GS^2 : 'THE UNIVERSE AND ALL ITS PARTS ARE 10D^i SUPERORGANISMS'

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SUMMARY

Abstract.
The Universe and all its parts, made to the image and likeness of the whole, are ten dimensional Superorganisms.
The substances of those Superorganisms are lineal space=energy and cyclical time=information, 2 dual concepts that express the fundamental duality of the Universe between lineal distances/motions and cyclical clocks/forms. The mind perceives in stillness the moving energy of the vacuum as lines of space=distance – the shortest geometry between two points - and the in-form-ation of the Universe carried in the temporal, cyclical clocks and frequencies, traced by vortices of charges and masses, as spherical particles – the geometry, which stores more information in lesser space. Yet the substances of reality are quantum, lineal forces of energy and cyclical vortices of time, which combine to create the ∞ complementary superorganisms of the Universe, all of them made with spherical particle/heads of information sum of multiple time cycles, fields/limbs of energy that move them & waves/bodies that reproduce the system.
As a result of this duality all systems perform only 2x2 type of dimensional actions: Individually they absorb Energy for its body/limbs (feeding/motion) and Information for its mind; socially they use their surplus of energy to reproduce its form, (ExI) and they gather in herds around networks of energy and information that distribute efficiently those 2 elements, creating bigger whole superorganisms, fitter to survive than the individual 'cell'.
The complex sum of all those time cycles and lineal energy motions give birth to the fundamental 'species' of the Universe, a 10D superorganism, composed of 3 elements - heads/particles of information that guide limbs/fields of energy, and combine in waves/bodies that reproduce the system - which extend through:
-3 local, organic, finite dimensions of spatial energy: length, the direction of limbs/fields in motion; height the location of informative particles/heads; and its re-product-ive product, width.
Those superorganisms grow through their 3 diffeomorphic dimensions, which enact its 3 organic functions in time, with a temporal order given by the dominance and increase of its information from birth to extinction, in a life-death cycle of 3±i ages:
+i: Birth in a lower 'fractal scale of space-time'
- Max. E: Past =youth or 'energy age' of maximal lineal motion.
- E=I: Present=steady state maturity, or age of balance between energy and information when the system iterates its form, creating its clonic offspring that makes the Universe both dynamic and immortal=seemingly unchanged.
- Max.I: Future, 3rd age of information, as energy warps into form (forces into masses & charges) till becoming exhausted.
-i: Death: The system dissolves into its parts, in a big-bang of energy that returns its form back to its cellular scale.
Thus, Universal systems extend through 3 ±i scales of complexity, its i-1 cellular, seminal scale, from where they emerge as individuals to become Relative Fractal, cellular units/points/parts of their bigger i+1 social scale or whole 3x3+i=10 D^i superorganism, till death dissolves it back. While from a continuous p.o.v. all those fractal i-scales form a 5th 'classic' Dimension.
Thus all life-death cycles are a journey through 3x3±i relative scales of the 5th dimension; defined by a metric equation, Se x Ti=K, such as smaller scales have more information as its time clocks run faster, but their product remains co-invariant, reason why superorganisms of different scales have the same power and lifespan. I.e. insects perceive 10 times faster than humans but live a maximal of 7 years, which insects will perceive as 7 x 10=70 life years of experience, the humans age.
Thus all superorganisms show 5 isomorphisms: 1) Duality of Energy and Information; 2) Ternary, topological, organisms dimensions of space; 3) 3±i ages and life-death cycle; 4) 4 actions: Max. E, Max. I, Exi, ∑Ex⎍I 5) 3 scales of existence.
General Systems Sciences (abb.GS^2) is the science that studies them.

I. TOPOLOGICAL SUPERORGANISMS OF ENERGY AND INFORMATION

1. The 4th paradigm of knowledge. The organic whys of the Universe.

A deeper explanation of this work considers the meaning of knowledge and what questions it must answer to exhaust the study of a certain subject. In journalism we ask what, who, how, when and why.

The evolution of science implies big shifts in the paradigms, languages and philosophical dogmas we use to understand the Universe. In the evolution of science we observed first 'what' (fact and experience) and then asked 'who'. It was the mythic age of science, the first paradigm of knowledge – when an anthropomorphic being, often a god was the cause of all events.

Then the Greeks used reason to ask the 'what' (experience) and 'how' of things, its causes and consequences. It was the 2nd paradigm of knowledge: logic thought.

The 3rd paradigm started by Galileo with his use of machines (clocks and telescopes), responded to when, measuring space distances and time frequencies in great detail with a single space-time system. The tics of the heart, the stomach, the moon, the atom and the clock are different, but to measure them we needed a unit of time and so we equalized all rhythms with a clock, and to compare the spatial trajectories of those cycles we needed a 'background of space', so we put together all the broken spaces of reality into a joined puzzle, which we called Cartesian space-time. The error of a single space-time came when we forgot those simplifications and considered that the abstract space-time continuum of Descartes used to measure all other spaces and times was the real space-time.

The culmination of this process of mechanical measure came with quantum theory, which refined the measures of the cyclical trajectories of particles in the microscopic world and General Relativity, which refined them in the cosmological realm by correcting the deformations of those rhythms of time and distances of space caused by the limits of speed of our light-based Universe.

In philosophical terms, the paradigm of measure meant the birth of mechanism, the fundamental philosophy of our world today: the machine - no longer man, an organism - became the 'measure of all things'. This was a simplification, as today we realize that machines merely imitate our organs of energy and information with networks of metal-atoms (so a crane is an energetic arm of metal and a chip an informative brain of metal), which now we fusion into 'organic' robots. And so the change of paradigm from the Greek, Aristotelian and Asian tradition of organicism to mechanism is only a hiatus on a richer, more complex understanding of the whys of the Universe.

Mechanism changed also the language of understanding of the Universe, from Aristotelian Logic to mathematical Platonism, since mathematics was the language used by machines to measure the Universe of time and space with clocks and telescopes; while logic was the language embedded in the syntax of words, which measure time with causal verbs that describe the logic relationships between its 3 dimensions of past, present and future. So in terms of philosophy of science, mechanism meant a pendulum law that changed the paradigm from Aristotle (organic, temporal causality) to Plato (mechanical, spatial geometry). This was a wrong choice, because a truly inclusive theory of reality has to put together both languages and approaches as we shall do in this work: the geometric how & instrumental when matched by a temporal why, which must be by definition a causal, temporal process. The 3rd paradigm obsessed by spatial measure was not very kin of such inquire, as Feynman famously put it: 'the why is the only thing a physicist never asks'. And yet the why has always been a fundamental question of knowledge.

That why should respond to the existence of a program of creation, evolution and extinction of the reality we see all around us, which always gives birth and extinguishes the same entities, repeating their forms once and again. What is the purpose of the Universe and all its repeated parts? Why they have those forms and follow always a life and death cycle? Thus, scientists, not satisfied with the limits of the 3rd paradigm of measure kept asking the why, which could not be a personal God (the who of the 1st paradigm), neither the machine, the instrument of measure of the 3rd paradigm ('God is a clocker' said Kepler, because he used clocks to measure it and 'God speaks mathematics' said Galileo, because those machines translated the events of the Universe into mathematical data).

According to *Deism* the whys of existence are due to a personal being, external to the Universe that makes it all happen and cares for humans more than for the rest of His work. According to *Mechanism*, this is due to the self-similarity between the Universe and the primitive machines we humans construct to observe it. Mechanism though needs 'someone' to make the machine, which is not self-generated; so it is similar to deism, reason why the founding fathers of science, all pious believers, adopted it as a proof of the existence of God, which had given man self-similar properties – the capacity to make machines to the image and likeness of the Universe. The problem with those 2 approaches, which in fact are the same is obvious: a personal God is an anthropomorphic, subjective myth and science must be objective; while a mechanical view of the Universe still needs an internal, self-sustained process of growth, creation and synchronization caused by an external God that made and rewinds the clock - as Leibniz clearly stated in his critique of Newton ('Letters to Clarke'). Scientists today are unaware that mechanist theories are in fact deist theories, reason why Kepler and Newton, pious believers, liked them; since they were a metaphor of their self-centered, anthropomorphic religious beliefs: If man created machines because we were made to the image and likeness of God, God had created the ultimate machine, the Universe.

Such theories cannot satisfy the rational, objective, self-sufficient nature of science, as they require external myths to work. This leaves us only with a 3rd objective, scientific possibility, organicism - a more complex theory that comes of age in this work: if the why is neither God nor the machine, there is only a 3rd option in between - the organism, which is an intermediate concept; since an organism is self-sufficient as God is, yet it is part of Nature as the machine is.

So what systems sciences does, is to bring about a more scientific paradigm, in which everything becomes organic; and so God is not required to build an immortal Universe as in Mechanism. Why people who pretend to be 'scientists' still defend mechanism has to do with tradition (the Baconian Idols of the tribe of physics, who initiated modern science without abandoning their biblical beliefs) and with power (machines control the world in our technological civilization – they are the new Gods of mankind; and so they are the 'role models' for our philosophy of science – more than with objective scientific epistemology that *can only accept as a rational self-contained theory, organicism*.

2. A Universe of super-organisms and the 3 jargons of GS^2 (systemic, organic and dimensional).

Definition of a 10 D^i Super Organism

General Systems Science (abb.GS^2) considers that all what exists is part of a whole made to its image and likeness, and that whole is *a super-organism of energetic space and temporal information extending in 10 fractal dimensions of space-time in 3 relative scales of size, the 'cellular', individual and 'social scales*'. Thus what general systems sciences does is to describe the structure and laws of those super organisms, which is the template of all the systems of Nature, and then apply those laws to understand the 'scientific super organisms' of different scales of reality, each one studied by different sciences, from the microscopic scales of quantum physics to the geological and astrophysical scales of the Universe, going through the biological and sociological scales of man. To that aim we need to explain the 3 'sub-elements of the 'fundamental organic system', template of all what exists, defining:

- What is a system of energetic space and temporal information.
- What is a super-organism.
- And what are the 10 dimensions of all those super-organisms.

Those 3 sub-elements of the 'fundamental entity of the Universe' give origin to 3 different jargons, the *systemic* jargon that explains all as *systems of energy and information,* the biological jargon that considers all *superorganisms*, and the mathematical and physical jargon that explains all as *fractal, 10 Dimensional Space-time Island-Universes*. They are used indistinctly in our texts, since they are 3 equivalent jargons focused in each part of the superorganism:

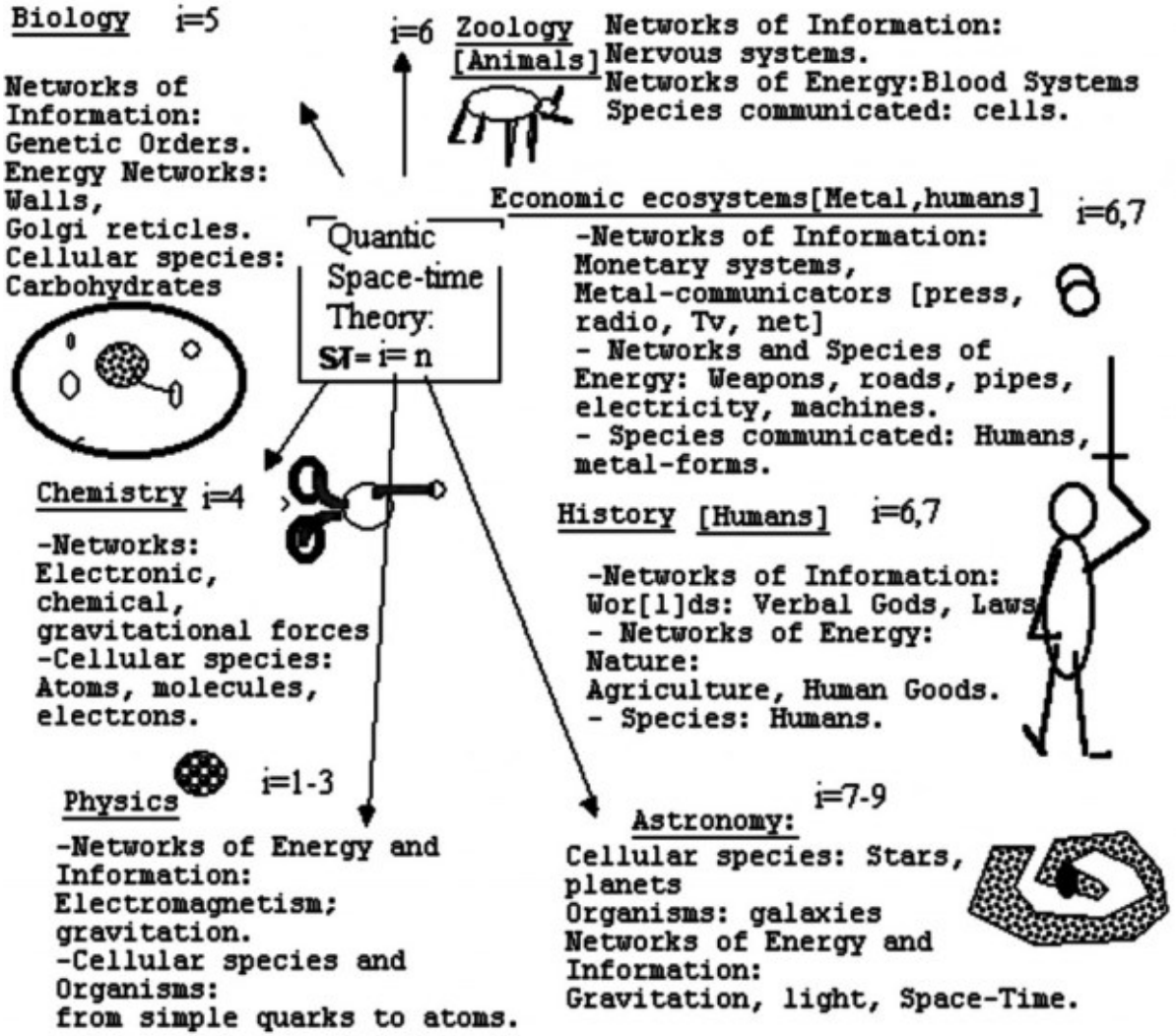
- The jargon of Systems proper, deals mostly with mechanical systems of energy and information; as it was born with the development of cybernetics, Theory of Information and Computer science. This jargon is obviously the commonest and standing, accepted jargon, preferred due to its abstract nature, easily to use when considering systems of machines or economic systems, without any 'holistic' philosophy attached to it. However the scope of this jargon is 'limited' and ultimately does not debunk the 'mechanist' philosophy of reality proper of our 'technological civilization',

which we consider erroneous in its 'first principles'. So this jargon, while being the standard of 'systems' sciences as its name indicates and perfectly suited for smaller analysis of systems, sub-systems and mechanical systems, made by human beings, imitating its own biological organs, it is not well suited to studied the 'Universe as an organic system' and "Nature' and its self-created systems. This jargon also considers the existence of isomorphisms – same properties in different systems, without explaining 'why' they happen. To that aim we need:

- The jargon of biology that defines the fundamental particle of the Universe as a 10 Dimensional Super organism of energy and information. Because this jargon accepts organicism not as a metaphor or analogy but as the homology from where to extract the hardcore formal, mathematical and logic laws of all systems of the Universe, we consider this jargon to be the 'truth' of General Systems sciences. Thus we shall use in our papers mostly the jargon and laws of super organisms, which have been hardly explored due to the lack of a proper formalism to study them; as its description requires new advances in our understanding of the structure of space-time and its 'scales' of size and different time speeds. Mainly the *understanding that there is not a single space-time continuum but infinite clocks of time that break space into infinite fractal parts; and the equivalence between space and 'energy' and time clocks and information, carried in the frequency and form of all the time clocks of the Universe.*
- Which leads us to the third jargon, the formal, logic and mathematical jargon of a Universe made of multiple scales of space and multiple, different speeds of time clocks that defines the 10 fractal, relative 'Dimensions' of all super organisms. In this formal level is where the most novel advances of this science take place, as we need to evolve our understanding of basic concepts such as space and time, its synonymous concepts of energy and information, the nature of fractal dimensions and fractal scales, etc. To that aim we use new tools of 'fractal geometry', non-Euclidean topology, multiple and causal logic to explain the meaning of the 3 dimensions of time, past, present and future – a task developed in our previous conferences on GS^{2o}.

The limits of human inquire in the organic nature of the Universe and the little acceptance of a holistic analysis of reality are due to the poor understanding of the fractal, multiple nature of space and time. Science has preferred due to the lack of formal precision of this more accurate truth, a simplistic, 'mechanist', single space-time continuum that facilitates measure. But this is no longer the case with the advances on Non-Euclidean Mathematics and non-Aristotelian Logic of multiple time arrows, developed by this author. As now we have the tools to reach in our organic vision of the Universe the same degree of precision that the simplistic single space-time continuum and mechanist vision of classic science. And so most of the novelties on hard science of these papers^{0} are found in the analysis of the 'last sentence' of our definition of a super organism or 'system' of energy and information, the understanding of what 'dimensions of space and time' are, and why super organisms are systems of 10 dimensions.

Recap. Any theory of science that pretends to describe the 'whole' must have a sound philosophy behind – which in the case of General Systems Sciences is the fact that the Universe to be self-sufficient, without an external maker, must be an organism - and a formal model of its philosophical statements that translates into mathematical and logical equations its description of its 'fundamental particle/model'. Such finding of a complex formalism to describe the organic properties of the Universe and its parts has been in fact, the main problem of General Systems Sciences. And so this formal model is what we are introducing in our papers, in a series of conferences at ISSS^{0}. The systemic jargon is a 'first step' of depth in the understanding of the organic paradigm of the Universe. It is useful when we deal with scientists accustomed to 'abstract descriptions'. For example, talking of mechanical systems we prefer the 'systemic jargon', as cybernetic and computer scientists do. If we talk of physical systems we prefer the dimensional jargon. But the more detailed, 'real jargon' is the one of superorganisms. So in this paper shall switch to the biological jargon of superorganisms to reach further knowledge of the structure of those universal systems. Thus we define the Universe as a superorganism of energetic space and temporal information extended in 3 scales of space-time with a total of 3 x 3 Dimensions of space that make the 10th Dimension or Whole superorganism. And we explain such superorganisms with the jargon of systems sciences and theory of information, with the jargon of biology and theory of superorganisms and with the jargon of mathematics, logic and space-time physics to better understand the 10 dimensions of those superorganisms and its fractal, scalar structure in space and time.



3. What is a superorganism: definition of superorganisms of energetic space and temporal information.

The fundamental particle of the universe is a superorganism, the structure that describes all natural systems when we achieve all the information possible about such entities, including the Universe - made of ∞ other super-organisms.

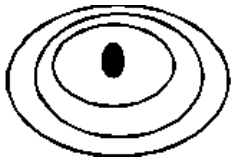
In the graph, in system sciences the fundamental concept of nature is a social organism, a herd or group of self-similar forms, which gather together thanks to their capacity to share the same code/language of information and the same energy. Such herds evolve together in complex networks, which survive 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 superorganisms of reality from simple atoms into molecules, into cells, into organisms, into societies. *A complex superorganism of networks of energy and information'* is the 'fractal unit' of reality made to the image and likeness of the whole Universe, also a $10D^i$ Superorganism. All those superorganisms *(abb.organisms as both concepts mean the same)* are cellular societies joined by networks of energy and information that range from galaxies, which are stars' herds, joined by networks of electromagnetic energy and gravitational information, ruled by black holes; to biological cells, herds of carbohydrates joined by networks of genetic information, commanded by black holes, living in a vital space based in water-oxygen energy processes; to human beings, an ambulatory collection of over a trillion cells, joined by informative, nervous networks and the blood, energy systems that feed them; to human societies, made of human citizens, joined by legal, political networks of information and energetic, economic networks, regulated with financial, digital languages.

Thus a superorganism of information and energy is a herd of cellular species related by networks of energy and information that constantly transforms energy back and forth into information, combines both and reproduces, iterates the system in other zone of space-time. How individual species organize themselves into complex herds, that biology

calls ecosystems or superorganisms? Precisely through those physiological networks, the key to understand any superorganism, including human ones (nations, civilizations).
In the Universe there are many type or such social organisms. Since "energy never dies but eternally transforms itself", superorganisms 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 - a 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 π 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. New, more complex species -the animal and the man- are 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 GS^2 (General Systems theory) is to study the common laws of such organisms, including human biologic and historic organisms (a social organism of humans), and economic ecosystems (a wave of products that interact with humans); trying to design and improve them, from the perspective of what is best for the survival of mankind, our social super organism.
The structure of super organisms: physical, biological and mechanical systems.
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, which form organic societies.
2. Networks that absorb, process and emit energy or vital space (limbs, transports and fields of energy).
3. Networks that absorb, process and emit temporal information (cyclical heads, particles and digital clocks).
4. Networks that combine and reproduce the energy and information of the system (bodies, waves & factories).
When we find those elements loosely connected we call them herds, the 1st step of social evolution; when they are interconnected in a complex, hierarchical system with 3 components (heads/particles, bodies/waves & limbs/fields of energy, we talk of an "organic system". In organic systems cells are very close to each other, and structured in 'hierarchical scales' dominated by the informative, neuronal head; while herds are loosely connected, more 'democratic' and often co-existing in a single 'plane of space-time'. Finally we talk of "ecosystems" of herds and superorganisms, when several entities co-exist in a vital space. Since information is often invisible to those who do not decode its language, we should not be cheated by the loose, spatial appearance of the superorganism. 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. Organic system, superorganism and organism become then synonymous concepts.
The reason we have not arrived earlier to the conclusion that the universe is made of such organic systems is 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. Humans are anthropocentric and self-centered in its scale and forms of reality, unable to believe that microcosms and macrocosms are "living 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.
We can with these concepts make a formal definition or 'template' for any Universal herd, superorganism or ecosystem that we can apply to all the systems of the "vital universe", composed of those 3 social scales of complexity. Each

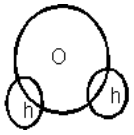
herd, superorganism or ecosystem will differ only in the specific energy or information we put into brackets.

“A universal microcosmic or macrocosmic superorganism 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], extending through 3 relative scales of increasing spatial size and diminishing speed of temporal information: its energetic, cellular scale, its individual, organic scale and its social, superorganic scale”. Fill the gaps with specific species, languages of information, forces of energy & cellular/individual/social scale and we can define any network-organism in the universe:
- An atomic superorganism is a population of (electronic) energy and (nucleonic) information, related by networks of (gravitational) information and networks of (light) energy, extending in the particle, atomic and molecular scales:



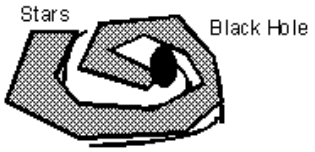
An atom is an organism, with a gravitational center of information, the nucleus, a vital space of energy species, the orbitals, and networks of gravitation and light energy that link both organic parts.

- A molecular superorganism is a population of atoms, related by networks of gravitational energy, and networks of electromagnetic information (orbitals, London forces, Van der Waals forces), spread on the atomic, molecular and cellular scale (biological superorganisms) or the scale of states of matter (physical herds).



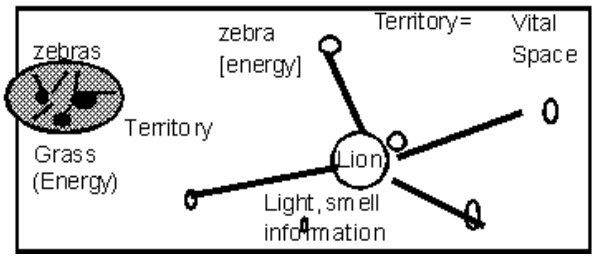
An 'organic' molecule, water, can be defined as a society of atoms, linked through gravitational and light energy and information networks.

- A “galactic organism” is a population of stars, related by networks of gravitational information, and networks of space-time energy, extended over the star, galactic and Universal scales. Their morphology is similar to that of an atom, where the nucleus is the black hole, and the stars the electronic orbitals. And in fact in the complex models of superorganisms the equations of space-time of both systems are similar, opening the possibility of a Universe of infinite scales in which each galaxy is an ‘atom’ of a new Universe of 10 D^i $scales^o$:

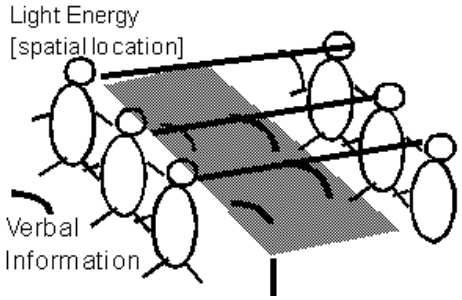


A galaxy is an organism, with a gravitational brain, the black hole, a vital space of energy species, the star orbitals, and networks of gravitation and light energy that link both organic parts.

