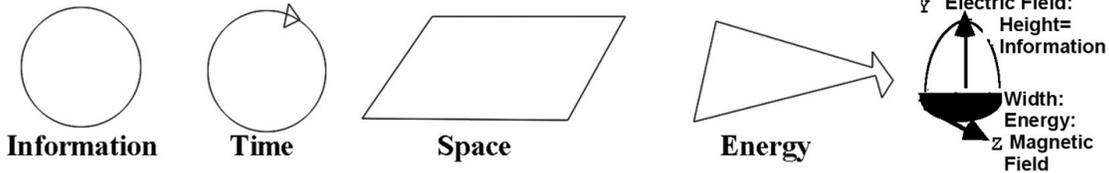


**Abstract.**

The 5<sup>th</sup> dimension is the dimension of spatial size and speed of temporal clocks. Both parameters are inverted: when systems grow in size the speed of its clocks, its 'time cycles', diminish proportionally, *both in biological and physical systems*. And vice versa. Smaller clocks tick faster and information processing carried by the frequency of those cycles accelerates, as it happens in chips, particles or life metabolism.

'A Geometry is the study of the invariant properties of a space(time), under transformations within itself' (Klein) As such, the geometry of the 5<sup>th</sup> dimension is defined by a co-invariant equation that relates 2 'inverse' parameters, spatial energy and temporal information:  $Se \times Ti = K$ , from where 5 invariant properties followed by all systems of the Universe can be deduced: the invariance of formal motions, of actions, of topological forms, of scales and of time ages. This paper will resume them.

**THE GEOMETRY OF THE FIFTH DIMENSION: A UNIVERSE OF 2 FORMAL MOTIONS**



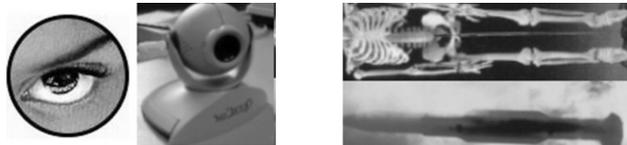
Reality has a 5<sup>th</sup> dimension of size scales with different speeds of temporal information. Since time is the moving perception of information and space the static perception of vacuum energy. Both vary in an inverse fashion, giving birth to the scalar geometry of the fractal Universe, whose 5D laws will r=evolve XXI c. science.

**3.The inverse properties of spatial energy and temporal information**

The Universe is made of 2 substances: spatial energy and informative time. Space can be seen as a whole fixed space or as a sum of multiple parts, many 'vital spaces' composed of 'quantum energies' enclosed by time cycles:  $\sum E = S$ . Time also can be measured with a single 'human', lineal clock-time, based in our 'minimal bit of information', the second with our mechanical clocks or as an infinite number of cycles that all entities trace, each one with a different speed and rhythm, each one with a different 'form' or information, provided by the shape of the cycle and its 'frequency'. So Space is synonymous of Energies and time of informations:  $S; \sum i = T$

We can see them together creating beings, the simplest of which is an action of light,  $ext=k$ . Informative machines and particles of information are cyclical, and all physical energetic systems are made of lineal planes of forces. Weapons are lines that release energy. And this duality structures all beings of the Universe: So we

are made of cyclical heads and lineal bodies. In the graph, *Form is function*. And so the ball – the inner part of a sphere - is the perfect form of information as it is the shape that stores more form in lesser space, and the line or plane the perfect form of energy, as it is the fastest motion/biggest surface of space between two points. *Space becomes then a lineal, entropy motion or 'energy' and Time a cyclical, imploding form of order or information, of inverse, complementary properties.*



In the graph, as a result of those morphologies we classify as energy or information organs not only carbon-life organisms, made of energy (bodies, food) and information (brains, eyes, senses, worlds), but also other beings and atomic species, even 'deconstructed

organs'. Since we can now recognize geometrically their energy or information organs. Some of those systems are mechanical, made of metal. Some are vital, made of carbon atoms.

Once those dualities are understood, we can compare the properties of both, spatial energy and temporal information, observing the inversion of its qualities and yet, in as much as both have the same number of dimensions, energy and information can transform one into the other by transmuting those properties:

<i>Informative time, Ti</i>	Vs.	<i>Energetic Space, ΣS</i>
Time-clocks: Information	Vs.	Space motion: Lineal energy
Small, still	Vs.	Large, moving fast
Tall, Perpendicular	Vs.	Long, Parallel
Hierarchical	Vs.	Democratic
Bidimensional Height	Vs.	Bidimensional Length
Repetition	Vs.	Width-Growth
Cyclical, Rotation, imploding	Vs.	Lineal, uncoiling, exploding
Informative Frequency	Vs.	Lineal Speed
Broken form	Vs.	Continuous, differentiable
Intelligent, perceptive	Vs.	Strong, fast.
Social, organic, creative	Vs.	Darwinian, destructive behavior
Future, evolved predator	Vs.	Past, energetic victim
Life arrow	Vs.	Death arrow.
Waves of space	Vs.	Particles of Time
Female, yin principle	Vs.	Male, yang principle
Masses, charges	Vs.	Forces, fields
Heads & senses	Vs.	Limbs & Bodies.

The formal=functional differences between energy and information (organs) is a duality - the 'Black hole Law':

*Maximal Space = Energy = Min. Form=body Vs. Max. speed of Information = Minimal Spatial extension=head*

For example, as the chip becomes smaller halving its size every 2 years it doubles its capacity to process information('Moore's Law) The reason is obvious: to think, to calculate you have to communicate in-form-ation, forms between elements of any informative system. The smaller the brain, the faster communication takes place within that brain and the faster it calculates and processes information in a logic manner.

### 1. The Measure of time cycles: frequency.

Each clock creates a discontinuous space-time, whose cyclical perimeter of in-form-ation encloses a piece of energetic space breaking reality into ∞ formal patterns; different time cycles with specific forms and frequencies. Thus the use of a single human clock that equalizes all of them misses 2 features of each of those time cycles:

- Its specific forms of in-form-ation in space, which gives birth to the main topological laws and invariances of the 5<sup>th</sup> Dimension (I).

- Its different speeds or frequencies. Since cyclical time is measured not by duration but by frequency, its inverse function:  $f(t)=1/T$ .

We shall see how the combined analysis of those 2 properties, missed by standard science give birth to new laws and invariances, common to all the systems of the Universe, among them:

- The temporal nature of masses and charges, which are not substances but vortices of time, clocks of the 2 main physical scales of the Universe - the quantum, electromagnetic and cosmological, gravitational scales. Masses and charges *are defined in 5D by the frequency of its vortices that determines its force or attractive power*. They are also the first units of in/form/ation. Thus, each mass and charge and its 'Universal constants' are invariant functions of their vortex frequency:  $E=Mc^2 + E=Hv \rightarrow Mc^2=Hf \rightarrow M= (H/c^2) f \rightarrow M=Kf$ .

- The synchronicities of frequencies across  $3\sum \pm i$  scales that create 5D systems and super-organisms (V).

- The Invariance of the  $3\pm i$  Life Ages and the  $3\pm i$  ages of all species or Plan of evolution. Since species are 'super-organisms' of a higher  $i+1$  scale, where each  $i$ -ndividual plays the role of a 'cell', and all together evolve in a similar fashion to the  $3\pm i$  ages of life systems (VI).

- The Invariance of the  $3\pm i$  self-similar States of Matter: Energetic Gas;  $e=i$  liquid and Informative Solid.

## 2. Definition of a Dimension as motion and distances. The Paradox of Galileo.

Since at quantum level all what we see as a fixed form or particle is in fact a rotating vortex or clock of time (mass or charge) with motion, dimensions are formal motions 'perceived as fixed space' *and we live in a world made of clock motions (time cycles) and energetic, lineal motion (forces) - NOT of substances*.

Thus dimensions are built by the motion of a particle-form with one dimension less or by the constant imprinting of a reproductive wave with in-form-ation across a simpler energy-space.

