

On The Origin of Physical States

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ABSTRACT For the first time in mankind history, all properties of elementary particles are uncovered and described concisely and systematically.

Aligning with the synthesis of the virtual and physical worlds in a hierarchical taxonomy of the universe, this theory refines the topology framework of universe, and presents a new perspective of the Yin Yang natural laws that, through the processes of creation and reproduction, the fundamental elements generate an infinite series of circular objects and a Yin Yang duality of dynamic fields that are sequenced and transformed states of matter between the virtual and physical worlds.

Once virtual objects are transformed, they embody various enclaves of energy states, known as dark energy, quarks, leptons, bosons, protons, and neutrons, characterized by their incentive oscillations of timestate variables in a duality of virtual realities: energy and time, spin and charge, mass and space, symmetry and asymmetry.

As a consequence, it derives the fully-scaled quantum properties of physical particles in accordance with numerous historical experiments, and has overcome the limitations of Heisenberg's uncertainty principle and the Standard Model, towards concisely exploring physical nature and beyond...

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1. TOPOLOGY FRAMEWORK

From Bohr's view "Everything we call real is made of things that cannot be regarded as real"¹, to Dirac's investigation² on "lack of time-like excitations", to Feynman's claim for the "existence of the rest of the universe"³⁻⁴, the search for a new philosophical science to overcome physical uncertainty is today's key mission to the unresolved problems of contemporary physics.

In order to describe some new concepts of virtual and physical ontology precisely, we first turn to the fundamental terminology of matter, virtual existence, states, energy, and mass. The topological formulations are separate and distinct from any metaphysical inquiry:

1. *Matter* is defined normally as the set of *states*, which consists or is composed of any element, object, substance, subject, or situation. Its existence can appear as virtual, or physical, or both. In short, matter is an existence in the form of states or events in general, virtually and/or physically.

2. *Virtual* existence refers to various matters in virtual environments of the universe, named *Virtual world*. Or *Virtual world* is an environment containing any set of virtual matters. These matters or virtual objects exist prior

to, and are necessary for, the formation of physical world. Since there are many ways to bundle virtual objects, the confinements of an environment are determined by the way we group objects. One such hypothesis is the multiverse⁵⁻⁶.

A matter exists and cohabits a synthesis of virtual and physical worlds within a hierarchical taxonomy of the universe. As a pioneer illustration, Feynman introduced "the rest of the universe" in the following thought experiment³⁻⁴:

"When we solve a quantum-mechanical problem, what we really do is divide the universe into two parts - the system in which we are interested and the rest of the universe. We then usually act as if the system in which we are interested comprised the entire universe. To motivate the use of density matrices, let us see what happens when we include the part of the universe outside the system."

3. *States* are mutational and transformable variables of the appearances or characteristics in either the virtual or physical worlds, or both. The universe is a supernatural environment structured for the totality of existence in the form of states as the formational variables of energy and

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matter. By grouping the states into virtual or physical worlds, or both, we define the virtual and physical worlds as simultaneous or coexistent. In fact, states of a matter are overlaid with transformations across multiple worlds.

4. *Energy* is a property of the states associated with the variables in virtual worlds, which are mutable in the transformation between virtual and physical worlds, or between massless and massive objects of a matter. In a physical world, energy appears inexorable, intractable, and transferable among the states. Virtual objects are embedded in or emerge as the formation of energy.

5. *Mass* is the enclave of energies or virtual objects that is only embodied in a physical world. A physical world, commonly referred to as the outer world, has mass enclaves, while a virtual world, commonly referred to as the inner world, is massless. There are multiple levels of inner worlds and outer worlds. Outer worlds include physical matter of living beings and inanimate objects. Inner worlds are instances of situations, with or without energy or mass formation.

As a summary, from virtual to physical words, the topology framework can be laid out by the answers to each of the following questions, in the sequential order.

- a. Why does a photon have energy but no mass?
- b. Why can't a quark or boson exist individually?
- c. Why can a subatomic particle exist individually?

Based on these topological terminologies, virtual and physical ontology of universe particles can be presented with the following structure:

- Chapter 2: Natural Laws
- Chapter 3: Constitution of Matter
- Chapter 4: Yinyang Fields of Dynamics
- Chapter 5: Semi-Physical Particles
- Chapter 6: Fully-Physical Particles
- Chapter 7: Conclusions
- Chapter 8: Appendix

2. NATURAL LAWS

In the virtual worlds, the fundamental concept is: *Xing* (性) or Yin Yang (*Yinyang*)⁷⁻⁸ (阴阳) duality. To simplify the concepts, denote *Yin* as “-” and *Yang* as “+”, which plays a vital role for virtual constitution and formation under an environment of virtual space, named *Xingspace*. The yin and yang, or simply - and +, are the states of an element or an object, which form a coherent fabric of our nature, as exhibited in all physical existence. They are complementary, interrelated, interconnected, and interdependent, each opposite giving rises to the other, as they become tangible interaction: *Yinyang Fields* or *Xing*

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Fields. With these concepts, the relevant natural laws¹⁵ can be outlined and simplified to three principles as the following:

Law #1: Creation into Two. At the origin of the virtual worlds, creation is a dichotomy process of “one splitting into two” from a neutral element, denoted by “o”, to a pair of yin “-” and yang “+” as one opposite duality, confined under virtual xingspace fields, appearing as the heavenly virtual sensations.

Law #2: Reproduction into Three. Birthing of a generation is the process of “one reproduce into three”, as extensions of creation process for growth, which is always associated with opponent partners in closely bounded commutational interchanges. As one of the formation processes, parturition is initiated to structure primary elements followed by growing into a series of objects in xingspace and then transforming into semi-virtual and semi-physical objects under a field environment of both virtual time, and states, named *Yinyang Fields*, emerging into the earthly physical reactions.

Law #3: Converse Mirroring Effects. Between virtual and physical worlds, elements obey converse mirroring effects characterized by either their yinyang opposition and/or reverse sequencing in xingspace fields. Aligned with their motions, a sequence order of yin objects always has a mirror sequence of yang's, and vice versa. This law agitates and unifies both of law #1 and #2.

Between virtual and physical, there are three domains with each of their own type of spaces and times, respectively, defined by:

1. *Xingspace field: Xingscope in virtual worlds.*
2. *Timestate field: Statescope between virtual and physical worlds. An observer under statescope environment is usually within the observed system.*
3. *Spacetime field: Spacescope in physical worlds. A physical observer under spacescope environment is usually external to the observed system.*

In virtual worlds, yinyang interactions under xingspace produce a set of fields through the circular movements of the yinyang elements. This results in the virtual objects birthing reproductions or annealing cyclical processes, bi-directionally transforming into or from the timestate fields, the movements between spatially controlled virtual worlds and dimensionally confined physical worlds: spacetime dynamics.

Through the laws and definitions, listed above, the fundamental elements and objects in the virtual worlds

can be derived and shown in the following chapter, which are constituents of particles in our physical world.

3. CONSTITUTION OF MATTER

In a hierarchical taxonomy, b , of the universe, it consists of a collection of X^b generations, represented by the following notation:

$$X^b = \{X^b : b \in B[0, 1, 2, \dots]\} \quad (3.1)$$

where B is the set of natural numbers. Each X^b generation has a series of the matrix objects of $\{X_u\}$ as its members that contain vector elements of $\{X_{uv}\}$, shown as:

$$X^b = \{X_u = \{X_{uv} : v \in V[0, M_b - 1]\} : u \in U[0, \zeta_b - 1]\} \quad (3.2)$$

where V and U are integer groups of 0 to $M_b - 1$ and 0 to $\zeta_b - 1$, respectively.

