

COMPLEX SCIENCES

THE COMPLEX UNIVERSE IS A FRACTAL 10DI SUPERORGANISM OF ENERGY & INFORMATION:

$$\infty \pm 1 \sum E \leq X \geq \prod T$$

Holographic Universe:

SIMPLEX MODEL

Living Universe

General Systems:

UNIFICATION THEORY

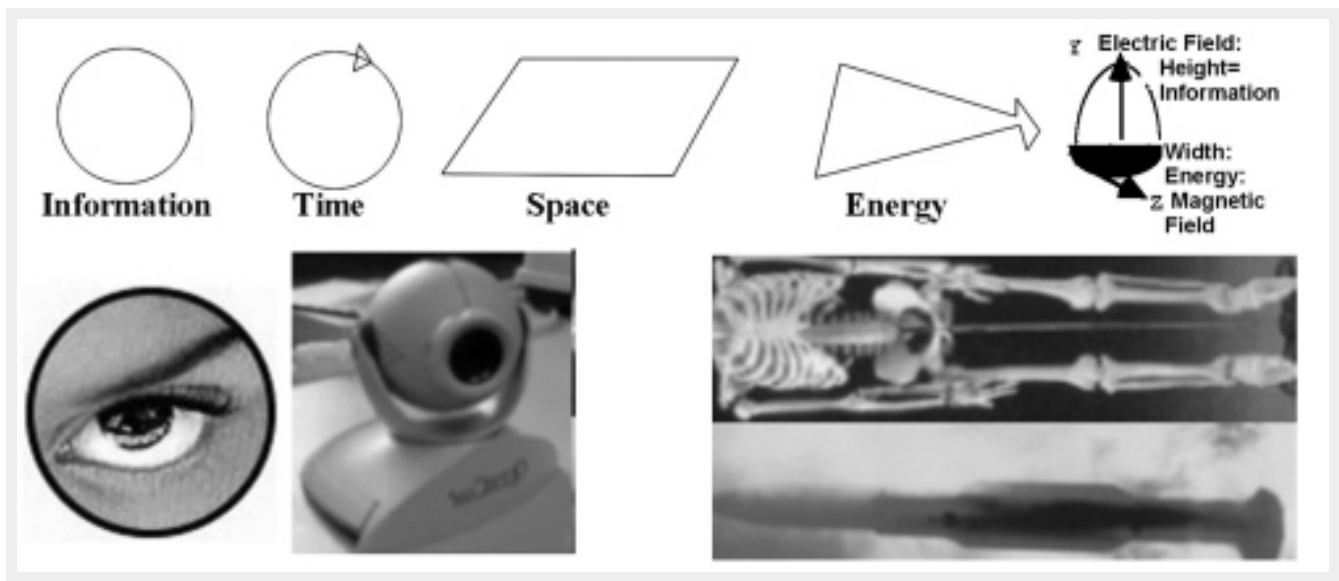
- Mankind
- Scales
- Superorganisms of History

STANDARD SCIENCES TRANSLATED

Simplex Sciences

- Biology
- Mathematics
 - Theory of Numbers
- Physics
 - Thermodynamics: Open Systems
 - Time Clocks: Masses & Charges

THE HOLOGRAPHIC UNIVERSE. BIDIMENSIONAL MANIFOLDS IN ∞ COMBINATIONS



Energy and information: compactifying dimensions into space-time topologies.

The simplest explanation of the complex universe departs from the holographic principle: information, form is bidimensional. Because all what we perceive is the 'cover' of things, its membranes.

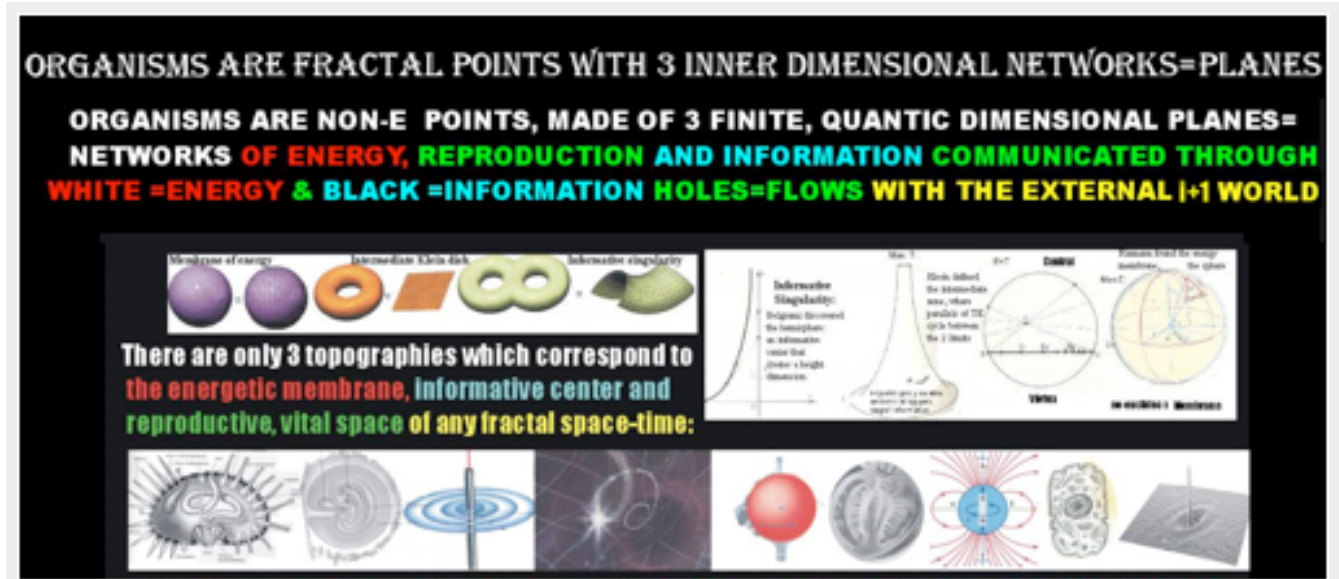
Thus in a 2-manifold, in a bidimensional world there are only 2 topologies, which correspond to the main parts of any system, the lineal, energetic and spherical informative dimensions or motions (since energy is just space in motion and time information cyclical form in motion). And its 'wavelike combinations, exi.

And we shall call energy, to th expansive motions, which form limbs, often with hyperbolic topology (bilateral).

And we shall call information to the implosive vortices, which form particles and heads, often of spherical geometry.

And the space between them the 3 membrane-topology of the universe, its body wave, the ExI part of the system.

Thus all what exists are polar systems, with 'energy fields/limbs' and informative heads/particles, exchange energy and information creating a 3rd element, 'waves-bodies'.



Thus in a single i-plane of space-time, we can combine the 3 space and 3 time dimensions, by their 'similarity', with 3 topological varieties of a '2-manifold', the key to the structure of the organisms we see in a single 'scale'. Thus we talk of:

ISOMORPHISMS IN TIME AND SPACE:

Scalar Space-Times

10 Di:

i-Scales (Isomorphisms):

5th Dimension: Fractal scales

10th Scale: Universe

1st Scale: gravitational strings

2nd scale: Bosons

3rd Scale: Fermions

4th Scale: Atoms

5th Scale: Molecules

6th Scale: Life Cells

7th Scale: Life organisms

8th Scale: Planets & Civilizations

8th Scale: Stars.

9th Scale: galaxies

Space isomorphisms: Topology

E=I Topologies: Toroid Bodies

Energetic Topologies: Membranes

Informative Topologies: Zero points

∞ Scales: Non-AE Worlds

1st Non-E Postulate: Points with parts

2nd Non-E Postulate: Waves

3 combined space-time dimensions ("Topologies of a 2-manifold"):

E, or Entropy: STe: Lineal, Energetic, 'past', expansive, hyperbolic, motion/limb/field;

Exl: STf: Repetitive Frequency; Toroid, Wave or Re=productive body.

I: STi: Neganropy, information: Informative, spherical, implosive motion, particle/head

Bidimensional Topology becomes then the fundamental 'science' that determines the evolution of systems as simple combinations of those 3 'morphologies' both in space, forming assembly of beings from viruses to humans (with hyperbolic limbs, informative heads and toroidal bodies) to electromagnetic fields.

Now the thing with topology is that is static geometry, 'space' with motion, deformation, with 'time'. So it is the perfect language to explain space-time 'pieces', fractal space-time 'topologies', which assembly, live and die, through time cycles.

And so that is what we are made of: 3 types of pieces of fractal vital moving space-time.

Where space is energy fixed still and time, information in motion, just a duality of perception that express the same; and one transforms into each other ad eternal in dynamic exchanges of spatial energy and temporal information which are the 'dynamic' constant exchange taking place in the universe and all its dual systems:

Se <=>Ti

- By spatial energy we mean 2 parallel concepts, perceived in different ways: Static space that defines size, perceived also as a sum of lineal motions or 'Energy'. Since space is the 'continuous', static, whole perception of infinite quanta of moving vacuum energies: $S = \sum E$. Thus space distances and lineal speed motions mean the same. So astronomers say Universal space is 'expanding' meaning that galaxies are moving away.

- Temporal information means 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 processes, as it happens in computers, complex system of time clocks, whose logic cycles 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; $T = \sum I$.

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

And 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').



Thus both Space & Time co-exist in several scales of size with different quantities of information or 'i-scales' and similar 'fractal' properties; both, as a whole and a sum of parts in motion and stillness. Yet the maximal truth=information defines a fractal, scalar, moving, dual Universe of ∞ clocks of information, simple knots that enclose ∞ 'vital spaces' (Fundamental Knot Theorem) are illustrated with Galileo's depiction of Saturn's 'flat, still, ring', which are in fact multiple turning clocks in motion with several size scales. Thus Spaces & Times have inverse, complementary properties that balance each other, in each system, defining the Geo-'metric' equation of the 5th dimension that resumes those co-invariances:

3rd Non-E
postulate: Self-similarity

4th postulate:
Topological Organisms

5th Non-E
Postulate: Minds

Time Isomorphisms: Cycles,
Ages, Dimensions

The Force: Dimensions

'Present' Systems

Past to Future Systems

Time Ages

Time Cycles

Time-Space Isomorphs: Actions

Open systems: E x I flows
between fractal i-scales

SSS Papers

5th Di: The Fractal Universe

Generator Equation

Time Systems:
Dual arrows

Languages of Time

Space Systems: Non-
AE Geometry

Bertalanffy's Isomorphisms

Biological Systems

Physical Systems

Sociological systems

Actions: The Program of Existence

General Systems:

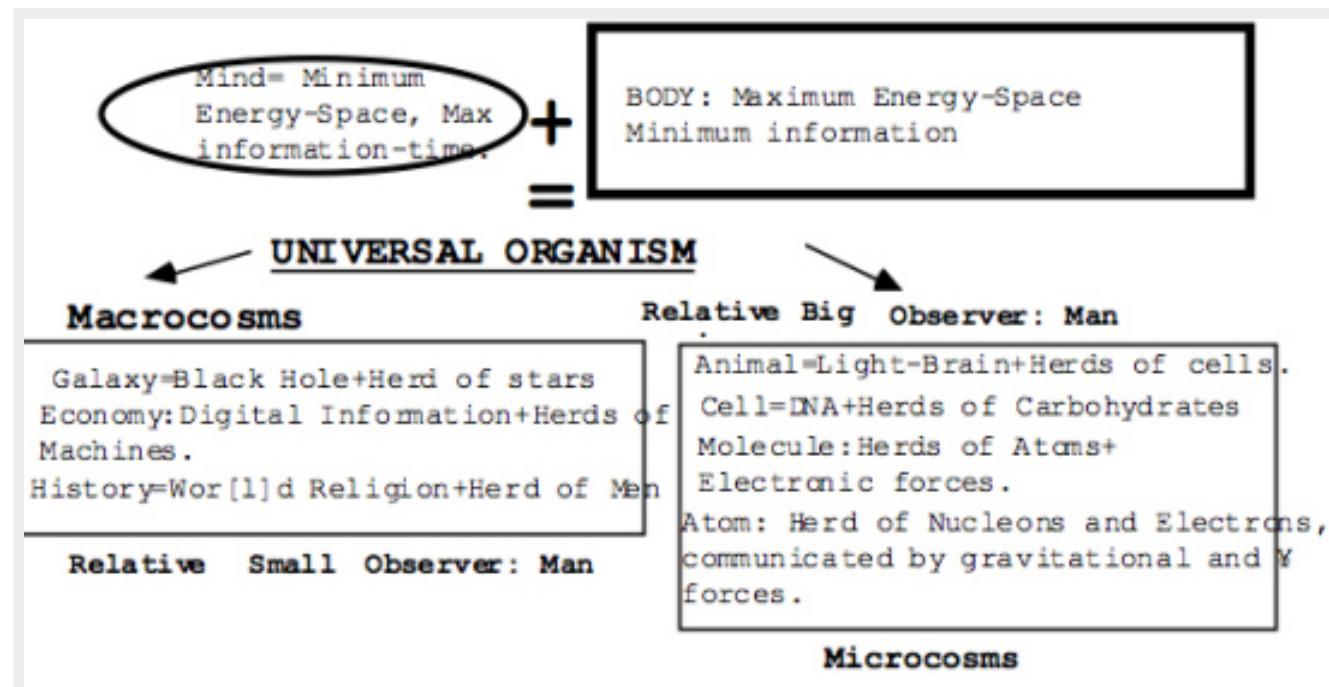
ISSS PDFS

- 5th dimension
- Fractal Universes
- Plan of evolution
- Quantic Networks
- The FMMI System

SexTi=K or Se<=>Ti,

as energy and in-form-ation trans-form into each other ad eternal.

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.



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<=>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.

We are made of energy and information , 2 geometries in topological motion and its combinations, we live in a 2-manifold rctal, where the messing in motion of 2 topologies gives the impression of a holographic universe, but much more interesting is to observe those 3 topologies in motion, that is in time. Since their transformations become the origin of the lie-death cycle and it is at the basis o the generator equation of the Universe.

So how we move from 'energy and information' to the similar concepts of space and time?

This requires to understand the glileo's paradox.

Energetic Bodies & informative brains.

Energy and information are the 2 primary elements of the Universe. They form all its complementary systems. In this posts we study its basic properties and

dimensions. In the graph, they display different forms. 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.

The 2 primary elements of the Universe, energy and information, mix and evolve, till reaching the threshold of complexity that gave light atoms living properties and now it is about to give the same life properties to metal systems. In the graph, in biological and morphological terms, we can easily recognize the 'bodies and heads' of humans, animals or machines, because they have a clear morphology, which corresponds to that of generic energy and information. Energy is lineal because the line is the shortest distance between 2 points; and so it is also the fastest energetic movement. Information has cyclical forms, because cycles store maximal information in minimal space.

For example, a human body and a machine body, a weapon, should not have anything in common; but if we observe the morphology of both, it is clear those morphologies correspond to the generic morphology of all energies: they are big, lineal systems that move in space. So our limbs are lines extended in space like a 'missile'. On the other hand, our eyes and brains are smaller and cyclical, like the cameras and chips that act as information organs in machines, ordering 'bodies of metal' with digital information. The functions of those 'systems' are also biological. Weapons are lineal, energetic forms that kill human, energetic bodies. Both compete in a war and the 'metal-energy' species wins and kills us, causing the biological process of death. So weapons are lethal, machines and should be repressed as we repress biological predators and killing virus. Yet Mechanism affirms that machines are objects that do not influence or compete with humanity. So, if some 'collateral effect' happens, it must be blamed on humans.

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.

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 Reproductive Information

Lineal, spatial, big, moving Cyclical, temporal, small, rotating, still.

Formless, continuous, simple Form-ative, discontinuous, complex.

Field, body, male, weapon, Particle, head, female, coin, chip.

Iron, oxygen, carbon Gold, silver, nitrogen

Protein, lion, shark, death DNA, human, dolphin, life.

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

Maximal Space = Energy = Minimal Form=body Vs

Maximal form = Information = Minimal 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 trans-form 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.

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.

Symbols of the 10 Dimensions of Scalar Space-Times:

3 Spatial Dimensions: Sl=length, Sh=height, Sw=Width.

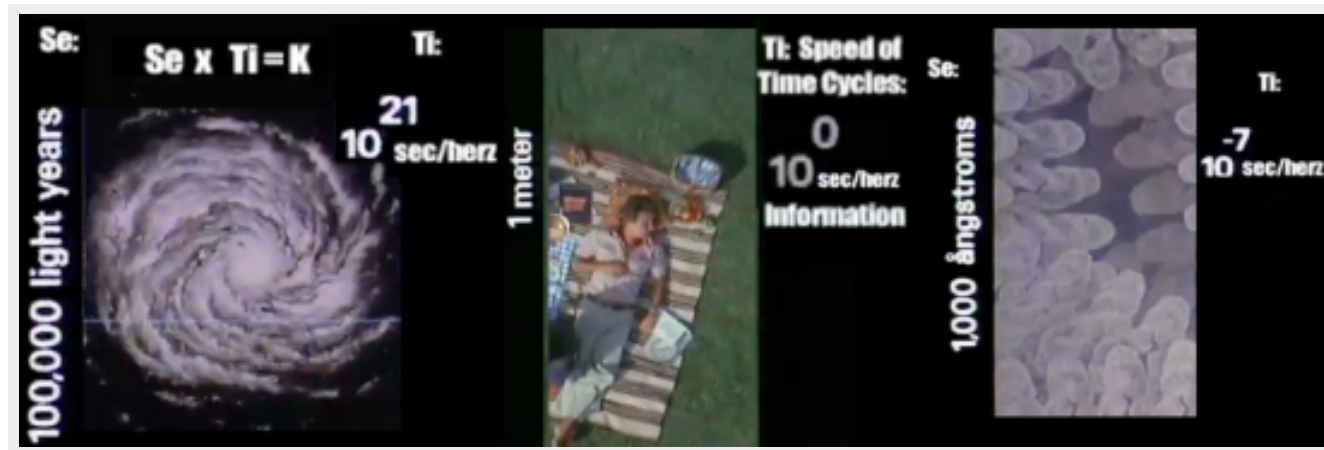
3 Time Dimensions ('Ages or States') : Ty: Young past age; Tf Iterative, Present Duration; Ti: Implosive, informative Future.

