

Dr. Prof. Tambara Federico's Logical Progression of Twelve Double Binary Tables of Physical-Mathematical Elements Correlated with Scientific-Philosophical as well as Metaphysical Key-concepts Evidencing the Dually Four-dimensional Basic Structure of the Universe

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ABSTRACT

Through a logical progression of twelve double binary tables of symmetrically four-dimensional associations (all of these being supported by interrelated physical-mathematical concepts and data), the author of this Research Essay, Dr. Prof. Tambara Federico, aims at developing new, more deepened scientific-philosophical outlooks and assumptions (including, among other things, the Millennium Problem of Prime Numbers) that will very probably prove themselves exploitable by both Theoretical and Applied Sciences, as pointed out in the final Part of this "revolutionary" Research Study by Dr. Prof. Tambara Federico (which also contains five remarkable conclusive theoretical considerations, each of them being supported by further scientific evidence based on physical-mathematical data and formulas).

INTRODUCTION

It must in first place be considered that the two relativistic key-concepts of, respectively, "Momentum, or energy/mass" and "space/time" no doubt involve what might be defined as "the smartest and most remarkable duality in physical reality", according to the following algebraic equations (worked out by Dr. Prof. Tambara Federico and aimed at unveiling the dually four-dimensional essence of the whole Universe, in particular reference to: rest mass " m_0 " VS. Relativistic mass " m "; Rest energy " E_0 " Vs. Relativistic energy " E "; Proper length " L_0 " VS. Contracted length " L "; Proper time " Δt_0 " VS. Dilated time " Δt "):

m_0 (rest mass of each particle) = $\frac{E_0}{c^2} = \frac{E}{\gamma c^2} = \frac{E}{c^2} \sqrt{1 - \frac{v^2}{c^2}}$; while m (relativistic mass) = $\frac{E}{c^2} = \frac{E_0}{c^2} \gamma = \frac{E_0}{c^2} \frac{1}{\sqrt{1 - \frac{v^2}{c^2}}}$; which in its turn is proportional to:

E_0 (rest energy of each particle) = $m_0 c^2 = \frac{E}{\gamma} = E \sqrt{1 - \frac{v^2}{c^2}}$; while E (relativistic energy) = $\gamma m_0 c^2 = \frac{E_0}{\sqrt{1 - \frac{v^2}{c^2}}}$; which in its turn is proportional to: L_0 (proper length) = $L \gamma = \frac{L}{\sqrt{1 - \frac{v^2}{c^2}}}$; while L (contracted length) = $L_0 \sqrt{1 - \frac{v^2}{c^2}}$; which in its turn is proportional to: t_0 (proper time) = $\frac{\Delta t}{\gamma} = \Delta t \sqrt{1 - \frac{v^2}{c^2}}$; while t (dilated time) = $\gamma t_0 = \frac{\Delta t_0}{\sqrt{1 - \frac{v^2}{c^2}}}$.

In second place, even the electromagnetic interaction field (in parallel with the above-mentioned interrelated concepts of momentum, or energy/mass and space/time) is similarly based on a dually four-dimensional structure given by, respectively, the dielectric vacuum constant ϵ_0 and the Vacuum constant of magnetic permeability μ_0 (a structure that can be decoded in the following physical-mathematical terms herewith expressed in the international system units of measurement):

$\epsilon_0=(8.85 \times 10^{12}) \text{ C}^2/(\text{N} \times \text{m}^2)$, corresponding to the four-dimensional combination: $8.85 \times 10^{-12} (\text{A}^2 \times \text{s}^4)/(\text{Kg} \times \text{m}^3)$;

$\mu_0=(1.26 \times 10^{-6}) \text{ N/A}^2$, corresponding to the four-dimensional combination: $1.26 \times 10^{-6} (\text{Kg} \times \text{m})/(\text{A}^2 \times \text{s}^2)$.

As concerns the basic universal formulas relative both to LATENT (or "HIDDEN") HEAT and to MOMENTUM (or "IMPULSE"), they also show clear evidence of the four-dimensional structure of physical reality, as pointed out in the following equations:

Latent heat "L"=[(heat "Q", or energy "E"): (mass "m")] \times [(space "s")²: (time "t")²]=space²: time², so that:

Momentum, or impulse=(heat, or energy: latent heat) \times (space: time), corresponding to the four-dimensional combination (expressed in I. S. units of measurement): [(J/°K) \times (m/s)]^[1].

Similarly, even the "0/1" numeration (related to the respective exponents of: 2⁰ and 2¹) in the binary system can, as a matter of fact, be decoded as a four-dimensional mathematical combination based just upon the absolute value "1" and implicitly given by:

$$1) [(\pm 1)-(\pm 1)]=0; \rightarrow 2) [(\pm 1)-(\pm 1)^{-1}]=0; 3) [(\pm 1) \times (\pm 1)]=1; \rightarrow 4) [(\pm 1) \times (\pm 1)^{-1}]=1.$$

Even more, by algebraically exploiting the above-mentioned concept of physical reality as a four-dimensional structure (in relation to both his own binary dialectics and the theory of numbers), Dr. Prof. Tambara Federico has managed to devise a comparatively easy solution to the millennium problem concerning prime numbers through a universal rule for systematically individuating the progression of all prime numbers in the following terms:

By adding to and subtracting from the square of each number as well as the product of two immediately consecutive numbers their respective contiguously preceding and/or following numbers so as to obtain uneven results, then at least one out of two results is always to be a prime number (as to products), whereas at least two out of four results are always to be prime numbers (as to squares) (**Figure 1**).

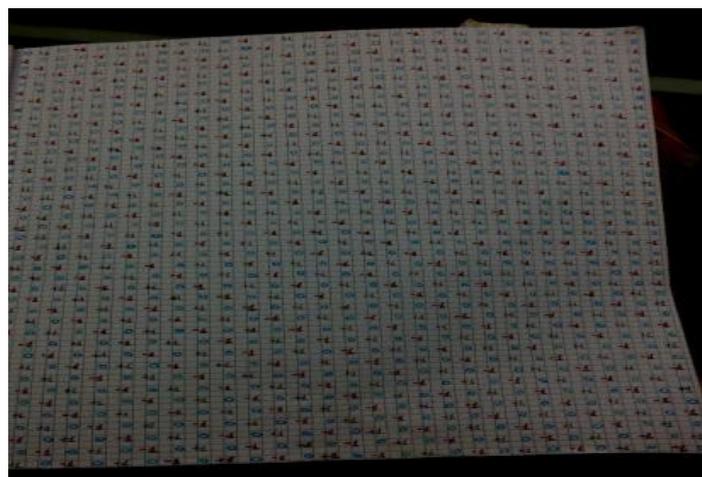


Figure 1. Tables of "algebraically pythagorical" pattern 1.

