

Exploration

A Cosmogonic Model of Human Consciousness: Part III

Claudio Messori*

ABSTRACT

This series of articles present a physicalist account on the origin of human consciousness. What is presented is a cosmogonic model based on the centrality of Tension assumed as an intrinsic and irreducible ontological presupposition associated with a pre-energetic undifferentiated and totipotent proto-dynamic principle (dynamis), whose differentiation gives birth to a space-time system of correlative interactions between physical objects denominated differentiated tensorial fractals (or tangent tensions) and undifferentiated tensorial fractals (or qualia). To describe the structure and dynamics that qualify the fundamental space-time dimension we can make use of the holographic principle, fractal self-similarity and the role reserved to the twisting moment (torque) in certain dual torus topology. In this light, human consciousness is recognized as the ecological and neuropsychological result obtained from the joint action realized through the holographic module, between poietic function, syntropic function and mnemotropic function the meanings of which shall be defined in the articles.

Part III of this series of articles contain: 4. Phenomenology of the transition between non-excited and excited regimes of the Irreducible Relativistic Dimension: fundamental physical ontology; 5. Principle of Minimum Perturbation (PMiP) and Principle of Maximum Perturbation (PMaP); and 6. Phenomenology of the event-horizon and space-time.

Key words: consciousness, states of consciousness, image-making, qualia, psychism, auto-organization, strange holographic attractor, syntropy, entropy, negentropy, mnemotropy, mnemopoiesis, confinement process, dynamis, holographic-fractal space-time, event-horizon, , toroid-poloid, tension, torque, Coriolis force, spin-internal motion.

Dedicated to the Jungian *unus mundus*

4. Phenomenology of the transition between non-excited and excited regimes of the Irreducible Relativistic Dimension: fundamental physical ontology

*The fundamental level is to be found in the **dynamics**, in the idea of a physical process, which is something which, by definition, cannot be an independent unit, since it is always **in between** its beginning and its ending. Each process is the result of, and leads to other processes. In this way processes can be seen as forming an indivisible, dynamical pattern, a holistic structure, from which the geometrical structure of space-time is to be abstracted. Heylighen Francis (A Structural Language for the Foundations of Physics)*

The *relativistic plane* can assume two forms or two coexisting and integrated space-time dimensions, one *irreducible* (**IRD**, Irreducible Relativistic Dimension) and one *reducible*

* Corresponding author: Claudio Messori, Independent Researcher, Str. Villaggio Prinzerà 1, Fraz. Boschi di Bardone, Terenzo 43040, Italy. Phone: +393282876077; e-mail: messori.claudio@gmail.com

(**RRD**, Reducible Relativistic Dimension) which are to be found reciprocally in *torque-torque coupling*, and each of which presents two regimes:

- i) a *non-excited regime* (**N-EIRD**, Non-Excited Irreducible Relativistic Dimension; **N-ERRD**, Non-Excited Reducible Relativistic Dimension),
- ii) and an *excited regime* (**EIRD**, Excited Irreducible Relativistic Dimension; **ERRD**, Excited Reducible Relativistic Dimension).

The irreducible form of the relativistic dimension in the quiet or non-excited regime (N-EIRD, Non-Excited Irreducible Relativistic Dimension) constitutes the basic physical plane exempt from matter, energy, space, time, and can be described as *a state devoid of structure (continuous, isotropic, homogeneous, imperturbed) and super-symmetrical* [12] of a **tension** qualifiable as **Implicated Tension, IT** which bears within it a protodynamic principle (*dynamis*¹) that is undifferentiated and totipotent². This state is indicated as an **implicated endodynamotensive state**.

¹ In Aristotele by *dynamis* (equivalent to *shakti* in Vedic cosmogony) is meant the *potency correlated to the action (energheia), efficient cause* connected to the *movement* and its quantitative and qualitative effects, the *inherent potency* or intrinsic possibility of a *body* to be translated in an *action (energheia)* that may be realized or not, a *value of reality* only possible with respect to the *real action realized*. The mathematician and philosopher Arthur M. Young recognizes the *action (energheia)* its fundamental causative value deriving it from the notion of *quantum of action* as formulated by Planck: *Let us also note that the purposiveness is associated with that aspect of light known as the principle of action (or least action). (...)What did Planck add to this principle of action that was not already present in the ideas of Leibniz? It was the notion that action comes in quanta or wholes, and that this unit is constant. Note that despite the tendency to refer to energy as quantized—a habit which even good physicists are given to—it is not energy but action that comes in wholes.*

Action = E x T (Energy x Time) = Constant (**h**)

Action is constant, energy is proportional to frequency. (**T** is the time of one cycle.)

(...) **Wholeness** is inherent in the nature of action, or decision, of purposive activity. (...) While mass is measured in grams, length in meters, and time in seconds, **quanta of action** are counted with no necessity of specifying the kind of unit. This implies their fundamental nature; actions **precede** measure, they are prior to the analysis which yields grams, meters, and seconds. It might be objected that action has the measure formula ML^2/T and hence cannot be dimensionless. The answer is that, though action has the dimension ML^2/T , we are taking the position that this particular combination of dimensions (known as action) is the **whole** from which time, mass, and length are derived. The reasons are as follows:

1. Action comes in irreducible **quanta** or units.
2. These units are of constant size, i.e., **invariant**.
3. They are counted, not measured.
4. Because indeterminate, they constitute the end point in the chain of causation and are therefore a **first cause**. (Source: <http://www.meru.org/coast/Arthur%20Young-LightAndChoice-RefUniv.pdf>)

² This description of the fundamental ontological principle as *Implicated-Tension that contains the dynamis* is analogous to both the Taoist cosmogonic vision of the *Tao Te Ching* (The Book of the Way and its Virtue) where the *Tao* corresponds to the *Implicated-Tension* and *Te* corresponds to the *dynamis*, and the cosmogony of the Vedas, where *Pradhana* corresponds to the *N-EIRD*, *Purusha* corresponds to *IT*, *Prakriti* corresponds to the *dynamis* and *Samsara* corresponds to the alternation of $EIRD \leftrightarrow RRD \leftrightarrow QD \leftrightarrow H-MD$.

