

## SUMMARY

1. The 10 dimensions of the complex universe.
2. The worldcycle: to exi=st.
3. 10D algebra. Part and wholes: Human Languages and theories. Truth.
4. The Duality of Space-Time: Motion and Form.
5. The program of the universe: the 4 drives of 'existential functions'.
6. Networks: Scales and Superorganisms in the fractal universe.
7. Perception. A Universe of  $\infty$  dimensional 'World-minds'

### I. THE 10 DIMENSIONS OF THE COMPLEX UNIVERSE.

Symbols of the 10 Dimensions of Scalar Space-Time :

3 *Spatial Dimensions*:  $S_x, S_y, S_z$ .

3 *Time Dimensions*:  $T_e$ : Energetic, Young past;  $T_f$  Iterative, Present Duration;  $T_i$ : Implosive, informative Future.

3 *Scalar dimensions*:  $i-1$ :Cellular;  $i$ :Organic;  $i+1$ :Social Scales.

10 *Dimension*:  $I, \Sigma$ : Whole.

.....

"*Questa essere opera inutile*" (I know many will call this a useless work.) Da Vinci. "The Notebooks"

So when people ask me what I do... I reply different things, but sometimes if I'm in good spirits for whatever reason, I tell them the higher truth – how I spend most of my time 'exploring 10 Dimensional Worlds.'

Of course, I rarely go in more detail, beyond that first sentence; to speak of 10 Dimensions, is good enough for people to look at me clueless - even if they are well versed scientists - wondering who is the idiot, me... or they (-;

But seriously, 10 Dimensional Super Organisms are really cool stuff. For one thing, you, me and everything else are 10 Dimensional superorganisms. So if you want to know yourself, you better know your ten dimensions.

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What is the Universe?

'A complex, fractal, super organism of 10 informative dimensions'

This answer, which resumes the formal and logic principles of systems sciences, also called complexity, is surprisingly short, but 'more complex' than the one physicists explore... which only has 4 dimensions. In that sense, a physicist would reply to the same question:

'A simplex, continuous mechanism in 4 spatial dimensions'.

And this is a huge 'leap' in understanding, from 'simplex' to 'complex', from 'continuous' to 'fractal', from 'mechanism' to 'organism', from an energetic, spatial description to an informative, temporal one, from '4 meager dimensions' to a whole tetrarkys of them.

This means we complex scientists, parts of the 10D fractal Universe have 6 more real dimensions, besides the 4 usual dimensions simplex physicists used to describe reality, which are, x-length, y-height, z-width –the dimensions of space - and one dimension of time:

*Present, Time Duration:  $T$  (or its inverse function of frequency,  $Tf = 1/T$ , which measures the number of 'wave steps' in a motion; hence gives us more information than a continuous time duration and it is preferred in complexity).*

Indeed Physicists calculate Time Duration, as a present dimension of 'simultaneous time', useful to measure the translation of any being in space.

*This Duration/frequency dimension of time,  $Tf$ , however is a short; 'present' dimension both in Galilean relativity, as it is obtained with 'instantaneous derivatives', ( $\partial t = \partial S/ v$ ), and in Einstein's Relativity (as Time is defined as 'simultaneous' measure).*

Reality and all of us, part of it, has more motions in time than short-lived spatial translations (external motions, created by repetitive=present steps, which do not change the internal form of the being).

There are also 'informative motions'... slow 'internal motions' that change the structure of the being, such as evolution and the life-death cycle.

And there are also multiple 'scales' of spatial size and social organization, from the quantum microcosms to the cosmological scale, which co-exist as *entities with 'different speeds of time and information processing (so a small particle turns and moves much faster than a big animal) Hence in as much as their two 'parameters' of measure of space (size) and time (speed) are different for entities of those 'different scales' of space-time, they must be treated as belonging to*

discontinuous planes of space-time, each one with its own dimensions.

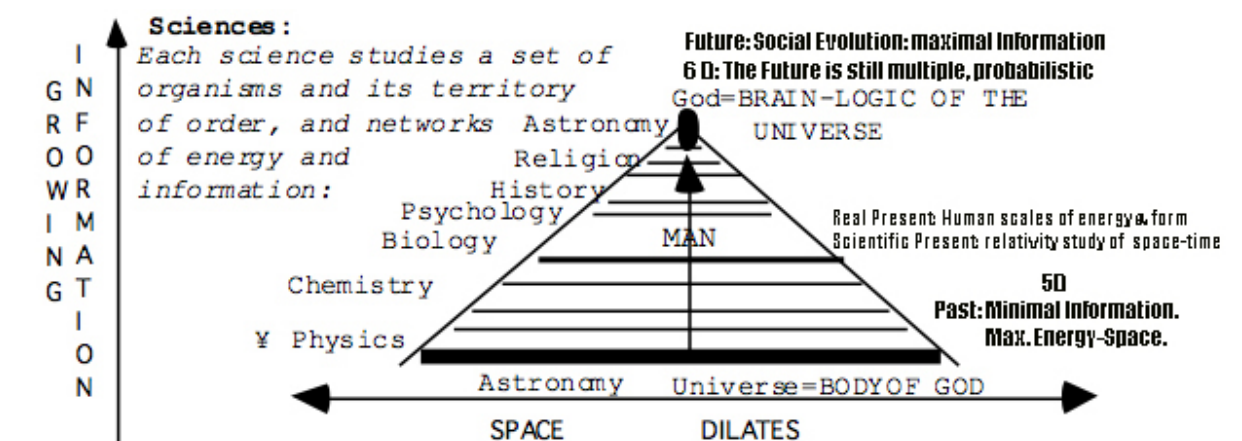
This is the fundamental insight of complexity about the structure of the Universe.

And so to understand the complex Universe with all those 'slow changes in time from past to future' and relative scales of spatial size with different time speeds, we need to consider a more complex view of the 'dimensions of time', and also introduce the concept of different scales of space-time co-existing within a physical or biological system.

Thus Complexity adds:

- *i* more dimensions of scalar social complexity and creation of information:  $\sum i \pm n$

As smaller things follow a simple arrow of social, scalar evolution, creating 'bigger, more complex wholes':



So particles evolve in groups called atoms, which evolve in groups called molecules, which evolve into cells which become societies called organisms that evolve into planetary societies, and as atoms also form, states of matter, and group farther into stars and planets, which evolve socially into galaxies, that evolve socially into Universes which might evolve further.

Thus the Universe has also a series of social scalar dimensions defined by two parameters: the relative size of its quanta of 'spatial energy', such as,  $i > i-1$ .

And the inverse acceleration of its clocks of time, as we become smaller such as:  $Tf(i) < Tf(i-1)$ .

Whereas the product of the 'speed' of time-clocks of a system (measure by its

frequency of rotation) and its relative size becomes 'co-invariant':

1.  $S \times T f = C(i)$ .

Thus i-dimensions of scalar complexity do have a 'metrics'. That is, a 'quantity' that remains invariant as we travel through those scales. Whereas 'travelling' means to 'change' our parameters of measure – in this case our 'size' and 'speed of time processing of information' or 'frequency'.

Thus if 'travelling through the classic 4D of simplex physics' means to move along the  $S_{x,y,z}$  coordinates during a 'Time duration'; travelling through the i-scales of size means to 'grow' in size' and accelerate our informative speed.

That is, travelling through the i-scalar dimensions of space-time, means becoming larger ( $\Delta S$ ) or smaller ( $\nabla S$ ), at the same time that our 'speed of processing information' changes. Since the effect in the  $Tf$  co-variable of growing in size is the inverse ( $\Delta S \rightarrow \nabla Tf$ ).

That means, smaller beings (chips, mice, black holes) move faster and have higher metabolic rates than bigger entities (engines, dinosaurs, stars).

It also means that travelling through the i-scalar dimensions is equivalent to a process of 'evolution' of a species (so for example animal life grows from earlier 'smaller' species' of higher metabolic rate into larger ones, from horses to dinosaurs); or a life-death cycle (so we are born as seminal seeds in a lower i-dimension with much faster metabolic rates and then emerge in a higher scale, with slower processing of information).

Yet for that to be possible, either the sum or the product of the 'relative energy-space' and the speed of its 'time'='information' (stored in the cycles and form of those clock-time cycles) must remain co-invariant.

Then it is not only possible to travel through those i-dimensions, but systems in different 'scales' can relate to each other by exchanging their relative energy and information, as organisms do between cells, individuals and societies.

And so systems can 'co-exist' in several scales of i-reality and travel through them by changing its relative parameters of internal 'energy' and 'information'.

And this is the key to understand why as superorganisms 'we are made of several scalar, social dimensions'.

In that regard we use for scalar dimensions the 3 scale-like sum symbol  $\sum$ . Since it expresses the fact that 'herds of individual 'energy cells' create a whole  $i$ -organism,  $\sum_{i-1} = i$ . And 3 of such scales, the cellular, individual and social scales suffice to define the existence of any of such super organisms.

Since superorganisms live through 3 of such scales, which we call  $i_{\pm}\sum$ , the  $i-1$ : 'cellular scale', where they are born as seminal seeds; the  $i$ : 'individual scale', where they emerge to live through a  $i+1$  'social scale', till death returns them to the  $i-1$  cellular scale. Thus 3 scales suffice to define the actions and events of any entity of the Universe, as their 'life-death cycle' happens in 3 of those  $\sum_{i\pm 1}$  complex dimensions.

### **Differences between Physical and Complex Dimensional analysis.**

It is important to stress before going further 3 key differences between Physicists' treatment of dimensions and complexity use of them:

- Physicists' dimensions not only are too few, but they are too similar and too abstract. That is they are all 'lineal dimensions' (an infinite interval in a Cartesian coordinates); and the one of time-duration, has also been made 'lineal' despite the obvious 'cyclical nature' of all the clocks of the Universe. Thus, by virtue of its mathematical definition in terms of motions of space ( $V=s/t$  and the equivalent Einsteinian metrics which adds  $c$ -speed to the mix), time duration is also lineal.

So we are in fact dealing with 4 dimensions of space. And even when physicists attempt to use more dimensions (as in string theory) they consider them also dimensions of space; though curiously enough the 'dimensions' of string theory (both in its original 10D and the ultimate M-theory) clearly resemble those of Complexity (as they are 'enclosed within the string as  $i$ -social dimensions are)<sup>2</sup>. So the proper way to convert M-Theory in a 'real' theory of the quantum Universe would require to further correct the meaning of its dimensions to match those of Complexity.

In any case at the present stage, Physicists are stuck with 'spatial' concepts of 'lineal dimension', which reduces further physicists' logic structures used to describe the events of the Universe.

In complexity however dimensions are of 3 kinds:

- 1) spatial, lineal dimensions; whose mathematical description suffices – reason why Physics is a mathematical-only theory.

0) temporal and hence cyclical dimensions (we measure duration by its inverse, cyclical frequency), *which require not only mathematical but also logic, causal laws to describe them.*

i) And organic, complex, Ci, scalar dimensions, which physicists totally ignore, since to fully describe them and the 'whys' of its symmetries and transformations, *we need not only mathematical and logic laws but also bio-logical concepts, such as the life-death cycle, the classic 4 'drives' of existence of biological systems (which constantly are feeding on energy; gauging=informing; re=producing, iterating a form, and evolving socially.)* It is this organic nature of 'i-dimensions', which manifests itself from strings (in a proper interpretation of its 10 dimensions and its reproductive, and dual, open, energetic and closed, cyclical informative states) to human beings, what widens truly the concept of dimensionality and allows broader philosophical interpretation of them.

- The first big difference is that physicists' dimensions are absolute, unique, encompassing the entire Universe, and act as an abstract 'background', that is, beings exist 'over' those dimensions. This of course is a primitive error derived from the use of 'paper and pen', when Descartes established with them, a graph in which the paper seemed to be the background dimensions over which events were drawn. This error of absolute space-time was canonized by Newton, ridiculed by Leibniz, who was right: we are made of space, of time cycles and of organic scales. We are NOT in a background dimensional universe. We are made of dimensions. And thus, dimension becomes fundamental to existence, because those 'complex dimensions' are what we are. We are cells and individuals and cells of societies, we are energy and information and repetitive motions, reproductive motions, and we are tall, wide and long. We are dimensional beings.

- And this leads to the 3rd big difference: in complexity dimensions are 'fractal', limited, reaching till the limit of each super organism made of them. The Universe and its parts are fractal 10 D super organisms, a puzzle of them, which interact and become part of bigger super organisms. It is thus all more messy, more complex, more alive, more enticing, vital and fun, equalitarian and organic that the meaningless motions of physics.

*In brief, we are made of 'vital space/energy motions', 'vital time/life durations' and 'vital social scales, cells, individuals and societies'. We are made of dimensions we are made of space, time and social herds; we are NOT in an abstract dimensional background. Hence the importance of understanding the dimensions of the Universe, its laws, symmetries and transformations as that is what we are.*

*Further on if we classify in 'time-duration' those i-scales it becomes evident that the i+n higher scale must happen in the future. As those scales are built 'plane after plane of 'existences', which grow in size as micro i-1 cellular entities become new i-'wholes' made of micro-cells.*

*Thus an arrow of relative future do exists in its i-scales as simpler particles are created before they ensemble into atoms, molecules, cells and so on.*

In the same manner if we consider the life of a being, which is born in the i-1 seminal scale and then grows to be born as an individual and finally when maturing, will intervene in the life of his society as a cell of i+1, it is obvious that youth comes 'before' old age and so we can talk of a past to future arrow, where there is a common pattern:

Either at individual level with wrinkles and repetition of forms, there is growth in information and loss after the plenitude of youth of energy, and so happens in physical system which acquires mass, curve and acquire form.

Thus if we consider the existence of 3 type of dimensions, Spatial Dimensions,  $S_{x,y,z}$ ; Temporal Dimensions, and Scalar dimensions,  $i_{\pm 1}$ , we write a general arrow from past to future in the 3 type of dimensions:

## *2.1 $i-n \rightarrow i+n \approx \text{Past} \rightarrow \text{Future} \approx \text{Energy} > \text{Information}$*

Whereas energy is considered an expansive motion in 'flat space',  $\Delta S$ ; hence related to flat space, and defined with a symbol that combines both:  $Se$ . And so a motion in space is also a lineal or flat, expansive motion, and we relate the 'fixed concept' of lineal distance or space, the expansive motion of entropy or energy (which measures work along the line of motion) and the Euclidean geometry of straight lines, and we will observe that all systems do have 'lineal limbs or field' that move the system.

On the other hand, information is its inverse, a 'warping' of energy into dimensional form that reduces its 'extension in space', increasing its information. Thus normally information is stored in cyclical rotary motions whose curved form and frequency carries its information. And all systems tend to have a cyclical head or particle - the smallest geometry that stores more information in lesser space.

Yet both 'geometrical motions' together are in a relative balance, given by the co-invariant metrics of i-dimensions:  $Se \times Tf = Ci$

Which in vital terms means that 'systems' are in balance between its energy-information components (body/heads, waves/particles duality).

Thus energy and information become the fundamental parameters of 'both space and time', as they have spatial geometry and motion in time, and as such will become the 'fundamental' elements to study in a synoptic manner the space and time equations of any i-scale of reality).

Therefore the fundamental symmetry between the 3 type of scales of the Universe relates all its elements and relative dimensions:

2.2 *i-1 (cellular scale) -> Past, Energetic Young Age* >>  
*(Present, Individual, Reproductive Age) >>* *i+n Social*  
*Scale, Future, Informative Age*

- Thus complexity also adds to the 'present' instantaneous,  $\partial T=1/f$  of Time, the only dimension measured in physics, two 'longer' dimensions or 'arrows' of time-space... Past Energy and Future Information:

E<... The relative past-energy of all 10D systems, which complexity calls 'entropy' and physicists recognize, but have not integrated formally with the relative dimension of...

>I The future, which it calls information; its inverse parameter, understood as in-form-ation, form-in-action, dimensional form.

Thus all 'fractal systems' of the Universe start in the past as 'energetic, spatial surfaces' without form, and as time passes, increase their form their in-form-ation, either as physical systems that 'warp' and curve with the passing of time ('Time curves space into mass' said Einstein) or as biological systems that 'warp', 'wrinkle' and increase the memories of its 'cycles' of vital form; till in both cases, when all form is consumed in a '3rd informative age', the system collapses, 'devolving' its information back into energy in the process of death. Thus complexity establishes besides the dimension of present 'repetitive motions' in space,  $\partial t:\partial s/v$ , 2 more 'arrows of time', the energetic past and the informative 3rd age which all superorganisms traveling in time experience as Energy decreases and information increases in the future.

And so we can establish the fundamental cycle of a 10 Dimensional Universe, the life-death cycle,  $\langle \Rightarrow \rangle$ , and its 3 ages:

-Max. E: Youth, the age of energy of the system.



- E=I: Maturity when the systems' energy and information find its balance.
- Max. I: Age of information, when the system warps and become old.

### 3.1 *Youth-Past : Max.E < = > Max. I: 3rd Future Age.*

And this is what happens in a worldcycle (motion in 10D), which is equivalent to a life-death cycle.

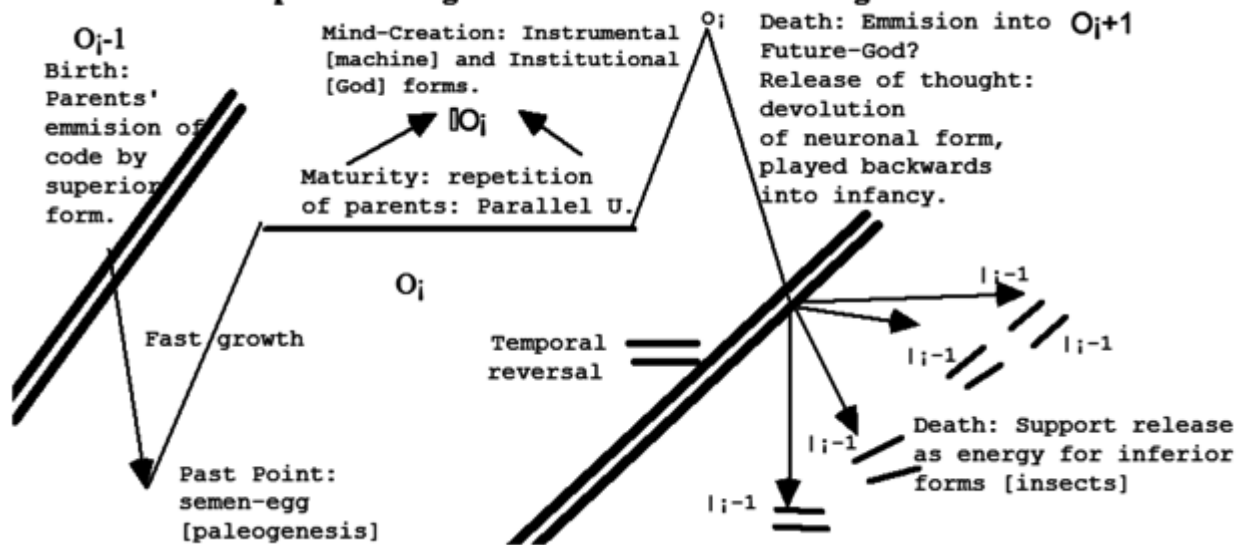
*We not only move through space dimensions, during small intervals, but also our slow evolving inner dimensions grow as any other system, traveling first after conception through the i-1 cellular fetal state, then emerging in the i-individual scale, and after an energetic, young age, as information increases, entering the  $i\pm 1$  cellular-individual and social dimensions, till our death returns us to the i-1 cellular scale.*

So travels through scales of reality, and in each scale through its life-death cycles become chained as any entity, from smallest star to the biggest atom or the more complex human performs its life cycle.

