

BIO-Quantum PHYSICS: DNA/RNA As an Information Energy Catalyst in Life Systems

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Abstract : DNA as a catalyst does not change in a metabolic transformation. In fact, DNA rebuilds a self-copy in all living cells. In a similar way, a generic catalysis can be present in small quantities in a reaction and is unaffected in quantity at the end of the reaction¹. This analogy can be a starting point in trying to develop the frontiers of research in Bio-quantum physics. At present, we encounter fundamental problems in sharing theoretical physics with molecular biology and await a better understanding of the meaning of life². First of all, I am sceptical about the scientific character of a biological conception that treats the more advanced molecules in evolution like inert matter to be disassembled in order to copy some pieces of genetic information as one would a "LEGO" toy.

Because a life system is based on the communication system³, I would like to prevail over the conceptual contradiction of a "dead molecule" being the principal actor of life in nature⁴. The purpose would be to introduce a new way of thinking where the DNA function is seen as more than the storage of genetic information. This is important in order to consider the "DNA /RNA dynamic system as an information energy catalyst, able to transmit and receive BIO-PHYSICAL quantum signals (e.g. Bio-Photons and associated Bio-Phonons), to and from the proteins in living cells .The interactive dynamic information exchange in Quantum-Bio-Physics requires a more drastic revision to some fundamental concepts in Science than any that have gone before.

Article:

The Central Dogma of Molecular Biology says that the bio-synthesis process (DNA -> RNA Series -> Protein) is referred to the set of processes whereby DNA is self-copied (replication). Some genetic codices are copied by t-RNAs (transcription) and finally transported through messengers (m-RNA) to ribosomes for translation of genetic codices into linear protein production⁵. This approach of "copy and glue", creates a mechanistic linear picture of traditional biology that seems too much like a typographical operation for transferring genetic information to proteins as though they were books. As a matter of fact, this dogmatic model now is criticized by contemporary biochemical science because it is incomplete in terms of what's really going on in the interactive communication between DNA Enzymes and Proteins. This model of protein production does not consider, in physical terms, the collective action of information exchange at the quantum level. It is necessary to co-organize in a precise spatial and temporal orchestration, all biological events that permit the metabolic cell's system to evolve and to transform itself, until cellular Apoptosis⁶.

Certainly, this criticism does not solve the problem of understanding the co-evolutionary transfer of information between DNA and Proteins until cell Apoptosis (e.g. the programmed cell's death as is known through the leaves falling from trees or petals from a flower). In fact today, it is still not evident in which manner all the necessary information flows between DNA/RNA activities and the complete metabolic operation of the living cell. In addition, it is not clearly understood how the evolutionary rules work in the genome, determining so precisely, the timed activities of enzymes during the molecular transformations. Today, biologists believe that the great potentialities of the genome are due to the phenomenon of "alternative splicing", utilised in order to generate many

different proteins from the same gene. In any case, it will not be possible to accurately forecast a splicing method to acquire the precise time/space ordering in a large protein and the variety that exists in the cells and in the more complex living organisms. Hence, through alternative splicing, various proteins can be generated. However, the functionality of the proteins in connection with the genetic information remains to be understood. This is because the effective dynamic function of proteins is a consequence of the three-dimensional folding and of other functional factors. Therefore it is clear that the living systems certainly do not only depend on the number of diverse proteins generated in a cell. The fundamental challenge of the living science frontiers is at present focused on the need to comprehend the self-catalysed control of the functionality of the complex circle of the living cells. Therefore we begin this challenge by a hypothesis about DNA/RNA/Protein co-evolutionary activities, thinking of the DNA/RNA action as a powerful catalyst that is able to communicate information.

Quantum Bio-physics in living organisms.

The quantum molecular level is still very little known in terms of quantized modes to exchange information in living systems. In truth, biologists recognize the need to accept an operational orchestration of the dynamical metabolic phenomena of life and speak about the communication of well-specified “signals” between DNA/RNA and protein functional activities. In fact biologists, until now, have not accepted the challenge of giving a physical interpretation of such signals, so their scientific investigation remains very limited. Therefore, there persists the open question of interpreting the signal communication in order to derive a physical explanation of the space/time orchestration of metabolic and differentiation changes in order to get a more complete understanding in the study of living matter.

The fundamental idea is that micro and macro physical structures need to be deeply nested so that communication through Quantum Physics's “wave/particles”, provide the basis for going beyond the reductive boundaries of mechanical science. This paper will develop an hypothesis in order to imagine the biological information-flow of signals, seen in terms of formation and communication transfer of quantum-particles, generically indicated by “...ons”. To explore this hypothesis in biological communication, we need to revisit biological phenomena in terms of “bio-quantum Physics”.