Normally, by *tension* is meant the effect or the state produced by a *difference in potential* or by the application of a force but in the context of the N-EIRD the *Tension/dynamis* is understood not as the effect but as the presupposition (*super-symmetry of implicated tension*) of all the differences in potential, of all the interactions or forces and of all the **physical and para-physical relationships (psychism)**.

The unique property ascribable to the N-EIRD, from whose excited regime (due to a breakdown in the *tensorial super-symmetry*) come all the confinement processes whether physical or para-physical, i.e. the unique property ascribable to the non-excited state devoid of structure of the *super-symmetry of implicated tension IT*, which bears within it in a latent form (implicated) the *totipotent and undifferentiated dynamis*, is given by its irreducible **symmetry of reflection**, which assigns to the N-EIRD a **property of reflection** (reflectance³) equal to one (total).

The passage from the non-excited to excited regime of the IRD occurs under the action of supraliminal selfperturbative phenomena produced by the *auto-reverberation of the dynamis associated with the IT*. The supraliminal auto-reverberation of the *dynamis* is tantamount to the *breakdown in the tensorial super-symmetry of the IT*. The breakdown in the *tensorial super-symmetry* produced by the twisting action exercised by the auto-reverberation of the *dynamis* on the *IT* determines the appearance of a frame of *tensions tangential to the IT tensorial symmetry plane*. The effect produced by the auto-reverberation of the *dynamis* on the tensorial super-symmetry is similar to that produced by the Van der Waals forces on the super-symmetry of a super-radiating atomic system ⁴: the auto-reverberation of the *dynamis* reduces the isotropy, homogeneity and continuity of the N-EIRD by introducing a discontinuous and unhomogeneous anisotropic factor, that results in the extraction of tensorial objects (tangent tensions) as an effect of the fragmentation of the IT.

The *IT tensorial super-symmetry* counters this frame of *tangent tensions on its plane of symmetry* generating *torque* ⁵. The instantaneous generation (zero time) of this *torque* impresses the propulsive action on the reflection/projection of the perturbation that results in the constitution of the EIRD.

Put another way:

- the N-EIRD has the capacity to *reflect totally* (total *reflectance*) any perturbative effect acting around it, such as to annul it;

³ Given an incident perturbation on a surface, the quota of perturbation that the surface is able to reflect is called *reflectance*. It is represented by the relationship between the intensity of the perturbation reflected and the intensity of the incident perturbation on the surface and is of an a-dimensional size. In optics, reflectance indicates the proportion of incident light that a given surface can reflect. This is represented by the relationship between the intensity of the radiant flow transmitted and the intensity of the incident radiant flow on the surface.

⁴ (...) *in a small sample of two-level atoms (...) we have seen that the limitations to superradiance are due to Van der Waals interaction breaking the high symmetry of the atomic system: in other words, the Van der Waals forces make the atoms "distinguishable" from each other and reduce the high correlation of the pure symmetrical states. In multilevel systems, the "symmetry breaking" has another physical origin, but its effect is the same: the rate of superradiant emission is reduced.* [M. Gross and S. Haroche: *Superradiance: An essay on the theory of collective spontaneous emission*. In: PHYSICS REPORTS (Review Section of Physics Letters) 93, No. 5 (1982) , pag 392].

⁵ Torsion is a state of stress set up in a system by twisting from applying torque. Hence, torque acts as a force and torsion as a geometric deformation. In our case *tension super-symmetry* acts as a twisting-force and torque as the fundamental stress of space-time geometry.

- the supraliminal auto-reverberation of the *dynamis* associated with the *IT* (in the N-EIRD regime the *dynamis/IT is all there is*), generates a frame of *tensions tangential to the IT tensorial symmetry plane*;
- the reaction of the N-EIRD to *the auto-reverberation of the dynamis associated with the IT* consists in annulling the effect of the perturbation, in other words in neutralizing the twisting action triggered by the frame of *tensions tangential to the IT tensorial symmetry plane*;
- this neutralization is performed *by reflecting/projecting* the perturbation itself *in toto* (index of reflection or *reflectance* equal to 1);
- the result of this reflection/projection is the *confinement of the explication of the dynamis-IT* which is instantaneously circumscribed by what we might define as the *holographic pattern of an enveloping fractal mirror*;
- this confinement gives rise to the EIRD regime: a **non-local holographic resonant toroidal differentiated (tangent tension→toroid) and undifferentiated (qualia→poloid) fractal-tensor foam, wrapped around a wormhole without structure and dynamic (void)** [Fig. 4 and Animation 1].

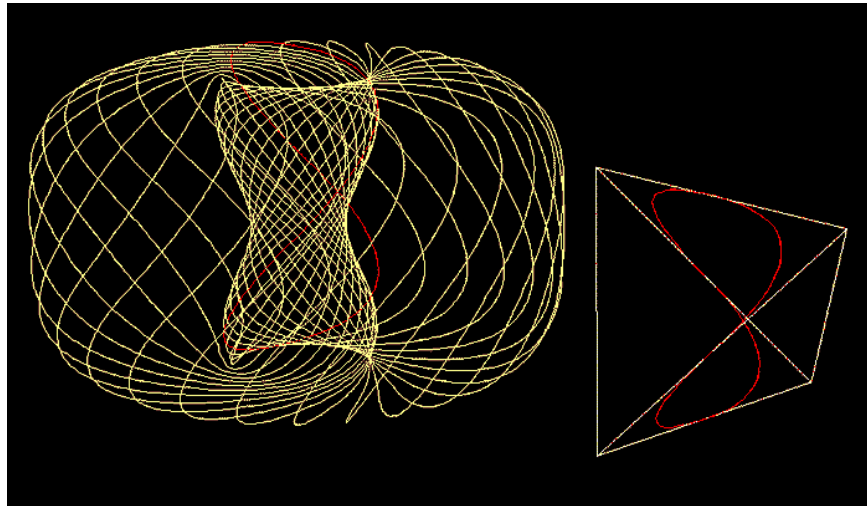
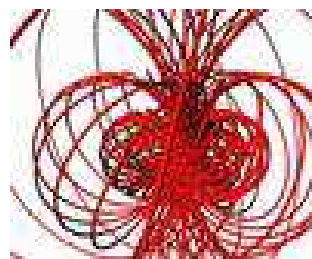