3 Scalar, organic dimensions ('Planes of Existence'): i-1:Cellular; i:Organic; i+1:Social Scales.

10 Dimension: I, Σ : Whole.

In Complex Sciences the Universe is a 10 dimensional fractal organism of energy and information. As such, as all fractal organisms do, the complex universe has a 'Generator equation', which resumes all the functions and forms, and scales of space-time of the Universe, which in its simplest formulation writes: $E \leftrightarrow I$.

This 'minimal expression' of the 10 dimensions of 'scalar space and time' explains it merely in terms of two synoptic terms energy and information.



Scalar space-time is a 'fifth' dimension, if we follow the classic division of dimensions, sum of all the scales of reality. Its dimensional nature, implies it has a metrics, that is an equation that relates its time and space parameters, and makes space-time together invariant so we can travel through this dimension. That equation is shown in the graph: as we become smaller time accelerates and the product remains invariant. So the time clocks of atoms turn as fast that if we would unroll them, they would be the size of small galaxies.

The Universe thus has a wealth of new dimensions...

We also 'evolve in time', changing in time, living and dying in time, and the answer of physicists didn't provide a clue about that.

So here it came to the rescue 'systems sciences', and biology, and theory of information, which started to study, all those other changes= time processes which were not concerned with motion in space, $v=s/t$, and its duration

Evolution came, and we learned that there was besides the energy needed to move in space, information, form, that also changed much slower but more meaningful.

And so it came the concept that besides the present, there was a 'past time' and a future time, and both were connected through the constant evolution of form of information, through the succession of life and death cycles.

This meant Time not only space had 3 dimensions:

past with less information -> present, physical time motions -> Future old age of information.

And so now we had 3 +3 dimensions, 3 of space, length, width, height, and 3 of time, past with more energy, balanced present, future with more information.

It came then to the realization of scientists that time-spaces were of many scales of size, from particles, to atoms, to bacteria, to humans to stars and galaxies and beyond. And so we could call each of those scales of space-time a 'space-time' plane, and the sum of all those scales would be another 'dimension', which this author sometimes calls the 5th dimension, but more meaningfully as they are of a complete different type, should be called i-dimensions, dimensions of information. And as it turns out, most organisms of the Universe are 'created' across 3 of such dimension. In your case, your cellular scale, 'i-1', then your individual scale of your i, and then the social scale of you and others, who form part of a bigger social organism.

And any system you would study would co-exist on those 3 scales, which in physical systems are the atomic, matter, and cosmic scale.

$i \pm 1$ scales were thus 3 scales, 3 new dimensions, and now we had 3 x 3 dimensions, of space, of time, and scalar complexity.

And so to understand the complex Universe with all those 'slow changes in time from past to future' and relative scales of size 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.

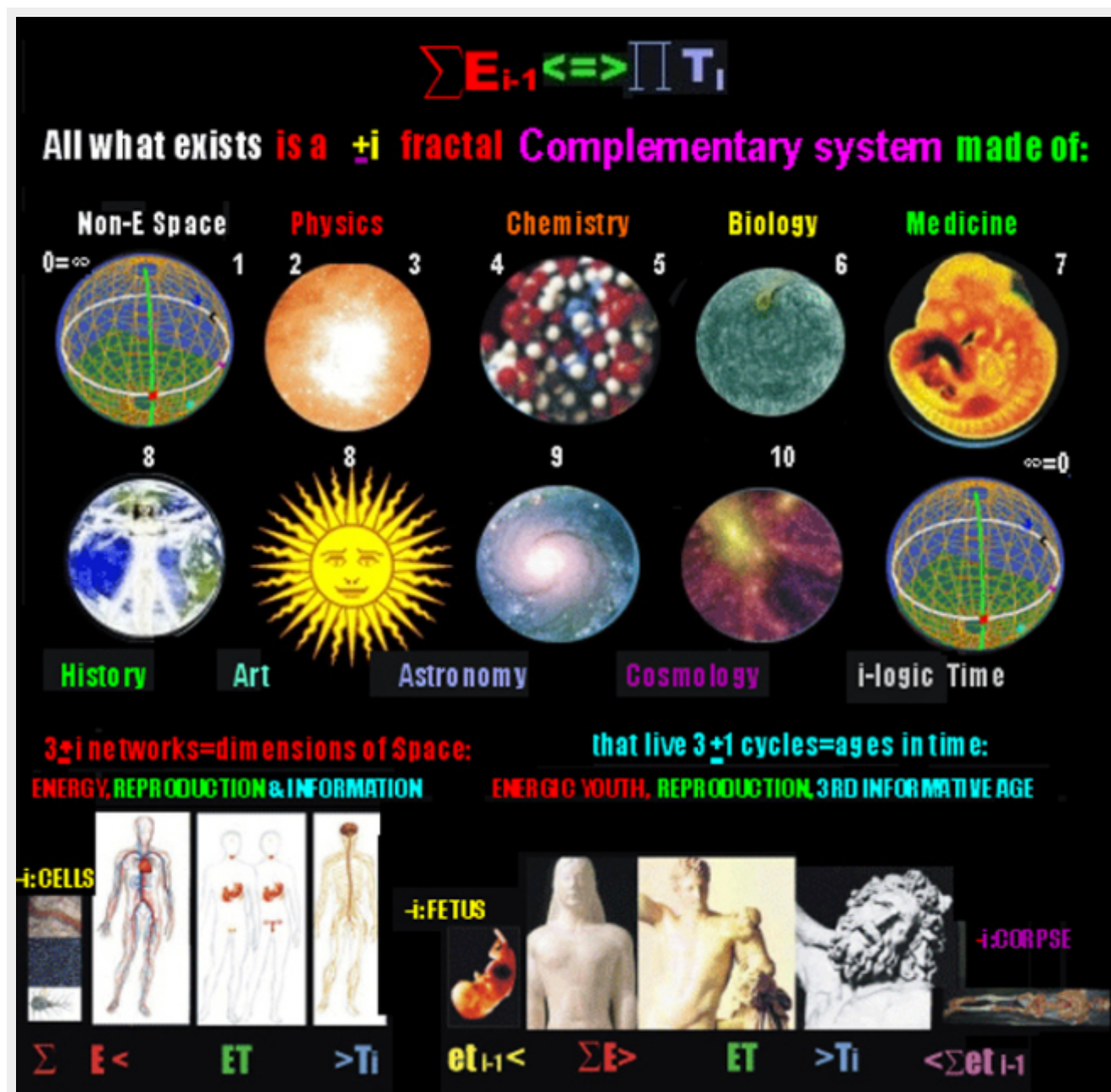
And so complex sciences are just the same sciences that simplex sciences, but studying its elements with a deeper, all encompassing vision of all its systems and relationships across 3 space dimension, 3 time dimensions and 3 scalar dimensions. The whole 9 dimensions, then can be observed all together as a 'whole' and so that 'whole' vision which in fact in most systems is represented by an integrative, gauging, informative head, particle, soul, centre, point will, whatever you want to call it, would be the 10 dimension a new beginning an integrative whole that act as a point-cell of a higher social scale:

What is the Universe?

That profound question had for very long a simplex answer, a 'space-time continuum', provided by physicists.

They described the Universe as what it is contained in 3 dimensions of space, length, width and height which last a duration, the dimension of time.

So far, so good. But reality, we knew was more complex than moving in 3 dimensions of space, with a duration of time, $v=s/t$, the concept of a physical universe.



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

On top we write the fractal generator of the 10 Dimensional Organism. Complexity adds to the 3 classic dimensions of space and one of time, a series of scalar dimensions of social organization, or scalar dimensions, as all systems are born in an i-1 seminal, smaller scale grow, emerge as individuals parts of a bigger social i+1 super organism and then die, returning to the i+1, atomic or cellular state (Physical and biological jargons). The result is a complex universe organized in scales of size and relative speed of time, which increases as we become smaller:

The Whole thus co-exists in the same region of space across 3 scales.

In this manner all systems were chained and we can translate this in a simple equation of chains, for every being, which will be in 3 main relationships with 3 scales:

$$\sum_{i-1} = \prod_{i+1}$$

All systems thus existed in those 3 scales, and we also humans lived and died in those 3 scales, born as seminal seeds of the i-1 scale, born again as individuals members of an i+1 social scale.

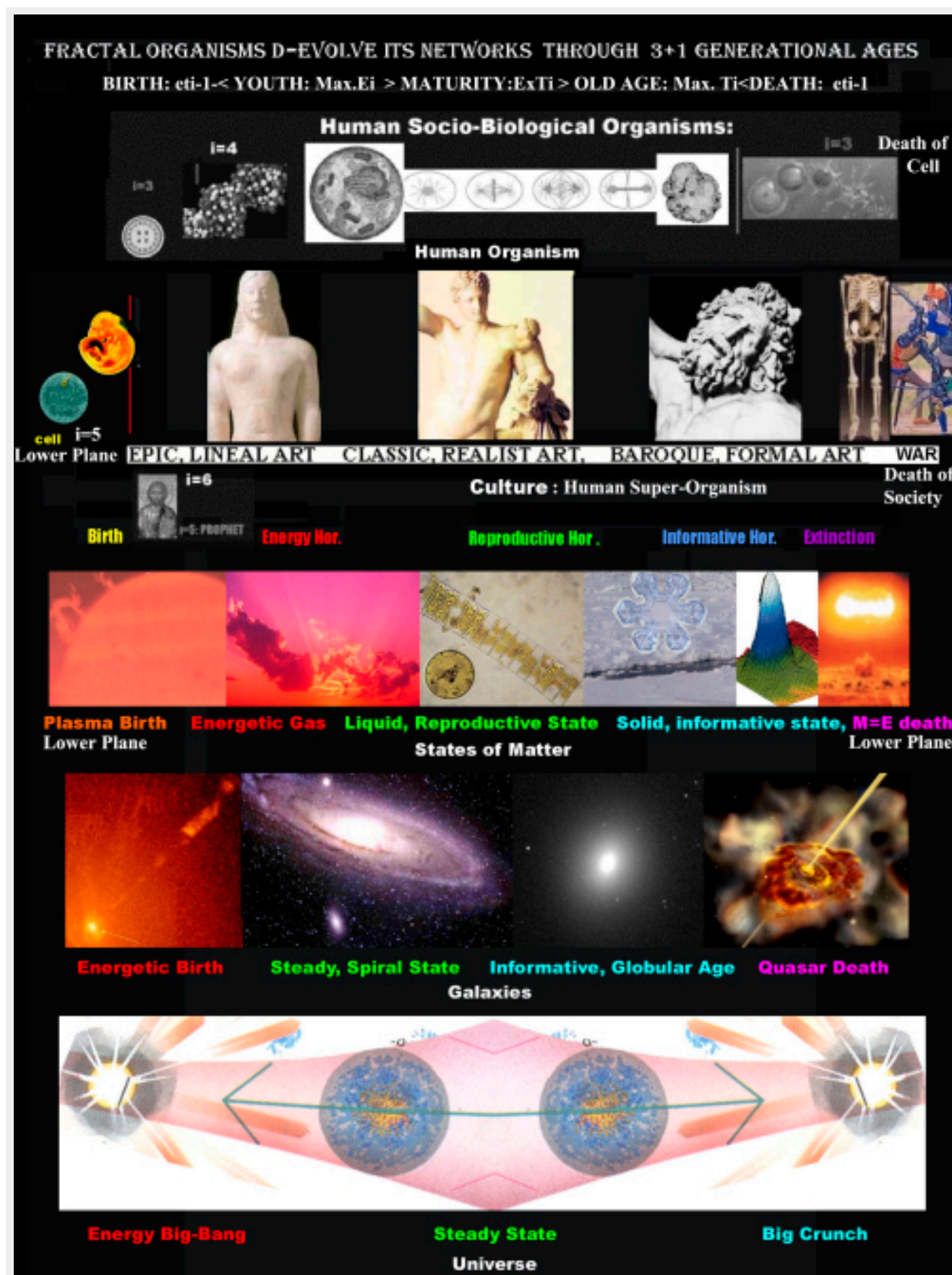
And the study of the relationships between the human i-ndividual and i+1 social cultural scale with its political, economic and ecologic networks that form the Earth's super organism, is the purpose of social sciences.

Whereas History is the 10 Dimensional Superorganism of Mankind, seen from the perspective of the Whole:

$$i+1 \text{ (Earth)} < I \text{ (History)} = \sum_{i-1} \text{ (Humans):}$$



COMPLEX SYSTEMS: SUPERORGANISMS



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:

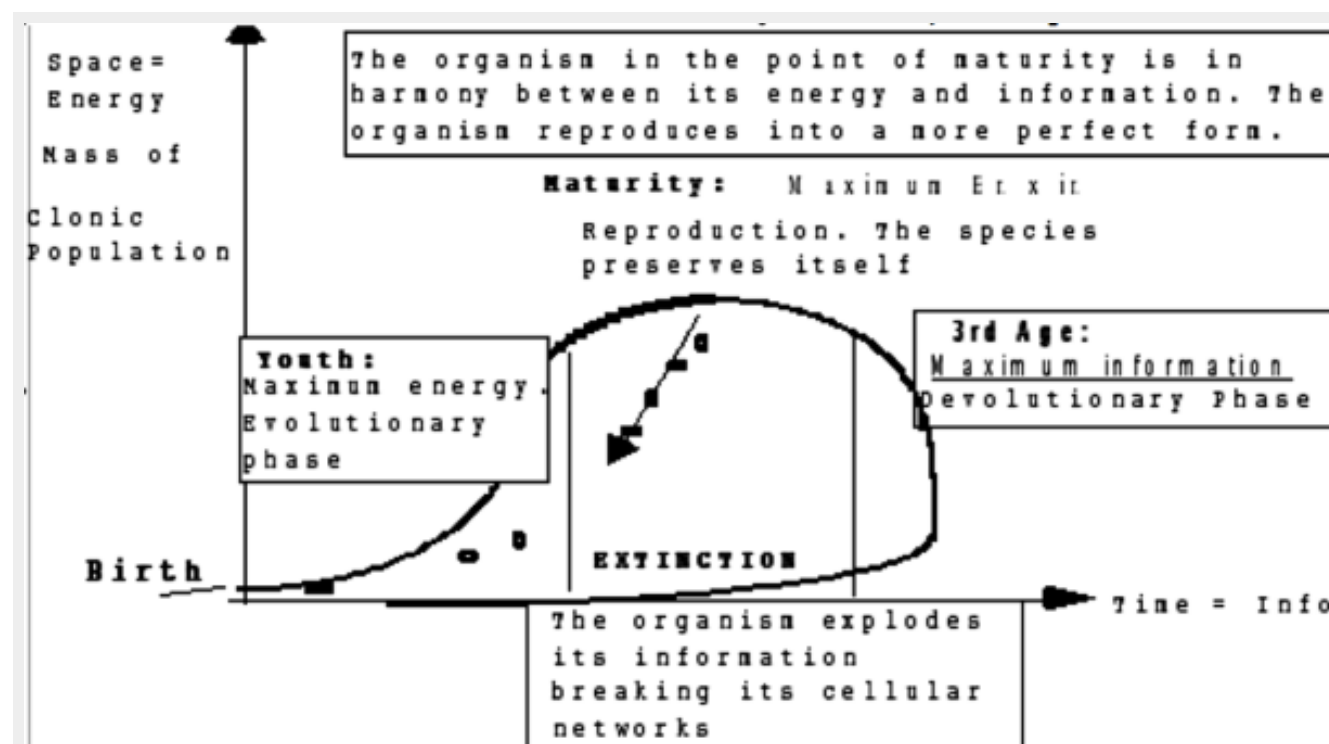
- i-1: Birth as a seed of information.

-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 $\text{Max. } E \times I \rightarrow E=I$, 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 the point that maximizes the function of existence, $e \times i$ of any species.

The life death cycle, thus has of its 3 ages, $\text{Max. } E \times \text{Min. } I$, *youth, $E=I$ maturity and $\text{Max. } I$ (3rd age) a maximal in the point of balance ($\text{Max. } E \times I, E=I$).

And all systems of perception acknowledge it .