DNA as an "ANTENNA" transmitting "Gene Quantum Signals"

Some unanswered questions require a new quantum-biological approach, because they involve the biological conversion of energy into bio-photons (particles of sound) and bio-phonons (particles of light) generally indicated by (“...ons”), as quantum-phenomena usable for communication processes in nature. To start to describe a model of quantum bio-communication, it is necessary to introduce important new elements that radically change our understanding of the DNA functions.

First of all, DNA itself can be considered a “nano-bio-technology” able to work as a “quantum-antenna” to spread “gene-signal” towards some active receptors of proteins in the cell. Within this hypothesis, DNA would be capable of communicating signals to the proteins and enzymes. It would be able to harmonise the regulatory relationship of the “anabolic” function, produce proteins, switch to “catabolic” pathways, carry out the transformation of meta-stable proteins into waste-simple products to eliminate them, and all within the precisely timed control of biological reactivity. Certainly DNA does not work as an isolated molecule. Therefore we need to conceive of the catalytic activity of the DNA/RNA coupling in order to suggest a model of biological “sound-chemical” reactivity based on bio-phonons communication in the living cells.

We know that from the point of view of bio-electrical behaviour, the closed and stable DNA is considered a bio-polymer ; hence it does not conduct any electromagnetic field as in a wire. Rather, when DNA is open via the enzyme (DNA-polymerase) into two anti-parallel half chains and after is closed again from side to side with the binding protein activities, the DNA chains become polarised and depolarised. During the opening and closing, the DNA can emit quantum particles ("**Gene-Ons**") corresponding to the double helix polarization in "bi-polarons", interacting with "bio-phonon" emission. These last are generated by the breaking of hydrogen bonds of the sequences, of A-T and C-G couplings. Therefore, such quantum particles generated by the opening of the DNA helicoidal molecular chains, and by the breaking of the h-bonds, can communicate a quantum-spectrum, based on a series of "**Gene-Ons**". This spectrum has an exact correspondence with quantum-pulses to the coding information of the gene because it is emitted at the same time that the gene is copied by the RNA.

The DNA-Antennae have some similarity with the "Casimir Effect" of zero point energy production in quantum mechanics. Paul Dirac predicts that invisible particles in quantum mechanics could become materialized for a short time and that these virtual particle appearances should exert a force that is measurable. Therefore Hendrik Casimir (*Phys. Rev.* 73, 360, 1948) predicted (and after verified using non-conductive plates,) the production of positive forces, generated by activity in the vacuum. This effect is very powerful at small distances.

In a similar way the "**Gene-Ons**" model, where the biological energy is quantised into 'bi-polarons' and coupled with 'bio-phonons', can be a source for generating a codified sound-wave flow, able to interfere by resonance effect in order to activate molecular switch assets of functional protein activities. Polarization modes depend on the spatial localization of the particular gene in the DNA chain, so that bio-photons can successfully represent a system of "semantic resonance" for anticipating a mutual recognition between DNA/RNA codification/de-codification processes and the successive metabolic transformations of proteins. This is because the "**Gene-Ons**" particles are able to communicate genetically codified information to harmonize the space/time orchestration of a living cell from its differentiation to the final apoptosis⁷.

Terminological clarifications of Information conception as codified energy.

The theoretical approach of "*DNA as an Antenna*" is to this point incomplete. In fact, it is based on an intuition of cognitive and bio-semiotic sciences. Wherever the DNA as an "Antenna" is transmitting to a distance "Gene Quantum Signals", they are codified as "genetic quantum-sound waves/particles in order to be easily recognizable by proteins (e.g. "**Gene-Ons**"). The resonance of some active protein's sites can be conceived as a speedier and more efficient system of reception at a distance of genetic information where the precision of communication substantially depends on the co-evolutionary character existing between genes and proteins that permits the best folding organization of the receptors. The above approach correlates two kinds of genetic transmissions in a way that the double interaction will both be considered as complementary aspects, a) by contact transfer and b) from quantum sound anticipation and feedback. The second gene-information exchange can increase the genetic information power in efficiency and security. In fact gene "codification" and transmission is not far from an analogy of society, where an organic set of linguistic rules can be codified both in terms of the sounds as a vocal transmission of thought and also in graphic symbols, used in the written organization of concepts. Certainly the model of DNA working as an "nanotechnology-Antenna" is to this point, only a speculative hypothesis argued on the basis of a truly observable cooperation between proteins and DNA/RNA. For instance, it is necessary to open the DNA and copy a section of the genetic codex, and to close the double helix again by the activity of binding proteins, in order to permit the gene expression. (see the figure below regarding the collaboration between proteins at the replication fork).