Fig. 4

Biaxial or tetra-toroid, also coined as *external toroid* warped around an *internal poloid*, as drawn here has 27 identical loops. Compared with ordinary toroid coil, the main differences are twisted loops instead of the plain toroid loops and the involuted "donut hole". While 27 closed loops are presented to show a tetrahedron relationship, all loops can be one continuous twisting line. (Image source: <http://harmoniouspalette.com/TetMold.html>)



Animation 1:

Click on the link to watch the animation: <http://vimeo.com/3945328>

(Animation source: *Hopf Fibration*, by Daniel Piker)

Phases of transformation in a toroid-poloid starting from two plain orthogonal toroid loops (spatially in phase but temporally out of phase), one associable with the values of the differentiated tensorial fractals/tangent tension (toroid) and the other associable with the values of the undifferentiated tensorial fractals/qualia (poloid).

This non-local and resonant holographic diffusion with toroidal-poloidal topology of differentiated (tangent tension→toroid) and undifferentiated (qualia→poloid) fractal-tensor foam wrapped around a wormhole (vortex) lacking in structure and dynamics (emptiness/void/vacuum) which qualifies the EIRD constitutes the basic space-time fabric upon which are grafted all the physical and para-physical phenomena (psychism) that qualify the dimensions of the manifestation.

Ontologically, the transition by reflection from the N-EIRD to the EIRD represents the first bifurcation, the original bifurcation in the genesis of the physical and para-physical phenomenological Universe. All successive bifurcations are derived from this via homomorphism (basic dynamic-structural equivalence) and translate the dynamic and structure of the EIRD, by contextualizing it.

Since the EIRD is the product of the confinement of the auto-perturbation of the N-EIRD, the structure (fractal-prochiral⁶) and the dynamic (monopolar-achiral tensorial potential) of the EIRD translate and in-form (contextualize) the properties of the N-EIRD as they are realized by the perturbation itself:

- i) the unity of the N-EIRD is translated and contextualized by the holographic configuration of the EIRD: holographically, each fraction of the EIRD contains the complete information recorded in the whole (*property of reflection, tensorial composition, torque, space-time geometry*) and each of its fractions can contain an unlimited number of secondary in-formation;
- ii) the totipotency of the N-EIRD is translated and contextualized by the absence of dynamics and structure of the void implicated in the EIRD regime and expressed by the internal zone (wormhole-vortex) delimited by the poloid in the toroidal-poloidal space-time geometry (**Fig. 4**);
- iii) the isotropy, homogeneity and continuity of the N-EIRD are translated and contextualized respectively by the *self-similarity, invariance in scale* and *quasi-*

⁶ **Prochirality**, or *prostereoisomerism*, is the property of a structure or process or an *achiral* part of them to become *chiral* if one of its two linking relationships is replaced by a new one (according to Hanson). This passage presupposes the existence of a *stereogenic centre* or a *stereogenic axis* or a *stereogenic plane* and corresponds to the substitution or addition of a variable or group of variables to the structure or process that **desymmetrizes** the achiral part. When this process of **desymmetrization** presupposes not one (prochirality) but two passages we speak of **pro-prochirality**. In the context of the EIRD, *pro-prochirality* is a property derived from *self-similarity* (similar ≠ symmetrical) of its *fractal structure* while the *stereogenic centre* resides in its *torque* (see Paragraph 4.). A process or a structure at *n*-dimensions is called *achiral* when it can be superimposed on its specular reproduction on *n+1* dimensions. A process or a structure at *n*-dimensions is called *chiral* when it cannot be superimposed on its specular reproduction on *n+1* dimensions. Chirality is a pseudoscalar property that remains invariable with an operation of symmetry of the 1st order and changes sign with an operation of symmetry of the 2nd order. A chiral structure or process can be in a position to *rotate the plane of diffusion/propagation* of a scalar/vectorial phenomenon in a levogyrous or dextrogyrous sense. This property is called *rotatory power*. When the structure or *stereogenic* process is a helicoidal/spiroidal phenomenon, the chirality deriving from it is called *helicity*.

- continuity* [13] of the *fractal-proprochiral* structure with toroidal topology of the EIRD;
- iv) the *reflective property* of the N-EIRD i.e. its capacity to consistently neutralize (tensorial polarization) the perturbations emerging within or around it, is translated and contextualized by the capacity of the EIRD to consistently limit (polarization of the cycles of tensorial hysteresis) the global effects given by the perturbations emerging within or around it, inducing them to occupy the lowest possible level of discontinuity, anisotropy and dishomogeneity (*Minimum Perturbation Principle*);
 - v) the *dynamis* involved in the *IT* is translated and contextualized in the toroidal-poloidal space-time geometry of the EIRD, where by toroidal-poloidal geometry is meant a holographic and fractal-proprochiral frame that is dynamic and virtual (intrinsically non-observable) topologically comparable to a *toroid-poloid spiroid* affected by the propulsive (accelerating) action of a torque;
 - vi) the *ante rem* absence of temporal collocation (non-instant) of the N-EIRD is translated and contextualized by the *fractal lap times*, the indeterministic component of the *indifferentiated/qualia tensions* which, in the toroidal configuration of the space-time dimension featuring a structure (fractal-proprochiral) and dynamics (monopolar-achiral tensorial potential) of the EIRD (space-time in-fusion) occupy the internal structure (poloid), and prefigure *time* in a prescriptive and non descriptive form (contextualizing *non-time* is equivalent to prescribing its antithesis i.e. *time*);
 - vii) the absence *ante rem* of spatial collocation (non-place) of the N-EIRD is translated and contextualized by the *fractal lap times*, the indeterministic component of the *differentiated tensions/tangent tensions* which, in the toroidal configuration of the space-time dimension featuring a structure (fractal-proprochirale) and dynamics (monopolar-achiral tensorial potential) of the EIRD are arranged on the full orbit of the toroid, prefiguring the dimension of *space* in a prescriptive and non-descriptive form (contextualizing *non-space* is equivalent to prescribing its antithesis i.e. *space*);
 - viii) the opposition exercised by the N-EIRD towards the breakdown in *tension symmetry* provoked by the supraliminal auto-reverberation of the *dynamis/IT* is translated and contextualized in a form of *internal resistance* polarized in the spatial component of space-time which tends to keep the planes of the *manifestation* (EIRD, QD, H-MD) restricted to the fundamental N-EIRD regime. Thus the environs of the manifestation come to be affected by two opposing and complementary tensions: **a)** the tension of *becoming* (tension/*energheia*) of the *confinement processes*, polarized in the temporal component of space-time, according to which nothing-is-created-nothing-is-destroyed-everything-is-transformed, triggered by the process of original confinement that generates the stationary but non-stable dimension featuring EIRD structure and dynamics (the *Born*) and **b)** the intrinsic *internal resistance* of the *Born* towards its deliverance from the isotropic, homogeneous, continuous, imperturbed regime of the N-EIRD (the *Non-Born*). From the opposition that separates these two *fundamental tensions* (the *becoming of confinement processes* vs. *internal resistance*) is triggered the **torque** of the EIRD regime: the coupling of the *torque-torque* that links the N-EIRD regime to the EIRD regime is given by the coupling of the *torque* generated by the opposition of the N-EIRD to the explication of the frame of tangent tensions triggered by the