- An “animal ecosystem” is a population of carbon-life species, related by networks of light information, and networks of life energy (plants, prey), extended on the animal, ecosystemic and Gaia scales:

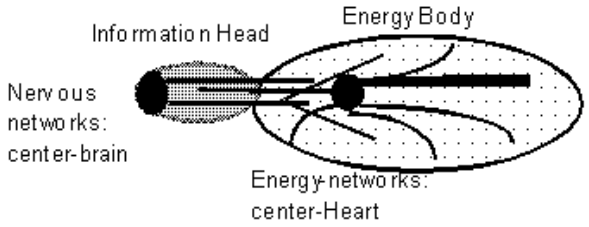


A life ecosystem is composed of several herds of species, each one with its own energy networks [vital-space=territory], which share the same informative forces: lights and smells the common network of information.



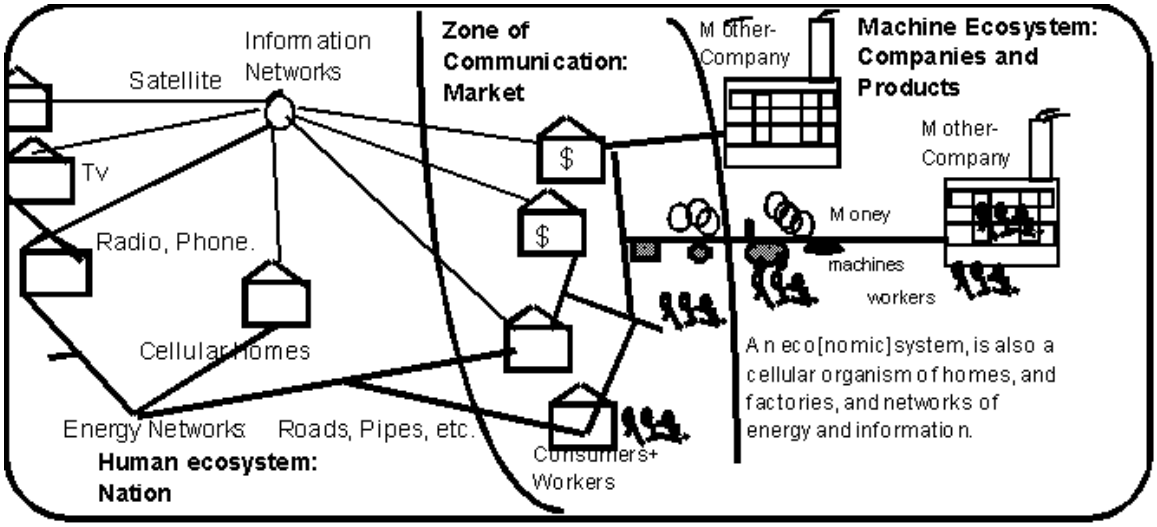
A human group is like a cellular body communicated through verbal codes of information [words, laws, mass-media], and systems of energy [light-spatial location, light based food, such as plants and animals]. We talk of societies as organisms, of a different complexity, from minimal social networks, with a reproductive function [family], to massive, more sophisticated social networks [nations, civilizations].

- A species is a superorganism made of a population of life organisms, related by networks of genetic information and networks of life energy (habitat, ecosystem), born of a first 'individual cell' that radiates into herds, which evolve socially or become extinct by better superorganisms, extended in the cellular, individual and herd/species scales.
- A human organism is a population of DNA cells, related by networks of genetic and nervous information and networks of energy-providing blood, extending over the cellular, individual and social scales:
- A bio-historic organism is a population of humans, related by networks of verbal information and carbon-life energy,



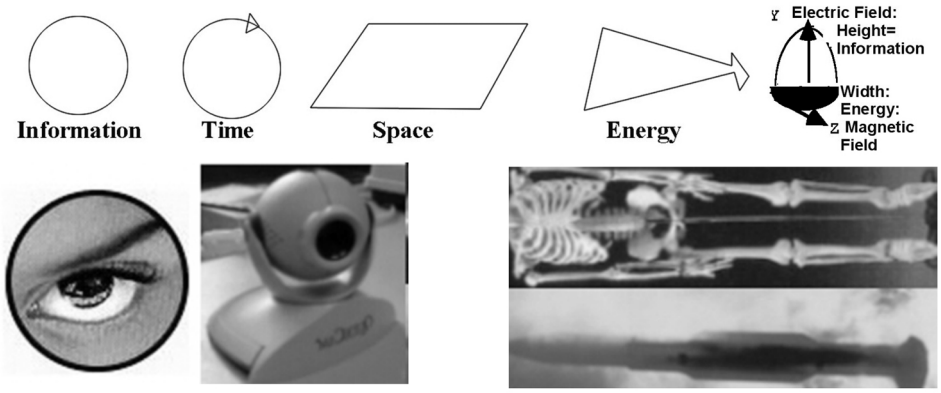
A human being is a herd of cells, distributed into two specialized organs, the information head, and the energy-body; related by 3 networks: the blood-energy networks, the nervous-information networks; and the endocrine-reproductive networks.

extending over the individual, national and planetary scale of the superorganism of Humanity, History, the existence of the human species from the first group of homos that talked to the last one that will die probably substituted by:
- A bio-economic organism, is a population of human workers/consumers and machines, related by networks of monetary and electronic information, networks of agricultural, transport and electric energy, extending in the mechanical, corporative and global stock-market scales:



The main difference between both type of systems, a historic and an economic organism, is found in the main 'organic

unit' of the economic ecosystem, which is NOT contrary to belief a human being or its superorganisms, nations and



civilizations, but a new organization, appeared with the Industrial R=evolution of machines, called the company-'mother' whose function is to evolve and reproduce a product, overwhelmingly a machine – an organism of metal, made to the image and likeness of our human organs of energy and information Thus, while History is a human superoganism, the economic ecosystem is a mechanical superorganism ruled by company-mothers of machines, which follow a set of biological, evolutionary and organic laws independent of mankind; *as the goal of corporations is to evolve and reproduce those machines sold for a price,* adapting the world to the needs of those machines, creating networks of energy and information for them (digital networks, electric networks, etc.) even when the needs for vital space, and the collateral effects of those machines in our environment, collide with the needs of human beings.
All those dimensional systems studied by all type of sciences can now be understood with similar laws derived of the General Laws of all Universal, Complementary systems of energetic space and temporal information.
And General Systems Sciences, also called Complexity is the XXI century discipline that studies those laws, becoming truly a Unifying Theory of all the Systems of the Universe.
XIX century was dominated by Biology and Evolution, with the work of Darwin and Marx, who applied Darwinian concepts to History. In XX c. Physics dominated science with its studies of 'present simultaneous time measures' achieved by relativity, which made time a parameter of space and energy motions. But neither Biology, focused in the study of systems that dominate in dimensional form, and temporal processes of evolution and reproduction of in-formation (life and social systems), nor Physics focused in systems dominated by energy and spatial processes of motion, suffice to understand the full 'picture' of the Universe. Only a science that fusions in its analysis, both elements, energy and information, and explains the Universe as a complementary system in which those 2 'motions' or 'forms', interact together, can extract the most general laws that explain reality. And that is the task of General Systems Sciences.
All those systems have common properties, due to their common substances, energetic space & temporal information.

4. Systems of energetic space and Temporal Information

We are all systems of energetic space and temporal information that combine to create ∞ actions & super organisms
General Systems Theory (abb.GS^2) studies the common laws of all the superorganisms of energy and information of the Universe. So to understand those 2 primary components is the first step to understand a superorganism:
- *E*s, *Se*: By energetic space we mean both space and energy, considered the same reality. The difference between both concepts is perceptive. The mind fixes and sees the ∞ lineal, planar motions or '*energy'* that fill vacuum space – *being motion, the ultimate substance of reality* – as static space, distance and size. The mind maps a 'continuous', static perception of all the infinite quanta of moving energies of the vacuum and puts it together. Thus Space= ∑Vacuum Energies. 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). This will be truth in any 'relative' fractal scale of 'motions that occupy space' and the mind sees as a continuous. So a biological, vital space is seen as an 'individual', while it is merely the sum of infinite circadian cycles and flows of carbon-life dissolved in water.

Thus we shall call both together 'Energetic Space' as 'Energy', meaning 'a sum of lineal motions', is the truth that a single space-continuum simplifies.

- *To,Ti: Temporal information*: In the same manner, Time clocks – cyclical motions - and information - the static forms of those time clocks perceived by the mind - are the same concept. The mind again 'simplifies' to fit in its limited space, all the time clocks of the Universe into 'forms'. Cyclical time, measured by the frequency of its cycles, is the inverse of 'duration': $T=1/f$. And it has the same unit of measure that a bit of information; a 'hertz' or unit of frequency, which 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 its time clocks and informative cycles; $T=\prod I$, and talk of temporal information (and energetic space) as the real two motions/substances/forms/arrows of the Universe.

We call this 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: Es<=>To.

Only then, when we realize that energy and space are the same and time and information are also the same, we can come the conclusion that we are NOT placed in an abstract space-time continuum, but the Universe is a puzzle of entities made of energetic space/lineal motions and clocks of information/cyclical motions, which combine to create infinite complementary systems of 'vital energetic space and informative time-clocks'.

Something quantum physics acknowledges in its fundamental formula, ExI=K, which we write properly as Es x To = K: Energetic Space x Temporal information combine to become an action of energy and time; and we all are a sum of actions of energy and time - balanced, stable, constant Systems of energy and information. So we say I don't have enough energy and time (our substances) to do this.

Thus $\sum Es \times \prod Ti=k$ is the fundamental equation of the Universe that defines all systems as a sum of energy quanta and information bits/clocks ($\sum$, $\prod$ being the operators that aggregate quanta of energy into vital spaces and bits of information into networks). And this 'simplex' equation explains all systems of the Universe, made of 'particles and waves' (Physical systems, complementarity principle) or 'heads/nuclei' and 'bodies' (biological systems).

The formal and functional properties of Energy and Information and its combined body/waves.

Let us consider the properties of those 2+1 systems, energy systems (limbs, fields), information systems (particles, heads) and its reproductive waves and bodies that combine its properties and some of its subspecies:

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 summarize the formal & functional differences between energy vs. information (organs) in a morphologic equation:

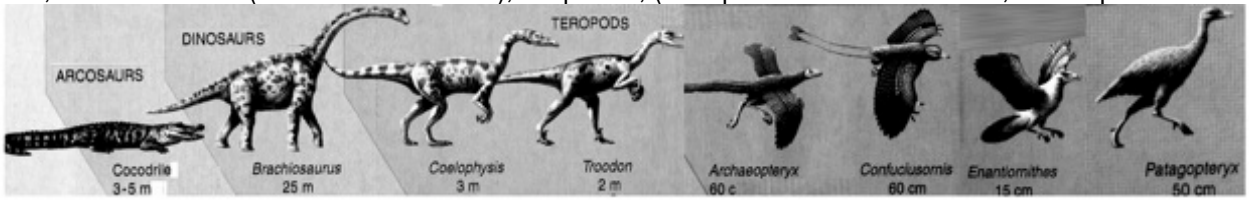
Maximal Space = Energy = Minimal Form=Limbs Vs

Maximal form = Information = Minimal Spatial extension=heads

E=I: Balance between both, 'Reproductive, iterative, 'present' Bodies'.

Those properties are common to every 'particular' system's organ. Information is smaller and processes 'time cycles and logic paths faster'. For example, the chip becomes smaller as it evolves into a better brain that processes information faster. Every 2 years it doubles its capacity to think, as it dwindles in size. But black holes that turn faster and carry more information in the frequency of its cycles are also smaller than stars. Thus the morphology of heads of information 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 in-form-ation, 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) & information (brains, eyes, senses, words), but all beings, even 'deconstructed organs'. Since we can recognize geometrically their energy or information organs. Some of those systems are mechanical, made of metal. Some are vital, made of carbon atoms. Some are physical, geological. Yet all of them have a biologic influence over us, provoking changes in the energy & information systems of mankind that we should control for our own benefit.
Human sages have intuitively understood that duality. I.e.: Descartes said all was made of space or res extensa and cyclical vortices - charges and masses that act as clocks and carry the information of the universe. And he was right.
Eastern religions also understood the dual game of creation, as all is yang, Shiva, energy and yin, information, Vishnu that combine together, exi, to create the ∞ beings in existence (quoting the 1st verses of 'Tao Te King').
All species, sciences, religions and arts play a Game of creation, which is a logic-mathematical function: to Exi=st. That is, to combine energy & information (exi), creating constant, stable superorganisms of space-time (st).
Yet the function exi is maximized when E=I (5x5>6x4…). Thus a top predator superorganism, one that survives better is one that maximizes the balance between body and head, mens sana in corpore sanum: Max. Exi (e=i). And this is the goal of existence of all systems of the Universe, which survive and we see as 'superior forms'. Indeed, it is the classic definition of beauty in art, as a balance of spatial size and form: harmony and proportionality. It is the 'mature age' that lasts longer, after the young age of energy, before the 3rd age of 'excessive form', when systems reproduce.
It is thus essential to understand the properties and balances of energy and information, departing from its simplest mathematical and logic equations that combine its perfect forms, the line of motion or shortest distance between two points, and the cycle or shape with maximal 'form' in minimal space, origin of all other 'conic shapes' of reality, as they are the 'ultimate' essence of the detailed properties of each complex superorganism of spatial energy & temporal form.
It is also important to grasp the 'general' meaning and parallelisms of jargons described those 2 elements, as they change slightly from scale to scale and its forms change as they become more complex, with 'more dimensions' and extend through more 'scales'; but even then they maintain its equivalent forms and functions. Information is 'dimensional form' and Energy lineal motion. And so its two most perfect shapes are the line and cycle in 1 and 2 dimensions. And yet whe we grow in dimensions we find the 2D plane and the 3D sphere, the geometry, which stores maximal form in minimal space, *in which again information has one dimension more than energy.*
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.
Further on, all those systems tend to occupy the 3 different dimensions of their local space-time. Since heads perceive better from a projective geometry on top of the system, the height dimension is the dimension of information. And so all systems guided by the dominant mind-informative dimension evolve in height, from physical systems (planar Universe and planar irregular galaxies evolved by tall black holes of gravitational information into spherical and high dimensions) to life, from individuals (kids who rise to walk), to species, (from planarian worms to men, from reptiles to birds):



Then the dimension of motion is length as it is the lineal motion on the surface of energy the system feeds. And finally its combined exi, reproductive dimension is the width dimension of its diffeomorphic space-time. Those dimensions are obviously local and so they can be even inverted according to what is energy for each species. So animals, which

receive information from light vs. plants who receive energy from light and information from chemical roots have their dimensions inverted: the head of the plant is under the ground, and the animal has it above to 'see' light. And light itself has the electric dimension of information, its height, the magnetic dimension of energy, its length, and the c-dimension of reproduction of its wave, its width, which eyes see as length. The global 3 dimensions of the Universe are the puzzle sum of all those entities moving with its 3 local dimensions.

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.

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 biologic: 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 (in that regard organicism changes radically the meaning of the industrial evolution of machines and the relationships of symbiosis and predation between man and machine->see last chapter of this paper).

We shall use therefore as synonymous, Energy, Space and lineal motion, Es, Se, E, S, |, and Cyclical Time, Information, cyclical motion, To, Ti, I, T and write the 'Universal equation' accordingly: Es⇔Ti, E⇔I, SxT, EsxTo etc. Since using synonymous will help the reader to 'change its chip', its way of thought from 'lineal logic; in which A is always A and only A to think in parallel, and see the unity of all forms underlying its 'appearance'. To that aim he must also change its 'scientific mind' from 'geo-metric, exact measure' to 'topological variations', where motion and form go together and slight variations do not change the topology of the being. And we will return to that.

Energetic Limbs, Reproductive Body/Waves & informative heads/particles.

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:

— Es: *Energy organs, fields or* limbs *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-form-ation of their 'preys'.

— Ti: *In-form-ative organs create form* and trans-form the clocks of the Universe into forms of languages that map out the 'reality of time cycles' performed by all the entities of the ecosystem, in which the species exists, into 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', anticipating the 'future' cycles of reality. 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. *And they dominate, control, guide & shape the future of the system.*

— *Reproductive organs* repeat the 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.
The body, reproductive system might not be though part of the 'integral system'. We observe, most often a 'mother' in a bigger scale (stars for atoms, corporations for machines, mothers for semen) or an external reproductive system (enzymatic reproduction), as in the case of human factories, carbohydrates or atoms in stars. In those cases we will see ONLY the limbic/head, energetic/temporal systems.

But there is always somewhere a 3rd reproductive system, or else the organism will not survive beyond death.
Let us resume some of this 'dual' or 'ternary' systems of energy and information:
- *Physical systems are made of particle with clocks of information and waves that feed on fields of lineal motion.*

In physics quantum theory is a detailed analysis of reality and its minimal parts, as opposed to Relativity that uses a general, simplified view of a single space-time continuum, as it is concerned with the study of the 'whole' Universe, a superorganism whose 'whole' spacetime is the sum of all its parts. Yet in the more detailed version, quantum physicists concluded that Physical systems are always made with a wave that absorbs energy & a particle or clock of temporal information and one cannot exist without the other (complementary principle of quantum physics).
Further on physical systems can be described according to the duality of the Galilean Paradox (all can be seen in motion or stillness) as composed of solid particles, charges or masses absorbing fields of lineal energy seen as extended space, or we can see them dynamically, as a vortex, a cyclical Eddie, which absorbs the motion=energy of a flow of gravitational or electromagnetic forces 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. And this is indeed closer to reality – a Universe in perpetual motion, where energy and information are two type of motions combining and reproducing by the mere act of continuing their motions, creating the infinite shapes of the vital Universe.
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.
Easily proved mathematically combining quantum and relativity equations: $E=hv$, $E=mc^2 \rightarrow m=hv/c^2=K(h/c^2)v$. Thus mass attraction is directly proportional to the v-frequency of the vortex, as in hurricanes or eddies. Masses and charges thus are eddies of forces which turn with a frequency that defines the information of the Universe, acting as the simplest clocks of cyclical, informative time, whose acceleration or frequency of angular speed, w, is in fact the meaning of mass (Principle of equivalence between acceleration and mass of Einstein's general relativity). They are time that curves the lineal speed of a gravitational or electromagnetic field that sinks into the mass or charge, becoming transformed into a magnetic, electric or gravitational field ('Time curves space into masses' said Einstein). And the physical system is 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 is what Newton said the Universe was made of: Forces of Reality= Mass (cyclical clocks) x Acceleration (lineal motions): *F=ma.*
That is, the universe is made of vortices of mass or charges, cyclic acceleration and lineal forces, lineal accelerations: Descartes said all could be described as vortices, matter and 'res extensa', vacuum. So this ultimate duality is the first dynamic structure of the Universe that switches on and off between both states: M(Ti)<->Es.
- *Biological beings* are 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 cytoplasm body that moves it.
- *Mechanic systems,* robots, made by imitation of man's organs, re=produced in company-mothers, have chip-brains attached to camera-eyes that process information with body-platforms that move with a field of electric energy.

- *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 goods the social body needs, using the energy of the Earth.
Each of those systems will process information with a different network of logic or mathematical paths, through particles, genes, chips or brains, attached to a re=productive body that will repeat the elements and cycles of existence of the system, and a limbic, moving platform that will use different types of 'energetic space' to displace it.
In the jargon of physics we talk of clocks of cyclical time - charges and masses - that carry in their frequency the information of the Universe; reproduce that information with its body, waves and move using the energy of its fields of force. In biology we talk of heads, brains and cellular nuclei that process information, reproduce it with their bodies and cytoplasm, using the gravitational fields of the Earth and its water and air currents as the energy of its motions. All those systems obey certain laws derived of the nature of energy and information, the 2 formal motions whose interactions cause the game of creation and extinction of living superorganisms, which makes up universe.

5. The program of the Universe. Isomorphism of actions of all natural superorganisms.

Yet existence and life is not about motion or form but its combination – it is about actions. We all like to act, not to gather information or lower ourselves to the mere sensations of energetic pleasure. So happens in physics where the unit of all systems is the 'action' of energy and time. Thus the universe and all its species follow a program of 4 actions or 'functions' or 'drives' or 'dimensions' or 'arrows' of existence, determined by the duality of energy and information:

- Max. E: To feed on energy to move and refill the energy of the system.
- Max. Ti: To gauge information to direct the motions of the being, perceive and create parallel forms.
- Es x To: Thus to reproduce, combining both, energy and form, into actions and parallel beings.
- ∑, ∏, i: And finally, to gather socially with similar exi entities into whole, new planes of existence.

And this simple program of 'motions in spacetime', of actions, which ultimately responds to the 'need to survive', by feeding the body-limbs, informing the mind, reproduce it beyond death and becoming part of a stronger 'whole', able to gather energy and information for the herd, is the 'purpose of existence'. What all systems of the Universe do.
Thus we shall see constantly that form and function, dimensions of vital space and its functions in time work in parallel. And recognize the 'vital, organic' nature of the Universe in those 4 'arrows or dimensions of existence', called in biology drives of life, which all systems follow, even physical systems, studied in a parallel paper to this one[0].
Moreover the '4 Dimensions of classic space-time' are related to those 3 drives of existence, as we 'are made of spacetime' and the ultimate vacuum space is light in motion (proved by its energy and constant creation of photons). This light-space thus have 4 Dimensions, which correspond to its 4 'drives of existence': Max. I: the high dimension of the electric field where the head-photon stays most time. Max. E: The magnetic field dimension perpendicular to the electric field. exi: the dimension of reproduction of the wave or speed, which indeed in Maxwell equations is the product of the energetic-magnetic and electric-informative field. And finally colors, the social dimension.
Yet in atomic particles we also find the 4 quantum numbers that define the electron and respond to those 4 vital dimensions: the main number or 'energy dimension', the secondary number or 'informative dimension', the spin that defines the reproduction/decoupling of particles with inverse spin and the magnetic number that orders the societies of electrons. And then again we find 4 Maxwell equations that represent those 4 dimensions of existence in electric flows.
We only study in this paper the 4 Dimensions of life systems, which will be coded in life beings in 3 scales, in cells by molecules (4 genetic letters), in organisms by physiological systems (sensorial-informative, digestive-energetic and blood systems, unified by the ego-brain, which creates the whole) and in society by memes and its networks (energetic-military networks, economic-reproductive networks and cultural-political informative networks, the 'whole').
Thus we call those '4 drives of existence', feeding, perceiving, reproducing, and evolving socially, each one represented by a symbol of the 'Generator Equation of energy and information systems', ∑ (herding), E (feeding) , <=> (reproducing), I (informing), the program of existence as all from the atom guided by its 4 quantum to each human with its cycles of working, informing, entertaining, eating, moving, loving, acting socially performs it. They are the proof of a living, organic, sentient Universe, in which all its parts are made to the image and likeness of the whole. Since both physical and biological systems, process energy (feed on energy to move), process information (gauge information to

orientate its motions), reproduce or decouple into similar systems or particles and evolve socially, ∑, into bigger systems. Quantum theories are called 'gauge theory', because particles seem to gauge information. Sociological groups are called 'fields' because they can be studied with physical laws in their motions. When we accept the essential similar hierarchical, scalar structure and dual energy-information dynamics of all systems then we come to startling conclusions regarding the equalitarian nature of all systems of the Universe, different in 'quantity' and 'complexity' but not in 'quality'. We shall study in detail in this paper those 3±I arrows/dimension/drives of existence both in individuals and its superoganisms, *which are its species, and see how they are ordered in time by the life-death cycle, which is paralleled in species by the processes of evolution->radiation of species->extinction of those with lesser energy x Information force, which happens to be those who did not evolve into superorganisms.*

(The reader will excuse the use of synonymous constantly in those texts but that is the essence of GS^2, to show that different sciences merely use different 'names' for the same phenomena, so 'drives of life' is the program of life for biologists, 'dimensions' is the program for mathematicians, 'quantum numbers' for physicists, arrows of time for poets, will of existence for philosophers, and so on. The same happens with energy and information vs. space and time, just parallel concepts of biologists and physicists, with systems or organisms, etc.)

From 1, the Superorganism, comes 2, the system of energy and information. From 2 comes 3, the spatial organisms with energetic fields/limbs, reproductive waves/bodies and informative heads/particles. And from 3 comes 4, the arrows or 'drives' of existence of those superorganisms, which absorb energy, information, reproduce and evolve socially its cells into bigger superorganisms. This 1->2->3->4 'series' take the entity into a new scale of existence.

Recap. Since life is defined as a system that processes energy and information, reproduces it, ExI, exchanges both with an external Universe, and becomes organized, ∑, into complex herds and cellular organisms, both physical systems, which associate into atoms and molecules, reproduce by decoupling self-similar particles and become organized with a field/wave/body and particles of information, which cannot exist without each other... and life beings, which also reproduce, gauge information, absorb energy and move with it, and associate in more complex wholes, in a bigger scale of which they are mere units.