Elementary examples of parallel number progressions

Products of immediately consecutive numbers with corresponding couples of uneven results:

$$(2 \times 3)+1=7 \text{ AND } (2 \times 3)-1=5 // (3 \times 4)+5=17 \text{ AND } (3 \times 4)-5=7 // (4 \times 5)+3=23 \text{ AND } (4 \times 5)-3=17 // (5 \times 6)+7=37 \text{ AND } (5 \times 6)-7=23 // (6 \times 7)+5=47 \text{ AND } (6 \times 7)-5=37 // (7 \times 8)+9=65 \text{ (composite number) AND } (7 \times 8) - 9=47 // (8 \times 9)+7=79 \text{ AND } (8 \times 9)-7=65 \text{ (composite number) // } (9 \times 10)+11=101 \text{ AND } (9 \times 10)-11=79 // (10 \times 11)+9=119 \text{ (composite number) AND } (10 \times 11)-9=101.$$

Squares with corresponding "quartets" of uneven results

(3)²+2=11 and (3)²-2=7 and (3)²+4=13 and (3)²-4=5 // (4)²+1=17 and (4)²-1=15 (composite number) and (4)²+3=19 and (4)²-3=13 // (5)²+4=29 and (5)²-4=21 (composite number) and (5)²+6=31 and (5)²-6=19 // (6)²+5=41 and (6)²-5=31 and (6)²+7=43 and (6)²-7=29 // (7)²+4=53 and (7)²-4=45 (composite number) and (7)²+6=55 (composite number) and (7)²-6=43 // (8)²+5=69 (composite number) and (8)²-5=59 and (8)²+7=71 and (8)²-7=57 (composite number) // (9)²+8=89 and (9)²-8=73 and (9)²+10=91 (composite number) and (9)²-10=71 // (10)²+9=109 and (10)²-9=91 (composite number) and (10)²+11=111 (composite number) and (10)²-11=89^[2].

In this way Dr. Prof. Tambara Federico, by adapting his own physical-mathematical (as well as scientific-philosophical) dialectics to the above-mentioned binary combinations, has also managed to develop a logical progression of twelve double binary tables moving (through interrelated parallel sequences) from the infinitesimally small up to the (micro/macro) cosmic levels that "mold" physical reality itself, as listed in the Section below **Table 1**.

Twelve double binary tables of four-dimensionally symmetrical associations

First double binary table of four-dimensionally symmetrical associations (**Figure 2**).



Figure 2. Tables of "algebraically pythagorical" pattern 2.

Going back to the very origins of the Universe, two couples of fundamental and deeply correlated factors (or "archetypes" underlying physical reality itself) can be individuated, which are respectively to be identified with:

Table 1. Second double binary table of four-dimensionally symmetrical associations.

1) $[A \text{ primeval cause of physical reality (more than probably an unlimited temperature } \infty \text{ force mathematically equal to: } 0^0/0^0)] \infty 2)$
 $[Primeval \text{ effect (mathematically equal to the undetermined quotient of the former)}] \leftrightarrow 3)$ $[Beginning \text{ of a universal "chain of actions"}] \infty 4)$
 $[consequent \text{ beginning of a universal, parallel "chain of reactions"}] ././1) [(momentum \times time): (mass \times space)] \infty 2)$ $[Its \text{ only possible corresponding quotient, equal to: } 1] \leftrightarrow 3)$ $[Creation \text{ of "quantity" (related to everything)}] \infty 4)$ $[parallel \text{ creation of "quality" (related to everything)].$
 (This parallelism is the key to all other symmetrically structured, binary sequences analyzed further below).

Considering the above-mentioned couples of factors (mathematically equal, respectively, to $0^0:: 0^0$ and 1), it can be noticed that the very first four natural numbers in the decimal system (respectively: 0, 1, 2, and 3) unquestionably compose an exclusive "quartet" of immediately consecutive "elementary" numbers that start from the "neutral" base $0=0^n=0^n+... n (0^n)$ (without any composite ones among them, in that both "0" and "1", although not properly identifiable with prime numbers, are nevertheless infinite powers as well as infinite roots of themselves, so that they can be practically compared to and considered as prime numbers): consequently, 0, 1, 2, and 3 are also the only natural numbers that include, in themselves, immediately consecutive arithmetical sums **Table 2**.

The aforesaid mathematical "quartet", in its turn, can be paralleled with the universal physical "quartet" consisting of, respectively: the gravitational, the weak nuclear, the electromagnetic, and the strong nuclear interactions between all existing elementary particles/antiparticles, as pointed out in the following double binary table:

Table 2. Third double binary table of four-dimensionally symmetrical associations.

$\{1\} [0=0^n=0^n+...n (0^n)=0^1] \rightarrow 2) [1=0^n+...n (0^n)=1^1] \infty \{3\} [2=0^n+...n (0^n)+1^n+1^n=1^n+2^0=2^1] \rightarrow 4) [3=0^n+...n (0^n)+1^n++ 2^0=2^0+2^1=3^1]$
 $\{1\} [Gravitational \text{ interaction}] \leftrightarrow 2) [Weak \text{ nuclear interaction}] \infty \{3\} [Electromagnetic \text{ interaction}] \leftrightarrow 4) [Strong \text{ nuclear interaction}]$

Among other things, it can also be noticed that any other existing forces – no matter whether natural or artificial ones – are just "composite" forces, in that they always result from these four universal interactions (**Figure 3**).

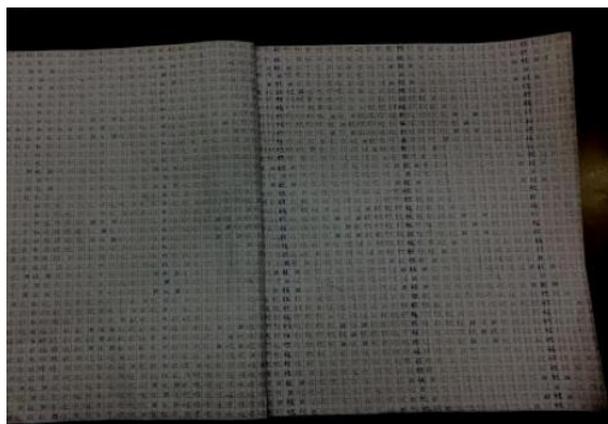


Figure 3. Tables of "algebraically pythagorical" pattern 3.

The above-mentioned four interaction fields can in their turn be paralleled with the four fundamental geometric entities as well as dimensions (respectively: point, line, area, and volume), which similarly interact with each other and thus end by composing every possible geometric site or shape in space (or, more precisely, in space-time), so that:

Table 3. Fourth double binary table of four-dimensionally symmetrical associations.

1) [Gravitational force] ↔ 2) [Weak nuclear force] ∞ 3) [Electromagnetic force] ↔ 4) [Strong nuclear force]. //
1) [Point] ↔ 2) [(Either continuous or varying) straight vs. curved line] ∞ 3) [(Rectilinear vs. curvilinear) area] ↔ 4) [Volume].

These four geometrical "archetypes" can also be compared to quanta, which began to produce, through all possible mutual collisions between photons and photons or gravitons and gravitons, or else photons and gravitons, respectively matter/antimatter particles or else photonic units (composing "dark", that is invisible, neither properly leptonic nor properly hadronic matter/antimatter) along with axionic units (composing "dark" energy) at the very beginnings of the Universe **Table 3**.

And in relation to all what considered above, as well as according to Dr. Prof. Tambara Federico's theory of everything, both gravitonic and photonic quanta were first generated (and subsequently made collide with each other) very short after the Big Bang, that is about 10⁻⁵⁰ seconds A.T.B., by an unlimited and allmighty, as well as unconditionally space less, timeless and massless temperature ∞ force that had previously "splitted up" (and thereby caused the big bang itself): all this must presumably have taken place at a primeval, unrepeatably 10³⁵ °k temperature (when gravitonic and photonic quanta were generated), which was very soon to lower down to 10³² °k (when universal gravitation first came into existence as a force separated from the other universal ones) **Table 4** [3].

On the basis of such considerations, all possible interactions between elementary particles can be consequently paralleled with as many geometrical configurations in the space-time continuum, as evidenced in the following table:

Table 4. Fifth double binary table of four-dimensionally symmetrical associations.