supraliminal auto-reverberation of the dynamis and the *torque* generated by the *opposing tension* between the *becoming of the confinement processes* and the *internal resistance* of the EIRD [Fig. 5; Fig 6].

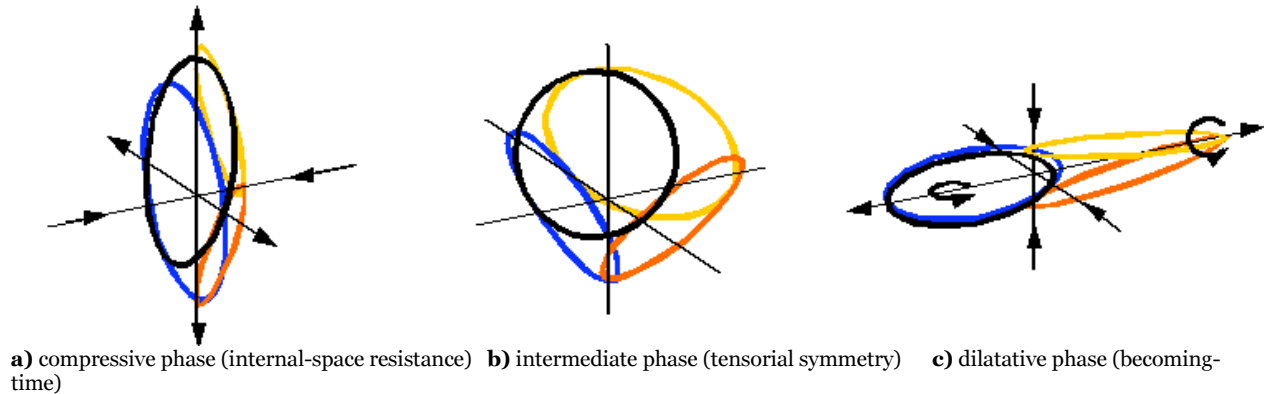


Fig. 5

Image source (modified): http://www.worldnpa.org/pdf/abstracts/abstracts_2649.pdf

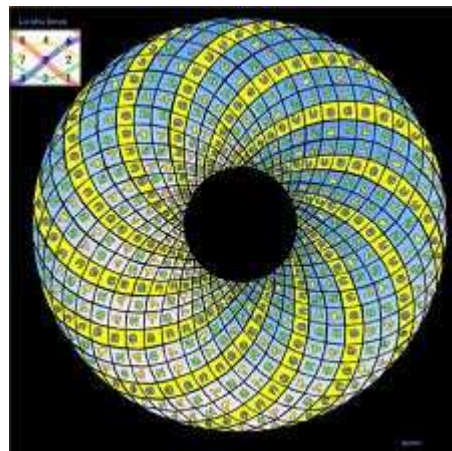


Fig. 6: Lo Shu Torus

(Image source: <http://hans.wyrdweb.eu/tag/void/>)

If we combine the Expansion and Compression patterns a *Torus* (a Rotating Circle) appears. The Zero (the Void) is in the Center and Contains the Vortex. The Vortex represents another Cycle in which every structure/pattern is destroyed to start All Over Again.

5. Principle of Minimum Perturbation (PMiP) and Principle of Maximum Perturbation (PMaP)

From the events that characterize the transition from the non-excited regime to the excited regime of the IRD we can extract two general principles.

The **first principle** or **Principle of Minimum Perturbation (PMiP)** says that every physical system or *domain of relational confinement* (tensorial, oscillatory, stereodynamic) tends to occupy the lowest possible level of discontinuity, anisotropy, unhomogeneity,

responding to an effect of perturbation acting inside or around it so as to reduce it to the minimum degree possible.

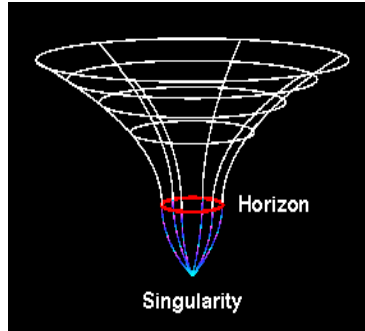
The **second principle** or **Principle of Maximum Perturbation (PMAp)** states that when a *domain of relational confinement* is influenced by a perturbation able to trigger a transition of its regime, the domain itself possesses four ways to react to the perturbation:

- i) minimizing the perturbative effect **by absorbing it** and assuming a configuration that changes its own state reversibly (reversible transition) maintaining unaltered its own tensorial/oscillatory/stereodynamic identity (e.g.: water is always water whether in a solid, liquid or gassy state; adaptive biological function; physiological auto-poiesis);
- ii) minimizing the perturbative effect **by reflecting it** until it provokes a **bifurcation** which may generate a new order of phenomena, or new forms of the manifestation, or new domains of relational confinement (e.g.: bifurcation through reflection induced by the RRD and generation of QD; bifurcation through reflection bosons \leftrightarrow fermions; bifurcation through reflection from the domain of the prokaryotes to the domain of the eukaryotes);
- iii) partially absorbing and partially reflecting the perturbative effect by eventually assuming a new tensorial/oscillatory/stereodynamic identity without abandoning the type of relational confinement domain that the specific domain belongs to (e.g.: transition from the IRD to the RRD in the RD domain; transition of the *Homo Abilis* genus to the *Homo Sapiens* genus in the *Homo* domain);
- iv) irreversibly losing its own tensorial/oscillatory/stereodynamic identity by transforming itself into its tensorial/oscillatory/stereodynamic constituents (destructuring of the relational confinement of the system with zeroing of its subsistence or condition of resonance; irreversible transition).

