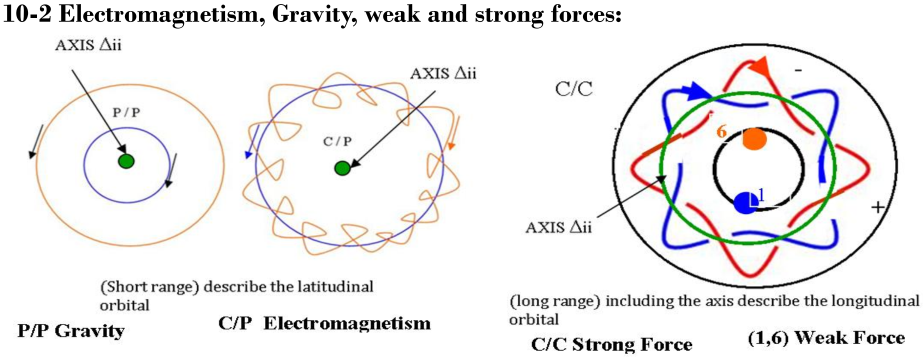
$\rightarrow \begin{pmatrix} M \\ R \end{pmatrix} = \frac{1}{2}\begin{pmatrix} 1 & 1 \\ 1 & -1 \end{pmatrix}\begin{pmatrix} x \\ y \end{pmatrix} = \frac{1}{\sqrt{2}} H \begin{pmatrix} x \\ y \end{pmatrix} \qquad with (x, y) = (1, \sqrt{5})$

Or: $\ 1 + \sqrt{5}^2 = \sqrt{6}^2\ which\ imply\ the\ sum\ of\ \ the\ circles\ C_1 + C_5 = C_6$

That generates the Gravity 37 through the quadratic equation of $(-1,6)\ \rightarrow\ 37 = 6^2 + (-1)^2$ relatively to the flow 5, or congruence modulo 5.

Conclusion: The Multi-verse orbits with an oscillation harmonic periodic in the form of the Spiral of Fibonacci that converges to $\varphi = \frac{1+\sqrt{5}}{2}$ the Golden Ratio.

10-2 Electromagnetism, Gravity, weak and strong forces:



(Fig.32)

As a result, we deduct through our system that:

- The gravity is represented by a prime with its super-partner prime image P/P (short range)
- The electromagnetic force by a composite with its super-partner prime image C/P (with medium range).
- The strong force by a composite with its super-partner composite image C/C (Long range)
- While weak force results from the interaction of the graviton 1 and neutrino 6

Summary of the Equation

With simple tools of ingenuity, pencil and paper, we discovered the equation for the Theory of Everything, and through it we learned that the architecture of the universe is based on the structure of discrete numbers which reveal the perfection, elegance, and beauty of the universe. We disclosed the solid foundation of the universe's structure and design through its mathematical framework. With this original Theory of Everything, we have created a new paradigm which finally divulges the secret reality behind the physical properties of our universe.

We live in an 11-dimensional universe, inside a mathematical equation. This mathematical equation will guide us and will lead us in the exploration and discovery of wonders that have never before been imagined. The "Equation of Everything" showed us how the entire system: S= {*Space/Time/Matter/Energy/Gravity/Electromagnetism*} is homogeneous, unified and connected, explained the most important fundamental physical theories, and revealed the hidden connection between quantum theory and the macro-system which relies on space/time/gravity (where the theory of quantum gravity is finally reached).

We finally through this simple equation have at last disclosed the enshrouded secrets of Time! We revealed Time's origin and its properties, and we demonstrated how a time machine could be generated from gravity and electromagnetism. We also learned about "dark energy" and "dark matter" (neither of which could be described experimentally). While dark matter (as the backbone of the multi-verse) attracts, connects the multi-verse, and controls galaxies through gravity, dark energy acts as the opposite "repellant force" that results from the dynamics of the multi-verse…a new breed of dynamics that possess the power to induce inflation and the expansion of our universe.

We learned in the quantum field, about the spin of a particle and its electro-dynamic behavior which determines the path or the "quantum circuits" for the system through an "automata language" program that create woven networks which constitute the "fabric" of space. Signals of radiation and energy are sent through this fabric "lattice" along a cyclic transformation.

The Equation also gave us the means by which to perceive the geometrical shape of the multi-verse which will allow us to accurately determine the rate of universal entropy. We revealed the origin of the "Big-Bang" and how the universe crystallized and coalesced during those first few micro-seconds of existence. The Equation disclosed the enormity of the universe and allowed us to envision and contemplate the universe's colossal inventory of matter and energy.

The equation that represents The Theory of Everything is an application of quantum gravity and String Theory from the notion of super-symmetry with the representation of spinors through the theory of harmonic motion, which is based on parity or "chiral symmetry" that appears to be reflected and seen in nature.

The Equation will disclose in the field of biology, an important relationship among DNA, quantum entanglement and electromagnetism due to DNA teleportation, structure and shape. A mathematical model based on electromagnetism embedded with the properties of quantum entanglement will provide the cure for many illnesses and will map out the shortest route for the discovery of new methods and techniques with which to finally defeat and eradicate the viruses that have been plaguing humankind for millennia.

By: Salahdin Daouairi

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