Despite the effective level of ignorance about what is in similar cases, the management of information communication, the idea of “**Gene-Ons**” transmission, conceived as a non-localised quantum-phenomenon of a coupling between the quantized electromagnetic field (bi-polarons) and quantum sound waves (bio-phonons), is marked by traditional scientists as a return to “**Vitalism**”. This makes it very difficult to open up a new branch of quantum-bio-physics aimed at developing a deeper understanding of the information flow generated through the most fundamental molecular quantum-levels of biological structure. For this reason, it is not only necessary to augment an “ad hoc” model of DNA as an “Quantum-ANTENNA”, but it becomes necessary to go beyond the reductionist limits of the mechanical paradigm of traditional science, to open a new way of thinking about the old challenge of understanding “**what is life**”. It is necessary to develop an advanced strategy of **Knowledge-Based Bio-Economy**. Therefore to avoid a too easy criticism of the “**Gene-Ons**” assumption of a bio-system of codified information energy communication, it becomes useful to clarify the etymology of the terms connecting information in relation to the codification of forms.

The verb “*to inform*”, used in common daily language is originally related to the expression “*to model according to a form*”. In fact, “*to inform*” derives from the Latin “*in-formare*” that means, “*to give a form*”. There is, therefore, an original “operative” value in the “information”, because from its etymology we can appreciate the remarkable ability of the ancient scientists to anticipate the informing activity to produces a form. In fact, the ancient Greek scientist Aristotle, wrote: “*Information is a truly more primitive and fundamental activity than energy and matter*”. Information does not have the current meaning because it is something that precedes every physical form. Information is related to the Greek world “*morphé*” which means the potential preliminary activity to obtaining an objective form, i.e. the effective form that we can perceive, pre-exists as a virtual conception before the concrete material being of an object. Therefore the visual representation will be interpreted by some ancient Greek scientist as the word “*Eidola*” e.g. a pure qualitative image or symbolic simulacrum where from an invisible shadow, it becomes a graphic perceptual form.

Originally, “information action” represented an interface with the double activity of codification of forms. As a matter of fact, information is related to both aspects: a) the potential codification plan of producing an objective form, and in turn, b) we can perceive an object as forms of information transmission. Thus, the “information-form” relationship is a circular relation of codification and de-codification of signals. The first activity corresponds to an action to reproduce a codex-plan necessary to produce an object and the second, to send back, over a distance, an intelligible message of the forms as an object to sense perception. In the mechanical reductionism of science, forms are directly correlated with matter or energy interactivity, all working in the same Euclidean space-time. Therefore, the existence of a potential (virtual) state of information conceived as a system of codifying/de-codifying signals (that the ancient Greeks attribute to the intellect of nature,) disappears in the reductionistic mechanical sciences. As a consequence in the mechanical paradigm of science, information directly assumes an objective meaning. It is no longer conceived in terms of ancient humanism where there is an intermediate hidden level; a qualitative matrix of codex transformation that becomes the basis for generating knowledge.

Change of mechanical paradigm in knowledge based bio-economy

“Alienation in science” can be defined by the degree of separation between scientific content and the possibility for creative results in research. The quantum mechanical criteria of wave/particle duality is an example of scientific alienation. In twentieth century science, wave/particle complementarity belongs to a dual nature e.g. in some cases the same quantum of energy behaves as a wave, and in other cases it collapses into some quantized particle. Thus wave-particle simultaneous duality is a conceptualization responsible for the inadequacy of conventional concepts

like "particle" and "wave" that is necessary to fully describe the behaviour of quantum objects. This duality is a serious limitation in quantum mechanics and gives rise to various paradoxes. As a matter of fact, the permanence of the wave/ particle duality leads to a logical inconsistency in the interpretation of the fundamental experiment where only a single wave/particle passing through two distant holes (double-slit experiment), can give the interference phenomena. A different idea about wave/particle is born in the context of “**Bio-active information**”, where the coexistence of the dual wave/particle is broken because the admission of a “**Pure Information Wave**”, behaving similar to the “**Vacuum energy in empty space**” is experienced, even when space is devoid of matter. A pure information wave can be seen as an new entity; an underlying background of potential [energy](#) that lives in a different composition of [Space/Time](#). The “**pure Information Wave**” can be transformed by quantum resonant tunnelling in “**..ons**” particles , e.g . the effective energy form (able to do work), collapses from the virtual dual state of information energy, because of tunnelling effects into effective “**..ons**”.