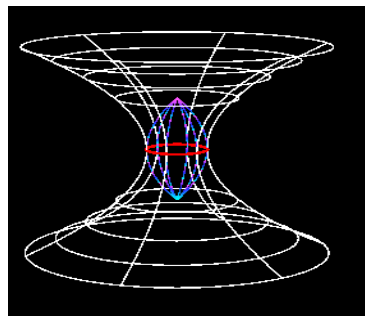
6. Phenomenology of the event-horizon and space-time

*The event-horizon is a **global** property of an entire space-time and is defined **non-locally in time**.* Jonathan Thornburg

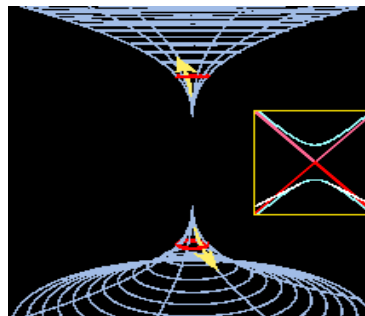
According to the standard cosmological vision, an *event-horizon* is a phenomenon of *space-time singularity* envisaged following Einstein's Theory of General Relativity (the theory, which Einstein developed in the early 20th century, states that matter curves space-time, and it is this curvature which deflects massive bodies, an effect that we interpret as the influence of gravity) when a non-banal and singular gravitational phenomenon or a gyroscopic motion at relativistic velocity deform the *space-time continuum* determining an *event-horizon* (**Fig. 7**).



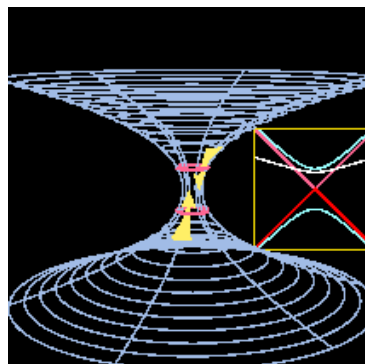
7a) a black hole and its event-horizon or Schwarzschild radius (red ring)



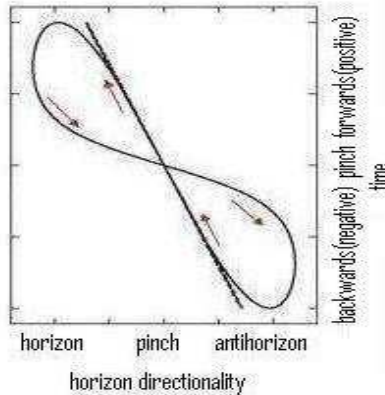
7b) the Schwarzschild bubble (central fusiform figure in blue) at the centre of the *space-time tunnel* (Schwarzschild wormhole) generated by a *black hole* (the upper part of the figure; positive values) and its *temporally inverted double* (a white hole is the time reversal of a black hole), a *white hole* (the lower part of the figure; negative values)



7c) illustration of the pinch-off-phase in the zeroing phase (inward shift) of a Schwarzschild wormhole applying the Kruskal space-time diagram (note the directionality indicated by the yellow arrows of the horizon at the top and its anti-horizon at the bottom)



7d) illustration of the pinch-in-phase in the formation phase (outward shift) of a Schwarzschild wormhole applying the Kruskal space-time diagram (note that in the *pinching point* the directionality of the horizon and its anti-horizon twist and invert)



7e) the unstable dynamic of the Schwarzschild wormhole describes a Twisted-Pinched Loop where the directionality of the event-horizon in the upper ring assumes positive values and an anterograde motion (black hole with its *future-horizon*) until the *twisting-reversing switch* at the point of intersection (*pinching point*) with its anti-horizon, to assume negative values and a retrograde motion in the lower ring (white hole with its *past-horizon*). (See the animation: http://casa.colorado.edu/~ajsh/schwwbig_gif.html)

Following the Catastrophe Theory and with reference to the initial conditions of the Universe, the *pinching point* represents the point of crisis which triggers the transition from the Pre-Quantum and Pre-Energetic Dimension to the Quantum and Energetic Dimension. In accordance with general relativity, the standard cosmological perspective (based on high-temperature phase transitions) interprets this catastrophic point of dimensional transition as a contraction of all the energy (matter) of the Universe into a single *space-time point* (or *singularity*, a place-event where energy-matter, density and temperature are infinite) to $T=0$ followed by the expansive phase of the Big Bang.

Fig. 7

Graphical illustration of the Twisted-Pinched Loop (7e) taken from Schwarzschild geometry of a space(time) portion stretched in radial direction by a black hole formation (7a,b,c,d).

Images (a,b,c,d) source: <http://casa.colorado.edu/~ajsh/schw.html>

The Schwarzschild metric admits negative square root as well as positive square root solutions for the geometry. The complete Schwarzschild geometry consists of a black hole, a white hole, and two Universes connected at their horizons (red ring in Fig. 7-b-c) by a wormhole. The negative square root solution inside the horizon (lower half in Fig. 7-b) represents a white hole. A white hole is a black hole running backwards in time. Just as black holes swallow things irretrievably, so also do white holes spit them out (see the yellow arrows in Fig. 7-c). The wormhole joining the two separate singularities (black and white hole) is also known as the Einstein-Rosen bridge, if generated it would be unstable and pinch-in-off immediately. In standard cosmology black hole is classified by the only three properties that it possesses: Mass, Spin, and Magnetic Field. The simplest black hole has no spin and no magnetic field. This is called a Schwarzschild black hole. A black hole that has a field but no spin is called a Reissner-Nordström black hole. One that has both a magnetic field and spin is called a Kerr black hole. Two other features can characterize a black hole: the accretion disk and jets. An accretion disk is matter that is drawn to the black hole. In rotating black holes and/or ones with a magnetic field, the matter forms a disk due to the mechanical forces present. In a Schwarzschild black hole, the matter would be drawn in equally from all directions, and thus would form an omni-directional accretion cloud rather than disk. Jets form in Kerr black holes that have an accretion disk. The matter is funneled into a *disk-shaped torus* by the hole's spin and magnetic fields (confronta con Fig. 12).

