

SCIENCE OF QUALITY Serie n°- 3

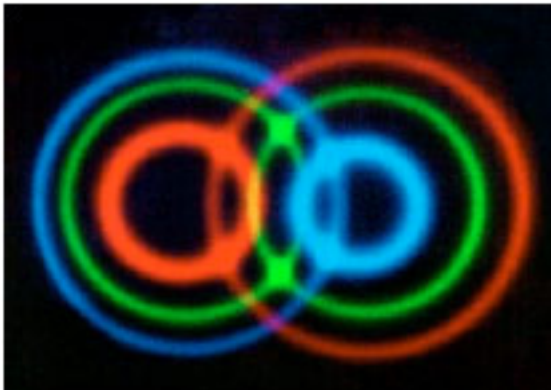
BIO-QUANTUM COMPUTING.

Pathways of mental change



"Through the inherent property of IN-FORM-ACTION, can be formed a new definition Science of Quality"

The Bio-quantum-computer research (1), introduced here, it is considered to be a breakthrough technology with high expectations for a new generation of computer that works on a completely new principle, and that holds many possibilities inconceivable with existing computers (2) First of all it is necessary to start with some definition and general knowledge about Quantum Computers innovation. “Q.bit”, (3), indicated by $|0\rangle$ and $|1\rangle$ probabilistic state, defines the unit of information of quantum computers. Unlike the binary “bit” of current computers has only two possible states (0) or (1). The unit of measurement of quantic-computers the “qbit” uses a much more complex logic involving multiple states entanglement, enabling a new efficient processing of information. The Austrian physicist Erwin Schrödinger coined the term ‘entanglement’, to describe the peculiar connection between quantum systems, e.g. when Q. particles show a sharing interchange of information states. Quantum Entanglement correspond to a non local properties of entangled particles forming an hybrid reticular network, that permits to calculate in parallel multiple states of information simultaneously, unlike classical bits have only one value at time. (4)



Entangled photons

Therefore Q. Entanglement it is the necessary ingredient of Quantum Computation (5) and can be referred as a parallelism of states surposition of a set of simultaneous quantum state information. Transfer of this entangled quantum state to an arbitrary distant location is known as “tele-transportation entanglement assisted”. Teletransport (6) do not exchange energy or matter but only pure information. Therefore tele-transportation in quantum computing to not allow communication of information at superluminal level because the transfer of information state happens simultaneously.

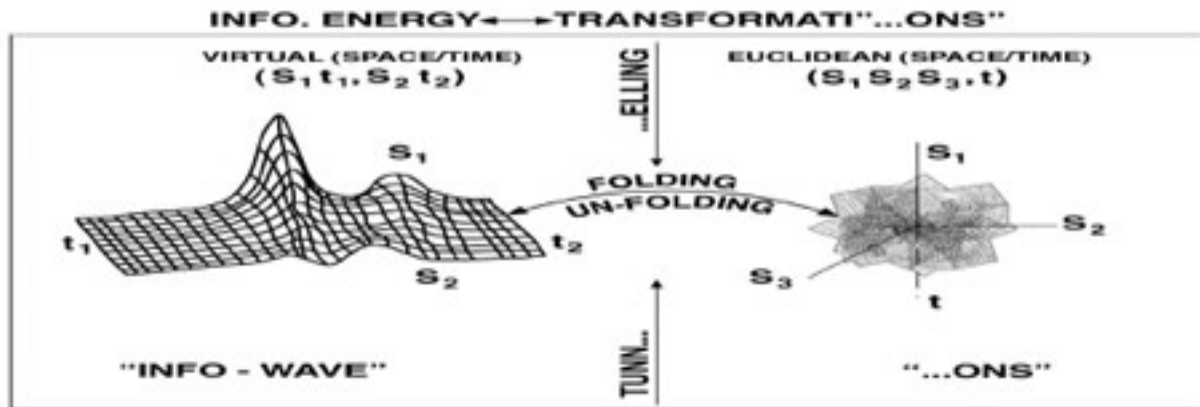
The problem that need an answer is to reply to the question : how can be possible a simultaneous transfer of information when quantum particles becomes entangled ? This question may require quantization of space time dimensions to bond Quantum Mechanics with Special Relativity.