The heuristic value of the “Bio-active Information” theory⁸ is driven by the assumption that every configuration of “virtual wave/particle” is based on a variable architecture of the space/time of “Information Energy”. It differs from the Euclidean perception of the universe commonly organized within three [dimensions](#) of space, and one dimension of time ($s_1, s_2, s_3 + t$). In Euclidean space/time, travelling of “**..ons**” is ordinarily associated with an extreme dependence on linear watching-time measurements in a non-relativistic i.e an absolutely independent continuum of three-dimensional geometry. Also, we can distinguish a non-interactive “*simultaneity*” in transmitting “Pure Information Energy” generated by means of the DNA sequences over long distances. This simultaneity of transmission-and-reception if genetic information in a cell can be justified only by going beyond the classical Euclidean concept where the observer is arbitrarily separated from observation. In fact, if we think in the traditional method of Euclidean perception, the simultaneity of signal transmission becomes forbidden. This is because in a fixed space/time Euclidean diagram where time has a linear dimension of successive and arbitrary timing instants, simultaneity is impossible. On the other hand, “simultaneity “ for spreading the gene-signal over the entire cell does not conflict with a virtual representationist paradigm of “Information Energy”.

The alternative Space/Time Fourth Dimension of the Non-Euclidean Information Energy

Going beyond the essence of quantum mechanics where every single particle has the characteristics of both waves and particle, means to clarify how the wave can have physical meaning , i.e. not only a probabilistic value. Unfortunately, it is easy to see how our understanding of space /time is shaped by our everyday perceptual conception of Euclidean material geometry. In spite of this, a fixed model of space/time cannot work within an invisible quantum-reality. A non-Euclidean geometry works better in an immaterial space. For that reason, the traditional Euclidean perception of space/time in the quantum world can be restructured as a virtual pre-image digitalized in two bits of space/ time co-ordinates ($s_1, t_1 + s_2, t_2$), that describes the virtual reality of a pure qualitative “**information energy**”. The transformation of space-time coordinates by a cognitive intuition can be obtained by simply changing the extension of one local vibration of atoms into a long distance resonant vibration . This extension provides the change-over from one space co-ordinate into a second time co-ordinate in the pure information field, where the imaginary Wave/Particle oscillates in order that they can contemporarily exist in this virtual context which is described by the four vector of bi-dimensional space and bi-dimensional time. As a matter of fact, in a relativistic context where the gene-signals are created and destroyed, time and space do not belong to different incommensurable entities as in classical mechanics. Thus, in a more theoretical formalization the transformation from one space dimension to one time dimension, can be obtained via a quantum tunnelling based on a reversible jump, where one component of time coordinate \leftarrow in relation to \rightarrow INFORMATION ENERGY \leftarrow it is folded//unfolded \rightarrow within a space coordinate \leftarrow as a consequence of tunnelling caused by a quantum fluctuation effect during the \rightarrow ENERGY /MATTER INTERACTION.

Hence, starting from a virtual information signal, living in a “virtual life” of non-Euclidean space/time, the signal will effectively be transformed in a objective pulsing “..ons”, e.g. effective particles oscillating in an Euclidean geometry of the energy/matter interaction.

One aspect of the travelling of “..ons” , in Euclidean rigid geometry is that the loss of information associated to the signal is very high, because the signal strength is reduced by the inverse of the square of the distance. So that in the contact of fixed Euclidean geometry of space /time, we can allow the transfer of genetic information only by contact. In spite of this, the Virtual dimension of the Information Energy living in the bi-dimensional Space/Times ($s_1t_1 + s_2t_2$), permits a small loss of information from a signal, because the signal strength remains quite constant at distances. The virtual bi-dimensional existence of gene-signals in time and space, is not transformed through interactivity with matter in an effective “..ons”, working in an Euclidean space/time. In this way it is possible to re-interpret Aristotle's concept of information as a coherent physical intermediate virtual state, associated with the transformation of different codified forms of microscopic energy and matter. For this model of understanding, there might well be a need to develop a new approach towards thinking about theoretical bio-quantum physics. In fact, the very act of immaterial-perception means that the information energy packets are modulated in a virtual interpretation of the mind and thus turn out to the space-time perceived by senses or by instruments. Within a holistic point of view of the unity of science, it can be conjectured that the tunnelling effect can be the ability to transform the space/time frames as taking place in the entire Universe. This is because we cannot think beyond what is in the brain. As a consequence, information energy permits us to go beyond the quantum-mechanical traditional approach. This is because “Pure Information-Energy” exists in a non-Euclidean space/time of the mind. It pre-exists, and impacts on physical reality by codifying the energy and matter coming into Euclidean space.