Compare the dynamics illustrated in **Fig.7** with that illustrated in **Fig 8** below:

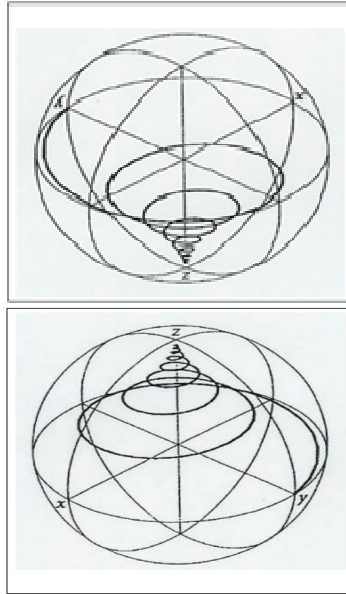


Fig. 8

Image source (modified): http://www.bcs.org//upload/pdf/quantum_holography.pdf

The Heisenberg group G helix of resonance [the image below with its reversal above - ndr] after excitation by a $\pi/2$ MRI magnetic pulse. The pitch of the helix indicates the energy gain due to the longitudinal relaxation effect. This is typical of a single-frequency FID (Free Induction – thermodynamic- Decay). [Credit: Walter Schempp].

In accordance with general relativity, the standard cosmological perspective interprets *space-time* as a *mathematical continuum* consisting of three spatial dimensions and a temporal dimension (which can assume both positive or anterograde values and negative or retrograde values), and whose decomposition into *ever smaller parts is without a break*, i.e. can have no end. This perspective leads to interpreting our physical Universe (mathematical *ante rem*) at the time of the Big Bang as a *singularity*, that is to say, as an *infinitely small physical entity*, i.e. devoid of *extension*, *mathematically indefinible*. But how can a *physical entity* (the Universe) derive from a *mathematical entity* (space-time) in the form of an *infinitely small physical entity*⁷ that is *mathematically indefinible* (singularity)? How can a plate of spaghetti derive from the *emblée* of the hat of a mathematical conjuring trick in the form of an ultra-compacted mixture of physically digestible ingredients that are mathematically undigested?

⁷ Qualifying a physical entity by the adjective *infinite* for spatial categories or *eternal* for temporal categories remains one of the indicators of the evident difficulty met by physicists, with the complicity of mathematician and philosophers, in dealing with reality when it is too large or small to be harnessed by the weft of analytical thought. The sole ambits that admit a legitimate and appropriate use of the binomial *infinite-eternal* are those that deal with mathematical bodies and those that deal with metaphysical bodies, however physical reality is not made up of either of these! Outwith these two ambits this binomial has to be replaced by the expression *unlimited in time and space*, where the adjective *unlimited* is not in fact a synonym of *infinite-eternal* because where the binomial *infinite-eternal* qualifies a body *per se*, the adjective *unlimited* qualifies a body in relationship with objective limits and/or subjects encountered by the observer in circumscribing it. If we confuse a physical body with a mathematical one we are confusing the object of the investigation with the tool used to describe it. If we confuse a physical body with a metaphysical (transcendental) one we are confusing the difficulty we encounter in re-cognizing our finiteness with the tension we feel towards the possibility of a mysterious infiniteness.

If we did not have general relativity available, the mathematical precision with which the curvature of space (time) is calculated under the effect of massive objects of planetary and stellar dimensions would not be possible, compromising, for example, the orbital stability of the entire system of satellite positioning and making any space mission impracticable. Nonetheless, the paradoxes (straddling physics and metaphysics) that emerge in the presence of non-banal and singular massive objects like black holes or the Universe at the time of the Big Bang pose some unavoidable questions that still await an answer.

Because of this, for some time physicists have been considering the possibility of providing an explanation for non-banal and singular gravitational phenomena and for gyroscopic motions at relativistic velocity that deform space-time, without recourse to the concept of space-time as a *continuum* (which does not reconcile the *continuous-infinite* nature of the gravitational field with the *granular-finite* nature of the fields introduced by quantum mechanics) and without recourse to that of singularity as an infinitely small object (mathematically irreconcilable, to the extent that mathematicians, paraphrasing a celebrated Zen aphorism, have coined the expression: *If you meet infinity in your calculations, kill it*).

With aim of unifying gravitation and quantum mechanics, in 1924 Arthur Eddington proposed as an alternative to the *gravitational action* of Einstein-Hilbert (*action* which in astrophysical environs describes how gravity emerges from the curvature of space-time in the presence of matter and energy), a gravitational action that is valid in the absence of matter (i.e. a vacuum). The recent re-elaboration of Eddington's *gravitational action*, carried out by the astrophysicists Maximo Banados and Pedro Ferreira⁸, led to a hypothesis that at the time of the Big Bang space-time was not continuous but was characterized by a minimum length, a non-continuous space-time that excludes the idea of the Universe as a singularity and which, consequently, leads to elimination of the necessity to turn to the very concept of singularity.

As for the meaning to be assigned to a non-continuous space-time, an alternative to the continuous one theorized by general relativity and that proposed more recently by the String Theory, the hypotheses currently in vogue orbit around four possibilities:

- i)** space-time is not continuous but discreet (granular or quantized; Loop Quantum Gravity);
- ii)** space-time is both continuous and quantized (theory of information⁹);
- iii)** space-time is neither continuous nor discreet but fractal [1];
- iv)** space-time is a distribution of scalar fields (Auto-Reproducing Chaotic Inflationary Universe¹⁰).