1) [points ∩ points (=production of the basic linear components of 2-d and 3-d angles)] ↔ 2) [points ∩ lines (=direct production of 2-d and 3-d angular spaces)] ∞ 3) [lines ∩ lines (=production of areas)] ↔ 4) [areas ∩ areas (=production of volumes)].//[gravitons ∩ gravitons (along with the production of gluonic//hadronic colours/"anticolours")] ↔ 2) [gravitons ∩ photons (along with the production of elementary photonic "dark" matter units and their corresponding axionic "dark" energy units)] ∞ 3) [photons ∩ photons (along with the production of elementary leptonic particles/antiparticles)] ↔ 4) [leptonic particles ∩ antiparticles/quarks ∩ antiquarks (along with the production of all hadronic particles/antiparticles)].
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All elementary particles/antiparticles produced by quanta necessarily fall within the above-mentioned interaction fields and are mutually related with each other by means of four respective classes of "Intermediating subatomic particles that operate as "vectors", in particular: **Table 5**

Table 5. Sixth double binary table of four-dimensionally symmetrical associations.

1) [Gravitons] ↔ 2) ["Weak" gauge bosons] ∞ 3) [photons] ↔ 4) [Gluonic charges of "colours"/"Anticolours"]//1) [Gravitational interaction] ↔ 2) [Weak nuclear interaction] ∞ 3) [Electromagnetic interaction] ↔ 4) [Strong nuclear interaction].
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Moreover, even as concerns the particular cases of gluons (related with the production of hadronic particles) and leptons

(produced by colliding photons) the four-dimensional structure of physical reality can be easily put in evidence through the following double parallel sequence **Table 6**:

Table 6. Seventh double binary table of four-dimensionally symmetrical associations.

1) [Gluonic "blue" colour/anticolour] ↔ 2) [gluonic "red" colour/anticolour] ∝ 3) [gluonic "green" colour/anticolour] ↔ 4) [gluonic "yellow" colour/anticolour].//1) [electronic (anti)lepton] ↔ 2) [muonic (anti)lepton] ∝ 3) [Tauonic (anti) lepton] ↔ 4) [electronic/muonic/tauonic (anti) neutrino (which is the fourth type of lepton)].

On the basis of the double binary sequences examined above, another symmetrically complementary one, concerning the smallest particles in the Universe, as well as to the four types of intermediating "vectors" (correlated with as many interaction fields and supporting, respectively, the four universal interacting forces between any existing particles/antiparticles) can be inferred in the following general terms **Table 7**:

Table 7. Eighth double binary table of four-dimensionally symmetrical associations.

1) [Gravitonic quanta] ↔ 2) [Photonic quanta] ∝ 3) [Axionic units (of "dark" energy)] ↔ 4) [Photonic units (of "dark" matter)].//1) [Gravitons] ↔ 2) ["Weak" gauge bosons] ∝ 3) [Photons] ↔ 4) [Gluons (charged with colours/Anticolours)].

Considering the fundamental sequences of both leptonic and gluonic/hadronic particles, another parallel four-dimensional structure can be evidently individuated even in the space-time continuum, where the full development of space and time can be respectively represented, once again in dualistically binary terms, as follows **Table 8**:

Table 8. Ninth double binary table of four-dimensionally symmetrical associations.

1) [leftwards ↔ rightwards (dilating space dimension)] → 2) [downwards ↔ upwards (dilating space dimension)] ∝ 3) [forwards ↔ backwards (dilating space dimension)] ∝ 4) [inwards ↔ outwards (dilating space dimension particularly related to "ubiquitous" hyperspace, that is the fourth dimension of geometric space)].//1) Past time ↔ 2) Present time ∝ 3) Future time ↔ 4) Hypertime (or "eternity", as is traditionally defined).

Consequently, another "mirror" symmetrical sequence, specifically related to time in parallel with the trigonometrically "quartet" basically composed of: $[\sin\alpha \cap \cos\alpha] \leftrightarrow [(\text{co})\sec\alpha \cap (\text{co})\tan\alpha]$ could be worked out as follows below **Table 9**:

Table 9.Tenth double binary table of four-dimensionally symmetrical associations.

1) {[hypertime, or "eternity"=(past time ∩ present time) ↔ (present time ∩ future time)] ∝ 2) {[past time=(hypertime, or "eternity") ↔ (present time)] ∝ 3) {[present time=(past time) ↔ (future time)] ∝ 4) {[future time=(present time) ↔ (hypertime, or "eternity")]} //1) {[Tanα (=Sinα/Cosα) ∩ Secα (=1/Cosα)] ↔ [(CO)Tanα ∩ (CO)Secα]} ∝ 2) {[Sinα ↔ Cosα]} ∝ 3) {[Sinα ↔ Cosα]} ∝ 4) {[Cosα] ↔ [Tanα ∩ Secα]} ∝ {[(CO) Tanα] ↔ [(CO) Secα]}.

A further symmetrically parallel sequence can consequently be inferred, as concerns charge, energy and all types of waves or radiations, that is **Table 10**:

Table 10. Eleventh double binary table of four-dimensionally symmetrical associations.

1) [{"strong" gauge charge} // {"weak" gauge charge}] ↔ 2) [(magnetic charge) // (electric charge)] ∝ 3) [(potential energy) // (kinetic energy)] ↔ 4) [(rest energy) // (relativistic energy)].//1) [(gravitational waves or radiations) // (radio waves)] ↔ 2) [(microwaves) // (infrared waves)] ∝ 3) [(visible light) // (ultraviolet rays)] ↔ 4) [(x rays) // (gamma rays)].

Subsequently, if moving from a microcosmic level up to a microscopic one, the following double parallel sequence can also be evidenced **Table 11**:

Table 11. Twelfth double binary table of four-dimensionally symmetrical associations.

1) [(Anti) quarks ↔ (anti) hadrons (most of all nucleons/antinucleons)] // 2) [(Anti) neutrinos ↔ (anti) electrons] ∝ 3) [(Anti) hadrons / (anti) leptons ↔ (anti) atoms] // 4) [atoms ↔ molecules]. // 1) (Ionized plasma state) ↔ 2) (Gas state)] ∝ 3) (Molecular liquid state) ↔ 4) (Molecular solid state)].

Finally, the following parallelism can be individuated both at macroscopic and even at cosmic levels:

Table 12. Parallelism at macroscopic and even at cosmic levels.

1) [(Any given molecules) ↔ (respective cells)]//2) [(Any given genes) ↔ (respective gene typical cells)] ∞ 3) [(Any given chromosomes) ↔ (respective cells)]//4) [(Any given organic tissues) ↔ (respective body organs)]//1) [(Any given orbiting sky bodies in planetary and star systems at large) ↔ 2) [(Respective stars)] ∞ 3) [(Any given star systems)] ↔ 4) [(Respective galaxies)].

Considering all what has been classified and analyzed in these twelve binary tables, it can be reasonably inferred that the whole physical Universe should be properly conceived, in scientific-philosophical terms, as a developing and/or decaying four-dimensional system that has been dually extending on macro/microcosmic scales in time through its history, yet being finite; or more precisely, as a four-dimensional "body" that combines together, inside itself, such binary processes, physical components or cosmic events as **Table 12:**

1. [(Photons) ↔ (gravitons)] along with [(Photonic units of "dark" matter) ↔ (Axionic units of "dark" energy)]
- 2) [(Momentum, or impulse/energy developing both from radiation and from matter/antimatter) ↔ (mass)] along with [(space) ↔ (time)]
- 3) [(Atoms) ↔ (respective molecules)] along with [(inorganic) ↔ (organic matter)]
- 4) [(Heating) ↔ (cooling)] along with [particle acceleration ↔ particle deceleration]
- 5) [(Particle colliding) ↔ (particle scattering)] along with [(particle absorbing) ↔ (particle emitting)]
- 6) [(Macro and/or microcosmic implosions) ↔ (macro and/or microcosmic explosions)] along with [(macro and/or microcosmic crunch) ↔ (macro and/or microcosmic expansion)]
- 7) [(Centripetal forces) ↔ (centrifugal forces)] along with [(increasing trends) ↔ (decreasing trends)]
- 8) [(Life) ↔ (death)] along with [(good) ↔ (evil)]^[4].