Before to reply to the previous question it is important to remember that major breakthroughs in physics are based on a change in the meanings of space time configuration. (7). In fact Einstein theory of special relativity, proposes a Space-Time distortion of the traditional Cartesian orthogonal codification of three Dimensional Space (3D) and the only one time coordinates. The relativistic space and time are not more split in two absolute entities because belong together to a single continuous construct called the four dimension space-time (4D). It is important to remember that in an Euclidean space solid bodies do not alter their size or shape when moved in it, while a fluid can alter both size and shape but not volume when it is moved about. Differently in a curved relativistic space we can observe, as in a curved mirror, that the reflected picture represent a distorted figures in which forms and size and volume are dependent upon the variation of the position of the observer in a continuum four dimension (4D) of the quadri-vector described by Albert Einstein. The observer cannot see the four dimensions; therefore Einstein said the relativistic curve of space-time can be conceived as a field where the curvature is caused by means of time. In conclusion special relativity view, it is maintaining the fundamental Euclidean perception of space shifted by time. Einstein's conception of unified space-time in complementary and interconnected 4D, nowadays need to be modify to understand how entangled Q. Particles may take on a superposition states, that combines parallel information energy as a simultaneous process. In fact we know that, under experimental conditions, two entangled particles appear to influence one to the other instantaneously by means of a “ shared delocalized interchange” of information. Hence Entangled Particles are interconnected informationally. Therefore those experiment of Q.Computing make an impact of contemporary science to go beyond the model of over-simplified reality, based exclusively on interaction of free- Energy (E) and Matter (M), with a very limited capacity to interpret information interactions, especially in relation to the systems able to carry information at distance. As a consequence seems without a solution the possibility to understand tele-transportation associated with entanglement as an instantaneous non-local, exchange of information. In teletransport there is anything involvement of energy (E) or matter (M) transfer, this because interconnectedness of entangled particles belong only to a transfer through at distance resonance of pure information. For that reason a solution can be find introducing a new concept of

“ information energy” (I), as it is necessary to understand how (I) can interact with (E) and (M) to create all forms in the Universe . In this sense, this paper belong to a talk-series which goal it is to open a debate about the “Science of Quality”. An analogy can be useful to introduce the “In-Form-Action” concept to understand tele-transportation as an exchange of pure information Energy . In fact we know that the superficial films of matter (M) has different cohesive properties of the bulk in order to define the boundaries of the form to every substance. In similar way it will be possible to admit a complementary existence of a Superficial Information Energy (I), as a surface section of free-Energy (E), that contains the informational codex of the wave-particle states. Information Energy (I) can be transformed in Free Energy through quantum-tunnelling effect.

collapse in a composition of space and time structured as a planar morphology composed by (2D of Space + 2D of Time), e.g composed by one Bit of Space dimension (s1,s2), plus one bit of time dimension. (t1,t2). This basic Quantic-level of space-time structure, it is an expression of pure information Energy (I), that belong to an special paradigm of pure “information energy”.

The second Q. level of the differentiated structure of Space-time, is generated by the E/M interactions and it is living in a second order of space-time of Euclidean architecture based on 3D of space dimensions + 1D dimension of time. At last the complete interaction of those different codification of Quantum Energy levels of space/time e.g among (I)+(E)+(M), gives all the possible composition to create the forms acting in the four dimension



Tunnelling effect characterize the transcription zone of the various space –time forms between (I) and (E)

Informational and Physical Quantum levels of Space-Time

The above idea can be supported by means of considering that in Quantum Mechanics the space-time need to correspond to a discontinuous reality. So that we be able to rethink about the “ Information Energy” from an entirely new viable scientific perspective of Space-Time configuration. In fact in Q. Mechanics there is the possibility to obtain two discontinuous “quantic-regions” of space time, in order to understand how the forces of nature are mediated not only by means of the exchange of Q.particles, but also through instantaneous pure information (I), e.g. without travelling effects of free-Energy dispersion. For this goal it is necessary to split Space Time in levels of “Quantum Discontinuity”, where at the basic level, take the proper state the fundamental field of Information Energy (I) based with non Euclidean geometry, while at the higher level exists the Energy / Matter interactions dimension, working on the classical Space-Time architecture. The first level can be generated in a way that an “entangled particle” be able to