The description of these four hypotheses lies outside the scope of this work, what I am interested in underlining is that in the event-horizon (with its *double*, the anti-horizon) there is no longer a mere mathematical category of *continuous mathematical-space-time* curved by *singularity-hypermassive object*, but it can assume a non-banal, physical, as well as mathematical, consistency.

⁸ Banados M. and Ferreira P., *Eddington's theory of gravity and its progeny*, 2010:
<http://arxiv.org/pdf/1006.1769.pdf>

⁹ Achim Kempf, *Information-theoretic natural ultraviolet cutoff for space-time*, 2010:
<http://arxiv.org/pdf/0908.3061.pdf>

¹⁰ Andrei Linde, *From the Big Bang Theory to the Theory of a Stationary Universe*, 2006:
<http://arxiv.org/pdf/gr-qc/9306035v3.pdf>

In the context of this investigation, the *event-horizon* represents the boundary between the planes of the manifestation and traces the limits of observability and comparability of the phenomena that lie before and beyond the *event-horizon*. In this meaning it represents the *inertial system of reference* with respect to the phenomena correlated to it, in the sense that the phenomena generated by a transition (e.g.: N-EIRD→EIRD) refer to the *inertial system/event-horizon* generated by the actual transition.

The genesis of the *event-horizon* lies in the *property of reflection* of the dimension that triggers the dimensional bifurcation:

$$N-EIRD \rightarrow EIRD \rightarrow RRD \rightarrow QD \rightarrow H-MD$$

On the *event-horizon* all the physical and para-physical bifurcations (psychism), correspond to a vertical or horizontal shift from the domain of the manifestation upon which rests the bifurcation towards another domain or towards another plane of manifestation.

The *event-horizons* are three plus one, one for each of the three dimensional transitions explicated (excited irreducible relativistic → excited reducible relativistic → excited quantum → hyper and middle dimension) plus the *event-horizon* involved in the original transition N-EIRD→EIRD.

The three *explicated* event-horizons are wrapped, kinked around the *implicated* (original) event-horizon and find themselves in a state of space-time superposition, that is non-local, (entangled) (**Fig. 9**).

The space-time horizon of the original, fundamental events corresponds to the *reflection symmetry horizon, mirror symmetry line* generated by the transition between the regime of the N-EIRD and the regime of the EIRD.

The EIRD, we will recall, is the product of confinement due to reflection of the auto-perturbative state of the *dynamis* associated with the *IT*.

The structure (fractal-proprochiral) and the dynamic (potential tensorial monopolar-achiral) of the EIRD translate and in-form (contextualize) the properties of the N-EIRD *just as they are explicated by the total* reflection of the auto-perturbative state of the *dynamis/IT*.

The total reflection of the auto-reverberation of the *dynamis/IT* by the N-EIRD is comparable to the reflective action of a mirror with an index of reflection or reflectance equal to 1, i.e. total.

This degree of reflectance is given by the fact that the N-EIRD is intrinsically and irriducibly isotropic, continuous, homogeneous and unperturbed, and as such behaves as an ideal reflecting surface.

On the contrary, the reflection index of the EIRD, like the reflection index of any other dimensional state, cannot be equal to one but can only come close to one.

We might compare the EIRD to the surface of a lake reflecting an image of the Moon. Not only is the image of the Moon on the surface of the lake not the Moon, but the image is the product of a series of conditions (the variables) that create a relationship between the surface of the water and the solar light reflected by the lunar disc. Each of these conditions corresponds to a *variation in state*, i.e. a perturbation. Depending on a certain number of *variations in state* the image of the Moon reflected by the surface of the water will appear more or less deformed, more or less distorted with respect to the original.

In our case, the image of the N-EIRD reflected by the EIRD is distorted for two reasons:

- first, because the EIRD is not a reflected image of the E/NIRD but is a specular and distorted image of the perturbation of the *dynamis/IT* reflected by the N-EIRD;
- second, because the dynamics and structure of the EIRD are themselves perturbations which alter its reflective capacity (reflectance < 1).

At every transition between a regime and the successive one, the distortion changes according to the perturbation which triggers the transition summed to the perturbation introduced by the dynamics and structure of the new regime.

The EIRD, as a specular and distorted image of the perturbation of the *dynamis/IT* reflected by the N-EIRD, re-produces this perturbation by inverting it (just as on the acoustic plane a sound is an inverted reflection of its echo).

If we assimilate the EIRD regime to a *regime that is stationary but not stable of tensorial infusion that pulsates under the action generated by variations in the opposing tension between the **internal resistance** vs. the **becoming of the confinement processes***, this inverted re-production of the perturbation of the *dynamis/IT* reflected by the N-EIRD means that in the EIRD the propulsive-repulsive action (monopolar polarization) exercised by the *torque* during the projective-reflective phase of the DRIN-E→DRIE transition is re-produced by the introduction of a quasi-specular action of an opposite sign, giving rise to a *dipolar polarization* that pits acceleration vs. deceleration, repulsion vs. attraction. In this way *opposing tension* and therefore the *torque* of the EIRD becomes the site of a *stereogenic centre* able to *desymmetrize the achiral* part of the EIRD i.e. of *desymmetrizing the becoming of the torque* and with it the *space-time geometry* of the EIRD.

The *desymmetrization of the torque and the space-time geometry* of the EIRD:

- i) is the triggering factor of the transition from the DRIE regime to the RRD regime,
- ii) is the condition that is the origin of the *Coriolis potential* and the *Coriolis force* (EIRD→RRD transition), the force that opposes the desymmetrization of the torque¹¹ [14],
- iii) is the condition that is the origin of (ERRD→QD) the *energetic phenomenon* (which contextualizes the *dipolar polarization* of the torque), *space* (which contextualizes the *internal resistance*) and *time* (which contextualizes the *becoming of the confinement processes*).