The duality of motion-distance is similar to the way we see a car moving in a night picture as a fixed line, or the stop and go duality of a film projector, which is perceived as motion. And it has deep implications, which help to resolve many uncertainties of physics. The next graph illustrates this and other dual paradoxes of endophysics –motion vs. stillness; continuity vs. discontinuity, single space vs. fractal scales, all of which depend on the detail of the observation – hence the quantity of information we have on the object we study:



*In the graph, Saturn's rings, first observed by Galileo, seem continuous, still and bidimensional from far away; but observed in detail they become discontinuous in motion and made of 4D spherical particles.*

*Moreover, what appears as a single space-time continuum in detail becomes at least 3 scales: that of the rings with cyclical motion, of its particles, the rocks that turn within them and the not seen but known scale of atoms that create the solid networks of those rocks. The 'present' state of science deals mainly with the single space-time continuum of the more 'obvious' human scale studied in terms of 'present'=differential motions,  $\partial t$ , with minimal latitude of time. The 5<sup>th</sup> and sixth dimensions deal with a longer duration from the absolute past (birth of the entity) to its absolute future (its death), when evolutions of form, frequencies of multiple actions and cycles of creation and extinction happen.*

The Paradox of Galileo - 'why if the Earth moves, we see it still?' - is the key question to understand the meaning of dimensions, which can be generalized to all forms: 'why we see reality still, if all what we study in the

quantum scale has motion?' The answer- given by quantum physics that we expand to all scales - is the law of complementarity: 'all what exists is still and has motion at the same time; all is a 'fixed particle' and a 'moving wave', but we perceive a limited quantity of information about reality – either state, but not both dual, complementary states, a motion state and a still state, together:

All entities exist in a dual state of internal, 'vital' space with no relative motion between its parts and external time motion. All has a function in time and a form in space. As Schrodinger's cat, all is dead and alive...

### 1. POINTS WITH PARTS. 2. LINEAL ET WAVES-FLOWS

**Quantic Points have inner dimensions. They share dual lines-flows of energy & information with other points, creating quantic, organic networks=planes of space-time:**

### 3: EQUALITY VS PERPENDICULARITY

**Perpendicular exT flows create destructive & hierarchical events. Parallel flows build social networks. The combination of both, create the complex i-dimensional structure of superorganisms:**

### 4: QUANTIC PLANES

**Non-Euclidean geometry. Fractal points.**

The Paradox of Galileo explains the dualities of motion and stillness, continuity and discontinuity and the fractal nature of non-Euclidean points, which grow in size and form as we come closer to them.

Einstein used the 5<sup>th</sup> postulate of Non-Euclidean Geometry (Points through which multiple parallels can cross), to describe the structure of real space. This was also a first step towards the correct analysis of the 5<sup>th</sup> dimension and all the fractal scales of space-time enclosed within it. To complete that analysis, we have to expand Non-Euclidean geometry (abb. Non-E) and adapt the other 4 Euclidean postulates to the new definition of a point through which multiple parallels can cross, *because in closer view we can enlarge the point to fit them.*

If a 'point' can enclose multiple parallels it must have volume, and hence we must reform also the 1<sup>st</sup> postulate of Euclidean geometry - definition of 'a point (that) has no breath' and the other 4 derived from it. *As now points must have breath to enclose more than one parallel.*

So now a line made of points with 'breath', hence cycles, is in fact a wave with a height equivalent to the point's

### 5: I-VOLUTION

**Quantic Networks joint Non-E points through dual flows of energy & information into present, existential planes. Planes organize a 5th hierarchical i-dimension through unequal flows of energy from past micro to macrocosms & information from future macrocosms to microcosms:**

diameter – as the form of the external perimeter drawn by a 'cycle'-similar to a wheel advancing in a lineal path draws a wave (2<sup>nd</sup> postulate).

And a plane (4<sup>th</sup> postulate) becomes now a topological network of points with volume (particles in physical spaces, cells in biological spaces and so on) communicated by waves of energy and information.

Finally 'equality' (3<sup>rd</sup> postulate) must be now both external (classic Euclidean postulate) but also internal in the parts of the point. Yet since we cannot perceive the complete information internal to the point, isolated to our complete perception by its external membrane that 'seems' fixed to us (Galilean Paradox, Endophysics) we must talk instead of equality of degrees of 'self-similarity' between any 2 space-time forms. So *the Invariances of Absolute Relativity between entities of different scales are NOT equalities as those of Relativity but 'similarities'*.

Yet since motion, discontinuity and fractal structure becomes evident as we come closer to the object, increasing our information and the truth of an entity is a direct function of the quantity of information we have of it, a Universe made of motions NOT substances, of discontinuous, fractal space-time, not of continuum fixed space is more truth. Thus, all systems must, by the paradox of Galileo, be defined in time and space to achieve a complete description of an event. *Yet the fractal, discontinuous, moving, scalar description is logically more truth. Indeed*, in the formalism of Non-Aristotelian logic, 'truth=information' is measured in terms of probabilities and is a function which increases proportionally to our closeness to the entity we study and so it reaches 1, when information and truth become the same only when we occupy the same space-time than the being – that is, as Haldane put it: 'Only the Universe (or any being) has all the truth (information) about itself'.

So we define the dual nature of dimensions: '*A dimension is a motion perceived as still extension or distance*'

Hence dimensions can be generated by motions of particles and reproductions of waves. In the lower scale dimensions are in fact defined by the reproduction of lineal strings, laterally, into bidimensional planes and 3 dimensions by the reproduction of a cyclical closed string into tubes.

In the Universe at large, space is a planar vacuum, teaming with energetic motions that appear at a large scale 'as fixed' space-distances (quantum vs. relativistic view); and its 'units of substance are rotating Galaxies, their time-clocks. Some consequences of this Galilean duality studied in other papers<sup>3</sup>:

- Galaxies are separating from each other as 'space expands' (current perception) but from a moving perspective this means they moving up to  $Z > 10C$  speed, and so *the cosmological world of 'dark energy' becomes a new 'fractal scale' which we cannot perceive within the C-limit of our electromagnetic membrane.*

- The Big-bang's main proof of an accelerating, entropic, lineal space is balanced by the imploding creation of galactic mass-clock vortices, making the total expansion of space-time null and the Universe eternal in a steady state, of fluctuations along the length-axis or dimension of energy (vacuum expansion), and the height axis of black hole formation of mass (implosion). Thus the Cosmos can have an  $\infty$  number of steady state scales.

- The vacuum of our scale of space-time is made of light, which *can be seen as a single sheet of fixed space-distance or as electromagnetic motion at c-speed. Since vacuum is filled even in its minimal energy density by a background radiation light – a fact that explains the creation of virtual particles, the first condensation of energy-space into light waves or clocks of time (closed light paths, which start with the 'first' clock, the electron, a condensed density of light photons).*

- *Galileo's paradox explains the immortality of the Universe, since a Universe made of motions cannot stop.*

#### **4. Conservation principles. Energy-Mass. Actions of energy and time.**

Because now time and space are both motions, it is possible to transform one into the other, *by changing their form*, which is the true meaning of the Principle of Conservation of Energy and Information:

*'All what exists are systems of energy and in/form/ation that trans/form into each other ad eternal:  $E < = > I$ '.*

Another event explained by the 2 universal motions is the equation  $E=Mc^2$ , in which lineal energy becomes in-form-ation - a mass clock: when energy reaches its c-speed limit and keeps absorbing energy from a field (i.e. a synchrotron) the new energy is deviated into a higher dimension of information, creating a mass vortex, which will increase its rotational acceleration=mass=(equivalence principle).

What is the minimal  $exi=k$ , complementary system of energy and information? Physicists will notice that the 5D Generator is the same equation than the minimal 'action' of quantum physics,  $exi=k$ , or minimal complementary system = quantum of space-time; which lead us to study the Invariance of space-time actions.

All the laws of conservation of momentum in physics are derivatives of 5D metrics and the previous laws, since masses and charges are vortices of time and speeds are energy motions:  $M(T) \times V(E)=K$ ; while violations of conservation principles merely means that part of the energy and information has 'emerged' into a different  $i \pm 1$  scale (often the gravitational, unperceived one, as in the case of neutrinos).

### **Conclusion.**

4 FUNDAMENTAL conclusions of 5D metrics will CHANGE our perception of reality:

- The Universe is eternal, made of 2 motions in perpetual  $ex \leftrightarrow$  change, NOT of substances.
- Since the metrics of 5D for the whole space-time Universe are the same than the equation which defines the 2 parts of any system, we conclude that we do NOT exist over an independent space-time but we *are made of space and time, each of us is a complex system made of bits of temporal information, of circadian or physical clocks and surfaces of vital space, imprinted by the form of those cyclical in-form-ations.*

In physical systems all scales and particles are background dependent, *constructed with pieces of spatial energy and temporal information, starting with the smallest theoretical scale of background dependent, lineal, open strings which are rods of Planck's space and cyclical, closed strings which are the tiniest Planck's time-clocks.*

- Since all systems are made of Se and Ti, 5D invariances and laws *apply to all systems of the Universe, creating a PANTHEIST Universe, a fractal of its Fundamental Particle, the Complementary Systems,  $SexTi=k$ .*
- All complementary entities displace a particle/head that gauge information over an energy body/field directing its actions: *MOTIONS WITH FORM*, which can combine in ONLY 5 Invariant actions –  $\Delta E$ ,  $\Delta I$ ,  $exi$  (reproduction & communication) and 2 types of social growth:  $\sum E_i$ : **energy herding in the same scale &  $\prod \pm 1$  creation of informative networks across  $3 \pm 1$  scales.** Those 5 actions define the program of all Complementarity systems & its invariances (from invariance of physical momentum to the cyclical actions of humans along their existence).