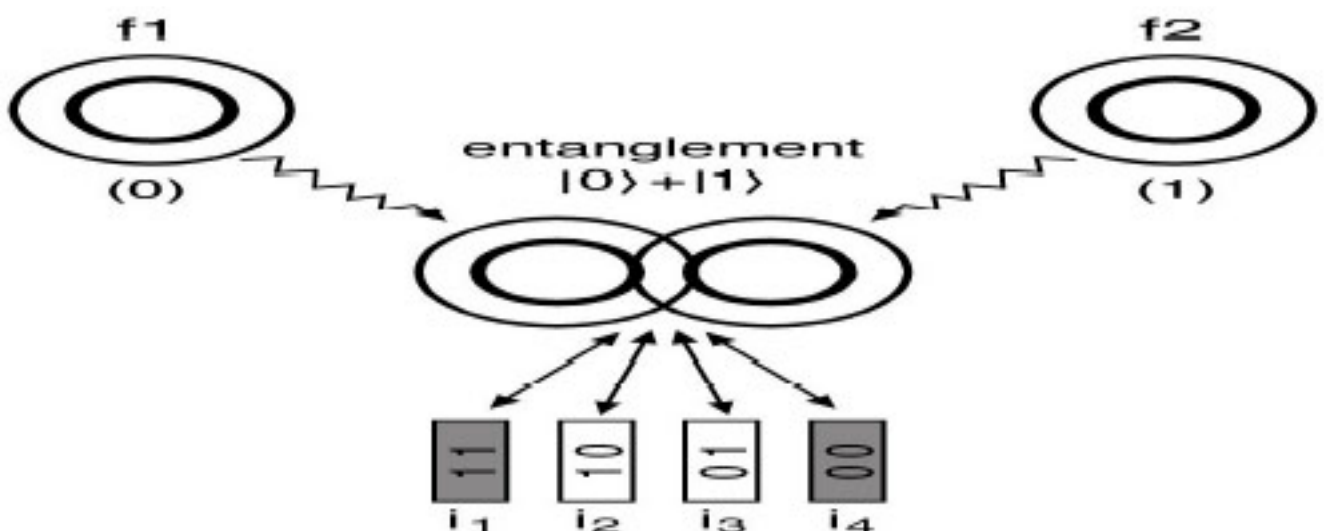
of Universe (4D) where the past, present, and future all exist in a simultaneously composition, as Einstein suggested in his later researchers on the general relativity. Those quantised levels of the 4D space-time permits to separate the “information energy” (I), as a virtual or potential energy, that can be transmitted in a flat 2D-space as a wave where the 2D of time permits that the field of information can be exchanged simultaneously. This because the exchange of information do not respond to a linear dimension of time flow in a causal succession of what happen before and past. The Euclidean dimension of space time can be find again by the “info.waves”, through a reversible transformation of tunnelling or similar effects. This operation is capable to transform the Pure Information waves in photonic free Energy. The last are belonging through a folding operation from the fundamental Q.Bits. by means of a space coordinate transposition in a time coordinate in a way to jump up from the Virtual Space-time of (I) to the Euclidean domain of Space-Time of (E)/(M) interaction. . Hence the folding operation acts as a “space > time transposition” that can be seen through an imag, visualizing when a delocalized wave

component of the virtual wave informational field collapse into a localised vibration in a way that a component of time of information energy, become visible as a third component of space.

In conclusion the quantization of the 4D of space-time in differentiated levels permit to acquiring the possibility to refer science of communication at two complemented discontinuous "quantic-regions" of space time, with different paradigmatic properties. In the first level we assume the existence of pure information energy (I) able to communicate by means of tele-transpotation , in the second level, can interact two form of Energy e.g. free-Energy (E) and condensed Energy (M), in a coherent dimension of the ordinary Euclidean Space-Time.

It is important to underline that as a consequence of the spitting of Informational from Physical Quantum levels of Space-Time, the traditional Q. physics and the Especial relativity, did not disappear, because the breaking of the old paradigm of science no more based on an unitary generalized dimension of the space time, regards only the fundamental level of pure Informational energy, and do not change the higher level of space time of E/M interactions . Therefore this theoretical innovative approach of quantized space-time permits to obtain in a mature science, multiple view of understanding science; then allow to go beyond the classical limits of scientific disciplines, in order to realize solution to the emergent properties of the quantum level of "Information Energy" in terms of an theoretical integration remaining in agreement to the state of the former science perception.