The desymmetrization of the *torque and of the space-time* of the EIRD as a condition from which *space* and *time* originate (ERRD→QD) allows us to clarify what should be understood, physically, by *space-time* or the *space-time continuum*, terms made abundant use of in the context of this treatise and which I discussed at the beginning of this paragraph:

- *space-time* or *space-time continuum a)* is the fundamental physical warp devoid of spatial collocation and devoid of temporal collocation given by the state of *infusion* that exists between the *tension of internal resistance vs. the tension of*

¹¹ So contrary to all physical intuition, by rotating a fluid we make it change its physical properties, make it "stiff". Taylor's experiment remind us of the fundamental fact that the Coriolis force is not just deflecting moving bodies, but opposes their displacement by trying to restore them to their initial position. (Credit: Anders Persson)

becoming, **b**) is made up of *differentiated and undifferentiated tensorial fractals*, **c**) features a *monopolar-achiral tensorial potential*, **d**) is affected by phenomena of *hysteresis-tensorial polarization-resonance*, **e**) is configured as a *hologram* and structured as a *fractal-proprochiral* (since the proprochirality of the EIRD regime is a property derived from its stereogenic centre).

Space-time or space-time continuum or fundamental space-time geometry coincide with the relativistic excited IRD regime, where the *confinement processes are fractals that are subliminal and coherent with the space-time geometry (state of in-fusion of resistance-space vs. becoming-time) immersed in a monopolar-achiral tensorial potential*.

But where is the sense in speaking of *processes devoid of a temporal and spatial collocation* if a process is such only in accordance with a spatial and/or temporal collocation of events? The physical reality of a process is *made of* spatial coordinates and temporal coordinates.

Unquestionably, but we could also say that the coordinates we use to define space (or spaces) and time (or times) are conventional indicators (just as Planck's Constant is a conventional indicator of quantum *granularity*) which we have recourse to in order to orient ourselves in mapping reality, but they are not reality, they are parts of our mental/instrumental map and not of the territory. Questioning ourselves on what collocation to give space-time, which reality are we speaking of?

The physical reality of the events that we collocate inside the ordinary coordinates of time and space clearly is not the same as that which we refer to when speaking of space-time. The physical reality of space-time *responds to other coordinates*, with respect to which our ordinary coordinates, albeit scientifically sound, vacillate until they become zero.

Do we have available a paradigm and the linguistic tools to express this other space-time reality without plunging into contradiction? We could make use of the excess of sense of the symbol, the space-time dilation of the oniric experience, the alterity of spaces and times in the tension experienced in altered states of consciousness (i.e. shamanic experiences), languages and expressive forms of Dionysian art which belong to the underground pulsions of the unconscious and which are fully expressed through music, we could give ourselves over to the experience of space and time in meditative practices, but none of these possibilities can tell us what we should understand by space-time continuum in the context of relativistic physics.

A process can be understood as a series of *variations in state*. To define a *variation in state* we must make reference to an *inertial system* with respect to which the variation or variations take place.

In the ambit of the EIRD the reference inertial system is represented by its *space-time event-horizon*.

But here too the limits traced by our internal representation of external reality and by the language which expresses it pose us some problems: how can we say that the *space-time continuum* is something that apparently has nothing to do with the ordinary coordinates of space and time and, at the same time, establish that the *space-time event-horizon* traces limits on observability and the comparison of phenomena that lie *before and beyond* the *event-horizon*? The existence of a line of demarcation between a *before* and a *beyond* already establishes a *spatial and/or temporal collocation* of events.

The many paradoxes and the many shadow areas that emerge in the attempt to interpret, understand and describe quantum, quantum-relativistic and relativistic phenomena force us to adopt an epistemological perspective that is open to paradox but that also suggests how to critically re-think the scientifically proven certainties that we derive from investigating and describing ordinary reality: are we absolutely sure that these certainties weighed against these paradoxes do not make the reality described by a scientific method less objective than we would wish it to be?

As much as we force ourselves to be objective we will never be able to avoid the subjectivity that is intrinsic to being observers: reality ceases to be such as soon as it is observed, i.e., reality observed depends, at least in part, on the reality of the observer. This is true for ordinary reality and even more so for non-ordinary and paradoxical realities such as the quantum, quantum-relativistic and relativistic.

Should our observation of reality favour certainties and view paradoxes with suspicion, it is because we have built a world of certainties that views paradoxes with suspicion. Are we able to integrate the paradox into our perspective of knowledge?

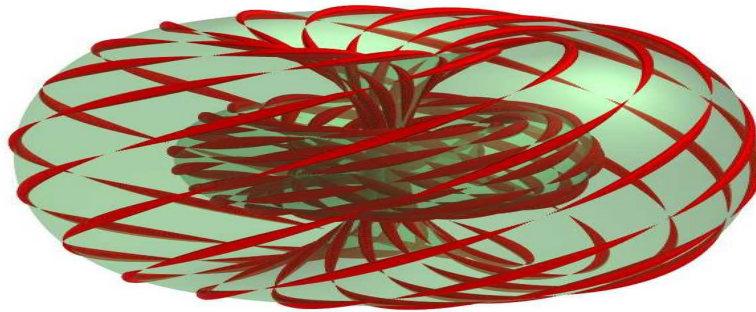


Fig. 9

[Source: *Concepts of a space-time warp: Warp Theory*. At: http://portal.groupkos.com/index.php?title=Warp_Theory_101]

In the EIRD dimension, the space-time topology is schematized by two complementary embriated *toroids* (replicants), united by and wrapped by a *poloid* which delimits a vortex: the loops that constitute the two toroids correspond to the **internal resistance** (compressive-accelerative phase of the hysteresis cycle of the Twisted-Pinched Hysteresis Loop; spatial component of space-time) and are composed of **tangent tension** differentiated tensorial fractals (of a positive sign those that make up the external toroid and a negative sign those that make up the internal toroid) while the loops that form the *shared poloid* correspond to the **becoming of the confinement processes** (decelerating dilatory-phase of the hysteresis cycle of the T-PHL; temporal component of space-time) and are made up of undifferentiated tensorial fractals, **qualia** (of a positive sign those that make up the external surface of the poloid and a negative sign those that make up the internal surface of the poloid). The two toroids are polarized in the spatial component of the space-time continuum (state of space-time in-fusion) while the poloid is polarized in the temporal component. The black hole-vortex (void) circumscribed by the poloid is devoid of dynamics and structure and is totipotent.

(Continued on Part IV)

Note: References are listed at the end of Part IV