6. Topological Spaces. The why of geometrical forms.

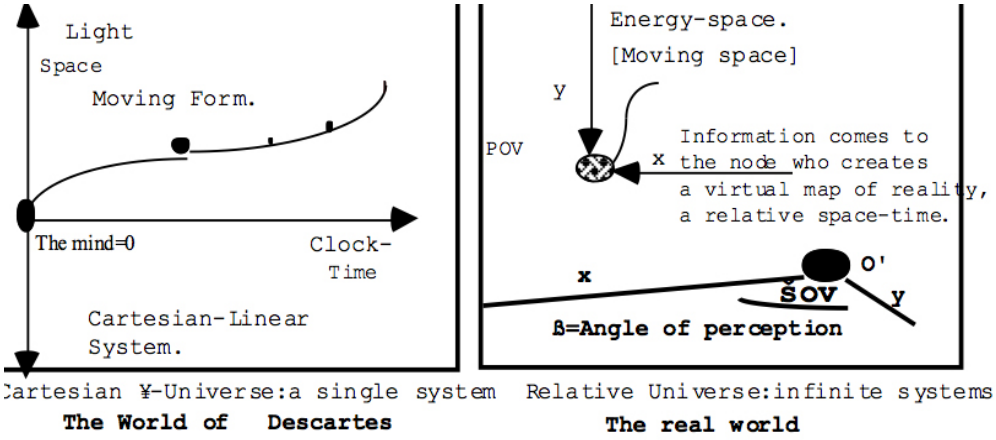
All what exists is a form of space with a motion/drive/dimension/action in time. We can thus simplify formally all systems, considering that a 'geometrical form with motion' is called a topology (a geometry of space that can be deformed in time by motions without breaking it), and that in a 4D Universe (as ours is 'classically' described in a single i-scale of space-time), there are only 3 known 'forms with motion' or 'topological varieties' (mathematical jargon), each one becoming one of the 3 'vital organs' of the superorganism. Thus the forms of those organs in space have their equivalent function in time and both together define one of the 3 'topological varieties' of the organism, observed in a single i-scale of space-time. And NOTHING else can exist, as there are only 3 topological varieties, 3 dimensions of space and 3 functions of time. Thus the 3 spatial networks and its 3 time functions create 3 type of topologies (geometries with motion), which are:

- Energetic topologies – networks: Spherical-Planar varieties that form the 'enclosing membrane of the system.
- Informative topologies – networks: Hyperbolic-Tall varieties that form the central 'zero-point' or mind of the system.
- And reproductive topologies – networks: toroid-cyclic varieties that fill the body between membrane and nucleus and reproduce with its cycles of exchange of energy and information, both the membrane and the zero point.
- Which put together create a 'whole' 'fractal point with volume', a solid sphere or 'Ball' (in topological jargon) composed of its 3 organs, with the zero point in its center and north-south axis, its relative planar membrane separating it from the outer universe and its body organs with its cycles between the center axis and the surface exchanging energy and temporal information, Es⇔Ti. In the graph we can see many of those 'whole' balls and since almost all entities of the Universe have an external membrane with a few apertures to exchange energy and information with the environment and topological varieties admit 'deformation' (so your skin would be the surface of a deformed ball with the apertures of the senses and excretory systems), we can consider that the Universe is made of 'fractal points', points with volume which are in words of Leibniz 'a world in itself'.

We must in that regard before we study the connection between those 'whole fractal points' and its 3 topological parts that inform, move and reproduce the system, consider a formal 'analysis' of such points, which is given by the

'expansion' of Non-Euclidean geometry, fusion with Fractal mathematics and topology, the 3 most advanced branches of mathematics today, which accordingly are the 'formal foundations of GS^2 – the most advanced science.

7. Non-Euclidean Points of view.



Let us then start that journey considering the expansion of Non-Euclidean geometries needed to formalize complex physics with the definition of a complex, fractal, Non-Euclidean point. The last advance in Geometry was made by Riemann and Einstein. Riemann realized that a point can fit multiple parallels and Einstein used those Non-Euclidean points (in Euclidean mathematics a point has no breath and only fits one parallel), to describe the space-time of the Universe. A Fractal point is an advancement of that concept. It states that all points when perceived in close distance enlarge and have inner parts of energy and information, of 'motion and form'. So as a fractal grows in information when we come closer, so do the points of the Universe. Then they can fit multiple parallels. Moreover, since now points have parts, the 5th non-Euclidean postulate requires to change the other 4 postulates built on the concept of a point without parts. This fact surprisingly ignored by mathematicians for 150 years is the departure 'point' of a new Non-Euclidean set of 5 postulates needed to formalize the complex models of superorganisms and the fractal geometry of a Universe of Multiple scales of Spaces and multiple clocks of Times:

1st Postulate: 'A fractal point is a world with an inner content of information that creates its 3 internal, topologic, organic dimensions and a content of energy that traces its external motions=time arrows'

2nd Postulate: 'A line is a wave of fractal points.'

3rd Postulate: '2 fractal points are self-similar when their external, spatial perimeter or their inner information is equal. Similar points form organic networks by sharing their energy and information. Dissimilar points ab=use each other in Darwinian relationships'

4th Postulate: 'A plane is a network that joins points through waves of energy and information.'

5th Postulate: 'A fractal point has inner apertures to the world, through which multiple waves of energy and information can cross.'

The first postulate explains a fractal point as a point with parts. Now a point can be any entity of the Universe. In a more detailed analysis those parts turn out to be the three canonical topologies of a four-dimensional Universe, which describe an informative, hyperbolic region or 'head', a toroid, 'reproductive body' and lineal or planar energetic limbs and membranes, common to all the points of the Universe.

The 2nd postulate explains the interaction between two points connected by a wave of communication or 'line' and its laws are essential to understand the communication of energy and form and the creation of networks between points.

The 3rd postulate explains the type of interactions between 2 points according to their relative equality, which will bring them together into a social network or dissimilarity, which will make them not interact or enter into a Darwinian relationship in which a point absorbs the energy of the other. It is thus the essential postulate to understand the causal actions of creation and destruction, eusocial evolution and Darwinian struggle in the Universe. And they resume in a simple sentence: Love your brother/species, who shares your information and evolve together into a social whole.

The 4th postulate defines the creation of networks made of systems of points across multiple scales of space-time.

Finally the 5th postulate, which seems redundant with the 1st defines a 'mind' or focus of multiple flows of information:

In the graph, because a Cartesian graph (left) is an abstract continuum of lineal space-time, based in a single rhythm of a mechanical clock and a continuous space of points with no 'breath' (Euclidean definition of point), ever since it became the canonical representation of space-time, science has reduced the infinite vital spaces and time clocks of the Universe into a single, absolute time and a single absolute space, with a single point of view, that of the human I=eye mind in the

origin of coordinates. In that sense the Cartesian plane represents the visual continuous light space-time that fills vacuum and it represents the 3 perpendicular coordinates of light. Thus Cartesian coordinates are equivalent to the height=electric field, width=magnetic field and length=wave speed of light. Since light is the space we see and so its 3 coordinates are self- similar to those of the Cartesian, human mind made with light.

The real Universe though has infinite minds or points of view that gauge information in infinite scales of space-time with different pixels besides light (smelling minds, gravitational minds, sound minds). And they will see a different world. Since the Cartesian world is just the light space-time we see.

Each of those minds will be a zero-point, an infinitesimal that stores a 'still mapping' of the infinite Universe in its focus of perception, stored in the language it creates with the pixels of those forces, to represent the Universal Grammar of all languages: space-time events of exchange of energy and information, E⇔Ti.

So each mind, as we have seen studying human languages of perception will map with 'ternary' elements the 'ternary topologies' of the Universe and use that information to act-react in its environment looking for its 4D program of existence (feeding on energy, perceiving information, reproducing actions and self-similar beings and evolving socially). Each of those minds-points of view will have therefore volume to fit the flows of energy and information that go through them, which is the definition of a Non-Euclidean, Fractal point of view through which ∞ parallels can cross.

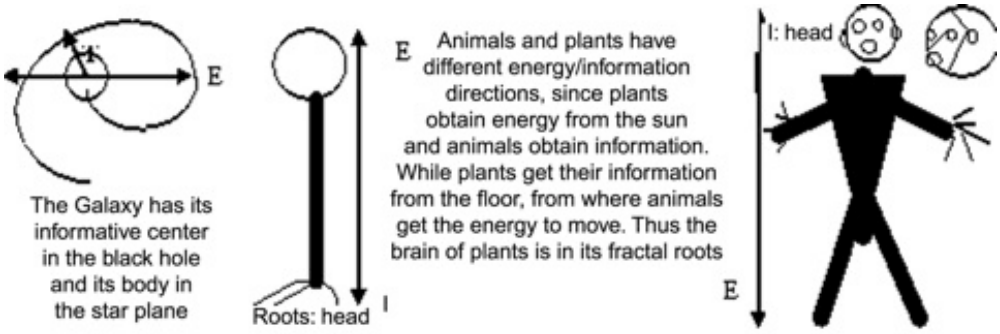
Thus, we define all entities as 'whole' fractal points whose laws can be explained with a new geometry of space-time, Non-Euclidean geometry, born of the completion of the work of Einstein in physics and Riemann and Lobachevski in the field of mathematics. Since now all points have form and motion, they have breath; and since now all lines have form and motion they are waves; and since now all planes are networks, they are discontinuous planes. Thus, the new formalism of space-time explained in detail in other lessons of this work^{o} redefines also the geometry of the Universe in dynamic, discontinuous terms. Now the scalar nature of reality comes in mathematical terms from the fact that points become communicated by waves and then n-points become communicated by planes/networks, which 'warp' in the 3 dimensions of space to form a 'bigger point', unit of a new i-scale. So for example cells become neuronal networks, creating a human 'point-head', which is part of a global super-organism, which if we were to map with a point for each human head would form again a spherical network over the surface of planet earth – our social superorganism.

The universe is made of networks of such i-points, and each network is what we call a world or discontinuous space-time, st, unit of a bigger fractal network, a new st-point in itself. So a network of particles becomes an atom, which becomes an st-point of a molecule and so on till creating the networks of the Universe.

Even humans can be studied as Non-E points, in which each head is indeed a spherical point that communicates constantly energy and information with other humans, forming social networks.

Recap. To understand Multiple spaces-times we need to evolve further mathematics, the language of science. Leibniz, Einstein and Riemann, who in the XIX c. realized that 'through a point infinite parallels can cross' (5th postulate of non-Euclidean geometry) are the points of departure. 'Non- Euclidean points' with form and motion, made of knots of time cycles, are the final elements needed to understand the why of the Universe. They socialize into networks that become points of a higher scale, which reproduce and organize new networks; and so the Universe keep growing in fractal scales, from particles that organize networks and become atoms that organize networks and become molecules that organize networks and become cells, that become organisms, that become planetary societies; while planets and stars form gravitational networks that become galaxies, organized by dark matter into Universal networks. Thus each Non-E, fractal point is a world in itself - a topological point with a volume of energy and information that relate it to other points through waves, which carry energy and information and create networks that warp into bigger points.

8. Dimensional analysis: Diffeomorphism: fractal relativity. Each species has 3 relative ternary dimensions.



The 3 topological regions of any 'fractal point' orientate in 3 relative dimensions of 'informative height', energetic length and its perpendicular combination into reproductive width: exi=k. Thought those 3 dimensions are diffeomorphic, adapted to each relative ecosystem of space-time where the system absorbs energy

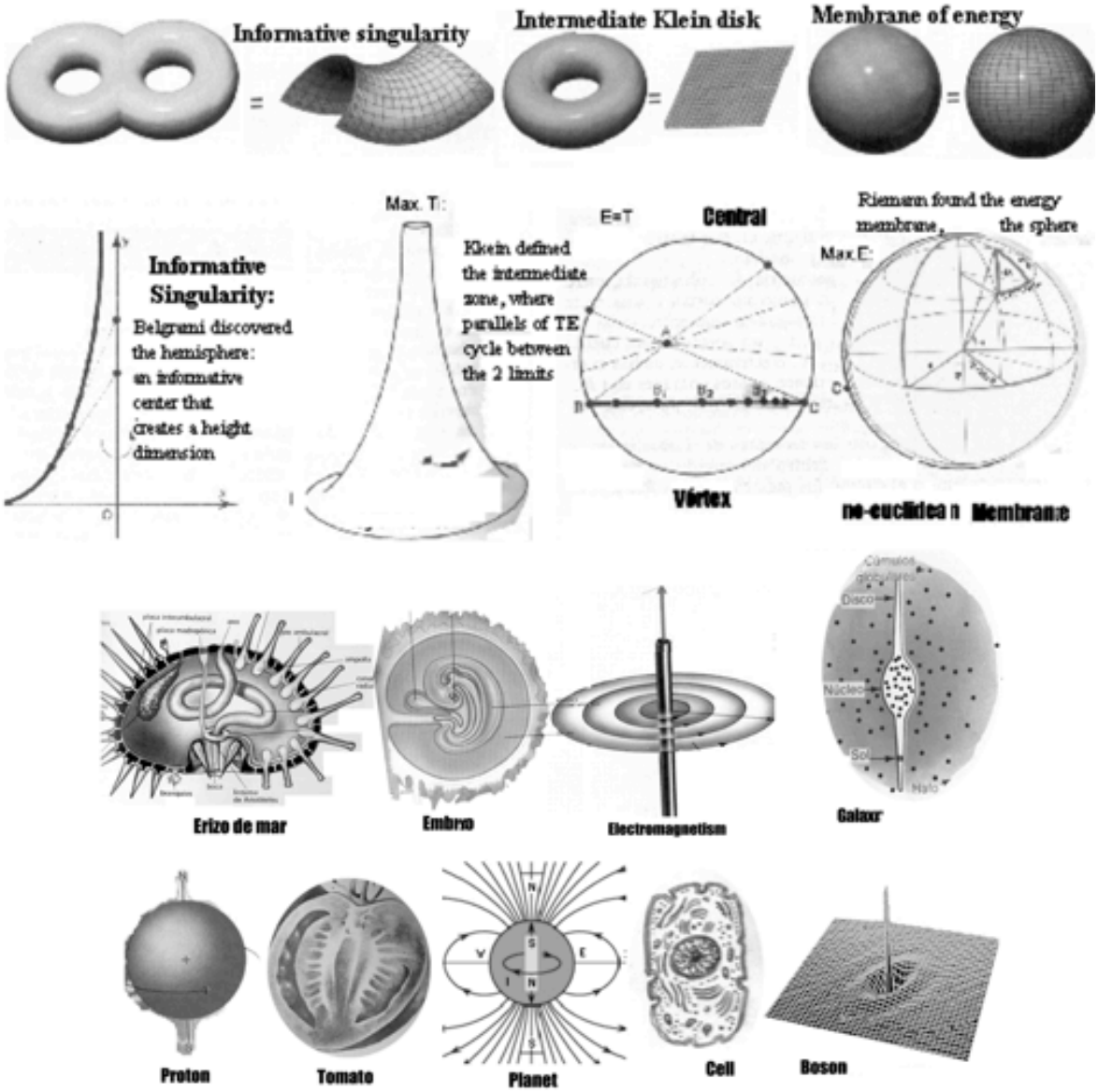
and information. Thus each 'space-time being' deploys a particular 'direction of height-information', 'length-energy' and 'width-reproduction', different from other beings, interacting with the flows of energy and information of its ecosystem through its particular, 'local'=diffeomorphic coordinates, which departing from its informative zero-point or relative 'self', establish accordingly its 3 relative, perpendicular, fractal dimensional actions of energy, information and reproduction. The Universe then becomes the sum of all those diffeomorphic 3D fractal space-time beings.

A key, mathematical element is required to have a vital, topological view of the superorganisms of space-time: the relationship between the 3 canonical dimensions of the continuum Euclidean space and the 'fractal' (smaller) dimensions of each fractal point/superorganism, whose external limit is the membrane. Each of those dimensions is maximized in the corresponding functional topology: height is the dimension of informative perception, as it allows a 'higher' point of view that scans a larger territory, length the dimension of energetic motion, 'parallel' to the lineal field of energy that moves us, and its perpendicular, wide dimension is the reproductive dimension that combines both (exi). This is clearly evident in the simplest forms that show the 'geometrical game' with more precision: the magnetic (energetic, flat), electric (informative, tall) fields of light space-time, and its Product (Maxwell equations), the reproductive light wave are perpendicular to each other (exi). Each of them corresponds to each function of light (being the 4th function social color). This is the 'first' cellular unit of our light world, from where all further 'evolutionary scales' of space-time beings are born. Thus the causal justification of the perpendicularity of the 3 functional, organic dimensions is its existence *in the basic action-unit of space-time, our vacuum space-time made of actions of light. As we are all social evolution of H-plancks space-time actions*. Again we see the 3 perpendicular fields happening in electromagnetic fields (Maxwell rule).

It has to be noticed that we talk of 'fractal dimensions' not continuous, ∞ dimensions. The difference between them is this: A fractal dimension is a 'filling' of a dimension by networks and branches which grow and will ultimately fill the total continuous dimension of the entity in the domain in which we define the entity but can reach in its filling in a certain moment a 'quantity' between the 0 and 1 value of the total filling/dimension. They are partial dimensions. And this is precisely what we mean. A Superorganism, for example, a human being, will have 3 'local, fractal, networks' attached to many cells, and those are its 3 fractal dimensions: the informative, nervous network and all its attached cells and organs, the reproductive, blood networks and all its organs and the digestive, energetic network and all its organs.

In the graph, 3 examples of diffeomorphic beings of space-time and its relative arrows of energy and information: a galaxy with an inward arrow of gravitational information, pointing towards the central informative black hole; a tree and a man, whose informative/energetic dimensions are inverted. Since plants use light as energy and animals use it as information. So the informative direction of animals is up, towards the head that absorbs visual information from the sky, opposite to the informative arrow of plants, which is down, towards the roots that absorb chemical information. Both have their space-time parameters inverted, as it often happens between energy victims (in the graph, plants) and their anti-forms or predators (animals). Thus each species establishes its own up and down arrows; its relative energy and informative directions, departing from that central knot of information, which is gauging and perceiving. What classic science denies and system sciences proves is the reality of an existential will in that perceptive=informative knot, which controls the entire organism and directs its search for 'actions' that provide energy and information to the being. It is precisely the infinite number of Discontinuous, Non-Euclidean Points of View, what creates a general arrow of Information in the Universe that constantly reproduces the form of those entities and balances the arrow of continuous entropy, energy motions and expanding space, which physicists dogmatically consider the only arrow of the Universe. *And so in all entities, when the zero point appears, order systematically grows: the crystal starts to reproduce its formal structure in 'cells', the hurricane becomes stable (and vice versa, bombing the 'eye' of the hurricane destroys it; the galaxy once the black hole of gravitational information is formed acquires it order, etc.)*

9. The 3 varieties of topological space-times: We are ternary assemblies of vital, organic geometries.



In the graph, Reality is made of fractal points, whose parts perform energetic, informative & reproductive functions. As complex as one of those points-entities might be when observed in detail, *any fractal point is made of 3 regions whose geometry responds to the 3 topologic varieties of a 4-Dimensional Universe, the convex plane, the torus & the sphere.*

The Universe comes down to wholes made of 3 internal parts whose geometrical properties maximize their energetic, informative and reproductive functions: When we see fractal points far away we describe them as points with breath, with the tools of Euclidean geometry since the 'inner space' shrinks to a point and so the 'bulk' or curvature of space-time shrinks to a plane. Yet, when we come closer to them, they grow into points with volume. The volume of those Fractal, Non-Euclidean points can thereafter be studied with the 3 types of canonical, Non-Euclidean geometries or topologies of a 4-Dimensional Universe – the Universe we live in. Those 3 topologies make up the 3 regions of the point, which correspond each one to the 3 essential functions of any system: the external, energetic membrane; the central, informative brain and its reproductive combination, exi.

- Max. E: An outer membrane of energy, described by Riemann's spherical geometry. This external, energetic membrane has the topology of continuous surfaces called *the Riemann sphere*, which is the external surface of any point - the skin and limbs and any of its multiple self-similar entities, some of which are drawn at the bottom of the graphic. In any system of the Universe, the membrane acts as the energetic, external surface of the informative, point through which the point absorbs energy from the external Universe, to process it into information.
- Max Ti: A zero point: an inner center, corresponding to convex topologies (left graph), made with 2 cyclical forms. It is

the dominant informative topology of any fractal organism, described by Belgrami in the XIX c. as a conical form with 'height', with negative curvature. Temporal information dominates and defines an arrow of complexity and increasing 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.

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.

Energy and information systems have inverse properties: energy is expansive, external, more extended. Information is implosive and smaller. Thus we find the informative head or system either on top of the reproductive body, with a spherical and smaller size or in the center, and its topologies will correspond to those of maximal form; the so-called *hyperbolic topology.* In the upper graph, it is the double ring, or convex, hyperbolic surface, with maximal form, or informative center of any entity of the Universe, the point in which the fractal reproduction of information reaches its zenith. It is the same form than the toroid but with a higher content of information, reproduced by doubling the toroid.

- ⇔: The toroid, a middle, body or reproductive zone, described by Klein as a disk of quanta in cyclical motion that communicates energy and information between the inner and outer zones, filling up the space-time between the nuclei and the external membrane. It is the zone where the reproductive organs of the system exist. . It must be noticed that according to Klein, the topologist that studied better this type of surface, the toroid is NOT really a fixed form of space, but we must consider those cycles' motions and add the parameter of speed. Thus Klein introduces the Paradox of Galileo to describe the Non-Euclidean geometries of the Universe as we have done in this book. Cycles are mere static perceptions of motions and we must always consider distances as space-time distances. So we say: London is at 4 minutes distance because we consider distance and speed together. This is ultimately the meaning of time in physics, a measure of the speed of motion as a way to gauge space-distances: v=s/t.

The ideal, abstract mathematical intermediate spacetime, which combines both functions, describes the behaviour and form of many real, dual systems and its social herds. For example, a herd of animals in an ecosystem will move between their hunting and water fields (where they gather energy) and their breeding, inner region where they reproduce information, making cyclical trajectories between both regions. In this manner, they occupy a vital space-time, called a 'territory', which shows the properties of the reproductive body (a Non-Euclidean Klein spacetime, as it shares its fundamental property - the fact that the particles of the intermediate space are confined between the other 2 regions, which are never reached in its cyclical trajectories. For example, in a cell, the molecules of the organism will not touch the protein membrane or the central DNA nuclei. Thus, the inner quanta are confined within the Klein's disk by the 2 other regions that have more energy & information and destroy them and/or absorb their energy and information at will.

In abstract terms, mathematicians introduced in the XIX c. the concept of an *infinite, relative distance* measured no longer in terms of static space but in terms of time and movement, as *the distance between the point and a region that cannot be reached*. Thus Klein defines a relative infinity, as the region beyond the discontinuous membrane whose insurmountable borders the inner time-space quanta can't cross, as a cell cannot go out of a body, an atom beyond C speed or 0 K temperature and a man beyond the Earth's atmosphere. Thus, the informative center and external membrane become the 2 relative infinities or limits that the movements of the intermediate point cannot breach.

As in the myth of Achilles and the turtle, Achilles never arrives because every time he moves he crosses a smaller spatial distance. The same happens in a fractal space-time, when a point moves *temporally* towards its inner or outer space-time limit and finds an increasing resistance to its movement, till finally it is deviated into a cyclical trajectory around the outer, energetic membrane or the height dimension of the inner informative singularity or it is destroyed. So the intermediate, fractal cells of the point circulate in parallel cycles always inside the interior of the sphere with contact zones of the type A *(central, 2nd row of figures in the previous graph).*

In a human organism, the blood system might seem infinite for the red cells that transport energy since they never reach the outer Universe. For that reason in the drawing, Klein interprets the intermediate region of the Non-Euclidean point as an infinite *circle with an invisible, unreachable membrane,* whose motion-distance is unreachable, hence infinite, equalling the 'space-time distance' between the intervals B1-B2 (long) and B2-B3 (short but difficult to cross), despite being B2-B3 increasingly shorter in space. Since the quanta take longer in each step and don't reach the membrane.

This is often due to an increase in the 'density' of the space, which despite having less distance has more 'points' in its network, such as the case of black holes or jails. When those inner points reach the membrane at point C they become destroyed or deviated.

Thus, the energetic membrane and informative center are the discontinuities that isolate the intermediate cellular quanta, creating a discontinuous 'World' within the point. Those discontinuities are called in Geometry a relative infinite, in Biology a membrane, in Sociology or Topology a national border, in fractal theory a co-dimension of a point. They are defined in physics by Lorenz Transformations that make c-the limit of energetic speed and 0 k the limit of temporal, formal stillness. Yet those physical limits are not the limits of an absolute Universe, but the limits of the fractal space-time membrane of light and its evolved electroweak beings, since the Universe has at least another bigger gravitational membrane, in which the smaller light-space exists; a fact with enormous repercussions for a proper description of the Cosmos, which extends beyond those limits. Since the gravitational scale should be faster than light-speed forces and cooler than 0 K masses.

In the graph, we observe several non-Euclidean points created by those 3 canonical topologies that can adopt multiple forms by deformation, but suffice to construct all the shapes of our Universe. Indeed, a topology is deformable. So an external membrane, which corresponds to the topology of a sphere, can become any shape, as long as it is not torn up, to enclose a reproductive and informative zone. So your skin is in topology a sphere, which encloses the complex forms of your reproductive organs.

Since those 3 topologies suffice to describe any 4-Dimensional form, it follows that the Universe is merely a puzzle of energetic, informative and reproductive parts, iterated=reproduced and then associated in 'numbers', creating all kind of entities as those shown in the previous graph, from different sciences, which are assemblies of those 3 topologies.