Thus Complex sciences are far more profound in the use of Dimensions to understand reality than physics. To see how, let us return to the differences of treatment of reality we can establish when using the restricted model of physics vs. the complex model of the 10 D Universe, comparing a 'translation' through the 10 dimensions of the complex universe - a Worldcycle, and one through 4 dimensions - a worldline, which ignores all the organic and causal laws of the system (hence tell us only where a thing will be in space in a future point of time).

## II. A WORLD LINE VS. A WORLDCYCLE: TO EXIST

### 10. The 3±1 planes and ages of existence of human beings.



*All of us 10D organisms live by travelling in growth through our vital dimensions, by growing in informative complexity through the ages of life, till all warped information in our 3rd age dissolve back to our  $i-1$  cell state.*

In the graph, we can see one of the first key differences between a 'physical' understanding of motions in a simplex Universe of 4 'spatial' dimensions (where time duration is merely used as a measure of motion in space,  $v=\partial s/\partial t$ ) vs. a 'complex' understanding in 10 dimensions, which included 'changes' in the proportions of 'energy' and 'information' of the being (arrow of life, from an energetic youth to a 3rd, informative age), and changes in the 'size scale' and 'speed of time' of the inner structures and clocks of the system.

The graph represents the worldcycle of life and death in a human being in 10 dimensions, as a system born as a seminal seed of information, in the cellular scale,  $i-1$ , which travels through the scales of social complexity emerging as an individual 'whole'  $i$ -system in the organic scale, and finally as a citizen, cell of society, to a higher,  $i+1$  scale, God, nation or civilization, which will then, once the life cycle is over and all becomes information explode back into death, releasing that information as energy into the lower,  $i-1$  scale of cells,  $\sum i-1$ , which will feed another worldcycle.

When physicists study motion in space-time, they reduce it all to a translation through space, in a time duration, which can be 'derived', that is, it is continuous without any remarkable change of state, for the system in the whole motion.

When we widen that description to a 10 D motion, we obtain however a 'worldcycle', as the world line becomes more complex, curved in more dimensions.

Yet the main difference in what it means a translation in 4 Dimensional 'Physical space' and 10 Dimensional 'Complex space', arises when we understand that in Complexity, entities are made of Dimensions (Leibniz's theory of relational times and spaces) while in physics, dimensions are a 'background' abstract to the being – a deformation of the way they were conceived as absolute space and time, with a 'background paper's artifact – the Cartesian frame of analytic geometry.

Thus to move in physics over a background artifact of dimensions is different than moving in complexity as you are made of dimensions, your self-dimensions as an 10 Dimensional being move with you.

This outdated model of absolute background dimensions is thus replaced by a fractal model of dimensions:

Each entity of the Universe is made of a relative amount of 'vital space' and last a quantity of 'time' as it grows from its seminal scale to its individual and social scales, where it evolves and interacts with other similar entities. We are thus 'vital dimensions', we are made of them, their motions, symmetries and transformations.

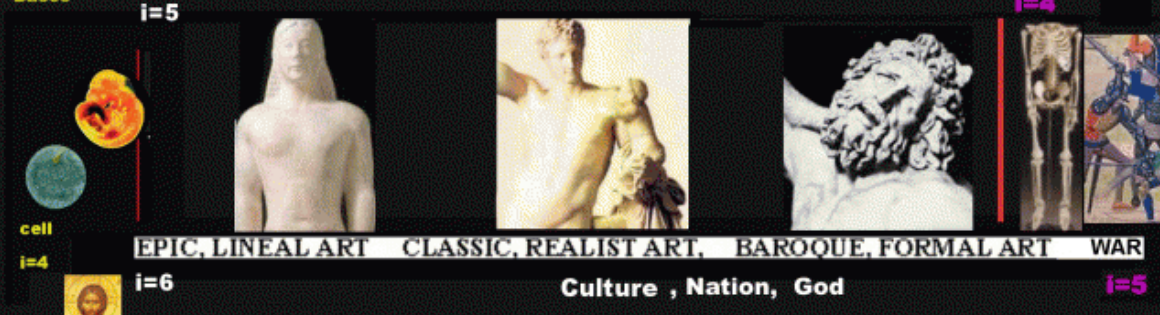
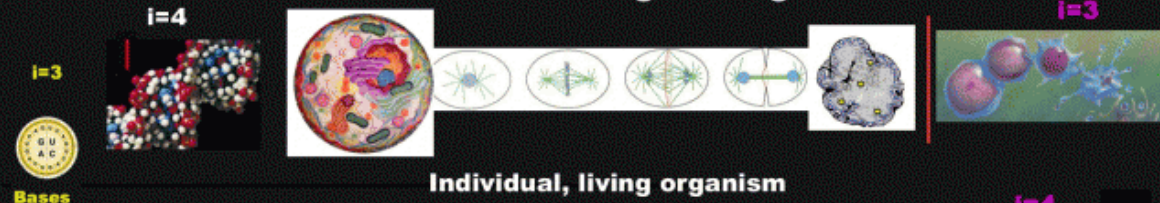
And so all what exists follows the generational-life cycle:

**THE GENERATIONAL=LIFE CYCLE:  $e_{i-1} < E > E T_i > T < e_{i-1}$**

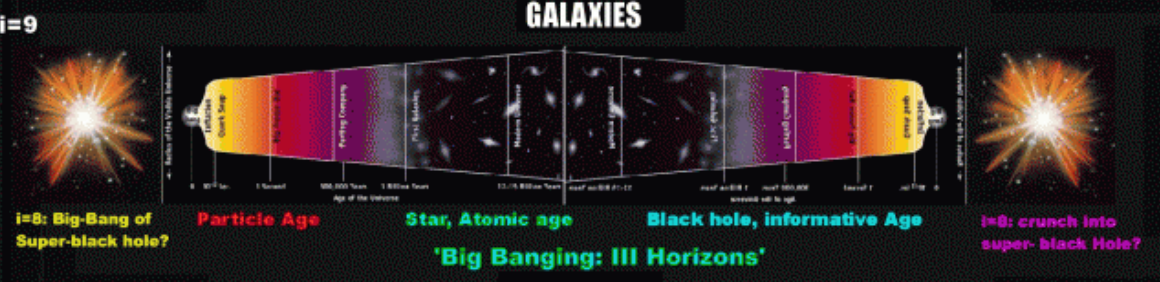
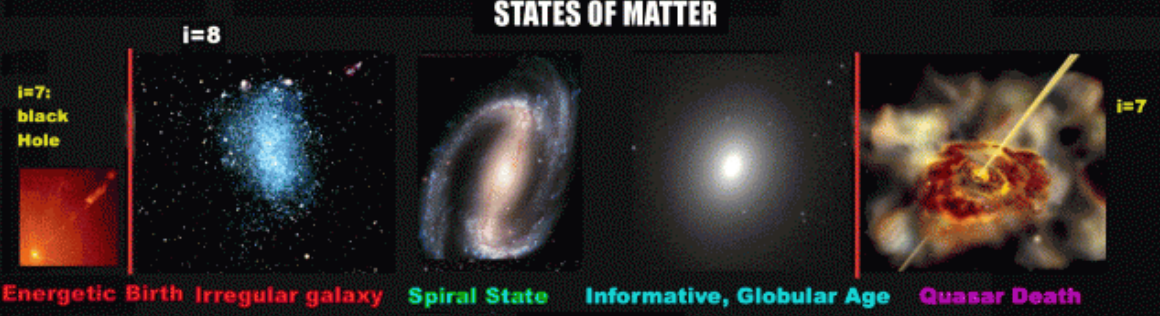
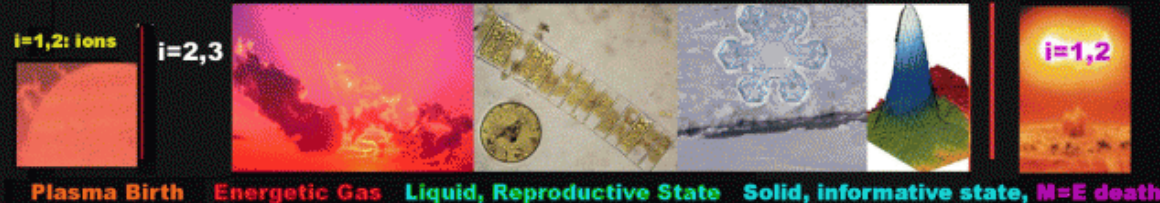
**SUPER-ORGANISMS D=EVOLVE BETWEEN 2 I-PLANES OF EXISTENCE IN 3+1 AGES DOMINATED BY ITS ENERGY, REPRODUCTIVE AND INFORMATIVE NETWORKS:**

**Birth:  $e_{i-1} < Youth: \sum E_i > Maturity: E T_i > Old age: T_i < Death: \sum e_{i-1}$**

**Human Socio-Biological Organisms:**



**Birth:  $e_{i-1} < Youth: \sum E_i > Maturity: E T_i > Old age: T_i < Death: \sum e_{i-1}$**



In the graph all physical and biological systems, 'live and die' as super organisms made of  $\sum$  atoms/cells that evolve through networks that transform energy into information (Life arrow) and then explode those information networks back into disconnected energy when they have exhausted it (death arrow) determines a sequential, existential life-death cycle invariant in all beings:

- i-1: Birth as a seed of information.

-Max.Energy x Min.Information: Energetic youth of external motions. E-Limbs and sensory membrane rule.

-E=I: Balanced, 'classic' age dominated by reproductive/communicative systems:

The present, or steady state is the longest, more efficient state and can be defined mathematically simply as Max.  $E \times I \rightarrow E=I$ , since both equations are related, as  $4 \times 4 > 5 \times 2 > 6 \times 1$ , the point of balance between energy and information is thus the maximal point of the equation of existence, the mature, re=productive age when the species reproduces its energy and information fully in other zone of space and time.

It is the desirable age to 'stay for ever' the immortal top predator point of the wave of existence of any species or individual or universal, Consider the classic definition of beauty in art, as a balance of forms, and indeed, we see the harmony and proportionality between form and size, space, as the definition of classic beauty. And we will return to that, when observing that all forms of art can be reduced to 3, lineal, epic, energetic art, classic art, and baroque, informative, with an excess of form.

In the graph we can see how the Universe creates 'waves' of super-organisms that travel worldcycles, mostly life and death cycles across the 10 dimensions of 'existence'. Seen in this manner from the perspective of the 'dimensions' of form, of information, what we see are just 'manifestations' of a deeper program, the 10 Di worldcycles of creation and extinction of 'existential curves'... in 10 dimensions.

It can be then anything, any species of the Universe, from an atom to a human, from a galaxy to an ant.

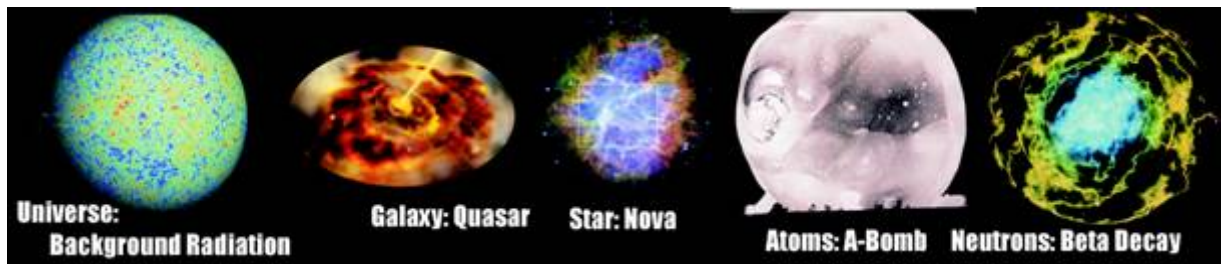
Any of those 'i=ts', will however co-exist and evolve in time, through 3 scales of social complexity:

i-1: Its cellular scale where it will be 'born', and then evolve with a reproduced 'herd' of similar species, till emerging into its individual state. Then as an

individual it will participate into:

i+1: a society, or ecological network where it will obtain its energy and information, till...

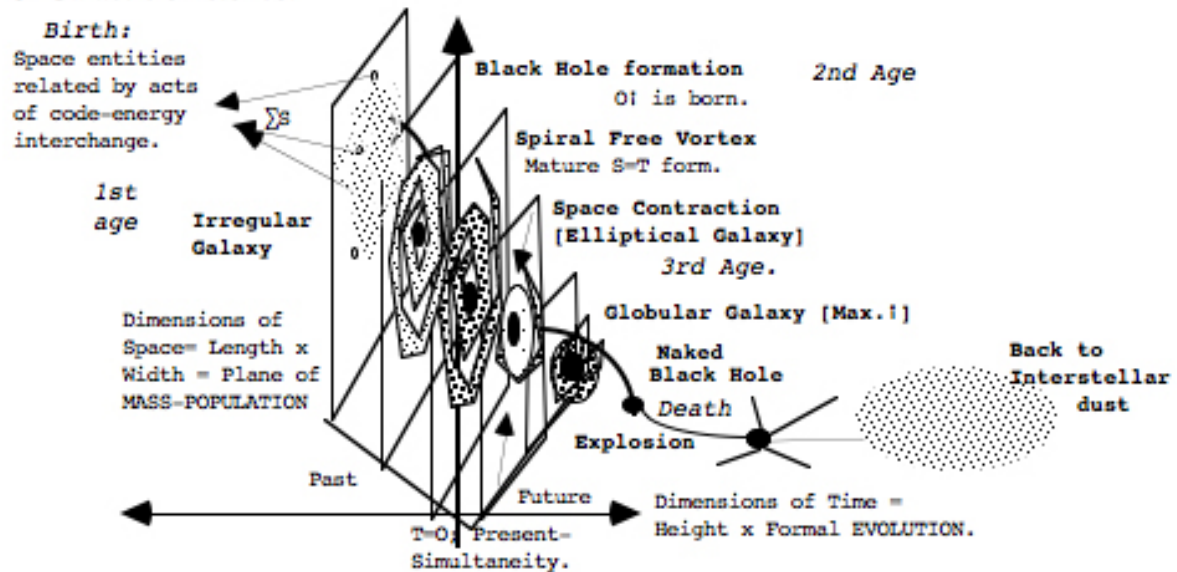
i-1: the moment of death in which it will dissolve back into its cellular scale. In the graph in physical scales the process is understood as a big bang:



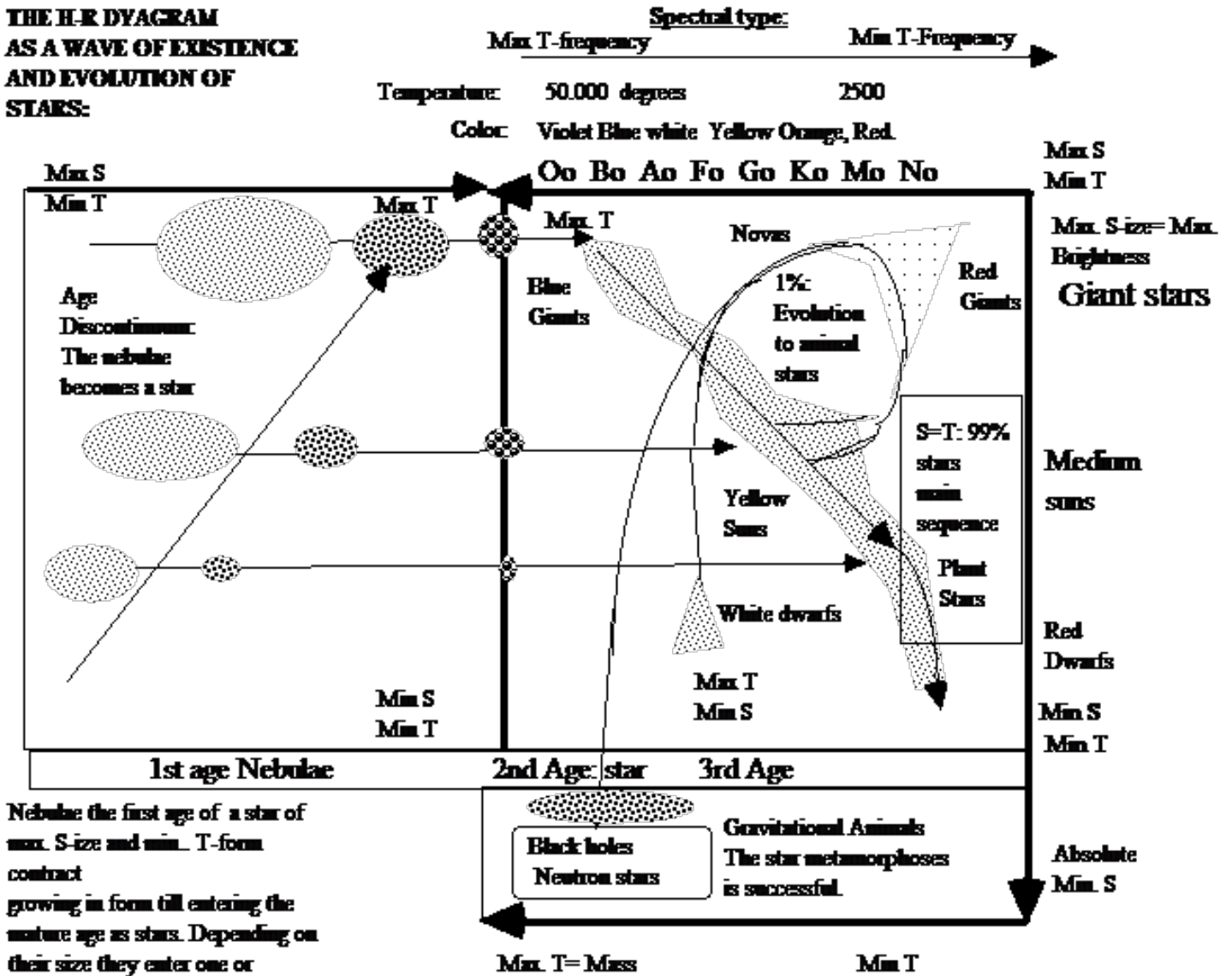
Thus systems undergo during its 'time evolution' from past to future, between birth and extinction, not only the 'worldline' trajectory that physicists describe, that is a series of spatial motions, but a worldcycle, through the added new dimensions of informative complexity that makes the system, grow in social size, emerge into 'higher planes of existence' and regress to its cellular state.