II. INVARIANCE OF QUANTUM ACTIONS: THE 5 ACTIONS OF SPACE-TIME SYSTEMS.

THE 3+1 TEMPORAL CYCLES AND SPATIAL DIMENSIONS OF AN I-ORGANISM:

ORGANISMS ABSORB, EMIT AND COMBINE SPATIAL ENERGY & TEMPORAL INFORMATION IN 4+i TEMPORAL CYCLES OF:

Energy=Feeding Space=Reproduction Information=Perception, Time=Cyclic change and Fractal, Social Evolution

$\sum E_{i-1} > E_i$       $eti > \sum ETi$       $\prod ti > T_{i+1}$       $E_i > TE_i > T_i$       $\sum T_i > T_{i+1}$

PERCEIVED IN PRESENT SPACE AS THE 4+i PERPENDICULAR DIMENSIONS OF ANY RELATIVE QUANTIC S-T ORGANIC FIELD:

Energy=Lineal Movement, Space=Width, Information=Height, Time=Cyclic Movement and social, fractal evolution

that combine creating 'bodies': planar, present networks of spatial energy :

and cyclical networks of temporal information or heads:

THOSE QUANTIC, RELATIVE SPACE-TIME ORGANISMS PUT TOGETHER CREATE THE CONTINUOUS SPACE-TIME PLANES OF EACH I-SCALE OF THE FRACTAL UNIVERSE, STARTING WITH THE THE LIGHT-SPACE MEMBRANE THAT HUMANITY PERCEIVES WITH ITS ELECTRONIC SENSES...

1. Deduction of the 5 Invariant Actions of all systems from the Invariance of Energy and Information.

Quantum physics discovered that the Universe is not made of substances but of motions called actions that combine energy and time. The simplest action of energy and time is called an h-Planck constant – the first complementary 'being', the simplest bricks of the Universe that creates light, electromagnetic space-time.

5D science expands the principle to all scales: from a quantum particle to a human that states 'I don't have time or energy to do this', we find all existential systems combine both motions into constants of 'action':  $exi=k$ .

We are all complex 'knots' of energy and time actions, motions with form. Let us classify all those possible Universal actions, departing from the fact that there are only 2 motions, lineal energy and cyclical information, combined in  $exi$  actions, which organize themselves into 'complex knots', herds of multiple actions,  $\sum exi=k$ .

Thus all what systems can do are 4 type of actions performed by all complementary bodies/fields of energy and heads/particles of information:

- $\Delta E$ : Systems feed on energy for their bodies/fields.

- $\Delta I$ : They absorb information for their heads/particles.
- $\Delta E \times I; E \Leftrightarrow I$ : They communicate both, often merging E&I to reproduce the entity in other space time zone, to survive after death or become reproduced by an external catalyzer or enzyme. i.e: 'enzymen' make machines.
- $\sum e \times i$ : They evolve socially in more complex networks that survive longer in time and space.

Those 4 arrows are 'necessary' for any complementary system of energy and information to last. As any complementary system will die if it doesn't replenish its energy ( $\Delta E$ ) and information,  $\Delta I$ , or reproduce before death,  $\Delta E \times I$ . While systems made of multiple actions,  $\sum e \times i$ , will have more energy and information, more 'power' becoming top predators able to feed on single systems, as biology shows (herds dominate individual species).

Further on, since according to 5D metrics a larger system acts slower in time, the advantage of a herd can be upset by their slow collective actions by a smaller, faster predator. So systems try to take advantage of the different 'density' of information and energy happening in different i-scales, acting also in their lower and upper scale. Yet since, according to the laws of geometry, any part of a given space-time can only 'travel' and interact in those domains that match its own  $S_e \times T_i$  parameters; for a system to travel through 3  $i \pm 1$  scales of the 5<sup>th</sup> dimension with different parameters, it has to co-exist simultaneously with 'smaller  $i-1$  cells' and bigger  $i+1$  super-organisms. This fact defines the 'fundamental particle' of the Universe, a scalar super-organism that co-exists simultaneously in 3  $i \pm 1$  ternary scales to extract energy and information from them – in the case of a human being, in our cellular, individual and social scales. And explains the 5<sup>th</sup> dimensional action - organicism:

-  $\sum E_{i-1} \Leftrightarrow \prod T_i$ : This equation, which includes all the other actions, is the Generator equation of all the entities of energy and information or space and time of the Universe, of all Existences.

Where  $\prod$  is the symbol for a 'network' of cyclical, informative 'neurons/particles', T, that unlike 'loose' herds/webs of energy fields/cells across a single space sheet, are relatively 'fixed' and interconnected with all the others, *through a lower scale of 'axons/simpler actions'*. Which is the origin of the many power laws of the Universe, since the number of connections='axons-simpler actions of energy' will be the square of the number of T-neurons/particles, a fact generalized for systems analyzed through several i-scales. Hence we write  $T^i$

### III. INVARIANCE OF TOPOLOGICAL FORMS: COMPLEMENTARY SYSTEMS IN SPACE.

#### 1. Parallelism between the 5 Actions of diffeomorphic systems and their 5 Dimensions of Reality.

Galileo's Paradox makes the 3 dimensions of space also motions: At quantum scale 'space' is a bubbling world of electromagnetic energies and particles condensed from those energies. In our scale, space is a gas whose volume is proportional to its motion/temperature:  $PxV=knT$ . And as its motion grows volume-space grows.

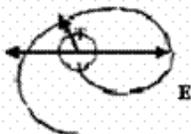
Physicists, unaware of the paradox of Galileo still draw higher dimensions as weird spatial drawings, when beyond 3D, dimensions are time motions of a *higher fractal scale*.

*Dimensions are functional motions perceived in stillness, which explains the generation of dimensions:*

A point with motion creates first a height dimension to 'gauge' from an advantageous P.O.V.; then it moves forward in its diffeomorphic dimension of energy feeding, creating a plane; a line in motion creates a bidimensional plane of information; a plane in motion, reproduces laterally, creating a mass-volume and a volume in motion creates a life-cycle or world-cone - the concept used in Relativity to define the 4<sup>th</sup> dimension of time. But *we cannot generate more dimensions in this fashion, except as mathematical entelechies, at least in our observed Universe, since they are neither such forms nor further functions in a single continuous space-time plane. Thus the 5<sup>th</sup> dimension of scales, with different time speeds structures superorganisms.*

It is the *holographic principle*: 3D space has 2 dimensions of temporal information, height and width (so a book or a screen has those 2 dimensions that you 'read') and 2 dimensions of energy, length and width, as we absorb energy in the direction of motion, reproducing and storing cells in the 'fat' dimension of width that merges both, exi dimensions of space-time. Thus both, energy 'sheets' and 'informative antennae' are bidimensional, perceived by human senses as a duality of motion-stillness (Galileo's Paradox). So the 1<sup>st</sup> dimension is length or speed; the 2D are a moving plane or sheet of information as this page is; the 3<sup>rd</sup> is a volume or rotating body, which moves through the 4<sup>th</sup> dimension, treated as space in Relativity (a world line). Finally, *an organism in 5D seems 'still' but within it all cells and particles are performing complex cycles of energy and form.*

Moreover we observe that as *each more complex action includes the previous ones*, each 'bigger dimension' includes the previous ones. So the line includes the point; the plane, the line; the volume the plane and the world-cone the plane. Thus we write in dynamic terms the Generator, as a feedback equation of fluxes of energy and information between 2 poles,  $\sum E_{i-1} \leftrightarrow \prod I_i$ , that create 5 Diffeomorphic, fractal, Space-Time Dimensions.



The galaxy has its informative center in the black hole and its energy body in the stellar plane



Animals and plants have opposite energy and time directions since plants use light as energy and chemical particles as information.



In the graph, the diffeomorphic Principle of Einstein's 4D analysis acquires an organic nature, when we see the Universe as the sum of  $\infty$  Complementary exi systems whose dimensions have organic functions: Systems feed on their relative dimension of energy-length, perceive in their relative

dimension of height and reproduce in their relative combined dimension of width, which are assembled into each specific species. In the graph, an animal has its informative height in its high perceptive light dimension, but a plant, which uses light as energy has its up and down dimensions inverted respect to the man and its chemical brain buried on the Earth. So both have opposite energy-time coordinates. Yet both have an 'anteroposterior', lineal 'outward' energy oriented structure. While a galaxy has a cyclical, informative, inward structure, as the stars' body absorbs energy from intergalactic space, reproduces matter with it and feeds the internal informative knot of gravitation, with a higher height dimension the black hole.