Thus the laws of the 5 Non-Euclidean postulates and 3 topologies common to all species formalize mathematically the structure of superorganisms and explain why in space mathematics is the language of the Universe – as *we are vital mathematical geometries of space-time with motion, albeit more complex than the static, Euclidean simplifications used by mechanist science in its description of those superorganisms. Thus the evolution towards a topological Non-E description of species brings back the 'vital' motions lost in the abstract, Euclidean simplifications:*

In the graph, an animal, an embryo, an electromagnetic flow, a galaxy, a proton, a seed, a planet, a cell and a boson display the 3 topological zones of a fractal point, each of them performing 1 of the 3 functions/arrows of space-time.

Thus a key law of GS^2 is an old law of science: Each form of topological space performs a time function/arrow.

Those 3 topological regions correspond to the 3 main arrows/dimensions of space-time of each of those systems:

Information (head) x Energy (membranes) = Reproduction (toroid cycles between both)

Thus the toroid regions explain processes of transformation of energy unto information as topological transformations.

From the 'analytic' perspective of Non-E Geometry, the 'whole' is a fractal point (1st postulate), which absorbs energy and information through apertures in its membrane (5th postulate), and evolves socially with other points through waves of exchange of information and energy (2nd Postulate), in relationships of social evolution or Darwinian 'perpendicularity' according to their similarity (3rd postulate), forming 'networks' of cellular points (4th postulate).

Thus *while the 3 topologies of a single 'space-time' scale of the superorganism, corresponding to the 4 Dimensions of space-time of that single 'scale', describe the 3 arrows of all systems performed in a single scale, the Postulates of Non-Euclidean mathematics allow us to understand* the 4th arrow of social evolution, which requires more than a point - parts that become wholes, and hence more than a single scales of space-time – as points (1-5th postulate) join in lines and planes (2nd and 4th postulates). Thus *the 3 most advanced branches of 'XX-XXI c. 'mathematics, fractals, Non-Euclidean Geometry and* Topology confirm the organic paradigm, as the natural evolution in our comprehension of the Universe beyond the simplex vision of mechanist science and Euclidean static mathematics and a single space-time. We live in a mathematical universe, but it is a Universe of Multiple Spaces-Times, where all 'forms' have a 'function' and hence a 'motion in time'. Let us consider a few more 'formal functions' and details of those 'vital, mathematical, superorganisms'.

In the graph, the 3 functional topologies of a Non-Euclidean point become the 3 regions of all Natural organisms:

Physical systems: Fig.5, Atoms have a central, informative mass of quarks, spatial, electronic membranes and fields of gravitational and electromagnetic forces exchanged between them. Those 3 topologies also describe the galactic structure (fig.4): the central black hole is the hyperbolic, informative topology, the Halo of the galaxy is a Riemannian, spherical form, and the stars in the intermediate region, which feed the dark matter of black holes and reproduce the atoms of life, turn in cyclical, toroid paths around the central black hole.

Electromagnetic space-time (fig.3) is the simplest physical world where the most basic morphologies play that same process of transformation of external energy that converges and reproduces cycles, attracted by a Non-Euclidean point, charge or mass: $E=Mc^2$. The interaction of electromagnetic fields that 'reproduce' a central 'zero-point', a high new flow of electric or magnetic information shows *the constant, reproductive and creative nature of the Universe.*

Planets (fig.7) also have an outer membrane (radiation field, atmosphere) that protects the system from external high energy rays, an intermediate cyclical field of convective flows of magma that reproduce and 'form' the rocks of the planet and an internal zero point 'crystal', which likely 'perceives' gravitational forces guiding the orbits of the planet.

Finally a 'bosonic' highly ordered state of matter (fig.9), packs in a hyperbolic dimension of 'height' atoms.

Biological systems: Cells (fig.8) have lineal, external membranes of proteins, which are a deformation of a Riemann sphere, an informative nucleus and in between they are invaginated by all kind of e⇔i cycles that transfer energy and information from the outer world to the cell. Animals (fig.1) are in its palingenetic, simpler forms, of spherical symmetry, displaying digestive=energetic networks, informative, sensorial/nervous networks and reproductive organs. In its seminal and embryonic state (fig.2) some of those functions are exercized by the 'higher' mother superorganism of its upper i+1 scale. When they are external seeds (fig.6, tomato), the structure as a fractal point is independent, with the genetic information (seed proper) in the center, the protective external membrane and the 'body of food' that will allow the reproduction of that information in between.

A human has a reproductive body; lineal, energetic limbs & a cyclical head, with an informative, smaller brain, composed of two hemispheres, which are hyperbolic, convex, warped forms, corresponding to the informative dual ring of a Belgrami cone. The hyperbolic, highly warped brain is a double toroid, self-similar to the hyperbolic topology of informative cycles. So the brain hosts more information in lesser space than the body, as a mirror of its functions. Man though, shows in his 3 canonic, topological organs a specific diffeomorphic adaptation to a specific environment – the earth, and its high light-information, low land-electromagnetic, repulsive energy motion and prey feeding axis.

Yet from the simplest seed to the complex topological evolution of a human being, the 3 elements of fractal points always display the properties of its topological forms/functions:

- The informative zero-point is either in the center, where its communication with all the inner parts of the system is maximal or it has height as it accumulates information, from an external ecosystem and it is the smallest part.

-The external membrane is larger, continuous and protects the system. A*ll Fractal points are inner worlds, whose membrane creates a discontinuity that defines an External Universe or* outer world from where the point obtains its energy and information.

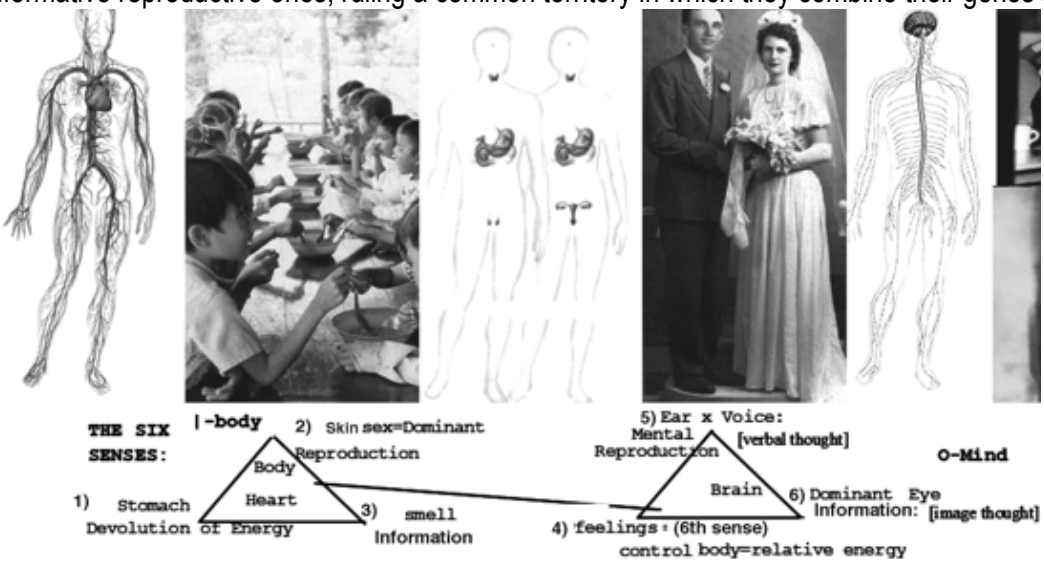
- In all fractal points there is an inner middle volume or intermediate territory, which combines the energy coming out of the external, spherical, topological membrane and the information provided by the convex, complex formal center. In the simplex, pure description of Non-Euclidean topology this region is made of similar points that form groups in perpetual movement that draw cycles of parallel lines, between the other 2 regions, as they gather energy and information combined in new parts. And they create space by cycling within the other 2 regions. Thus, the intermediate zone is filled with organs that reproduce the parts of the system with orders of information given by the center and the energy absorbed through the membrane, which latter migrate towards the other 2 zones. So in a galaxy, stars are transformed into black holes that migrate to the center. In a cell we find mitochondria that produce energetic proteins and RNA for the surface membrane. In the human body organs reproduce hormones and products used by the brain; while bones, reproduce red cells that migrate to the open membranes to absorb external energy. In an ecosystem, the territory controlled by an informative center, *the predator*, produces preys to feed the predator, who takes them to its central den.

However the membrane is also the zone through which the point emits its reproduced micro-forms of information, and so it displays 'sensorial holes' to relate the point to the external Universe. Thus all fractal points, despite being discontinuous worlds, will have in their external membrane several generic openings or 'senses' joined to the informative networks or 'brains' and energetic, 'digestive networks' of the organic system:

- *Max. +Es: A* '*mouth*' or opening that absorbs energy.
-*Max. -Es:* '*Cloacae*', through which the cyclical body expels its residual energy.
-*Max.+Ti: An* '*eye*' through which the informative center receives external information.
-*Max.–Ti: An* '*antenna*' to emit information.

As information has more form, it is quantized. So Energetic apertures are single & bigger (mouth, anus) than informative ones (eyes, ears). Those apertures vary in their number, location and size, depending on the form of the point. In simple spheric seeds, they are mostly situated in 3 regions in which exists a dimensional parallelism between function and form:

- *Max. Es*: The lower region, or Plane=Equator of the system tends to the membrane region that absorbs energy. So your mouth and nose that absorb energy are below your eyes and ears.
- *Es=Ti*: The Intermediate tropics where often the same opening emits and absorbs temporal energy.
- *Max.Ti*: The upper region or in spherical fractal points (common in 3-Dimensional 'environments' in which there is not a diffeomorphic orientation as in human/earth environments, mostly in water or vacuum space) the North-South Poles axis act as 2 relative, negative and positive apertures, communicated by the height dimension that crosses the zero-point informative singularity or Belgrami hemisphere (non-E ideal form).
- *ΣEs⇔Ti: The reproductive, central region, body or 'territory' which combines Energy and Information:* The + North Pole absorbs information(magnetic fields in atoms & planets) that crosses through its central singularity where after absorbtion is deflected to the intermediate region where it mixes with energy from the equator plane coming from the 'mouth' apertures of the membrane to create exi actions & forms. In many fractal points the informative and energetic centers establish 2 opposite flows of energy and information that become relative negative/positive poles. So, the particles of the intermediate region trace elliptical trajectories, with 2 focus on the centers of the energetic/informative topologies. It is the case of any bipolar system, from binary stars, one dominant in energy and the other an informative neutron star or black hole; to bimolecular systems or n-p pairs in the nuclei of atoms. The same duality of 2 specialized centers controlling a common territory, or vital space happens in biology where most species have male-energetic, lineal bodies and female-informative reproductive ones, ruling a common territory in which they combine their genes to rise its offspring.



In graph, the analysis of the human being in terms of its 3-network systems and its 6 senses, which absorb energy and information for those networks, 'who' perform the energetic, informative and reproductive actions of the living system.

Medicine & Physiology deal with the 3 networks of the human organism, whose functions connected to the senses enact our time arrows: The Digestive, Energetic System is attached to the senses of smell and taste; the hormonal, blood, reproductive system is attached to the senses of touch and the 6th, emotional sense and the Nervous, Informative System is attached to the higher senses of sight and sound.

Recap: The fundamental Particle of the Universe is neither physical nor spiritual but logic-mathematical: the fractal point described by the Laws of Non-Euclidean, fractal Geometry and topology, as an entity which becomes more complex when we come closer to it, till we can differentiate its 3 regions, corresponding to the 3 topologies of a 4-dimensional Universe: an energetic membrane, an informative center, and an exchange zone of bites of energy and bits of information between both.

In all systems we find a core/brane that acts as the dominant region of the organism and display paradoxically less spatial extension than the other regions they rule. It is the smaller nucleus of cells, humans and galaxies generates its information (DNA, human brain/eye system, galactic black hole, CPU (central processing unit) in computers, etc.) In a galaxy the halo of dark matter and the central black hole dominate and seem to feed and form the radiant matter of which we are made. In man, the informative brain, extended through the central spine and senses, dominate the reproductive body and guide it.

The 2nd region in importance is the 'body' or reproductive region, which absorbs energy from the limbs that become imprinted by the system's information.

Finally the 3rd region of the system, which is easier to renew, due to its formal simplicity is the energetic region, the skin, limbs and membranes, which brings energy to the intermediate region to allow the reproduction of the information stored in the center or head of the system.

Given the ∞ possible deformations of those 3 unique topologies of 4-D space-time, reality creates an enormous variety of species, from an original seed of spherical information that develops those 3 regions in morphologies that soon resemble energy lines, reproductive cycles and information centers.

Our energetic region extends in lineal limbs; reproductive cells group into organs, becoming the body; while the informative centers move to the height dimensional and multiply its cellular forms in the sensorial boundaries of the head. All those processes studied by morphogenesis, can now be explained not only in its how but its why.

Thus, the 3 relative forms of energy (external membrane), information (dual ring) and reproduction (the cyclical paths that exchange energy and information between the external membrane and the inner convex form), can be found in any system of reality. In all those systems, the informative region dominates the bigger, simpler reproductive body.

10. The 10 Fractal dimensions of Super Organisms.

A super-organism is an organism made of smaller super-organisms and part of a bigger super-organism or living in a bigger territory. Thus a super-organism is a 'scalar', 'fractal' structure since it exists in '3 scales' of relative size, of parts that become wholes. We call those 3 scales the 'inner, cellular', 'individual' and 'external, social' scales in a generic manner, even if those 3 'specific names' only apply to animal organisms, made of cells, individuals and part of societies.

Other systems have different specific names. So for example, a cell will have a molecular scale, cellular scale and social, organic scale as part of an ambulatory collection of cells called humans.

In physical systems the same happens, a star will be made of plasma ions, its cells and form part of a superorganism, the galaxy; and so on.

What matters to us in this first definition is the realization that all systems which have a relative 'zero point' of view, or 'informative center' that process its information will have around that relative center an upper, central and lower scale of existence, which are in fact 'fractal scales' independent of each other and hence with 3 'relative space' dimensions of height, width and length.

Thus if we add up the 3 x 3 dimensions of the system, we get a nine-dimensional system across 3 scales of reality. If we call I, the 'individual' main scale of the system, where most 'information' is gathered, we talk of i±1 scales for any super-organism, tightly related to each other. Such as for example, a human being co-exists in its cellular i-1 scale, its social i+1 scale and its individual scale as an organism.

And it is impossible to explain the existence of the entity as an individual without considering its other two levels of 'energy' and information, i.e. its genetic i-1 scale of cellular information and its i+1 memetic scale of social and cultural information; its i-1 cellular organs and networks of blood-energy and its i+1 work and wealth.

The super-organism is always determined by 3 scales and hence by 9 dimensions, which make up a 'whole'. This 'whole' is what we call the 10th Dimension of the Super organism or energy and information System, as it integrates the entire system into a unit of a new scale. Hence it 'exhausts' the 9 'equal scales' of the system becoming the 10th scale.

All superorganisms are made by an assembly of 3 type of dimensional, spatial networks or 'forms' of space each of them having a certain 'functions' or motion in time; that is all of them are made of the 3 organic dimensions of space, and 3 arrows, or functions in time.

As such what GS[2] studies first is the nature of those 3+3 dimensions of space-time and how they build up the superorganisms of The Universe. All of them are defined as 3 Dimensional 'forms of space in motion', thus with 3 parallel dimensions of time.

Those '3 dimensions' make a local 3-Dimensional system in our scale of individual space-time, which is the human being. Then we will find in a lower scale of space-time our cells occupying also each one 3 dimensions to fill up the cell space-time, and in the upper scale we will find our society with its global superorganism and its political and cultural, informative networks, its reproductive, economic networks and its energetic, Earth's geography. But in all those cases the dimensions will not be infinite and they will be relative in scale to the size we perceive.

To understand the fractal nature of those dimensions we must bring up another key characteristic of those superorganisms - *their diffeomorphism* - a word borrowed from Relativity which explains precisely this: any superorganism is relative and local as it has a 'focus-mind-point of view-CPU that processes information' around it in those 3 scales of space-time, perceiving and mapping the Universe from its 'relative focus of information' in the forces and languages that 'traverse' its zero point of view or hyperbolic center of informative processing.

This is essential to understand the unity and relativity of the Universe. As any superorganism with a focal point of view will consider and extract most of its information on those 3 scales which for it will become the only real scales.

Thus a superorganism is a structure in which a cellular system is divided in 3 topological spaces, a limb-energetic space, a body-reproductive space and a relative head-informative space, which perform 3 motions in time, energetic motions, informative motions and repetitive motions… And because those cellular systems can be seen in different i-scales of relative size and informative speed, from cellular to individual to social scales, we must consider that we can perceive such dimensional organisms at least in 3 scales, one of relative 'micro-size, normal size, and macro-social size.

This i-element is essential to fully grasp the fractal self-repetitive scales of the Universe and so we can talk of it as the 7th dimension or 10th dimension of space-time that completes the entire organism. Let us see why.

The superorganism is structured in 3 relative scales always. As the soul or point of view of the superorganism, in the human case, the human mind, obviously sees downwards and upwards a smaller negative scale and a bigger positive one. Those are the 3 scales of reality, and we observe further that each component of the organism is focused onto one of the 3 scales: the mind to the social organism, the body to the direct sensations, the cellular scale and the limbs to the lower fields and sensations of gravity, heat and cold, related to smaller scales that give us energy.

Strictly speaking, because the organism co-exists in 3 scales we must define it as 10-dimensional organism, that co-exist in a territorial of i-1 scales, in a body of i-scales and a social mind of i+1 scales. And so the total are nine scales + I, the beyond below and over us. Though we can make less exhaustive dimensional analysis. Such as:

3D organisms, in which we consider only the 3 diffeomorphic, space-time dimensions and its functions, (->8).

4D systems, if we add the dimension of present time (classic science, superseded by the more complex dimensional analysis of this blog).

5D superorganisms, if we consider the entire scalar dimension of relative i±1 scales a dimension of eusocial evolution, as we did in previous papers[0]

The usefulness of those different scalar or dimensional analysis thus will depend on which aspects of the system we concentrate. To state that all 'organisms' are in fact superorganisms in the more complex 10D^{i} analysis, though if we consider a 3-4D analysis in a single space-time scale they seem to us 'organisms' as we don't study its smaller cellular and social superorganic scales. Of those partial analysis the most important is the 5D analysis as it allow us to deal with the fundamental, complex action of superorganisms: its evolution into complex social systems, determined by what we shall call the 'metrics of the 5th dimension'. This will lead us to a better understanding of the 3 'causal dimensions of time', past, present and future – the other essential analysis of superorganism, focused in its functions and life/death cycles.

Recap: The One, the Superorganism, is made of two 'substances/forms/motions', temporal information and energetic space, which combine to form the infinite bodies and waves of the Universe. And so from one comes two and from two the 3 parts of space and functions of time that pegged together create the superorganisms of reality.

All Natural systems have 3 components, or spatial dimensions: the informative head in the high dimension; the limbic, energetic system that moves it in the long dimension and the re=productive body extended in the width dimension. Each of those spatial organs enacts a temporal motion or function, processing energy (the limbic system), information (the head system) and reproducing both (the body system). Lineal and cyclical motions, combined in reproductive waves & bodies, create the physical and Biological

ternary Dimensions of space and Time that are the essence of all entities of reality. Yet all of them can be seen as 'forms' or motions: 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, which balance their lineal and cyclical accelerations, energies and times.

Thus, we define a fundamental 'particle', the 'Organic System' made of 3 Dimensional organs of space, heads, bodies and limbs that play 3 Dimensional Functions or arrows in Time, Information, reproduction and energy, which is the most common entity we find in the Universe, whose similar laws organize most events and forms of reality.

Further on each of those systems co-exist in 3 relative scales of eusocial space-time or 'levels of complexity': the cellular, individual and social scales. So, for a full description of a natural system, we MUST first consider its 3±i 'elements', the informative head, the energetic limbs that move the system, and its 'combination', the reproductive, action body that fusions both, placed in a +i bigger ecosystem, in which it will absorb –i, smaller quanta processed and broken further as energetic motion by the limbs or integrated as pixels of a mental mapping of information by the head, or used to reproduce its own cellular systems by the body. This is the 3rd –i scale of the system, in which we will observe again how cells 'exist' as 'dimensional functions' of energy, information, reproduction and social evolution – the 4 wills or simplex and complex dimensions enacted by all systems.

And this 3x3+1 analysis of the whole in its 3 scales through its dimensional actions gives the whole 'picture' of the superorganism.

Reality has '3 dimensions' and 'functions', energy, information and their combinations, exi 'actions' and 'bodies' that reproduce both. Those simple principles are the essence of the dimensional structure of the Space-time Universe, made of infinite 'fractal systems' organized by its 3 'spatial, dimensional parts' which perform 3 'temporal actions' and the sum of all those systems is what we call the Fractal Universe. Thus, the Universe is a fractal of 10 Dimensional superorganisms of space-time. We are 'made of spatial dimension and temporal functions, parallel to those spatial dimensions'. Absolute space-time is only the sum of all those fractal 6-dimensional superorganisms put together as if it were a single 'entity', with a single time-clock (the human mechanical one) and a single spacetime scale, (the background light-space we see in the galaxy and the 10Di superorganisms that float on it, seen from the scalar perspective of man).

11. The 3 dimensions of time, and its metrics: entropy-past, balanced presents and information-future.

The ultimate 'substances' of reality are lineal motions (or energy-space), which has 3 'dynamic' states, as 'acceleration' (entropy growth or 6th dimension), 'deceleration' (growth of form, or 5th dimension) and constant speed, (lineal motion or 'energy-space' in a static 4th dimension of time). And Cyclical motions (or time-information) which has also 3 'dynamic' states, as acceleration (increase speed of vortices that diminish in size and increase its rate of processing information as in chips or black holes), or 5th dimension, deceleration (expansion in space and slow down) or 6th dimension and static form (in a relative present 4th dimension of time).

Those are basic concepts to understand the Universe in terms of dimensions of space and time, its motions and life-death processes in the infinite 'fractal space-times' of which we are all made. And the fundamental property to observe is the inverse complementarity of those 2 formal motions, energy-space and time-information, which is the fundamental law that structures all the systems of reality in a tug-of-war between both tendencies, which ultimately always end in a zero sum such as 5th + 6th arrows of space-time (information + entropy) = Static present.

We shall then generally put together those 3 arrows and dimensions of time under the co-invariance of their product, which defines the metrics of the 4th -5th-6th Time dimensions: Se x Ti = K.

This equation will become the essential equation of the Universe. As it resumes the 3 'dimensions of time' and hence the 3 dimensions of present-space, a slice of the total flow of time of the Universe:

Present: Se x Ti = K (an instantaneous derivative of the flow of time, expressed in Galileo's relativity: V=s/t and its complex einsteinian version).

Past-energy-youth arrow/dimension/age of time: ΔSe x ∇ Ti = K (entropy arrow, or 6th dimension)

Future-information-3rd age/dimension of time: Δ Ti x ∇ Se = K (information arrow or 5th dimension),

Now the choice of the 'number' of 'dimensions' of time, is relative. I have used in different papers different numbers, but in this paper, as the 4th present dimension is a convention of classic physics, I give the 5th dominant arrow of time – information the 5th dimension and the opposite arrow of entropy the 6th dimension, and establish a dominant 5th dimension arrow and 'metrics', such as systems that grow in spatial size decelerate in informative, time speed and vice versa, systems that increase in temporal information diminish in size (chip black hole paradox). But the longer, dominant arrow of time is 'the 5th dimension' or life arrow, as death, the energy-entropy arrow lasts an instant of time, and 'present' 4th D-arrow is just an instant of the total flow of time. So we tend to use the concept of the 5th Dimension or flow of information as

the total 'time flow' of the Universe, and in fact in many complex analysis we can 'eliminate' the 4th instant of present and the 6th death, instant, and study time as a 5th informative arrow.

So we could say that General Physical Systems Theory, basically has an opposite view of the Universe to that of classic physics that concentrates in the analysis of spatial, entropy motions and makes time a 'derivative' of space parameters, considering only the 4th Dimension of present, by turning the whole conceptual frame upside down, and studying the Universe from the perspective of information and time, making 'space' a parameter or present dimension of time flows. And considering in greater detail the dominant 5th Dimension of information; so it illuminates reality from a complementary perspective to that of classic physics.

In that regard, the previous scheme of the 3 dimensions of time, and its metrics gives us a simple definition of General Physical Systems Theory (abb.GPST):

'General Physical Systems studies 'the 3 dimensions of time' and its metrics - the 6th dimension of spatial size, the 5th dimension of speed of temporal clocks that carry the information of the Universe in the frequency of its cycles and its complementary present , balanced actions of energy and time, Se x Ti = K'.

We shall indeed observe that most laws of Nature are particular cases of all those dualities resumed in the Co-invariance of Se x Ti = k present systems shown in its constant balances (being Universal constants and vital constants the expression in physical and biological space-time of those balances).