In fact in classical physics, information is considered a discrete entity living in time and space; so that matter and energy also information is considered all localized entities having particular values of space coordinates in relation to the only one coordinate of time. Rather, in the quantum informational substrate of (I), for the reason that it is working without E/M collisions, it is becoming possible to transfer information with zero consumption of energy e.g by means of Q. teleport. As a pratical consequence in the Informational level Information Energy cannot be copied; this because the non locality of Information permits the advent of four superposition of parallel states working simultaneously, where a change in one state modify the complete assembly of shared informational states. This statement it is important for instance to send encrypted messages of pure information as money transfer. In ending the above way to think about the quantized Space-Time, gains a coherent scientific thought because would include not only the observer, but the observer's world creative view, in a way that physical laws correspond effectively also in a logic of qualitative dominion (e.g. rather than only in a physical quantitative field), to include the emergent observation experimental phenomena when they not fit more in he old paradigm of science. Using the quantized paradigm shift ,can be possible understand for instance, how not observable energy can be generated from vacuum and other experimental data that are not explainable by conventional hypothesis of traditional science. Finally the quantization in different levels of the 4D space-time is opening up a new realms of experience in a way that till now is no more possible to interpreted by means of the unified conception of space-time .



Beyond Entaglement symultaneous processing of a new "form" of information

Although creating a new Quantum Physical conception of space-time levels significantly changed the way computer technology is used and perceived. Despite the immense practical achievements in creating faster Q. Computers, able to work in parallel simultaneous delocalisation of information, we need to understand that in the state of instable entanglement, the multi-states clouds the information energy can be processed only through a probabilistic domain. Viceversa after the slow down from the instable entanglement to the Energy of Information level, (I) in the fundamental informational state, calculations can be made in terms of pure (or virtual) Information Energy and hence can be transmitted through tele-transportation, this because may not need to be converted back to a photonic or matter based Space-Time format of E/M interaction. In the entangled mixed state of wave-particles the transmission of information cannot be transfer instantaneously at distance , because of the limits of the speed of light in the Euclidean Universe, while the simultaneous information-processing, at the “Q.bit Level” of space -time, can be made by means of parallel states in a not probabilistic manner. Computing in this .Q.Bit.Level permits to understand the nature of Information Energy. In fact while the result of the operation (0 + 1), handled by a normal information processing of a conventional computers gives a 50% probability to obtain as a result (0) or (1); the Entangled State ($|0\rangle + |1\rangle$) when slow down to the fundamental informational Q.Bit Level, generates four parallel combination of Q. Bits. The result of computation, thus is to obtain the following parallel multiple state named as (11,01,10,00). Two of them are symmetric (11and 00) and the other two are anti-symmetric (01,10). This is an important difference because the boundary condition of symmetric configuration of pure information do not permit any folding activity through tunnelling interaction, this because the symmetry forbid any polarization of the symmetric states (i1,i2,i3,i4) of pure information. Nevertheless the anti-symmetric field (01,10) can be folded passing through to a transition zone where can skipped up the second level of the Euclidean space-time, and can be possible interaction between energy and matter belonging to the same level of Euclidean space-time. This consideration implies that the quantum computation can be useful to speed pure virtual information processing, to transfer simultaneously pure information energy, that are only partially transformed in physical phenomena effectively working in the Euclidean space-time. To understand in simple words, the previous considerations, you can think to test with a switching knob and a light bulb; so that in order to ignite the light you will have to push ON (e.g. (01)-state transition) and to close the light you need to

push OFF (e.g (10) -state transition). Nevertheless in the case that you push twice ON-ON (e.g. (11)-state transition) or OFF-OFF (e.g. (00)-state transition), you will not obtain no interaction between Energy and Matter, that allows to ignite the light bulb. Anyway both 00 and 11 states are effective information through which you can learn about light phenomena.

BIO-QUANTUM COMPUTERS

The spitting in Informational and Physical Quantum levels of Space-Time can be imagine as a gateway opening a whole innovative challenges of Bio-Computing, dropping down to the fundamental quantum existence of virtual information. One of this challenge will be to utilize the above concepts and rules of bio-quantum physics to develop Bio-Quantum Computers (8). In fact DNA gene-communication can use both: 1) the localised copy of genes and also can have 2) a simultaneous delocalized role in communicate gene information. In fact DNA, as a nanobiotechnology, can utilize two functions to communicate: 1) through transfer a quantitative localized information by near contact with RNAs, to generate proteins, and also 2) to diffuse qualitative information by means of working as an ANTENNA able to transmit at distence gene signals, using a systemlike of quantum-teletransportation . This second method of gene information by means of simultaneous transmission it is necessary to activate the co-ordination of various living functions in the cell to as well as for developing the complex cellular dynamical reproduction of forms, e.g to controll the functional complex folding of DNA and proteins , and to co-organize the metabolic funtionality till the programmed apophosis of the cell. (9) Henceforth following the above quantized space-time theory it is becoming evident that Bio-Computers could be made from organic materials using DNA . The historical background to understand the possibility to develop Bio-Computers using the structure of DNA, has its roots in the late 1950s with the hypothesis of Nobel laureate Richard Feynman that firstly introduced the concept of computing at a biological molecular level. Feynman's creative idea, was later realised in 1994 when Leonard Adleman performed the first molecular-level computation using DNA. In contrast conventional computers, that operate though linear sequencing taking on one task at a time, the Alderman's preliminary experiment reveals the distinct advantage of the DNA approach is “parallel processing”, allowing to DNA based computers, to solve quickly very complex problems. Hence DNA can be considered as a nanotechnology material that will result in faster computing by enabling massively parallel computations.