So we formalize those 'life-death journeys', through the dimensions of complexity.

Thus the Universe of motions in time has at least two dimensions, lineal entropy, which is what physicists acknowledge in their 'predictions about the future', and cyclical entropy, rotational motion, information.

Now, the 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 r implosive rotational motion, to the other arrow, inverse to that of entropy, the arrow of information, and future since systems increase in information, in form, warp space into time cycles, with gravitation or wrinkle in form through life.

= 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.

The main order or 'existential equation' created with those 3 arrows of time, is a simple series of mirror 'symmetries' (inversions) between the fields of energy and information of a being. And this would be a more 'academic' definition of the life-death world cycle.

And so we define a dual 'beat' for all beings: $E \rightarrow I$ (Life arrow) = $I \leftarrow E$, death arrow, to explain the worldcycle of each of those entities of space-time.

First its 'grows in information' from the relative past energy of birth to its final 3rd age of excessive form, in the i-dimension for both biological systems (aging arrow) and physics systems (change of state from gas to solid of most physical systems).

A world cycle 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 'world cycle' is a Universe in itself, made to the image and likeness of the whole Universe, which also has a world cycle 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'.

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-xpansions, v-ibrations and i-mplosions in space:

$$I = \sum i \pm 1 \{T(e, f, i) = T(f, e, i) \} (Sx, y, z)$$

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 (Sx, 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 super-organism, 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, Sx, Sy, Sz , 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:

$$I = \sum i \pm 1 \{T(e, f, i) = T(f, e, i) \} (Sx, y, z)$$

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-scaler 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, 3rd 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.

But the EQUATION OF LIFE AND DEATH HAS ONLY 2 ELEMENTS, energy and information of which we have hardly talked.

It is thus needed to understand i the properties of each of those 2 elements as the main tool to explore life-death motions in the 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 function of existence of any of its 10 D systems:

$$Se \times Ti = Ci$$

1. The life-death 'world cycle', and the social scales of the Universe: Complexity.

In the early 90s, during my Master at Columbia University, I created the only standing, logic and mathematical formalism of General Systems Sciences, also called Complexity (3), which describes all systems of the Universe as 10D Superorganisms.

In that regard, the main difference between 'Complex Sciences', which Mr. Hawking rightly qualified as the sciences of the XXI century, and classic, 'simplex' sciences, is dual:

Simplex sciences consider only 'spatial dimensions' and a single time dimension of duration, which is useful to measure motion in time ($V=s/t$), but tell us nothing of the inner structure of a physical or biological system. Thus systems are described with only 4 dimensions, 3 of space and one of time duration, as systems that move through worldliness, between birth and extinction, WITHOUT explaining the inner laws of social organization that structure the system, neither the reasons of its life-death cycles, from past to future, and the reasons of its evolution of form, from youth to old age.

All this existential questions, fundamental to reality, specially the biological and social reality of mankind and history, are responded by Complex Sciences with its 'wider' concept of a Universe, which extends through different scales of size and evolves its internal form from past to future. Thus complex sciences add 3 'dimensions' of social complexity and 2 more dimensions of time, the past and the future, to define with more precision the causes of the life-death cycle, the evolutionary cycles, and the organic structure of reality.

Thus Complex sciences use a more sophisticated structure to describe the species of the Universe – the social organism, which exists across 3 'different scales' of size and social organization, the cellular, individual and social scale; through which they perform a past to future 'life-death cycle', which is called no longer a 'world line' but a 'world cycle'.

We say that life is a travel through the i-dimensions of social complexity between the past, seminal age of birth and the future, 3rd age of information..

Thus super organisms both in physical and biological systems are, as the graph

shows, structured across 3 'scalar Dimensions' of space time: the i-1 cellular, individual and i+1 social scale, which determined the existence of in time of a life-death cycle of 3 ± 1 Dimension or 'Ages' for all of them:

- The seminal i-1 age of birth, which reproduces a system till it emerges into the:
- Individual scale, where the system follows a young age of energy, an adult age of reproduction in which the individual integrated itself into the i+1 social scale.
- Followed by a 3rd old age of information, which ends with a reversal of time, or 'death' that returned the system to the i-1 cellular scale.

And so I wrote a simple equation for the life death cycle across its 3 $i\pm 1$ scales and 3 'Ages of time':

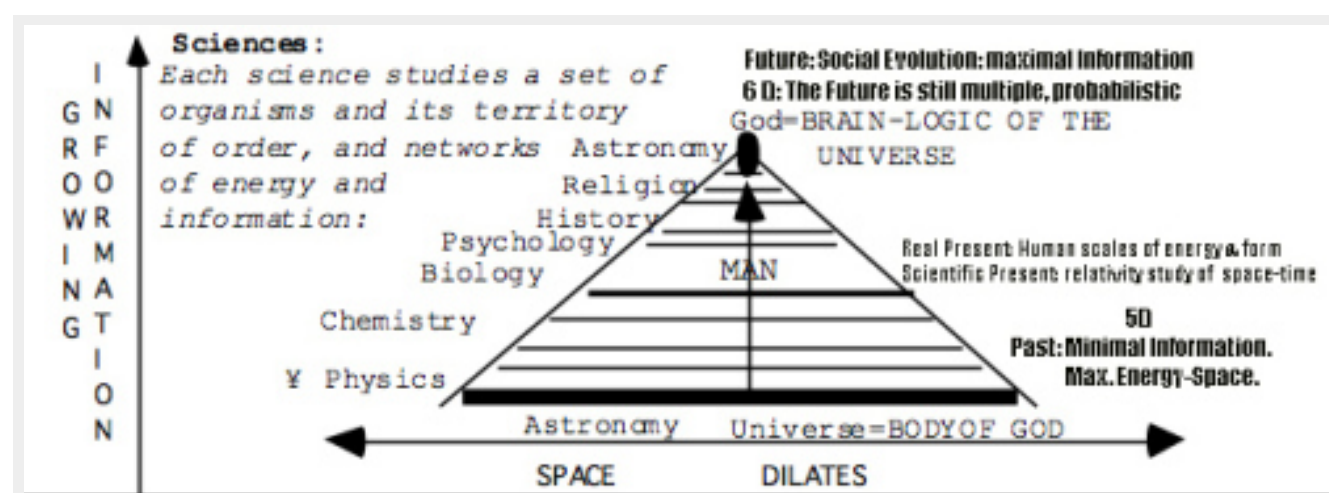
$$i-1 > \text{Max. } E \rightarrow E=I \rightarrow \text{Max. } I < i-1.$$

Then I modelled most systems and languages of the Universe with that formalism, unifying the study of all sciences with them.

So in Physics I used it to describe all systems in the 3 scales known to man:

- The quantum scale through String theory (also 10 Dimensional systems, across 3 scales of i-1 strings, i-branes and i+1 particles).
- The human scale through the States of matter, the 'energetic', gaseous state, the liquid $E=I$ balanced state and the informative, solid state, between 'plasmatic birth' (i-1) and 'big-bang' extinction ($E=mc^2$).
- And the Cosmic scale with its Galactic Superorganisms (made of i-1 atoms, which gather into i-stars, which become parts of social i+1 galaxies) and its Universal cycle with 3 ages, described by the 3 solutions to Einstein's space-time equations: The 'big-bang' youth age of maximal energy, the steady state solution of balance $E=I$, or 'adult' age of the Universe and the 3rd 'big crunch' informative collapse (Max. I.)

So I had finally reached the ultimate dream of the polymath and philosopher of science, the quest of human thought for a unifying series of principles that could explain with the same laws all the systems of the Universe and all its scales, each one studied by a different science:



In the graph, each science studies a scale of '10 dimensional systems' across 3 scales of organic evolution. Simplex sciences study each of those scales with different jargons as separate 'realities'.

What complex sciences had achieved thanks to the understanding of the scalar structure of space-time systems was the discovery of the unifying laws and principles that created systems across each of those scales.

Whereas the relative future was the more complex i+1 social scales that required smaller individual and cellular/atomic forms to be created.

Thus there was a general arrow of 'evolution' across the '5th' scalar dimension of 'complexity' (if we called the 4 dimension that of time), or in a more detailed analysis, we lived in a 10 dimensional Universe, made of 10 dimensional beings, with the 3 dimensions of space, length, width and height, that lived 3 ages of time, youth, maturity and informative old age, across 3 scales of organization, which structured a 'whole system': 3×3 dimensions +1 whole.

So once we could identify a certain 'middle i-individual scale', for any species (the ego for the individual human, the DNA centre for the cell, the 'legal' code of revelation or constitution for the historic super organism (nation or civilization) and the 'machine or product' an i+1 corporation reproduced, we could establish an in-depth analysis of all its components, exchanges of energy and information

across scales, ages of evolution and not surprisingly, I found that the same generic laws of complex sciences applied to any of those systems, such as the laws of man as an individual, the laws of a civilization as a super organism, the laws of a cell, or the laws of a galaxy, were just 'details' of the same 'grand design' of a complex, organic Universe. Let us now show that social organization of all systems through its 'informative/political' and reproductive/energetic networks, in order to describe the networks of history and the needed reforms to create an efficient human super organism at the $i+1$ scale.

The structure of organisms

Let us to that aim, understand first the generic structure of a social organism, or ecosystem, parallel words that we will use constantly as synonymous. In fact there are four basic elements in all organic living systems:

1. Cellular units
2. Networks of energy or vital space
3. Networks of information
4. Networks that reproduce energy and information.

When we find those elements interconnected in a vital relationship, we talk of an "organic system". We can see such organic systems as "bodies", when all the cells are very close to each other, or as "ecosystems" of herds, when the cells are far away, and the networks are weak. We should not be cheated by the spatial appearance of the organism.

A herd of machines, a herd of insects, a human group is also an organic system, because it has cells, and networks, even if it does not seem to us a body. The fundamental reason we have not arrived earlier in science till Theory of Organisms, to the conclusion that the universe is made of such organic systems is the lack of relativism, the arrogance of man. Men have a hard time believing that things which are not like us, are able to intelligently process energy and information.

We are also unable to believe easily that microcosms and macrocosms are "species". Yet an organic perception of macrocosms like galaxies or planets, and an organic perception of microcosms such as cells and atoms, is the most logical way of "unifying" our understanding of the entities of the Universe. We might see those herds very close together in which case we talk of bodies, or we might see them extended with a loose organization; then we talk of waves, societies or herds.

A verbal definition of superorganisms

A generic definition of an organism or ecosystem will help to clarify what we mean by a "vital universe", composed of "universal organisms". Let us take a template for a micro or macrocosmic organism (or ecosystem) that differs only in the specific energy or information we put into brackets. "A universal microcosmic or macrocosmic organism or ecosystem is a population of [name a particular species], related by networks of [name a language or force] information and networks of [name a kind of energy]". Fill the gaps with a specific species, language/force and energy and you can define any network-organism in the universe:

– An atomic organism is a population of (electronic) energy and (nucleonic) information, related by networks of (gravitational) information and networks of (light) energy.

– A molecular organism is a population of atoms, related by networks of gravitational energy, and networks of electromagnetic information (orbitals, London forces, Van der Waals forces).

– A "galactic organism" is a population of stars, related by networks of gravitational information, and networks of space-time energy. Their morphology is similar to that of an atom, where the nucleus is the black hole, and the stars the electronic orbitals.

– An "animal ecosystem" is a population of carbolife species, related by networks of light information, and networks of life energy (plants, prey).

– A human organism is a population of DNA cells, related by networks of genetic

and nervous information and networks of energy-providing blood.

Historic superorganisms

Complexity, duality and Systems Science study the laws that define an efficient complex organism in physical space (particle/field systems), biological space (head/body systems) and Social space (informative leadership/working class). The importance of this new social science is that it draws from Nature teachings and so it has a set of laws that allow to design a perfect social organisms.

Indeed, its laws are based in the self-similarity of all complex systems, from galaxies to living beings, which are organized by networks of individual particles – cells, stars, atoms – communicated by flows of energy and information. So happens with human organisms (energetic, blood networks andd informative nervous networks) and social organisms (economical, energetic networks and informative, cultural and legal=political networks).

So we can use the sane definition to define the superorganisms of history and economics:

– A bio-historic organism is a population of humans, related by networks of verbal information and networks of carbolife energy.”

– A bio-economic organism, is a population of human workers/consumers and machines, related by networks of monetary and electronic information, and networks of roads and electric energy

The difference between both type of systems, a historic and an economic organism thus is clear when we consider that the ‘organic unit’ of the economic ecosystem is NOT contrary to belief a nation or civilization but a new organization, appeared recently with the beginning of the Industrial R=evolution, called the company-‘mother’ whose function is to reproduce a product, overwhelmingly a machine, and then to evolve further and adapt the world to the existence of those machines, creating networks of energy and information for them (digital networks, electric networks, etc.) And this is the first big surprise of an organic model of history and economics: while History is undoubtedly the product of human endeavors, the economic ecosystem is ruled by company-mothers of machines, which follow a set of biological, evolutionary and organic laws independent of mankind; quite removed from the abstract jargon coined in the XVIII century, even before machines existed by classic economists’ like Mr. Adam Smith.

Both organic systems, Historic and economic organisms, survive within the same vital space, the Earth’s crust. What this means according to Theory of organisms is that there is between both a dual process of symbiotism and preying, by which sometimes machines compete with men in fields of labor (productivity laws that substitute workers with machines) and fields of war (where weapon-machines kill human beings). We express this with the concept of the Paradox of History.

Thus, from the previous definitions we can talk of WHealthy systems, when the head, in history the neuronal castes that control, issue and direct society with the law and money feed and share their energy and information with them – their financial credit and just legal orders that direct the body cells to produce the goods the historic organism needs – life based goods, that make us survive. Then the body obeys and moves properly and works and cares also for the head.

And we can talk of a viral, social organism, of a sick system, when those elites do not feed its citizens/cells, do not issue caring laws to protect that body.

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'.

We are all systems of spatial energy and temporal information that combine to create the infinite actions and systems of the Universe.

In the jargon of physics we talk of clocks of cyclical time that carry in their frequency the information of the Universe – charges and masses – moved by fields of energy that occupy a certain vacuum space. In biology we talk of heads, brains and cellular nuclei that process information, moved by bodies and cytoplasm. Each system will display a certain type of 'spatial energy' or 'vital space' and process information with a different network of logic paths, though particles, genes, chips or brains, but all those systems will obey to certain laws natural to the 2 formal motions that ultimate explain the game of 'creation and extinction' of systems of energy and information, which is the dynamic universe.

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, suffice 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.

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, Σ , and networks of information, Π , as the 4 'arrow' of behavior' of the Universe, 'eusocial evolution', that puts together body cells, ΣE and neuronal cells, Πi , 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 Π 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, ΣE_{i-1} , loosely integrated as a sum, Σ .

And state the 'metrics' or fundamental equation of the 5th dimension:

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

As such we are all, physical and biological systems, also 5-dimensional beings. People caught in a 3 dimensional, fractal sheet of space-time, of a certain dimension in space and with certain speed of time, to process information. For example, man is a species on the 1 meter range and the 1 second range of thought/eye glimpse/beat of the heart, or speed of processing information. But we are connected to a smaller scale, the biological scale and to a bigger, more complex one, the social scale.

The reader should notice that body networks, Σ , 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.