The integer of M_b represents an index of the v elements in the X^b generation. Elements are supernatural sources of universe. Based on Law #2 for reproduction, the number of the elements follows its birthing process, "Reproduce into Three", when the b generation advances:

$$M_b = 3^b + M_1 : (b > 1), \quad M_0 = 0, \quad M_1 = 3 \quad (3.3)$$

where M_1 is a base for all generations.

The integer of ζ_b represents an index of the u vectors extending the X_u elements into ζ_b numbers of groups as objects, each of which has fixed M_b numbers as their common $\{X_{uv}\}$ elements. Each of the objects carries messages from the virtual worlds that transform between virtual and physical worlds. Therefore, the objects are named *Messaon* (信子 in Chinese), or virtual universe particles.

At the beginning of a world, a complete virtuality appears as if nothing, $M_0 = 0$, at the $b = 0$ initiation, called the b_0 generation, followed by its first b_1 creation, as inception of three $M_1 = 3$ foundations by a set of the xing symbols of (yin, neutral, yang) = $(- 0 +)$, similar to the "beginning of the world": heaven (+), super-element (o), and earth (-), respectively.

Upon this foundation, it grows with b from generation to generation, representing movements of life streaming and cycling in virtual worlds. Their constitution can be visualized by the following fundamental actions:

$$\nearrow (+) \rightsquigarrow (+ o +) \sim (+ - +) \quad (3.4a)$$

$$(o) \rightsquigarrow (o) \rightarrow (+ o -) \rightsquigarrow (\pm o \pm) \quad (3.4b)$$

$$\searrow (-) \rightsquigarrow (- o -) \sim (- - -) \quad (3.4c)$$

$$N_0 \quad N_1 \quad N_2 \quad a\downarrow \text{ or } a\uparrow \quad (3.4d)$$

where " \rightarrow " sign for creation, " \rightsquigarrow " for reproduction, and " \sim " for correlation.

These four columns of the b_2 generation v result from the reactions of yinyang fields on the super elements, creating and generating sets of virtual objects, messaons. The 1st column (o), messaon N_0 , creates yang (+), and yin (-), and descends itself (o) to the 2nd column, which forms messaon N_1 . Each of the elements either reproduces or creates elements in the 3rd column, messaon N_2 . Based on Law #3, elements at center of the 3rd column must reverse themselves to their xing opposite as mirror reflection. Similar to creation, it therefore generates the middle elements of the 4th column, producing a pair of messaons: $a\downarrow$ and $a\uparrow$. For more details, refer to Appendix.

Because yinyang fields continues to interact among themselves, a total of the $\zeta_0 = 12$ messaons appear at the b_2 generation as maxima, shown by:

Objects	Xing (u)	Elements (v)											YinYang Space				
		0	1	2	3	4	5	6	7	8	9	10	11	w_{\pm}	w_{\cdot}	w_0	w_+
N_0	u_0	-	0	0	0	0	0	0	0	0	0	+	0	0	1	10	1
N_1	u_1	-	-	-	-	0	0	0	+	+	+	+	0	0	4	4	4
N_2	u_2	-	0	0	-	0	+	+	0	+	+	0	0	0	4	4	4
N_3	$u_1 + u_2$	-	-	-	-	0	+	+	+	+	+	+	0	0	5	2	5
$a\downarrow$	$u_{a\downarrow}$	-	-	+	-	+	0	+	-	+	-	+	0	0	5	2	5
$b\downarrow$	$u_{a\downarrow} + u_1$	-	-	0	-	+	0	+	0	+	0	+	0	-1	3	5	4
$c\downarrow$	$u_{a\downarrow} + u_2$	-	-	+	-	0	0	+	0	+	0	+	0	-1	3	5	4
$d\downarrow$	$u_{a\downarrow} + u_1 + u_2$	-	-	0	-	0	0	+	+	+	+	+	0	-2	3	4	5
$a\uparrow$	$u_{a\uparrow}$	-	+	-	+	-	0	-	+	-	+	+	0	0	5	2	5
$b\uparrow$	$u_{a\uparrow} + u_1$	-	0	-	0	-	0	-	+	0	+	+	0	1	4	5	3
$c\uparrow$	$u_{a\uparrow} + u_2$	-	0	-	0	-	0	0	+	-	+	+	0	1	4	5	3
$d\uparrow$	$u_{a\uparrow} + u_1 + u_2$	-	-	-	-	0	0	+	0	+	+	+	0	2	5	4	3

Table A: Xing Matrix of Messaons

where the foundations of element $v = 0$ is earth, $v = 5$ and 11 super-elements, and $v = 10$ heaven. The yinyang interactions operates with the addition rule for yinyang signs: $(+, +) = +$, $(-, -) = -$, $(+, -) = 0$, $(0, \pm) = \pm$. Since nature of an element is beyond virtual worlds¹³, the yinyang capacity w_{\pm} of a messaon is a reverse to the summary $w_{+} + w_{-}$ of its yinyang elements.

The messaon N_0 is an object completely virtual at any worlds as an origin of supernatural resources, the dark energy, while N_1 is its first creation; appearing at the b_1 , b_2 , or any of generations. The N_2 is the initiation of the b_2 generation followed by its xing field interaction with N_1 's filed to form N_3 . The messaon $a\downarrow$ is an initiation of yin messaons, while the $a\uparrow$ an initiation of yang messaons. Finally, the yinyang interactions produce three more sets of messaon pairs:

$$(a\downarrow, a\uparrow), (b\downarrow, b\uparrow), (c\downarrow, c\uparrow), (d\downarrow, d\uparrow) \quad (3.6)$$

where the symbol ↓ denotes downwards to earth, and ↑ denotes upwards to heaven. These pairs form a foundational yinyang duality, particle-antiparticle, production-annihilation, symmetry-asymmetry, and so on. The messasons of $N_0, N_1, N_2, N_3, a\downarrow, a\uparrow$ under yinyang balance are neutral, named *Neuton* (神子 in Chinese). The $b\downarrow, c\downarrow, d\downarrow$ under yin influences are defined as *Yinton* (阴子 in Chinese), while the reminders of $b\uparrow, c\uparrow, d\uparrow$ under yang influences as *Yangon* (阳子 in Chinese).

4. YINYANG FIELDS OF DYNAMICS

Under the xing fields, messasons of b_2 generation form cycling sequencings of either a counterclockwise yin \ominus or a clockwise yang \odot . Assuming the yin fields convey the messasons of $X_{u\in X_u}$ for Eq(3.2) while the yang fields convey the messasons of $\dot{X}_{u\in X_u}$, we have the yinyang dynamics propagating the two sequencers \mathbf{X} 和 $\dot{\mathbf{X}}$, periodically:

$$\mathbf{X} \equiv \{X_{ij}\} = \{N_0, N_1, N_2, N_3, a\downarrow, a\uparrow, b\downarrow, b\uparrow, c\downarrow, c\uparrow, d\downarrow, d\uparrow\} \quad (4.1a)$$

$$\dot{\mathbf{X}} \equiv \{\dot{X}_{ij}\} = \{N_0, N_1, N_2, N_3, a\downarrow, a\uparrow, b\downarrow, b\uparrow, c\downarrow, c\uparrow, d\downarrow, d\uparrow\} \quad (4.1b)$$

$$\{X_{ij}\} = \{X_{u\in M_{ij}}\}, \quad \{\dot{X}_{ij}\} = \{\dot{X}_{u\in M_{ij}}\} \quad (4.2)$$

The two sequences of messasons represent the fundamental dialectical unity of the yinyang characteristics, emblematic of valuational equality rooted in unified, dynamic, and harmonized structures balanced by an alternative series of yin or yang supremacy.