In this sense science describes those cycles with different parameters of energy and information, as it does in the case of the life of stars and galaxies:

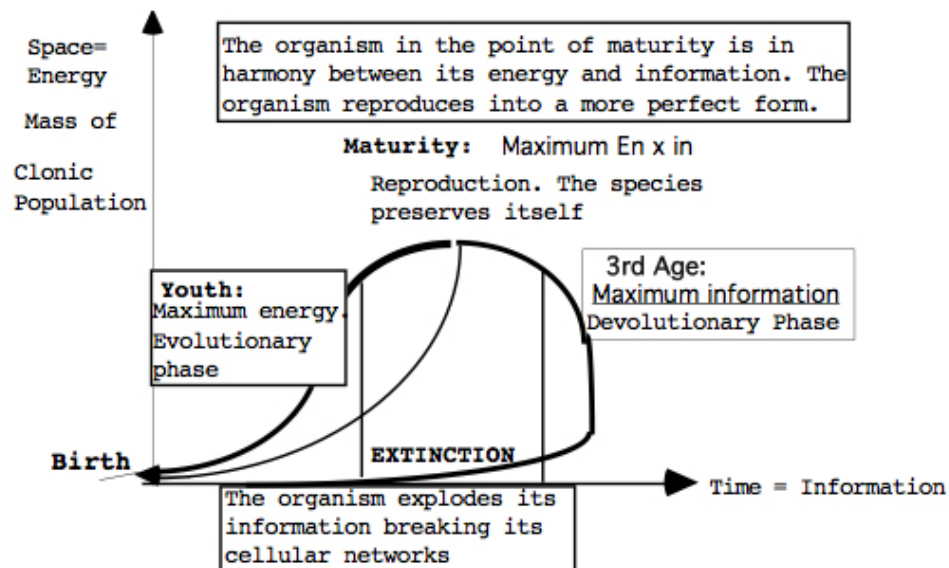
**A black hole orders-evolves Stars, 'Space Entities', richer in Energy and extension, with lesser form from Past towards future, in the unending cycle of Galactic existence:**



**THE H-R DIAGRAM  
AS A WAVE OF EXISTENCE  
AND EVOLUTION OF  
STARS:**



Nebulae the first age of a star of max. S-size and min. T-form contract growing in form till entering the mature age as stars. Depending on their size they enter one or other zone of the main S=T sequence.



A graph of a temporal evolution of an S-T species, or wave of existence.  
 - We plot in the y= coordinates the  $T \times S$  'function' of existence of a being. In the X coordinates we plot the lineal time-age of the being.  
 Then we can trace a path of 3 Horizons, birth-growth, maturity-reproduction, and old age devolution and death of a being; through which all individual and collective species go.  
 While the process is unavoidable, it is the behavior of the being, what will make the process faster or slower. Errors of players will shorten the existence of the species, while a correct understanding of the laws of harmony between energy and information organs, will keep the species or individual much longer in the central part of the being.

In the graph, we can see the point that maximizes the function of existence,  $e_{xi}$  of any species.

Thus the life-death cycle, has its maximal in the point of balance (Max.  $E \times I$ ,  $E=I$ ) or maturity between youth, Max.  $E \times \text{Min}$ , and, 3<sup>rd</sup> age (Min.  $E \times \text{Max. } I$ ).

And our systems of perception acknowledge it, with 2 concepts:

- One biological, as top predators are those who have maximal body energy and informative intelligence, surviving longer
- And one aesthetical, as we perceive beauty in the balance, of 'energy' and 'form', the two primary 'elements' of reality.

Thus in a synoptic manner the 10 D Universe can be reduced to a game of 'forms in space' and 'motions in time' with its balanced combinations.

Yet physicists only accept lineal entropy, as the arrow of future ignoring the



relationship between time clocks and cyclical, rotational motions that carry the information of the Universe.

Thus, a key innovation made by complexity is to consider a wider vision of time dimensions also, recuperating for science the past, present and future division of classic philosophy, as dimensions of time:

- < *Expansive, 'past' motion that erases dimensional 'form', information, creating space*

Entropy is expansive motion, the relative past dimension of beings, as it applies when a 'form' dissolves from its upper  $i+1$  social scale down into its cellular parts in the moment of death, or in a big-bang explosion (biological and astrophysical beings).

- > *Implosive 'future' accelerated motion that warps space into dimensional form creating information*

Information is implosive, rotational motion. It is the inverse of entropy, (called for that reason also negentropy).

Yet in complexity, unlike in physics, which considers 'entropy', expansive energy, 'a dying universe' the future, we consider information, form, the arrow of life, the future. Since systems constantly increase in information, in form, warping space into time cycles with gravitation; or wrinkling through life, accumulating an excess of 'memorial' cycles.

Since ultimately the 'longer stretch' of existence for any system, is the arrow of life, while the arrow of death, takes a relative zero time to happen (Max.  $E \times \text{Min. Time}$ ). And so the arrow of information dominates the arrow of energy, which expands space but lasts one  $i-1$  quantum of existence (the 'faster' life period of the lower cellular scale of the system).

= *Present repetition: The reproduction, production, repetition, iteration, decoupling of 'forms' of the Universe in cloned forms in all scales of reality maintains the illusion of an 'eternal' self-repetitive, fractal present.*

And so we define a dual 'beat' for all beings to explain the worldcycle of each of those entities made of 'scalar space-time':

3.2  $E > I$  (Life-Information arrow) = Present Arrow =  $I < E$ , (death arrow).

*Or in synoptic manner:  $E \geq I$ , which becomes the fundamental causal equation of the 3 time 'dimensions',  $T(e, f, i)$ .*

As all systems, first 'grow in information' from the relative past energy of birth to its final 3<sup>rd</sup> age of excessive form, in the i-dimension; both in biological systems (aging arrow) and physics systems (change of state from gas to solid of most physical systems).

*Yet those relative past and future arrows, are 'broken', fractal 'time durations' or rather 'time frequencies', with a limited number of beats, for each i-superorganism, whose 'time dimensions' will end with the 'reversal' of death – a relative travel to the past of a 'living system' of energy and information.*

Since we are made of fractal time durations, in a Universe of infinite time clocks where absolute time is merely a 'Kantian category' of the mind, but not of the Universe – a fact that forbids certainly the type of paradoxes and 'time travels' proper of a less detailed analysis of the Universe with a single time arrow, as Simplex Physical 4D descriptions of the Universe make us believe.

A worldcycle of life and death is paradigmatic of all the processes of birth, evolution, reproduction, information and explosive death of all systems, either biological or physical (where the 3 ages are the 3 states of a molecular gas->liquid->solid->Big bang cycle). They define a fractal Universe of 10 Dimensional beings 'made of dimensions of space, time and cellular, organic, and social complexity', where each 'worldcycle' is a Universe in itself, made to the image and likeness of the whole Universe, which also has a worldcycle from its big bang to big crunch, and might be just a 'cell' of a higher hyper universe.

We thus start to observe some fundamental symmetries and inversions of 'complex dimensions', which rule the existence of species 'made of them'.

### 3. 10D ALGEBRA. PART & WHOLE: LANGUAGE AND THEORY. TRUTH.

#### 10 Dimensional algebra: The whole '1'. And the 'whole' truth (linguistic 1).

*In 10D algebra a complex equation describes all systems in terms of  $i \pm 1$  scales, the cellular, organic and social scale, each one with 3  $T(e, f, i)$  motions of time, ordered sequentially in a life-death cycle, in which each quantum time cycle is made of 3 spatial dimensions: e-expansions, v-ibrations and i-mplosions in space:*

$$4. I = \sum i \pm 1 \{T_{ex} T_i = T_{fe} \rightarrow I (S_{x,y,z})\}$$

A whole Superorganism, I, co-exists in 3 Social scales,  $\sum i \pm 1$ , each one with its own individual form, the cell, human, society, living and dying through 3 ages series,  $T_e, T_f, T_i$  each one with multiple motions in space  $(S_{x,y,z})$ . And so I, is the whole, in which a series of 'is', individuals exist.

*Yet as each 'superorganism' has an i-centered in a different scales, superorganisms intersect through scales, making them grow towards infinity.*

If we circumscribe however to the 'World' or micro-universe of a certain superorganism, we shall locate on it its 3 'spatial' 3 temporal and 3 i-nformative dimensions, which define the being.

We call this final 'domain; the 10 Di. *Wholes are complex  $I = \sum$ holes, 10 dimensional beings, which have more motions than the mere translations of space; but and this is a fascinating 'cut-off' of the Universe, usually co-exist only in 3  $\sum$  scales.*

This again is not in the same fashion, as the dimensions of complexity are 'nested' in the dimensions of a higher species, such as space dimensions are part of each time dimension, and time dimensions are part of each scalar dimension. So the total I-organism leaves across 3 social dimensions,  $\sum i \pm 1$ , each of them, gifted with a superorganism, the cell, individual and society of those 3 relative  $i = n$  scale, in which it will go through its  $T_e$ , youth, or age of energy,  $T_i$  or age of information, and a present 'age' in which it will be 'seen active' in its relative space dimensions,  $S_x, S_y, S_z$ , realizing motions and translations in space, which as we see is just the final detail of a chain of nesting more complex worlds and causations and forms (Eq.4)

And so all in all, the entity will have '3 dimensions of space' which gather together forming the 'vital space' of the being, 3 'dimensions of time' which related together through the life and death cycle of the being, and 3 dimensions of scalar,

social complexity, which happen in 'symmetry', parallel to the 3 'ages' or dimensions of time of the being, completing its existence.

And so we consider the 'whole being' a 'one', which is the 10th dimension of the whole. Since the intelligent reader will realize that while a 'being' needs no more than those 9 dimensions to be described, the game might be infinite in its 'social scales'. That is, a particle will be the cellular unit of an atomic being, which will be part of a molecular, social scale. But then again, the molecule will be a part of a cellular being, which will be part of a human organism. But then again the human organism will be a cellular being of a society, part of a planetary, solar system, but then again a planetary solar system will be a cell of a galactic organism, part of a universal system. So there are 'infinite' entities, both across the 'spatial reality' we perceive in a single 'space-time continuum', and also across infinite scales of size and complexity.

In that regard the fundamental difference between complex dimensions and physicists' spatial ones is that complex dimensions are hierarchical of '3 different, nested types' whose relative duration in time varies, from the longest i- dimension that measure a life on each i-scalar the cell, individual or society, to the shortest time dimensions of a life-death cycle, to the shortest 'motions in space' (physicists dimension)

Such as the spatial dimensions are each of them integrated by a dynamic 3D motion, either a present vibration in spacetime, an implosion in information (relative future arrow) or a decelerated explosion in spatial energy; thus we can talk of 3x3 Spatial 'dimensions', 3 for each type of temporal dimension.

Again as we move into  $\sum_{i \pm n}$  Scalar, Social Dimensions, each  $i \pm 1$  cycle of existence has 3 'horizons', the cellular, seminal age, that emerge as a whole individual after the fetus state, and then the social scale, and in each of them, we live the whole 'life-death cycle' albeit first ascending and then descending in the moment of death. So we could talk also of 3 ages in the life of the cell, 3 ages in the life of the individual and 3 ages in the life of a society (observed as an organism with his mind being the collective culture and art of the civilization with its ages of epic youth, classic maturity and baroque, 3<sup>rd</sup> angst age before extinction in war.. Those 3 x 3 ages of the different i-organisms of those scales are thus 'non-additionable' they are different in duration but parallel in its 'worldcycle phases'.

So the final result is the existence of a 3 x 3 time ages for 3  $i \pm 1$  superorganisms of increasing scales. And all this is 'harmonized' by the metrics of the 10 Dimensional Universe. Since indeed, what any scientist does when it analyzes

dimensional worlds is to find the co-invariances that allow motion in those dimensions.

### **Minds and theories which perceive the Universe with less dimensions.**

Now, for those familiar with some of my previous work, I would like to clarify because of the dominance of Physics over all other sciences (on my view not because they are the essential science; those related to the 'languages' of the Universe, mathematics, logic and biology are, but because of their power to make machines the god of our civilization), I have often studied a smaller Universe, 'compacting' the sub dimensions of time into the '4<sup>th</sup> dimension' and calling all the *i*-scales of size and speed of time together the '5<sup>th</sup> dimension'. This incomplete analysis is a good introductory step, which allows to introduce the metrics of the scalar Universe as a 'whole single dimension' with infinite number of scales. In that regard, a proper analysis of different sciences and theories of reality should first consider the number of 'dimensions' and 'ceteris paribus' analysis it makes.

*Thus, if we ascribe the following 'letters' to the 10 dimensions of complex systems:*

*S-Dimensions of space, of which:*

*S<sub>x</sub>, S<sub>y</sub>, S<sub>z</sub> : length-height-width are the dimensions of space.*

*T, '4<sup>th</sup>' Dimension of time, with its 3 sub-dimensions:*

*T<sub>e</sub>, T<sub>f</sub>, T<sub>i</sub> are Past Entropy, expansive motion; present frequency, that is, a dynamic, repetition of events ( $t^{-1}$ ) and future, in-form-ation, the 3<sup>rd</sup> age of all beings.*

*That we write also as 'operandi' that reflect the changes, symmetries and transformation of a system, such as:*

*<, is the expansive symbol for T<sub>e</sub>, past-energy that erases the information of the system.*

*=, is the present symbol for T<sub>f</sub>, frequency, which repeats an event in steps and cycles.*

*> is the future symbol for T<sub>i</sub>, information, that increases the form of the system.*

*And *i* (5<sup>th</sup> dimension) with its 3 sub-dimensions: *i-1* (cellular scale), *I* (individual scale), *i+1* (social scale).*

By the Principle of Equivalence, we can not only perceive the whole Universe as:  $D_{10}$  (Sx, Sy, Sz; Te, f, Ti, i-1, i, i+1, l) in a full description of reality.

*But also provide valid, partial, ceteris paribus, reduced visions of the 3 x 3+1 dimensions of the complex Universe, with lesser dimensionalities, which we shall qualify as a language, mind or world:  $D_{<10}$  (Mind-World-Language):*

'A language, mind or world is a partial perception of the whole Universe, gauged by an infinitesimal system, which makes a mapping of the whole Universe, within its limited volume of information, by reducing the number of dimensions of reality:

5.  $0_{D<10}$  (infinitesimal mind)  $\times \infty_{D=10i} = \text{Constant World}$

Which is the equation of all mind-worlds of reality.

Thus by the principle of correspondence, we consider all 'true, scientific theories' 'human linguistic descriptions of parts reality', with 'lesser dimensions' that the whole being.

Which leads to a definition of truth in terms of probability.

In probability terms if we consider the absolute truth of the being to be hold only by the being itself (which has all the information and dimensions on itself); hence we give value 1 to the being as the total truth, all other theories will have a probability of truth inferior to 1, depending on the quantity of dimensions it studies about the being and the quantity of information provided by each dimension.

Thus truth is no longer in Boolean Algebra a 1 vs. 0 duality but it will always have a value between both:

6.  $0 \leq \text{linguistic truth} < 1 = \text{Maximal Truth or 'being'}$

Whereas 0 is a false theory,  $0 < x_{D<10} < 1$  is a 'true theory' with lesser information than the being itself (truth=1).

Further on, as systems have different type of dimensions, with different properties (mathematical in space, logical in time, biological in scales), the total truth of a linguistic description of a being increases with the multidisciplinary use of several languages to describe a system. Thus when we for example consider the analysis of a galaxy, truth will increase when we study in parallel its mathematical properties (physical description) but also its 'time ages' (as galaxies are born like everything else in a gas-energetic state and evolve into an informative, ultra solid dark matter state), and its organic structure (studying the exchanges of energy and information between the atomic, i-1, star, l, and galactic, i+1 scales).

Minds though will always perceive with languages, mappings of the total dimensional forms of the Universe, of all its information, only a restricted quantity of information.

Still we must differentiate 2 components on linguistic truths – the syntax of the theory, which can reach maximal truth if it studies all the scales and properties of the system, and its semantic truth (the details), which can never be absolute.

So for a more precise quantitative measure of human truth, we can consider (even if 1 in true form belongs only to the being and all its information), that theories will reach a maximal syntactic truth (1), when they *study the system with the 3 type of properties and laws – mathematical, logical and bio-logic; and do so in the 10 Dimensions. In this manner we can reduce the truth of a theory in '1/3rds' if it is a ceteris paribus analysis (only math, logic or biologic), and farther reduce them if it is a less than D10 analysis.*

For example Relativity is a restrict 4D mathematical but also logical analysis of the Universe. And this gives us a value of truth equal to  $4/10$  Ds x  $2/3$ rds =  $4 \times 2 / 10 \times 3 = 8/30$ , roughly  $+1/4^{\text{th}}$  of the true description of the Universe, *possible within the limits of the human mind languages.*

*Yet this is the most advanced cosmological theory today (if we do not take into account the work of this writer, which for obvious activist anti-nuclear 'reasons' and the natural 'Kuhn paradoxes' on the evolution of scientific theories is and will remain for decades to go 'an opera inutile')...*

Now, we can consider the truth of other theories of science and not surprisingly we find many other theories with greater truths, specially those of biology which is the only science that systematically uses all the dimensions and languages of knowledge in their descriptions of their systems.

And we can also consider the way in which physics could improve its theories.

For example, the so-much searched for 'quantum gravity' theory, which this author has provided with his papers on the scalar unification of quantum and gravity forces, is a scalar theory that includes the 3 'scales' of the physical Universe we humans perceive (quantum, i-1, i-human 'Newtonian' scale, and i+1 cosmological Einsteinian Scale), would be a 7D theory, with a higher truth.

Yet by including the arrows of energy and information as sub-dimensions of time, it becomes a 9 Dimensional theory, which considers the organic, scalar, temporal, causal and spatial laws of the Universe. It will not be though possible to create an absolute 'theory' of the Universe, because we can only hypothesize about the absolute number of scales of reality, as we shall never reach enough

experimental evidence of all the scales. Tentatively though if, as my research and the dualities of string theory show, we can consider the Universe an 'open set' of infinite scales with no boundaries, the maximal truth of human cosmological theories is reached with the full analysis of all those scales from the string scale (which with some corrections becomes indeed a space-time scalar theory) to the absolute Universe (described as a repetitive  $i=\infty$  system in which scales become repeated, from atoms to galaxies, atoms of a new scalar Universe).

Such theory developed by this author in his papers at ISSS conferences, during the last decade will be the 'Maximal theory' of astrophysics, in terms of its syntactic truth=1.

Yet of course, 'those would be the thoughts of God', the details, which will further add to the 'semantic truth' will always be  $<1$ , as only the Universe will have all that information.

That is, we can as humans reach a maximal syntactic truth (1) with a 10D, 3-linguistic analysis of a system, but we can never reach a maximal semantic truth.