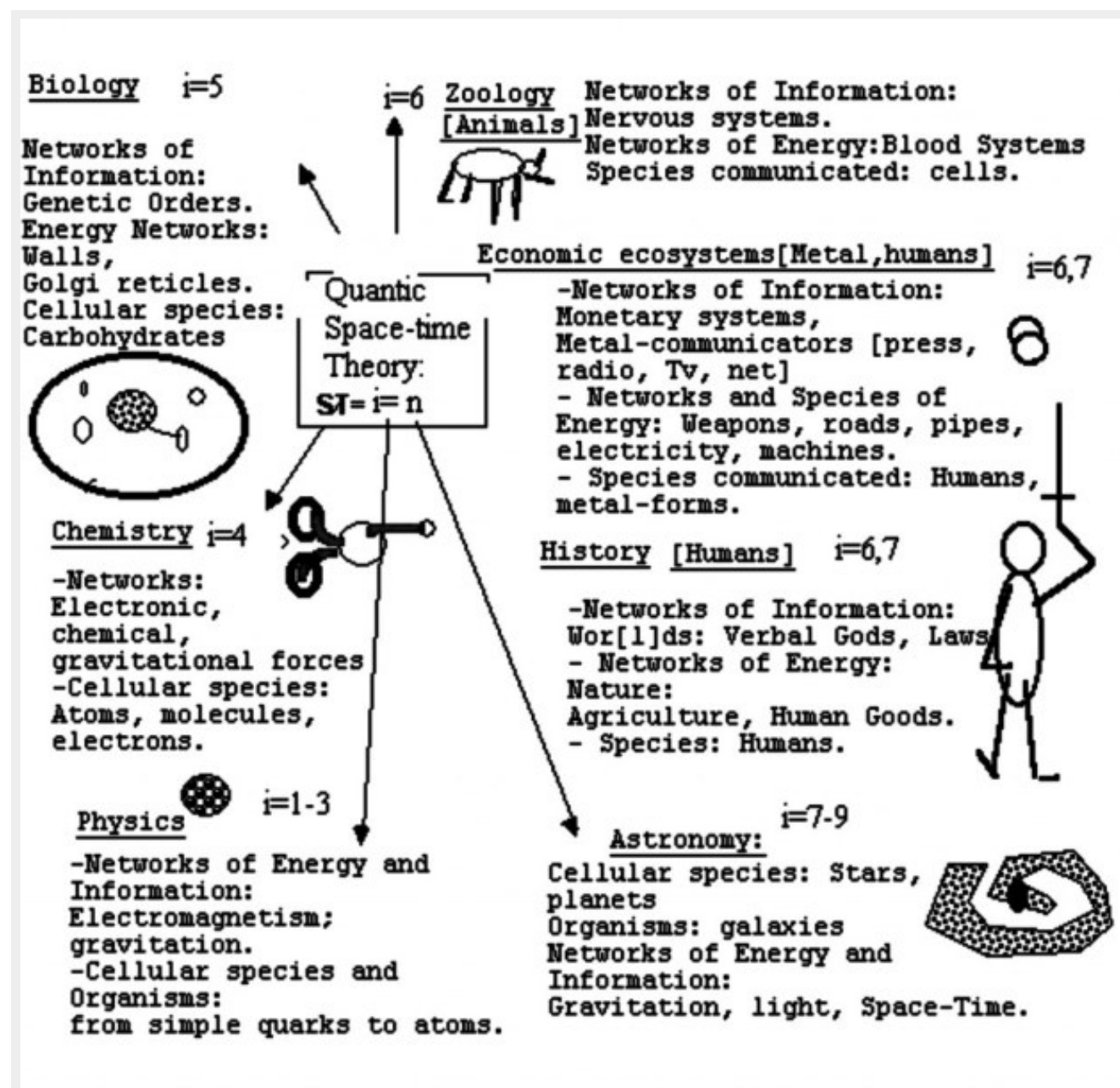
If the first and second type of analysis of the Fractal Generator of all systems, $E \Leftrightarrow I$, gives birth to duality, the science I chaired in the International Congresses of Systems Sciences, this 3rd type of analysis of General Systems Sciences, gives birth to the subdisciplines of Hierarchy and the fractal analysis of space and the Universe at large. And both together allow us to define the 'Universe':

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: $\Sigma E_{i-1} \Leftrightarrow \Pi I_i$

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 I-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 next graph we describe the main systems and scales of fractal size, which structure the Universe:



In the graph, in system sciences the fundamental concept is a social organism, a herd or group of self-similar forms, which gather together thanks to their capacity to share the same code/language of information and the same energy. Such herds evolve together in complex networks, which survive better than individual particles or cells, acting together as a single group.

Thus, systems sciences recognizes as the fundamental evolutionary force of the Universe the survival capacity of groups, which determine an arrow of future that has evolved the organisms of reality from simple atoms into molecules into cells into organisms into societies.

What is an organism of information and energy? A herd of species related by networks of energy and information, that constantly transform energy and process it in a vital way. How individual species organize themselves into complex herds, that biology calls ecosystems or bodies, or organisms? Precisely through those physiological networks, the key to understand any organism, including human social organisms (nations, civilizations).

In the Universe there are many type or such social organisms. Since "energy never dies but eternally transforms itself", organisms have an enormous variety of species and sizes, depending on what energy they process. What do they all have in common? All organisms are "societies", organized by networks of Energy and Information.

The former is clearly the case in all the sciences from physics to biology, where a common phenomenon occurs: the existence of parallel groups of beings organized into a single regular formation. Molecules are made up of atoms and electronic networks; economies are made up of humans and machines; galaxies are composed of stars, which orbit rhythmically around a central knot, or black hole, of gravitational information. Human bodies are organized by cells controlled by the nervous system. A tree is a group of leaves, branches, and roots connected by a network of energy (salvia) and information (chemical

particles).

Atoms share energy and information between them through electrons who finally shape δ orbitals that create molecules. Molecules grow and become DNA, which controls the cell. Cells then radiate until their density saturates the vital territory of the herd of cells. To improve in such small territory the Information and energy of each cell, the nervous-informative organs, and the energetic, blood organs appear. A new, more complex species -the animal, and the man- is born. Then humans increased in social size, forming a new macrocosm -the macrocosm of History and economics- where a lot of humans and machines organize themselves into societies, through words and digital information.

The purpose of this web is to study such organisms; historic organisms (a social organism of humans), and economic ecosystems (a wave of products that interact with human beings), as organic systems; trying to design and improve them, from the perspective of the health of what is best for the survival of man, as the ruling species of that organism.

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 $3 \pm i$ 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: I-Light and O-Photons.

3rd d Scale: Fermions: I-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: I-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 ∞ small and large, because charges and masses are quantum and cosmic vortices of space-time with similar equations defining similar scales, in 5D 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 ∞ number) from protons to stars to galaxies, atoms of a hyper-Universe.

And 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 1040, 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 γ -rays and neutrinos (the space bosons of the γ 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 ∞ 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-forma the Universe ($E > I$ or life arrow)

– And 'big-bang' entropic deaths that expand it ($I < E$).

Giving birth to the widest/longest life death cycle, $E > I < E$, imitated by all its parts, shaping the final Invariance, sum of them all,

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.

Energy and Time clocks are two types of motions; so the universe was made of motions not of substances, a maya of the senses... This Galileo already noticed when he said *e pur si muove e pur no muove*. That is, the Earth moves but it seems to be still, so our eyes can perceive and gauge information.

Those simple principles are the essence of the duality of the Universe, from where all other laws of science can be deduced.

Indeed, we generalize the principle to all systems, and write, energy as E, Time, as I, and actions as their product, $E \times I$, which is maximized by a simple mathematical law, when $E=I$. So 5×5 is bigger than 8×2 .

This equation $E=I$, which implies all systems seek a balance between its spatial energy and temporal information is the new fundamental equation of XXI century science.

As it describes all the systems of the Universe, as 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 dont have energy and time to do this.

As actions of energy and time performed with your system is all what you or any entity of the Universe does. Let us now without entering in great detail about the 10 dimensions of the Universe, attempt a qualitative description of that whole reality, departing from its simplest 'metric equation'.

Sciences study Systems of energy and information.

And General Systems Sciences unifies them lying down a series of Laws that all Systems follow, based in that simple fact – that all what exists is made of two components energy or space (moving/static view) and time or information (moving/static view).

The result is a Unification Theory of All Sciences.

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 in-formation, 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.

This is basically the lemma of this site, a logic and mathematical formalism of Complex sciences.

Complexity though is not only a mathematical model of the Universe, which explores in more depth than 4D Relativity the physical and biological world.

It means also a different philosophy of the Universe, according to the Principles and Dimensions of General Systems Sciences, or 'complexity', whose philosophy of science considers reality a 10 Dimensional Super-organism.

So we might as well start this web, describing the 10 Dimensions of the Complex Universe, the fabric of reality.

I. THE 10 DIMENSIONS OF THE COMPLEX UNIVERSE.

Symbols of the 10 Dimensions of Space, Time and Information:

3 Spatial Dimensions: Sx=length, Sy=high, Sz=width.

3 Time Dimensions ('Ages or States') : Ty: Young past age; Tf Iterative, Present Duration; Ti: Implosive, informative Future.

3 combined space-time ('2-manifold Topologies'): STe: Energetic, expansive motion; Re=petitive Frequency Wave, STf; STi: Informative, implosive motion.

3 Scalar dimensions ('Planes of Existence'): i-1:Cellular; i:Organic; i+1:Social Scales.

10 Dimension: I, Σ: Whole.

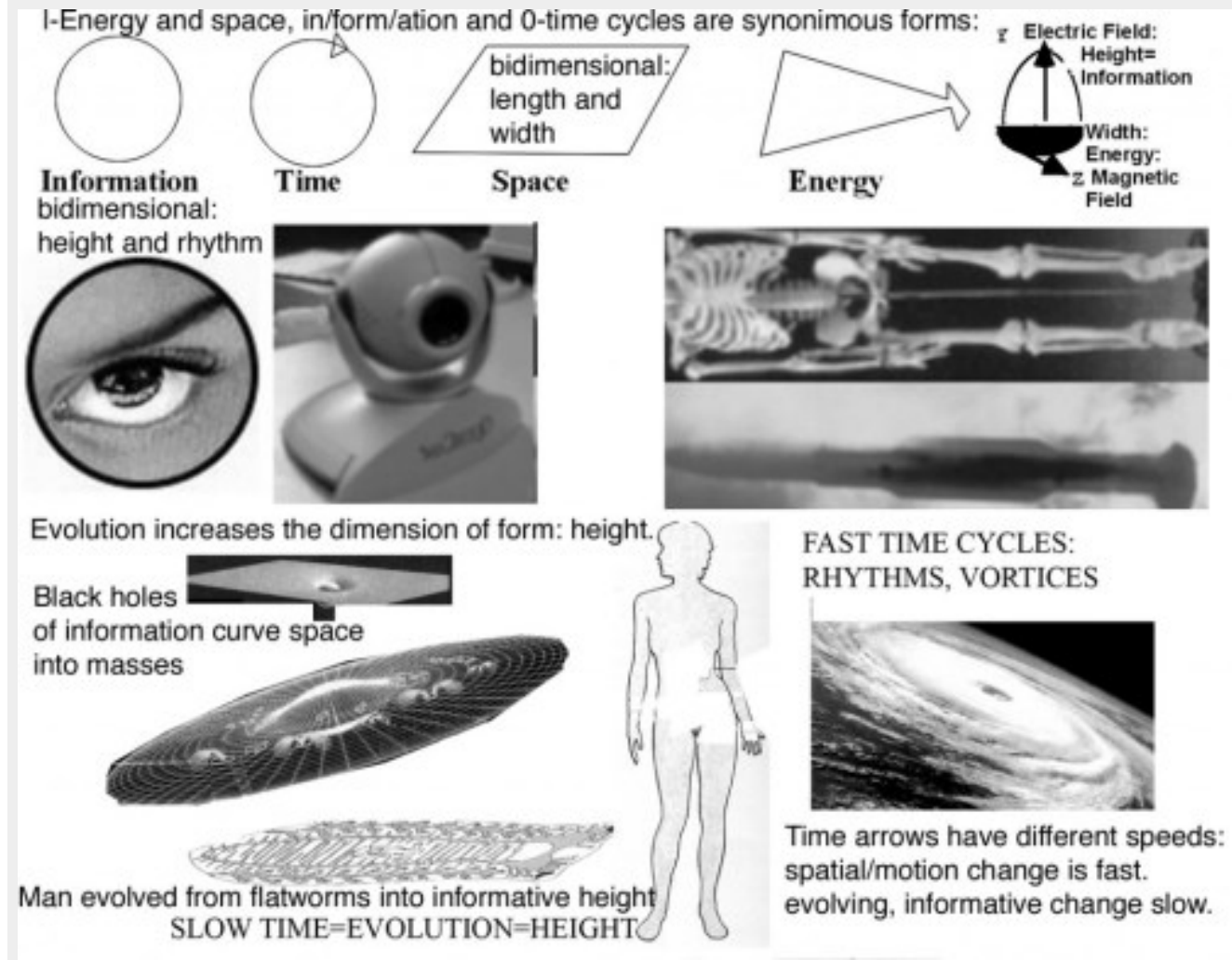
5th Dimensional, 'compactified' analysis:

3 Spatial Dimensions: Sx, Sy, Sz.

4th Dimension of Lineal Time-Duration (divided into 3)

5th Dimension of i-scales of Complexity (divided into 3)

III. DUALITY: ENERGY=SPACE x INFORMATION=TIME=CONSTANT ΣORGANISM



The life death-cycle brings us to a second new discipline, of systems sciences, albeit 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 again we understand in great detail but never have treated it all together 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.

– 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 $S=\sum E$. 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 we can consider the total time of the Universe, a sum of all the time clocks and informative cycles of the Universe; $T=\sum I$, and talk of temporal information (and spatial energy) as the two motions/substances/forms/arrows of the Universe.

We call this essential fact of 'Endophysics' the Galilean Paradox, as we humans perceive the Earth 'quiet', as space, when it is moving as a mass of rotating clocks. 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: $Sx=Ti$.

Then when we consider two dimensions, 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 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:

$Sx/Ti=V$ (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 = K^3 for tridimensional ones.

Finally in 4 dimensions, which is not the same than the quark world of strong force, as 'masses' mean different, in the cosmological, 4 D Universe and the 3 D electromagnetic light Universe we live in, or the 2 bidimensional Universe of quarks and strong forces. The confusion here is because strong forces and protons are self-similar to black holes and cosmic gravitation, but the parameters of the strong and gravitational forces though self-similar are not the same.

Thus, we formalize those 'life-death journeys', through the synoptic dimensions

of complexity 'spatial energy' and 'temporal information', whose 'systems physical or biological' through 3 i-scales, or super organisms, remain 'relatively constant' trying to maximize in the act of living their 'body-mind, particle-wave energy and information"

The answer brings us to a second new discipline, of systems sciences, albeit 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 again we understand in great detail but never have treated it all together 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.

Thus the Universe of motions in time has at least two dimensions, lineal entropy, which is what physicists acknowledge in their 'predictions about the future', and cyclical entropy, rotational motion, information.

Now, the 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 r implosive rotational motion, to the other arrow, inverse to that of entropy, the arrow of information, and future since systems increase in information, in form, warp space into time cycles, with gravitation or wrinkle in form through life.

= 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.

The main order or 'existential equation' created with those 3 arrows of time, is a simple series of mirror 'symmetries' (inversions) between the fields of energy and information of a being. And this would be a more 'academic' definition of the life-death world cycle.

And so we define a dual 'beat' for all beings: $E \rightarrow I$ (Life arrow) $= I \leftarrow E$, death arrow, to explain the worldcycle of each of those entities of space-time.

A series of 'perpendicular inversions' and 'parallel symmetries' between the relative energy and information fields of a super organism of space-time.

And so we can combine this new insight on the flows from past to future of time worldcycles to go further in the analysis of the life-death cycle, of a beings specifically in its most important scale, the individual scale.

As we can see how those $e \rightarrow I$ $+i \rightarrow E$ life-death arrows 'subdivide' further into 'ages of life' or states of matter:

i: Its individual scale, where it will go through 3 'states or 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:

To then

$I \leftarrow E$: explode into death and return to its cellular scale.

Thus 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.

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, M.(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:

Max. $\sum E \times I$

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

First mathematics tell us, that Max. ExI 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 ,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:

E->I, x I->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, Ex I is the present.

So we have our equation of the 3 dimensions of time.

We are a function of existence, with 3 dimensions, past, the age of energy, $E \rightarrow I$, present, the age of balance and reproduction $E \leftarrow I$, when the function of existence is maximized, and future, the arrow of information, ad death, $I \rightarrow E$ when information returns to the past.

The first thing we notice though is that in the equation, death is equal in value to Life.

thus are formed by the 3 dimensions of time, what we call our youth

We shall attempt a first definition even if it introduces concepts not familiar to the reader, in the 2 fundamental languages of human thought, mathematics and words:

'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.

The i-scalar dimensions of space-time' are dimensions of spatial size and speed of temporal clocks that carry the information of the Universe in the frequency of its cycles.

It is thus essential to understand the meaning of energy and information in each science, departing from its simplest mathematical 'shapes', the line or shortest distance between two points, or natural trajectory of any motion and the cycle or shape with maximal 'form' in minimal space.

Thus in the simplest mathematical scales of reality, information is defined as 'dimensional form' and energy as 'lineal motion, and we write; $\pi \Leftrightarrow O: \pi = I/O$ as the first 'Universal Constant' or 'Game of Existence' of the Universe, in which a system switches on and off between an informative and energetic state. Those 'beats' of the Universe between energetic and informative states are the essence of what we call the 'Function of Existential actions, exi , or function of $exi=st-ence$ ', to which all events can be reduced.

In each Natural 'i-scale' of the Universe of growing complexity of i-nformation, from the smallest atom to the bigger galaxy, we find 'Complementary Systems', where two poles of energy (physical field/biological body/galactic plane) and information (physical particle/biological head/black hole), exchange energy and in/form/ation between them and with the external Universe: $E \Leftrightarrow I$.

Thus we can simplify and unify our analysis of all universal systems, by defining both physical and biological systems with that simple equation of '2 arrows of time':

$\Rightarrow E$, which means the creation of 'expansive, lineal motion' or energy or entropy or disorder.

$\Rightarrow I$, which means the creation of in-form-ation, dimensional form, implosive, cyclical motion and order...

It is important to understand the 'general' meaning of those 2 elements, as they change slightly from scale to scale but maintain certain equivalent characteristics. Information is 'dimensional form' and Energy lineal motion. And its two most perfect shapes are the cycle or sphere, the geometry which stores maximal form in minimal space. So heads, particles, cameras and black holes are spherical and small in space but store a lot of information in its 'dimensional' curves. Energy or motion is 'lineal distance', displacement, and the line is the shortest distance in space, so bodies, fields of energy, planes, cars and galactic planes are 'planar spaces' to maximize motion.