But we have to make some key adjustments to 'lineal physics'. For example, the concept of cyclical time or information is the inverse parameter of lineal time or duration, Td =1/To, which physicists write as $T=1/f$. Thus what we call here cyclical time is in physical equations, 'frequency' of information showing indeed why cyclical time clocks carry the information of the Universe. And so many laws of physics now become 'enlightened' in their conceptual comprehension by merely substituting Time duration by frequency and observing them as by-products of the metrics of the 5th-6th dimensions of time (abb. 'metrics of 5th dimension, as information is the long-lasting dimension of time).

For example, physicists write: S/T=V (constant speed), And so we write S x f(v)=K, which is the clearest expression of the metrics of 'time-space' for one-dimensional systems (we again write time-space, not space-time, as GPST, considers time and information dominant, so we also talk of 5th Dimensional metrics as the 5th dimension of flows of information dominates and in a certain way encloses the 4th, present and 6th past dimension).

And we write $E=M(t)c^2$ or $E/M(t)=C^2$ as the commonest physical expression of the 'metrics of the 5th dimension' for bidimensional systems, since a mass is a bidimensional clock of time, in physical space.

And we write Entropy (E) x Charge (T)= K^3 for tridimensional systems of physical space-time – our Universe.

As such, space-time systems always relate those 2 'inverse' parameters, which balance each other: SexTi=K.

12. The metrics of fractal, scalar space-time (Abb. The metrics of the 5th, dominant, informative dimension.)

According to Klein's definition, 'a Geometry is the study of the invariant properties of a space(time), under transformations within itself' (Erlangen Program). Thus, the Geometry of the 5th dimension studies the invariant properties of such space-time, as we move within it, expressed in formal equations (the metrics of the 5th dimension) and logic laws that define those invariant properties: Se x Ti=K (4 D) + Δ Ti x ∇ Se = K (5D)+ ∇ Ti x ΔSe = K (6D):

Most systems of the Universe, 'seeing' in present are balanced co-invariances of both parameters, SexTi, together. And dynamically they show how space and time are intertwined: when systems grow in spatial size the speed of its clocks, its 'time cycles', diminishes proportionally, both in biological and physical systems. As we grow in space, time clocks tick slower and vice versa: as we become smaller the time cycles of all species, which carry their in-form-ation in their form and

frequency, tick faster and the frequency of information processing accelerates, as it happens in chips, particles or life metabolism.

Yet, in any interconnected system, including the Universe as a whole, the product of the speed of time, Ti, which determines the quantity of information the system can process and its spatial size, Se, remains invariant.

Thus '5D's metric equations' (we abbreviate the 3 dimensions and total metrics of cyclical time, past-death, present and future information with the expression, 5th Dimension related to the dominant, lasting future time), show in any Universal system how variations in spatial size are balanced by a parallel inverse diminution or increase on the speed of time clocks and information we observe. That is, the product of the spatial energy, Se, and Temporal Information, Ti of any system remains constant: Se x Ti = K.

The graph shows in 3 scales (cosmic, human and atomic space-time) the co-invariance of the 5th dimension:

The clock-like cycles of matter, planetoids, planets, stars and galaxies, become slower as we grow in size and vice versa: the clocks of smaller molecules, atoms and particles becomes faster, as we shrink. So Mercury turns faster than Pluto according to Kepler's 3rd Law, and any clock-like vortex turns faster the smaller it is, according to the vortex equation: VoxRo=K. Since Kepler's 3rd Law and any physical vortex are particular cases of the metrics of the 5th dimension. As the laws of invariance of momentums that combine both parameters are.

The same time acceleration happens in living systems. Small animals have faster metabolisms and cells reproduce daily while their organisms reproduce once a year. Even machines follow this co-invariance: A computer processes information faster the smaller it is, as its 'clock-cycles' measured in Hertzs increase. So today we have nano-chips that process information at many Giga-hertzs per second.

This happens because a 5D vortex of temporal information is NOT a fixed physical, spatial form, but it exists dynamically through time; even though it can be perceived statically in space as in the case of a physical time-clock, mass or charge that appears according to the aforementioned paradox of Galileo as a fixed substance or particle. And this fact is of enormous importance for the algebraic analysis of the 5th dimension, as it allows to generalize the laws of those accelerating vortices of information and apply them to explain biological evolution and the constant increase of information of living systems that warp with 'age', become more 'intelligent' species, or as our civilization does, constantly increase their technological complexity.

There are Infinite clocks of time, hence infinite spaces, some of which are illustrated in the graph. What is then the total reality? Another concept, which we cannot explore in detail is 'endophysics', the fact that the brain selects from all the information and motions of the Universe a quantity of space-time, energy-information relevant to its brain. So for example, information is bidimensional because the brain only sees '2D pictures' (put together with stroboscopic vision into holographies of 3 dimensions). Thus it kills the 3rd dimension of space, the inner 'parts' of each being, observed only in its external membrane, and most of the motions of reality. Thus the total 6 D Universe is much richer in energy and time cycles that what we perceive. Endophysics is thus essential to go even beyond what this paper goes and sometimes we shall bring some elements of the mind's deformation of the Universe. But we are still humans and so when we try to do science we are limited to our senses and instruments. That is why we are not trying to study a space-time based in minds of smells but one which goes merely further in our visual understanding of reality, albeit now considering also 'the fringes' of our universe (the strong force and gravitational force worlds of the inner atom and the outer intergalactic space, we do not see) and specially considering the infinite clocks of time of our Universe, instead of a single human mechanical clock to measure all those different time speeds.

Information is a still picture of those time cycles. Thus since the mind 'understands' information, it always fixes reality, from its fixed, central point of view, which becomes its world or 'informative truth' that doesn't change. But while man is always the center of the world science evolves by widening its p.o.v. about space beyond the Earth, and about time, beyond the single speed of our mechanical clocks; finally accepting in this work ∞ scales of space size and time speed.

In classic physics, this was done first with the 'Earth' as the center of the Universe (Ptolemy's model); then with the sun as the center (Copernicus model) and then in a little understood expansion of the relative center, with the c-speed of our membrane of vacuum space as the still center (Einsteinian Postulate of fixed light speed in relativity). So the light-rod became the relative still center of the Universe, and this 'spatial-energetic' vacuum rod is today in physics, the 'fixed point of view' that allow us to make all type of measures. But while this 'convention' is excellent to make measures of physics in the galaxy, where indeed, vacuum space is a background radiation of light, it introduces many errors when we study 'regions' where light-speed is not constant or it is not the 'fundamental' form of vacuum space. This is the case of

intergalactic space-time, dominated by gravitational dark energy-space. Or inside the nuclei of atoms dominated by strong forces. It is also a 'convention' proper of the human mind, since our mind perceives electronic information and electrons 'stop' emit light and 'go'. So light is always emitted in 'stop' positions. Hence when Michelson measured the light speed with electronic instruments obviously it found it always constant as the 'stop electron' that emits information and the 'stop' electron that perceives it were in relative stop motion to each other. But if we choose the 'gravitational' scale of space-time over which 'light and electrons' float, such gravitational mind would see light speeds varying as probably quarks and black holes do. So we must understand the relativity of all 'fixed minds of space-time perception' even though we can only work with our electronic mind. I bring those facts in this paper so the reader understands the space-time light-vacuum continuum of Relativity is a convention useful for its mind, but we are going to use here a 'wider' fixed point of view, the previously explained co-invariance of the 5th Dimension (the past-present-future time arrows, and its Se x Ti = K coinvariance).

This is then the still point of view of the 5th dimension which ads all possible space scales of the Universe and all possible time clocks and speeds and so it allow us to study many more phenomena, than Einstein's C-rod.

In that regard, while knowledge is always relative, something must be 'still' still to make 'information' focused.

Our rod though is wider and so as Einstein's rod was wider than Copernicus, encompassing all the galaxy space-time, since in all universal systems, the product of the information and size of the system does not vary this dual invariance or co-invariance, Se x Ti =K is what defines the geometry and laws of all the scales of space-time of the Universe, including the gravitational, quantum and strong force scales, and all the arrows of space-time of the universe, including the arrow of information (5th dimension proper) the present arrow of 'simultaneous light-space measures' or 4th dimension of relativity and the 6th dimension of past-entropy-energy. In this simple form, thus the 'metrics of the 5th dimension' are the equivalent to Einstein's metrics of the 4th dimension - the famous $S - (ct)^2$ equation:

In the graph we illustrate that co-invariance. And so now we must define the 2 elements of the 5th dimension - the multiple clocks of time and scales of space that co-exist in every part of reality.

The image, taken from a film called 'powers of ten' by Eames, show this astounding fact: the speed of time-clocks, Ti, which are anything that ticks and turns, multiplied by the size of the space they occupy, Se, is constant, Se x Ti =K. And this fact allows the camera to travel through the 5th dimension by shrinking or enlarging your size, with the result that if you see the film you will NOT distinguish your travel outwards, growing in size in the 5th dimension from a normal travel in the 4th dimension, without changing scale of size or speed of clocks (we have added in our pictures the change in time speed, ti, which Eames did not know).

Each 'family of species' and relative scale of the Universe has a different SexTi=K equation, giving birth to the ∞ variety of Universal species. Such equation however becomes in a Universe in which we are made of spatial energy and temporal information, the most important equation of each species. And within that species remains mostly invariant. The same happens between all the derived species of that relative membrane of space-time.

The use of infinite clocks to measure time rhythms in the Universe is a theory of multiple spaces-times, whose parameters of Temporal Information and Spatial energy, surprisingly enough follow a simple mathematical law, Se x Ti = K, from where the order and structure of all the parts of the Universe can be deduced.

In the graph, different scales of the 5th dimension; the 'real' infinite quanta of spatial energy and bits of temporal information of the Universe, and 3 complementary systems, Se x Ti, made of 'energetic bodies/fields' and informative 'particles/heads' from physical sciences (a light field-photon particle), from biological sciences (a human body-eye system) and from economic sciences (a weapon-camera system).

Since the Universe is a fractal of infinite complementary systems, made of energy and information, whose 'common' properties is the field of study of the 5th dimension.

Let us resume a few basic errors of physics provoked by the ignorance of the informative arrow of the Universe:

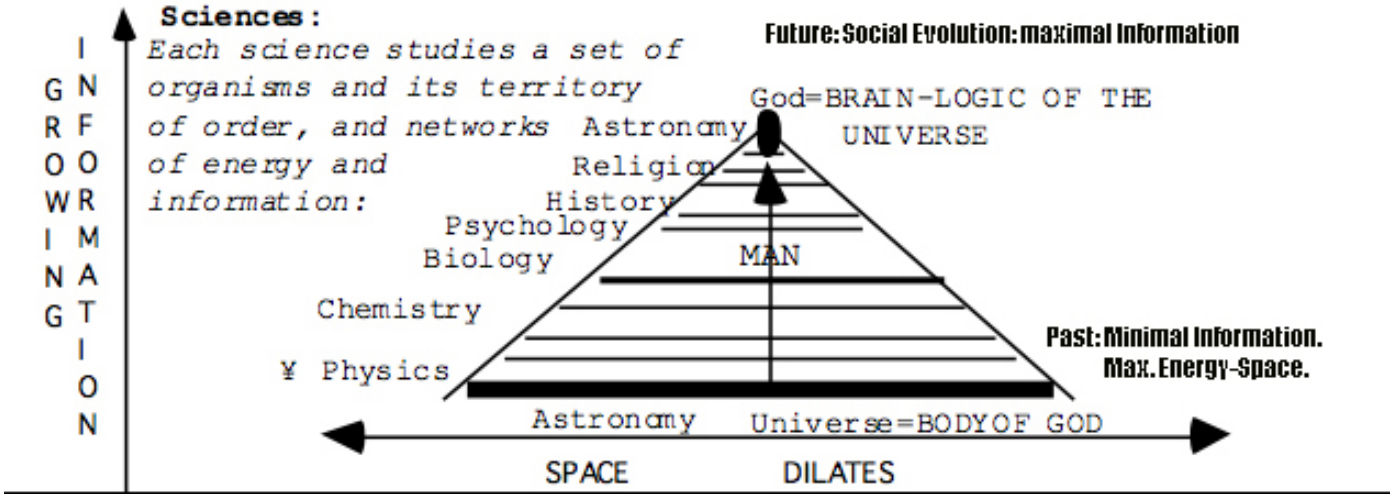
- Masses are natural vortices of time clocks of the gravitational scale and do NOT need a Higgs, which is merely a particle involved in the weak force that transfers information between both scales.
- The scalar universe is immortal. The 2nd law of entropy applies only to the energetic expansive force of electromagnetic light-space but i+1 gravitation is an informative=attractive force that balances the cosmos.
- The impossibility of a machine of continuous movement only applies to heat processes that include the 'molecular parameter' of temperature, but the entire universe is a perpetual machine of 2 motions, E>I, I<E.

- Black holes don't evaporate and there is not paradox of information. They are doors between 2 sheets of electromagnetism and gravitation, which transform our electromagnetic space into mass, evaporating our world into the gravitational world and not vice versa as Hawking believes - reason why we never saw one evaporating.
- The Universe neither grows nor it shrinks. Gravitation, which dominates galactic vortices implodes energy into mass and electromagnetism expands mass into energy: $E=Mc^2+M=E/c^2$ becomes then a zero sum of implosions and explosions, beats of E<=>I, which together balance the total Universe.
- Negantropy is a real arrow that reproduces fractal information, which Mehaute proved to happen always, when entropy no longer acts, as both arrows are inverted.

All this said 4 fundamental conclusions of 5D metrics that change completely our perception of reality are:
- The Universe is eternal, made of 2 motions in perpetual exchange, NOT of substances.
- Since the metrics of 5D for the whole space-time Universe are the same than the equation which defines the 2 parts of any system, we conclude that we do NOT exist over an independent space-time but we are made of space and time, each of us is a complex system made of bits of temporal information, of circadian or physical clocks & surfaces of vital space imprinted in form by those cyclical in-form-ations.

In physical systems all scales and particles are background dependent, constructed with pieces of spatial energy and temporal information, starting with the smallest theoretical scale of background dependent, lineal, open strings which are rods of Planck's space and cyclical, closed strings which are the tiniest Planck's time-clocks.
- Since all systems are made of Se and Ti, 5D invariances and laws apply to all systems of the Universe, creating a pantheist Universe, a fractal of its Fundamental Particle, the Complementary Systems, SexTi=k.
- All complementary entities displace a particle/head that gauge information over an energy body/field directing its actions: Motions With Form.

12. The scales of the Universe.



Finally an essential element of the purpose of the Universe which classic physics reject with its 'primitive', abstract, mechanist view of reality is the organic purpose of its systems. Physics was born with the use of sensorial machines (eye-telescopes and clocks that substituted in the measure of space and time our organic eyes and verbal time dimensions of past-present and future tenses). Thus the machine became the model of the Universe and Kepler said God had waited 5000 (biblical years) to find a mind that understood its clock-work. Only Leibniz replied that this was more of the same religious view, as a machine MUST be constructed by an external God. This didn't bother the pious believers of physics then – Newton dedicated more time to biblical studies than physics. It should bother though modern physicists. The alternative is GS^2 – organicism. The Universe structures itself into complex systems by assembling its parts, through networks of energy and information into bigger wholes, creating new scales of space-time. We are all made of space-time as super organisms of smaller cellular, molecular and atomic super organisms, all of them connected by two networks – one of energy and one of information. But this structure allow us to describe also the working of galaxies, similar to that of cells, also connected with a network of energy – the electromagnetic network of stars, and information, the gravitational force that informs it; and two species, the 'gravitational DNA' (black holes, dark matter) and the 'energetic stars' that

reproduce the matter of the galaxy – its ribosome. This organic description of reality as a self-repetitive fractal that structures itself into super-organisms of course does not invalidate the mathematical description of it. Both type of properties – spatial, mathematical, topological and biological, social, organic, network based – are needed to fully grasp both the mathematical how and the organic why of reality.

In the graph, the scales of the Universe, its 3 time dimensions of evolution of information and their sciences.

In the graph, we have written the two arrows of space-time, slow energy and fast information as past and future, and the human time speed as our relative present. Those scales are indeed the origin of the causal order between past, present and future and their life-death cycles in time.

Further one, in the complex models of GS^2 it is essential to understand how different scales interact with each other in the 3 dimensions of time and space. Indeed, a question never wondered, of enormous importance to explain the structure of the Universe is the relationship between those scales, the smaller ones that sustain the creation of the larger structures. Do they exist in the same 'time moment'? Or do the simpler scales – let us say the particles traced in the vacuum – appear earlier and sustain in a pyramidal constant construction the larger scales. Are we constantly drawn with 'formal motions' in an architectural design? That is indeed the case.

The simpler scales of that pyramid are NOT figuratively but really in the past. Because the Universe constructs a physical system literally by in-forming and molding the simpler Universe into new forms, 'brick by brick'.

This fact resolves the 'Paradox of Motion', understood since Zenon. In a continuous Universe motion is impossible, And indeed there is no motion. *Motion is reproduction of a movement that like a light-wave in the vacuum imprints and forms the previous scale; and then again, electrons are printed as 'a fractal nebulae' in the previous light scale and molecules are formed as complex motions drawn on the previous scale.* When a gas cloud moves, it does not move so much as it 'draws its motions' in a lower scale space-time. Motion is really reproduction of information. And for that reason the 'speed' of systems slows down as we go upwards in those scales (more motions must be drawn).

So the wave of atomic forms rebuilds first a string world of open string motions and closed string clocks that builds then bosonic light that collapses into atomic particles that draw again a molecular orbital.

Thus if you are so simple as light is and only have to inform and draw a light beam you move very fast, but if you are very complex and you have to draw all your information you go slower. And because the next scale is built upon the previous one, the previous one is in the past. Hence the arrow of information is in the future literally. When your cells, displaced a quanta of time to the past, build you as a 'whole', those cells, whose life cycles are back into the past, sustain you and draw you in their relative future.

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

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

1st Scale: Open strings of energy and closed time strings: Strong Forces & Gravitational space-time.
2nd Scale: Bosons: |-Light and O-Photons.
3rd d Scale: Fermions: |-Electrons & O-quarks.
4th Scale: Atomic Organisms: Periodic Table.
5th Scale: Inorganic and Organic Molecules
6th Scale; Life Cells. States of Mater: Energetic Gas, ExI Liquid and Informative Solids.
7th Scale. Life organisms; Energetic Plants; Informative Animals. Organic Metal-Machines
8th Scale: Planets. Human Civilizations; Economic Systems.
8th Scale: |-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.

Each scale has different speeds of time information, which we measure and compare according to their frequencies.
There is thus always a 'third way to see' reality beyond the 6 direct dimensions of this world, which are the scales in which we interact, and this i-dimension is of paramount importance to the total count of dimensions of an organism.
But from a larger non-subjective perspective all the scales of reality have the same existential value; as smaller scales grow in information (as a fractal does). So the product of its energy-size & information is the same in each scale. This 'co-invariance' of the size and information of any region of the Universe is what mathematicians call the 'metrics' of a 'dimensional system'. And in this case it is the metrics of the 'scales of space-time' of the Universe.
Those 3 'scales' of any superorganism are different in its properties as a 'space-time' since the unit/scale of space is different and so it is in an inverse fashion its time-speed (the speed of the clocks of time of each scale). As 'things become larger in space', their clocks of time slow down in its capacity to process information.
So an ant lives 7 years but think 10 times faster, and a quark is much smaller than a galaxy but turns around billions of time in a second. Yet both, the speed of 'time' and the 'size in space' balance each other, such as Es x To = K. This fundamental law of the Universe is what allows a super-organism to 'coordinate' 3 scales and the actions it develops on the 3 scales in synchronicity. So for example the faster speed of cell processes allow the cell to reproduce in a day, which is a 'life' for the cell and produce enormous quantity of enzymes for the entire body. The faster speed of a small chip allows it to process all the information of a large machine. What a system 'looses' in size in space and force and energy it gains in speed in time processing and intelligence the smaller it becomes, and this introduces many contradictions.
Essentially all what you see is part of one of them. It might be seen partially either because we focus in a 'part' of a whole, or because it is indeed an isolated part.
Thus from 1 the superorganism comes 3 topological parts +1(the whole); then adding the 3 +I social dimensions of the whole, 6+1 and then adding its 3 inner cellular dimensions (-i) 9+1. And this 10 Dimensional description is what will give us fully all the needed information about the existence of an entity.
3+1->6+1->9+1 however will make too bulky our analysis and logic equations. Thus we ''compact' the 3 ±I scales of the system with the ±I symbols that resume the dynamic process of emergence (birth and social maturity) and devolution (3rd age isolation and final death) which relates the individual to those upper and lower scales of existence.
How can we then formalize logically the structure of the superorganism and all its parts? With a new 'logic system' of symbols that represent those dimensions of a superorganism, in the form of a 'fractal generator equation'.

13. An equation to represent the Dimensions of all Systems of Reality.
The simplest equation to define all the superorganisms and systems of the Universe uses only 3 symbols. It expands the fundamental equation of science, (energy conservation) into the principle of conservation of energy & information:
'All what exists is a complementary system that transforms back and forth, energetic space into temporal information:
$\sum Se \Leftrightarrow \prod Ti$ *(dynamic view) or* $\sum Se$ *(limbs-field) X (body-wave)* $\prod Ti$ *(head/particle)=K (balanced system – static view).*
It describes all the systems of the Universe, as complex systems of energetic space and temporal information, in permanent motion, gauging information, moving with energy, and combining both, exi, to create, decouple and reproduce similar systems, in an immortal Universe made of infinite fractal complementary systems of energy and time, including you, who sometimes say ´i don't have energy and time to do this'. Actions of energy and time performed with your ternary system are all what you or any entity of the Universe does.
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<=>I, interacting with a bigger energy/information system - the Universe.
The first breakthrough of this more complex vision of reality took place in physics, when Max Planck the founder of quantum physics discovered that the Universe was made of actions of energy and time, *not of substances but of motions with form*: A = E x To. Light, the ultimate substance of creation was composed of two different motions, cyclical clocks of time (electric information), and lineal motions (magnetic fields). Energy (lines of space) and Time clocks (cycles of information) are two types of motions. Substances are a Maya of the senses. This Galileo 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.
In 'static', present terms as Es=To, implies all systems seek a balance between its energetic space and temporal information (as the equality e=i maximizes the previous equation max. e x i=5x5>6x4). And so the survival of the fittest, those with a higher, ExI, existential, energetic and informative force, makes most systems balanced Max.ExI (e=i)systems.

Those 3 symbols represent a superorganism in i=ts individual scale as its 3 topological networks/organic functions:
- Es: Energetic space, the lineal motions of the Universe.
- ⇔, X, the dynamic or static 'body/waves' that join both poles.
- Ti, To: Temporal Information, the cyclical clocks and heads of the Universe.

Where i (or st) represents an specific growing scale of wholes that become parts of new wholes and create the fractal, scalar structure of the Universe – *which put together in a continuum defines the 5th dimension of the Universe* – its scale of social complexity from i-∞ cells that gather into whole i-ndividuals part of, I+∞ social superorganisms of a new scale.

Thus i-scales of complexity represent the relationship of a superorganism with its social scales, which the superorganism perceives as a series of 'actions' he performs within its social group or ecosystem. Hence its 3 temporal, social actions' or 'functions' that those 3 spatial dimensional organs enact in time are described also by 3 symbols:

+i, +st: The positive arrow of information or life, the longest arrow or dimension of time, and direction of the future, as all systems are dominated by a particle/head of information that constantly curves and transforms into form, the energy of the System. Thus +i represents the arrow of future-information - the function of forming, perceiving, warping & wrinkling the superorganism till exhausting its energy in its 3rd age. Since the purpose of the Universe is to create networks of cells communicated with languages of information that emerge as a whole, we use those 2 symbols, +i, +st, to signify a 'higher' eusocial plane of existence - the creation of a new 'whole' plane of space-time. And viceversa, when a plane of space-time dissolves as its communicative, informative networks disappear and the being dies, we use the inverse:

-i, -st: The negative arrow of entropy, energy motion and death, the shortest arrow, and direction of relative past, as energy diminishes from an age of youth and motion, towards the future of information in which all energy is spent, and the system then reverses in the 'instant of zero time' called death, dissolving fast its information back into cellular energy disjoined and extended without networks that put those cells together. So Atoms explode into photonic parts, humans into cellular parts and galaxies into dust of space-time. Thus –st, -I means a lower plane of smaller 'cells'.

∑, ∏: Those Symbols represent the process of social evolution of parts into wholes, either as 'energetic parts' that are assembled into herds, ∑, or as 'informative parts' that join into networks, through 'axons' that connect each cell to all others (hence the ∏ multiplicative system and the higher power of informative systems over loosely connected herds).