FIRST CONCLUSIVE THEORETICAL CONSIDERATIONS

Three general equations about TIME "t", respectively:

$t = s : v \rightarrow t = (s \times m^{1/2}) : (E^{1/2}) \rightarrow t = (30 r \times h^{3/2} \times s^{5/2}) : t^{5/2}$, in parallel with other three "symmetrical" ones about SPACE "s", respectively:

$s = t \times v \rightarrow s = (t \times E^{1/2}) : (m^{1/2}) \rightarrow s = [(45 h^{3/2} \times s^{9/2} \times t^{-9/2}) - (64 \pi^6 \times r^4 \times k^4 \times T^4 \times G)]^{1/2}$, can be used for linking Quantum Mechanics together with Relativity Theory, as much as for providing clear evidence about the Universe as an expanding, but also as a "closed" – and therefore finite – progressively ordered, four-dimensional structure determining physical reality, that is:

[Gravitons ∩ photons] ∞ [axionic units ∩ photonic units (of "dark" matter, along with their corresponding axionic units of "dark" energy)] → ["space ∩ time ∞ energy ∩ mass" continuum] → [blue-red-yellow-green "colours"+their respective "anticolours" (=4+4 "hadronic archetypical units") ∩ 6 quarks+6 antiquarks] ∞ [(electronic/muonic//tauonic) neutrinos-electrons-muons-tauons+their respective antiparticles (=4+4 "leptonic archetypical units") ∩ 6 leptons+6 antileptons] → [(gravitational interaction field) ∩ ("weak" nuclear interaction field)] ∞ [(electromagnetic interaction field) ∩ ("strong" nuclear interaction field)] → [(gravitons) ∩ ("weak" gauge bosons)] ∞ [(photons) ∩ (gluons)] (**Figure 4**)^[5].



Figure 4. Tables of "algebraically pythagorical" pattern 4.

In addition to all this, it can even be maintained that, if physical reality were actually infinite, then no speed could ever be determined nor even generated in the whole Universe (what is axiomatically false).

Even more, if Space and Time were also infinite (and therefore without any origin or end), then no Mass nor its corresponding Energy could ever be determined nor even generated in the whole Universe.

Further evidence is also provided by the fact that each quantum is no doubt indivisible: if the Universe were instead infinite, then even the least elementary particles should be infinitely divisible!

Last but not least, if the Universe as a whole were infinite, then it's very temperature could not have any limits at all, whereas these limits are marked by, respectively, 0 °K and (most reasonably) 10^{35} °K.

SECOND CONCLUSIVE THEORETICAL CONSIDERATION

A geometrically "pythagorical" definition of mass can be consistently worked out, if we just consider the relativistic energy "E" of any given particle and its corresponding relativistic momentum "P"="γmc", where "γ" is the so-called "Lorentz Factor", which is equivalent to $[1 - (v^2 : c^2)]^{-1/2}$, as follows:

$$E=P(c) \rightarrow E=\gamma m(c)^2 \rightarrow m=E:\gamma(c)^2 \rightarrow m=E \times [1 - (v^2 : c^2)]^{1/2}:: c^2 \rightarrow m=E \times [(1 : (c)^4) - (v^2 : c^6)]^{1/2}, \text{ so that: } m^2=(E^2 : c^4) - [E^2 \times (v^2 : c^6)].$$

As a consequence, mass equals a Katheton having, respectively, $[E : c^2]$ as its Hypothenuse, and $[E \times (v : c^3)]$ as the other corresponding Katheton.

THIRD CONCLUSIVE THEORETICAL CONSIDERATION

In cosmogonical terms, the very origin of the progressively ordered, four-dimensional structure determining physical reality, that is: $[\text{gravitons} \cap \text{photons}] \propto [\text{axionic units} \cap \text{photonic units (of "dark" matter, along with their corresponding axionic units of "dark" energy)}] \rightarrow [\text{"space} \cap \text{time} \propto \text{energy} \cap \text{mass" continuum}] \rightarrow [\text{blue-red-yellow-green "colours"} + \text{their respective "anticolours"}] (=4+4 \text{ "hadronic archetypical units"}) \cap 6 \text{ quarks} + 6 \text{ antiquarks} \propto [(\text{electronic/muonic//tauonic) neutrinos-electrons-muons-tauons} + \text{their respective antiparticles} (=4+4 \text{ "leptonic archetypical units"})] \cap 6 \text{ leptons} + 6 \text{ antileptons} \rightarrow [(\text{gravitational interaction field}) \cap (\text{"weak" nuclear interaction field})] \propto [(\text{electromagnetic interaction field}) \cap (\text{"strong" nuclear interaction field})] \rightarrow [(\text{gravitons}) \cap (\text{"weak" gauge bosons})] \propto [(\text{photons}) \cap (\text{gluons})], \text{ must necessarily have been made possible by a sort of uppermost massless,}$

Space less and timeless – not yet gravitational nor yet nuclear, nor even yet electromagnetic – but just all mightily unitary "temperature ∞ force" (this is a scientific neologism herewith coined by Dr. Prof. Tambara Federico himself), which must have caused the "Big Bang" by simply and unconditionally (perhaps even deliberately!) "Splitting up".

Subsequently (more than probably 10^{-50} seconds after the "Big Bang"), this "temperature ∞ force" must have generated, first of all, the universal basic duality between gravitonic and photonic quanta, at the maximum (ever possible) 10^{35} temperature after the "big bang", as can be mathematically inferred on the basis of the following data and calculations relative to:

- 1) The proportional relation between the different physical-mathematical values associated with the three (already known) critical temperatures with their respective time intervals, very quickly after the "Big Bang" (**Figure 5**).

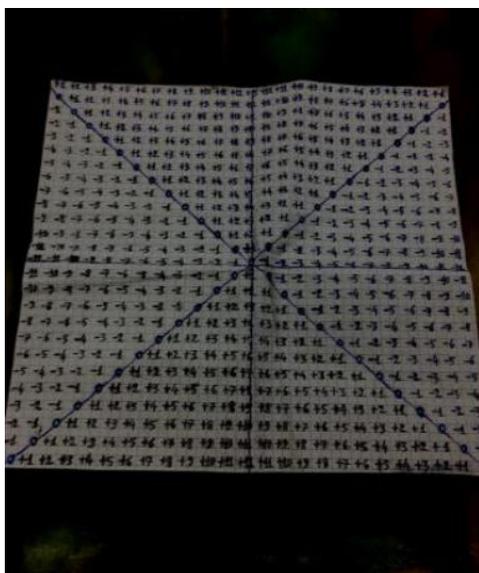


Figure 5. Tables of "algebraically pythagorical" pattern 5.