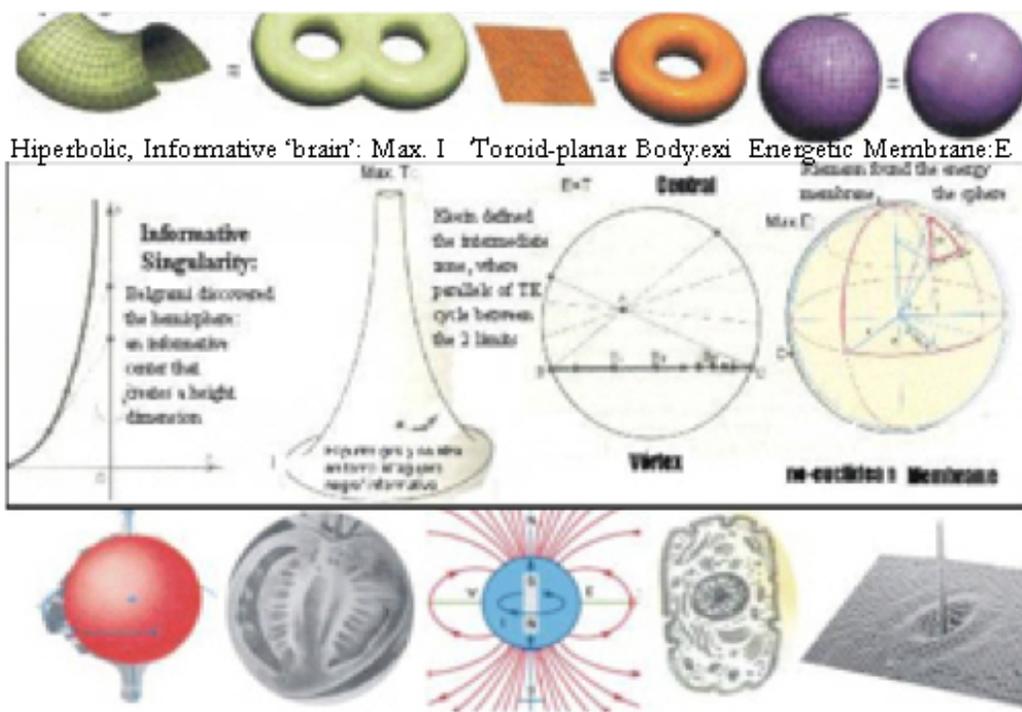
Thus there is a correspondence between the inner physiological networks of a being that perform EXI actions and its external diffeomorphic dimensions. So a dimensional form is also motion with a function. Even in a human being the height dimension is really the nervous-brain system network, his length motion, the natural path of his energy limbs, and his width is maximal in the digestive system that reproduces new cells.

Forms respond always to functions/actions in time, the commanding 'element' to which the form of any being adapts diffeomorphically to maximize its existential actions. Thus, there is a parallelism between 'vital function' and 'abstract dimension' as *each Dimension is diffeomorphic created by the vital space-time of each entity of the Universe performing its exi actions*. And each species is a 'fractal universe in itself', with different relative, energetic and informative directions that determine its own up & down arrows and complementary morphology,

The specific geometry of each species and its 3 simplex actions, energy feeding=length, information-gauging =height and reproduction=width fluctuate in shape, but they don't vary in topological form, giving birth to the Invariance of the 3 topological forms=functions of any entity observed in a single 3D space-time: Hyperbolic informative heads, toroid reproductive bodies and energetic limbs studied in the next paragraph.

While the 2 social  $\pm 1$  fractal dimensions, the 4th dimension of social motion in a social  $i+1$  herd and the 5D dimension of inner scales within the being follow the physiological invariances that create super-organisms co-existing in a *higher  $i+1$  ecosystem with a lower  $i-1$  internal, cellular space (B3)*. In the next graph we resume the 5 diffeomorphic dimensions=actions create a Generator Equation any being maximizes:  $Max. \sum Ex \square Ti$ .

**2. Topological invariance in 3D: Systems with i-heads/particles; exi bodies-fields and e-limbs/forces.**



On top, all 3D complementary systems are made by an assembly of the 3 only topological varieties of a 3 dimensional Universe, which correspond to the 3 organs and functions of all systems, according to the 'vital', moving nature of fractal, diffeomorphic dimensions: – Spheric limbs or membranes that process energy; Hyperbolic, informative zero points that gauge information and toroid bodies that combine and reproduce both, according to the mathematical laws of Non-Euclidean Geometry of those 3 forms=functions analyzed in the center. On the bottom we see samples of how the 3 forms assembly in different systems of the Universe.

We defined bidimensional forms of energy and information, the line-plane/open string (math-physical jargon) and the cycle-closed string. They can assembly 2-dimensional systems (quarks). Yet we live in a 3-dimensional Universe. Why? Since dimensional form is function, and systems are dynamic exchanges of energy and information, we need a 3<sup>rd</sup> dimension that combines and reproduce those complementary systems of energy and information. The result is the invariance of topological forms that defines a self-similar structure in all space-time systems of 3 dimensions, combining the inverse properties of lineal energy 'limbs' and, cyclical, informative Heads to a 3<sup>rd</sup> intermediate body geometry that allows a dynamic exchange between both poles:  $E \leftrightarrow I$ .

There are only 3 topological forms in 3D Euclidean space - *the space-time of any single i-scale*: Hyperbolic, informative topologies, energetic spheres/planes and reproductive, toroid-disks, used by the 2 other topologies to transfer energy and information. *Since 4D (motions in the external ecosystem) & 5D (inner space) happen across several  $\pm 1$  scales, perceived together as a curbed 'i-logic' Geometry (VII)*

All structures of the Universe are composed of only those 3 topologies: the concave-planar sphere (or cycle in a 2D world), the toroid body with its regular cycles that transfer energy and information between the external surface of the sphere and its center; which is the informative, hyperbolic region or zero point, the 'pixel eyes' that perceive in stillness a map of the Universe brought about by the flows of energy and information of the Torus.

### 3. The 3 topological forms=function of systems perceived in a single space-time continuum.

Interactions between hyperbolic I-zero-points (minds) and E-spherical membranes (energetic skin, limbs) through toroid cycles structure the generic  $E \leftrightarrow I$  'physiological / inner flows' of organisms or physical systems.

In topology a form is the same, if it is deformed but not torn. We use the Non-E concept of 'self-similarity'. Then the simplest, initial ternary system is a 'full' sphere – an egg- divided in 3 regions, sketched in the graph:

- E-membrane that closes an inner space. It hides the system and transfers energy & form to/from the outside.
- The inner exi-toroid space that topology calls the 'ball'. It does not include either the membrane or the...
- I-zero point. Hyperbolic center processing energy & information transferred by the toroid from the membrane.

Thus, the 3 together form the ternary structure of most systems, with an external barrier communicating with a torus cyclical flows of energy and information towards an informative, hyperbolic center or north south axis. Those 3 forms build all systems of reality. Since they enact the functions and morphologies of the main sub-systems of organisms – i-heads+ E-limbs + exi-bodies, written in i-logic (7) as:  $E < e_i > I$  or  $\sum E \leftrightarrow \prod T$ , where  $< = >$  represents the toroid body that exchanges energy & information between limbs and heads, fields & particles.

Energy, lineal motion is not an action 'per se'. It needs in/form/ation, which directs energy to create an action. All yin=information has a drop of yang=energy said Taoists who knew the game. Thus all systems require a zero point of information to see the energy/information absorbed by the membrane and delivered by the toroid-body. In all complementary systems the information center gauges reality (particles, eyes & brains) and the lineal fields, forces or limbs move them. While the 3<sup>rd</sup> system combines both, energy and form, reproducing the parts of the system. It is the exi elliptic, conic or toroid body – figures that are combinations of lines and cycles. Since form=function 3 Geometric Forms in space determine 3 functions in time creating 3D 'complementary systems':

- *Max. I: Head/Particle/Informative caste*: They display the hyperbolic, broken topology of information, observed in most 'brains' with an excess of warping and form (cortex, black holes, Chromosomes, Chip design).
- *Max. E: Moving Limbs/Forces/Energy class*: They show a concave, spherical topology (tiled with smaller planes proper of any external membrane, guts or cilia – in which membranes occupy most of the surface.