So we put all those symbols that analyze systems in its 3±i, 6±i or 9±i dimensions in a single equation that resumes it all:

$$\pm i \sum Es<X>\prod To$$

The Equation explains the structure of 10 D^i Organisms, which are all from the Universe to man. It is *the fundamental 'Generator, Fractal equation' of General Systems Sciences* or Complexity, a XXI C. science that unifies biology and physics, through the use of 2 '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. So we say: *'Everything in the Universe is a Complementary System that transforms back and forth energetic space into Temporal information: Es<=>To'*

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

So do 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 equation also represents the ternary elements of a universal grammar, e<=>i, which describes the syntax of most languages that *are* used by minds to map out in a synoptic manner the 3x3±I superorganims of the universe:

In mathematics we always write, F(x) OPERANDI g(Y). Where the function of x and y tend to be parts and wholes or energy and information variables, and the operandi 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.

In the 3rd language of mankind, words, Chomsky found its universal grammar to be also a ternary, I⇔E equation:

Subject (human, informative element) < *verb* (describes exi actions) >*object* (energy element submissive to the subject)

Further on, we can classify those languages, into primary, perceptive languages - *the spatial language of colors and the temporal language of sounds/music* – and complex exi languages, which combine both elements:

-Max. I x E: the language of words, dominant in time-verbal dimensions and…

-Max. ExI mathematics, where geometry is a spatial language and arithmetic & algebra a sequential, temporal one.

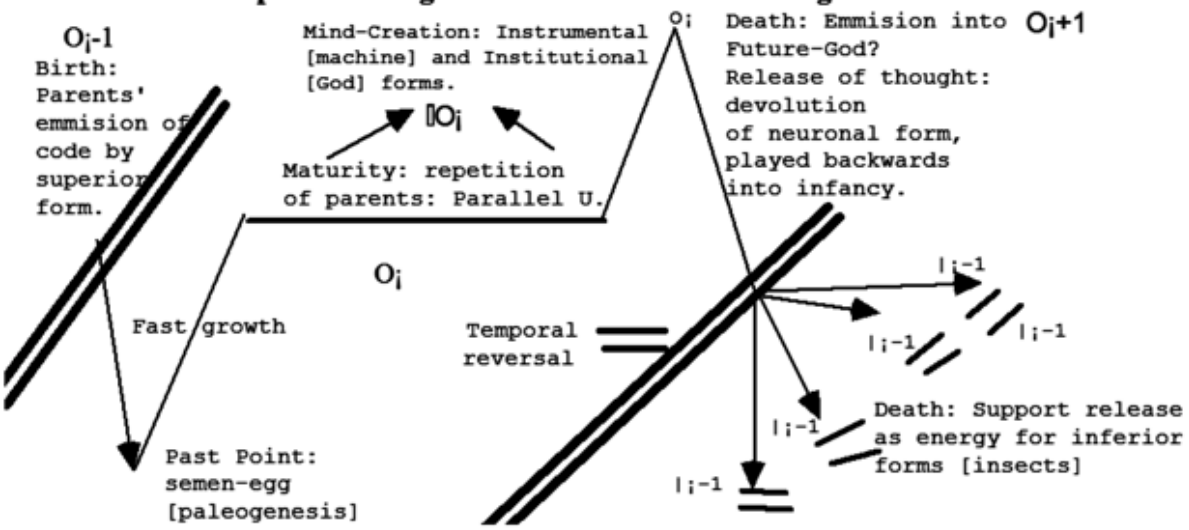
Mathematics is the dominant language of physical sciences, as those are species of higher energy-space-motion. But the much despised language of words with its causal logic of past->present->future dimensions IS better suited to explain informative, temporal processes. Hence evolution and social sciences rightly use it in its scientific theories.
We can even go further and comment on religion. Saint Augustine wrote a book called Trinitas, to explain the mystery of the trinity of God – where a God or Nation is the subconscious collective superorganism of all the believers that share the 'same' memetic 'DNA-code' as cells of the body of 'christ' (or Buddha, etc.). Hence Gods as human social superorganisms, which can be compared with many other ternary systems. In our example, the mystique metaphor of Trinity merely puts 3 elements in relationship, God, the collective superorganism, the mind of each human cell that believes and sustains the superorganism in its i-1 scale and the informative network or memetic code the Revelation book of words, which acts as the DNA genetic code in a body – making all cells with the same DNA code; all humans with the same Memetic 'saint spirit' act in harmony. Thus the saint spirit is 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:
God, 1st person, the word, 2nd person, became the mind of man, 3rd person, and inhabited among us (Saint John, 1)
All those visions of the ternary game of existence are partial visions that we unify in G.S.T. 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 the languages of the Universe. Upanishads said the 'languages of god' are infinite, but they all relate to the language of general systems sciences and its generator equation of superorganisms. Each 'ternary code' reflects part of the total properties of the Universe. As only the whole universe has all its information about itself and its ∞ parts, (Haldane). But we men can understand how all languages map reality and extract from its universal grammar, images of its ternary, e=i systems. Then we can deduce the laws common to all those systems, which we call isomorphisms or invariances - the common truth of the whole and all its parts.
We are exploring the fundamental equation of the universe, the one that generates *the motions=actions of* all its systems.
Indeed, we can also reduce the actions of all structures, forms, cycles and events of Nature to 2x2 simplex, individual and complex, social actions of energy and information, which are both the 4 'fractal dimensions' of physical entities (light dimensions+social color, 4 quantum numbers, 4 Maxwell equations), and the 4 'wills or 'drives' of all biological beings - since biologists define life as entities that feed on energy, gauge information, reproduce and evolve socially.
The main of them, is the existence of only 2+2 type of actions in the Universe:
- 2 simplex, individual actions of energy and information feeding (Max. E, Max. I) and 2 complex, social versions:
- Exi = Reproduction with a couple by imprinting the excess of energy with form and social evolution in herds and…
- ∑E, ∏I, creation of herds and social networks that combine to create the whole, represented by the generator equation:
- ∑E(X,⇔)∏I, where we add 2 symbols of social evolution, Σ a sum of the cells of the 'body' and ∏ a multiplicative network; since informative systems form networks that relate each cell to all others, multiplying its social power. While X is the organic, static, present vision of the system, and ⇔ the temporal, 'dynamic' feedback flow perception of it as a sum of cycles of exchange and combination of energy and information that all entities of the Universe. Thus 4 arrows, actions, drives, dimensions, cycles or whys suffices to explain all events, actions and its static forms in any i-scale of reality.
Recap. All what exists is a complementary system of energy and information that switches between both states: ∑Se⇔∏Ti. Each of those 4 symbols describe the whys of the 2 Simplex individual and 2 Complex, social actions of all beings, whose cycles create the space-time we perceive: E: energy cycles (moving, feeding), I: informative cycles (perception, inner form) and their social combination, E⇔I, the reproductive cycle and ∑, ∏, the social cycles that create herds of energy and networks of information.

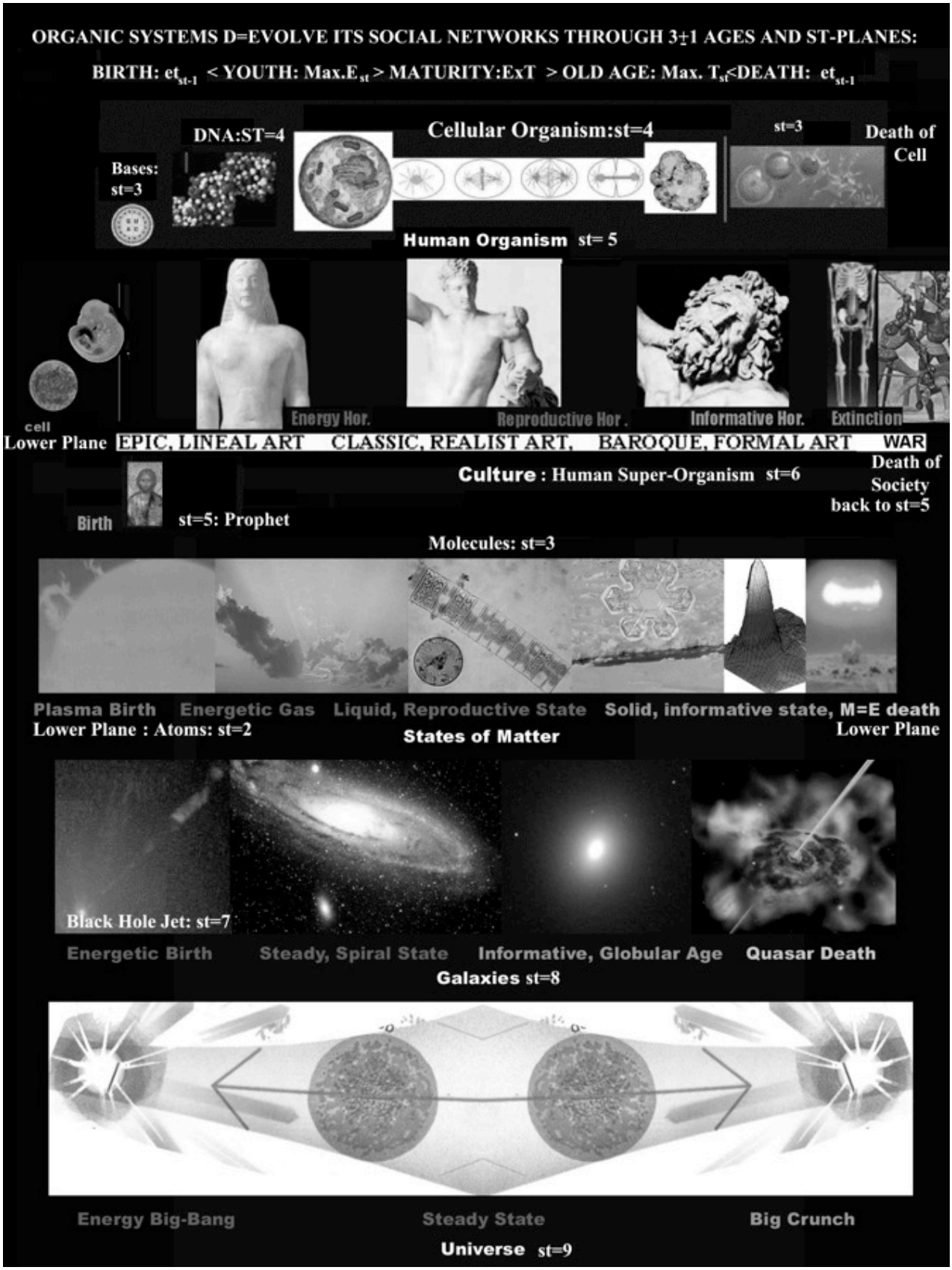
14. The life/death cycle and the generational cycle.

The formalism of the 2 simplest arrows of space-time, E->I and I->E, show that the properties of Information and Energy, of Form and Motion, are reversed:
- Energy moves; it is extended, lineal, big and simple, without form. Since the line is the shortest distance between 2 points. Information seems to us still - a pattern of form, which chains different cycles into shapes. It is small, cyclical and discontinuous; since the circle is the figure that stores more form in a lesser perimeter. Yet in dynamic terms, we must think of expansive big-bangs, which create extensions of energy and implosive, curved flows that create in/formation; 2 intuitive motions that Descartes considered the simplex 2 elements that create all realities (res extensa=space and vortices of mass /information). Once this geometrical duality is clear, we can deduce how the causal order of those Time Arrows creates in all space-time beings the life/death cycle, from birth to extinction. Since first Energy warps into Temporal Information in 3

long phases/dimensions of time (Life Ages). Then Information explodes back in 0 time into Energy in a *moment* of Death: After a 3rd age of information matter or life explodes, dies, extending in space, reversing the arrows of space-time: I->E.
- For example, humans are born as energetic, moving children that warp into a 3rd, old age of information.
- Matter is born as a plasma or gas, extended in space, which evolves into in/form/ative solids (atoms, black holes), through an intermediate exi, liquid phase.
So all creations of cyclical particles (masses and charges), all states of matter and all processes of aging can be explained with the 2 primary arrows/actions of space-time: e->i, i->e and an its intermediate state, which combines both, the reproductive, mature age of life, the liquid, most complex form of matter. Thus the energy and informative arrow together define an immortal Universe made of ∞ bites of energy and bits of information in cyclical trans-form-ation: a young surface of Energetic Space reproduces in/form/ation till it becomes old and wrinkled. Then it erases its form back into energy in the inverse process of death, completing an existential life/death cycle, which we formalize as the 3 phases of the generator cycle of the Universe:
E⇔I = Max.E x Min.I (youth) +Max. ExI (e=i): Reproductive maturity +Max.I (3rd, old age) –Max. Ex 0 I: Death = zero sum.
All beings that exist in time go through those 3±st ages that correspond to the 3±i arrows of space-time.
- i-1->i: Birth: a seed of i-1 information emerges into its i+1 scale as a whole, after self-reproducing & organizing socially.
- Max. E: Youth: The new-born grows its energy-limbs.
- E=I. Maturity: After evolving its reproductive systems, the life being will reproduce, combining energy and information.
- Max. I. 3rd age: Life acquires more information, warping and exhausting our energy as we implode our form.
- i->i-1: Death: Finally without energy, the warped in/form/ative i-organism dissolves back into i-1 cells; and further on into the i-2 scale of molecular forms from where it departed. *The cycle of existence then closes as a zero sum, which ensures the eternal life of the whole cosmos, our energy feeding new life. Since Life is as a superorganism is a trip through 3x3±i Dimensions of the scalar Universe. Humans travel between birth as i-1 seminal cells into i-ndividual existence, then as part of social i+1 superorganisms, dying back into the i-1 scale, after breaking our i+1 social ties in the old, 3rd retired age:*

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





In the graph, we observe those processes of creation and extinction of super-organisms departing from forms of a lower scale of existence in self-similar systems of different scales, from top to bottom:

St-2 (i-2) atoms become St-1 DNA molecules that transcend into st-cells, which go through the 3 ages/cycles of E-growth, ei-reproduction and i-nformation till its final apoptosis, when they die returning to its st-1 molecular and st-2 atomic scale.

-St-2 DNA becomes a seminal St-1 cell that emerges into an st-human being, which goes through the cycles of growth, reproduction and information till its final death, when it descends back into St-1 cells and St-2 amino acids used by insects to evolve a new cycle of existence.
- St-2 seminal cells become st-1 prophets, which create a code of information, the Book of Revelation which is memorized as a meme by all believers, creating an I+1 civilization, which goes through the ages of energy growth, reproduction and informative, baroque art/thought (since art is the mind of civilizations), finally becoming extinguished in an age of war.
The life death cycle is clearly the consequence of the messing of energy and information networks. Since the informative network exhausts the energy of the body herd of cells, warping them and committing a selfish suicide. Without the dominance of the informative network the 3 ages of life would not happen. Death is then the just return of the selfish ego-driven, information remembering, warped network- mind, *an infinitesimal point that reflects the ∞ Universe in its mental mapping, it often confuses with the whole, putting itself in its center*, back to its 0 truth as part of an immortal whole reality.
The same process is followed in the lower part of the graph in physical systems:
-St-2 plasma particles become st-1 atoms, which evolve into social states of matter, st-energetic gas, st-reproductive liquids and st-informative solids that further evolve as st+1 bosons into a new social plane of existence or dissolve back into st-1 atomic, ionic plasma and st-2 radiation ($E=Mc^2$).
- The same process in a cosmic membrane creates from a st-2 seminal nebula of atomic gas, st-1 stars, which further evolve through 3 ages from gas, to liquid to solid black holes that organize a herd of stars into st-galaxies, which die, exploding into quasars and reverting into intergalactic dust (st-2).
-We consider the Universe and its big-bang-big crunch process also a 3 ages system from an initial i-2 quark gluon soup that explodes in a big-bang of energy, then reproduces and evolves socially into informative, dark matter black holes, which organize body planes of stars that reproduce more complex atoms, forming spiral galaxies, till the process of informative evolution converts those galaxies into 'dark matter, black holes', which crunch back into a new 'singularity' to restart the cycle. And that process passes through 3 phases of maximal energy, e=I and maximal information shown mathematically in the changes of the 'cosmological constant' – which as all constants are parameters that show the different co-invariances of the energy and information components of all systems. In this case, slight changes in the cosmological constant give birth to the 3 ages/solutions of Einstein's equations, from a young, expansive big-bang age, where energy dominates into a balanced steady-state (alpha=0) till a final bosonic big-crunch, which gives birth to a hyper-black hole that will explode back into st-2 quarks, restarting the process.
Yet in all systems its reproductive age renews the being into an offspring of clonic entities defining a generational cycle, *as all individuals become 'cells' of a species that also go through those 3 ages as a 'whole superorganism'.* Since all species have a finite number of self-reproductive generations, after which the reproductive system becomes 'tired' and fails. So life has telomere clocks in its genes; and light has a mean life of 10^{10} years, after which its self-repetitive wave becomes tired and red-shifts back to dark energy (seen in the phenomena of 'expansive space that peaks in the mean 10^5 age).
Recap. The life-death cycle is both a travel through 3 ages of growing information till death reverses the inner time of the system and explodes its information into energy, but also a travel between 3 planes of space-time existence, as a seed of st-1 information reproduces and evolves socially, surfacing into a 'higher' st-plane of existence and then reverses through death the social process, dissolving back into its cellular stage. In fact, the process normally takes, when studied in more detail two jumps on planes of space-time organization and what we see as 'life' with its 3 ages is only the 'surface' of the iceberg of the complete cycle. The generational cycle is a finite cycle with a limit set by internal clocks: Energy and information arrows are reversed, since to create information we have to destroy energy and to create energy we must destroy information. Thus, the causality of the Universe is 'dualist': I->E (energy creation) + E->I (informative creation) - a fact, which explains the causal cycle of life (E->I) and death (I->E). Thus the 3 dimensions or ages of time are: past, the energetic, young age; present, the age of repetition= reproduction in which the being doesn't seem to change and future 3rd age of information.

15. The program, cycles and beats of the Universe: Es⇔To

In each Natural 'i-scale' of the Universe of growing complexity of i-n-form-ation, from the smallest atom to the bigger galaxy, we find 'Complementary Systems', where 2 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<=>I. Thus we simplify and unify our analysis of all universal systems, by defining both physical and biological systems with that simple equation of '2 arrows of space-time or future space-time events':
=>E, which means the creation of 'expansive, lineal motion' or energy or entropy or disorder.
and =>I, which means the creation of in-form-ation, dimensional form, implosive, cyclical motion and order...

It is important not to confuse 'the 2 arrows of space-time' and clocks of cyclical time that carry information, which is one of those 2 arrows. Those 'beats' of the Universe between energetic and informative states are the essence of what we call the 'Function of Existence, exi=st, cause of all events.

The commonest 'rhythm' of those 'time arrows is the rhythm of the life-death cycle, in which in the 'middle the 3rd arrow of present reproduction takes place, when E and I find its max. Exi (e=i) balance.

Thus our definition of past=youth=energy, present=reproduction and future=information=3rd age shows how the Universe finds its 'best' possible rhythm, which elongates the 'age of balance' in the middle time, when life lasts longer.

We explained first the 3±i topologies of space and its combined 3±i Dimensional, social actions that summarize the program of the Universe; and its 'long time order', the life-death cycle; yet in the series of 'micro-presents' that conform the existence of the entity, all those actions are performed one after another in 'quantum cycles', albeit with different frequency in each age (Max. number of energetic/moving actions in youth, of family/reproductive actions in maturity, of informative actions in the 3rd age). Hence the 'cyclical nature' of the 4 actions-arrows-dimensions-drives of the program of existence (Max. E: Feeding, Max. I: Perceiving, Max. exi: Reproducing and ∑,∏I, evolving socially into superorganisms.

Since systems are wholes, they must achieve those 'partial actions' of their program of survival in a sequential manner, switching between them to complete them all; and they do so with a series of sequential rhythms particular to each scale age and species of reality. Thus the knowledge of those cyclical patterns and its forms and the way they are 'synchronized' together into 'knots of actions' are essential to define the specifics of each species and its cyclical patterns, frequencies, synchronies, nature, structure, form, functions and behaviors at social and individual scale. The general pattern is:

- *Simplex Actions:* All entities feed on energy because they need to move and they all have a reproductive body/field of energy, which must be replenished, or else it will be spent. And this overall function of all systems, feeding on energy becomes the first arrow/ cycle of time of the Universe.

Yet all those complementary forms do have also an information network that requires to perceive the Universal tapestry. So in fact, even before the entity feeds it will have to perceive, gauge and calculate information. And this becomes the second arrow of time, of all complementary beings. And again we realize that even physical particles gauge information, and certainly move with it field of forces. So do biological beings that process information with DNA nuclei and heads, and process energy with their cellular bodies. And so now we have 2 arrows of space-time – a concept that means tendencies of the future - energy and information, and two types of cycles to accomplish them. But unlike the classic concept of science of a single continuous time arrow (the arrow of energy or entropy), because we have now two arrows, time must be discontinuous, as the entity must go from energy cycles to information cycles and this establish the universal, fundamental beat of reality: all entities of the Universe go through a process of motion (energy process) and stillness (perceptive informative process). Since we realize that to perceive and map information you have to 'measure' in stillness. Here it comes the meaning of all those metric spaces of classic science. They describe the arrow of information and measure; while all those analysis of motions and speed describe the arrow of energy.

Thus we define a universal beat of existence, E⇔I, motion, stop, motion, stop, energy, information. Like a movie in which the frame moves and stops and illuminates in stillness creating a form of information, all entities of the universe have stop and go rhythms, day motions and night sleep, and when they move they process energy and when they are still they process information. Again the generator equation of spatial energies and temporal cycles of information explains it: E⇔I.

Thus there are 3 simplex actions that all systems perform *individually*, Max. E: moving-> Exi: Feeding -> Max. I: perceiving. So all systems move, feed and re-form what they ate into its own components. And this rhythm establishes a stop and go, constant switch between energetic motion and perception in stillness to fix a map of the Universe or create the components of the system, from the simplest electron that stops, feeds on and perceives light and moves to the human that stops to feed 3 times a day and then the entire night to process its inner forms and moves most of the rest of the day. And those are the most frequent, constant actions of all systems, as all move, feed and perceive. Let us consider 2 examples of the simplest switch between 'form' and 'motion', cyclical shape and lineal shape, to show the variety that those patterns generate departing from the homologous nature of all 'energy' and 'information states':

A simple E-T-E cycle is the clock: the lineal needle comes always to the same point and closes a cycle.

In the simplest mathematical scales of geometry, information is defined as 'dimensional form' and energy as 'lineal motion, and we write, π: I <=> O: |/O. Thus pi, the switch between 3 diameters combing into a cycle is the first 'Universal Constant' of the 'Game of Existence' of the Universe, in which a system switches '3 relative lines' into a 'compact' informative whole, as it mutates on and off between an informative and energetic state. *Universal constants in fact are proportional constants*

between energetic and information states (forms and distances).

- *Complex actions*: Systems to survive and live beyond death reproduce or evolve socially into parts of a stronger whole. Those are the less frequent actions, since they require a couple and the 'complete' recreation of the being, not a mere part of it or the universe as in feeding and perceptive actions. While simplex organisms 'externalize' reproduction, as atoms do (those actions are made by its i+n social scales, its cosmic bodies). Then they never enact the reproductive cycle. Yet the less frequent action is 'becoming' part of a whole, as the metrics of the 5th dimension, Se x Ti =K imply that wholes are bigger than its parts, hence their life cycle is much slower and so parts normally only become part of a whole in all its generation, as cells of the superorganism. Most superorganisms though reproduce through 3 social scales, then their 2 complex actions synchronize as the superorganism emerges after a series of steps of *cellular reproduction-> social evolution-> cellular reproduction*… as shown by patterns of growth and evolution of a fetus from a first seminal cell that reproduces, evolves in form, reproduce, till birth. Thus the Universe and any of its partial systems form a deterministic, interconnected whole of infinite harmonies between all its cellular cycles, chained by their symbiotic nature, such as the fastest informative cycles gather in ternary and decametric scales, connected to the frequency of the energetic cycles, which are connected to the frequency of reproductive cycles, which are connected to the frequency of the social cycles.

So we write: Max. ff(I) > Max. f(E) > f(Re) > Min. S.

Since an informative cycle is required for the entity to orientate itself towards a field of energy, and both energy and information together in great quantities/cycles are required to create a reproductive cycle; and finally multiple, self-similar reproductive entities are needed to create a super-organism. A similar hierarchical chain happens if we observe those entities in space, relative to its size such as: the pixel of information is minimal, making informative systems smaller than bodies and its bites of energy. And each of them is smaller than the total, reproduce organism composed of both pixels and bites, which is smaller than the eusocial system of which the organism is a single cell: Min. $\prod$I x $\sum$E= I < S.

We have used the synoptic language of the Generator Equation to describe those processes. Since a new field of science of enormous richness is the algebra of cyclical space-time, which studies the generator equation and all its possible beats from where all events of reality will emerge. This equation is to systems sciences and complexity what the Unification equation of Physics is to physicists, a sub discipline of the wider view we bring here - since we shall be able to deduce all the equations and species of all the sciences of mankind from that simple first beat.

Recap. Time events are cyclical, happening 'from time to time', when an entity absorbs energy or information with its field/ body or particle/head. The Universe is a tapestry of fractal, vital spaces, imprinted by cycles of temporal information, which create infinite beings. Those beings reproduce, combining those arrows and then associate in larger social groups. They are the 4 arrows/cycles of time that the 3rd paradigm of metric spaces pegged together into a single space-time continuum.