A recent version of a bio-molecular computer, (developed at the Technion-Israel Institute of Technology)- is mostly composed of DNA molecules and enzymes, as it is described in the March 2005 issue of the Journal of the American Chemical Society. Computations are carried out by processing the input (double-stranded DNA molecules) with the help of enzymes that cut and reassemble the DNA in a series of steps. The output is a new form of a slightly altered DNA molecule. Nowadays a better examining how organisms solve problems of “bio-communication” can lead to new methods of bio- computation. For this scope it will be necessary to deeply understand how can interact, cells and environment ,by means of a dialogue at distance and in real time among the various component of living systems. Anyway the complexity and viability of DNA driven computations it will be not only depending by the difficulty to set up those experiments on “bio-computers”, since it will be of extreme importance to develop an open scientific-creative culture that will provide useful experimental guidance in the future “Science of Quality”. Hence for implementing this contemporary challenge to develop an appropriated raising of level of common thinking is not only necessary rational set of theory because a trans-disciplinary modern culture including science, art and humanities, need to design new ways of visualizing a contemporary system reasoning just more able to construct new insight of the qualitative relationship between physical realm and virtual reality.

Artists often look at the same object of changing concepts of quantitative-mechanical science, from different perspectives and using different media to represent the same historical need to operate a mental change to enhance the knowledge based bio-economy.

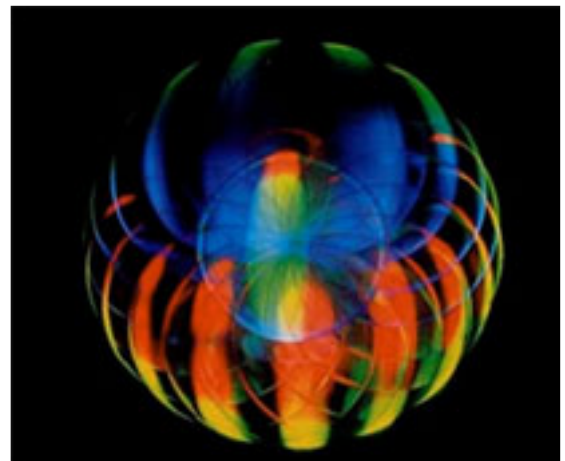
In any case there are many similarities between artists and scientists creative imagination, so that it is possible favouring to share conceptual innovation between the modern art and the science of quality, as for instance it can be seen through the common appreciation of “entangled beauty” (11) that works as a contemporaneous idea in science and art of natural systems evolution (12).

BIBLIO ONLINE

- (1) - Bio-computers : <http://www.biophysica.com/quantum.htm>
- (2) - Quantum coputers : <http://www.colossalstorage.net/entangled.htm>
- (3) - Q.Bits : <http://www.nec.co.jp/hpc/sx-e/sx-world/no26/e8.pdf>
- (4) - Entangled Photons : <http://physicsweb.org/objects/world/15/11/9/photons.pdf>
- (5) - Non Classical Computation : <http://www.cs.york.ac.uk/nature/gc7/journeys.pdf>
- (6) - Teleportation : <http://www.daviddarling.info/encyclopedia/T/teleportation.html>
- (7) - Space and its dimensions : <http://members.aol.com/Mysphyt1/yggdrasil-9/Whitmell.htm>
- (8) - Bio-Molecular Computers: <http://www.hpcwire.com/hpc/355226.html>
- (9) - DNA-ANTENNA: : <http://www.wbabin.net/science/manzelli.pdf>;
http://www.edscuola.it/archivio/lre/bioquantum_physics.htm
- (10) - Science of Quality : <http://www.wbabin.net/science/manzelli3.pdf> ;
http://www.edscuola.it/archivio/lre/science_of_quality_1.htm
- (11) - The Science of Beauty : <http://www.wbabin.net/science/manzelli3.pdf>
- (12) - ART & SCIENCE : <http://www.josevanroydali.it/>



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