Because of the alternative interacting of yin and yang fields, each of them periodically transforms messasons from xingspace to timestate to embody their appearances: the physical objects are initiated and characterized by periodic oscillations of virtual messasons following the procedures of:

- Virtual State: Virtual messasons in xingspace transformed to timestate of interval τ appear as discrete state levels, Quantum States (S).
- Oscillating Frequency: Emerging harmonic oscillators of virtual messasons embody as energy enclaves of semi-real objects, Energy Eigenstates (Ω).
- Statistic Integrity: timestate of spin, charge, and mass harmonize into elementary particles at a physical world, Spacetime Observation (\mathbb{O}).

Under the circular reactions $\exp(-i\omega\tau x)$ of the yin fields, it performs the matrix \mathbf{T} transformations in xingspace, sequencing the messason group $\{X_{ij}\}$ counterclockwise into a set of quantum statetime to provoke the semi-virtual ($x < 0$) or semi-physical ($x > 0$) objects. This action results the state function of $\psi(\tau)$ under the timestate fields in math forms of the following:

$$\psi(\tau) = \{\sum_u e^{-i\omega\tau x} X_{ij}\} = e^{-i\omega\zeta_b\tau/2} \mathbf{T} \mathbf{X} \quad (4.3a)$$

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$$x = \text{MOD}(u - 1/2\zeta_b, \zeta_b/2), \quad \omega = 2\pi/\tau_x \quad (4.3b)$$

$$\mathbf{T} \equiv \{T_{ij}\} = \{1, \omega^u, \omega^{2u}, \omega^{3u}, \omega^{4u}, \dots, \omega^{(\zeta_b-1)u}\}: \quad \omega = e^{-i\omega} \quad (4.3c)$$

Likewise, the yang fields, $\exp(-i\dot{\omega}\tau x)$, have similar actions of the matrix $\dot{\mathbf{T}}$ transformations sequencing clockwise into the messason group $\{\dot{X}_{ij}\}$ with the statetime functions $\psi(\tau)$ in math forms of the following:

$$\psi(\tau) = \{\sum_u e^{-i\dot{\omega}\tau x} \dot{X}_{ij}\} = e^{-i\dot{\omega}\zeta_b\tau/2} \dot{\mathbf{T}} \dot{\mathbf{X}} \quad (4.4a)$$

$$x = \text{MOD}(1/2\zeta_b - u, \zeta_b/2), \quad \dot{\omega} = 2\pi/\tau_x \quad (4.4b)$$

$$\dot{\mathbf{T}} \equiv \{\dot{T}_{ij}\} = \{1, \omega^u, \omega^{2u}, \omega^{3u}, \omega^{4u}, \dots, \omega^{(\zeta_b-1)u}\}: \quad \omega = e^{i\dot{\omega}} \quad (4.4c)$$

Mathematically, the Eq.(4.3c) and (4.4c) are the two samplers at u times the $(1/\zeta_b)^{\text{th}}$ circular rotation over arrays of the sequences $\{X_{ij}\}$ or $\{\dot{X}_{ij}\}$, respectively in opposite directions of counterclockwise $e^{-i\dot{\omega}}$ or clockwise $e^{i\dot{\omega}}$. Each of the u intervals in xingspace represents exact intervals in timestate as the associated discrete times, or simply:

$$\tau \in x \mid \dot{x} \quad (4.5)$$

The angular frequencies of yin ω and yang $\dot{\omega}$ are scalar rotation rates at their rotation cycle of τ_x or $\tau_{\dot{x}}$, respectively. They have a half phase of virtual forms under xingspace and another half phase of physical forms under timestate, mutating between virtual and physical worlds. Therefore, the frequencies yield a yang principle of virtual domain, xingscope, and a yin principle of physical domain, statescope, simultaneously as of:

$$\dot{\omega}\Delta\tau < \pi/\zeta_b \quad \omega\Delta\tau \geq \pi/\zeta_b \quad (4.6a)$$

Using Planck constant of \hbar , the principle becomes:

$$\Delta E \Delta\tau \geq \pi\hbar/\zeta_b \quad \Delta E = \hbar\omega \quad (4.6b)$$

This is known as the correspondence principle of uncertainty¹¹ as the classical limit at spacetime.

5. SEMI-PHYSICAL PARTICLES

With Eq (4.3) and (4.4) sampling the two sequencers of $\{X_{ij}\}$ or $\{\dot{X}_{ij}\}$, it is straightforward to derive the matrices of the quantum states of yin S_x and yang $S_{\dot{x}}$, shown as Table B-C, respectively.

S_x	0	1	2	3	4	5	6	7	8	9	10	11
S_0	N_0	N_0	N_0	N_0	N_0	N_0	N_0	N_0	N_0	N_0	N_0	N_0
S_5	N_0	N_1	N_2	N_3	$a\downarrow$	$a\uparrow$	$b\downarrow$	$b\uparrow$	$c\downarrow$	$c\uparrow$	$d\downarrow$	$d\uparrow$
S_4	N_0	N_2	$a\downarrow$	$b\downarrow$	$c\downarrow$	$d\downarrow$	N_0	N_2	$a\downarrow$	$b\downarrow$	$c\downarrow$	$d\downarrow$
S_3	N_0	N_3	$b\downarrow$	$c\downarrow$	N_0	N_3	$b\downarrow$	$c\downarrow$	N_0	N_3	$b\downarrow$	$c\downarrow$
S_2	N_0	$a\downarrow$	$c\downarrow$	N_0	$a\downarrow$	$c\downarrow$	N_0	$a\downarrow$	$c\downarrow$	N_0	$a\downarrow$	$c\downarrow$
S_{-1}	N_0	$a\uparrow$	$d\downarrow$	N_3	$c\downarrow$	N_1	$b\downarrow$	$d\uparrow$	$a\downarrow$	$c\uparrow$	N_2	$b\uparrow$
$\psi(S_0) \sim$	N_0	$b\downarrow$	N_0	$b\downarrow$	N_0	$b\downarrow$	N_0	$b\downarrow$	N_0	$b\downarrow$	N_0	$b\downarrow$
S_{+1}	N_0	$b\uparrow$	N_2	$c\uparrow$	$a\downarrow$	$d\uparrow$	$b\downarrow$	N_1	$c\downarrow$	N_3	$d\downarrow$	$a\uparrow$
S_{+2}	N_0	$c\downarrow$	$a\downarrow$	N_0	$c\downarrow$	$a\downarrow$	N_0	$c\downarrow$	$a\downarrow$	N_0	$c\downarrow$	$a\downarrow$
S_{+3}	N_0	$c\uparrow$	$b\downarrow$	N_3	N_0	$c\uparrow$	$b\downarrow$	N_3	N_0	$c\uparrow$	$b\downarrow$	N_3
S_{+4}	N_0	$d\downarrow$	$c\downarrow$	$b\downarrow$	$a\downarrow$	N_2	N_0	$d\downarrow$	$c\downarrow$	$b\downarrow$	$a\downarrow$	N_2
S_{+5}	N_0	$d\uparrow$	$d\downarrow$	$c\uparrow$	$c\downarrow$	$b\uparrow$	$b\downarrow$	$a\uparrow$	$a\downarrow$	N_3	N_2	N_1

Table B: Quantum Matrix of Yin States (S_x)