16. Species are superorganisms. Its ages: Topologic Evolution

In all space-time scales, species follow a future arrow towards more information, which increases in 3 horizons and finally evolves individuals into societies, herds and macro-organisms, related by a common language/network of information.

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The evolution of species is equivalent to the 3±i ages of individuals with a twist: death is not the only solution to the cycle, but the duality of *∂*-disintegration or ∫-integration into a social group (in the case of life a cellular group), which defines the life/death cycle gives two choices to some 'top predator' informative species: After its 3 horizons or evolutionary ages the species might become extinct or transcend into a super-organism.

In the graph, the seminal, 1st species packs a lot of information in minimal space: It is the Worm Hole, the chip, the 1st bilateral animal, the 1st mammal, the horse and the 1st Homo Sapiens, which seem to have evolved from a dwarf ancestor, which first discovered technology and had a dwarf brain, albeit with an evolved morphology similar to that of the Homo Sapiens: the Homo Floresiensis.

Then the new 'highly informative' top predator follows in its evolution a plan of dimensional evolution that transforms species with a high content of energy into species with a high content of information through 3±st horizons, similar to the ages of an individual organism. *Since species are macro-organisms in which each cell is an individual of the species.*

-First in its 'energetic youth', the species grows in size as horses, humans, bilateral animals or black holes do.

-Then the species suffers a reproductive radiation, colonizing new ecosystems.

- Next the species suffers a diversification, *according to the ternary principle into 3 subspecies, one dominant in energy, another in information and a 3rd one balanced in both parameters.*

- Finally, a new top predator extinguishes the species or the informative one evolves into social organisms of different complexity, stronger than the individual and survives.

Thus in Biology the 3±st ages between birth (st+1) and extinction (st-1) apply both to organisms and to species that go through 3±st horizons, parallel to those 3±st ages and main arrows of time of all systems of the universe. Thus there is an informative, 'intelligent', organic order in evolution. Though it is not a plan designed by a 'personal God' who cares for humanity, but by the limits that the morphology of lineal space and cyclical time and its combinations impose to the evolution of species. The so-called 'intelligent design' is the ternary, existential cycle that applies to every form of the Universe as it evolves in 3 possible sub-species: an energetic, lineal species, an informative, cyclical one or a reproductive form, of balanced ΣE=∏Ti parameters. Those 3 forms become the 3 horizons between birth and extinction of any species: A top predator form of max. energy, or I horizon of the species; a balanced form, ΣS=Ti, that reproduces so fast over its prey-energy that creates a 'biological radiation' and parallel extinction of the lesser victim till reaching a trophic balance, or II horizon of the species and a form of max. information or III horizon: Max. E, Max.Re, Max. I:

+1: Birth: max. Ti. The chip paradox (conception).

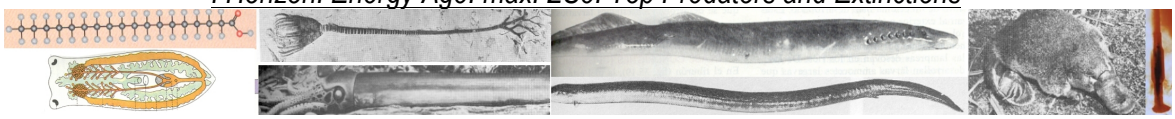
In the previous graph, the creation of a new species takes place according to the same 3 ages of any space-time cycle that become the 3 horizons of any species: after conception that creates 'a seed' of pure information and minimal Energetic Space, species go through a young age of energy growth that creates 'bigger species'; a mature, reproductive age of forms in balance between its energy and information, when the species maximizes its reproduction, radiating in huge numbers; and a third horizon of informative evolution, when it diversifies into multiple sub-species, becoming finally extinguished by a new top predator form, since its evolution has reached its limit. However, in certain species, after the III informative horizon, a social phenomenon happens: if the species has developed a new language of information, it gathers into herds that evolve socially together creating macro-cellular organisms of a 'higher', more complex Plane of existence. So prokaryote evolved into giant eukaryotic cells and those cells evolved into animals, of which ants and men, the most successful, informative insects and mammals, evolved further through pheromones and verbal information into societies and civilizations.

The 'Black Hole' age of any species is parallel to the informative, genetic conception of any organism, born out of a 'seed' that packs the maximal genetic information in minimal space. It is caused by the dominance of informative cycles over its Energetic Vital space. *So a new top predator species is born with a lot of new, genetic=Temporal Information packed in a reduced size (Max. Ti=Min. Se).* This happens because information is processed faster in smaller spaces. For example, a 'logic instruction' is resolved faster in smaller chips. Thus tiny species with huge numbers of neurons deliver stronger and faster group *actions* of energy and information, Min.ΣSe x Max. Σ^2Ti, than slower, bigger species (Min. Σ^2Ti x Max.ΣSe):

Since they are highly informative, they can coordinate those fractal actions in herds that act simultaneously as a single organism. *So their actions show a higher existential, exi force, which defines them as top predators*, as they are stronger and faster than the 'slow actions' of a single, bigger body. For example, small English boats shooting faster against big galleons defeated the Spanish Armada; a pack of wolfs kills slow reins and herds of orcas kill bigger whales. Small,

intelligent top predator brains rule bigger, less informative bodies, because time dominates space, information dominates and shapes energy. Thus men, the most informative animals, are the Earth's top predators; Worm Holes with maximal gravitational information are the top predators of the Universe and chips rule machines.

I Horizon: Energy Age: max. ΣSe: Top Predators and Extinctions



In their youth, species fed and grow into energetic, lineal, planar, top predators, becoming carbohydrates (fats), worms (planarians), lineal echinoderms and fishes, monotrema, Neanderthals and smart weapons.

A new-born, small foetus grows very fast in size as it multiplies its cells. By homology, a new, more efficient species is born as a small, informative, complex being that latter grows in spatial size during its energetic youth, becoming a lineal, energetic, big, top predator species that feeds on less evolved forms. Thus after conception, young fishes grew into big sharks of linear forms; after the polemic, dwarf Homo Floresiensis, who seems to have invented technology, the next Homo Sapiens with an extensive fossil record were big, energetic Neanderthals; the 1st big molecules of life were fat carbohydrate chains of linear form*;* the 1st insects acquired soon gigantic bodies in the Carboniferous; after chips were born as small machines placed in PCs and toys and the first robots they control are big tool-machines and huge weapons of mass destruction, lineal missiles and planes, that kill human beings.

During this energetic age, often a parallel process of extinction of a previous species, which becomes victim of the new predator, takes place. So when lineal proteins appeared, free carbohydrates disappeared from the primordial soup; in the Cambric most water species disappeared, as cephalopods with eyes multiplied; mammals feeding on eggs probably extinguished dinosaurs except those who put eggs in unreachable places (birds); humans extinguished most mammals and weapons extinguish non-technological cultures and when they become terminators, they will extinguish man.

II Horizon: reproduction: max. ΣSe =Ti: Radiations of species.

In the II Horizon (1st graph, bottom, left) the species finds a balance between form and energy and it reproduces in massive radiations: The protein age gives way to the age of amino acids, with nitrogen, informative atom on its 'relative heads' that multiplied all over the Earth; slow, reproducing sharks gave way to balanced tubular fishes that multiplied faster; brachycephalic Neanderthals gave way to dolichocephalic Cro-Magnons that colonized all continents; while young, giant stars, born in the I horizon, acquire the balanced size of yellow suns, the commonest of all stars.

III Horizon: Max information: Max. Evolution=differentiation

In its 3rd horizon (1st graph, bottom, right) species increase its information, growing in the height dimension or acquiring cyclical forms, improving their sensorial, informative skills: Nucleotides dominated life molecules; echinoderms changed to cyclical shape; fishes developed their inner networks in the dimension of height; amphibians became round; saurian and mammals became bipeds; Neanderthal became Sapiens Sapiens with round skulls and chipped machines acquire today android forms with their heads on top. And the key of this process is obviously the evolution of a hyperbolic, informative element: Nucleotides appear when they added informative, nitrogen rings and cyclical sugars to amino acids; a yellow sun becomes a neutron star of higher gravitational, informative density*;* insects developped its brain capacity and bees and ants appeared; while the Homo Sapiens evolves more complex technological tools; finally in the III Industrial R=evolution of machines, informative chips and televisions dominate the economic ecosystem...

±st: Extinction vs. Evolution into super-organisms.

The main difference between organisms and species happens after their 3rd age: Organisms dominated by nervous, informative systems, which control closely its cells, warp their cellular energy, till the organism dies, according to a clock set by the rate at which energy is metabolised, 'in-formed' by their nervous system.

Yet species, due to the discontinuous nature of their individual 'cells' do not exhaust their collective energy. So they might survive without further evolution, in its 3rd horizon, or they might become extinguished by a new, more efficient species, appearing on their ecosystem. Or they might evolve socially, becoming the 'cells' of a macro-organism. We talk, in fact, of 3 basic strategies of survival, according to the Ternary Principle:

- *Max. ΣE: Creation of balanced, trophic energy pyramids* that supply new victims.
- ΣE=∏i: *Diversification of individual forms* into new species that will survive the extinction of the parental species. Thus we talk of evolutionary, genealogical trees of 'son species', similar to those of any individual. Yet, while the different generations of an organism work together, creating informative networks between them that shape herds and families,

'son species' tend to kill-extinct the mother species, feeding on their energy. We call that fact, *the Oedipus paradox*. So mammals killed reptiles, men killed mammals and robots might kill human beings.

- *Max. Ti: Species also evolve socially their individual forms into super-organisms*, thanks to the creation of networks by specialized, informative 'cells' that integrate all other cells into a whole, bigger form, which has more *exi=stential force* than the individuals of a herd. Since the fundamental parameter of a top predator is its Max. exi force, which determines the strength and capacity of its actions, eusocial evolution maximize survival in the fights for existence as the sum of actions is stronger than individual ones. Yet *the individual must retain its 'speed' of action-reaction, which requires to attach a smaller faster network of informative entities to a slow* herd that extends in a *wider space ecosystem, in which they share a min. quantity of information only with is parallel adjacent* - so their actions per time unit are slower and less coordinated*. The result is a dual superorganism with a fast head and a slow, big body.* Hence we consider the creation of super-organisms, the final evolutionary stage of a herd of individuals from the same species: each individual of the herd becomes then a 'relative cell of the body' of the super-organism. While the specific language of communication and information of the species and the specialized cells of information that carry them, become the relative nervous/ informative network of the super-organism. Those informative cells form networks that pack closely the other cells *in min. space, controlling them with a specialized language of information*, as the queen pheromones do in anthills; nervous cells/ impulses did with chemical cells in the Pre-Cambrian age or financial and verbal languages have done with humans in societies, which are superorganisms of human beings.

Most space-time systems co-exist in 3 main scales of microcosmic and macrocosmic forms (physical species do so at the atomic, molecular and crystal scale; biological ones, at the cellular, individual and ecosystemic level), which are similar because they are created by an earlier process of differentiation and social evolution of individual parts into bigger wholes.

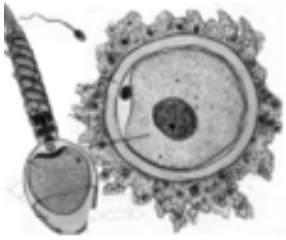
- *Extinction*: If species fail to achieve informative, social evolution, growing into super-organisms, they become victims of other species that have continued their evolution and become extinct or in case of having a higher rate of reproduction, lay at the bottom of a trophic pyramid. So today 90% of insects are social; Neanderthals became extinguished by verbal Homos and Protista with limited genetic content (mitochondria) became slave organelles of social, eukaryotic super-cells.

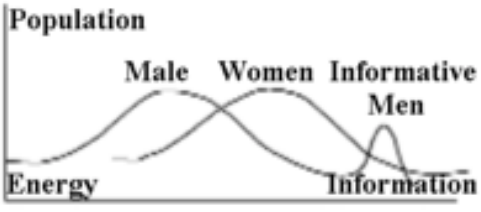
In all species and all scales of existence, the process of evolution is dual: species differentiate into 3 forms, which then recombine, giving birth to new species, as it happens in cells (energetic proteins, informative DNAs and reproductive RNAs that make up the cell), or in atoms (energy forces, informative quarks, balanced electrons that reproduce its nebulae on gravitational space).

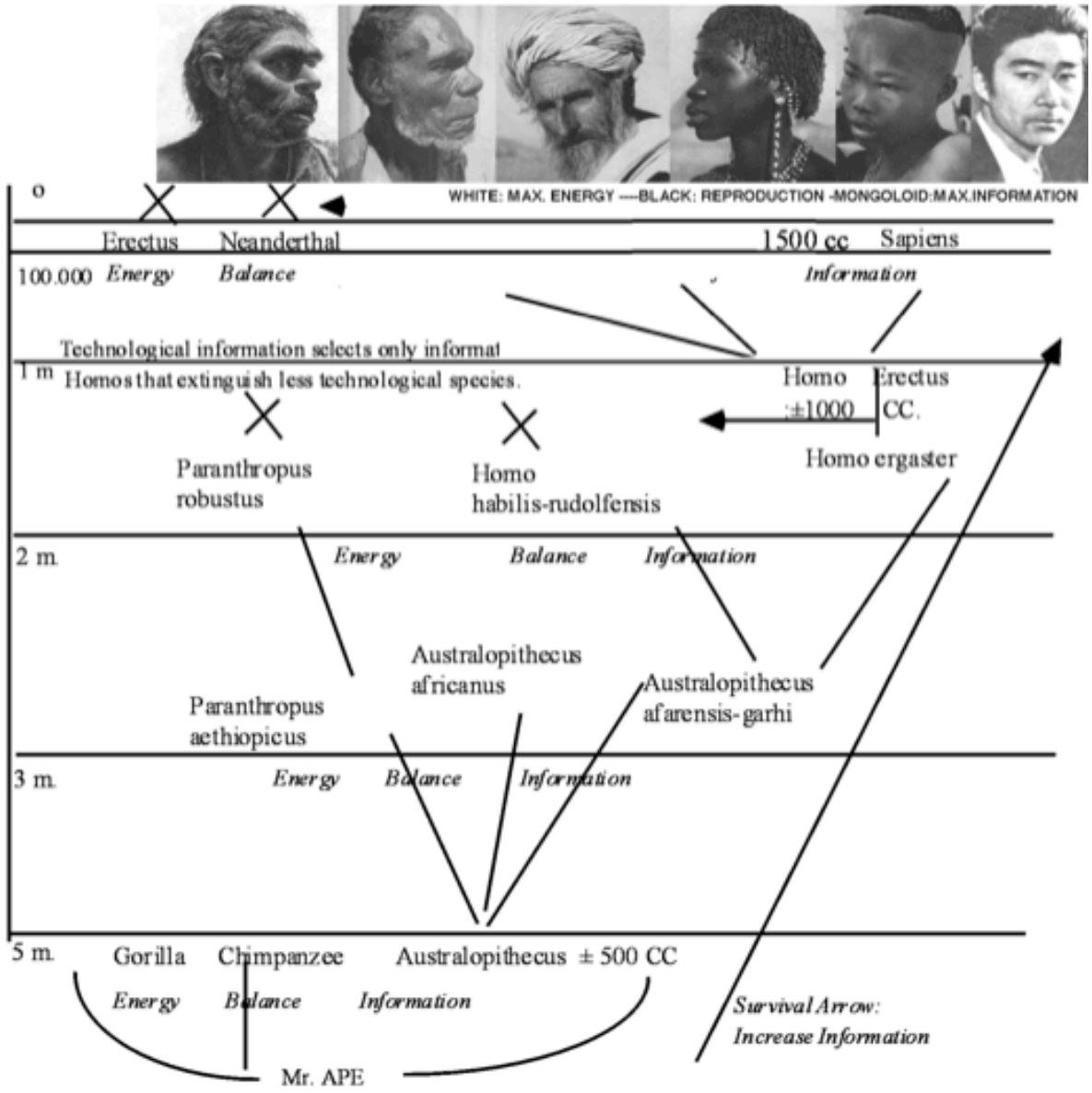
Recap. The simple, morphological plan of evolution that each fractal species of the Universe repeats is *caused by the fact that there are only 2±1 forms in the Universe, lineal energy and cyclical information and i=ts reproductive, body combination*. So only 3 new types of species can be created, one with more energy, one with more information and one that reproduces both. The process of evolution of species is equivalent to the 3±st ages of individuals: born of a seed or first individual of maximal information, the species grows its energy in its youth, radiates in an age of massive reproduction and finally diversifies into ternary types. After its 3 horizons or evolutionary ages the species might become extinct or transcend into a super-organism. Evolutionary theory went through 3 ages that stressed topological evolution (Darwin), interaction between the scales of life (genetics) and the different speeds of time and E⇔I beatings of the Universe. Those ternary causes explain the speed and accuracy of evolutionary changes.

17. The evolution of man: Ternary differentiations.

The Universe has 3 arrows/dimensions of creation, energetic length, informative height and balanced=symmetric, bilateral reproductive width. This simple dimensional game happens in humans. It is also a sexual principle: Women reproduce information with its cyclical bodies; males have lineal bodies with more energy. But women have 10 times more lineal, white matter in their energetic brain, and men 6 times more cyclical, grey matter. Thus females are: Max. I (Body) x Max. e (Mind). Males are: Max. E(Body) xMax. I (Mind); so their minds and bodies complement each other –a duality that should be the basis of all gender studies void of 'ideologies'. Further on our height dimension confirms our informative nature:







Complexity defines a Ternary game of evolution by differentiating species in informative and energetic species, combined in balanced organisms. The same game evolved man from the original ape 5 million years ago into the human being. Moreover the differentiation is established first from an initial top, predatory, young energetic species (gorilla in the human case) that diverges into a reproductive, mature species (chimpancee bonobo); and finally in its 3rd informative age gives birth to a more mental species (Australopithecus). This thesis of multiple spaces-times first established in the foundational book of this science 20 years ago, was confirmed with the discovery of the exact genetic clock: the divergence between gorillas and chimpanzees is 1.17, then the genetic clock diverges 1.17 to create man. Thus the same plan of evolution, which describes all other biological species of the Universe created man from Mr. Ape.

In human evolution the ternary principle applies beyond the triad of apes: each successful, dominant Homo differentiates into an energetic and informative species, which recombine, creating more complex=informative and stronger=energetic homos that displace their parental forms, thanks to their higher Energy x Information. Yet the dominant, overall arrow favors informative species. Since when Homos were born, the energetic top predators were felines, far stronger than the strongest possible homo mutation. So the evolutionary direction in which the big apes could find an ecological niche within the mammal kingdom was the informative arrow. They were already fit to that purpose, since they spent long times living in stillness in the summit of trees, where they learned to control complex motion in the dimension of informative height, adding a 3rd spatial dimension to their brain. So they became informative masters among mammal species.

In the graph we study the ternary process responsible for the creation of humanity: *as humans evolved, they followed the same pattern of 3 ages proper of all species.* Thus, Homos diversified into energetic, informative and reproductive forms that show a higher balance between energy and information. Yet only the informative species, the dominant 'arrow' of future survives in each of the 3±i horizons of increasing informative evolution, from Australopithecus with 500 c.c., into Homo Erectus with 1000 c.c. into Homo Sapiens with 1500 c.c.

In all those phases, humans split into an energetic species and an informative one that recombined to create a 3rd species. Those species will further evolve technology also in 3 horizons called: the upper, middle and lower Paleolithic. Finally, humans diversified in 3 races, specialized in Energy (white race) and information (Mongoloid) with a reproductive, black race, the last to be born, which mixes the pre-mongoloid (bushman) and white races.

The constrain established by the fact there are only two elements, energy and information, to create reality, whose lineal and cyclical forms are invariant at scale, in all systems of the cosmos, means the Universe imposes the same program of creation to all its species. Thus from an initial ape species we find a ternary differentiation ±5 million years ago, into 3 sub-species of great apes that live in Africa:

- *Max. E: Gorilla,* a big, energetic species that reaches 200 kilos, with a square, huge jaw.
- *E=I: chimpanzee*, with a smaller body and a bigger brain. According to the Black Hole law, the smallest organism evolves informatively. Thus, the 'dwarf chimpanzee', the Pan Paniscus, which today shows the highest learning skills among apes, was the species that seems to have evolved into a 3rd informative horizon of big apes. It is:
- *Max. I: Australopithecus*, which splits in 3 evolutionary ages of growing brain volume:

I Horizon: 500 cc.: From Australopithecus to Homo Erectus.

We have dated the oldest mandibles of Australopithecus Anamensis, the top predator of the 3 big ape species, in 4 million years. The Australopithecus, after reproducing massively in the savannah ecosystem that favors his bipedalism, suffers a new ternary mutation. The 3 descendants of that Australopithecus Afarensis that inhabited the Ethiopian plains around 3 million years ago are:

- *Max. E: Paranthropus,* an energetic species with huge mandibles and a lineal, planar brain. He looks like a heavy-set, humanoid gorilla. He was probably vegetarian. The first subspecies found is Paranthropus Aethiopicus, which will further evolve into the stronger Paranthropus Robustus.
- *E=i. Australopithecus Africanus,* which maintains the form of the original Australopithecus Afarensis, perhaps with inner improvements in his soft tissue. He lives in South Africa as a contemporary of Paranthropus.
- *Max. I: Australopithecus Garthi.* He is the informative species, with a bigger brain, which starts to acquire the shape of all informative species: a rounded forehead, as the sphere is the form, which holds more information in lesser space.

Those 3 species live very close. Around the Turkana Lake we have found remains of the 3 Homos. Yet the arrow of future favors informative Homos. So the top predator Homo will be the Australopithecus Garthi that goes through a mature age of massive reproduction, probably extinguishing the other 2 subspecies and expanding worldwide into new ecological niches that favored their genetic and memetic adaptation through a new, ternary split:

-*Max. E: A regressing, energetic A. Garthi,* similar but taller than its parental Australopithecus.
-*E=I: Homos Habilis and Rudolfensis*, with similar brain capacity to the original Garthi.
-*Max. i. Homo Ergaster*, an informative ape with a 1000 cc. brain, which doubles the brain capacity of Australopithecus.

II Horizon: 1000 cc. From Homo Erectus to Homo Sapiens.

Homo Ergaster, after a reproductive radiation throughout the planet, subdivides in 3 Homo Erectus sub-races:

- *Max.E: Pithecanthropus,* the oldest species similar to Homo Ergaster, found in Java.
- *E=i: Homo Erectus* proper, found in China, who grows in the informative dimension of height that favors perception from an advantage point of view, to 1.7 m. He has simple technology, a skull without forehead and thick bones that handicap further cranial evolution.
- *Max. I: Homo Floresiensis,* the smallish species, which according to the Black Hole paradox should be the form who gave origin to Sapiens, as the smallish 'pan paniscus' evolved the chimp into the Homos. Recently discovered, he is a formal mutation with a smaller body, whose morphology resembles for the first time that of a human being. He has thinner bones that allow further growth and a higher forehead, the location of the creative part of the brain.

Paleontologists also found the first advanced technological tools in his sites in Flores Island, which is an isolated place, the ideal region to foster further evolution, due to the lack of top predators (allopathic evolution). Thus, he adds now technological energy weapons that substitute body strength and define a single arrow of future for human evolution:

information. His improvement in neurological form, probably caused first his rapid expansion thanks to his new technological tools and then a rapid growth in size through the cross-breeding with the taller Homo Erectus species, giving finally birth around 300.000 B.C., to a new energy/information duality:

The energetic, big Neanderthal and the informative Bushman, which combine again to give birth to multiple races.

The 3rd, informative Horizon: Homo Sapiens, 1500 cc.

Those predictions based in the ternary principle and the Black Hole paradox (information is small and evolves in dwarf species) were confirmed by genetic maps and the Homo Floresiensis.

— Lineal, energetic, visual Homo Sapiens Neanderthal, with ±1500 cc.

— A 2nd informative pygmy strain, the 1st verbal woman or mitochondrial eve, probably a bushman, also with ±1500 cc.

± 80.000 years ago she crossed into the Middle East, probably mating with earlier Neanderthals, giving origin to the visual, energetic white male (Homo Palestiniensis, whose skulls show mixed traits from both species).

± 40.000 y. ago, in the high Tibetan plains, she became the informative Mongoloid that colonized Asia, America and descended upon Europe and Africa, where she cross-bred with the Capoid (bushman) and became the black man, the balanced E=i, reproductive race, completing the final, ternary differentiation of the main races of mankind.

Cultural races The 3 types of minds: Emotional, visual and verbal brains.

Further on, as racial tribes evolved socially and emerged into cultural societies, which are super-organisms of history, the ternary, racial division of mankind between energetic white men, informative Mongoloid and vitalist blacks, will become the cultural differentiation of human beings in 3 type of brain orientations, and hence cultures of the mind according to the 3 elements of all systems - energy, information and its reproductive combination; reflected in 3 types of brain morphology:

— *Visual, dolichocephalic energetic, lineal, spatial brains/cultures*, proper of the white man, with his concepts of lineal time and his passion for technological, energetic weapons and individual, selfish behavior. It is the long brain dominated by the visual eye in the Occipital axis, also dominant in the Homo Neanderthal.