*E=I: Reproductive Body/Vacuum/Working class*: The topology of the reproductive system is a combination of the other 2, a toroid or plane, which can be emitted by both, more complex systems in waves and cycles that

communicate energy and form between the two dominant poles of the system - membrane and zero-brain.

Man is also an interconnected complex system with the eye and brain as his zero point, the cellular ovoid body that reproduces most substances and its external and internal gut membranes that exchange of energy and information with the external universe through 5 apertures, called senses...

- *The membrane* is a network of planar, self-similar cells, which encloses and isolates the inner organism from the outside world. It allows the transfer of energy and information with the external world through the holes of the network; developing specific functional holes: those for energy are called mouths, Those for information are called senses. They will be also positive or negative in its directional motion in order to absorb or expel wasted energy and information. All systems will have at least those 2 types of wholes in their strong, energetic, spatially extended membrane that circles the 'vital space or body territory' of the entity. *The external* membrane can be multiple: the most extended, less loosely guarded one is the territorial zone in which the informative center moves. In the organic Universe, spatial structures are always 'functional' and made of loose networks with motion, which therefore have, as any network does, dark spaces in the holes between them

- *The still center or hyperbolic north-south axis, or zero point* is the point that processes information and hence also the point of consciousness of any system, of any world, of any topology of 4 dimensions, of anything that exists, of anything that *is*. *To create a mental image, the pixels of the zero point* are able to form a boson, synthesis of all its units. In the same manner, a sphere can create in the center of its inner space-time a reflection mirror of all its cells – a zero point of the whole self. According to 5D metrics, the informative zero point is far smaller than the membrane, but its time cycles and processes are much faster.

*How energy absorbed by the membrane's senses become pixels of information in the zero point? Form and function together explain it:* A key property of spherical membranes that matches form and function is the fractal similarity of all its cellular units, which are exchangeable and similar to the whole (Poincare conjecture in mathematics and Bose-Einstein statistics in physics). Since spheres are *invariant to rotation, its curvature is constant and shrunk with no tear into a point. Thus the sensorial cells of energy of the membrane shrink into pixels of the zero-point, which becomes a still map of the external Universe.* Look around yourself and you will not see any zero point. All 'brains' are internal, small, protected, isolated, yet connected, communicated by the sense of the membrane with the external Universe, forming its image within 'a mind.'

We can see that simple assembly in the graph, the eye-zero point system is the hemisphere (right side), in which the flows of the torus converge, coming from an external 'Riemann sphere', or membrane, joined with the zero point by a series of flows that reduce energy into denser form.

In the point in which that speed is reduced to zero, a zero point appears, in which a pixel mirror of the external sphere, corrugated into a linguistic image gives consciousness to the system. Then something magical occurs, the zero point processes that energy into information that forms and provokes a change in the position of the entire system. Since the zero point is the will of the system. The membrane develops the limbs of the system. The zero point is the brain and consciousness and the torus the physiological systems or flows of energy and information between both.

Causality determines the flow of growth: the external membrane gives birth to the zero point - it is the father element. Fact this which brings the theme of evolutionary development in time of a ternary structure in space.

- *The torus.* Finally the toroid-wave-ovoid-conic form combines both and can be emitted by both, as the torus is just a quanta of a sphere (through the intermediate plane state of the graph, coiled first into a cylinder then curved and pegged into the torus) or the zero point – detaching one of its donuts. Hence its  $\Leftrightarrow$  external, communicative qualities, as a quanta,  $|i-1$  or  $O_i-1$  of  $E_i$  and  $T_i$  or reproductive, internal,  $ex_i$  qualities as an organ.

Since function=form topology shows physical and vital actions in geometric terms *whose invariance becomes*

*the Invariance of topological forms in a 3D real space.*

This Ternary, topological structure produces  $\infty$  self-similar forms in which a central zero point absorbs energy transformed into still perception, a toroid body reproduces exi cycles and forms and limbs and membranes move the whole system, in search of E & I to complete its 5 actions of existence... Though the specific combinations of energy or information of each species - defined by its 'vital' or physical, Universal Constants (energy/information ratios) – might vary, the space-time structures and cycles of all those social organisms will be self-similar.

## IV. INVARIANCE OF SCALE: EMERGENCE LAWS & SUPERORGANISMS

### 1. Emergence of invariances, departing from the Generator Equation and its 2 formal motions, E, I.

We obtained each new invariance of the 5<sup>th</sup> dimension, departing from the previous one. This process is resumed in the Fundamental Law of the scalar Universe – *the Law of Emergence*, according to which the properties of each  $i-1$  scale transcend diffeomorphically=adapted to the next scale. Hence departing from the duality of space-time and its inverse properties, we defined the co-invariance of the 5<sup>th</sup> Dimension,  $Se \times Ti=K$ , from where all other co-Invariances emerge. Thus we deduced them departing from those 5D metrics with the help of Existential Algebra, resumed in its formal Generator,  $\sum Ei-1<x>\prod T^i$  and its  $3\sum \pm i$  actions, E, I, exi,  $\sum$ ,  $\prod$ ,

First we described E and I, which create complementary systems made of energy lines and informative cycles (open/closed strings) with invariant, O, | topological forms. Then we extracted from those 2 elements a 3<sup>rd</sup> one that combines, communicates or reproduces them, exi or  $\Leftrightarrow$ , the toroid.

Next we analyzed with the Galilean Duality of motion/stillness the similarity of Dimensions in Space, Motions in Time and Functions=Actions, deducing the 3 primary actions of the 5D-Universe, energy feeding, information gauging and reproduction, from the combinations of those 3 topologies of any single  $i$ -scale of space-time.

Then, we added the 4<sup>th</sup>,  $\sum$ , action of social evolution in herds & waves easily explained by the Galilean duality of  $i$ -continuous vs.  $i-1$  quantic perception across 2  $i$ -scales:  $i-1$  waves/herds of self-similar  $\sum$  energy with parallel 4D-motions are perceived as 'continuous, whole  $i$ -spaces'. It is the Einsteinian continuum vs. quantic space and the particle-wave duality of physics; it is the problem of Individuals vs. Universals in philosophy, and Riemann's definition of a space as a collection of adjacent points with similar, undistinguishable properties.

Now we complete the analysis of the 5<sup>th</sup> Invariance, studying the creation of super-organisms through  $i\pm 1$  fractal, cellular scales that become wholes, through the creation of networks of  $\prod=T^i$  bits of information, *based in the previous duality of cells/waves that become continuous wholes across 2  $i$ -scales*.

*This means that the 3 topologic, invariant forms* Limbs/membranes of energy, informative zero points and cyclic, toroid bodies become in the  $i-1$  scale cellular systems, whose morphologies are not rigid forms but deformable networks of points bonded by flows/waves of energy and information (2<sup>nd</sup> Non-E Postulate) with a physiologic function: Those 3 topologies exist to perform informative, reproductive and energetic functions, adapting their form dynamically to those functions=actions, changing their geometry as distances=flows between points of the network shorten or lengthen but do not tear to maintain invariant the topological form=function.

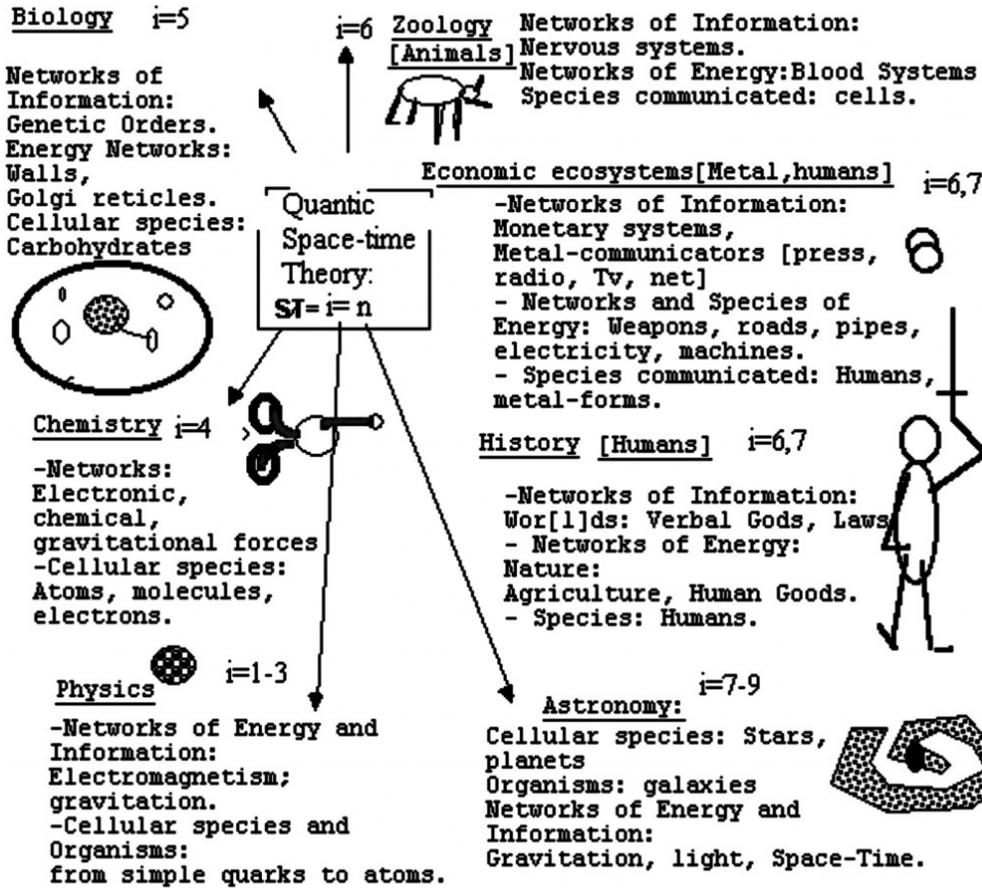
### 2. Cellular, physiological networks create Superorganisms. The $i$ -scales and $i$ -sciences of reality.