\hat{S}_i	0	1	2	3	4	5	6	7	8	9	10	11
\hat{S}_{15}	N_0	$d\downarrow$	$d\uparrow$	$c\downarrow$	$c\uparrow$	$b\downarrow$	$b\uparrow$	$a\downarrow$	$a\uparrow$	N_3	N_2	N_1
\hat{S}_{14}	N_0	$d\uparrow$	$c\uparrow$	$b\uparrow$	$a\uparrow$	N_2	N_0	$d\uparrow$	$c\uparrow$	$b\uparrow$	$a\uparrow$	N_2
\hat{S}_{13}	N_0	$c\downarrow$	$b\uparrow$	N_3	N_0	$c\downarrow$	$b\uparrow$	N_3	N_0	$c\downarrow$	$b\uparrow$	N_3
\hat{S}_{12}	N_0	$c\uparrow$	$a\uparrow$	N_0	$c\uparrow$	$a\uparrow$	N_0	$c\uparrow$	$a\uparrow$	N_0	$c\uparrow$	$a\uparrow$
\hat{S}_{11}	N_0	$b\downarrow$	N_2	$c\downarrow$	$a\uparrow$	$d\downarrow$	$b\uparrow$	N_1	$c\uparrow$	N_3	$d\uparrow$	$a\downarrow$
$\psi(\hat{S}_{10})$	N_0	$b\uparrow$	N_0	$b\uparrow$	N_0	$b\uparrow$	N_0	$b\uparrow$	N_0	$b\uparrow$	N_0	$b\uparrow$
\hat{S}_{10}	N_0	$a\downarrow$	$d\uparrow$	N_3	$c\uparrow$	N_1	$b\uparrow$	$d\downarrow$	$a\uparrow$	$c\downarrow$	N_2	$b\downarrow$
\hat{S}_9	N_0	$a\uparrow$	$c\uparrow$	N_0	$a\uparrow$	$c\uparrow$	N_0	$a\uparrow$	$c\uparrow$	N_0	$a\uparrow$	$c\uparrow$
\hat{S}_8	N_0	N_3	$b\uparrow$	$c\downarrow$	N_0	N_3	$b\uparrow$	$c\downarrow$	N_0	N_3	$b\uparrow$	$c\downarrow$
\hat{S}_7	N_0	N_2	$a\uparrow$	$b\uparrow$	$c\uparrow$	$d\downarrow$	N_0	N_2	$a\uparrow$	$b\uparrow$	$c\uparrow$	$d\downarrow$
\hat{S}_6	N_0	N_1	N_2	N_3	$a\uparrow$	$d\downarrow$	$b\uparrow$	$b\downarrow$	$c\uparrow$	$c\downarrow$	$d\uparrow$	$d\downarrow$
\hat{S}_0	N_0	N_0	N_0	N_0	N_0	N_0	N_0	N_0	N_0	N_0	N_0	N_0

Table C: Quantum Matrix of Yang States (\hat{S}_i)

These two matrices will composite as physical universe particles representing various “flavors” and “colors” for the particle physics¹⁰ and algebra structures of symmetry and asymmetry for the group theory¹².

The number of appearances for each of the messaons at a given state represents their emerging frequencies in a quantum level, individually, shown by the following Table D-E:

Occurrence Matrix - Number of Yin φ	\hat{S}_i	Frequency Matrix of Yin Field
N_0 N_1 N_2 N_3 $a\downarrow$ $a\uparrow$ $b\downarrow$ $b\uparrow$ $c\downarrow$ $c\uparrow$ $d\downarrow$ $d\uparrow$	\hat{S}_i	N_0 N_1 N_2 N_3 $a\downarrow$ $a\uparrow$ $b\downarrow$ $b\uparrow$ $c\downarrow$ $c\uparrow$ $d\downarrow$ $d\uparrow$
12 0 0 0 0 0 0 0 0 0 0 0 0	\hat{S}_{10}	- - - - - - - - - - - -
1 1 1 1 1 1 1 1 1 1 1 1 1	\hat{S}_9	φ_1
2 0 2 0 2 0 2 0 2 0 2 0 2	\hat{S}_8	φ_2 - φ_2 - φ_2 - φ_2 - φ_2 - φ_2 -
3 0 0 3 0 0 3 0 0 3 0 0 0	\hat{S}_7	φ_3 - - φ_3 - - φ_3 - - φ_3 - -
4 0 0 0 4 0 0 0 4 0 0 0 0	\hat{S}_6	φ_4 - - - φ_4 - - - φ_4 - - -
1 1 1 1 1 1 1 1 1 1 1 1 1	\hat{S}_{11}	φ_5 φ_1
6 0 0 0 0 0 6 0 0 0 0 0 0	\hat{S}_{10}	φ_6 - - - - φ_6 - - - -
1 1 1 1 1 1 1 1 1 1 1 1 1	\hat{S}_{11}	φ_5 φ_1
4 0 0 0 4 0 0 0 4 0 0 0 0	\hat{S}_{12}	φ_4 - - - φ_4 - - - φ_4 - - -
3 0 0 3 0 0 3 0 0 3 0 0 0	\hat{S}_{13}	φ_3 - - φ_3 - - φ_3 - - φ_3 - -
2 0 2 0 2 0 2 0 2 0 2 0 2	\hat{S}_{14}	φ_2 - φ_2 - φ_2 - φ_2 - φ_2 - φ_2 -
1 1 1 1 1 1 1 1 1 1 1 1 1	\hat{S}_{15}	φ_1
40 4 8 10 16 4 20 4 16 10 8 4	Sum	5 1 2 2 3 1 4 1 3 2 2 1

Table D: Matrix of Yin Frequency $\mathcal{Q}\{f_{i\varphi}\}$

Occurrence Matrix - Number of Yang ω	\hat{S}_i	Frequency Matrix of Yang Field
N_0 N_1 N_2 N_3 $a\uparrow$ $a\downarrow$ $b\uparrow$ $b\downarrow$ $c\uparrow$ $c\downarrow$ $d\uparrow$ $d\downarrow$	\hat{S}_i	N_0 N_1 N_2 N_3 $a\uparrow$ $a\downarrow$ $b\uparrow$ $b\downarrow$ $c\uparrow$ $c\downarrow$ $d\uparrow$ $d\downarrow$
1 1 1 1 1 1 1 1 1 1 1 1 1	\hat{S}_{15}	ω_1
2 0 2 0 2 0 2 0 2 0 2 0 2	\hat{S}_{14}	ω_2 - ω_2 - ω_2 - ω_2 - ω_2 - ω_2 -
3 0 0 3 0 0 3 0 0 3 0 0 0	\hat{S}_{13}	ω_3 - - ω_3 - - ω_3 - - ω_3 - -
4 0 0 0 4 0 0 0 4 0 0 0 0	\hat{S}_{12}	ω_4 - - - ω_4 - - - ω_4 - - -
1 1 1 1 1 1 1 1 1 1 1 1 1	\hat{S}_{11}	ω_1
6 0 0 0 0 0 6 0 0 0 0 0 0	\hat{S}_{10}	ω_6 - - - - ω_6 - - - -
1 1 1 1 1 1 1 1 1 1 1 1 1	\hat{S}_9	ω_1
4 0 0 0 4 0 0 0 4 0 0 0 0	\hat{S}_8	ω_2 - - - ω_2 - - - ω_2 - - -
3 0 0 3 0 0 3 0 0 3 0 0 0	\hat{S}_7	ω_3 - - ω_3 - - ω_3 - - ω_3 - -
2 0 2 0 2 0 2 0 2 0 2 0 2	\hat{S}_6	ω_4 - ω_4 - ω_4 - ω_4 - ω_4 - ω_4 -
1 1 1 1 1 1 1 1 1 1 1 1 1	\hat{S}_5	ω_1
12 0 0 0 0 0 0 0 0 0 0 0 0	\hat{S}_0	ω_0 - - - - ω_0 - - - -
40 4 8 10 16 4 20 4 16 10 8 4	Sum	5 1 2 2 3 1 4 1 3 2 2 1

Table E: Matrix of Yang Frequency $\mathcal{Q}\{f_{i\omega}\}$

where $f_{i\omega}$ and $\hat{f}_{i\omega}$ are integers, and the last line is the emerging rate of messaons. Applying the yinyang capacity w_{\pm} of Table A to each object at the left sides of Table D-E, we have matrices of yinyang capacity of Table F. From Table D under yin fields, the messaon $b\downarrow$ appears 25% more frequently than the $a\downarrow$ or $c\downarrow$. Likewise, from Table E under

yang fields, the messaon $b\uparrow$ appears 25% more frequently than the $a\uparrow$ or $c\uparrow$, parallel to the recent LHC discovery⁹⁻¹⁰.