How mind comes into existence and how it functions at the quantum level was contemplated by Max Plank, (Nobel prize winner in Quantum Theory) . He wrote : *"There is no matter as such! All matter originates and exists only by virtue of a force. We must assume behind this force the existence of a conscious and intelligent Mind. This Mind is the matrix of all matter."* Thus to empathize with the holistic approach towards Quantum-Energy where mind-brain are not separable units, it is necessary to remember the limits of possible transformations in the mechanical sciences where time/space changes are not accepted. In the mechanical paradigm, on the basis of fixed Euclidean dimensions of space and time, all transformations of energy and matter are seen only in two ways i.e. a) through the operations that transform space (e.g. translations, rotations, similarities, etc..) and b) by those operations which transform spatial co-ordinates in terms of the dynamics of motion (e.g. the variations based on the measure of the speed e.g. the quotient between space over time.)

Driven by this method of mechanical thought, all other chemical and biochemical transformations of reagents in products remain without any possibility to forecast the results. The knowledge of the contribution of the catalysis to the transformation path can only be obtained through some experimental data. On the other hand, an application of non-Euclidean Space/Time transformations from virtual wave/particles to effective vibrating “..ons”, can be useful in order to better understand the method of communication expressed by information signals at the quantum level that considers the " **DNA/RNA as an information energy catalyst of life systems**" .

DNA/RNA catalyst's multiple activity as driver of metabolic clock-reactions .

In the case of the stable DNA double helix, the pre-existent information energy is really enclosed in two reverse electromagnetic non-linear oscillations with zero conductivity. The information energy in this case corresponds to a virtual double state of quantum wave/particles where the space-time

four-vector is split in two dimensions for space and two dimensions for time. Only when the DNA double helix is open, information energy collapses and this virtual information field produces "**Gene-Ons**"; so that they can interact with every object in the Euclidean dimensions of space/time. In fact this change of space-time co-ordinates, transforms the virtual status of quantum particles and its potential information energy into an effective electromagnetic force⁹. Therefore "**Gene-Ons**" can be the catalytic driving force to make specific and accurate information available at a distance. It can be received through a resonance effect by enzymes and other active sites of proteins in order to allow a variety of metabolic reactions to take place and in a way, to reduce the amount of energy required, and to establish the correct clock-cycle for the cell's life.

Some colleagues criticize the idea of space time transformation based on a pure energy information field, shaped into two bits (s1,t1) + (s2,t2) of space-time coordinates, telling me that I simply reinvent the "ether" as a hypothetical medium for transmitting catalytic radiation in bio-quantum physics. Others say that I think as an esoteric alchemist speaking about a new way of "transmutation", or other irrational kabala. The theory does not seem an appropriate conceptual instrument for interpreting various experimental observations in "true" mechanical science¹⁰.

Conversely, I think that to build up the notion of bio-chemical information, we need to better understand the basic concept of "catalysis". Catalysis is the phenomena by which a given reaction, contains more information than chaos in order to reduce the amount of energy required to control the reaction. Therefore, the effect of the catalyst activity is the observable changes of the speed of the reaction. In fact, the catalyst actions generate a specific co-operative information co-ordination in order to drive a chemical or bio-chemical transformation of mass, from the reagents to the products, in a system open to an exchange of energy and matter. In conclusion, any catalyst's action permits chemical reactions or bio-molecular processes to take place more effectively in the context of a controlled timing development, by means of better co-organized conditions of information energy. As a matter of fact, out of this control of information exchange, all reactions cannot achieve an auto-catalytic coherence in producing particular products. Otherwise, all the reactions would be unable to find any new equilibrium positions. Thinking in this way, the system DNA/RNA can be seen as an evolution of chemical catalytic systems for spreading genetic codified information into a dynamic self-generating process of protein's expression and contemporarily getting information through "**Gene-Ons**" to control the timing flux of metabolic reactivity in living species. Hence in bio-quantum-physics, the "**Gene-Ons**" assumption can be of key importance in the regulatory functioning of DNA/RNA catalyst's activities in relation to many important biological processes taking place in living cells .

Wave-Particle-Evolutive-Genetics

As previously mentioned, true "Bio-quantum physics", introduces important new theoretical elements of Genetic information . In fact "**Gene-Ons**" communication radically changes our understanding of the workings of the DNA/RNA catalytic system by means of a transformation of information energy. This is because "**Gene-Ons**" carried out at distance by means of codified quantum energy, contain a series of specific frequencies exactly complemented by the gene "clipped" and "glued" from DNA through the RNA system. The effective presence of "**Gene-Ons**" can be identified through fast spectroscopy methods which are able to detect the very low frequencies produced by the breaking of H-Bonds of the base pairs, e. g. A-T (- bridging by a double H-Bonds) and C-G (containing triple H-bonds). This can be experimentally difficult but not impossible.