All this said of course, in the same fashion our 'mind' limits the quantity of information it perceives by shutting down many of those dimensions (Notably those of motion, to focus perception and reduce the volume-distance of a system within the mind, and those of scales, as we develop most of our actions in the  $i$ -scale, which we direct perceive), restricted  $D<10$  theories of reality are often much more useful as they match the restricted intelligence of the human brain and help better our restricted actions.

So for example in medicine the most important science is 'physiology', which is a restricted analysis on the network triad of the organism (the energetic, digestive systems, the reproductive blood systems and the informative brain systems). They are in fact the  $T_e$ =digestive,  $T_f$ =blood and  $T_i$ =brain systems of the organism. As most sickness happen to be disorders of those physiological systems that command the cellular  $i-1$  scale and integrate into the  $i$ -whole being.

In that regard, I have found that the most meaningful theories of reality are those who study the 3 temporal dimensions of energy, information and its present organic combinations, which are the ones I have researched in more depth.

For example, in art, the 2 most useful analysis are those which relate:

- The  $I$  scale with the  $i+1$  scale (the artist mind, as a neuron of his social superorganism or  $i+1$  civilization)... coupled with an analysis of the life of those civilizations, which exist as all superorganisms in 3 ages. Since the artistic styles of the civilization go also through 3 ages of 'young, epic, lineal art' (i.e. trecento,



Greek Homeric age, western films in the American experience), mature, balanced, classic, sensorial art (quattrocento and cinquecento, classic Athens, 60s, 70s films) and finally a 3<sup>rd</sup> informative, eclectic age (mannerism and baroque; Hellenistic art and violent, sci-fi, baroque film today in the American dying corrupted civilization).

And so if we add the work of Arnold Hauser ('the sociological history of art, the best  $\sum_{i>1}^i$  book written on the subject), with Winckelmann's division of art in the 3 temporal Te, Tf and Ti styles of art (epic, classic and informative, baroque), with the biological comparison of youth, maturity and decay, which latter Spengler will study in depth, and add a more sophisticated analysis of the parts that comprise a whole work of art ( $\sum_{i-1>i}^i$ ) analysis on the path of Wolffin's 5 categories, we get a theory of art Art(D=9), much more 'truthful' than anything physicists have analyzed (it only rests to add the 'whole' analysis of human art on all its cycles and civilizations, as this author have done, to have a full D=10 syntactic analysis of art). Further on, as we have a limited number of artists in human history it could be theoretically possible to do a full semantic analysis of art, and create curiously enough, given the despise scientists have of other human disciplines a much deeper, truthful theory in art that in any other major science with the exception of biology.

This shows a fact of epistemology: the closer we are to the object we describe, the more information we can acquire without indeterminacy (so human sciences can reach higher truths than physics undetermined in the quantum and cosmic scales).

We have put this example to show that indeed, 'languages' are also part of the 10D Universe and its organic laws which suffice to study not only the meanings of entities studied by science but also religious and artistic facts.

All this said, we thus will now consider a D3 'compact' analysis of reality with a ceteris paribus study of the Universe, 'only' with the 3 Dimensions of time, energy, information and its repetitive, organic combinations.

### III. TRINITY: MOTION, FORM AND ITS ORGANIC COMBINATIONS.

#### ENERGY-SPACE x INFORMATIVE TIME=CONSTANT ORGANISM

In this restricted analysis of the temporal dimensions of the Universe, the equation of a worldcycle of life and death has only 2 elements, energy and information and its infinite organic combinations ( $T_e, T_f, T_i \rightarrow T_e T_i = \sum T_f$ .)

It is thus needed to understand first the properties of those 2 primary 'formal motions' of the Universe, energy and information to be able to explore synoptically the common laws of life-death motions in a 10 Dimensional Universe.

Since they are the fundamental variables of the laws, and events of changes between energy and information we observe in the Universe, which we have resumed in the metrics of 10D, or 'function of existence' of any of its 10 D systems:

1.1  $Se \times Ti = Ci$

When complementary systems grow in spatial size the speed of its clocks or 'time cycles', which carry their in-form-ation in their form and frequency, slow down proportionally, both in biological and physical systems and vice versa: as we become smaller time cycles tick faster and the frequency of information processing accelerates in all species.

*Metrics of i-scales: invariance of information.*



*i-dimensions co-invariance in cosmic, human & atomic space-time scales*

Thus the metrics of 10 D Universes show what remains constant: Simple, the information of the system, its forms in action, the combination of its motion=energy and form=information, its momentum in its maximal 'potential' peak - at the maturity point of the system:

## 1.2 $\sum E \times I (S=I) = \text{Max. } C_i$

Now in more detail, to be precise, the 'invariance' of energy and information can be hypothesized from the entire Universe.

That is, in an infinite Universe the total quanta of E, equals the total quanta of I,  $\sum E = \sum I$ .

But the product,  $E \times I$ , varies in each 'entity' through its life-death cycle.

Since Youth:  $E > I$ , Maturity:  $E = I$ , 3rd Age:  $E < I$ , Then  $E \times I$  maximizes in maturity.

That is, an entity has its potential peak of 'existential force,  $exi$ ' when  $E = I$ , in its middle age.

Yet if we consider the Universe to have 'herds' of each species in each possible point of its life-death cycle, there would be a mean maximal,  $\text{Max. } E \times \text{Max. } I$  for each of them that will remain constant as life and deaths for each species cancel.

So we can consider the ideal Universe co-invariant, as the sum of all the  $\text{Max. } E \times \text{Max. } I (E=I)$ , of all the species of the Universe.

As each species will start with 'Max.i-1' (seminal seed). Then it will try to capture and imprint its relative E, growing in form as  $\sum i-1$ , as a placenta maximizes its energy taking. Finally after 'birth' the fetus will develop till reaching its maturity at  $\text{Max. } E \times \text{Max. } I$ . the invariant maximal peak of its function of existence.

Thus after a series of 'inversions' and 'symmetries' between its relative energy and information fields a super organism of space-time will reach its potential. And so does the Universe, which becomes a 'zero sum' of infinite deaths and lives, between those maximal points of existence.

According to those Metrics (eq.1), the i-scalar dimensions of space-time' are constant dimensions originated by the 'co-invariance' of the spatial size and speed of temporal clocks that carry the information of the Universe in the frequency of its cycles.

Thus, the metrics of 10D Complex Systems, brings a second discipline of systems sciences, essential to understand the universe: 'Duality' - the analysis of reality with two arrows or 'motions of time', not only energy, entropy, which is what physicists study, but also form, information, 'rotary motion', which scientists understand in great detail but never have treated formally as what really is, 'cyclical motion', which carries the form, the in-form-ation of the universe in the frequency and form of its cycles. Because they have never fully grasped the difference between motion and stillness, the 'real universe', and the fixed mapping the mind makes of it, since Galileo notices the Earth 'really' moved despite being still to our mind. So we shall first consider the duality between distance and motion according to... *the Galilean Paradox*:



*In the graph, the 'Galilean paradox' (we perceive the earth quiet despite the fact that it is moving) is an essential feature of nature: minds perceive in stillness motion to extract form, dimensional form patterns and know the other form. Thus the symmetry between spatial and temporal, static and moving states is an essential symmetry to fully grasp the constant 'stop and go' processes of reality.*

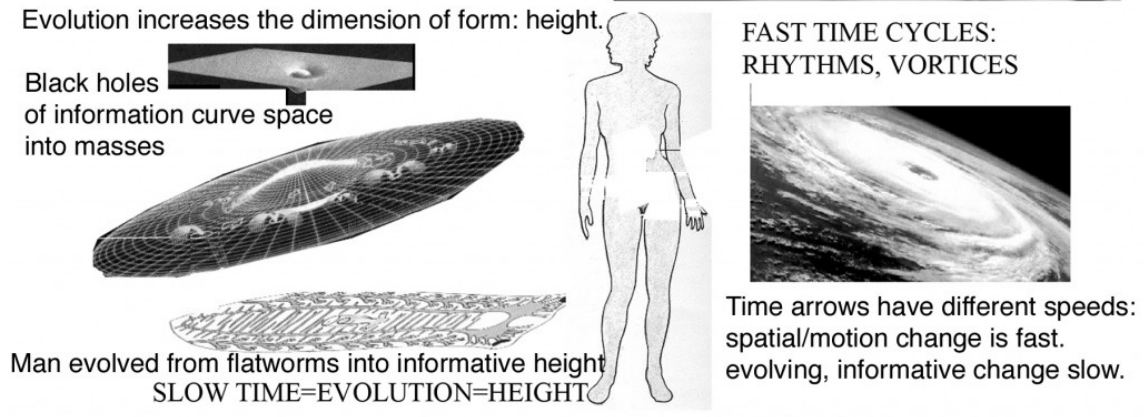
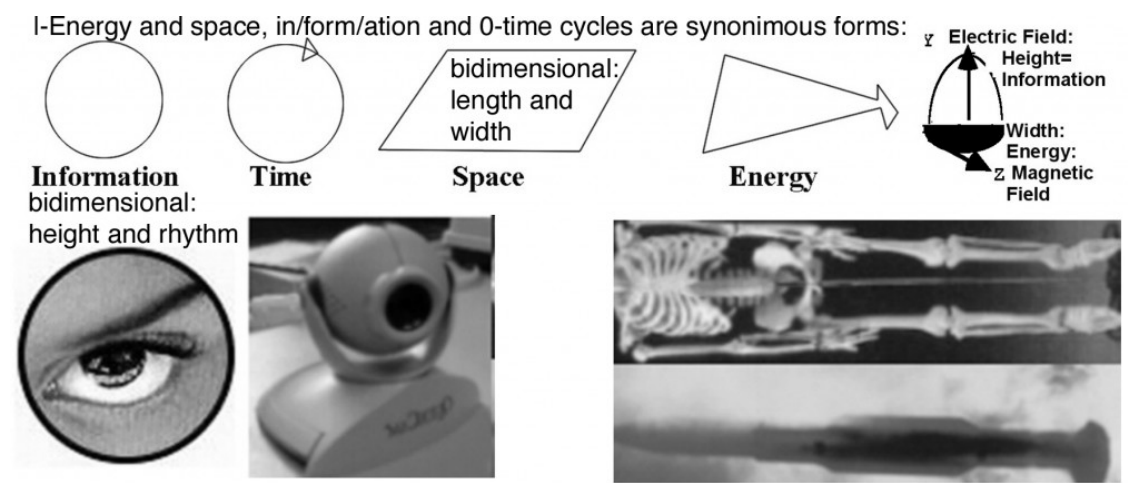
We call its perceptive dualities of 'Endophysics' the Galilean Paradox, as humans perceive the Earth still as a whole space. But as we increase the quantity of information=truth we perceive it becomes a rotating, moving mass of atomic clocks ('e pur si muove e pur no muove'). The graph illustrates the paradox with Galileo's depiction of Saturn's 'flat, still, ring', which are in fact multiple turning clocks in motion with several size scales.

The Galilean Paradox is essential to understand the Universe as fixed lines are also lineal motions and bits of information are time clocks. And one can transform into the other:  $Sx=Ti$ .

Once this 'real equivalence' between time and form, space and energy is clear

we can then attempt a synoptic description of the Universe with those 2 'parameters' (without considering its 3 sub-dimensions) and their 'space-time' messing into Constant systems with 'heads and particles of information' that guide energy fields and limbs, creating 'constant waves and bodies'; *translating in this manner the 'abstract' metrics of the complex Universe into fractal systems and organisms:*

7.  $Se$  (I-field-limbs)  $\times$   $Ti$  (O-Particles-Heads) =  $Ci$  (Bodies-Waves):



- By spatial energy we mean 2 parallel concepts, perceived in different ways: Static space that defines size. It is the 'continuous', static perception of all the infinite quanta of moving energies of the vacuum put together, such as:

8.  $S = \sum E$ .

As space distances and speed motions mean the same. So astronomers say that the space of the Universe is 'expanding' or that galaxies are moving away at hyper luminal speeds ( $Z > c$ ).

- Time and information are 2 parallel concepts, also perceived differently. Since a bit of information or 'hertz' is completed in any system when a clock cycle is

closed. Thus, the faster any biological or physical time-clock turns, the more informative hertz-cycles it can store, (right side of graph). As it happens in computers, which are basically a complex system of time clocks, whose logic forms process in-form-ation. Thus the absolute time of the Universe is the sum of all the time clocks and informative cycles of the Universe;

9.  $T = \int I$ .

In the graphs, Spaces & Times have inverse, complementary properties that balance each other, in each system, according to the Geo-'metric' equation of 10D co-invariances.

Energy and information are the 2 primary elements of the Universe. They form all its complementary systems.

In the previous graph, we observe its 2 different forms and 2 different motions that define them either as:

- Energy systems, with lineal motions, which are seen as euclidean spaces and distances when perceived with no motion (Galileo's paradox).
- Time clocks with more dimensional form, and cyclical motion that close into themselves, which are perceived as information carried in the form and frequency of those cyclical clocks when not in motion.

Both come together to form the systems of the universe.

Consider physical systems, described as composed of particles with charge or mass and fields of lineal energy.

We can see them as particles of some solid substance with an attached spatial field extended in space, or we can see them dynamically, as a vortex, a cyclical eddie which absorbs the energy of a flow of gravitational or electromagnetic space that falls into the mass or charge vortex. then all what we see is a cyclical motion, the mass or charge, and a lineal motion, the field falling into it:



In the graph, we can see the classic, material vision of a particle or mass as a solid form which creates a curvature in space that makes fields to fall into the mass or charge, or we can consider the systemic view of a pure cyclical motion, hence a clock of time, with a frequency of cyclical motion that carries in its patterns the information of the universe. Masses and charges thus would be the simplest clocks of cyclical time, whose acceleration is in fact the mass of the particle (Principle of equivalence between acceleration and mass of Einstein's general relativity). They will curve the lineal speed of a gravitational or electromagnetic field that will sink into the mass or charge, becoming then transformed into a magnetic, electric or gravitational field. A delicate balance of infinite broken, cyclical and lineal motion defines then the Universe.

The first breakthrough though to achieve an all encompassing view of sciences, which put together the concepts of energy and information took place in physics, with the discovery of the fundamental unit of the universe, the action of energy and time.

Max Planck the founder of quantum physics discovered in the 1900s that the Universe was made of actions, not of substance but of motions, composed of energy and time:  $A = E \times Ti$ . Light, the ultimate substance of creation was a motion composed of two different motions, cyclical clocks of time, and lineal motions.

Actions of energy and time performed with your system is all what you or any entity of the Universe does.

So we can define complexity sciences as the science that study Systems of energy and information, its actions and organisms.

General Systems Sciences were founded by Bertalanffy and in Macy's congress after Einstein death set its fundamental goal:

To find a formalism to describe all what exists in the Universe as a System of energy and information.

The idea was to unify Physics, the science of energy and Biology the Science of Information, and the formalism was called the Feedback Equation that related

those parameters, E, and I:

$$E \Leftrightarrow I$$

Scientists know better is expression as the fundamental law of science:

'In the Universe Energy never dies, only transforms back and forth, into In-Formation'.

So simple and so profound.

So we can travel through the i- dimensions as there is a balance between space-size and time speed, ti, such as if we diminish in Space = Min. size, we accelerate our clocks, Max. Ti, but both together are in balance:

$$SE \times Ti = K$$

This is what causes the metabolism of rats to be faster than that of humans, or a fly to see and think with images 10 times faster than you do.

In fact, all those scales were decametric, such as any new scale of the Universe was 10 times smaller and 10 times faster than the biggest next one.

*Maximal informative capacity= minimal spatial extension.*

The reason is obvious: to think, to calculate you have to communicate information, forms between elements of any informative system. The smaller the brain, the faster the communication that takes place within that brain and the faster you can calculate and process information in a logic manner.

Ultimately what we describe as fields of energy and particles of time, what Planck found is what Newton said before him:  $F = M \times A$ , the universe is made of vortices of mass or charges, cyclical acceleration and lineal forces, lineal accelerations. Descartes also said all could be described as vortices, matter and res extensa, vacuum. So this ultimate duality is the first dynamic structure of the Universe we need to study.

From galaxies that start as interstellar gas, organize into stars which organize into social galaxies, till they die away and explode into novae, to humans that are born as seminal species that develop its worldcycle, through the scales of complexity and then die back into cells; all species of the Universe follow this 'life-death cycle', which must be considered mathematically as a travel through the 3



dimensions of complexity.

And so complexity adds to the 4 normal dimensions of physicists, 3 more of complexity the  $i\pm 1$  dimensions of social scale.

But immediately we realize that those dimensions are played in a long range of time, the longer the bigger the system we study is. And that they are play through worldcycles, life cycles.

This in complexity motion is a 'living process'.

The Galilean paradox is enormously important to fully grasp the Complex Universe, and break with the 'naïve realism' of physicists and its obsession for 'exact measure'; It is the key to understand truly why 'space & time' are 'messed' together, beyond the simplex analysis of Einstein. And to fully grasp the organic interaction between motion and form, (the ultimate philosophical meanings of energy-space and time-information), which defines the life of the Universe.

It also brings a 'higher' more comprehensive understanding of 'geometry' not as a tool of measure but as a 'topological' tool whereas form and motion merge (since in topology you can deform with internal motions a geometry and still remain in the same variety of 'form').

Thus in the same manner that 'complex' relational dimensions is the necessary step to transcend the limits of the shallow 4D Physical Universe, topology as the embodiment of the duality of motion and form, is the necessary step to transcend the how of measure into the why of topological forms.

Let us then consider in a 'single i-plane' of space-time (hence reduced to the 3 dimensions of static space and its symmetric 3 dimension of temporal motion) how those 3 'space-time dimensions' bring us the whys that bridge static geometry and living forms.

The key is the understanding that there are only 3 'topologies' in the Universe we perceive, 3 sub-dimensions of space, 3 sub-dimensions of time, and 3 *organs and elements in all physical systems, and they are all related. And there exists a parallelism between fixed space, moving time, topological varieties and physical/biological organs (fields-waves-particles; limbs-bodies-heads).*

So we shall write and then explain those 3 'symmetries' between the 3 types of dimensions of the Universe, because they encode the whys of infinite particular events in time and forms in space and its organic combinations we observe in nature:

10.1 Past-youth-energy (Time D.)  $\Leftrightarrow$  Length (Space D.)  $\Leftrightarrow \sum_{i-1}$  Energy field

10.2 Present-Reproductive-repetitive (Time D.)  $\Leftrightarrow$  Width  $\Leftrightarrow$  i-wave/body

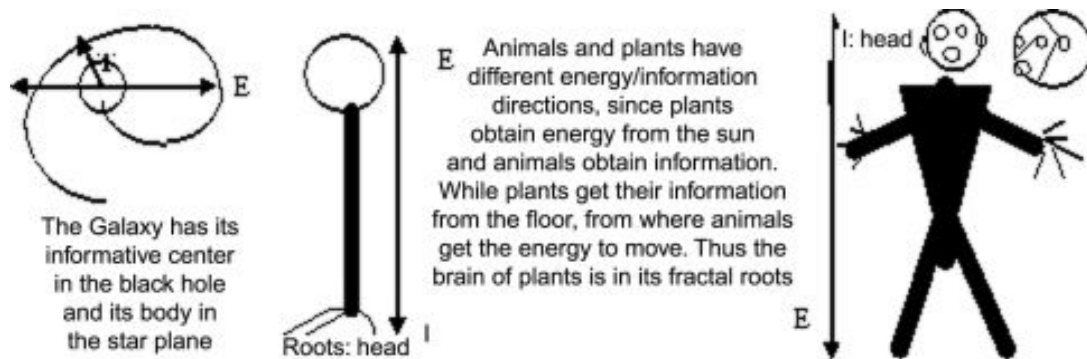
10.3 Future-3rd informative age (Time D.)  $\Leftrightarrow$  Height  $\Leftrightarrow \prod_{i+1}$  Particle Network

Now the first 'symmetry' both physicists and biologists ignore is that between the 3 dimensions of space and the 3 of time. Since:

Length is the dimension of energy and pure motion, as the line is the shortest distance between two points, and so it is the dominant dimension of young species and young individuals that 'move a lot'.