The range of these values, indeed, needs to be completed by means of the very first, not yet scientifically investigated "transition phase" in the history of the Universe (that is a sort of "missing ring" in the cosmogonical chain) according to a new "decreasing sequence", herewith opportunely integrated and additionally expressed in absolute values that correspond, in their turn, to each given arithmetical difference within the aforesaid sequence formulated by Dr. Prof. Tambara Federico:

[~10⁻⁵⁰ sec after the "Big Bang" (exclusive existence of an uppermost "temperature ∞ force" causing the creation of the gravitonic/photonic quantum duality) ~10⁻⁴³ sec (origin of gravitational interaction)=~|10⁷| sec] ∞ [~10³⁵ °k~10³² °k=~|10³| °k] ≡ [~10⁻⁴³ sec~10⁻³⁵ sec or ~10⁻³⁴ sec (the origin of "strong" nuclear interaction)=~|10⁸| or ~|10⁹| sec] ∞ [~10³² °k~10²⁸ °k or ~10²⁷ °k=~|10⁴| or ~|10⁵| °k] ≡ [~10⁻³⁵ sec or ~10⁻³⁴ sec~10⁻¹⁰ sec (origin of "weak" nuclear interaction as separated from the electromagnetic one)=~|10²⁴| or ~|10²⁵| sec] ∞ [~10²⁸ °k or ~10²⁷ °k~10¹⁵ °k=~|10¹³| or ~|10¹²| °k] → [~|10⁷| (sec) ∞ ~|10³| (°k)] ≡ [~|10⁸| or ~|10⁹| (sec) ∞ ~|10⁴| or ~|10⁵| (°k)] ≡ [~|10²⁵| or ~|10²⁴| (sec) ∞ ~|10¹³| or ~|10¹²| (°k)].

2) The equivalence between, respectively: the maximum possible range (that is: 35) of composite numbers within any given interval between two immediately consecutive prime numbers on one side, and the power exponent relative to the above-mentioned uppermost, 10³⁵°k critical temperature (10⁻⁵⁰ seconds after the "big bang", at the very origin of gravitonic and photonic quanta) on the other [6].

More in general, the cosmological process concerning the creation (reasonably made possible only by a perfectly uniform, unlimited and "self-sufficient" temperature ∞ force) of all quanta along with their respective quantities of motion at light speed (since 10⁻⁵⁰ seconds after the "big bang" onwards) must necessarily have been followed up by the generation of a progressively ordered, four-dimensional structure determining physical reality, that is: [gravitons ∩ photons] ∞ [Axionic units ∩ Photonic units (of "dark" matter, along with their corresponding axionic units of "dark" energy)] → ["space ∩ time ∞ energy ∩ mass" continuum] → [blue-red-yellow-green "colours"+their respective "anti-colours" (=4+4 "hadronic archetypical units") ∩ 6 quarks+6 antiquarks] ∞ [(electronic/muonic//tauonic) neutrinos-electrons-muons-tauons+their respective antiparticles (=4+4 "leptonic archetypical units") ∩ 6 leptons+6 antileptons] → [(gravitational interaction field) ∩ ("weak" nuclear interaction field)] ∞ [(electromagnetic interaction field) ∩ ("strong" nuclear interaction field)] → [(gravitons) ∩ ("weak" gauge bosons)] ∞ [(photons) ∩ (gluons)] (**Figure 6**).

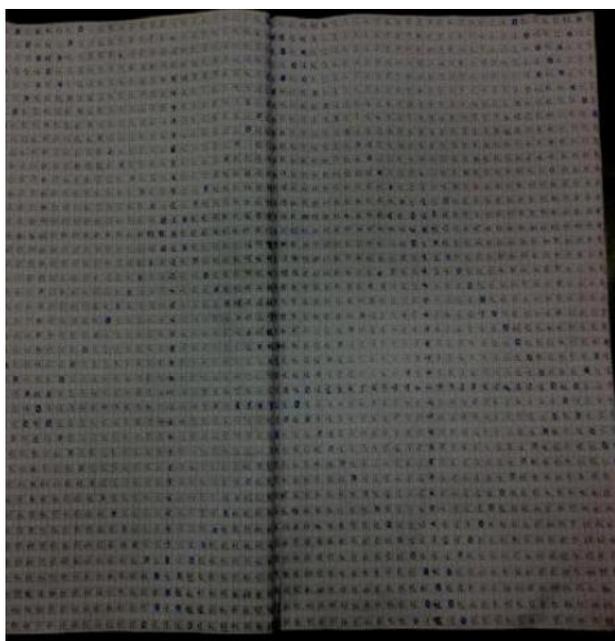


Figure 6. Tables of "algebraically pythagorical" pattern 6.

This cosmogonical process might also be expressed, in its turn, through a physical-mathematical sequence worked out by Dr. Prof. Tambara Federico as follows:

[(temperature ∞ force)^{0/0}]: [(temperature ∞ force)^{0/0}], what also means: spontaneous "splitting up" on the part of the infinite "temperature ∞ force" → direct production of: [gravitonic quanta ∩ photonic quanta] ∞ [axionic units ∩ photonic units (of "dark" matter)] → [total (quantity of) heat "q" (=transferred/exchanged energy "e") ∩ space] ∞ [(mass) ∩ (time)] → [total (quantity of) heat (=transferred/exchanged energy) × (time)²]=[(mass × space²)] → [q (=e) × t²]=[(m × s²)].

Starting just from this basic, "symbolical" sequence, a "paradigmatic" series of couples of universal binary interrelations

can be developed, all of them unveiling a fundamental unity between the four interaction fields (beyond any possible present macrocosmic "asymmetries"), as exemplified below: [gravitonic quanta \cap photonic quanta] \propto [axionic units of "dark" matter/energy \cap photonic units of "dark" matter/energy] \equiv [quantity of motion \cap heat (equivalent to: transferred/exchanged energy)] \square [quantity of motion \cap mass]; \equiv [spin \cap quantity of motion] \propto [energy \cap quantity of motion]; \equiv [fractional vs. integer quantum spin number \cap fractional vs integer (net) charge quantum number] \propto [barionic number \cap leptonic number]; \equiv [($\int se \times ds$)=($\sum qi: \epsilon 0$)] \cap [($\int sb \times ds=0$)] \propto [($\int \phi ye \times dl$)=(- $d\phi \times b$): dt] \cap [($\int \phi yb \times dl$)=($\mu 0 i + \epsilon 0 \mu 0$) $\times d\phi \times (e: dt)$]; \rightarrow [leptonic/hadronic particles \cap respective atoms//molecules] \propto [atoms/molecules \cap respective material aggregations/substances]; \equiv [gas state \cap plasma state] \propto [liquid state \cap solid state]; \equiv [sky bodies orbiting around their respective stars (in planetary systems) \cap respective stars] \propto [star systems \cap respective galaxies]; \equiv [genes \cap respective living cells] \propto [living cells \cap respective organic tissues]; \equiv [molecules \cap living cells] \propto [organic tissues \cap body organs]; \equiv [geometrical points \cap geometrical lines] \propto [areas \cap volumes].

All the above-listed sequences are evidently correlated with the aforesaid four-dimensional structure of the Universe ^[6].