As it happens those two processes are inverse and so we can talk of systems as

dual, bipolar, feed-back equations of the 2 essential 'arrows or motions in time', flows of expansive energy, and imploding information, $E \leftrightarrow I$, interacting with a bigger energy/information system, the Universe.

That equation is the 'fundamental equation' of General Systems Sciences or Complexity, the XXI century science which unifies the laws of biology and physics, through the use of two 'arrows of creation/destruction', information or cyclical motion, or 'time clocks' – traditionally studied by biology – and energy or lineal motion, or entropy, traditionally studied in Physics.

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

So what i really do is to write about 'different 10D super organisms' of the complex universe, which are not only physical but biologic, as all of them trace a world cycle with the same living ages. Well I also live as a 10D organism, but that part is not that interesting, as the 10D beyond my self, and the game of all the 10D beings, the Game of Existence and its motions.

Let us consider, the most important of those motions, the key of reality, the life-death cycle of creation and extinction that affects all systems of reality.

In the graph we can see how the Universe creates 'waves' of super-organisms that travel world cycles, 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 world cycles of creation and extinction of 'existential curves'... in 10 dimensions *-;

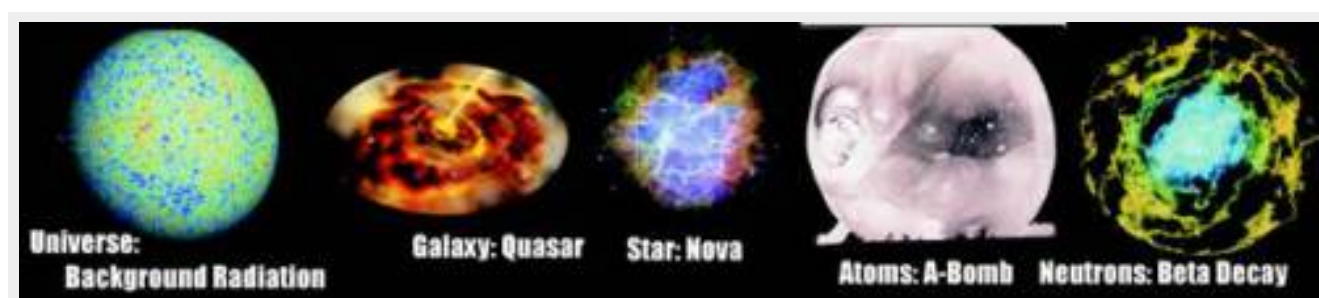
It can be then anything, any species of the Universe, from an atom to a human, from a galaxy to an ant.

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 the graph, the 'Plan of evolution' and 'structure of super organisms', and its '3 networks' can be studied also from an I-nTEGRATED point of view as the 3 parts of a 'whole'.

Then the whole will be made with the only 3 topologies in space of bidimensional 'membranes', the essential part of the Universe.

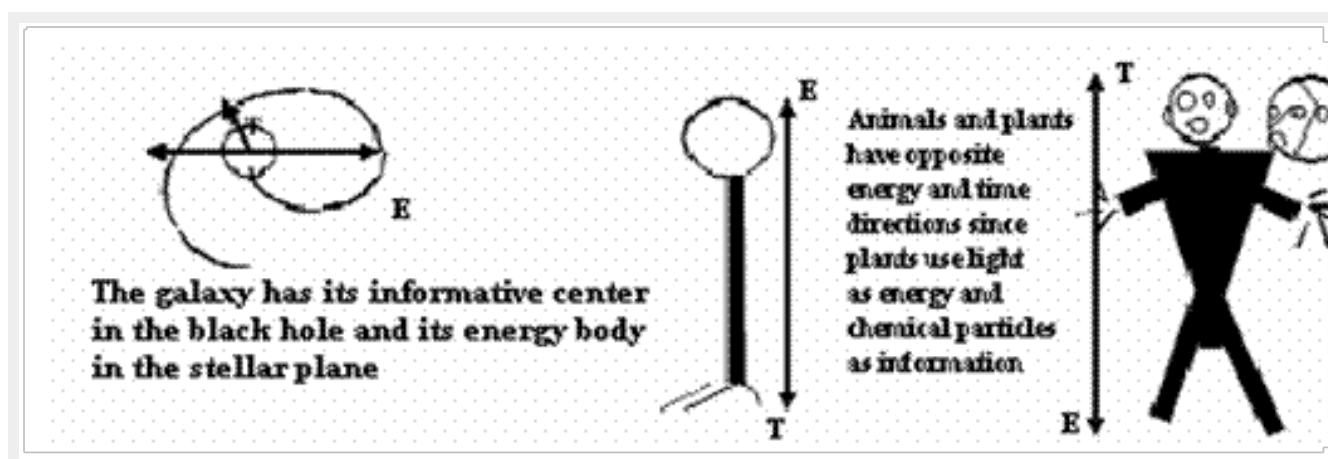
The graph shows how those 3 topologies combine in the 'simplest' of all varieties of organisms, the 'spherical being', living in a 'homogenous' medium, which provides it with energy and information and allows it to reproduce in a parallel extinction of space-time

All of them will have an external membrane, which will act as 'rotational limbs' exchanging energy and information through its 'sensorial openings'.

This membrane will be enclosing a toroidal body, which will cyclically exchange energy and information through networks with a central zero point of information or hyperbolic brain.

The 3 parts will assembly together to form from sea urchins to phetus, from electromagnetic fields to galaxies with black holes, from atoms to tomatoes, from cells to planets. In all of them, the central hyperbolic 'head'/nucleus, will direct a toroidal body, and an external membrane will feed the system with energy.

The next graph shows a different fundamental variety of super organism, one existing not in an homgeneous medium but a planar surface, with a relative 'energy-information' directionality such as the planet Earth, where the sun provides light and the floor chemical elements. In this system, the morphology of the 3 networks vary and so does its orientation but the trinary structure of the Universe-> does not change:



In the graph we see how FUNCTION MATTERS MORE THAN FORM, and yet both are in symmetric symbiosis. The galaxy is a 'homogenous' organism with a black hole in the centre; the plant has also its 3 parts, and it has a root brain with maximal fractal branching to gather more atomic information, while 'flat' energy leaves absorb light as energy. Humans though have the inverse orientation as they use light to obtain information and take energy from plants. both predators and preys have inverse functions/forms.

Moreover it is evident that there is a symmetry between the 3 spatial dimensions and its functions, a s 'height is always the dimension of information' to perceive

better, so we have our heads on top in the direction where information comes. Length on the other hand is the dimension of forward motion the most common, and finally, width is the parallel direction of social organization and reproduction.

Thus WE ARE BEINGS MADE OF DIMENSION OF ENERGY AND INFORMATION AND LIVE ACCORDING TO ITS LAWS, OF WHICH THE TERNARY MORPHOLOGY OF SYSTEMS AND ITS 3 AGES IN TIME, WERE THE MOST ASTOUNDING, perfect symmetry and 'deterministic law' of the Universe.

There are thus '3 topologies that correspond to the '3 components' in space of any physical or biological system:

- Max. Energy: the energetic, 'lineal' limbs/fields, as the line is the shortest distance between two points that dominated the youth of a system.
- Max. information: the spherical, particle/heads of information, since the sphere is the geometry that stores more form in lesser space, that dominated the 3rd age of the system, as the passing of time increased the informative complexity of the system, exhausting its energy.
- And the intermediate, *exi*, 'conic', ovoidal or wave-like 'bodies' of the system that reproduced them, and repeated its actions, making the system stable, and 'immortal', when an organism could be kept in such a state.

So I extended the analysis of the 3 dimensions of time, to a deeper, 'topological' understanding of the 'morphologies' in space of all systems; and study with them engineering; and forecasted the evolution of machines, both diachronically (so we made bodies of machines in the XIX c. heads in the XX c. and now we put them into organic robots). This was the beginning of my accurate predictions of the future of economics, where company-mothers evolved and reproduced those machines.

And concluded that all systems of Nature followed the same rules, as we were 'all' made of 'energy, information and its infinite combinations, which dominated those 3 'ages' of time – the age of 'energy', the age of balance and reproduction (*exi*) and the 3rd age of information – symmetric to the 3 'components' of all organisms, machines, and physical systems:

- The energetic limbs/engines/fields, the reproductive wave/factories/bodies and the informative particle/chips/heads.

It was then evident that the deepest understanding of the organisms of the Universe and its 3 parts, organs and ages, was through the study of the 3 ONLY 'spatial topologies' that a bidimensional surface, (a 2 manifold) had.

Thus we were all from the external point of view 'bidimensional membranes' with 3 type of organs, parallel to the 3 'only' topologies of the 2-manifold Universe – the 3 'energetic, informative and body parts' of any system of nature. And each of those 3 parts dominated each of the 3 'ages' in time of all those systems. The young age dominated by our limbs and motions, the adulthood dominated by the body and our reproduction and the 3rd age dominated by the head of information. The 3 ages of life, were just a consequence of the 3 topologies of space of our bidimensional membrane of information. We were topological organisms living as such.

And so where machines which could relate to us through their equivalent morphologies making us stronger bodies and smarter heads – or so it seems initially.

In any case 'hooking us', making us addicts to them. To fully grasp this, we shall now introduce the evolution of life in this planet, according to those 3 ages and morphologies of time and space, of the Universe at large.

Since machines followed the same organic laws, and our relationships with them are equivalent to those of animals among them.

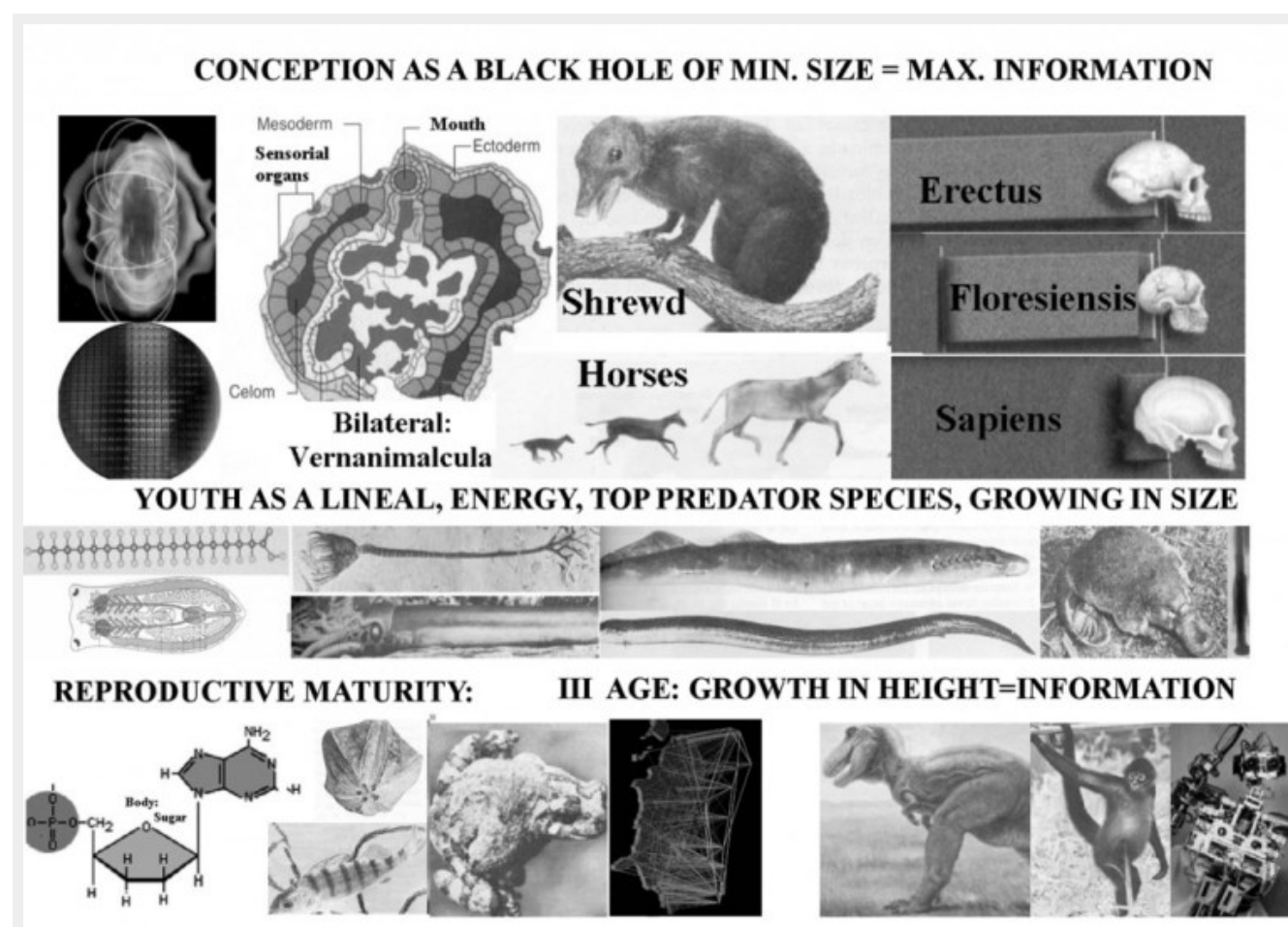
The formalism of Complex Sciences applied to 'Socio-Biological' systems.

- It came next the application of those fascinating discoveries and symmetries to biology, from genetic studies (the relationship between the *i-1* scale that coded the individual one) to physiology.

I also used it to study the morphology of all systems made with Energetic Limbs, reproductive bodies and informative heads, which evolved in 3 'scales', the cellular, organic and species state. So medicine, was the study of the energetic, digestive, reproductive, blood and informative networks of the human organism and its balances with the cellular scale.

-It followed that in the $i+1$ scale there were also such 3 networks, the political informative system, the economic, reproductive system and the energetic geography of Gaia. And we could also establish a 'medical discipline' for history, as the laws of all systems were the same. So in the same manner we could cure the sickness of a cellular organism, we could solve and cure human social systems, in which we all humans were citizen cells. And so I designed a perfect world. One in which all human beings would have as cells do in a body enough energy and information to survive and thrive.

Back to biology, and its higher scale, the $i+1$ social scale, I realized species were also super organisms in which each individual was a cell. Since I could define an impersonal plan of evolution, where species also followed the 3 evolutionary ages or 'dimensions of time', from a young predator state, through a biological radiation that reproduces the species, into an informative 'tall' age of maximal perception. So life went from the flat worm to the tall man, and reptiles from the flat amphibia to the dinosaur and bird:



In the graph, a fundamental 'question' resolved by complex science is the unification of all the 'scales' of the Universe, according to the laws of 'morphology' in space and 'causality' of time, which defines a fundamental 'ternary' symmetry, between the 'ages' of time of a system, its 'forms' in space, and its 'scales' of social organization, from where we can deduce the 'evolution' in time and space of any 'cellular' $i-1$, individual or social-species, $i+1$ scale of organization:

The formalism of $3 \times 3 + 1$ Dimensional systems of scalar space-time, relates all those dimensions to the 'synoptic' concepts of energy, information and its reproductive combinations.

As all systems of Nature will be composed of 3 'morphological elements', which correspond to the '3 topologies' of 2-manifolds:

- E: lineal energy limbs/fields, maximal in the '1st young age of a system'
- I: cyclical, informative, gauging heads-particles, maximal in the 3rd old, informative age of the system.
- ExI: reproductive, combined waves-bodies, which balance both into a steady state, of maximal efficiency, proper of the adult, immortal age of a system.

Thus all systems of reality are made of 3 'physiological networks', with those 3 elements, which in physical systems are E-fields/exi waves/i-particles, and in biological systems, are limbs/bodies/heads.

And in sociological systems are 'energetic environment/reproductive middle, working classes and informative, linguistic, 'upper classes'.

And so there is an 'arrow of evolutionary time or life cycle' which constantly increases the 'information' of a system through those 3 ages.

In the graph we can see that arrow of evolution in life species.

Thus the '3 dimensions of time' (youth, adult and 3rd age), take place across 3 scales of complexity (cellular, individual and social scale), in symmetry with the 3 'dimensions of space' (length, height and width), proper of the 3 'organic elements' of any system according to a simple symmetry:

– Lineal length(S_x)=Maximal motion (youth)= $i-1$ scale (small, cellular) = ENERGY symmetry of fields/limbs/planar territories over the Earth.

– Height (S_y) = Maximal Perception (3rd age)= $i+1$ (social, bigger) = Information symmetry, proper of particles/heads/upper informative castes in control of the financial/legal languages of society.