Thus the topological invariance becomes now a physiological invariance, and we define all systems as super-organisms with 4 elements extended in 2  $i$ -scales:

1. Cellular units, when we perceive the system in the  $i-1$  scale.
2. Networks of energy, membranes and limbs.
3. Networks of information – zero points and fractal, sensorial 'nervous' networks.
4. Networks that reproduce energy and information.

All entities are  $i-1$  parallel groups of 'cellular societies' knotted by energy and information exchanges into networks that emerge as a single social  $i$ -form. Molecules are made of atoms and electronic networks; galaxies are composed of stars, which orbit rhythmically around a central knot, or black hole of gravitational information. Human bodies are organized by cells, controlled by the nervous, informative system. A tree is a group of leaves, branches and roots connected by a network of energy (salvia) and information (chemical particles). Cultures are

made of humans related by verbal, informative laws and economic networks made of human workers and consumers, that provide their energy guided by financial networks of information (salaries, prices, costs):



*In the graph, an  $i$ -super organism is a group of  $i-1$  cells joined by energetic, informative & reproductive networks that communicate them.. Those  $i-1$  cells are also superorganisms made of small  $i-2$  molecules joined by e, exi & l networks and so on and so on.*

*Thus we define any system as an  $i$ -superorganism made of smaller, similar  $i-1$  super-organisms. And each  $i$ -scale of superorganisms & its  $i$ -cosystems are studied by a human ' $i$ -science' but all of them follow the same Invariances & emergence Laws & Galilean Paradoxes of 5D Metrics formalized with the tools of Existential Algebra & Non-AE= $i$ -Illogic Geometry.*

We unify all Natural Systems as superorganisms using a single template definition, since they differ only by the  $i$ -scale or ecosystem in which they exist or the specific types of energy & information their networks are made of:

'A super-organism (name an organism) is a population of iterative (name a cellular species), related by informative (name a language or informative force) and energy networks (name a kind of energy), which combine into a reproductive network that iterates the organism.'

Fill the gaps with a specific species, language of information and force of energy and we can define any network-organism, which will be a 'part' of a whole  $i$ -plane or ' $i$ -cosystem', composed of several species that occupy different 'vital spaces' but interact through the same language of energy & information:

An  $i$ -plane or  $i$ -cosystem (name a specific  $i$ -plane) is a population of several (name the species), related by informative languages (name their languages or informative forces) and energy networks (name the energies).

i.e.: The ' $i$ -plane of 'zoology' includes all beings of relative size,  $i=6$ , that use light as information, called 'animals'. The  $i$ -plane 8, a galaxy, includes as parts, all celestial bodies of size  $i=7$  related by gravitational networks, etc.:

- An atomic organism is a population of (electronic) energy and (nucleonic) information, related by networks of (gravitational) information and (light) energy.
- A molecular organism is a population of atoms, related by networks of gravitational energy and networks of electromagnetic information (orbitals, London, Waals forces).
- A cellular organism is a population of molecules, related by energetic networks (cytoplasm, membranes,

Golgi reticules) and genetic information (DNA-RNA.)

- A human organism is a population of DNA cells, related by networks of genetic, hormonal and nervous information and energy networks (digestive and blood systems).

- An animal ecosystem is a population of different carbon-life species, related by networks of light information and life energy (plants, prey).

- A historic organism or civilization is a population of humans, related by legal and cultural networks of verbal information and agricultural networks of carbon-life energy.

- An economic ecosystem or nation is a population of human workers/consumers and machines, related by networks of digital information (money, audiovisual information, science) & energetic networks (roads, electricity)

An economic ecosystem differs from a historic organism because they use different languages of information (civilizations use verbal or ethic laws while economic ecosystems use digital prices) and include 2 different species: human beings and machines.

- A galaxy is a population of light stars and gravitational black holes, related by networks of gravitational information and electromagnetic energy.

-A Universe is a population of galaxies joined by networks of dark matter and energy.

In a Universe of  $\infty$  scales – hence of *Absolute Relativity* - the i-number is relative to the limits of the perception of the observer that classifies them. So as humans we perceive between 2 i-limits – the atom and the galaxy, which might be self-similar, as black holes and quarks, their knots of information show self-similar equations in 5D metrics (1.5) and 4D metrics that models a galaxy as a hydrogen atom in the Einstein-Walker space. In any case they form the minimal and maximal scales of Human Sciences, creating our Se-size arrow.

Thus, if we use a decametric scale, *for the physical World* (Graph I.1) with 2 limits beyond our perception, 0 (gravitational space-time) and 10 (Hyper-Universe), we establish an i-parameter of space-time planes,  $\Delta Se = \Delta i$ , to classify all those relative scales of spatial energy and temporal information, each one studied by an i-science that in the 2<sup>nd</sup> part of this work we analyze with the metrics and invariances of the 5<sup>th</sup> Dimension. While in parallel, we can also establish a relative i-scale to study Living Systems and the Human World. Thus the main |energy and 0-clocks of time of each scale for physical and biological worlds will be:

1<sup>st</sup> Scale: Open strings of energy and closed time strings: Strong Forces & Gravitational space-time.

2<sup>nd</sup> Scale: Bosons: |Light and O-Photons.

3<sup>rd</sup> Scale: Fermions: |Electrons & O-quarks.

4<sup>th</sup> Scale: Atomic Organisms: Periodic Table.

5<sup>th</sup> Scale: Inorganic and Organic Molecules

6<sup>th</sup> Scale; Life Cells. States of Mater: Energetic Gas, Exl Liquid and Informative Solids.

7<sup>th</sup> Scale. Life organisms; Energetic Plants; Informative Animals. Organic Metal-Machines

8<sup>th</sup> Scale: Planets. Human Civilizations; Economic Systems.

8<sup>th</sup> Scale: |Stars & O-Black holes.

9<sup>th</sup> Scale: Galaxies, which might be the beginning of a new Scalar Game.

10<sup>th</sup> Scale: Universe, which might be a Gas cloud of Atoms of the new Scalar game.

Are the scales of space of the fractal Universe also  $\infty$ ? Yes. We provide a logic and mathematical proof: - Since each entity *must* have from its 'present', complementary state a relative, slower scales of past energy,  $E_{i-1}$  and a relative future, faster head-particle of information,  $T_{i+1}$ , we can consider each system and whole scale, to co-exist in 3 of such scales, as the graph shows for humans. Thus each new scale if it exists will again co-exist on 3 of those scales as part of a higher super-organism.