FOURTH CONCLUSIVE THEORETICAL CONSIDERATION

the above-mentioned four-dimensional structure of physical reality, that is: [gravitons \cap photons] \propto [axionic units \cap photonic units (of "dark" matter, along with their corresponding axionic units of "dark" energy)] \rightarrow ["space \cap time \propto energy \cap mass" continuum] \rightarrow [blue-red-yellow-green "colours"+their respective "anticolours" (=4+4 "hadronic archetypical units") \cap 6 quarks+6 antiquarks] \propto [(electronic/muonic//tauonic) neutrinos-electrons-muons-tauons+their respective antiparticles (=4+4 "leptonic archetypical units") \cap 6 leptons+6 antileptons] \rightarrow [(gravitational interaction field) \cap ("weak" nuclear interaction field)] \propto [(electromagnetic interaction field) \cap ("strong" nuclear interaction field)] \rightarrow [(gravitons) \cap ("weak" gauge bosons)] \propto [(photons) \cap (gluons)], can also be easily inferred, among other things, from:

I) the numerical constant in the formula concerning sphere volume "v", that is: $(4/3 \pi) r^3 \rightarrow \sim 4.1894 (r)^3 \rightarrow \sim 4.1894$, with "r"=1; or even with "r"= [(1-0.9)ⁿ ∞ : (n ∞)ⁿ ∞]ⁿ ∞ , if considering a sphere volume as correlated with an infinitesimally unitary radius corresponding, in its turn, to the unlimited mathematical power of a transcendent, four-dimensionally developing "hyperunit" (which just requires the " ∞ " function four times, as can be seen in the basic expression formulated above), so that: v (with an infinitesimally unitary radius) equivalent to: ~ 4 ;

II) the mean equivalent mass of one photon (that is: $\sim 4.150 \times 10^{-36}$ gr, in the cgs system; or also: $\sim 4.150 \times 10^{-39}$ kg, in the international system);

III) The number of possible charges (4 in total) related to quarks and their respective antiquarks, that is: +1/3, -1/3 and +2/3, -2/3;

IV) The four basic algebraic factors composing the major derived physical sizes, herewith expressed in the (international system) units of measurement, as pointed out in the following (serially ordered) equations, respectively: [Thermal conductivity=(Kg \times m): ($^{\circ}$ K \times s³) \cap [thermal capacity=(Kg \times m²): ($^{\circ}$ K \times s²)] \propto [magnetic field flow=(Kg \times m²): (A \times s²)] \cap [vacuum constant of magnetic permeability=(Kg \times m): (A² \times s³)] \propto [electric resistance=(Kg \times m²): (A² \times s³)] \cap [voltage=(Kg \times m²): (A³ \times s³)] \propto [electric capacity=(A² \times s⁴): (Kg \times m²)] \cap [dielectric vacuum constant=(A² \times s⁴): (Kg \times m³)].

Even more, just because of the four-dimensional structure of physical reality, each given photonic/gravitonic quantum must reasonably correspond to an equivalent "0" (or, more precisely: "0/0") mass, that is a quantum space time "hyper point" as well as the infinitesimally tiniest "pinpoint" energy unit, that is an indivisible, four-dimensional "energy dart" (equivalent to an infinitesimal, as well as shapeless and unceasingly spinning space time quantum "hyper point", simultaneously corresponding to:

[1) Moving point//past time \cup 2) moving line//present time] \propto [3) moving area//future time \cup 4) any given volume (rotating in hyperspace)//"eternity" (which can be defined as: "unlimited hyper time that, by operating in parallel with hyperspace, continuously connects past time, present time and future time with each other, thereby allowing them to alternately exist and interact").

"Hyper point" is another scientific neologism herewith used by Dr. Prof. Tambara Federico in order to geometrically define any given infinitesimally ^[5].

Unitary (as well as indivisibly four-dimensional and concave) hyperspace limited by two utmost closely interlocked solid angular vertexes (each of these being formed, in their turn, by the intersection between any given straight and any given hyperbolically curved line) that are to be respectively equal to: [(1 - 0.9)ⁿ ∞ : (n ∞)ⁿ ∞]ⁿ ∞ (expressed in second degrees), that is somewhat alike the infinitesimally "thinned" tops of two imaginary curved half-sails (orthogonally, half-crosswise "stuck" or "hooked" together into each other by their respective concavities, but without intersecting each other in strictly geometrical terms). In other words, each "hyper point" might also be defined as an "infinitesimal space time unit simultaneously being a point, a line, an area and a volume too (much like an indivisible cubic point, or even like the very central point of a Black Hole)".

It is therefore self-evident that the equivalent mass of any given quantum must "geometrically" coincide with the aforesaid "hyper point"; whereas each given combination of two intersecting straight "lines" matched with two complementarily convergent, hyperbolically curved "lines" (all of them determining, in their turn, the two above-mentioned infinitesimally unitary solid angular "vertexes") must consequently identify the four-dimensional limits of the universal "continua", herewith mentioned once again:

[Gravitons \cap photons] \propto [Axionic units \cap Photonic units (of "dark" matter, along with their corresponding axionic units of "dark" energy)] \rightarrow ["space \cap time \propto energy \cap mass" continuum] \rightarrow [blue-red-yellow-green "colours"+their respective "Anti colours" (=4+4 "hadronic archetypical units") \cap 6 quarks+6 antiquarks] \propto [(electronic/muonic//tauonic) neutrinos-electrons-muons-tauons+their respective antiparticles (=4+4 "leptonic archetypical units") \cap 6 leptons+6 antileptons] \rightarrow [(gravitational interaction field) \cap ("weak" nuclear interaction field)] \propto [(electromagnetic interaction field) \cap ("strong" nuclear interaction field)] \rightarrow [(gravitons) \cap ("weak" gauge bosons)] \propto [(photons) \cap (gluons)].

In this way, by just changing its own position at the speed of light, each given quantum, besides geometrically corresponding to one infinitesimal, shapeless as well as unceasingly spinning "space-time quantum hyper point", also corresponds simultaneously to: [1] moving point//past time \cup 2) moving line//present time] \propto [3] moving area//future time \cup 4) moving (hyperspace) volume//4) "eternity"].

FIFTH CONCLUSIVE THEORETICAL CONSIDERATION

In addition to the above-examined "miscellaneous" theoretical formulations, Dr. Prof. Tambara Federico has felt the urgent necessity of working out a basic progression of "algebraically pythagorical" sample patterns relative to the four universal types of interacting forces (when these were still united with each other, at a primeval temperature ranging from 10^{35} °k down to 10^{32} °k, that is between 10^{-50} and 10^{-43} seconds a.t.b.).

First of all, according to DR. Prof. Tambara Federico's "binary dialectics", the primeval super symmetrical, four-dimensional foundations of the Universe (in their turn generated, immediately after the "Big Bang", by an unlimited as well as space less, timeless and massless temperature $\infty \infty$ force that might be mathematically expressed only by: $0^0/0^0$) must have evidently corresponded to the following basic (minimum-sized and square-shaped) "algebraically pythagorical" pattern:

-1	0
0	1

(Where, if reading this minimum-sized "magic" square by rotating it clockwise in four steps, then such four-dimensional physical-mathematical relations can be identified as) $-1=[(\text{mass} \cap \text{time})] \propto [(\text{momentum, or energy} \cap \text{space})]$;

$0=[(\text{Time} \cap \text{momentum, or energy})] \propto [(\text{Space} \cap \text{mass})]$;
$+1=[(\text{Momentum, or energy} \cap \text{space})] \propto [(\text{Mass} \cap \text{time})]$;
$0=[(\text{Space} \cap \text{mass})] \propto [(\text{Time} \cap \text{momentum, or energy})]$.

In second place, a logically subsequent, extended "magic" square (relating to the four universal types of interactions in parallel with the four-dimensional structure of physical reality) can instead be represented by means of the following "algebraically pythagorical" pattern that starts from "0" as its central mathematical value:

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

(In this pattern, the four universal, super symmetrically ordered physical-mathematical dimensions – limiting our "finite" Universe as well as corresponding to the four universal interaction fields – can be respectively expressed according to the following progression).