Yin Matrix of Frequency $\mathcal{Q}\{f_{i\varphi}\}$												Yang Matrix of Frequency $\mathcal{Q}\{f_{i\omega}\}$																	
\hat{S}_i	N_0	N_1	N_2	N_3	$a\downarrow$	$a\uparrow$	$b\downarrow$	$b\uparrow$	$c\downarrow$	$c\uparrow$	$d\downarrow$	$d\uparrow$	w_-	w_+	\hat{S}_i	N_0	N_1	N_2	N_3	$a\uparrow$	$a\downarrow$	$b\uparrow$	$b\downarrow$	$c\uparrow$	$c\downarrow$	$d\uparrow$	$d\downarrow$	w_-	w_+
\hat{S}_0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\hat{S}_0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
\hat{S}_1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\hat{S}_1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
\hat{S}_2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\hat{S}_2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
\hat{S}_3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\hat{S}_3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
\hat{S}_4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\hat{S}_4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
\hat{S}_5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\hat{S}_5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
\hat{S}_6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\hat{S}_6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
\hat{S}_7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\hat{S}_7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
\hat{S}_8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\hat{S}_8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
\hat{S}_9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\hat{S}_9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
\hat{S}_{10}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\hat{S}_{10}	0	0	0	0	0	0	0	0	0	0	0	0	0	0
\hat{S}_{11}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\hat{S}_{11}	0	0	0	0	0	0	0	0	0	0	0	0	0	0
\hat{S}_{12}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\hat{S}_{12}	0	0	0	0	0	0	0	0	0	0	0	0	0	0
\hat{S}_{13}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\hat{S}_{13}	0	0	0	0	0	0	0	0	0	0	0	0	0	0
\hat{S}_{14}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\hat{S}_{14}	0	0	0	0	0	0	0	0	0	0	0	0	0	0
\hat{S}_{15}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\hat{S}_{15}	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sum	0	0	0	0	0	0	-20	4	-16	10	-16	8	-52	22	Sum	0	0	0	0	0	0	0	0	0	0	0	0	0	

Table F: Yin or Yang Capacity of Matrices: $\check{Y}(w_-)$ and $\check{Y}(w_+)$

In order to calculate the final physical parameters, statistical analysis must first be introduced to derive some intermediate variables as a means of transitioning or bridging from a virtual world to a semi-virtual world. At any of a given quantum state, the parameters can be defined by:

z_i : Number of the messaon types ($i=0,+,-,\pm,a$) (5.1)

ζ_b : Dimension of xingspace (5.2)

f_x : Number of occurrences within a xingspace cycle (5.3)

ζ_i : Yinyang degree of xing space ($i=0,+,-,\pm$) (5.4)

π_i : Yinyang probability ($i=+,-$), $\pi_+ = \zeta_- / \zeta_{\pm}$, $\pi_- = \zeta_+ / \zeta_{\pm}$ (5.5)

q_i : Yinyang charge ($i=+,-$), $q_- = \zeta_- / \zeta_b$, $q_+ = \zeta_+ / \zeta_b$ (5.6)

where the index of ($i=a$: all), ($i=0$: neutron), ($i=+$: yangon), ($i=-$: yinton), ($i=\pm$: yangon+yinton). As a means of transition to a semi-physical world, these definitions derive the physical parameters as the following:

σ_i : Spin, $\sigma_0 = \zeta_0 / \zeta_b$, $\sigma_{\pm} = \zeta_{\pm} / \zeta_b$ (5.7)

q : Charge, $q = q_+ + q_-$ (5.8)

With these preparatory definitions, the Tables G-H exhibit the semi-physical particles in timestate between the virtual and physical worlds.

Yin Property of the b2 State Variables																				
States	Yin Fields				Neuton				Yinton				Yangon				Total YinYang			
	Space	Types	Occur	Degree	Spin	Types	Degree	Prob.	Charge	Types	Degree									

for the yangon $b\uparrow$ charged with $+1/2$, at spin $1/2$, a **semi-Positron**; or S_{+0} , for the yinton $b\downarrow$ charged with $-1/2$ at spin $1/2$, a **semi-Electron**. Both are associated with N_0 neutons. Further more, at the states of S_{-0} and S_{+0} , there are pure N_0 neutons at spin 1, known as **Bosons, Photons or etc.**

antiproton, and another type of the 3-pairs at states of $(S_{\pm 4}, S_{\mp 2}, S_{\pm 4})$ charge-balanced at $+1$ ($=+2/3-1/3+2/3$), known as **proton**.

Yang Property of the b2 State Variables																		
States	Yang Fields			Neutron			Yangon			Yinton			Total YinYang					
	Space	Types	Occur	Degree	Spin	Types	Degree	Prob.	Charge	Types	Degree	Prob.	Charge	Types	Degree	Spin	Charge	Types
S_{+5}	12	12	1	6	1/2	6	+4	2/3	+1/3	3	-4	2/3	-1/3	3	6	1/2	0	6
S_{+4}	12	6	2	6	1/2	3	+8	4/3	+2/3	3				6	1/2	+2/3	3	
S_{+3}	12	4	3	6	1/2	2	+3	1/2	+1/4	1	-3	1/2	-1/4	1	6	1/2	0	2
S_{+2}	12	3	4	8	2/3	2	+4	1	+1/3	1				4	1/3	+1/3	1	
S_{+1}	12	12	1	6	1/2	6	+4	2/3	+1/3	3	-4	2/3	-1/3	3	6	1/2	0	6
S_{+0}	12	2	6	6	1/2	1	+6	1	+1/2	1				6	1/2	+1/2	1	
S_{-1}	12	12	1	6	1/2	6	+4	2/3	+1/3	3	-4	2/3	-1/3	3	6	1/2	0	6
S_{-2}	12	3	4	8	2/3	2	+4	1	+1/3	1				4	1/3	+1/3	1	
S_{-3}	12	4	3	6	1/2	2	+3	1/2	+1/4	1	-3	1/2	-1/4	1	6	1/2	0	2
S_{-4}	12	6	2	6	1/2	3	+8	4/3	+2/3	3				6	1/2	+2/3	3	
S_{-5}	12	12	1	6	1/2	6	+4	2/3	+1/3	3	-4	2/3	-1/3	3	6	1/2	0	6
S_{-0}	12	1	12	12	1	1	0	0	0	0	0	0	0	0	0	0	0	0

Table H: Yang Elementary Particles (Semi-Physical)

Under yin or yang fields, at state $S_{\pm 4}$, there emerge two types of the 3-pair semi-particles at $1/2$ spin charged with $\pm 2/3$, respectively. At $S_{\pm 2}$, there are two types of one-pair semi-particles at $1/3$ spin charged with $\pm 1/3$, respectively. The “types” represents particles and anti-particles; the “pair” represents “flavors”; while the number for pairs represents “colors”. In fact, associated with various numbers of neutons, messaons manifest semi-physical particles appeared more variations than currently known “flavors” or “colors” of **Quarks or Bosons**¹⁰.