- The mathematical problem to resolve in order to find if those scales are  $\infty$  is this: There are in the physical Universe 2 scales whose 5D invariances are 'equal', making them both an alpha and omega of a new game of

scales? We have proved that indeed, the 5D metrics and invariances of the quantum scale – specifically the proton – *are the same than the metrics of black holes, the atomic nuclei of galaxies, beginning of a new, hyper-Universe*; a fact which also unifies masses and charges – the time clocks of those 2 scales - as G and Q become in 5D metrics self-similar in value, by translating the electromagnetic jargon to the jargon of gravitation: Then, a 3D time-vortex equation,  $UC(G,C) = \omega^2 r^3 / M$  describes both time vortices, charges and masses, as we obtain by substituting for those 2 Universal Constants, G and Q, 2 inward accelerating vortices of mass that ‘suck’=attract space with a force=acceleration (equivalence principle), differing exactly by  $10^{40}$ , the experimental difference of strength between both forces. And further on we find, simplifying with the gravitational vortex jargon the ‘esoteric’ jargon of electromagnetism that the Proton radius has the same formula than a black hole, the Schwarzschild horizon. Those facts, coupled with the dualities of string theory, in which quantum strings are self-similar to cosmic strings, show a Universe of  $\infty$  scales in which each galaxy is an atom. As Mr. Einstein foresaw when modeling his Universal Einstein-Walker metrics, considering each galaxy to be a hydrogen atom. So:

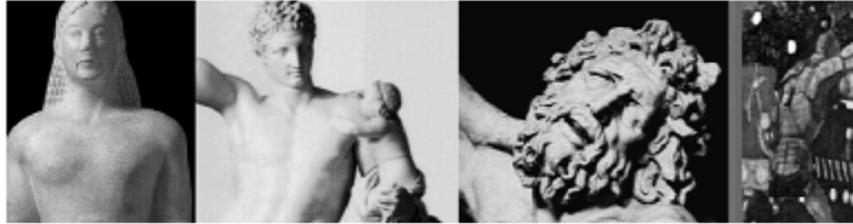
*‘The Universe is a Fractal, scalar super-organism, infinite in time duration, in time cycles, in spatial extension and spatial scales, in which all parts are self-similar to the whole, made of an infinite number of complementary systems of lineal energy and cyclical information, structured into social super-organisms, through  $3\sum \pm i$  scales, which constantly create 5 Dimensional, functional actions, lineal energy feeding, high, informative gauging, wide, reproduction, social evolution and travel through 3 of such scales in the life-death cycles of existence; all of which is expressed in a feed-back equation, from which all laws and equations of science can be deduced:*

$\sum E_{i-1} \Leftrightarrow \prod T_i.$ ’ Which is in dynamic terms the Fractal Generator =Creator of all Existences.

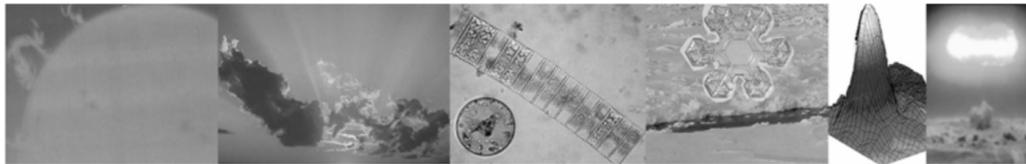
Thus 5D Metrics -paraphrasing Einstein- give us both, the Thoughts of The Creator – its Generator Equation and ‘i=ts’ details - every part or event of the Universe, whose laws can be extracted from such ‘thought’.

**V. CAUSALITY OF TIME ACTIONS: THE LIFE-DEATH CYCLE.**

*Age of Energy, Classic age of Harmony, Old Age of information, Explosion and Death:*  
*Human: Youth (0-20a.); Maturity (20-40); 3<sup>rd</sup> age and death (60-80).*

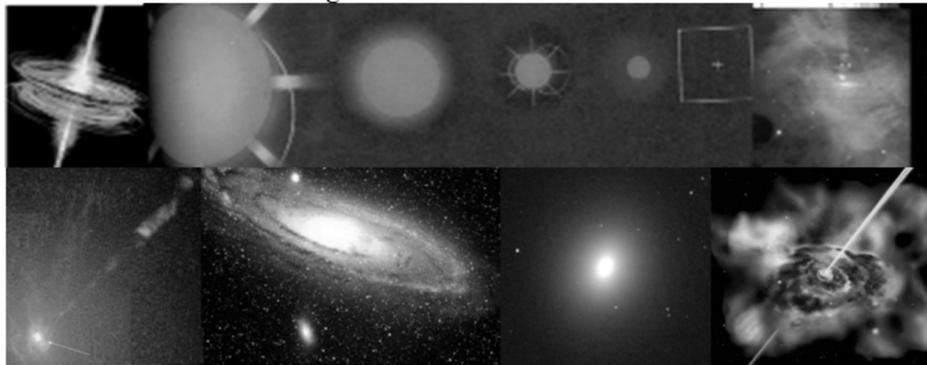


*Culture: Epic, Lineal Art; Realist, Classic Art; Baroque Art. War.*

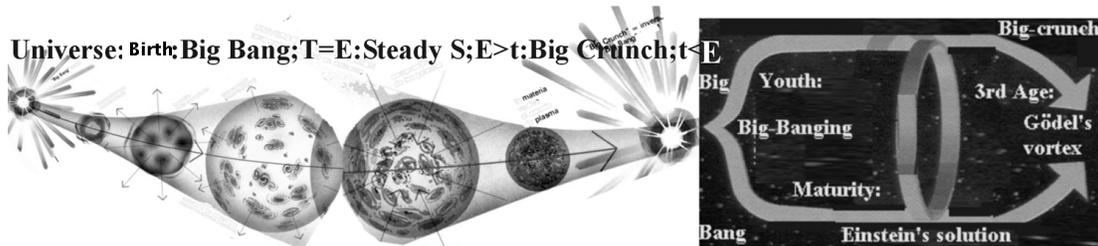


*Matter: Birth: Plasma Max. E: Gas E=T: Liquid Max. T: Solid T(Mc<sup>2</sup>) << E*

*Star: Birth: Nebula. Max. E: Gigant star. E=T: Sun. Max. T: White Dwarf. T<<E Nova*



*Galaxy: Jet Max.E: Irregular. E=T Spiral↔Elliptic. Max.T: Globular T<<E: Quasar*



**The 3±i ages of the Life/Death cycle: Conception->birth->Youth-Maturity->3<sup>rd</sup> Age->Death.**

*The invariance of physiological networks in superorganisms determines the final Invariance of the 5th Dimension, the life-death cycle of existence and its sequential time order in all beings shown in the graph:*

- i-1: Birth: We are born as a seed of information that:

-Max. Energy x Min. Information: The being goes through an energetic youth of fast motions, in which the energetic limbs and external sensorial membrane dominates.

-E=I: Balances energy and information in a mature, reproductive age, in which the internal, topological, reproductive system dominates.

- Min. Energy x Max. Information: Till it warps all its energy into form, in the 3rd age in which the central, hyperbolic, informative brain/particle singularity is dominant. This age ends in:

- Min E x Max.I <  $\sum E_{i-1}$ : Death: Exploding back into energy, erasing its information in the process of death.

Thus the invariance of the life/death cycle and its sequential ages is followed by all systems, even in matter (energy=gas state, liquid= reproductive state, solid=informative state), and the Universe born in the big bang, evolved as the cosmological constant changes into a steady state that collapses into a Gödel's vortex. Since the 3 solutions to Einstein equations represent ordered sequentially in time the 3 ages of the cosmic 4D-scale.

### 3. Evolutionary development. A glimpse to the birth and death phases/ages of the existential cycle.

We can't study in detail all the laws and i-logic sequences (VII) of the life-death cycle, thus we shall consider briefly the less understood, when the being exist in the lower i-1 scales, birth and death.

- Eli >  $e_{i-1}$ : Conception: When energy saturates the internal networks of the super-organism the action of reproduction imprints internal information into the excess of energy, creating a self-similar organism as a *seed or cell of the lower scale*. Often the process involves 2 entities specialized in information (female) and energy (male) or with opposite E-I coordinates. So electrons with opposite spin and quarks absorb energy and produce seminal rays of light and gluons that give birth to new electrons and quarks; crystals produce 'cells' that keep reproduce new fractal cells. Humans produce lineal, energetic semen and cyclical ovules:  $E_i < e_{i-1} \times i_{i-1} > I_i$ .

- Birth:  $e_{i-1} < \sum e_{i-1} > e_i$ : The fecundated ovule,  $e_{i-1}$ , reproduces into a clonic, social wave,  $\sum$ , which evolves morphologically into a ternary system till emerging in the same plane of i-xistence than their parents. This fetal phase follows the dominant arrow of lifetime, information:  $E(\text{membrane}) > \text{Toroid}(ex_i) > i\text{-zero point}$ .