A fundamental requirement is to now find a correspondence between theory and fact. Today, advancement in cognitive neuro-sciences consider man (male and female) an integral part of the

communication of the Universe. Neurological cognitive sciences will bring about a radical change in our understanding of what information is working in nature and must also have wide repercussions in our knowledge of our relationship to the rest of the universe¹¹. In truth, the fundamental basis of the unity of science is found in Aristotle (340 BC). He said : “*Metaphysics is universal and is exclusively concerned with primary substance*”. We definitely need to keep in mind that he identified information as something that is more primitive than energy and matter. His concept of information as a coherent physical intermediate state associated with the transformation of different forms of energy and matter in microscopic states is needed to develop a new approach in theoretical quantum-bio-physics. Information energy (**I**) must pre-exist to impact on physical reality. Thinking about quantum bio-information, the re-composition of subject and object into an holistic domain of science permits us to think that every mind-brain transformation would be considered an activity coming from virtual reality. Therefore (**I**) can be conceived as a potential matrix of information-energy. The collapse of the wave/particle duality can be seen as the transformation of the potential information energy in “...**ons**” quantum particles, which are able to interact as effective vector-forces in Euclidean space.

In addition, we can recognize that Information Energy is the fundamental driving force in quantum bio-physics to provide progressive changes to enhance some mutation in natural systems. In fact the mutations in the macroscopic world can be considered as caused by the basic quantum interactions of communication among quantum-particles. This sharing of information energy gradually determines, at the macroscopic level, a non-causal information to the system evolution. As a result, the gene-information that controls living dynamics, cannot be interpreted as a product of chaos. We believe that the highly structured information activities directed by the evolution of catalytic adaptive exchanges among the triadic interaction of information, free-energy and matter generates a system that gradually produces macroscopic mutations caused by quantum jumps in the evolutionary path. On this conceptual basis, we are able to renew the science of Information, strengthening the correspondence between bio-quantum phenomena of communication and wave/particles, and biochemical evolution of information as an integrated fundamental basis of DNA/RNA catalytic- evolutionary Activities.

It becomes important to underline that the term “*reality*”, in its widest sense, includes everything that is becoming, whether it is observable, or only comprehensible, or apparently self-contradictory as the wave/particle in quantum mechanics. Reality in this sense, may include both being and becoming , whereas the concept of “existence” is often restricted to objective being related to an Euclidean conception. Therefore, virtual reality in the holistic view, represents a mind-image resolution that becomes an effective existence, like in the actualization of “...**ons**”. It needs to be included in the scientific domain. For instance, utilizing an electronic image, the two non-Euclidean (s1t1+s2t2) and Euclidean (s1s2s3,t) structured worlds, can be seen as two asymmetrical space-time circuits, working as a parallel system and connected by an oscillating quantum tunnelling gate. In the first circuit, a work-free non-observable information energy (**I**) oscillates as gene signals until it can be potentialized into free energy quanta (**E**), in order to transfer the wave/particles to the Euclidean circuit by quantum tunnelling fluctuations where they can be observable “... **ons**”.

To accept this model of an exchange between “*virtual and objective reality*” we need to find a solution to the following dilemma: Either: a) the required *nonobservable signalling of* “information energy “ must be modeled into Euclidean space in “...**ONS**” , or b) the traditional energy conservation law is falsified.

For this challenging dilemma, we must complete the traditional “*Energy Conservation Law*” by considering information as a kind of virtual energy, a pure qualitative entity that can be transformed into other forms of quantum-energy. The law then becomes, “*all events in nature belong to a*

particular form of different codified energy transformations, so that the total energy cannot be created or destroyed'.

Starting from this generalised postulate of Science and taking into consideration information energy as a part of the total energy-matter transformation, we determine that the sum of all transformations of energy components must equal zero. So that if we add all the different codifications of energy in relation to all possible combinations of space time co-ordinates in syntheses, we have :1) the vibration-energy, (**E**), and 2) the codified-energy like matter (**M**), plus 3) the information energy (**I**). At this point, because the global variation (**www.**) of any constant (**K**) is equal to zero we obtain:

<E total = (E) + (M) + (I) = K> ; i.e. at any time < www. [(E) + (M) + (I)] = 0 >
Hence <+w.(I) = - w.(E) - w.(M)> .