The basic characteristics of the $b2$ generation is the semi-virtual and semi-physical particles with fractional charges formed by the doublet sequencers of messaons.

6. FULLY-PHYSICAL PARTICLES

Messaons in the $b2$ generation evolves further into the $b3$ generation, where they are balanced under a coherent equilibrium stabilized in their respective field states. Based on Law #2, among them, every three sequences of the $b2$ states are grouped together to form a unity of the $b3$ substances¹⁴. Therefore, three of the $b2$ sequences orchestrate in harmonic convolutions, which happens being translated to the point-wise multiplications in timestate domain as the following math equations:

$$\Psi(\tau) = T_{b1} \{ X_{a1}(x) * X_{b1}(\tau-x) * X_{c1}(x-\tau) \}; T_b = \hat{T}_{b1} T_b \quad (6.1)$$

$$= \Psi_{a1}(\tau) \Psi_{b1}(1/2 \zeta_{b1} \tau) \Psi_{c1}(\zeta_{b1} \tau); \tau \in X | \dot{x} \quad (6.2)$$

Finally, the messaons are materialized into fully-physical particles of subatomics in spacetime, shown in the tables of I-J, from which, the composite particles of spin $1/2$ have one type of the 3-pairs at states of $(S_{\pm 4}, S_{\mp 2}, S_{\pm 4})$ charge-balanced at -1 ($=-2/3+1/3-2/3$), known as

Yin Property of the b3 State Variables with Charges																			
States	Yin Fields					Yan Fields					Yin Fields					Total			
	Degree	Spin	Charge	Types	Occur	Degree	Spin	Charge	Types	Occur	Degree	Spin	Charge	Types	Occur	Charge	Types		
S_{+5}	6	1/2	0	6	1	S_{+0}	6	1/2	+1/2	1	6	S_{+0}	0	0	0	0	+1/2	1	
S_{+4}	6	1/2	-2/3	3	2	S_{+1}	6	1/2	0	6	1	S_{+3}	6	1/2	0	6	1	0	6
S_{+3}	6	1/2	0	2	3	S_{+2}	4	1/3	+1/3	1	4	S_{+4}	6	1/2	-2/3	3	2	-1	3
S_{+2}	6	1/2	0	2	3	S_{+3}	6	1/2	0	2	3	S_{+3}	6	1/2	0	2	3	0	2
S_{+1}	4	1/3	-1/3	1	4	S_{+4}	6	1/2	+2/3	3	2	S_{+2}	4	1/3	-1/3	1	4	0	3
S_{+0}	6	1/2	0	6	1	S_{+5}	6	1/2	0	6	1	S_{+1}	6	1/2	0	6	1	0	6
S_{-1}	6	1/2	-1/2	1	6	S_{-0}	0	0	0	0	0	S_{-0}	6	1/2	-1/2	1	6	-1	1
S_{-2}	6	1/2	0	6	1	S_{-1}	6	1/2	0	6	1	S_{-3}	6	1/2	0	6	1	0	6
S_{-3}	4	1/3	-1/3	1	4	S_{-2}	6	1/2	+2/3	3	2	S_{-2}	4	1/3	-1/3	1	4	0	3
S_{-4}	6	1/2	0	2	3	S_{-3}	6	1/2	0	2	3	S_{-3}	6	1/2	0	2	3	0	2
S_{-5}	6	1/2	-2/3	3	2	S_{-4}	4	1/3	+1/3	1	4	S_{-4}	6	1/2	-2/3	3	2	-1	3
S_{-0}	6	1/2	0	6	1	S_{-1}	6	1/2	0	6	1	S_{-5}	6	1/2	0	6	1	0	6

Table I: Yin Field of Composite Particles (Fully-Physical)

Yang Property of the b3 State Variables with Charges																			
States	Yang Fields					Yin Fields					Yang Fields					Total			
	Degree	Spin	Charge	Types	Occur	Degree	Spin	Charge	Types	Occur	Degree	Spin	Charge	Types	Occur	Charge	Types		
S_{+5}	6	1/2	+1/2	1	6	S_{+0}	0	0	0	0	0	S_{+0}	6	1/2	+1/2	1	6	1	1
S_{+4}	6	1/2	0	6	1	S_{+1}	6	1/2	0	6	1	S_{+1}	6	1/2	0	6	1	0	6
S_{+3}	4	1/3	+1/3	1	4	S_{+2}	6	1/2	-2/3	3	2	S_{+2}	4	1/3	+1/3	1	4	0	3
S_{+2}	6	1/2	0	2	3	S_{+3}	6	1/2	0	2	3	S_{+3}	6	1/2	0	2	3	0	2
S_{+1}	6	1/2	+2/3	3	2	S_{+4}	4	1/3	-1/3	1	4	S_{+4}	6	1/2	+2/3	3	2	1	3
S_{+0}	0	0	0	0	0	S_{+5}	6	1/2	0	6	1	S_{+5}	6	1/2	0	6	1	0	6
S_{-1}	6	1/2	-1/2	1	6	S_{-0}	6	1/2	-1/2	1	6	S_{-0}	0	0	0	0	-1/2	1	
S_{-2}	6	1/2	0	6	1	S_{-1}	6	1/2	0	6	1	S_{-3}	6	1/2	0	6	1	0	6
S_{-3}	6	1/2	+2/3	3	2	S_{-2}	4	1/3	-1/3	1	4	S_{-2}	6	1/2	+2/3	3	2	1	3
S_{-4}	6	1/2	0	2	3	S_{-3}	6	1/2	0	2	3	S_{-3}	6	1/2	0	2	3	0	2
S_{-5}	4	1/3	+1/3	1	4	S_{-4}	6	1/2	-2/3	3	2	S_{-2}	4	1/3	+1/3	1	4	0	3
S_{-0}	6	1/2	0	6	1	S_{-1}	6	1/2	0	6	1	S_{-1}	6	1/2	0	6	1	0	6

Table J: Yang Field of Composite Particles (Fully-Physical)

In addition to the neutons at spin $1/2$, these composite particles have one type of the 3-pairs at the states of $(S_{\pm 2}, S_{\mp 4}, S_{\pm 2})$ charge-balanced to neutral 0 ($=-1/3+2/3-1/3$), known as **Neutrons**, and another type of the 3-pairs at states of $(S_{\pm 2}, S_{\mp 4}, S_{\pm 2})$ charge-balanced to neutral 0 ($=1/3-2/3+1/3$) as well, known as **Antineutrons**. Furthermore, there are more triplet composite neutrons, antineutrons, or neutrinos at any of the states shown in the tables of K-L.