It all starts with the creation of a hollow membrane, departing from the initial cell that multiplies into a herd,  $e_i < \sum e_i$ , forming a sphere, the 'morula', which absorbs energy from the external world and differentiates into two relative i-E poles setting a diffeomorphic E-I dimension - the I, 'animal pole' on top, in the height, informative dimension and the vegetal, larger pole in the bottom, forming the blastula. Then the sphere invaginates forming the endoderm a hollow that communicates both poles, the future digestive tube that completes the creation of the energetic system. It is the gastrula in a biological organism; an electromagnetic field created between 2 particle-points. The dual low between both E-I poles establish an 'arrow of entropy' from the bottom to the top transferring energy and an arrow of information from top to bottom transferring information. And this dual convective flow in cyclical motion will be perceived by a top or central zero-point as information, mapping an image of the external world - a brain, a DNA nucleus. Finally, a 3<sup>rd</sup> layer is born, the mesoderm of muscles and connective, tissue  $\leftrightarrow$ . So, gastrulation gives birth to 3 i-planes, the ectoderm, endoderm and mesoderm origin of the 3 main physiological networks dimensions of any super-organism, the energetic, reproductive & informative networks. And this patterns can be generalized to all physical and biological systems that change the topological structure of the embryo, from a simply connected surface (sphere-like), to a non-simply connected surface (torus-like); and differentiate cells into 3 types (endodermal, mesodermal, and ectodermal). Each will differentiate further into 3 sub-systems plus a i+1 zero point that integrates as a 'whole' the entire being (brain system in humans), for a total of  $3 \times 3 + 1 = 10$  dimensions of existence – *the commonest Non-AE system of the Universe from 10-dimensional strings to 10-dimensional man*.

From a plant seed with an external membrane and a middle body in which the zero-point of genetic information will feed on, as it grow the axis in its lineal, young, energy phase, to an animal embryo just described; from an atom with a hard crust, the electron that exchanges  $E \times I \neq$  rights with the central informative, gravitational quarks to a star system with its hard crust, the Oort belt, a series of toroid, planetary cycles and the star zero-point, itself divided into an external energetic gas cover of maximal Temperature, a body of magnetic cycles that guide plasma from the central zero point of maximal density to the surface, we see repeated this 3

topological construction ad infinitum (IV,2), either in a lineal bilateral, moving shape with limbs, body & brain on top or a cyclical, informative one, with spherical membranes, an informative center and a toroid body ((IV,I).

- Max E: |Youth: Networks are flexible webs of points that can adopt different topologies by modifying the distribution of those points, so as the fetus grow it differentiates into the 3 topologies of existence, as it acquires the 4D dimension of motion in the i+1 ecosystem the coiled, informative, radial or spherical state changes topologically into the uncoiled, bilateral, anteroposterior, lineal, moving form. In static systems of spherical nature as galaxies or ovum are, the zero point is kept in the center, but if the species lives in a plane as the Earth is, the membrane evolve into a bilateral, planar forms with a length motion and the zero point migrates from is center to the forward head in which the informative cells reside to see in length, or in the relative dimension of information - height that allows perception of a wider angle - as in men or antennae.

- E=I. Mature, reproductive age, when the Function of existence is maximized (Max.  $E_i \rightarrow e=i$ ). It is the longer stage, perceived as 'beautiful', balanced, from spiral galaxies to classic art, to actors in their 30s.

- 3<sup>rd</sup> informative age: The informative, selfish dominant system keeps absorbing energy from the other 'slave networks' till it exhausts it. Then the organism warps and finally dies.

Death:  $e_i < \sum E_{i-1}$  According to the opposite properties of E vs. T, the long time arrow from energy to information or 'life'  $E \rightarrow I$ , lasts in time but has a small space range, while the reversal from information to energy or 'death',  $I \rightarrow E$ , explodes into a larger space region in a short time. So the biggest space, the cosmos created in a hypothetic big bang death lasts during inflation  $10^{-43}$  but creates a huge Universe. Thus Big-bangs are physical deaths which happens in all scales (graph VII,1). The law of range of forces also follow that co-invariance: the shortest range corresponds to the weak force that trans-forms particles of bigger informative mass and lasts longer in time. While the invisible force with 0 information, gravitation has an  $\infty$  range:  $0 \times \infty = k$

**4. The plan of evolution: The 3±i ages of speciation of species.**

**CONCEPTION AS A BLACK HOLE OF MIN. SIZE = MAX. INFORMATION**

**YOUTH AS A LINEAL, ENERGY, TOP PREDATOR SPECIES, GROWING IN SIZE**

**REPRODUCTIVE MATURITY: III AGE: GROWTH IN HEIGHT=INFORMATION**

Evolution repeats the 3±i ages of the life-death cycle in the i+1 scale, as organisms are  $\sum$  quanta of the i+1 Species. But since a Species is a free herd after 3 horizons=ages of evolution similar in their topology to the 3 ages of organisms (graph), the 3<sup>rd</sup> informative species can emerge as a social super-organism, related by a common language/network of information. as ants and humans did.

Since in all space-time scales species follow a future arrow towards more information, which increases in 3 horizons and finally evolves individuals into societies, herds and macro-organisms.

So the 3±i ages of species are: Small informative seed (first small species-fetus)-> Energy feeding (growth) -> Young age when the species growth in size -> Reproductive/radiating age-> follows by a reproductive 'radiation' of the species as a new 'top predator', while the individual gives birth to an offspring-> Informative age/speciation of the species -> extinction/death & survival of the son species.

This sequence applies also to the analysis of the 'frozen horizons' of the big-bang and the particles it created.

Thus evolution transforms energetic, young species into old, informative ones in 3∑±i horizons, self-similar to the ages of an organism. *Since species are super-organisms in which each individual is a 'cell' of the species:*

- *Seminal birth.* In the graph, the seminal, 1<sup>st</sup> species packs a lot of information in minimal space: It is the Black Hole, the chip, the 1<sup>st</sup> bilateral animal vermanimacula, the 1<sup>st</sup> mammal (shrewd), the 1<sup>st</sup> horse; the 1<sup>st</sup> Homo Sapiens, Homo Floresiensis, a dwarf with an evolved brain of similar morphology to that of Homo Sapiens who discovered technology; and the first, future 'self-reproductive machine' (nano-bacteria)...

- *Energic youth:* Species grow in lineal planes & size as the carbohydrates, fishes & flat worms of the graph.

-Then the species suffers a reproductive radiation colonizing new ecosystems as a top predator.

- Next the species suffers a speciation, according the ternary principle (VIII,3) into 3 subspecies, one dominant in energy, another in information and a 3rd one balanced in both parameters.

- Finally, a new more evolved top predator of Max. ExI extinguishes the species in its primitive herd state of lesser efficiency and higher spatial extension or the informative species evolves into social organisms, joined by a common language of information stronger than the individual and survives (pheromonal ants, verbal humans).

Since Evolution=speciation *creates species by maximizing any of the 5 actions-dimensions of existence:*

*Hence we talk of a first decoupling of species with either evolve socially into ∑- herds based in the similarity of 'external' bodies; or evolve into ∏- informative networks based in the similarity of internal heads, according to the new postulate of 'equality' (3<sup>rd</sup> postulate of Non-E Geometry, VII, 3), which is the pre-condition of social evolution. Since equal species evolve together and different ones hunt each other from atoms to humans, who also become racist when their external skin seems different or talk a different inner language.*

*A 2<sup>nd</sup> speciation maximizes 1 of the 3 only Invariant topologies=organs that create 3 types of new 'top predator' species: Those with better Energy-force or better Information-Brain or more balanced internal networks (Max. ExI->E=I) that we will use to explain human evolution from the ape to our 3 main races (6<sup>th</sup>).*

In cells, *the combination of ∑ vs. ∏ and E, exi, I differentiation creates 3 arrows of cellular evolution: E-digestive cells with big body and minimal i-nuclei: E=I, muscles, single cytoplasmic cells with multiple, small nuclei; and i-neurons with huge nuclei with multiple cytoplasmic branches (dendrites).*

In Cosmology there are plasma herds (stars) vs. ∏-quark bosons (black holes) and 3 'families of i-quarks'.

The evolution of species also follows the 'Oedipus Px', as new sons-species are better and often extinguish their fathers. So sons take advantage of parents; mammals extinguished reptiles and weapons, human beings.

We conclude that the 5D Invariance of 3∑±i actions combined with the Invariance of 3 Topological Forms=physiological networks proper of any 3D super-organism are the origin of the 3±i ages/horizons of organisms and species. As actions and topologies have a causal order equal to the invariant sequence of the 3±i ages (III,2):

ΔI (seed)->ΔE(youth)->Δexi(reproductive maturity)->Δ∑(social evolution)->Δ∏(creation of superorganisms)

Thus all the events and forms of all parts and wholes of the fractal, organic Universe are indeed created by the Generator Equation of the 5<sup>th</sup> dimension, ∑Ei-1<X>∏T<sup>i</sup> that represents the 5 actions of existence.