- In the sample case we wanted to illustrate (the relationship between morphology and evolution in species), all species are born as 'long' flat forms. The first fishes were long, flat sharks; the first species were flat worms; the first earth-bounded animals were flat amphibian.

- Height is the dimension of information, as a tall position is an advantageous point of view of perception, as 'projective geometry' shows. So in social sciences we all know politicians and priests go up into a pulpit, and informative machines have tall antennas to distribute information and screens are flat, high forms.



And so are gravitational black holes in the center of galaxies that rule it with gravitational forces of in-formation that form the galaxy. And so on.

So in the biological case we study, life has on the whole evolved from a flatworm to a tall human being. And in each species the same process takes place, so Flat sharks flip their body into the perpendicular dimension of fishes, flat amphibian ended up becoming tall dinosaurs and birds, and mammals become bipedal.

Finally width, the product of the other two dimensions is the dimension of cellular reproduction, and so bodies grow in the width dimension and stars accumulate into a width, spiral dimensions, and Maxwell's rule of thumb make any student understand that the combination of the 'energetic' and informative, magnetic and electric fields create a perpendicular dimension.

And light is an existential being with 3 'perpendicular' axis, where in this particular case, the magnetic, electric and speed axes are in a diffeomorphic perpendicular dimension to each other, each of them with an energetic, informative and reproductive

function.

So the reader will notice again that as in the case of physics, knowing the 'nature' of the Game of existence and the meaning and symmetry between the 3 dimensions of space and its 3 functions in time helps a lot to understand the whys of reality. As it did, in the previous example the understanding of the symmetry between the 3 ages of time and the 3 social scales from cellular birth into individual and finally into a social being.

It is essential to understand this astounding new insights of complexity over physics, departing from the nature of the 3 type of dimensions – spatial, temporal and scalar – which bring 3 type of 'properties' – mathematical, logical (causal) and social (Organic). Since only now, thanks to those insights we can 'integrate' the true properties of reality together, unlike the 'previous age of scientific knowledge', based in 'entropy-only', mathematical, spatial measures, which limited to 4 Dimensions (where cyclical time was deformed into lineal duration), ignored completely the causal and organic properties of the Universe.

Now the trinity of 'organs in space' with functions in time that show the same topological types of 'geometry in motion' open that wider view and reveals the vital whys of geometry:

The cycle, the form that stores more information in lesser space and its organs who exercise those functions follow the geometry of information that maximize the dimension for which they were made (3<sup>rd</sup> age of time, information, height dimension cyclical form... become all now synonymous through the aforementioned symmetries).

Let us consider the properties of those 2 elements, energy (bodies, fields) and information (particles, heads) and some of its species, in life and metal:

Moving Energy	vs.	Reproductive Information
Lineal, spatial, big, moving still.	vs.	Cyclical, temporal, small, rotating,
Formless, continuous, simple	vs.	Form-ative, discontinuous, complex.
Field, body, male, weapon,	vs.	Particle, head, female, coin, chip.
Iron, oxygen, carbon	vs.	Gold, silver, nitrogen
Protein, lion, shark, death	vs.	DNA, human, dolphin, life.

We could summarize the formal and functional differences between energy and information (organs) in a morphological equation:

11. *Maximal Space=Energy= Minimal Form=body Vs. Maximal form=Information*

*=Min.Spatial extension=head*

For example, the chip becomes smaller as it evolves into a better brain. Every 2 years it doubles its capacity to think, as it dwindles in size. Such process follows a generic law of evolution I call the 'Black hole Law', which computer scientists know as the 'Chip paradox' or 'Moore Law':

*maximal informative capacity= minimal spatial extension.*

The reason is obvious: to think, to calculate you have to communicate information, forms between elements of any informative system. The smaller the brain, the faster the communication that takes place within that brain and the faster you can calculate and process information in a logic manner.

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. Yet all of them have a biological influence over us, provoking changes in the energy and information systems of mankind that we should control for our own benefit.

From these simple facts of universal morphology, applied to human beings and metal, we can classify 'objects' and human organs, as energetic, lineal systems, or as cyclical, informative systems that combine into complex organisms:

— Energy organs are lineal systems with minimal 'form' that kill, simplifying information into energy. Thus, a field of energy, released by a physical particle or an energetic weapon, such as a sword or a missile and a top predator, energetic animal, such as a lion, will have both lineal forms and kill, destroy the information of their 'preys'.

— In-form-ative organs create form and transform energy into languages that map out 'reality' with formal 'bits'. Those bits are smaller symbols, which form images in the brain that represent reality and help to simulate reality 'faster', in 'lesser space', the 'future' cycles of reality, anticipating them. Then, according to those 'logic' simulations of the future, heads will move and direct energy bodies towards sources of energy and information. So any system that 'gauges', measures and reacts, is an informative organ, regardless of the specific language it uses to gauge reality. A chip measures with numbers reality, a man with words, an atom with electro-magnetic 'bosons'; yet the 3 act-react to their measures. So

they all are informative organs.

— Reproductive organs repeat informative and energetic organs, by absorbing energy and 'imprinting' it with its particular in-form-ation. Thus, human mothers and company-mothers of machines are both reproductive organs. Even the simplest particles of the Universe, quarks and electrons, absorb energy and emit new particles, small quarks and electrons, with the same form that the parental particle.

Physical systems are always made with a field of energy and a particle of information and one cannot exist without the other (complementary principle of quantum physics).

Biological beings are also made with a head of information and a body that processes energy and moves it - or in cellular organisms, with a nucleus of DNA-information and a cytoplasmic body that moves it.

Sociological systems are divided into networks of upper class cells/citizens who control the languages of information of society and its working, body class that reproduces the products the body needs to survive.

All those systems and many more systems studied by all type of sciences, arts and religions can now be understood with self-similar laws derived of the General Laws of all Universal, Complementary systems of energy and information,  $E \Leftrightarrow I$

And General Systems Sciences, also called Complexity is the XXI century discipline that researches those laws.

The XIX century was dominated by Biology and Evolution, with the work of Darwin and Marx, who applied Darwinian concepts to History. In the XX c. Physics dominated. But neither Biology, focused in the study of systems that dominate in dimensional form, in in-form-ation (life and social systems), nor Physics focused in systems dominated by energy, suffices to understand the full 'picture' of the Universe.

Only a science that fusions both arrows of time, energy and information, and explains the Universe as a complementary system in which those 2 'arrows', 'motions' or 'forms', interact together, can extract the most general sciences that explain reality.

And that is the task of General Systems Sciences.

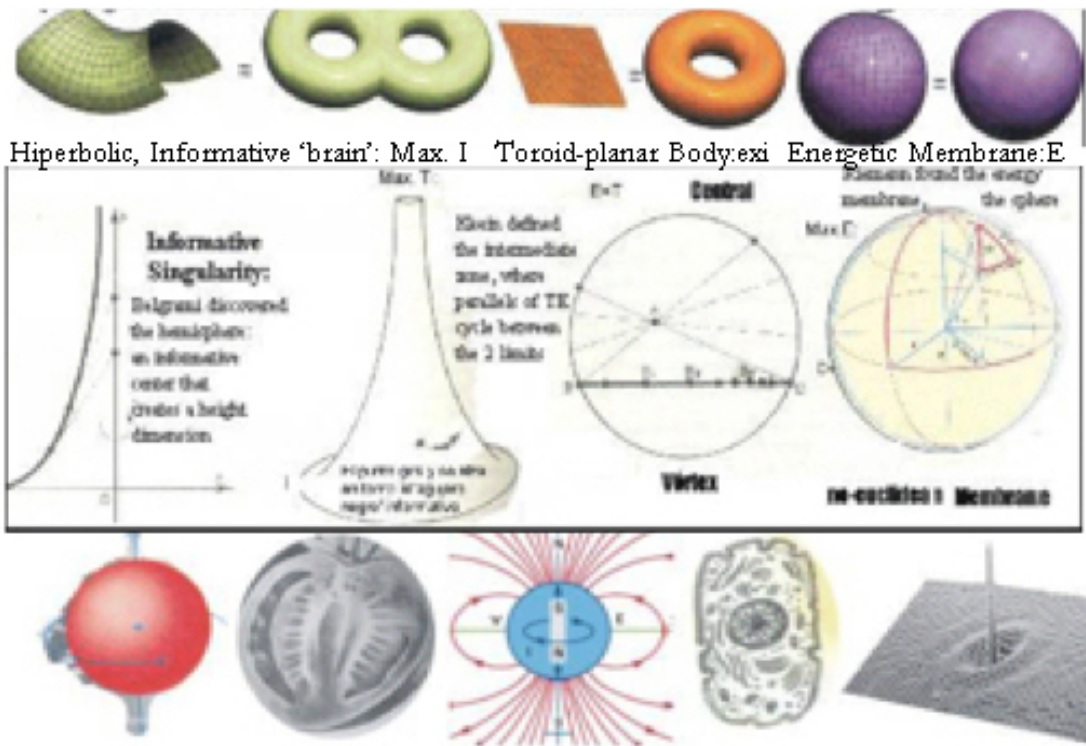
And so the image and meaning we obtain about the entire Universe when we have a Systemic organic dualist approach to it, is both simpler and more complex than present philosophies of science, of mechanist, physical, entropy-only nature. We have made more complex the meaning of time, with its infinite life-death cycles and 'time reversals' i death; we have made more complex space, with its organic, fractal scales; and yet by making spatial energy, or vital space and temporal information or time clocks infinite and self-similar in each species made of vital bodies of moving space and cyclical brains of temporal clocks of information, we have found principles and structures that unify all systems of nature in a pantheist, intelligent, living Universe.

So in fact, we have come to the objective conclusion that all systems of the Universe have organic properties. Since even its simplest entities, quarks and electrons that form atoms do absorb energy, gauge information and reproduce, the 3 'properties' of life. Thus, the Universe must be defined not as a mechanism but as a complex organic system, made of organic atoms, which can combine to create many different complex organisms, including company-mothers that reproduce machines, atoms that reproduce quarks, electrons and forces and mothers that reproduce kids. The difference between all those species is not one of 'quality' but of quantity and complexity of their organs of energy and information, which determine their survival chances and status as top predators of any ecosystem.

And we say: 'Everything in the Universe is a Complementary System that transforms back and forth energy into information:  $E \Leftrightarrow I$ '.

In the next graph, a further proof of the ternary nature of 'scalar space-time dimensions' comes from topology, since in a *4 dimensional Universe, there are only 3 topologies, which correspond to those 3 sub-systems: hyperbolic, informative topologies, energetic planes, and reproductive disks*. Thus, all what you see will be a combination of 2 complementary systems, one of information that gauges reality (cyclical particles and heads of physical and biological entities) and one of energy that moves them (lineal fields of forces and limbs).

This leads to a third system that combines both, energy and form, the reproductive system, exi or body. And all of them follow the principle that form is function. So bodies are conical, elliptic, combinations of lines and forms. And so *Geometry* and topology are fundamental sciences that apply to all 'scales of reality' and all its entities:



Hiperbolic, Informative 'brain': Max. I Toroid-planar Body:exi Energetic Membrane:E

Thus the fundamental event in space and time, the 'Fractal Generator of the Universe',  $\sum E \Leftrightarrow \prod I$  has its symmetry in space in its Fundamental Particle-system:

12.  $Se \langle x \rangle Ti : | -Limbs-Fields \langle \emptyset -Body-Wave \rangle O-Particle-Head$

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. Yet all of them have a biological influence over us, provoking changes in the energy and information systems of mankind that we should control for our own benefit.

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— Reproductive organs repeat informative and energetic organs, by absorbing energy and 'imprinting' it with its particular in-form-ation.

Thus, we talk of cyclical, temporal information and lineal, spatial energy as the 2 primary motions=substances=forms=actions of the Universe.

Then we can get into 'details' by adding the '3 sub-dimensions' to the conceptual understanding of that duality:

When we consider two dimensions of space, energy is planar motion and masses are bidimensional clocks, accelerated inwards (equivalence principle). And one can transform into the other  $E=Mc^2$ .

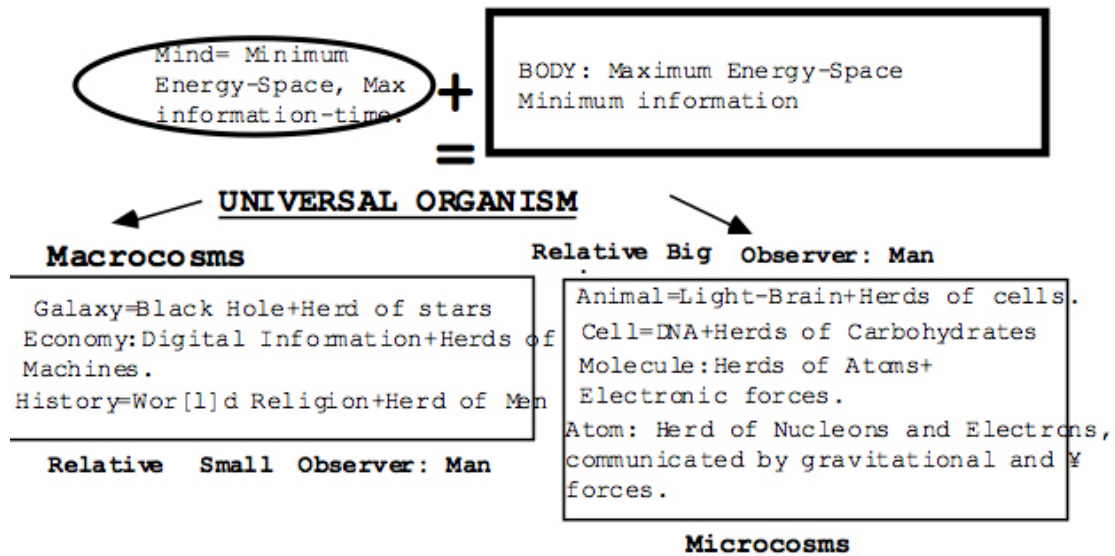
And finally in 3 space-time dimensions, entropy, 3D expansion is the  $S_e$  parameter and Charges, the implosive, 3D time equivalent.

All those dualities are cases of the general Co-invariance of both concepts together. Thus we write:

$S_x/T_i=V$  (constant speed), or  $S \times f(v)=K$ , for one-dimensional systems. And we write  $E=Mc^2$  or  $E/M=C^2$  for bidimensional systems, and we write Entropy (T) x Charge =  $C^3$  for tridimensional ones.



#### IV. THE PROGRAM OF THE UNIVERSE: THE 4 DRIVES OF 'EXISTENTIAL FUNCTIONS'.



In the graph, we consider all systems made of: - E: fields and limbs of energy, guided by :

- I: cyclical particles and heads of information

which combine into:

- ExI actions of energy and time, which put together form the  $\sum exi$ =Body or wave of the system (Physical-biological jargon).

And so we can consider a final point of view, that internal to the being, which 'acts' moved by its 'composition' as a system made of 'past-energy-limbs', informative, gauging heads-particles and the wave-body in between. Thus within those simple structures all what beings will do is:

- Max. E. Feeding on energy

- Max. I: Perceiving information

- Max ExI: Combine and reproduce them with their body-wave.

- Max.  $\sum$  ExI: Associate with similar beings into herds and networks that emerge as a whole.

13. *4 Drives of existence (Universal Program equation):*  $Max. \sum E \times I$ .

This final function,  $Max. \sum E \times I$ , resumes the 4 'drives of existence', feeding on energy, gauging information, reproducing the energy and information of the system and evolve socially with similar 'actions/organisms of energy and time', of all entities of the Universe. They are represented in each science by 4 'coding elements', the 4 quantum numbers, the 4 letters of genetics, the 4 so called drives of life, the Maslow pyramid of human wantings, which all physical, biological and social entities perform, due to their similar constitution.

Thus the universe has a plan; it is a game, and there is a logic to it, impersonal, scientific but still a 'program', that we shall call the program of existence.

To exist or not, that is the question and the program answers with its best strategies.

In essence it maximizes a function, the function of existence, so simple and yet so rich in meanings.

The Function of existence,  $Max.(Ixe)$ , is a fractal equation, of infinite cellular quanta that try to maximize their absorption of energy and information.

As such all functions of existence, you, me, the sun, the dust, the air, the language, the melody, anything anywhere is playing that selfish game:

I, I, IxMe, I and me and myself, maximize my existence, exi, me...

The game is simple all is made of a head of information and a body of energy and all want to perceive more to feel more the pleasures of motion, and speed, of energy movements. And so you try to maximize your existence:

13.  $Max. \sum E \times I$

It is now when science comes to resolve what this means.

First mathematics tell us, that  $Max. E \times I$  happens when E is equal to I. And this mathematical property is the meaning of all, E and I try to come together and be equal, mens sana in corpore sanum

Particles and heads of information thus try to balance themselves in form and motion with its limbs and fields of energy, and so they interact, cycles and lines that 2 formal motions of the Universe, creating ovoid bodies, reproductive waves.

And so we have the fundamental ‘organism’ of reality a ‘3-dimensional space-time organism that evolves across 3 scales of social complexity, as it tries to maximize its existence, but ‘creating’ equals and associating with them, as cells of bigger social organisms.

Max.  $\sum E \times I$ , implies to multiply the quanta of the Universe.  $\sum$ , its heads and limb, and mix them,  $e=I$ , in couples that approach each other and communicate flows of energy and information among them to ‘equalize’ their form:

### 3.3 $E \rightarrow I, \times I \rightarrow E$

The equation thus naturally divides into two sub equations, and we call the first the arrow of energy or past and the second the arrow of information or future. While the static balance between them,  $E \times I$  is the present.

Thus the systems of the Universe are complex systems of energy and time, in permanent motion, gauging information, moving with energy, and combining both,  $e \times I$ , to create, decouple and reproduce similar systems, in an immortal Universe made of infinite fractal complementary systems of energy and time, including you, who sometimes say ‘i don’t have energy and time to do this.