Yin Property of the b3 State Variables for Neutons																		
States	Yin Sequence					Yang Sequence					Yin Sequence					Total		
	Degree	Spin	Types	Occur	Table	Degree	Spin	Types	Occur	Table	Degree	Spin	Types	Occur	Table	Table	Table	
S_{+0}	12	1	1	12	S_{+0}	6	1/2	1	6	S_{+0}	12	1	1	12	12.6,12	1	6	
S_{+1}	6	1/2	6	1	S_{+1}	6	1/2	6	1	S_{+1}	6	1/2	6	1	1,1,1	6	1	
S_{+2}	6	1/2	3	2	S_{+2}	8	2/3	2	4	S_{+2}	6	1/2	3	2	2,4,2	5	5	
S_{+3}	6	1/2	2	3	S_{+3}	6	1/2	2	3	S_{+3}	6	1/2	2	3	3,3,3	4	4	
S_{+4}	8	2/3	2	4	S_{+4}	6	1/2	3	2	S_{+4}	8	2/3	2	4	4,2,4	5	5	
S_{+5}	6	1/2	6	1	S_{+5}	6	1/2	6	1	S_{+5}	6	1/2	6	1	1,1,1	6	6	
S_{-1}	6	1/2	1	6	S_{-1}	12	1	1	12	S_{-1}	6	1/2	1	6	6,12,6	1	1	
S_{-2}	6	1/2	6	1	S_{-2}	6	1/2	6	1	S_{-2}	6	1/2	6	1	1,1,1	6	6	
S_{-3}	8	2/3	2	4	S_{-3}	6	1/2	3	2	S_{-3}	8	2/3	2	4	4,2,4	5	5	
S_{-4}	6	1/2	2	3	S_{-4}	6	1/2	2	3	S_{-4}	6	1/2	2	3	3,3,3	4	4	
S_{-5}	6	1/2	3	2	S_{-5}	8	2/3	2	4	S_{-5}	6	1/2	3	2	2,4,2	5	5	
S_{-0}	6	1/2	6	1	S_{-0}	6	1/2	6	1	S_{-0}	6	1/2	6	1	1,1,1	6	6	

Table K: Yin Field of Neutrons (Fully-Physical)

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Yang Property of the b3 State Variables for Neutons																	
Yang Sequence					Yin Sequence					Yang Sequence					Total		
States	Degree	Spin	Types	Occur	States	Degree	Spin	Types	Occur	States	Degree	Spin	Types	Occur	Triple Loop Occur	Types	
\hat{S}_τ	ζ_0	σ_0	z_0	f_k	\hat{S}_τ	ζ_0	σ_0	z_0	f_k	\hat{S}_τ	ζ_0	σ_0	z_0	f_k	f	z_a	
\hat{S}_{+0}	6	1/2	1	6	\hat{S}_{-0}	12	1	1	12	\hat{S}_{+0}	12	1/2	1	6	6,12,6	1	
\hat{S}_{-1}	6	1/2	6	1	\hat{S}_{-3}	6	1/2	6	1	\hat{S}_{-1}	6	1/2	6	1	1,1,1	6	
\hat{S}_{-2}	8	2/3	2	4	\hat{S}_{-4}	6	1/2	3	2	\hat{S}_{-2}	8	2/3	2	4	4,2,4	5	
\hat{S}_{-3}	6	1/2	2	3	\hat{S}_{-3}	6	1/2	2	3	\hat{S}_{-3}	6	1/2	2	3	3,3,3	4	
\hat{S}_{-4}	6	1/2	3	2	\hat{S}_{-2}	8	2/3	2	4	\hat{S}_{-4}	6	1/2	3	2	2,4,2	5	
\hat{S}_{-5}	6	1/2	6	1	\hat{S}_{-1}	6	1/2	6	1	\hat{S}_{-5}	6	1/2	6	1	1,1,1	6	
\hat{S}_{-0}	12	1	1	12	\hat{S}_{+0}	6	1/2	1	6	\hat{S}_{-0}	12	1	1	12	12,6,12	1	
\hat{S}_{-3}	6	1/2	6	1	\hat{S}_{-1}	6	1/2	6	1	\hat{S}_{-3}	6	1/2	6	1	1,1,1	6	
\hat{S}_{-4}	6	1/2	3	2	\hat{S}_{-2}	8	2/3	2	4	\hat{S}_{-4}	6	1/2	3	2	2,4,2	2	
\hat{S}_{-3}	6	1/2	2	3	\hat{S}_{-3}	6	1/2	2	3	\hat{S}_{-3}	6	1/2	2	3	3,3,3	4	
\hat{S}_{-2}	8	2/3	2	4	\hat{S}_{-4}	6	1/2	3	2	\hat{S}_{-2}	8	2/3	2	4	4,2,4	5	
\hat{S}_{-1}	6	1/2	6	1	\hat{S}_{-3}	6	1/2	6	1	\hat{S}_{-1}	6	1/2	6	1	1,1,1	6	

Table L: Yang Field of Neutrons (Fully-Physical)

From the messaoon states in Table B-C, the Table I-J expound that conversion points of the vertexes at the states of both $(\hat{S}_{+0}\hat{S}_{-0}\hat{S}_{+0})$ and $(\hat{S}_{+0}\hat{S}_{-0}\hat{S}_{+0})$ have the essential properties of:

- ★ $b \uparrow$ fades away at \hat{S}_{+0} under yin supremacy.
- ★ $b \downarrow$ under yin supremacy embodies at \hat{S}_{+0} as **Electron**.
- ★ $b \downarrow$ fades away at \hat{S}_{+0} under yang supremacy.
- ★ $b \uparrow$ at yang supremacy, embodies at \hat{S}_{+0} as **Positron**.
- ★ Dark Energy N_0 dominates at \hat{S}_{-0} and \hat{S}_{+0} .

The basic characteristics of the $b3$ generation is the fully-physical particles in integer charges formed by the triple sequencers of messaoons, known as **Leptons**, **Neutrinos**, and **subatomics**¹⁰.

7. CONCLUSIONS

In summary, messaoons natively produce all of elementary particles, antiparticles, and their compositions. Under symmetry and asymmetry, a fully-physical particle of $b3$ generation is composed of the triple messaoon sequencers of $b2$ generation including *Leptons* and *subatomics* with integer charges, while a semi-virtual particle of $b2$ generation is composed of the double messaoon sequencers of $b1$ generation including Quarks with fractional charges. Besides, *Bosons*, including gauge boson, exist at all generations formed by the special N_0 messaoon, as dark energy, is embedded within all of the messaoons, carrying all type of the forces of weak, strong, gravity, or electromagnetic dynamic fields.

Worlds in Universe is a holistic theory for the intimate interconnections among the three fundamental domains: while virtual objects in *xingspace* emerge the various transition fields of states in *timestate*, they institute spacetime with dimensionality relative to their movements and synergies. State, time and spaces are the variables of spin, charge, and energy spectra, generated by *yinyang* fields under their interrelated duality of messaoon sequencers. In physical worlds, they appear in the form of

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the earthly dimensional dynamics and the heavenly virtual time states, affiliating with chronicle events.

This enlightenment¹³ has shown that the particle research can be expanded to its internal movements beginning from yinyang duality in xingspace with the double sequencers and triple-loop convolutions in timestate, to state symmetries of transforming fields, to energy oscillations of virtual objects, and finally to spacetime degrees of relative dynamics.

As a conclusion, this paper has presented the inception principle of quantum states appeared as the fully-scaled properties of universe particles. In the physical world, the dynamic fields of energy and mass in spacetime will be uncovered explicitly in the next paper.

8. APPENDIX

At the beginning of a world, a complete virtuality appears as if nothing, $M_0=0$, at the $b=0$ initiation, called the $b0$ generation, followed by its first $b1$ creation, as inception of three $M_1=3$ foundations by a set of the xing symbols of (yin,neutral,yang) $=(-0+)$, similar to the “beginning of the world”: heaven (+), super-element (o), and earth (-), respectively.