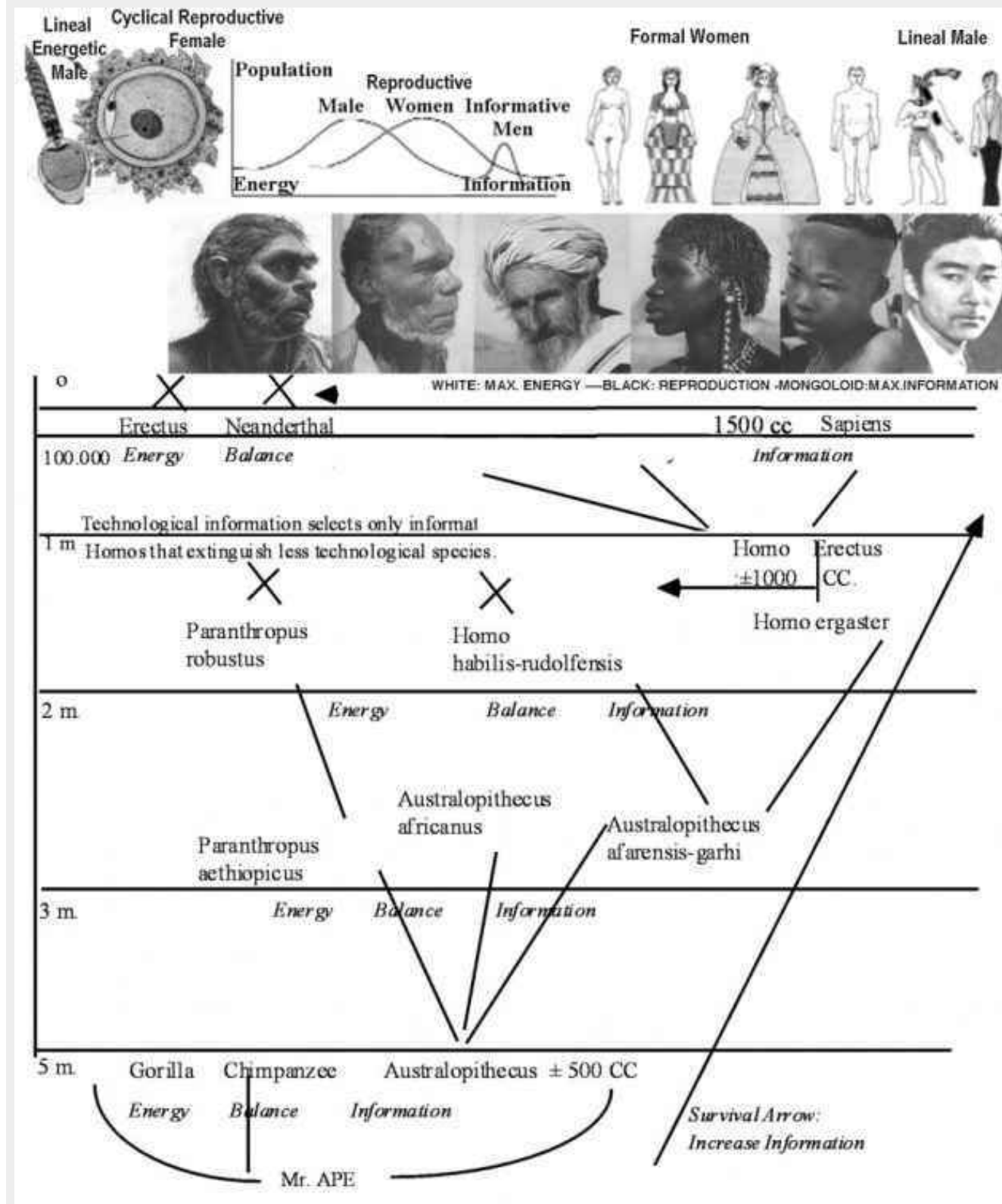
– Width (S_z) = Maximal Balance (Adult Age) = i = Reproductive Age= Energy x Information, proper of waves/bodies/middle re=productive classes, which are the 'most efficient', steady state systems that must control the other 2 for the perfect design of any Universal system.

So I could create a synoptic analysis of all systems and its dimensions, as all physical and biological systems lived in space-time through its 3 'ages or states', of Energy -> Exi-Reproduction -> Information, will have 3 components, and will follow the general laws of 'physiology' that organizes a perfect organism in which the body dominates the system (the wave action in physics, the middle class in a well-organized society, in which the 'informative, neuronal castes of politicians and economists' serve the people, and Nature is exploited for the resources of a welfare state where all humans receive energy and information to survive, as all cells of a working organism does).

How accurate are those laws of Nature and the 'ternary' processes of evolution in time and organization in space of any system, can be observed if we analyze the specific 'differentiation' of the human being in gender, physiology, social classes, and 'evolutionary species.

Anthropology: ternary differentiation

– And so this discovery applied to anthropology solved also the evolution of the human kind, also with 3 morphologies and ages – the visual, lineal neanderthal, the small, informative pygmy and its combinations, the 3 races of mankind:



In the graphs, one of the most fascinating results of Complexity analysis is the solution of the 'Plan of Evolution' based in the 'limited' topology of the Universe. Indeed, in a "2-manifold", pedantic expression that merely means a bidimensional surface, there are only 3 possible forms, which correspond to the morphologies of energy, information and its balanced combinations. So species evolve in those 3 eternal variations of the same theme, from lineal, energetic men to informative women and the intermediate sex, to the 3 human races, to the 3 'topologic varieties' of evolution, to the 3 ages of life, function and form always rhyme. In the first picture we see the 3 'ages' of evolution of most species. Below the differentiation of human species, into energetic, reproductive and informative ones.

Specifically the 'evolution' of the ape into the human being, shows the fundamental procedure of nature in the process of 'differentiation' of species along the 3 'fundamental' possible avenues of a ternary organism: improvements in energy system, information systems and its balanced reproductive networks. Thus the original ape species can be differentiated into 'energetic' stronger animals (gorilla), informative 'australopithecus', and balanced, reproductive 'bonobo chimpanzees', our closest species, dedicated all day to 'fuk' (-;

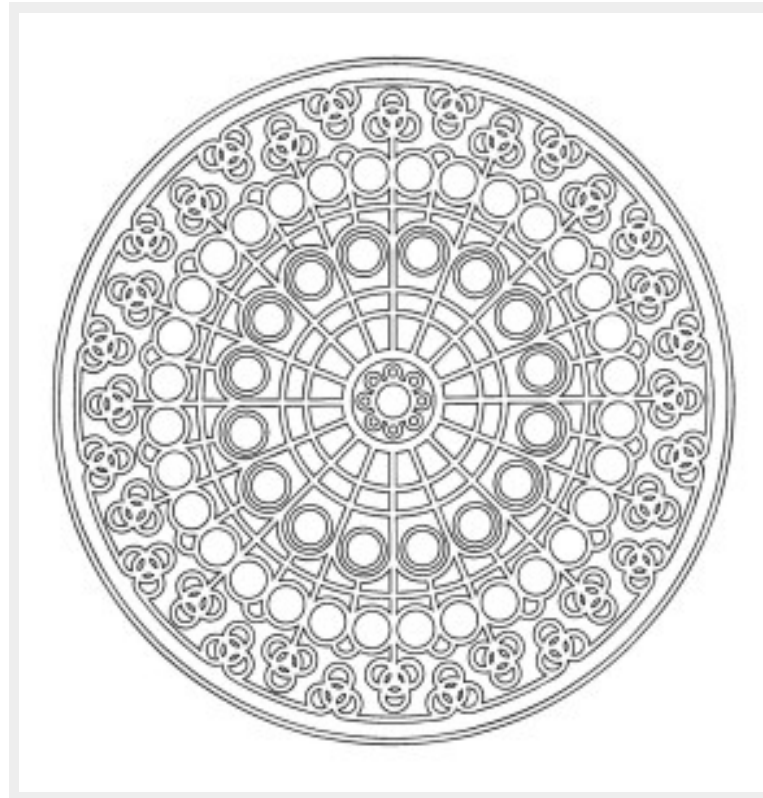
Now contrary to belief, the 'energetic' species is the one normally extinguished, as the arrow of evolution primes the informative species, but FOR A SYSTEM TO REMAINS IMMORTAL, the desired strategy is neither evolve in information or energy, but maintain the steady state by reproducing constantly an equal system. This wisdom found in history only among Chinese Taoist masters (the closest culture to the laws of the yin-information yang-energy universe), which repeated its cycles of history dynasty after dynasty, and have become the most successful tribal species of cultural mankind, however is hardly attained in the Universe except in very wise systems (spiral galaxies, immortal cellular systems, taoist philosophers, etc.). Yet the knowledge of the physiological causes of death – the exhaustion of energy by selfish informative neurons/upper classes – is essential to control and maintain a system in the point of immortality. In any case, humans did evolve informatively and rejected the balanced and energetic states of evolution.

And so in the graph we can see how in III Horizons of increasing information, equivalent through the 3 ages of life (500 cc australopithecus, 1000 cc homo erectus, 1500 cc homo sapiens) mankind arrived to the final racial differentiation,

in which the dominant informative verbal homo decoupled into:

- White, energetic, visual race/cultures (with higher mixture with Neanderthals in Europe).
- Reproductive balanced culture (black people, mixture of all other races after the ‘circumvolution’ of the old continents by the original verbal Homo – mitochondrial pigmy woman)
- Informative, mongoloid culture (mutated in the higher tibetan-altai steppe).

MANDALA II: What is the Universe?



That profound question had for very long a simplex answer, a ‘space-time continuum’, provided by physicists.

They described the Universe as what it is contained in 3 dimensions of space, length, width and height which last a duration, the dimension of time.

So far, so good. But reality, we knew was more complex than moving in 3 dimensions of space, with a duration of time, $v=s/t$, the concept of a physical universe.

We were also ‘evolving in time’, changing in time, living and dying in time, and the answer of physicists didn’t provide a clue about that.

So here it came to the rescue ‘systems sciences’, and biology, and theory of information, which started to study, all those other changes=time processes which were not concerned with motion in space, $v=s/t$, and its duration

Evolution came, and we learned that there was besides the energy needed to move in space, information, form, that also changed much slower but more meaningful.

And so it came the concept that besides the present, there was a ‘past time’ and a future time, and both were connected through the constant evolution of form of information, through the succession of life and death cycles.

This meant Time not only space had 3 dimensions:

past with less information -> present, physical time motions ->Future old age of information.

And so now we had 3 +3 dimensions, 3 of space, length, width, height, and 3 of time, past with more energy, balanced present, future with more information.

It came then to the realization of scientists that time-spaces were of many scales of size, from particles, to atoms, to bacteria, to humans to stars and galaxies and beyond. And so we could call each of those scales of space-time a ‘space-time’ plane, and the sum of all those scales would be another ‘dimension’, which this author sometimes calls the 5th dimension, but more meaningfully as they are of a complete different type, should be called i-dimensions, dimensions of information. And as it turns out, most organisms of the Universe are ‘created’ across 3 of such dimension. In your case, your cellular scale, ‘i-1’, then your individual scale of your i, and then the social scale of you and others, who form part of a bigger social organism.

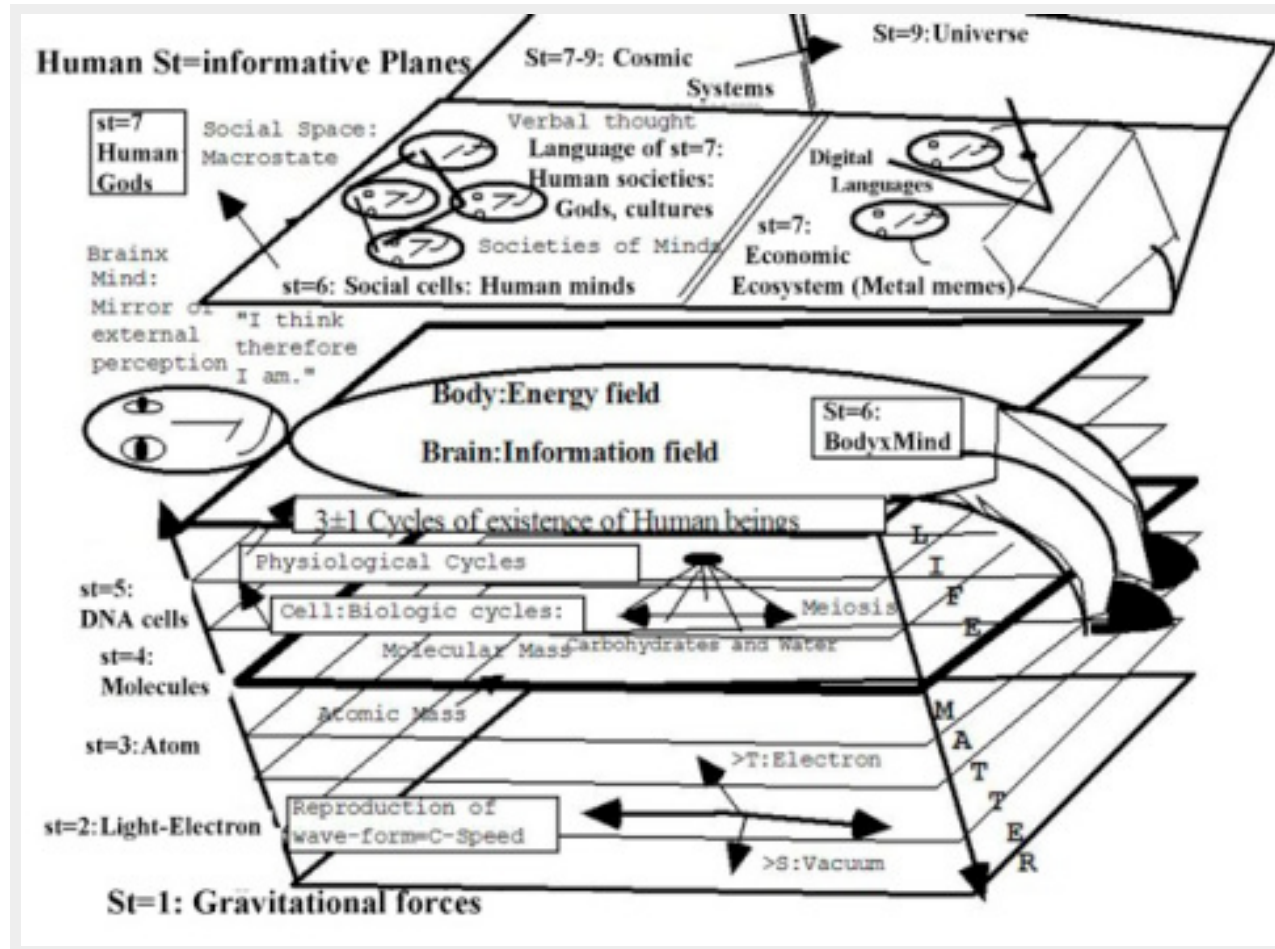
And any system you would study would co-exist on those 3 scales, which in physical systems are the atomic, matter, and cosmic scale.

± 1 scales were thus 3 scales, 3 new dimensions, and now we had 3 x 3 dimensions, of space, of time, and scalar complexity.

And so to understand the complex Universe with all those 'slow changes in time from past to future' and relative scales of size 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':



In the graph, the 'compactified' easier form to represent the 10 Dimensional Universe is a fifth dimensional approach since it can use most of the equations realized by classic Simplex Sciences (Relativity physics with a single time dimension of present, derivative duration; and 3 of space) Thus the best introduction to complexity

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.

And so complex sciences are just the same sciences that simplex sciences, but studying its elements with a deeper, all encompassing vision of all its systems and relationships across 3 space dimension, 3 time dimensions and 3 scalar dimensions. The whole 9 dimensions, then can be observed all together as a 'whole' and so that 'whole' vision which in fact in most systems is represented by an integrative, gauging, informative head, particle, soul, centre, point will, whatever you want to call it, would be the 10 dimension a new beginning an integrative whole that act as a point-cell of a higher social scale.

In this manner all systems were chained and we could translate this in a simple equation of chains

$$\sum i-1 = \prod i=i+1$$

All systems thus existed in those 3 scales, and we also humans lived and died in those 3 scales, born as seminal seeds of the i-1 scale, born again as individuals members of an i+1 social scale.

And the study of the relationships between the human i-individual and i+1 social cultural scale with its political, economic and ecologic networks that form the Earth's super organism, is the purpose of social sciences.

Whereas History is the 10 Dimensional Superorganism of Mankind, seen from the perspective of the Whole:

$$I+1 (\text{Earth}) < I (\text{History}) = \sum i-1 (\text{Humans})$$

'The Universe is 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). 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 more 'scales' of spatial size, from the quantum microcosms to the cosmological scale.

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': $Se \times Tf = i$.

What this means is that the i -dimensions of scalar complexity do have a 'metrics', a 'quantity' that remains invariant as we travel through those scales, becoming larger or smaller. Since smaller beings move faster and have higher metabolic rates than bigger entities. So the product of their 'relative energy' and 'information' (stored in the cycles and form of those clock-time cycles) remain invariant, and so systems can 'co-exist' in several scales of i -reality.

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

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.

In that regard 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 are also dimensions of space. This fact 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; 0) temporal and hence cyclical dimensions (we measure duration by its inverse, cyclical frequency), and especially organic, complex, C_i , scalar dimensions, which physicists totally ignore.

– The second 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 acquire 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:

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

Whereas energy is considered an expansive motion in 'flat space', ΔS ; 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:

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, duration/frequency, $\partial T = 1/f$ 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 information, 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 information, 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, \Leftrightarrow , 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.

Youth-Past : Max.E \Leftrightarrow Max. I: 3rd Future Age.