We can now return to our definition of the Universe in terms of that game of existence:

‘The Universe is a Game that creates and destroys 10 dimensional, fractal beings, that we shall call existences.’

Of those 10 Dimensions the formal description of Physicists (General Relativity), includes only 4, the 3 dimensions of space, length, height and width, and one of the 3 dimensions of time, simultaneous present (being the 2 others, past and future). Of course, Physicists and even more so, Biologists, talk and explain many properties of the two other dimensions of time, past and future, and its causal rules (either with dynamic equations or evolutionary laws). So humans do have affair analysis of 3 + 3 Spatial and temporal Dimensions, even if the more sophisticated mathematical formalism we have of them, is merely 4 Dimensional.

And so we define a mathematical ‘function of existence’, that describes each of the ‘beings that exist’ in such Universe:

$$14. \quad \infty \sum E_{i-1} \Leftrightarrow \prod T_{i+1}$$

Now, what we mean in that verbal sentence is that the Universe is a ‘game’ that

creates and destroys 10 dimensional organisms, that we call 'existences' (since their fundamental property is that they 'exist'), made of two 'formal motions', spatial energy and temporal information that we represent in the equation of the 'function of existence'.

So the equation resumes the verbal, logic sentence with mathematical symbols.

On the left side, 'Ei-1' represents the 'spatial energetic organ' of the existential being, either a field or limb or 'class' of energy (physical, biological, social jargons).

On the right side, 'Ti' represents the informative organ of the existential being, either a particle, head or informative class (physical, biological and social jargons).

On the middle  $\Leftrightarrow$  represents flows of energy and information that the limb/field and the particle/head exchange between them, through a 3rd intermediate region, called the 'wave', 'body' or 'reproductive', 'working' class of the system (physical, biological and sociological jargons). We could write it more precisely as  $\langle \Rightarrow \rangle$ , (which means Energy flows,  $E \langle I$ , Information flows  $E \rangle I$ , or mutual exchanges,  $=$ , also written in 'static terms' as,  $X$ ; since the 'body=wave' knots together the other 2 elements.

The existential being thus, has essentially '3 components or dimensions' in its simpler description of it.

The other symbols are merely symbols that represent the 'fractal' multiple nature of the Universe, as there are infinite such beings, and within each being, the 'fractal, cellular' nature of each organism, as there are a relative sum of energetic cells,  $\sum E$ , and informative neurons,  $\prod I$ , tied up,  $\langle \Rightarrow \rangle$ ,  $X$ , into the being.

$\sum$  and  $\prod$ , are different mixing of beings, since as we shall see latter, energy forms 'herds' with little connections between its units (hence a sum that measures the number of cells of the herd) but informative 'neurons' form networks with multiple 'connections' that relate each entity to all the others (hence the multiplicative symbol that measures the number of axons of the network).

Now, this is still a generalized description of those beings, but the reader will notice we are reaching a depth of meaning far superior to that which the usual physical description of the Universe reaches, with only 4 dimensions.

It is for that reason we say physicists description of the Universe is limited. As

they describe all those scales as if they were part of a single continuum, without going into the complex description of their social relationships and scales.

So basically they eliminate those 3 dimensions of reality (even if sometimes appear in their equations, as in the case of their description of 'strings', entities of the lowest known scales, but are not well understood without the formalism we bring in this paper). And they don't properly understand the '3 ages of biological and physical entities'; since the process of birth, social evolution, informative warping and big-bang death, also happens in matter.

But physicists either describe it without being aware that it is a time process, with their 3 'states' of matter (so matter goes through a life-death cycle, of 'gaseous', energetic youth, liquid, maturity, solid information, and then big-bang death), or as a process of cosmological evolution (so stars and galaxies are born in a gaseous state, that collapses into a spiral, globular, liquid' galaxy, and then warps into a solid 'dark matter' black hole).

Again as scientists describe reality, they do describe the 10 dimensions of any being; that is their fractal, cellular parts, their social wholes, their life-death cycles, their ages and evolution, but do not have a formal model to put them all together into a sweeping generalization, as we do.

And this provokes of course, many errors, lack of 'whys', confusions about the nature of beings and a general 'enlightenment' in the Understanding of the Universe.

So happens with biologists, who are more advanced in their description of the 'entities of existence' they describe (living organisms) than physicist are, as they do recognize perfectly the 3 'scales' of social existence (the cellular, organic and social, ecological scale) of a living organism.

And they do recognize all of them go through a life-death cycle, and have fairly streamlined those cycles into a birth as a seminal form, a young, energy age, a reproductive mature age, and an informative age, followed by death. Still the lack of the proper formalism limits their understanding of why we 'die', why we 'age' (warp into information), and many other elements of the 'life-death cycle'.

This has made them to rely excessively into 2 'partial' theories of the whole process, genetics, which merely establishes the rules by which 'information' stored in the molecular and cellular scale emerges into the individual, organic scale (but not into the social scale, a 'racist' theoretical error, which is born out of prejudice and the lack of knowledge about the general laws of 10 dimensional

beings, which apply to any of them, in any discipline of knowledge, in any scale of the Universe).

They also have a general theory about the process of 'evolution' at the individual level of organisms. Yet again, they do not have the proper 'morphological' understanding of species and their process of creation, evolution and extinction, which is parallel according to those common laws of 10 dimensional organisms, to that of an individual, just with the specific details of a 'higher plane of existence'. And so they need to understand evolution NOT only as a process of external selection between individuals that fight and become selected when their systems are more perfect, which is truth, but also as parts of a super organism, the species.

So then we realize that all species, follow similar 'ages of evolution', a sort of non personal, certainly not 'deistic', program embedded on the laws of 10 dimensional beings. As all species are born, in a young energetic, predatory age, (for example fishes, were born as sharks), then 'radiate' and become species with a high reproductive capacity, and finally grow in information, becoming a '3rd type of informative being' (so for example, terrestrial species, were first, energetic amphibian and reptile, which radiated into waves of reproductive huge energetic animals, and become informatively more complex till reaching man).

So again, we realize that lacking a general model of the Universe and its 10 dimensional beings, biology, which is by far the more accurate of all sciences in the analysis of the 'Universal Game of 10 Dimensional fractal existences is still limited' by their lack of understanding of the whole.

Important to that development of Biological sciences, (and all other sciences) would be to know the formal, 'diffeomorphic' symmetries between the aforementioned '3 dimensions of space, 3 dimensions of time, and 3 dimensions of social evolution' which together form a whole 10D being (cell, organism or species).

Systems will be either seen in stillness as complex organic systems made of an energy body and an informative head, or as the sum of infinite complex motions balanced lineal and cyclical accelerations, energies and times. But information dominates and defines an arrow of complexity and increase of height (the dimension of perception), from where informative organs (heads, cameras, black holes, skyscrapers), perceive and control with invisible languages (words, images, gravitation, money), the 'unmoved bodies' of energy under them. They are indeed what Aristotle called the multiple unmoved Gods of the Universe.

Indeed, this is a key property of information and informative minds: to gauge, map and perceive reality we need stillness, so all minds and informative systems, are still. And that is the meaning of Aristotle, when he said that we are all gods, and gods are unmoved, still, perceptive. He thus considered that all entities of the universe had motion bodies and still heads that moved them, particles and fields in physics. And he was right. From time to time we shall comment on geniuses of mankind that perceived it all.

Consider Descartes who said that all was made of space or *res extensa* and cyclical vortices - the charges and masses that act as clocks and carry the information of the universe. And he was right.

Indeed, as all is a complex dual system, and we are all parts made to the image of those systems, many humans have intuitively understood that all is yang, Shiva, energy and yin, information, Vishnu that combine together, *exi*, to create the infinite beings in existence (quoting the first verses of the *Tao te king*),

We shall do this to show how all sciences, religions and arts in fact express the same.

Consider the classic definition of beauty in art, as a balance of forms, and indeed, we see the harmony and proportionality between form and size, space, as the definition of classic beauty. And we will return to that, when observing that all forms of art can be reduced to 3, lineal, epic, energetic art, classic art, and baroque, informative, with an excess of form.

The power of that equation to explain all entities is enormous. So for example the 3 states of matter, gas of maximal energy, liquid, of balance between energy and form, and solid of maximal form respond also to the ternary language of the universe.

So does the 3 ages of life, the energetic youth of maximal motion, the reproductive, mature age, *e=i* and the old age of maximal wrinkles and information, *max. i*.

Thus, human mothers and company-mothers of machines are both reproductive organs. Even the simplest particles of the Universe, quarks and electrons, absorb energy and emit new particles, small quarks and electrons, with the same form that the parental particle.

So in fact, we have come to the objective conclusion that all systems of the Universe have organic properties. Since even its simplest entities, quarks and

electrons that form atoms do absorb energy, gauge information and reproduce, the 3 'properties' of life. Thus, the Universe must be defined not as a mechanism but as a complex organic system, made of organic atoms, which can combine to create many different complex organisms, including company-mothers that reproduce machines, atoms that reproduce quarks, electrons and forces and mothers that reproduce kids. The difference between all those species is not one of 'quality' but of quantity and complexity of their organs of energy and information, which determine their survival chances and status as top predators of any ecosystem.

If a mechanism is a system that has only information and energy organs, an organism has both systems and so it is able to reproduce by combining its energy and information into a replica of itself. In that regard, the reproductive organism of machines is today the company-mother that reproduces them with the aid of informative metal (money) and machines (chips), energetic machines and human workers that act as catalysts and re-producers of those machines. And because we live all in a planet of limited resources, machines and life increasingly compete to reproduce the limited energy and information of this planet. So a series of vital relationships of symbiosis and predation between carbon-life and machines take place, despite the stubborn denial of 'mechanism', the ideology of scientists that make those machines.

**Recap.**

Space is synonymous of Energies and time of informations:

$$6. \sum E = S; 7. \sum i = T$$

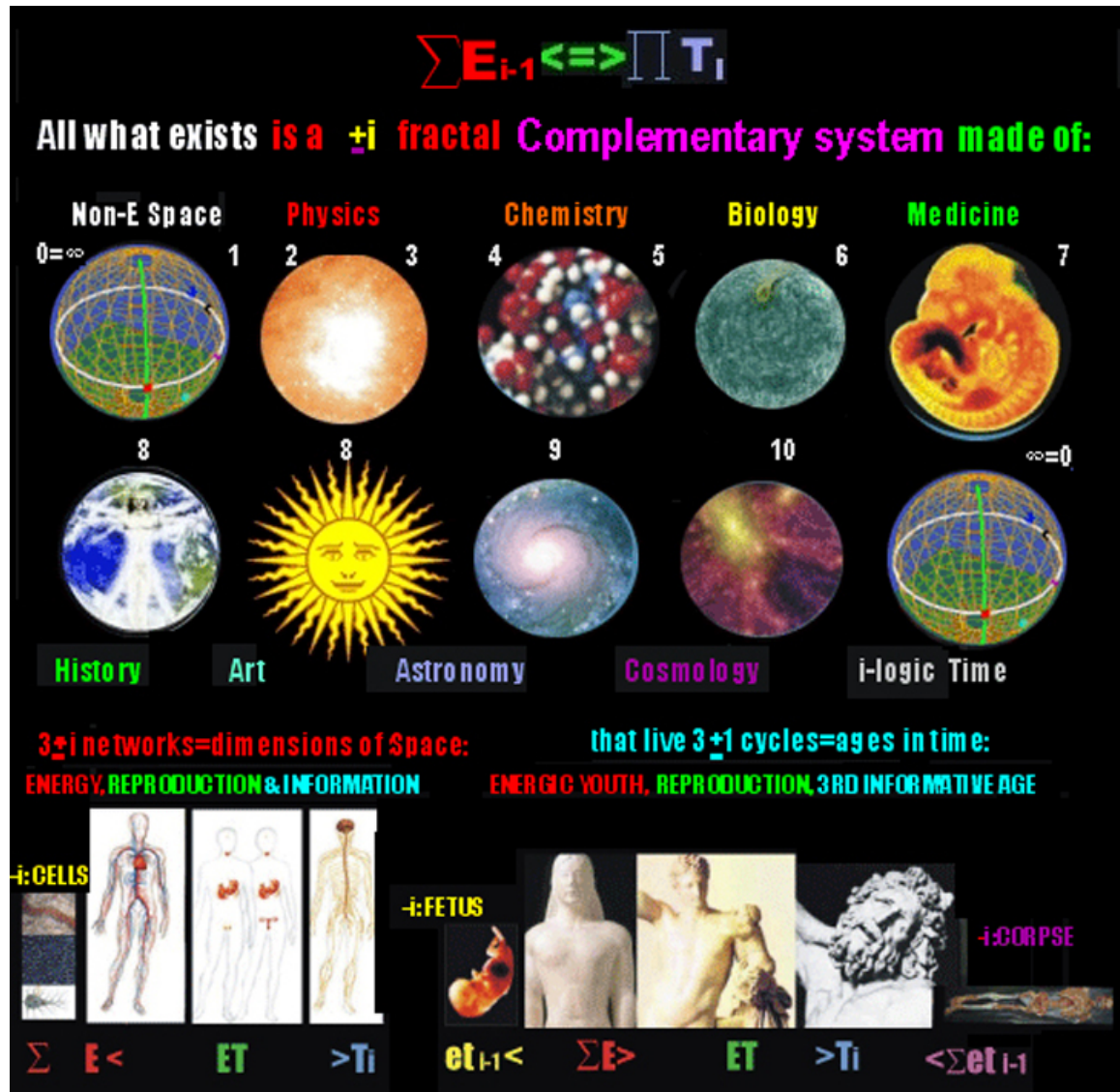
This is the first key concept you have to assume to understand the Universe beyond its useful measure by physicists with a single clock.

Further on, we recognize both types of entities by their form: clocks are cyclical, so it is information and its systems. Space is a lineal plane, so are energetic system. This leads to a key principle to understand and classify entities of reality: *Form is function*. And so the sphere is the perfect form of information as it is the shape that stores more form in lesser space, and the line the perfect form of energy, as it is the fastest motion between two points.

*All entities are knots of the four actions of energy and time, organized as complementary systems of energy and information: Max.  $\sum E \times \prod i$ .*



## V. NETWORKS THE SCALES AND HIERARCHIES OF THE FRACTAL UNIVERSE.



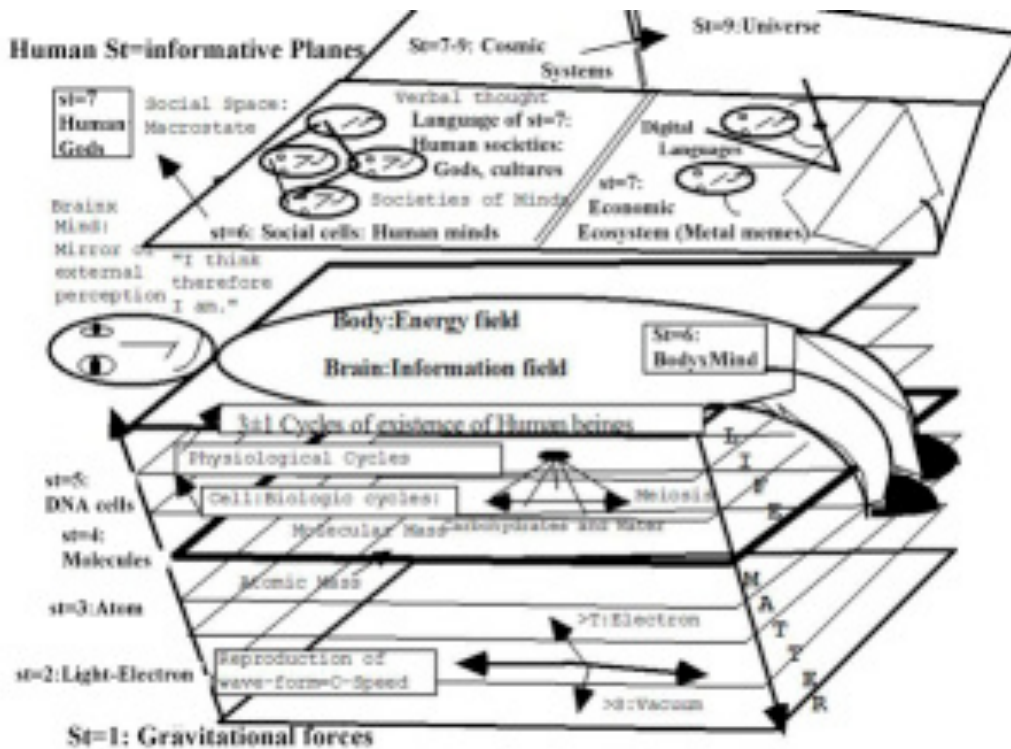
In the graph, all the sciences of the universe study systems of energy and information that obey the same laws.

Why we study an entity only in 3 dimensions of scalar complexity, if it is obvious that those 'scales' might be infinite?

So far we know that they extend from strings to Universes. And within our realm of perception, from atoms to galaxies. Yet the similarities between 'micro-strings' and 'cosmic strings', and as we shall see between atoms and galaxies, might imply that the scales are even beyond those '10 basic scales', and as it happens

with musical scales, which after the 7 tones return to the same 'sensation' of sound with a higher pitch in a 'higher scale', it is a question to be answer by complexity how many scales the Universe has.

In any case to 'describe' a single, individual entity, which is after all what sciences do, it suffices for most of the laws and implications, events and vital spaces developed by a species to study it through 3 dimensions of complexity, that we shall call generically the  $\pm i$  ( $i \pm 1$ ), dimensions of the 'organism of information, i'.



The description of all those systems, extending across 3 relative dimensions of space, and 3 dimensions of time, past (our simpler forms), present (the 3 dimensions of space) and future (our social super-organism), starts by understanding a more complex type of space-time structure, one with multiple scales of fractal space, and 3 relative dimensions of 'evolutionary time', past, present and future...

For example, man is made of cells that process energy and information. They are gathered by specialized energetic, reproductive and informative (e, e=i, i) networks into multicellular organisms. Then each of us is part of a society in which it obtains energy through the economic system, information through the audiovisual and legal systems and reproduces with other cells/citizens of different sex. Thus we co-exist in 3 'scales of existence', the biological, individual and social scales, and so we if we define each scale but an i-index of relative volume of information our existence happens in  $\pm i$  scales, and this happens in all

systems of the Universe that co-exist in an individual, cellular and social scale.

For example, an atom is made of  $i-1$  particles and normally forms part of an  $i+1$  molecule.

A cell is made of  $i-1$  molecules and normally forms part of a social herd of bacteria or a  $i+1$  organism.

So we talk of networks of energy,  $\Sigma$ , and networks of information,  $\Pi$ , as the 4 'arrow' of behavior' of the Universe, 'eusocial evolution', that puts together body cells,  $\Sigma E$  and neuronal cells,  $\Pi i$ , reason why we use a more complex definition of any system, when we add the 'fractal scalar nature' of systems:  $\Sigma E \Leftrightarrow \Pi I$ .