- *The growth of Information Energy enriches the minimum of the other components of energy. This result is designated the "PRINCIPLE of FERTILE EVOLUTION" (PFE)*

Hence on the basis of the **PFE-Formula**, we obtain one solution of the energy codification/de-codification cycle in the evolution of nature. Information energy (**I**) can be seen as the result of an holistic, co-evolutional development, where different forms of diverse codifications of energy can interact to produce greater quality of "Information Energy Quanta". Therefore the **<PFE-formula>** effectively gives a possible "[direction of evolution](#)" in order to select, through a catalytic auto-organization, each developmental interaction in which nature progressively transforms energy and matter interactions to increase the energy required to advance the processing of information, + **w. (I)**

Following this mode of thinking, the **< PFE –formula >** represents an evolutionary model for increasing the "**energy quality**" based on the useful sharing of information codex interchanges during a quantum triadic interactivity among (**E**), (**M**), (**I**), where the DNA/ RNA represent the major tool of the catalytic process of evolution.

In conclusion, I would like on the basis of these and similar hypotheses, to promote an "EUROPEAN PROJECT "IDEE", regarding the frontiers of BIO-Quantum PHYSICS. This preliminary exercise in cognitive science can provide an opportunity to go beyond mechanical conceptualization where the evolutionary transformation does not remain conceptually blocked as a consequence of unpredictable mutations among different phases of evolution.

- *Finally I am interested in finding a "HOSTING INSTITUTION" involving an agreement with a team of researchers to propose an IDEE European Project under the Title: <"BIO-Quantum Physics: "DNA/RNA as an information energy catalyst's of life system ">, aimed at asking for a Grant to the EU call - section 2.1.2 - ERC- "Advanced Investigators"- 2007.*
- *see: <http://erc.europa.eu/index.cfm?fuseaction=page.display&topicID=66>*

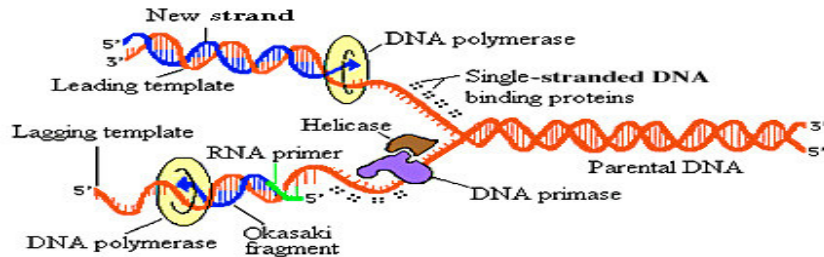
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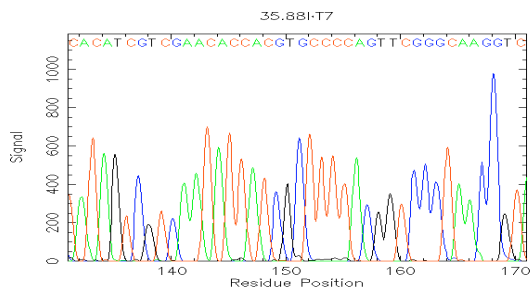
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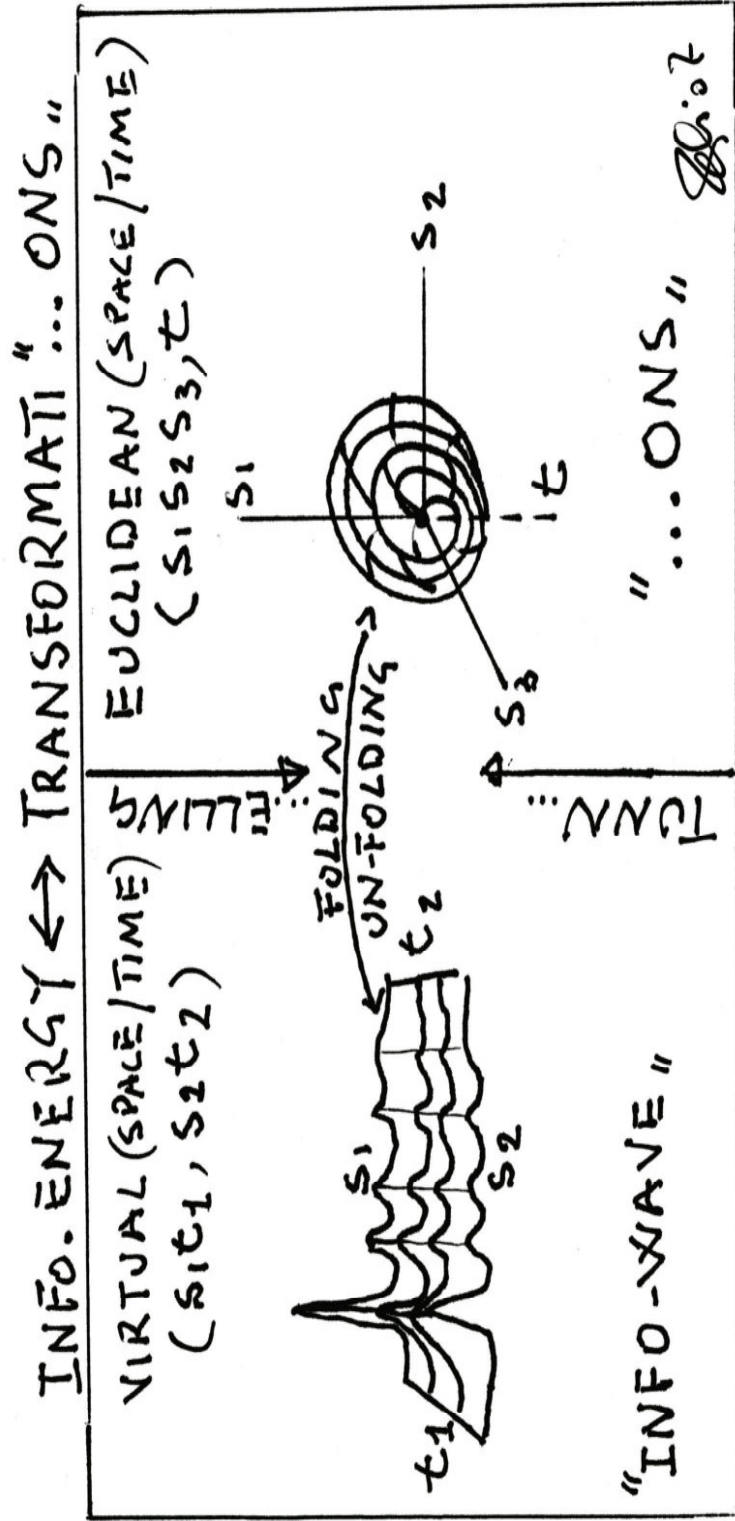
[Casimir Effect :http://users.erols.com/iri/ZPEpaper.html;](http://users.erols.com/iri/ZPEpaper.html)
http://en.wikipedia.org/wiki/Casimir_effect#Measurement
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<http://www.cheniere.org/>