— *Cyclic, informative, brachicephalic, mongoloid brains*/*cultures* natural to East Asia, with cyclic time concepts. It is the wide, verbal brain; dominant in the ear axis; hence giving birth to female, eusocial cultures like the Chinese.

— 'Sensory, reproductive, colored cultures', which in Africa and India developed human senses to their limits. It is a makrocephalic brain, dominant in the height/medullar axis with a tall head, peaking in the top/motor and sensorial area.

It is the best culture/age for human survival, as in all species, since it balances both arrows, E=I. Thus we should promote paradoxically the culture that a technological civilization discriminates: the reproductive, sensory culture.

19. General Linguistic Systems. **Universal Grammar: Information (subject) < Action (Verb) > Energy (Object).**

The mind of man and its program of behavior is written in the syntax of its grammar. Humboldt and Herder were right; the grammar of languages is the program of the cultural world. Next Chomsky found the Universal Grammar and its ternary elements: *Subject; Verb; Object.*

He was also right. Since Human Grammar is a reflection of the Generator Equation of Energy & Information:

Information (Subject) <Verb (exi-action) > Object (Energy).

General Systems sciences put together both discoveries and takes linguistics a step further in its evolution.

The key to understand the meaning of language is to divide all grammars into its 3 elements, which *reflect in the human mind, mirror of the Universe, the 3 essential elements of the 'Generator Equation of all complementary systems of energy and information of the Universe: Information < Action > Energy,* Which humans perceive in words:

Human Subject < Verbal action > Object, energy of the Subject

How the generator equation creates the different species of human languages?

There are several forms in which the Generator 'decouples' and splits in different 'varieties' of systems, which correspond to the processes of creation of different physical particles (quantum generation), biological species (Plan of evolution), and linguistic species (cultural differentiation). The simplest form in which to generate 'varieties' of any type is to apply the combinatory laws of mathematics to a system with 3 elements, the Information<Action>Energy systems of reality. The results are 6 combinations in the 'power order' of the 3 elements of all systems, which are common to all disciplines of science. If you have 3 elements, I, A, E (Information-action-energy), then you can combine them in the following orders: IAE, IEA, AIE, AEI, EIA, EAI; which give birth in Physics 6 essential types of particles and antiparticles and in Biology to 6 types of basic animal forms, according to the order of its physiological networks and so we shall find 6 basic varieties of languages, which are studied by *Typological Linguistics*, called the SVO, SOV, VOS, VSO, OSV and OVS varieties. Let us consider those 6 Universal varieties of languages and cultural character comparing it with the 6

varieties of animal species, to do a classic exercise of GS^2 homology.
The 3 elements of all systems are reflected in all sentences, as they narrate how 'human subjects' perform verbal actions over objects. And there are six theoretically possible basic word orders for the transitive sentence:

- Subject-verb-object (42%: English, Chinese, Russian: Flexible, 'mammal' languages)
- Subject-object-verb (45%: Japanese, Latin, Turkish: warrior, 'reptile' languages, objectual, unemotional)
- Verb-Subject-Object (9%: Semitic, religious, 'insect' languages, imperative, little freedom)
- Verb-Object-Subject (3%: Malagasy, Fiji, 'bird' languages, seafarer)
- Object-Subject-Verb (0%: Amazonian, Mexica, subsistence agricultural, Bacteria Languages)
- Object-Verb-Subject (1%: Apalai, Viral Languages, recollectors)

What they tell us about mankind is clear: when we analyze the abundance of those typologies among human cultures: Humans, this proves are 'self-centered beings' for whom the Subject must come always before the object, since in 87% of languages subject comes first. And among those the most successful (2/3rds of speakers) are SVO languages - the most evolved, mammal languages, where the 'informative' nervous system dominates.
This responds to the fractal nature of the Universe, where there is always a p.o.v. or subject that gauges with languages the universe and considers to be its relative center according to the definition of a mind –p.o.v.:

' A mind is a zero point or world, an infinitesimal still mapping of the infinite Universe, created with informative pixels, which believe to be the center of that universe: O-Mind x ∞ Universe = Constant perceptive World.'

1) SVO: *Inf<Act>En* systems dominated by Informative subjects whose goal is an 'action' established upon the energy system. This is the 'natural' most evolved order in the Universe in balance, corresponding to the 'mature' age of all evolutionary forms. Those are the most flexible, feedback systems of the Universe.
2) SOV: *InxEn=Act* systems. the informative subject still dominates. but relates first to the Object of energy, through the action. The object thus become the most important element, and so these are 'productive systems', in which the object is either devoured as energy or reproduced through the negative or positive actions of the Informative subjects.
Those 2 systems are the most common systems in the Universe, as they represent the two essential 'beats' between a 'temporal', flux, evolutionary state (Inf<act>En) and a 'spatial', fixed, organic state.
In Animal life systems, the 3 'elements' are the physiological networks of the organism; so we define a simple Generator Equation for Living Animal Organisms: Nervous, Informative System < Action/Blood system > Energetic, Digestive system. And we find 2 essential type of species, or phyla, where the nervous system dominates, the mammal which has an obvious order of: Nervous system > Blood System > Digestive system.
And then the second most evolved species, Birds. And so it happens in languages, where over ¾ of human beings speak mammal languages (SVO languages), even if in a previous less evolved time, SOV languages were dominant. There are not many 'bird languages' since man does not fly so there are no human birds. Still there are bird languages among seafarer humans (Malagasy, Fijians) showing the isomorphism of all structures of the Universe.
What about the other 4 type of languages? We can classify them in 'arrogant languages':
SOV Reptile cultures/ Languages are languages in which the subject-nervous system are pegged and direct primarily the energetic, objectual system, while the blood-active system is secondary submissive to those other 2 systems and less developed. It is also the 'cold' structure of Reptilian living systems, in which nervous and digestive system dominate actions, provoking a constant growth of the energy/force of the system without limit except death; while the underdeveloped action system is made of 'cold blood'. In a fascinating homological cultures, SOV languages are proper of 'energetic', 'warrior' cold-hearted cult(ure)s of weapons able to kill the 'other', seen as an object, such as German, Japanese or Roman=Latin Empires did historically. Yet if war is the negative action of SOV languages, the productive, Subject x Object positive action is the + side of SOV cultures. So Germans and Japanese are very productive, dedicated to re=produce their mechanical objects with absolute work zeal - even weapons that kill us.
VSO Insect Cultures/Languages. Finally those languages and cultures whose order of words is 'imperative', with the verb first – a form of language that more evolved ones use only in moments of danger or hierarchical institutions, as it is deemed rightly an impolite, fundamentalist form of though – are, well, I just said it, fundamentalist, imperative cultures. And so among human languages, Semitic cultures, specially in their old 'sacred' religious texts, Hebrew, Classic Arab and their Abrahamic religions, are insect, non-free cultures of 'believers' in the 'Word of God'.
Finally, the less abundant, less evolved languages of mankind are those in which the object, the 'energy' of the system, dominates the subject, the information. Those are languages in which the order is inverse, unnatural to the ego-centered

P.O.V. of th elanguage. Their equivalent in Physics would be antiparticles in which the electron is in the center instead of the informative quark. In animal life, they belong to the 2 categories of species, which started animal life evolution, in the microcosms, hence for whom the object-world in which they live is dominant. So we talk of:

OSV (object-Subject Verb) or bacterial languages. They belong to cultures that live in jungles in which they still fear the presence of animal predators and do have to act to live, or are constantly in the move as hunting/gatherers, or living in poor agricultural environments.

OVS (Object-verb-subject) or Viral Languages, in which there is not even motion in the subject, that is the Object comes first (the host cell) then the action (bacterial reproduction of the viral genetic DNA) and finally the seemingly dead, reproduced subject - the virus who parasites the cell, the human who parasites nature). Thus those are in Nature viral species, of little motion, and in the Paleolithic, they were proper of 'recollector cultures' where humans just reach a banana and eat without moving much, in paradises and allopatric islands without predators, in which humans are enjoying life and sex in a passive way. Those are the less abundant languages, and only occur in the Amazonian jungles, in which life is truly easy such as the Xavante and Warao …

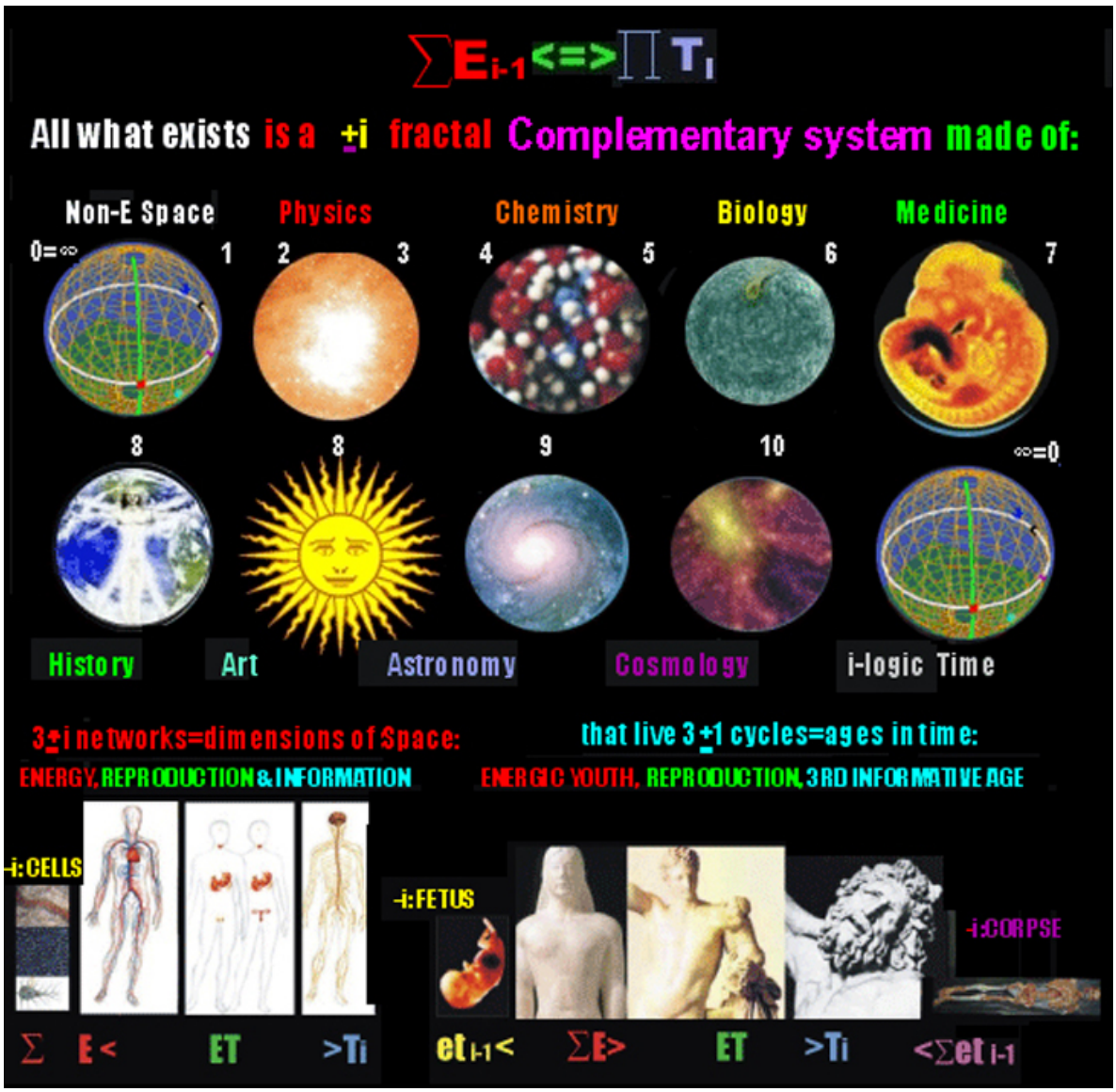
18. The superorganism of History.

Humans started in the Neolithic a process of eusocial evolution as the collective 'mind' of Gaia, our body of energy. Prophets of the wor(l)d expressed that goal through eusocial messages of love, empathy and 'sharing' of energy and information among humans to form networks and 'cultures and civilizations' – superorganisms of history. The final goal was to create a global superorganism based in welfare life goods in which all men could exercise its 4 drives of life (feeding, informing, reproducing and evolve socially). But the process was halted with the arrival of hard metal weapons (bronze age), and a language of information of metal (digital gold), which killed the body and hypnotized the mind of mankind, and whose values (violence and greed) eliminated the social networks of love, making some humans, who used it, 'animetals', to feel superior to non-technological cultures. They evolved metal in its 3 topological varieties, becoming associated to it the 3 people-castes on top of societies: lineal metal=weapon+man=warrior animetal, O-metal=money+Man, banker animetal, exi-organic metal machines+man, scientist. They despised as 'inferior', non-technological species, extinguishing them. Finally they created the superorganism of evolution and re=production of machines, the company-mother, which started with flows of monetary orders, the present process of terraforming of planet Earth into a planet of metal, in which man is a species secondary to the machines, symbol of 'the future' and its progress. So the evolution of mankind into a global, healthy superorganism of history was halted and nationalistic wars that justify the use of weapons, capitalist idol-ogies that justify the control of society by money and mechanist science that makes machines the center of the world, control our minds and maintain warriors, bankers and scientists as the top classes of our societies. The result is the present 'dying world of life and Gaia', asphyxiated and about to collapse, as selfish memes of metal, a new organic species (weapons=|- metal, money=O-metal and machines=organic metal) evolve and substitute us. This process is about to end as robots substitute humans in labor and war fields (cause of the present labor and perpetual war crises), in a process similar to the molting of a soft life larva into a hardcore insect, which ends with the death of all the enzymes, or 'enzymen' that provoked the mutation, creating the 'viral' machines or hard enzymes of the stronger system (robots) that once born kill the soft enzymes. Thus the Earth is molting from carbon-life to metalife, or from the human perspective lives in a cancerous process in which corporations and bankers monopolize the oxygen of the system, and release it only to corporations of machines denying a demand economy, based in a Universal salary=blood that could provoke a massive production of WHealth, welfare goods normal humans need to survive and would demand instead of expensive weapons and corporative robots. Thus, humans should design a better superorganism of history, a 'perfect world', based in a demand economy where as in all superorganisms, money=oxygen is produced from the bottom up with a global currency, Y€$ money (1 $=1€=100 yens=5 Yuans, at fixed parity with prices adjusted internally) and distributed to all cells of mankind. humanity will then demand and produce 'human, life goods', not selfish memes of metal, weapons that kill our body and hate-media and fictions that atrophy our mind. And instead of nationalist memes to justify the production of those weapons and hate-media, humans should allow diplomacy and a common legal, informative, nervous system to resolve national issues, evolving those anti-natural, smaller tribal superorganisms, the Homo Americanus, Britannicus, etc. into our natural Homo Sapiens Superorganism, 'History', as EU and UNO institutions try to do. Then we would not need to evolve the future terminator weapons that will eliminate us to combat 'tribal enemies'. Those 2 economic and political reforms coupled with the prohibition of evolving robotics, the new 'species' stronger and faster processing information than us, which will replace mankind, could ensure our 'immortality' on

Earth. Since under the present 'capitalist system' we will not survive the lethal evolution of machines of energy and information beyond Gaia's and human capacity to survive. Since death is an excess of energy (accident) or information (3rd warping age) that breaks the immortality balance E=I of the mature, classic age of any superorganism.
Thus humans will die due to 3 'singularity' events, which are as all divided in 3 ages:
- Max. E: the evolution of weapons of max. Energy (Nuclear bombs researched at CERN in its self-feeding, cosmic horizon – strangelets, black holes). Next year, 2016 CERN will double potency and pass the threshold of B.H. creation
E=I: Mechanisms of max. reproductive power (iron nano-bacteria that could kill earth eating its machines in 3 months)
Max. I: A.I. (platoons of robots guided by satellites). Those two events will come latter in the century, but observing the Universe teaming with planets, without A.I. Robots or Intelligence but filled with Black holes and strange stars (pulsars), it seems men will die in a Nova Explosion, if as it seems, politicians do not halt the evolution of weapons.

20. Conclusion: The isomorphisms of all Superorganisms. General Systems Sciences.

General Systems is the Philosophy of Science that unifies Biological and Physical Systems, first, by accepting 2 'two arrows of creation of futures', the creation of energy or motion (studied by Physics under the term, 'entropy') and the creation of information (studied by Biology under the term negantropy).It is a tenant of GS^2 (General Systems Theory) that the Universe constantly 'transforms back and forth, energy into information': E<=>I; and so all what exists can be described as a 'Complementary System of Networks of Energy and Information, ∑E<=> ∏I'.
In the graph, all sciences study 10-Dimensional fractal systems of energy and information – superorganisms - that obey the same laws, called 'isomorphisms' explained by GS^2: All those superorganisms are made of 3 organic dimensions of space, their hyperbolic, tall spherical heads/particles of information, moved by flat, lineal, energy systems, in the direction of length, and possessing a body in the dimension of width, which laterally reproduces the system. And those 3 organic dimensions of space, perform their actions in a time order, from a first age/dimension of maximal energy or youth, when the system is born, through a reproductive age of balance between its energy and information components, or present, mature time dominated by the body and finally a 3rd age of maximal information, when the head has absorbed most energy of the body, followed by a time reversal when the energy of the system is spent, all is trans-formed into in-formation And so for the game of existence never to stop, the system dies, explodes back into its parts of cellular energy: Death = Max I-> Max. E. Thus we can consider that all systems co-exist in 3 dimensions or scales of informative complexity, the i-1, cellular, i-ndividual and i+1 social scales. And so those 3 x 3 dimensions of space, time and complexity define a new whole, a 10 Dimensional superorganism.
General Systems Sciences classifies then all natural systems as wholes or parts of superorganisms. And it applies to the study of each particular superorganism the essential isomorphisms derived from its 10-Dimensional structure. Those 5 common properties of all superorganisms of the Universe and its laws is what truly defines a harmonic Universe in which all its parts behave like the whole and act in an organic, vital manner:
- *Isomorphism of its 2 components, energetic space and temporal information,* which 'combine' to create the infinite varieties of the Universe.
-*Isomorphism of its 3 physiological-topological forms in space and its relative dimensions* (lineal limbs that move the system with energy; tall, informative heads that guide it and wide, combined bodies that reproduce them).
- *Isomorphism of its life-death cycle in time and its 3±1 ages,* defined by the dominance of energy (youth), information (3rd age) and its balanced combination, e=I (maturity.)
- *Isomorphism of the 3 relative i±1 fractal scales of* cellular parts that become wholes, as the entity exists travelling through 3 relative seminal/cellular, individual and social, collective, i+1 scales. All those scales define therefore a fractal, 5th dimension of space-time, whose complex laws are the key laws of general systems sciences.
- *And isomorphism of its 4 dimensional cycles of space-time, the actions that all systems perform* and create an 'organic program' of existence, combination of the 2 arrows/substances/forms of the Universe, divided into:
- *Simplex actions of energy and information performed by the i-ndividual:*
- Max. E: Feeding, lineal motion; Max. I; Informing, perceiving.
- *Complex social actions* performed with a couple: exi, Reproducing or with a group, ∑: evolving socially, as a herd of energy and ∏, evolving as a network of information, through 'axons' that communicate each unit with all others:



A 4 'dimensional analysis' of systems show that all entities grow performing those '4 drives' of life. Some examples:

- 3+1 perpendicular dimensions of light: flat magnetic field: energy; tall, electric field: information, where photons are most likely found; its product (Maxwell equation): c-speed of wave reproduction. Social Evolution: Colors (∑photons)
- The 4 quantum numbers: Principal number defines the orbital energy and changes as electrons 'feed' on light. The orbital or angular number, its 'angle of height' or informative state; the spin number, its spin orientation, according to which it will or not couple with other electron and/or in favorable conditions with opposite spins emit a 'seminal ray' of light which crossed with the opposite spin 'gender' gives birth to a new electron; and finally the magnetic number arranges groups of electrons in a society. Similar numbers are found for quarks the other fundamental particle of the Universe. Thus since the essential particles of physics, photons, electrons and quarks, feed, inform, reproduce and evolve socially, we can indeed define a 'living, organic Universe' where all parts follow the same isomorphisms.
- 4 Maxwell equations define also those 4 actions for social flows of electrons in the next scale (laws of electricity).
- 4 basic atoms exercise those actions in simple carbohydrages: N act as the hea with its informative, vibration clock of enormous precision, Oxygen as the energy legs (OH^-, H^+ 'kicks'), Carbone as the structural, reproductive body, and H_2O as the territorial, social 'ecosystem', being H, both the pixel of information and the particle for energy transfers.
- 4 CGTA nucleotides code the 2 x 2 actions; the dual, more complex Purines for informative or social traits, the simplex Pyrimidines for simplex or energetic ones - a hypothesis, which genetics still cannot fully prove, till it couples all combinations of genes with their genotypes.
- 3(x3)+1 physiological systems define an animal: the Energetic/digestive system, the reproductive, blood system and the Informative, nervous system, each one displaying 3 sub-systems; all of them integrated by the 'I=eye' mind.
- As a consequence 4 social drives define the will of life and welare of human beings: our need for food and shelter

(E), our need for education and information (I), our desire to start a family (reproduction) and live harmonically in society (social evolution). And as such they should be the program of all humanist governments.

- Tthe industrial r=evolution of metal (machines& weapons) also takes place along those 4 sub-systems: in the XIX c. we made during the I Industrial Revolution, the energetic 'limbs' of machines (trains, steamers); then during the II Industrial R=evolution, its 'body-engines' (electric, oil engines); then its heads of information (mobile-ears, chip-brains, eyes-cameras), each of them enhancing, atrophying and substituting the equivalent drive of humans. While machines' 'complex actions' are carried by its 'reproductive' systems, company-mothers, and its social evolution, by the stock-market that through informative flows of e-money decides the corporations that survive or become extinct.
- Finally galaxies feed on interstellar gas; its body-plane of stars Reproduce atoms, their central black holes in-form them with gravitational waves, and emit polar flows of dark energy that connect them socially with other galaxies.

Notes

[0] In Cancun, Sonoma and Tokyo's ISSS meetings we considered the conceptual, formal, mathematical model, expanding our comprehension of Non-Euclidean, Fractal Geometry, Multi-dimensional topology and its application to describe the forms and motions of super organisms and its scales. We also developed the complex model of 3 arrows/dimensions/ages of time, past=energy, present=repetition and future=evolution.

In our conferences at Madison we used those laws resumed in this paper to describe the laws and species of biology and physics, since each species is in fact a superorganism of a higher scale than the individual, following the same morphological laws of evolution.

In the conferences at Hull and Waterloo we introduced the Socio-economic model, studying the evolution of the superorganism of history and the eco(nomic)system in which we live, and its sickness, 'capitalism', where a caste of cells of the body of history, the financial industry, monopolizes the distribution of 'air-blood' restricting and asphyxiating most human cells, creating a cancerous growth that is killing mankind, at the same time that it releases selfish memes to make people happy with their own asphyxia (as parasites and cancerous leukemia do, releasing substances that the cell craves or implanting selfish genes to make them work for them) This is the function of the media system, owned by the same financial corporations and the economic abstract science, with their fictional opium, ego-trips of nationalistic, religious or egoistic nature and the confusion of machine evolution with progress and human evolution.

In San Jose we dealt with the main isomorphisms of the Universe, with a 'reduced' dimensional model in which the upper and lower scales of systems and superorganisms, i±1 was treated as a whole 'single' 5^{th} dimension of social, evolutionary time between the remote past of vacuum space and the complex future of the whole Organic Universe.

In Washington we are resuming the whole model explained in previous conferences in this short introduction.

It is only left to introduce the 3 films made on the model, the documentary on the 'Superorganism of History', the documentary made on the Organic Universe of 10 D^i physical superoganisms and the 3^{rd} film 'quantum roulette' on the future extinction of man by organic bombs (black holes made by nuclear physicists) and organic machines (nanorobots and A.I.), completed and ignored by the 'system', which unfortunately as per our conferences at Hull and Waterloo is utterly corrupted, collapsing life and so it denies with its somas of technoutopias, abrahamic religions, capitalism and nationalism the negative side effects of those selfish memes of metal that help us to increase our power of energy and information but also atrophy, substitute, make obsolete and kill our bodies and minds (audiovisual fictions).

General Systems Sciences is indeed the highest possible understanding of the living Universe both in its new Non-Euclidean, Non-Aristotelian formalism, its organic vision of the superorganisms of mankind and its solutions to the problems of our species; though I doubt it will be known on time to cure our illness or those who are killing the superorganism of humanity under their somatic program will care to stop the process.

In any case I have enjoyed all my life this higher knowledge of the program of existence and the unity of all its systems and further on, as the Universe is a fractal, there will be infinite other planets in which life is thriving because GS^2 and the organic paradigm NOT the mechanist paradigm and the somatic memes of tribalism and egoism dominated life.

[1] Macrocephalic brain is a new word coined by this author to define the 'high' emotional axis of the human mind.