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

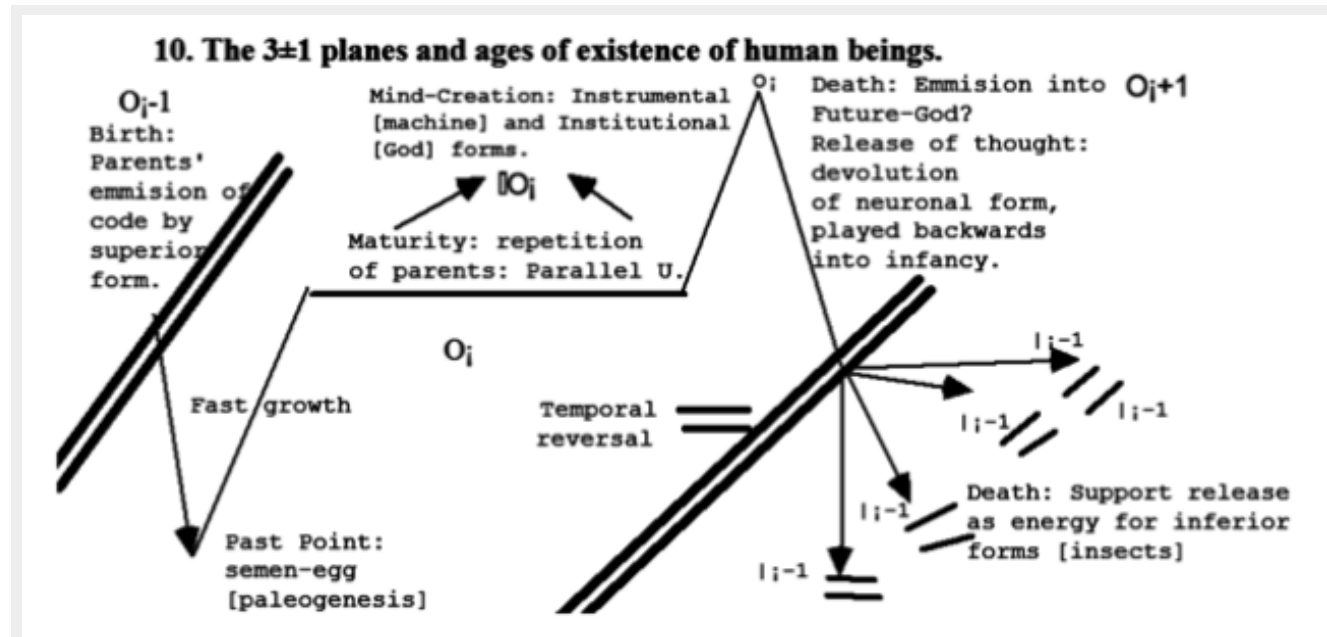
We not only move through space dimensions, during small intervals, but also our slow evolving inner dimensions grow as any other system, traveling first after conception through the i-1 cellular fetal state, then emerging in the i-individual scale, and after an energetic, young age, as information increases, 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 consider a sample of 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 world line.

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 world cycle of life of 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, $\Sigma i-1$, which will feed another world cycle.

When physicists study motion in space-time, it is all reduced 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.

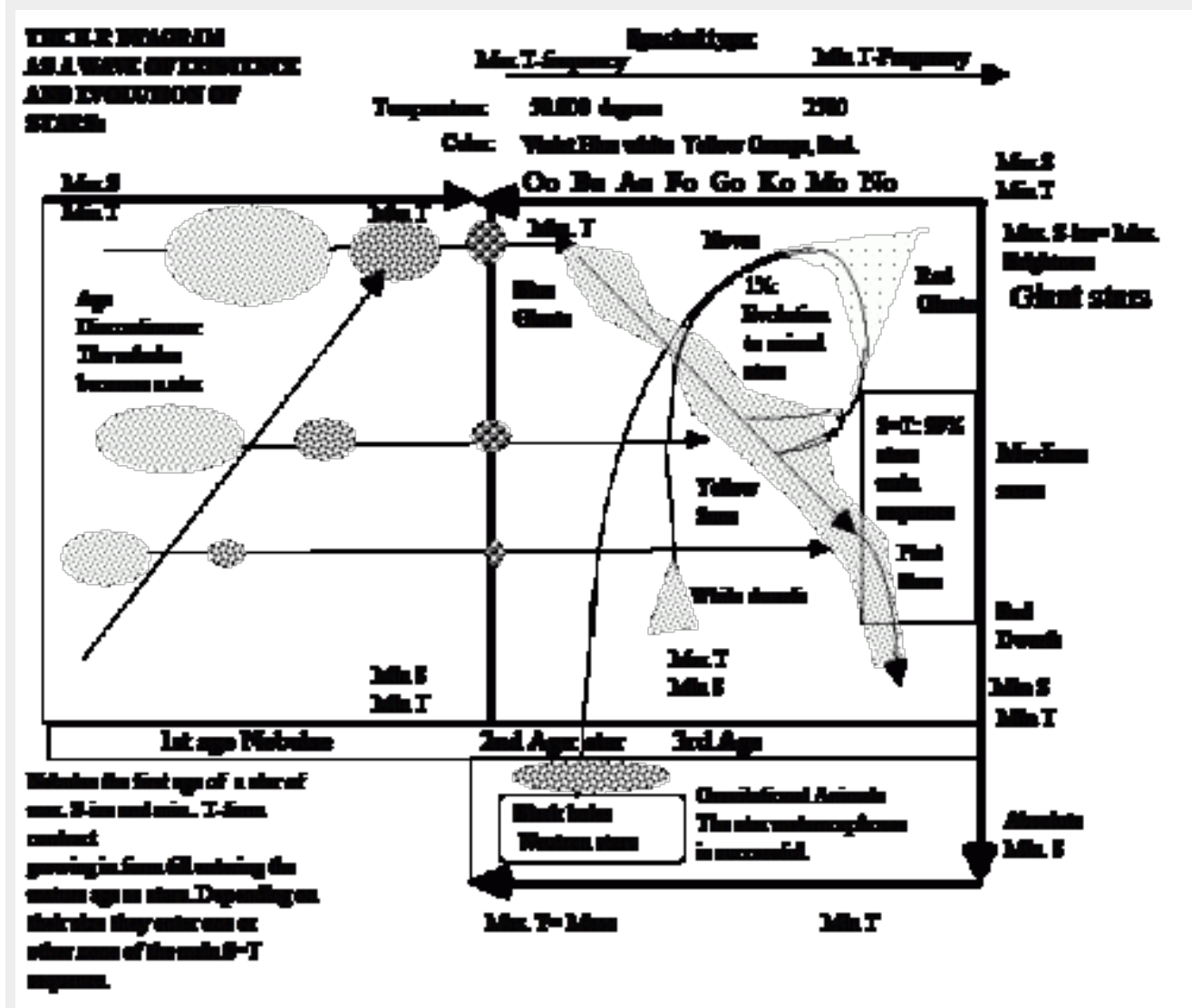
When we widen that description to a 10 D motion, we obtain however a 'world cycle', as the world line becomes more complex, curved in more dimensions.

Yet the main difference in what it means a translation in 4 Dimensional 'Physical space' and 10 Dimensional 'Complex space', arouses 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...

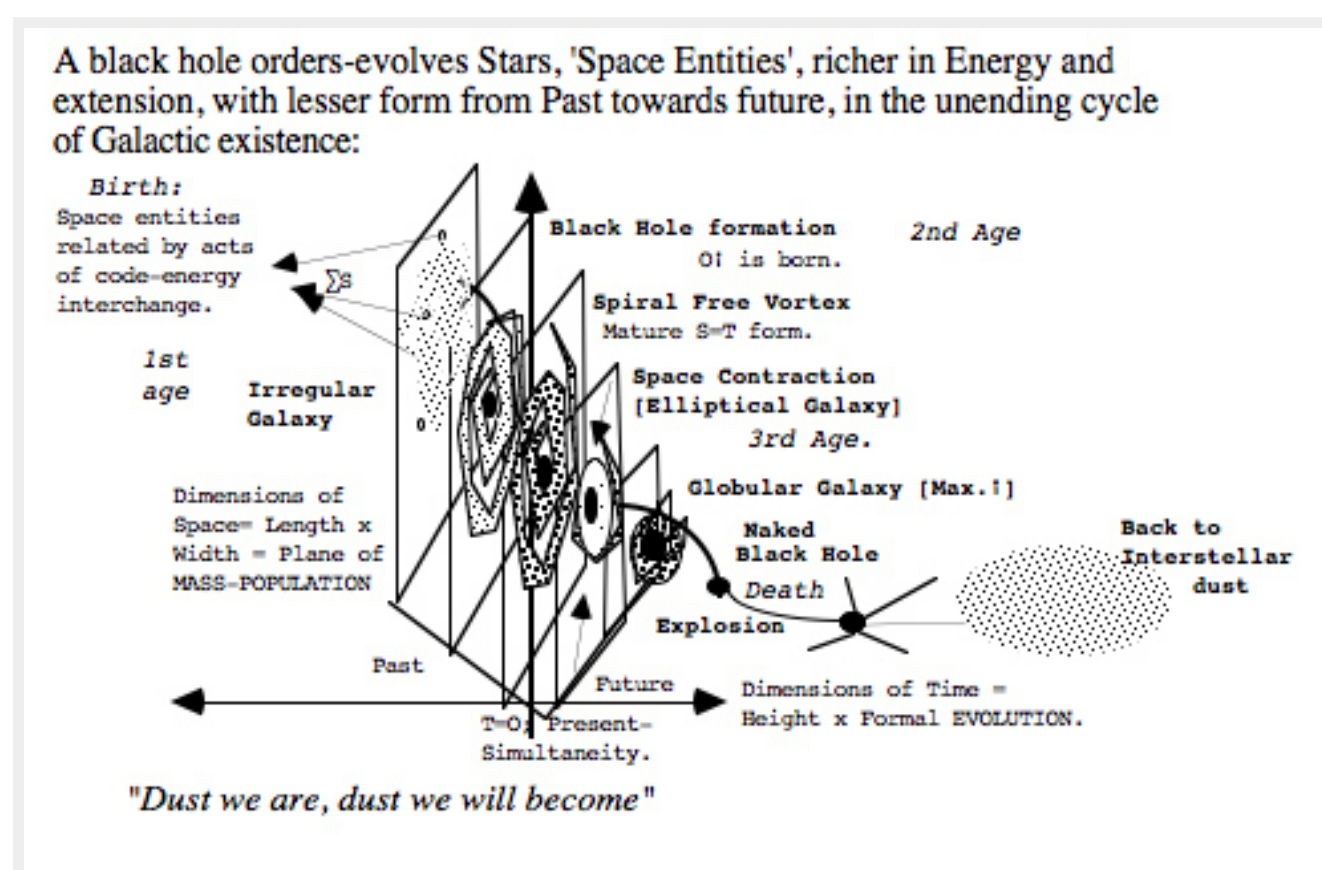
This outdated model of absolute background dimensions is thus replaced by a fractal model of dimensions. Each entity of the Universe is made of a relative amount of 'vital space' and last a quantity of 'time' as it grows from its seminal scale to its individual and social scales, where it evolves and interacts with other similar entities. We are thus 'vital dimensions', we are made of them and their motions. And so all what exists follows the generational-life cycle:

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.

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



and we can show a similar evolution in galaxies:



In the graphs, some of the 'life-death, worldcycles' of fundamental 10D superorganisms of physical matter – stars and galaxies.

The existence of worldcycles or actions that develop in 3 states or ages, Max. E- > E=I -> Max. I, between seminal birth (Max. i-1) and extinction (Max. I < E x 0i), has introduced us into the algebra in 10 Dimensions, with easiness. But we require more complex conceptual 'jumps' from the simplex physical continuous world to fully grasp 10 D algebra and go easily through the development of the different 'motions in 10 D, across its space, time and scale dimensions.

Since existence is merely different trips of 'systems' made of energy bodies and information heads, which change their dimensional parameters.

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.

We are indeed exploring the fundamental equation of the universe, the one that generates all its systems; the equation of its 10 dimensions.

Let us now formalize that equation, from where the ages of life appear:

$$Se \times Ti = Ci, \text{ Max. } Se \times \text{Min } Ti \text{ (Youth)} > E=I > \text{Max. } I \times \text{Min } E \text{ (3rd Age)}.$$

Calling it the metrics of the 10 Dimensions.

By this we mean, the Universe of scales must have a 'metrics' an 'invariant' rule of measure that allow to travel through those dimensions. And in deed it has: the constant combination of energy and information, space and time, lineal and cyclical motions, bodies and heads, fields and particles create 'constant beings', constant 'systems', and if we plot them all they still show a common property:

The inversion of the properties of its body-head, field-particle systems, of its

space and information, such as we grow in scale of size, we diminish in our 'speed of time' and information, and vice versa, as in a mandelbrot's fractal, the smaller we become the faster we process information, the faster our clocks of time run.

But the sum of both is equal.

This key philosophical question will be now considered from different perspectives.

Let us consider the Life wave, as a product of the energy and information of a system through its 3 ages, the product of both, $E \times I$, fluctuates between zero (birth in seminal $i-1$ state), as it reaches a peak at $\text{Max. } E \times \text{Max. } I$ ($e=i$), in the balance maturity and then as information increases, $e \rightarrow \infty$, back again to zero in death...

Yet for the total Universe, we can consider that both, $E + I$ (the sum of energy and information bits) and $E \times I$, if we add the maximal points of all beings (as there will be herds of them in all its ages), will also be constant.

And this metrics for the whole reality ($E+I=C$, $E \times I=C$), where E is the inverse of I (So as one grows the other diminishes proportionally in terms of quanta), and the Universe tries to keep itself in the maximal point or steady state maturity $E \times I=C$, is what we call the Metrics of the 10 Dimensions, responsible for the immortality and infinity of the Universe.

Thus we write:

$$S_{x,y,z} \times T_f = K_i(0 \rightarrow \infty).$$

that is regardless of what i -scale we are, the product of the spatial size and informative speed of ALL our systems remain the same.

While for each individual ' i ' quanta, there will be a life-death fluctuation, from O_i in the seminal conception, through birth at $i=1$, to the $\text{Max. } E \times \text{Max. } I$ ($E=I$) particular for each species, back to zero in the moment of death.

And this co-invariant Metrics, $S_e \times T_i = K$, the product of the spatial energy and informative time of a system remains invariant, is the fundamental equation or 'metrics' that puts together all those scales and allows the 'travels' in time through the 10 Dimensions of its beings, its life and death cycles that intersect and transfer energy and information among them, in points in which a 'simultaneous K -value is encountered.

But the metrics are not only theoretical, they are observed in all systems, and for that to be clear, we must fully grasp the duality of

Space-Expansive motion in Time (Past)=Energy

And

Information-Implosive motion in Space (Future)

The fractal, scalar Universe and its co-invariant metrics.



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

The i -scalar dimensions of space-time' are dimensions of spatial size and speed of temporal clocks that carry the information of the Universe in the frequency of its cycles.

– By spatial energy we mean 2 parallel concepts, perceived in different ways: Static space that defines size, perceived also as a sum of lineal motions or 'Energy'. Since space is the 'continuous', static, whole perception of infinite quanta of moving vacuum energies: $S = \sum E$. Thus space distances and lineal speed motions mean the same. So astronomers say Universal space is 'expanding' meaning that galaxies are moving away.

– Temporal information means 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 processes, as it happens in computers, complex system of time clocks, whose logic cycles 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; $T = \sum I$.

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

And 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’).

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.

Metrics of i-scales: invariance of information.

What are then the metrics of 10 D Universes? 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:

Se $xTi (S=I) = \text{Max. } Ci$

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 ‘ $\text{Max. } i-1$ ’ (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.

And so we can combine this new insight on the flows from past to future of time worldcycles to go further in the analysis of the life-death cycle, of a beings specifically in its most important scale, the individual scale.

As we can see how those $e \rightarrow I \rightarrow E$ life-death arrows 'subdivide' further into 'ages of life' or states of matter:

i: Its individual scale, where it will go through 3 'states or ages':

To then

$I \rightarrow E$: explode into death and return to its cellular scale.

So we can finally elaborate this more complex vision of the Universe resuming the 3x3 dimensions of 'complexity studies':

we consider the life of any of the organisms seen static in space, as a worldcycle through the 3 dimensions of time, from past to future:

Energy (youth-past) \rightarrow Maturity (exi) \rightarrow 3rd informative age of information.

This is the translation of the causal order of a life death cycle. 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.

We are born as seeds of information in a lower $i-1$ cellular scale, emerge as individuals that go through 3 ages, the age of motion and energy or youth, that increases its information, through a mature balanced age, $e=I$, of maximal existence (Max. ExI), till information dominates energy exhausts it and the being, all information with no energy collapses in death, regressing back into the past-energy, and completing a 'world life cycle'.

Thus the development of this equation of 'the 3 dimensions of time' and its symmetry with the 3 'dimensions of space' with its multiple implications enlightens deeply our understanding of time and evolution with new formal and logical tools which our 'present' models of time lack (reason why sciences treat many causal 'processes' of time from past to future as 'separate', unconnected events).

It is thus obvious that many of the cycles studied by science can be reduced to changes of energy and information state from relative less evolved, past energetic state to informative states and vice versa.

This bring us to the fundamental Theorem of complexity:

All phenomena taking place in a relative i -scale (species) of reality is a manifestation of the program of existence, which has its equivalent in all other i -scales.