- 2=gravitational interaction; -1=weak nuclear interaction; 0=unlimited temperature ∞ force;
- +1=electromagnetic interaction; +2=strong nuclear interaction

(Where the sequence of these algebraic values builds up geometrically uniform, or "isotropic" mirror symmetry) **(Figure 7)**.

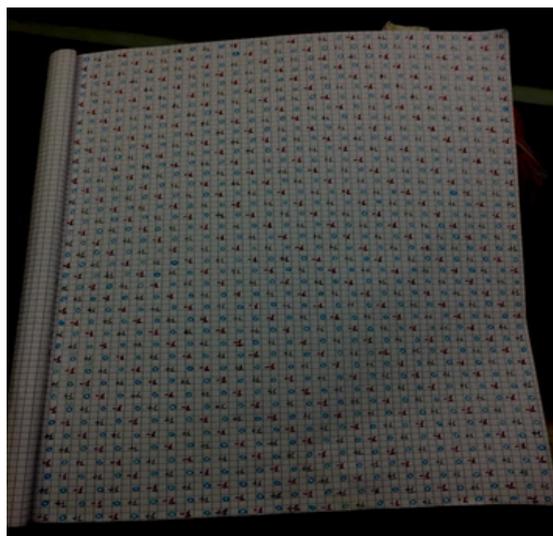


Figure 7. Tables of "algebraically pythagorical" pattern 7.

In third place, Dr. Prof. Tambara Federico's above-examined four-dimensional "algebraically pythagorical" patterns could also be related to the primeval basic quantum components of the universe (as well as the units of both "dark" matter and "dark" energy directly generated by collisions between the very first photons and gravitons), at an uppermost temperature ranging from 10^{35} down to 10^{32} °k, between 10^{-50} and 10^{-43} seconds after the big bang [3].

And in relation to the origin of quanta and "dark" matter units along with their corresponding "dark" energy units, the following square could be built up in "algebraically pythagorical" terms:

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

(Where, respectively)

- I) -2, -1, 0 → -2="dark" photonic unit; -1=photonic quantum; 0=temperature ∞ force;
- - 1, 0,+1 → -1=photonic quantum; 0=temperature ∞ force;+1=gravitonic quantum;
- 0,+ 1,+2 → 0=temperature ∞ force;+1=gravitonic quantum;+2="dark" axionic unit .

(In their turn, these physical-mathematical values can also form the following super symmetrically proportional combination)

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

(Where, respectively)

- I) 0, -1, -2 → 0=force ∞ temperature; -1=photonic quantum; -2="dark" photonic unit;
- + 1, 0, -1 → +1=gravitonic quantum; 0=temperature ∞ force; -1=photonic quantum;
- iii)+2,+1, 0 → +2="dark" axionic unit; +1=gravitonic quantum; 0=temperature ∞ force.

considering all this, further alternative subsequent "algebraically pythagorical" (and four-dimensional) physical-mathematical patterns concerning the first prototypical particles/antiparticles as well as the fundamental relativistic physical sizes, generated by gravitons and photons (in their turn both produced and made interact with each other by a massless, timeless and space less – as well as unlimited and unconditioned – temperature ∞ force mathematically equivalent to: $0^0/0^0$), could subsequently be formulated as follows:

1) GRAVITON:

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

-2, -1, 0 → -2=mass; -1=space; 0=temperature ∞ force;

-1, 0,+1 → -1=space; 0=temperature ∞ force;+1=time;

lii) 0,+1,+2 → 0=temperature ∞ force;+1=time;+2=energy;

(These physical-mathematical values, in their turn, are in symmetrical mirror relations with, respectively)

i) - 2, -1, 0 → -2=hadronic particle; -1=gluonic colour; 0=gravitonic quantum;

li) -1, 0,+1 → -1=gluonic colour; 0=gravitonic quantum;+1=gluonic anticolour;

0,+1,+2 → 0=gravitonic quantum;+1=gluonic anticolour; 2=hadronic anti particle.

2) PHOTON:

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

(where, respectively)

i) 0, -1, -2 → 0=photonic quantum; -1=weak gauge bosonic antiparticle; -2=leptonic antiparticle;

ii)+1, 0, -1 → +1=weak gauge bosonic particle; 0=photonic quantum; -1=weak gauge bosonic antiparticle;

iii)+2,+1, 0 → +2=leptonic particle;+1=weak gauge bosonic particle; 0=photonic quantum.

(in their turn, the above-reported physical-mathematical values are in the following symmetrical mirror relations with, respectively)

i) 0, -1, -2 → 0=temperature ∞ force; -1=space; -2=mass;

ii)+1, 0, -1 → +1=time; 0=temperature ∞ force; -1=space;

iii)+2,+1, 0 → +2=energy;+1=time; 0=temperature ∞ force;

considering all what analyzed above, dr. prof. tambara federico has managed to formulate a universal triple rule for decoding the basic four-dimensional structure of the universe by means of (super symmetrical) "algebraically pythagorical" squares developing "ad infinitum", according to the following four principles:

1) The algebraic sums of all progressively ordered real numbers placed along the four sides of each concentric square developing "ad infinitum" out from the central basic, minimum-sized one (with the sequence: -1/0/+1/0) are always finally "balanced", that is equal to "0";

2) Similarly, the algebraic sums of all numbers placed along the four sides of any given non-concentric square (no matter in which position nor how large it may be) are always finally equal to "0", provided that the algebraic sign of each alternate number along a side after starting whichever algebraic sum (e, g. the second number, the fourth one and so on) is changed;

3) In a parallel way, the algebraic sum of the four numbers placed, respectively, at the four "edges" of whichever square is always equal to "0", provided that the algebraic signs of two numbers placed at the second and the fourth "edges" are changed, after starting whichever algebraic sum;

4) Finally, the algebraic sum of the numbers placed along each of the two diagonals in any given square is equal to that of the numbers placed along the other diagonal, so that the final difference between the total mathematical values of both diagonals is always equal to "0".

It is understood that all these "algebraically pythagorical" squares could also mirror any possible relativistic variation (dilations/contractions) both in quantum fields and in such physical-mathematical "continua" as [(momentum, or energy ∩ mass) ∞ (space ∩ time)], etcetera.

(Notice: as to the six synoptic, super symmetrical "sample" tables of algebraically pythagorical squares attached, in the form of digital pictures, at the end of this research essay, particular thanks must also be addressed to mr. lupo pasquale, a clever self-learning italian student of mathematics that, once inspired and instructed by dr. prof. tambara federico himself, decided to draw the aforesaid four tables by hand on paper sheets;then dr. prof. tambara federico completed, also by hand, and finally selected the aforesaid tables).

This universal four-dimensional structure – systematically highlighted by dr. prof. tambara federico's "binary dialectics", in its turn connected with his own theory of everything – might also be scientific-philosophically and physical-mathematically expressed in the form of the following super symmetrical "tetrahedric" combination:

{[1] negative uneven numbers=f (- 2n-1-0.9 ∞) ∩ 2) positive even numbers=f (+2n)] < [3] negative even numbers=f (- 2n) ∩ 4) positive uneven numbers=f (+2n +1-0.9 - 2, - 1,+∞)]} → {[1] gravitons ∩ 2) gravitational interaction] < [3] "weak" gauge bosons ∩ 4) "weak" nuclear interaction]} → {[1] photons ∩ 2) electromagnetic interaction] < [3] (hadronic/gluonic) "colours" ∩ 4) "strong" nuclear interaction]} → {[1] time ∩ 2) angular momentum=(mass) × (space)^2: (time)] < [3] present time ∩ 4) "eternity" (that is: the "unlimited hyper time that, in parallel with hyperspace, unfailingly connects past time, present time and future time with each other, thereby allowing them to alternately exist and interact")=(past time) × (future time)^2: (present time)]}.