Upon this foundation, it grows with b from generation to generation, representing movements of life streaming and cycling in virtual worlds. For the $b2$ generation, there are $M_2=12$ elements. Their constitution can be visualized by the following fundamental actions¹³⁻¹⁴:

$$\nearrow (+) \rightsquigarrow (+ o +) \sim (+ - +) \quad (A.1a)$$

$$(o) \rightsquigarrow (o) \rightarrow (+ o -) \rightsquigarrow (\pm o \pm) \quad (A.1b)$$

$$\searrow (-) \rightsquigarrow (- o -) \sim (- + -) \quad (A.1c)$$

$$N_0 \quad N_1 \quad N_2 \quad a \downarrow \text{ or } a \uparrow \quad (A.1d)$$

where “ \rightarrow ” sign for creation, “ \rightsquigarrow ” for reproduction, and “ \sim ” for mirroring. These four columns of the $b2$ generation v result from the reactions of yinyang fields on the super elements, creating and generating sets of virtual objects, messaoons. The yinyang interactions operates with the addition rule \mp for yinyang signs: $\mp(+,+)=+$, $\mp(-,-)=-$, $\mp(+,-)=0$, $\mp(0,\pm)=\pm$.

The 1st column (o), messaoon N_0 , creates yang (+), and yin (-), and descends itself (o) to the 2nd column, which forms messaoon N_1 . The messaoon N_0 is an object completely virtual at any worlds as an origin of supernatural resources, the dark energy. Her xing symbol of u_0 shown by the 1st column of figure (A.1) is concealed on each of the 9 elements, shown as the incentive elements $v=1-9$ of messaoon N_0 in Table A, and denoted as the following:

$$N_0: u_0 = (o) \rightarrow (ooo) (ooo) (ooo) \quad (A.2a)$$

The N_1 is N_0 's first creation; appearing at the $b1$, $b2$, or any of next generations. Its elements are formed into three groups incepting its first $b1$ creation, inheriting from the base elements of $(+o-)$, and emerging into the 9 elements with its xing symbol of u_1 shown by the 2nd column of figure (A.1):

$$N_1: u_1 = (-, o, +) \rightarrow (---) (ooo) (+++) \quad (A.2b)$$

Each of the elements either reproduces or creates elements in the 3rd column, messaoon N_2 . Descending these three groups from the N_1 , the messaoon N_2 is an initiation of the $b2$ generation with its xing symbol of u_2 shown by the 3rd column of figure (A.1):

$$N_2: u_2 = (-o-) (-o+) (+o+) \quad (A.2c)$$

Followed by the xing u_2 fields interacting with N_1 's fields, it emerges the N_3 object shown by Table A. Its xing symbol is $u_3 = u_1 + u_2$, given by the following formula:

$$N_3: u_3 = u_1 + u_2 = (---, ooo, +++) \hat{+} (-o-, -o+, +o+) \\ = (---, -o+, +++) \quad (A.2d)$$

where each of the individual elements interacts with itself in different objects obeying the addition rule $\hat{+}$.

Based on Law #3, elements at center of the 3rd column must reverse themselves to their xing opposite as mirror reflection. Similar to creation, it therefore generates the middle elements of the 4th column in figure (A.1), producing a pair of messaoons: $a\downarrow$ and $a\uparrow$. The messaoon $a\downarrow$ is an initiation of yin messaoons, while the messaoons $a\uparrow$ an initiation of yang messaoons. They have their xing characteristics of $u_{a\downarrow}$ and $u_{a\uparrow}$, shown by the 4th column of figure (A.1) as the following, respectively:

$$a\downarrow: u_{a\downarrow} = (++) (+o+) (-+-) \quad (A.2e)$$

$$a\uparrow: u_{a\uparrow} = (++) (-o-) (++) \quad (A.2f)$$

Because yinyang fields continues to interact among themselves, a total of the $\zeta_b=12$ messaoons appear at the $b2$ generation as maxima. Finally, yinyang interactions produce the rest of the messaoons, with one yin set of $(b\downarrow, c\downarrow, d\downarrow)$ and another yang set of $(b\uparrow, c\uparrow, d\uparrow)$. The yinyang characteristics of each messaoon are given as the following, respectively:

$$b\downarrow: u_{b\downarrow} = u_1 + u_{a\downarrow} = (-o-) (+o+) (o+o) \quad (A.2g)$$

$$c\downarrow: u_{c\downarrow} = u_2 + u_{a\downarrow} = (++) (oo+) (o+o) \quad (A.2h)$$

$$d\downarrow: u_{d\downarrow} = u_1 + u_2 + u_{a\downarrow} = (-o-) (oo+) (o+o) \quad (A.2i)$$

$$b\uparrow: u_{b\uparrow} = u_1 + u_{a\uparrow} = (o-o) (-o-) (+o+) \quad (A.2j)$$

$$c\uparrow: u_{c\uparrow} = u_1 + u_{a\uparrow} = (o-o) (-oo) (++) \quad (A.2k)$$

$$d\uparrow: u_{d\uparrow} = u_1 + u_2 + u_{a\uparrow} = (---) (-oo) (+o+) \quad (A.2l)$$

In summary, the (A.1a-d) picture depicts Xing characteristics of the following objects, each of which contains the 9 elements with the $M_1=3$ fundamental elements ($v=0, 10, 11$), respectively. The rest of the objects are generated by the yin and yang reactions with the details summarized in the following Table A:

Matrix X_{uv} of Elements (v) with Xing (u) Movements																		
Objects	Xing (u)	Elements (v)											YinYang Space					
		0	1	2	3	4	5	6	7	8	9	10	11	w_{\pm}	w_{-}	w_{o}	w_{+}	
N_0	u_0	-	o	o	o	o	o	o	o	o	o	o	+	o	0	1	10	1
N_1	u_1	-	-	-	-	o	o	o	+	+	+	+	+	o	0	4	4	4
N_2	u_2	-	-	o	-	-	o	+	+	o	+	+	+	o	0	4	4	4
N_3	u_1+u_2	-	-	-	-	-	o	+	+	+	+	+	+	o	0	5	2	5
$a\downarrow$	$u_{a\downarrow}$	-	-	+	-	+	o	+	-	+	-	+	+	o	0	5	2	5
$b\downarrow$	$u_{a\downarrow}+u_1$	-	-	o	-	+	o	+	o	+	o	+	+	o	-1	3	5	4
$c\downarrow$	$u_{a\downarrow}+u_2$	-	-	+	-	o	o	+	o	+	o	+	+	o	-1	3	5	4
$d\downarrow$	$u_{a\downarrow}+u_1+u_2$	-	-	o	-	o	o	+	+	+	+	+	+	o	-2	3	4	5
$a\uparrow$	$u_{a\uparrow}$	-	+	-	+	-	o	-	+	-	+	-	+	o	0	5	2	5
$b\uparrow$	$u_{a\uparrow}+u_1$	-	o	-	o	-	o	-	+	o	+	+	+	o	1	4	5	3
$c\uparrow$	$u_{a\uparrow}+u_2$	-	o	-	o	-	o	o	+	-	+	+	+	o	1	4	5	3
$d\uparrow$	$u_{a\uparrow}+u_1+u_2$	-	-	-	-	-	o	o	+	o	+	+	+	o	2	5	4	3

Table A: Xing Matrix of Messaoons

where the foundations of element $v=0$ is earth, $v=5$ and 11 super-elements, and $v=10$ heaven. Since the super nature of an element is beyond virtual worlds¹³, the yinyang capacity w_{\pm} of a messaoon is a reverse to the summary $w_{\pm} = -(w_{+}+w_{-})$ of its yinyang elements.

Due to the translation complexity, this entire section includes only some relative contents of the theory from the Chinese books of [14] and [15].

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