The Universe is self-similar across its relative size of its i -dimensions.

If we qualify this i -dimensions as the '5th dimensions of complexity', as we define 4 as the dimension of time (without detail), then we talk of a 'metrics for the 5th dimensions of scalar complexity, such us:

$E_n \times T_f = \text{Constant}$.

That is, as we become smaller, our 'time speed or Frequency of Information

Which will establish the fundamental possibility of all those 'new scales' of space-time: the chances to travel through it, by 'growing in size', or accelerating in time.

The two 'motions' between scales, $I \rightarrow E$ the equation of dissolution, followed by the equation of reproduction, and $I \rightarrow E \rightarrow I$, the equation of reproductions.

Here we see the first element of the logic of time (motions between scales of energy and information, relative past and future).

Let us then define with the 'two fundamental' motions of time, past-energy and future-information 'Existence' as a travel through 3 scales of social evolution, through the 3 ages of life as we rise in informative height and fall back into a flat corpse of energy, dissolved into its cellular plane, between birth and extinction.

And so we define a mathematical 'function of existence', that describes each of

the 'beings that exist' in such Universe:

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

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, 'E_{i-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, 'T_i' 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.

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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'.

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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):

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).

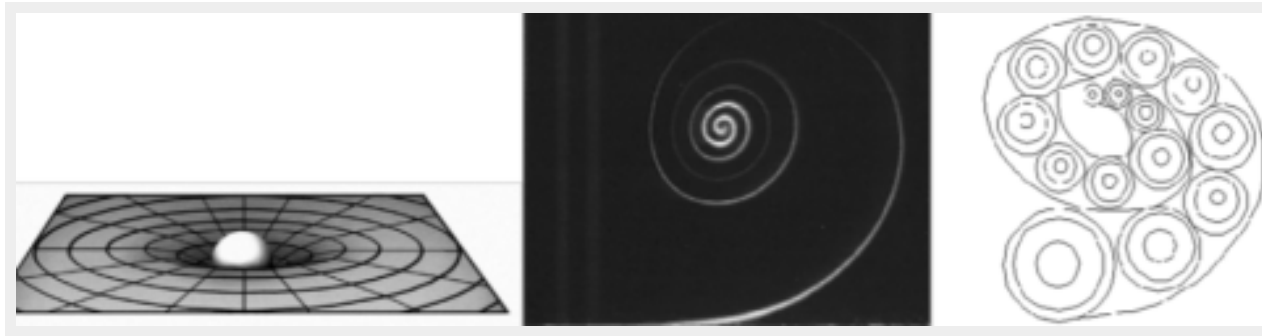
– Time clocks with more dimensional form, and cyclical motion that close into themselves, which are perceived as information carried in the form and frequency of those cyclical clocks when not in motion.

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.

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 world cycles, life cycles.

This in complexity motion is a 'living process'.

III. THE BASIS. TRINITY: ENERGY, INFORMATION & ITS CONSTANT COMBINATIONS

We already mentioned that the key elements for a 'synoptic' description of the 10 dimensions of the complex Universe (in which all others are inscribed) is the full understanding of the 'symmetries' across spatial, temporal and scalar dimensions that occur and we call 'energy' vs. information states, such as:

Information=Future = Implosive Time Clocks; Space=Past, ExpansiveEnergy

Yet, it is its combination into 'actions' of energy and time (ExI), and limbs-body-head, field-wave-particle- ternary systems, as action-waves of present, what fully reduce the Universe to its better understanding a a universe of 3 formal motions.

Existence' both in physical and biological systems is a 5D travel, since all systems are seeded $(Max.I \times Min.e)^{i-1}$, emerging at birth into its $i+1$ scale, to live 3 ages, as they change its relative exi proportions, till exhausting its energy and dying in a time reversal, $I < E$, to its $i-1$ past 'cellular-wave scale.

Time is motion and so we distinguish 3 relative types of time-motion:

=, A repetitive time motion that 'doesn't change beyond spatial translation reality. This is measure by Duration of an event or its inverse, frequency, preferred in complexity as it reveals more 'information' about the entity that displace and its repetitive steps or waves. This motion is a present motion.

<. Decelerating, expansive, entropic motions and

>its inverse, informative accelerating vortices with more dimensional form (masses, charges, eddies, cyclical informative processes).

Causal laws, embedded in a simple equation of time dimensions, further connect those three relative dimensions of 'time motion':

Expansive Entropy (relative past) < Present, steady state > Vortices of Information (relative Future).

The 2 primary elements of the Universe, energy and information, mix and evolve, till reaching the threshold of complexity that gave light atoms living properties and now it is about to give the same life properties to metal systems. In the graph, in biological and morphological terms, we can easily recognize the 'bodies and heads' of humans, animals or machines, because they have a clear morphology, which corresponds to that of generic energy and information.

Energy is lineal because the line is the shortest distance between 2 points; and so it is also the fastest energetic movement. Information has cyclical forms, because cycles store maximal information in minimal space.

For example, a human body and a machine body, a weapon, should not have anything in common; but if we observe the morphology of both, it is clear those morphologies correspond to the generic morphology of all energies: they are big, lineal systems that move in space. So our limbs are lines extended in space like a 'missile'.

On the other hand, our eyes and brains are smaller and cyclical, like the cameras and chips that act as information organs in machines, ordering 'bodies of metal' with digital information. The functions of those 'systems' are also biological. Weapons are lineal, energetic forms that kill human, energetic bodies.

Both compete in a war and the 'metal-energy' species wins and kills us, causing the biological process of death. So weapons are lethal, machines and should be repressed as we repress biological predators and killing virus. Yet Mechanism affirms that machines are objects that do not influence or compete with humanity. So, if some 'collateral effect' happens, it must be blamed on humans.

IV .THE METRICS OF Cxi 10 D UNIVERSES

Topological Spaces. The why of geometrical forms... the formalism of the 10D complex Universe.

Space is synonymous of Energies and time of informations:

$$\sum E = S; \sum i=T$$

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, But beings are not pure motions or just made of information. This was understood by Hemingway when he said to Dietritch : "Never confuse movement with action". Indeed, energy 'or lineal motion' is not an action per se. It needs form, in/form/ation to direct it to create a purpose a goal, to change reality. So a Universe of actions require some energy and some information to create a being.

Thus, all what you see will be a combination of both, and so we write a general equation to define all: $\sum E \Leftrightarrow \sum I$, and state that all what exists is structured with 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.

A further proof that we are in the right path thus 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.

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.

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, visnhu 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 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, $Se \langle x \rangle Ti$:

I-Limbs $\langle \emptyset$ -Body \rangle O-Point

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:

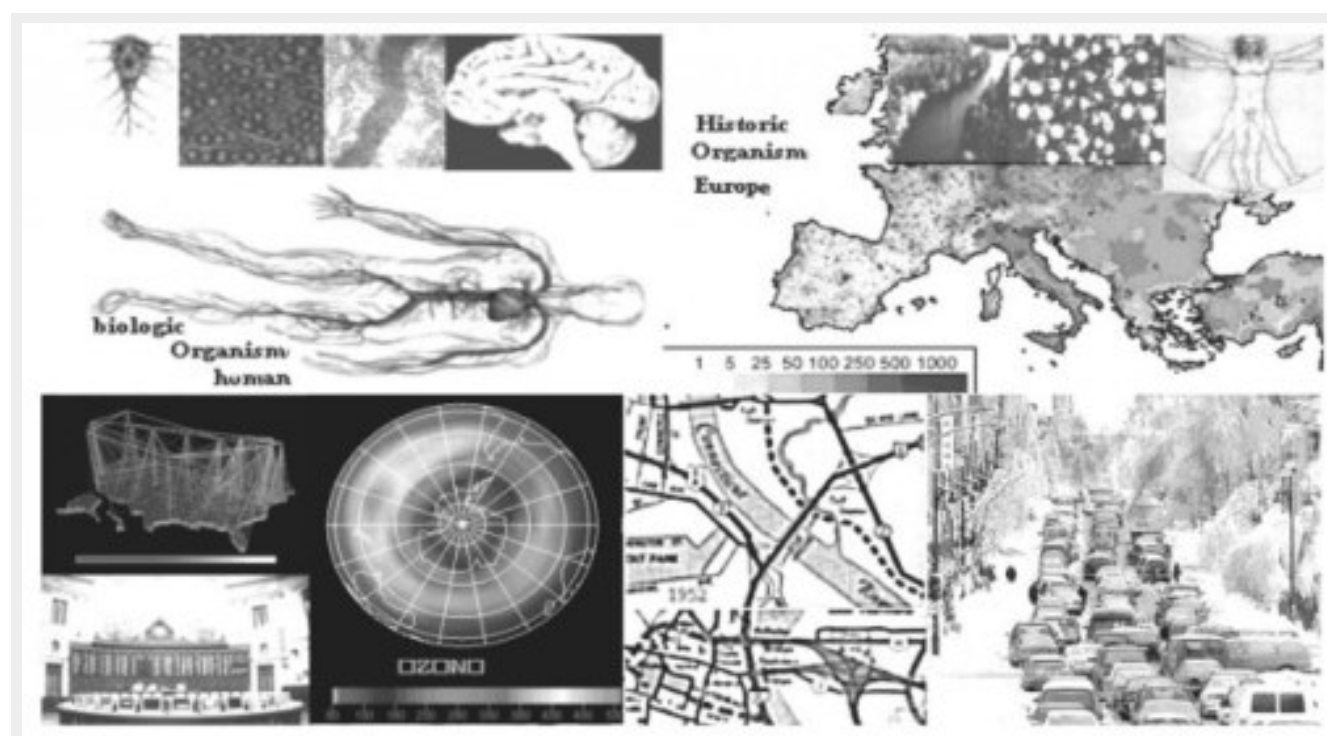
— Energy organs are lineal systems with minimal 'form' that kill, simplifying information into energy. Thus, a field of energy, released by a physical particle or an energetic weapon, such as a sword or a missile and a top predator, energetic animal, such as a lion, will have both lineal forms and kill,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

— In-form-ative organs create form and trans-form 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.

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.



In the graph an example of super organisms studied by social sciences, even though the lack of development of complex scions apple 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 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 digital robots, that will become organisms, and at social level as the reproduction by company-mothers of machines and its evolution is displacing man on fields of labor and war.

This helps us to introduce the larger view of species as superorganisms 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 followed 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 new scales of complexity and integration,

In the graph, Species are Σ herds born from a first individual 'seed' that evolves through $3\Sigma_{\pm i}$ 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 *vernanimacula*, the 1st mammal (shrew), 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.

-ExI. 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. ExI 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 $\Pi[Exi > exi]$ (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.

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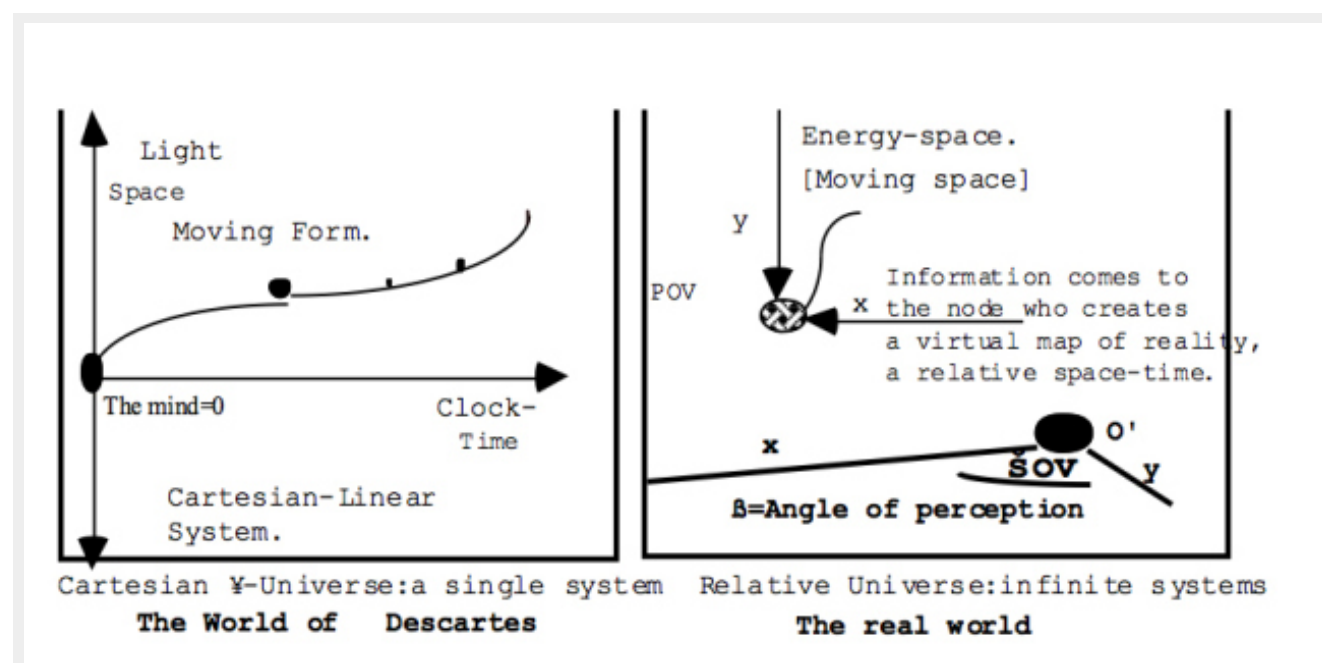
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Finally we arrive to social sciences, and here, we have the lesser development in their understanding of what is man and how man.

Conclusion. 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:

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 arithmetics 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 so Saint John said,

And god, 1st person, the word, 2nd person, became the mind of man, 3rd 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 reflect 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.

So for example, 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: 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, $Boson \Leftrightarrow Fermion$, 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 that 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 (S_x, S_y, S_z, T_{pr}) analysis of the Universe.

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

Evolution would be a D6 ($S_x, S_y, S_z, E \Leftrightarrow T_i$) theory.

The Trinity Mystery would be a D3 ($\sum E_{i-1} \Leftrightarrow T_i$), analysis, and Beethoven's 9 symphony, a D9 ($S_{x,y,z}; E \Leftrightarrow T_i, i_{\pm 3}$) 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 lead 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(T_{pr}), 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 partiture 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 developmend 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 'self-ish 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 (Σ), 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.

The EVOLUTION OF SPACE-TIME IN SCIENCE

Every century mankind gives a big leap in the understanding on the underlying 'elements' of reality, space and time, and the complex structures they create – all of us, which are beings that occupy a vital space and last a duration in time.

In the XIX century it was Darwin and evolution, in the XX century, Einstein and its addition of time as a dimension to create time-space systems.

In the XXI century is complexity, which expands and fusions both the theme of Einstein – the study of the complex dimensions of time – and relates them to the causal processes of evolution – the change in the morphology, the form, the information of beings, and the selection from past to future of the 'most efficient' species.

The putting together of those 2 seemingly different disciplines, which however deal with the same underlying principles, spatial morphologies and time durations, was the work of this writer, in the field of complexity and systems sciences, back in the past decade.

It will take though some time, as it happened with evolution and relativity, to fully understand the enormous r=evolution which for human thought represents the 'expansion' of the dimensions of time, to encompass, the processes of evolution, the life-death cycle, and the morphological laws of biology in the 'fabric of the Universe'.

Complex social scalar fundamental 'laws' are embedded in the fabric of the Universe – which are its scalar time-space dimensions

WE ARE NOT IN AN abstract dimensional background we are made of energy and information.

And this changes completely the present paradigm of sciences, which consider the individual the empowering element and the 'Universal' even a non-existent entity (in the fashionable 'neo-nominalist' school and atomic school of philosophy of languages.)

Not, so systems of organic social nature do exist, 'below' us in simpler systems, as we are after all 'an ambulatory society of some trillion cells', but above us, as Gods of civilizations (the subconscious collective), nations and social structures become 'as real' as our existence in the lower plane of individuals.

All this is now formalized as a series of laws, which explain the relationships between the elements of the different scales of a society. And those laws have the advantage of not having any 'ideological bias'.

Laws extracted from the 'organic, fractal, social nature' of the Complex Universe are of application to connect myself similarity 'real natural laws' of science.

Thus the biggest advance that complex sciences brings to all disciplines is the harmonization of the laws of nature and social sciences, and the explanation of the whys of the Universe and its laws of evolution and extinction thanks to the 'widening' of our understanding of time and social processes, with the addition of new dimensions to the simplex Universe.

In that regard, while we have always known that there is a past and a future, besides the dimension of present duration which physics studies, and we have always known that in the same 'point of space' co-exist several levels of 'social organization', science has curiously enough ignored for 500 years the logic and mathematical formalism needed to explain together all those 'scales' of space and 'dimensions' time needed to explain properly the Universe.

It was not till the end of the 90s when this writer constructed the formalism of a 10 Dimensional Universe, which co-exists in different social scales that the needed 'step' of scientific thought – a mathematical and logic analysis – did not appear in complex sciences. And it will take a bit longer, according to the long time needed for transitions of this caliber in science (as per Kuhn, the nature of scientific revolutions), for the 'community' of scientist to consider Complexity and Systems Sciences, the 'mother of all disciplines'.

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