Collaboration of Proteins at the Replication Fork



From : A brief Introduction of DNA and Proteins. Greg Gloor, Ph.D., Professor of Biochemistry,
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Note: Virtual Info-Wave lives in a hyperflat space time where the variation of Space (w.s) = konstant at infinitum as the variation of time (w.t) = konstant . Therefore the race w.s / w.t is ZERO at any time so that the simultaneity is a property of the virtual hyperflat bidimensional space and time.

For other transdisciplinary Conceptual references see - Bi-dimensional Time In art and Science : the existence of a bi-dimensional time is not a new idea; artists such Cubists were inspired by intuition of non-Euclidean space and created pictures of modern art anticipating alternative perceptions of space-time.

- See: http://www.edscuola.it/archivio/lre/tempo_bidimensionale.htm



“Marcel Duchamp in Thought” : French Cubist and Surrealist Painter He was born July 28, 1887 in a Normandy, France He pioneered innovative kinetic art. His pervasive influence was crucial to the development of Surrealism, Dada, and Pop Art. He died in Paris on October 1, 1968.

paolo manzelli may 20/2007 Firenze

Reference:

¹ See http://www.edscuola.it/archivio/lre/chemical_bases.htm.

² See: http://www.edscuola.it/archivio/lre/what_means_life.htm.

³ See: http://www.edscuola.it/archivio/lre/life_science_communication.htm.

⁴ See : <http://www.quantumbionet.org/eng/index.php?pagina=119>) This paper will be presented at QUANTUM-BIONET meeting in Pavia (It)

⁵ See: <http://www.edscuola.it/archivio/lre/oba.htm>

⁶ <http://www.edscuola.it/archivio/lre/apoptosis.htm> .

⁷ See: http://www.edscuola.it/archivio/lre/dna_come_antenna_biologica.htm

⁸ see <http://xoomer.alice.it/a.i.s/BIOACTIVEINFO.htm>

⁹ See : http://www.edscuola.it/archivio/lre/science_of_information_energy.htm

¹⁰ See: http://www.edscuola.it/archivio/lre/chemical_bases.htm

¹¹ See : <http://www.edscuola.it/archivio/lre/onnsup.htm>