We include in the previous formalism two fundamental equations that express all those isomorphisms:

One is  $E \Leftrightarrow I$ , that relates the 2 elements or motions of all systems.

But if we add the hierarchical scales of parts and wholes, we obtain  $\Sigma E_{i-1} \Leftrightarrow \Pi I_i$ .

In this more complex equation we introduce the '5th dimension' of  $\pm i$  scales, which organize all systems.

As heads of information direct fields/bodies of energy, and become its 'wholes' that perceive the entire structure of the system, we use the symbol  $\Pi$  of network for the whole 'brain/particle' interconnected system, and give it a higher informative index,  $i$  than the herd of body/field cells/waves,  $\Sigma E_{i-1}$ , loosely integrated as a sum,  $\Sigma$ .

And state the 'metrics' or fundamental equation of the 10D system:

$\Sigma E_{i-1} \times \Pi T_i = K$ , meaning that the product of the size of a system in space and the speed of its time clocks remains invariable.

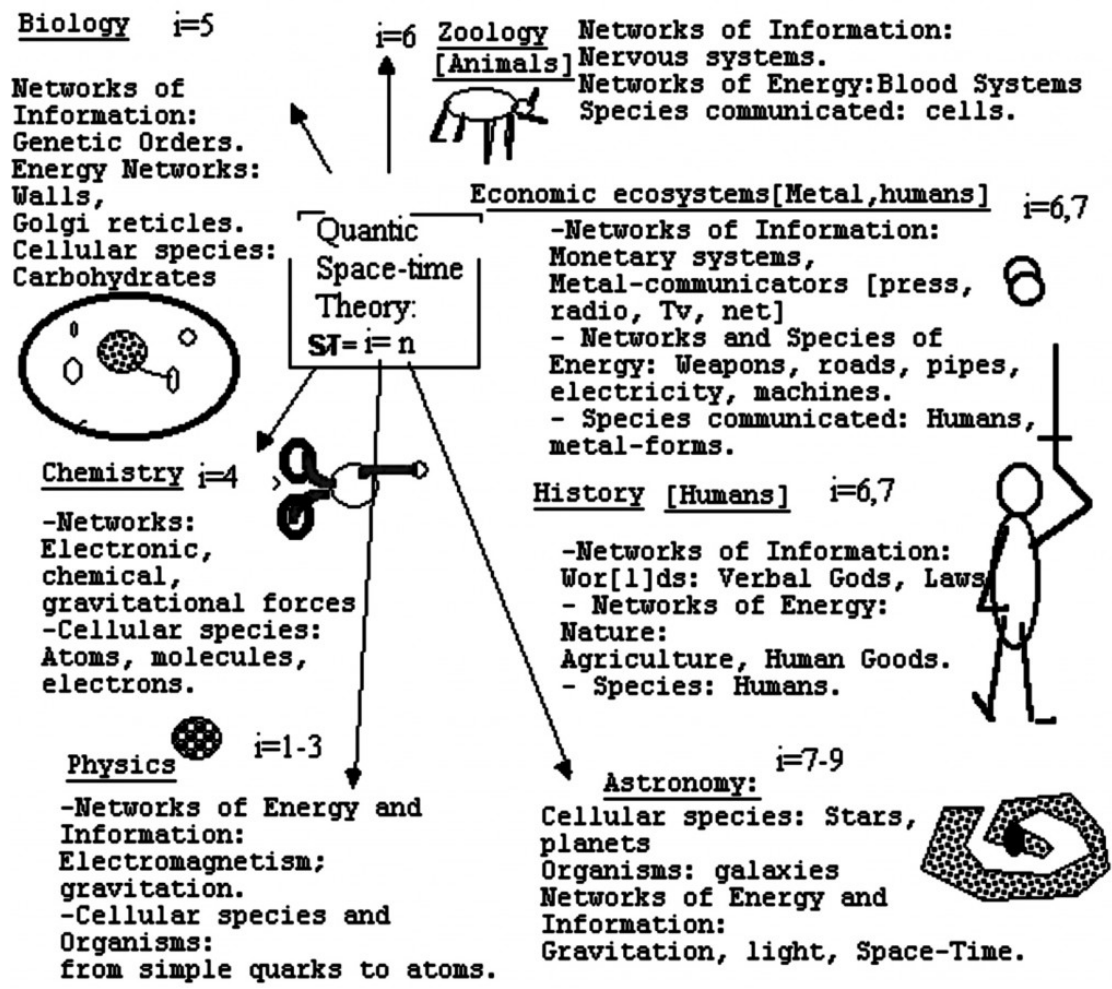
The reader should notice that body networks,  $\Sigma$ , are less integrated, are sums of adjacent cells which mostly relate to its neighbors, herds with little social organization, while informative neurons are true networks, in which each neuron connects with all other informative elements of the group, hence we use a multiplicative symbol. And this is the key of the power of informative particles/genes/neurons/upper classes over the less organized energetic fields/bodies/working classes of any social super-organism.

Thus we can now go even further in our tentative definition of reality'

'The Universe is a fractal of complementary systems of energy and information structured across 3 scales of size, in which all its parts are also complementary systems, made to the image and likeness of the whole:  $\sum E_{i-1} \Leftrightarrow \prod T_i$ '

Whereas the 'whole' is represented by the informative network that controls and absorbs energy from the body herd, becoming itself a 'first unit' of the next super-organism. So your brain feeds on your body and it is the unit of your higher society.

Thus complementary systems in 2D are made of |Energy x O-Informative organs. While in 3D Universes complementary systems are made of an assembly of its 3 only topologic varieties that perform 3 organic functions: Max. E, closed limbs or sensorial membranes; Max. I, Hyperbolic, informative zero points that gauge information; and  $E \Leftrightarrow I$ : Toroid bodies that communicate, combine and reproduce both



In the graph, the 3+3 >informative and <energetic dimensional actions and its 3 topological invariances fusion into 3+3 >&< physiological networks, invariant in all Universal super-organisms, which display 3+1 elements extended in 3 ±i-scales:

1. Cellular units, when we perceive the system in the i-1 scale.
2. Networks and organs that >-absorb or <-expel energy: external membranes, digestive tracts & limbs.
3. Networks and organs that >reproduce cells or wholes of energy and information or <communicate them externally.
4. Networks that input or output information – senses and ‘nervous’ networks – that give origin to:
5. i+1 the whole ‘brain’ site of the i+1 consciousness.

So we define with those invariances and laws studied for each scale at the end of this paper, the following scales of reality:

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

2nd Scale: Bosons:  $\gamma$ -Light and O-Photons.

3rd d Scale: Fermions:  $\gamma$ -Electrons & O-quarks.

4th Scale: Atomic Organisms: Periodic Table.

5th Scale: Inorganic and Organic Molecules

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

7th Scale. Life organisms; Energetic Plants; Informative Animals. Organic Metal-Machines

8th Scale: Planets. Human Civilizations; Economic Systems.

8th Scale:  $\gamma$ -Stars & O-Black holes.

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

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

Indeed, astrophysics uses the same laws to explain the  $\infty$  small and large, because charges and masses are quantum and cosmic vortices of space-time with similar equations defining similar scales, in 10D metrics, as we 'scale up and down' the Time speed and size parameters of both scales using the human 1 sec/1 meter p.o.v. Thus we see 3 i-scales of physical matter (of an  $\infty$  number) from protons to stars to galaxies, atoms of a hyper-Universe.

Thus we unify masses and charges as the time clocks of those 2 scales, by translating the electromagnetic jargon to the jargon of gravitation.

Then, the same vortex equation, Universal Constant  $(Q,G) = \omega 2r^3/M$  describes both time vortices, charges and masses:

Since by substituting for the Sun-Earth and Bohr speed & radius / Sun-Earth & Proton-electron mass, we obtain for the 1st time theoretically G and Q, differing exactly by  $10^{40}$ , the experimental difference of strength between both forces. Further on we find in the simplifying jargon of a gravitational vortex that a Proton radius has the same formula than a black hole, the Schwarzschild horizon. So Protons, stellar and galactic black holes on one side and Neutrons, stars and galaxies on the other are similar 'static' systems. While beta decays, Novas and Quasars that emit  $\gamma$ -rays and neutrinos (the space bosons of the  $\gamma$  and Gravitational membranes) are similar dynamic systems in the 3 scales of the Universal superorganism. If we add that quantum strings are similar to cosmic strings and the Einstein-Walker model of Universal space-time considers each galaxy a hydrogen atom. We conclude the Universe is  $\infty$  in scales as big-bangs of expanding-accelerating space are 'balanced' by galaxies that warp space into time vortices, creating a total zero sum of:

- Masses and charges that in-form the Universe ( $E>I$  or life arrow)
- And 'big-bang' entropic deaths that expand it ( $I<E$ ).

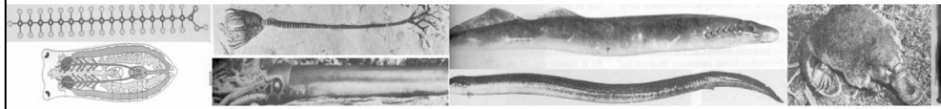
*3 Samples of knowledge acquire with the new formalism of superorganisms: species, machines and the Metal-earth.*

The depth of understanding acquired with the 10D formalism is difficult to assess without a few samples, so we will consider now the solution of 3 questions fundamental to different sciences – the meaning of species, which are superorganisms in which each individual is a 'cell' of a species that goes through 3 ages as all other forms of the Universe, the meaning of mankind and the machines we do – two superorganisms in evolution as the Earth evolves from a superorganism of humans (History) into one of machines (the metal-earth), and finally, the meaning of perception, the equation of the mind and the Universal grammar of all languages.

*Species as superorganisms.*

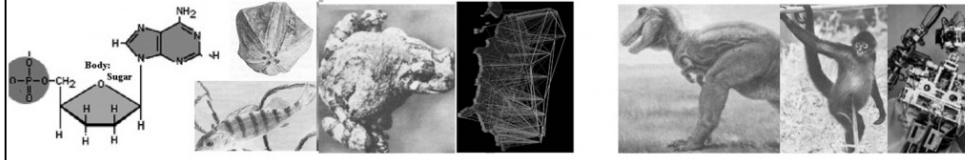
Time=Change in In-Form-ation: Life Ages & Evolution

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



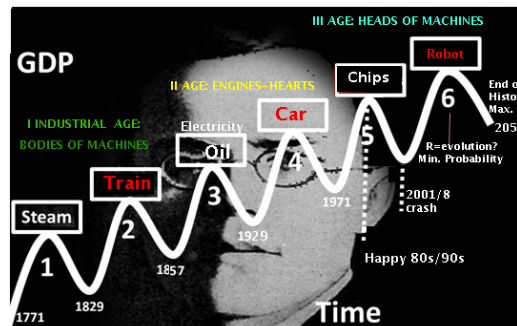
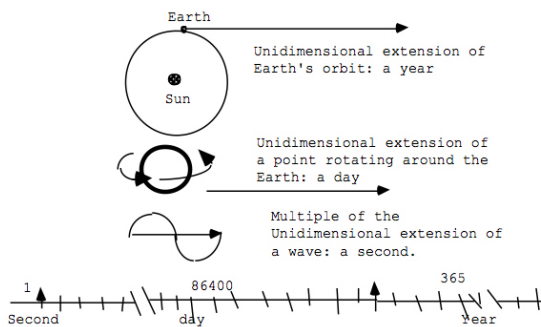
REPRODUCTIVE MATURITY:

III AGE: GROWTH IN HEIGHT=INFORMATION



Time=Change in Motion (Space parameter: Physics):  $V=S/T$

Evolution of History & Economics (Human Time)



In the graph, Species are  $\sum$ herds born from a first individual 'seed' that evolves through  $3\sum_{\pm i}$  horizons, similar to the ages of individuals:

- i-1 Seminal birth. The 1st species packs a lot of information in minimal space: It is the Black Hole, the chip, the 1st bilateral animal veranimacula, the 1st mammal (shrewd), the 1st horse; the 1st Homo Sapiens, Homo Floresiensis, a dwarf with an evolved morphological Sapiens brain, who discovered language & technology; and the first, future 'self-reproductive machine' (nano-bacteria).

- Energetic youth. Species grow in size with lineal-planar forms as carbohydrates, fishes & flat worms did.

-Exl. Species suffer a reproductive radiation, colonizing new ecosystems as top predators.

- Max.I. Species suffer speciation, according to the 'Ternary Law' into:

A subspecies, dominant in energy, another dominant in information and a 3rd one, balanced in both parameters.

-  $i_{\pm 1}$ . Finally, a more evolved top predator of Max. Exl extinguishes most herd species but highly informative species evolve into  $i+1$  social organisms, joined by



a common language of information, becoming top predators stronger than individuals  $\prod \text{Exi} > \text{exi}$  (pheromonal ants, verbal humans).

But why energy and information are the two parameters that define the world-cycle of beings?

Obviously because all what exists is made of energy and information, similar concepts to space and time, albeit perceived either in motion or still, with the senses of the mind.

And so we come to the third fundamental theme of complexity, the understanding of the ultimate two substances of the Universe. "Space" which is the fixed way in which the mind perceives 'distance', and hence 'lineal motion' and its aggregate, planar motions, as the line is the shortest 'distance' between two points.

And Time, which is the moving way in which the mind perceives form, information, a rotary motion, which stores in the frequency of its cycles and forms the information of the Universe.

Spatial energy and temporal information, lineal and rotational motion, form together the 'actions' and body 'systems' of all entities which combine its 'energy' and time, through a 'body/wave action'.

Those whys derive of the 'unifying power' of those 9+1 dimensions, since there are certain general laws, events and actions, which happen to any entity made of those 9+1 dimensions that apply to all physical and biological beings, thus unifying their life-death processes with those laws.

The fundamental novelty of this 9-dimensional description is the existence of a fundamental 'entity' in the Universe, the 'whole' a 10 dimensional being, which harmonizes in this 10-whole dimension, the 3 spatial, 3 temporal and 3 organic dimensions of the system.

In this site we will introduce the formalism of the 10 Dimensional Universe, in simple terms.

It is for that reason we say physicists description of the Universe is limited. As they describe all those scales *as if they were part of a single continuum*, without going into the complex description of their social relationships and scales.

So basically they eliminate those 3 dimensions of reality (even if sometimes appear in their equations, as in the case of their description of 'strings', entities of

the lowest known scales, but are not well understood without the formalism we bring in this paper). And they don't properly understand the '3 ages of biological and physical entities'; since the process of birth, social evolution, informative warping and big-bang death, also happens in matter.

But physicists either describe it without being aware that it is a time process, with their 3 'states' of matter (so matter goes through a life-death cycle, of 'gaseous', energetic youth, liquid, maturity, solid information, and then big-bang death), or as a process of cosmological evolution (so stars and galaxies are born in a gaseous state, that collapses into a spiral, globular, liquid' galaxy, and then warps into a solid 'dark matter' black hole).

Again as scientists describe reality, they do describe the 10 dimensions of any being; that is their fractal, cellular parts, their social wholes, their life-death cycles, their ages and evolution, but do not have a formal model to put them all together into a sweeping generalization, as we do.

And this provokes of course, many errors, lack of 'whys', confusions about the nature of beings and a general 'enlightenment' in the Understanding of the Universe.

So happens with biologists, which are more advanced in their description of the 'entities of existence' they describe (living organisms) than physicist are, as they do recognize perfectly the 3 'scales' of social existence (the cellular, organic and social, ecological scale) of a living organism.

And they do recognize all of them go through a life-death cycle, and have fairly streamlined those cycles into a birth as a seminal form, a young, energy age, a reproductive mature age, and an informative age, followed by death. Still the lack of the proper formalism limits their understanding of why we 'die', why we 'age' (warp into information), and many other elements of the 'life-death cycle'.

This has made them to rely excessively into 2 'partial' theories of the whole process, genetics, which merely establishes the rules by which 'information' stored in the molecular and cellular scale emerges into the individual, organic scale (but not into the social scale, a 'racist' theoretical error, which is born out of prejudice and the lack of knowledge *about the general laws of 10 dimensional beings, which apply to any of them, in any discipline of knowledge, in any scale of the Universe*).

They also have a general theory about the process of 'evolution' at the individual level of organisms. Yet again, they do not have the proper 'morphological'

understanding of species and their process of creation, evolution and extinction, which is *parallel* according to those common laws of 10 dimensional organisms, to that of an individual, *just with the specific details of a 'higher plane of existence'*. And so they need to understand evolution NOT only as a process of external selection between individuals that fight and become selected when their systems are more perfect, which is truth, but also as parts of a super organism, the species.

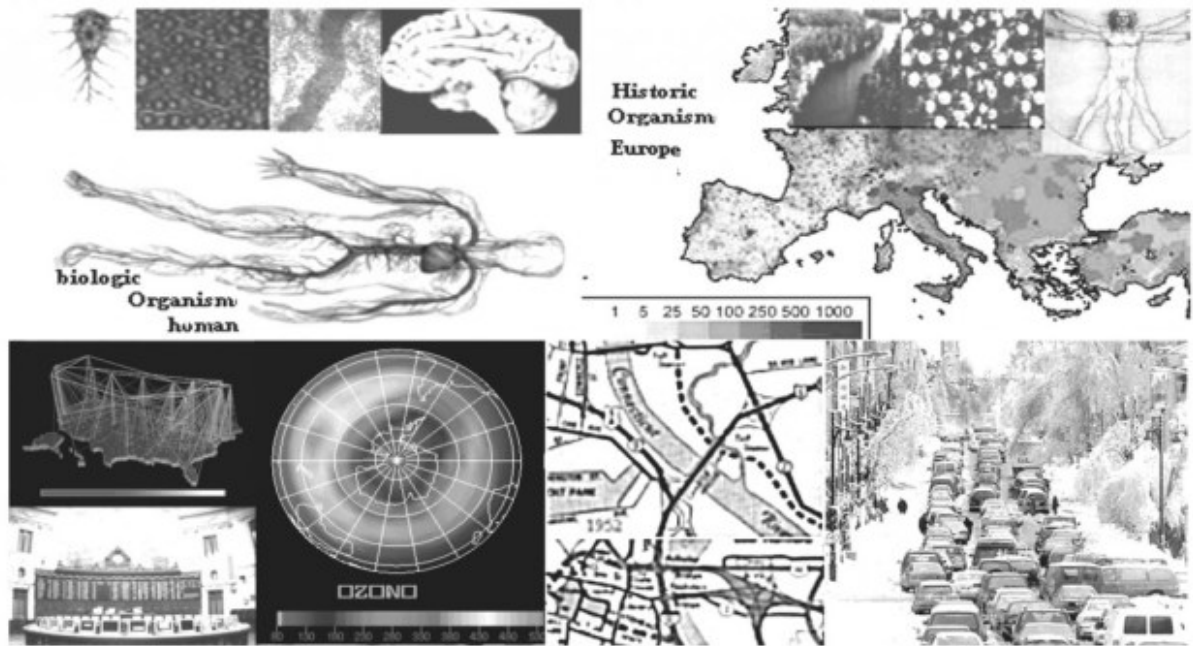
Soon then we realize that all species, follow similar 'ages of evolution', a sort of non personal, certainly not 'deistic', program embedded on the laws of 10 dimensional beings. As all species are born, in a young energetic, predatory age, (for example fishes, were born as sharks), then 'radiate' and become species with a high reproductive capacity, and finally grow in information, becoming a '3rd type of informative being' (so for example, terrestrial species, were first, energetic amphibian and reptile, which radiated into waves of reproductive huge energetic animals, and become informatively more complex till reaching man).