Whenever replacing "0" with any other (progressively ordered) physical-mathematical values, then a partial, or "anisotropic" (four-dimensional) mirror symmetry can be consequently obtained, as herewith exemplified by mutually comparing four "pythagorical" patterns starting and developing, respectively, from 1,+2 (which are the mathematical "follow-up" of the previous "archetypical" pattern based on "0"), as reported below:

I)			II)			III)			IV)		
-4	-3	-2	-3	-2	-1	-1	0	1	0	1	2
-3	-2	-1	-2	-1	0	0	1	2	1	2	3
-2	-1	0	-1	0	1	1	2	3	2	3	4

(Where the mathematical values corresponding to the four dimensions that limit our "finite" Universe are, respectively, expressed by)

I)				II)				III)				IV)		
-4	-3	-1	0	-3	-2	0	+1	-1	0	+2	+3	0	+1	+3

(In these cases, each of these four "pythagorical" patterns forms, herewith, a partial or "anisotropic" mirror symmetry).

(Notice: As to the six synoptic, super symmetrical "sample" tables of algebraically pythagorical squares attached, in the form of digital pictures, at the end of this Research Essay, particular thanks must also be addressed to Mr. Lupo Pasquale, a clever self-learning Italian student of mathematics that, once inspired and instructed by Dr. Prof. Tambara Federico himself, decided to draw the aforesaid four tables by hand on paper sheets).

CONCLUSION

To conclude, it must be pointed out that many of the logical-mathematical as well as physical-mathematical sequences of symmetrically proportional, binary relationships enunciated by Dr. Prof. Tambara Federico in this Research Study will more than probably prove to be suitable for disclosing new wide horizons to both Theoretical and Applied Sciences.

Even more, not only such disciplines, for example, as Physics, Mathematics, Cosmology or Information Technology, but also other ones like Biology, Chemistry, Biomedical Research and so on, might benefit from Dr. Prof. Tambara Federico's binary dialectics (aimed at analysing physical reality according to its four-dimensional structure).

In this respect, a lot of self-evident macrocosmic biological examples of four-dimensionally orientated, binary interrelations are no doubt suggested by the highly symmetrical structures in human (as well as animal and vegetal) bodies, along with their peculiar organs and respective components (all of them unmistakably belonging, in their turn, to specific "macrocosmic living systems"), like for example in the case of: heart, brain, as well as organical expulsion or breathing apparati (along with their own organs and/or simple components); or also inferior/superior dental arches (along with their respective right/left ∩ superior/inferior half-arches), eyelids, limbs and any other symmetrically structured body organs, apparati and even their simple components.

Applications

The major achievement by Dr. Prof. Tambara Federico consists, herewith, in a manifold demonstration that the four universal interaction fields of forces involving any particles (as well as antiparticles) in the universe can really be unified (at infinitesimal quantum levels), just on the basis of the aforesaid omnipresent, four-dimensional structure of physical reality, as well as according to Dr. Prof. Tambara Federico's scientific-philosophical (serially developed) theorem based, in its turn, on the following "quadruple functions":

"1" (That is the number representing a basic mathematical unit and common denominator), is herewith expressed as a product of the two simplest physical-mathematical binomials, so that it can be referred to as:

1=[(mass "m") ^-1 × (momentum, or impulse "p")] × [(space "s") × (time "t") ^-1] → "0" (that is "+1-1")=[(mass) ^-1 × (momentum, or impulse "p")]- [(space) × (time) ^-1] → [(±0): (±0)]=[(+n - n): (- n+n)] → production of any possible "n" mathematical value; whereas: (0)^2 ± (± 1)^2=(0 ± 1)^2 → [(0 ± 1) ± (0 ± 1)]^2=either "0" or "4" → n=[(4 × n^2)^1/2] - n → (as concerns probability variations) {[1] impossibility (=no probability at all)] < [2] (probability ≤ improbability)]} ∞ {[3] (improbability ≤ ≤

probability) < [4] certainty (=no improbability at all)] → {[1] "not even one particle" ∪ global absence of particles] < [2]"just one particle" ∪ exclusive singularity] < [3]"couple(s) or group(s) of any given particles" ∪ partial or limited plurality] << [4] "totality of existing particles" ∪ global or unlimited plurality]] ∞ {[1] "never (once)" ∪ unlimited negative sequence (constantly developing up to totality)] < [2] "just once" ∪ exclusive singularity] < [3] "more than once" (within any limited time sequence) ∪ partial or limited plurality] < [4] "always" ∪ unlimited positive sequence (constantly developing up to totality)] → (as concerns radiating energy levels in the electromagnetic interaction field) 1) {[radio waves ∩ microwaves]} < [(infrared rays ∩ visible light)] ∞ 2) {[microwaves ∩ infrared rays]} < [(visible light ∩ ultraviolet rays)] ∞ 3) {[infrared rays ∩ visible light]} < [(ultraviolet rays ∩ "x" rays)] ∞ 4) {[visible light ∩ ultraviolet rays]} < [{"x" rays ∩ "gamma" rays}]] → (as concerns the levels of energy-related physical sizes) {[1] pressure (=kg/m × s²) ∩ thermal conductivity (=kg × m/s³ × °k)] < [2] force (=kg × m/s²) ∩ momentum, or impulse (=kg × m/s)] ∞ {[3] thermal capacity, or entropy (=kg × m²/s² × °k) ∩ electric power (kg × m²/s³)] < [4] heat, or energy (=kg × m²/s²) ∩ angular momentum (=kg × m²/s)] → (as concerns the levels of energy sizes related to charges) {[1] magnetic field (=kg/a × s²) ∩ electric field (=kg × m/a × s³)] < [electric resistance (=kg × m²/a² × s³) ∩ inductivity (=kg × m²/a² × s²)] ∞ {[2] electric field ∩ electric resistance] < [inductivity ∩ voltage (=kg × m²/a × s³)] ∞ {[3] electric resistance ∩ inductivity] < [voltage ∩ magnetic field flow (=kg × m²/a × s²)] ∞ {[4] inductivity ∩ voltage] < [magnetic field flow ∩ electric capacity (=kg⁻¹ × m⁻²/a⁻² × s⁻⁴)] → (as concerns the four interaction fields) {[1] gravitational interaction ∩ 2) "weak" nuclear interaction]} < {[3] electromagnetic interaction ∩ 4) "strong" nuclear interaction]} ∞ {[1] photonic energy quanta ∩ 2) gravitonic energy quanta]} < {[3] photonic "dark" matter units ∩ 4) axionic "dark" energy units]} → {[1] time ∩ 2) space] < [3] mass ∩ 4) energy]} ∞ {[1] geometric point ∩ 2) line] < [3] area ∩ 4) volume]} ∞ {[1] past ∩ 2) present] < [3] future ∩ 4) hyper time]} → {[force=(mass × space): (time)²] ∞ [time=(mass) × (space): (momentum, or impulse)]} → {[angular momentum=(mass) × (space)²: (time)] ∞ ["eternity"=(past time) × (future time)²: (present time)]}.

(A physical-mathematical and scientific-philosophical research essay concerning a new "theory of everything" by Dr. Prof. Tambara Federico, ultimate between spring and early summer, dated 2017/06/29).

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