So again, we realize that lacking a general model of the Universe and its 10 dimensional beings, biology, which is by far the more accurate of all sciences in the analysis of the 'Universal Game of 10 Dimensional fractal existences is still limited' by their lack of understanding of the whole.

Important to that development of Biological sciences, (and all other sciences) would be to know the formal, 'diffeomorphic' symmetries between the aforementioned '3 dimensions of space, 3 dimensions of time, and 3 dimensions of social evolution' which together form a whole 10D being (cell, organism or species).

Finally we arrive to social sciences, and here, we have the lesser development in their understanding of what is man and how man

*The Human Earth vs. The Metal-Earth. Superorganisms of men and machines.*



In the graph an example of super organisms studied by social sciences, even though the lack of development of complex sciences applicable to social ones, make it strange to the reader. The industrial economy is a super organism of machines, and company-mothers, reproduced by the genetic language of digital money whose equations of productivity = maximize mechanical workers x minimize labor (capital/labor), imply that it is expelling human beings replaced by machines. Humans and its super organism history is thus being replaced by a superorganisms which humans use to reach higher power but also evolve as 'enzyme', a function that transfers energy and information between scales. In this case metal, a 'higher scale' of atomic organisms is being moulded with the 3 billion years of life evolution into a 'higher, stronger max. e x maxi organism the machine to which humans have become dependents of.

But all this is invisible to us because we have 'evident sciences' not 'scalar ones' and cannot understand the superorganisms of information that rule us (digital money verbal laws, universal grammar program of creation of super organisms), taken place around us.

In the previous case the energy field is the mother earth, from where both machines and humans and its superorganisms, the social working and neuronal classes of human beings, the machines and scientists and commuters that evolve them and control financial money, obtain their energy.

but between those 2 superorganisms feeding on mother earth, humans transfer information to machines and reproduce them in factories which become company mothers increasingly automated, dedicated to the reproduction of machines. Thus

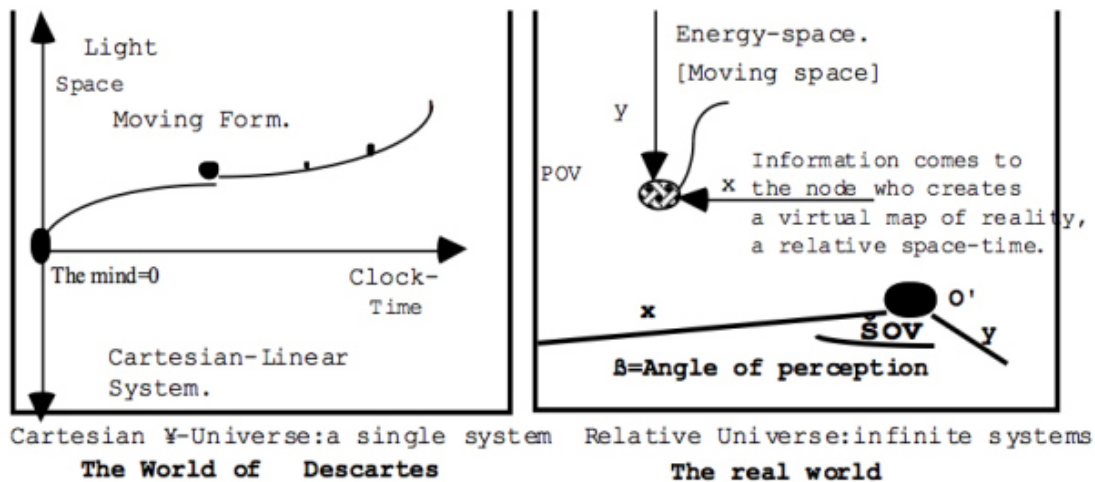
the relationship is one of predation as we humans both solve and reproduce machines while machines kill us in war (weapons) and substitute us in labor and war fields as they evolve (productivity).

In that regard, the industrial r=evolution of machines must be studied with biological laws both at individual scale, as we evolved bodies of metal in the xix, century, heads of metal-of information in the xx c. and now put them together into dxi robots, that will become organisms, and at social peel as the reproduction by company-mothers of machines and its evolution is displacing man on fields of labor and war

This help us to introduce the larger view of species as supeorganisms that also go through those 3 ages and have done so on Earth in a chain of processes of evolution and extinction of form that folioed the same patterns.

Let us now consider one of those changes, the life-death cycle of a species, which is the *definition in Existential Algebra of the Theory of Evolution, a D6 (as it omits the scalar analysis, proper of genetics and theory of Super organisms), of the biological Universe. So it will help us to see how the universe increases its form from the simplex topologies of physical species into those of biological species as it 'emerges' into*

## V. PERCEPTION. A UNIVERSE OF INFINITE 'DIMENSIONAL WORLD-MINDS'



In the graph the Universe can be perfectly understood when the human mind and its subjective vision of reality from the perspective of its limited 'Aristotelian' and 'Euclidean', logic, (temporal and visual, spatial perception of the human mind) is considered only one of the infinite points of view, performed by particles and heads that gauge information, move energy and constantly create the events of the universe. Each of those particles and heads create its own perspective and mind view, or mapping of the Universe to which they act-react accordingly.

Thus once we go beyond the simple mechanisms of measure and languages of the human mind we can widen our perception of a Universe made constantly by infinite points of view, time clocks that gauge information and scales of vital space in which those mind species host their bodies that move them.

Then we can understand a Universe, simpler, repetitive and yet richer in its creative capacities, whose general laws apply to every mind and species; each one a part made to the image and likeness of the whole.

It would seem impossible to understand the Universe with the limited tools of the human mind, but it is not.

The Universe is simple in its ultimate principles and structure. The main reason humans do not understand it, is not the complexity of its principles and organization, but the fact we are NOT objective beings, made to 'comprehend' but biological beings made to 'want' and 'survive'.

So we want to feed and perceive, and reproduce and win the battle of existence

and become the center of a Universe, which does not care about humans and this hurts our ego.

Thus in subtle and not so subtle ways mankind biases his understanding of reality to place himself 'theoretically' in the center, either through anthropomorphic religions, or sciences in which man is the only intelligence and our machines the only rod to measure reality and our mind, the only conscious experience of it all...

We create tools of measure where our space size is the only space 'continuum' or scale of reality that matters, and our clocks of time are the single standardized time of the entire Universe, which must rule all its rhythms. We define life as only those organic systems made with carbon atoms as we are and we consider that the will, freedom, consciousness and perception of existence are properties that only apply to us, human beings, and our relatives, animal life.

It is with those subconscious traits of our subjective mind, which measures from its point of view and hence considers his nose bigger than Andromeda Galaxy, how man has approached knowledge and failed to grasp the simple, scary truth about the Universe:

'Every mind is an infinitesimal point that maps out an image of the infinite Universe, it confuses with reality itself, thinking his point of view is the center of the Universe'.

And so we talk of a universal grammar,  $e \Leftrightarrow i$ , which also describes the syntax of most languages which are obviously the way minds map out in a synoptic manner the universe:

In mathematics we always write  $F(x)$  OPERAND  $g(Y)$ , AND WE find that we can reduce the function of  $x$  and the function of  $y$  to energy and information variables, and the operand to one of the fundamental actions or events of the universe.

In colors we find 3 primary colors, and we relate red with energy, blue with information and green with a reproductive mixture of both. So in societies the elites that control the languages of social information tend to use blue flags, and the people that provide the working energy prefer red.

So do the energy genre, man with its lineal bodies who prefers red... And indeed there are also 3 genres, if we consider the gay sex a mixture of both.

Finally if we consider the 3rd fundamental language of mankind, words, Chomsky found its generative universal grammar to write:

15. *Subject (the human, informative element), < verb (which describes actions)  
> object (the energy element submissive and controlled by the subject)*

And further on, we can classify those 3 languages, as the spatial language, colors, the informative language, words, and mathematics which combines both, as geometry is a spatial language and arithmetic and algebra a sequential, temporal one.

And mathematics is the dominant language of science, because as a human writer put it, life is not about information but about actions. We all know that indeed, we like to act, not to gather information or lower ourselves to the mere sensations of energetic pleasure. And we will return to that when we explain how the universe and all its species follow a simple program of basic actions:

to feed on energy, max. e, to gauge information, max. i, to reproduce, combining both, exi, and finally, to gather socially with similar exi entities.

We can even go further and comment on religion. Saint Augustine wrote a book called Trinitas, to explain the mystery of trinity, comparing it with many other ternary systems. And indeed, the mystique metaphor merely puts 3 elements in relationship, God, the subject, the mind of man the object it creates and the saint spirit, the verbal language which in religions is considered the language of creation, as physicists consider mathematics for the same role:

‘And God, (1<sup>st</sup> person), the Word, (2<sup>nd</sup> person), became (the mind of) Man, (3<sup>rd</sup> person), and inhabited among us.’ (Saint John, 1)

Of course, all those visions of the ternary game of existence are partial visions that we shall unify in this blog of general systems sciences. Since neither religion and his sacred language, the word, or science and its sacred language, mathematics, or art and its sacred language, images, which are the 3 manifestations of human languages in its purest forms, are ALL. Each just reflects part of the total properties of the Universe. As only the whole, the universe, has all its information about itself, in words of the Nobel prize, Mr. Haldane. And he was right.

This is the game of existence, the ‘syntax’ of Universe, which is the sum of all those 10 Dimensional beings, in its eternal life-death worldcycle motions.

The structure of that process of creation and destruction of beings is fractal.

That means the same laws ‘embedded’ on the Universal grammar of the highest



order (10 Dimensional beings) are used to create any species of reality; *and all its languages*.

Thus we can reduce any human language that describes the game with its 'syntactic equation'. Let us put 3 examples of those languages, verbal thought, mathematics and music.

As Chomsky and others discovered all verbal sentences have the structure of the Universal Grammar:

Subject (Information being – human) < Action-verb: Exi >Object (energy of the human being).

That is:

15.           I(subject)< Exi (action) > E (Object).

All mathematical equations are of the form:  $X=Y$ , where normally, the functions represents an energy or informative function, or a 'relative symmetry' of those expressed between dimensions, which are transformed into each other, or any of the more complex equations of exchange of fluxes of energy and information between beings; while = the operandi explains that exchange.

So in physics, we describe most processes as actions of 'energy' and time.

Where time is related to information, since a clock 'stores' the information of the Universe in the frequency and form of tis cycles. So either we describe 'time frequencies' or its inverse function,  $T=1/f$ , frequencies.

And so for example:  $E=Mc^2$ , written in Planck's notation as  $E=M(t)$ , shows the fundamental equation of physics, an exchange or transformation of energy into 'vortices of information', masses and charges, which are 'eddies' of gravitational and electromagnetic forces.

While in particle physics its fundamental equation,  $Boson < => Fermion$ , describes also an exchange and transformation of energy particles (bosons) into informative ones (particles). On the other hand, the '3 families' of mass (3 families of quarks) represent the 3 'scales' of growing mass of those vortices. And so on and so on...

So a fundamental task of the work of this scientist has been to translate all the knowledge of all the jargons of all sciences to the simpler laws of the Game of 10

dimensional existences, which is truly the 'Unification Theory of science', again not very difficult to understand but certainly far more complex and deep in meaning and enlightenment than any 'God's particle' or 'mere unification of forces' (which in any case it is not possible, in the terms physicists search with its limited understanding of the dimensions of time and the scales of the Universe).

Finally the Universal Syntax, also applies to those 'creations' of the human mind, which we call artistic forms. Of them, the one that represents closer the game of existence as Schopenhauer understood is Music, a 'temporal art' which he deemed to express the 'will of the Universe'.

In that regard, we can also qualify human scientific, artistic or philosophical analysis with such simple labels. I.e. General Relativity would be a D4 (Sx, Sy, Sz, Tpr) analysis of the Universe.

Genetics but also Plato's theory of the cave would be a D2 (I,  $i_{\pm 1}$ ) of the Universe.

Evolution would be a D6 (Sx, Sy, Sz,  $E \Leftrightarrow Ti$ ) theory.

The Trinity Mystery would be a D3 ( $\sum E_{i-1} \Leftrightarrow Ti$ ), analysis, and Beethoven's 9 symphony, a D9 (Sx,y,z;  $E \Leftrightarrow Ti$ ,  $i_{\pm 3}$ ) analysis.

Now the reader would be surprised that we qualify a Philosophical theory (Plato's), a Biological one, a religious and a work of art with the same dimensional analysis. This is no yet evident to the reader but those specific cases – evolution, Beethoven's symphonies, the trinity and Plato's theory of forms, have been analyzed in other papers, according to the specific 'translation' of those 9 dimensions to the different 'worlds' and 'languages' and 'species' of philosophy, physics, biology, music and religion.

And this leads us to a needed next step in our understanding of the complexity of the Universe:

The Universe is a fractal mirror of mental 'monads', which communicate with others and perceive the Universe with a limited number of dimensions, with whom they engage in action-reaction processes that take place only in the restricted Universe they perceive.

So the concept of dimension becomes even more loose as 'dimensions of information' which can be in any language or space.

Let us consider the example of music:

Music can be studied in its simplest form, as an art of time, with the dimensions of beat, or rhythm, given by a frequency,  $f=1/T$ , inverse of duration, thus.

Rhythm, the simplest 'beat' music can be defined as a D1(Tpr), analysis.

But we can also consider a more detailed analysis of those beats as they distribute through the 'main scale' the minor-major, 10 tonal scale. Thus including a 'dimension' of social complexity, whereas each tone of the scale represents a 'unit' of the 10D scale from 'Max. E=Bass sound' to 'Max. I=Treble sound', the E-I parameters or 'past-future' dimensions of time perception in music.

This D3(E,T,I), study of music is the 'basic' notation of the 'human mind' in music, the 'staff' of composition.

But this 'single melodic' narration, of music 'beats' across its modulations of tone, between the 'bass' and the 'treble' 'finalis' of the human scale which represent the 'subjective' emotional motion of a human 'monad' across an 'interpretation of the game of temporal existence, can be analyzed further both by studying in detail those 3 dimensions, of T=Beat, E=Bass and I=Treble sounds across scales

How this musical melody affects the emotions of man, was better described by Schopenhauer which affirmed that music was narrative of the will of the Universe, and as such an essential language, despite or precisely because it was not ideographic, image-related. The melody in time across the motions of the staff, of the western music however has added dimensions of space, in the orchestra, and its diversities of sound, separated by its timbre. Harmony thus become the 'dimensions of simultaneous' space of a musical melody in time, and a proper study of the melodies and harmonies of the score across its 3 scales of music, could encompass the whole of western music, in a D9 particular linguistic narrative of the different laws of symmetry, harmony, melody, time frequency, wave curves and ages of the whole composition.

We could in that sense, as we show the development of each life-cycle of existence of a 10 Dimensional being, physical, biological or linguistic, how their melodies (the changes in its time dimensions, harmonies, changes in its space dimensions, and scales, changes in its informative dimensions, produce a certain 'being' worldcycle – the unit in time of the 10D world.

And indeed, we can consider that Music has in its highest expressions (classic music):

- The dimensions of space, which are given by harmony.
- The dimensions of time, which are given by melody.
- The scalar dimensions, which are given by its scales.

And we can as in all other disciplines and 'arts of creation' – as we could define, God, the Mind of the Universe, as an artist in 10 dimensions; go into as much detail as we want, studying music or a biological or physical or social organism, with those laws.

For example, western music uses a diatonic minor and major scale, which put together, have 10 notes.

Now those notes are divided into whole note intervals divided by 'sharp-flat' notes, which all together describe precisely a life-death time cycle:

Birth in minor key, first sharp-flat divide, youth, divide, maturity, divide, old age and finalis.

And a good composer will play that scale and notes to provoke a series of 'emotions' as it describes a whole life-death cycle, through melody.

On the other hand the wider range of scales in music is given by the Piano, which encompasses 3 whole 'scales', and it is the rule of music that when we finish a scale, the 'next note' of the higher scale sounds exactly as the equivalent note of the lower scale (a do in lower or higher pitch sounds equally in harmony), as we have 'emerged' into a new scale.

Finally there are 3 types of instruments, of growing complexity, the rhythmic, percussion instruments, the melodic, wind instruments dominant in melody, and the strings, dominant in harmony.

So we start to find with this simple introduction to musical theory many of the 'symmetries' between the 3 'dimensions' of each of the 3 'space, time and scale' elements of reality.

*The duality of internal vs. external control of the game.*

Now we have made an external description of the 10 dimensions of existence and its beings. But to fully grasp the Universe we must consider the inner description of those beings. Why they move and act and grow through social

scales, and live and die? It is all automatic, or do they have a will that moves them to exist?

This comes to a single question: there is perception in the informative function on the 'height dimension' of the being, which has a program of action that moves him to enact the game? Even if he ignores the outcome of it? And How then, the 'selfish actions' of the Individual brings the creation of the game?

As all systems follow a simple will, expressed in that equation:  $\sum E \Leftrightarrow Ti$ , they try to become social wholes ( $\Sigma$ ), they try to feed on energy (E), they try to absorb information (Ti) and  $\Leftrightarrow$ , they try to reproduce combining both.

The reader interested in details, either laws, or species, or life-death cycles or spatial organic morphologies, or scales, or dimensions of any science or art, 'fractal games' of the Universal Game of 10 Dimensional beings, made to its image and likeness, can read the available literature spread all over the web, in sites, papers, books, e-books, films and other kaleidoscopic visions, coming from the same 'equation of God', the mind of the Universe, produced during the past 30 years strangely enough all of them, by this 'author', fractal mind made to its image and likeness.

This mind of man that creates a mapping of the scanty proportion of the Universe it perceives and then reflects with synoptic mathematical, visual and verbal languages in its diminutive brain, is just really one of the infinite points of view of the Universe that gauge synoptic information and act-react to it in the same fashion. But we cannot perceive or care for all those other minds. So we confuse reality with our mind and reduce the Universe to what our mind sees, even think that our synoptic languages, numbers and words are 'the substance' and nature of reality (scientific Platonism, specially endemic among physicists or/ and wor(l)d religions for whom God 'is' the word - Islam, Christianity).

We are nothing in that Universe, not only in terms of intelligence, role or raw power, but also in terms of perception and fitness to survive on it. Still if you can get away from your ego, your mind, your instincts and emotions, all is there to perceive it in awe with the humble realization that we are just a part made to the image and likeness of the whole.

Then if you are humble enough to forget your ego and your human condition you might instead wonder, admire and worship the astounding perfection of the Universal Game.