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"ENTANGLEMENT THEORY" : from q.Particles to q.Bits and from q.Bits to q.Particles

Conceptual contradictions of Quantum mechanics and some revision and new cognitive proposals of Bio-Q.Physics.

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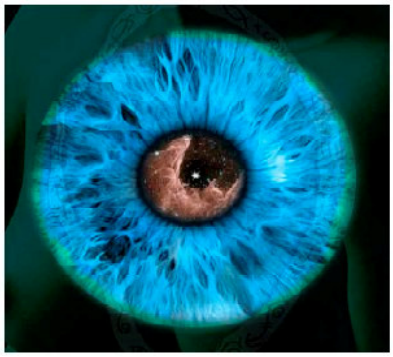


http://deanradin.blogspot.com/2006/05/entangled-artists.html

There are some good reasons to suppose that the quantum mechanic theory needs to be revised to restore an integrated reality between the subatomic world of Q.Particles and a reasonable interpretation of the macro-world of our daily perception.

The above is the fundamental endeavour of Bio-Quantum Physics that aims to open a conceptual restoration of Bio.Quantum Reality. This approach can begin from the knowledge of various internal problems in contemporary physics. For instance, we know that the standard formulation of quantum mechanics is logically incompatible with special relativity. As a matter of fact, a wave of energy is not localized in space and time, so that two different waves can occupy an identical position in the space at same time. A classical particle is described exactly by means of three local coordinates at each moment of time, and no other particle can be superimposed on the same space-time dimensions. Thinking about the classical topology of space and time, contradictions appear that result in the various paradoxes contained in contemporary physics. Those conceptual problems are primarily a consequence of the fact that any instantaneous action-at-a-distance is prohibited, because nothing can travel faster than the speed of light to connect two dimensions of space-time.

Furthermore, according to the usual interpretation of quantum mechanics, the fundamental building blocks of energy and matter are neither wave nor particle, but some complemented combination of wave and particle. The position of a particle appears at a precise time as a material object with a precise position in space. Outside of the moment of particular measurement, the evolution of the particle is described by the laws of wave mechanics. Therefore quantum mechanics seems to contradict the idea of an uniform reality of Euclidean space-time. In fact, prior to the measurement, a particle is a probabilistic wave with an unknown position because the particle assumes the form of a non-localised wave, spread over space and time. In spite of this traditional conception of quantum mechanics, the "dual slit experiment" demonstrates that a single wave-particle can recombine wave and particle after passing through two slits. (2). So it is necessary to assume that both wave and particle are a complementary reality, i.e. the wave is not only a

probabilistic function existing outside of the effective energy domain as was accepted by the previous affirmed theory of Q.Mechanics.

To resolve this problem, it is good reasoning to consider that the energy conservation principle is not completely described by means of the complex interactions between free-energy **(E)** and condensed energy; the last in forms of matter **(M).** This is because the existence of "**vacuum energy"** (1), e.g. the energy obtained through the collapse to the ground state of the system, that does not contain previous physical forms of energy and matter. Therefore a new kind of energy exists near the "*zero point energy*" with experimental evidence. As a consequence, this new form of energy **(I = Information Energy),** needs to be taken into consideration as an additional quantity to re-establish real total energy conservation. Hence generalizing the "**Energy Conservation Principle**" the sum of all transformations **(w.w.w**) 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 obtain:

$$\mathbf{w.w.w.\ [\ (E) + (M) + (I)\ ] = 0}$$

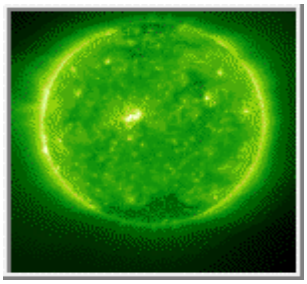
F*rom this equation we get three equations as follow representing the total energy broken in three complementary strategy of evolution of a "**complemental inhomogeneous universe**" :*

A) **+w.(I) = - w.(E) – w.(M) ; *B)* +w.(E) = - w.(I) – w.(M)> ; *C)* <+w.(M) = - w.(I) – w.(E)**

- *A) -The growth of Information Energy enriches the maximum in correspondence with the minimum of the other components of energy. This result is designated the **"PRINCIPLE of FERTILE EVOLUTION", because it is a valid strategy of evolution for living environments in the Universe.***

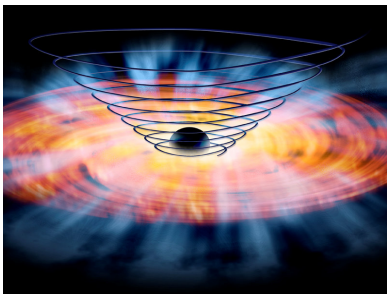
Living EARTH
http://www.nasm.si.edu/research/ceps/etp/earth/earth_spheres.html

B) – The amazing growth of the Free energy spectrum is produced by the stellar structures, such as the sun , in spite of the decrease of the Energy codified as matter and information energy.



A new look to the sun :
http://www.solarviews.com/cap/sun/eitfexii.htm

C) – The growth of matter are prepeared by super massive black holes (9) in their inner regions with super intense gravity in relation to the evaporation of other forms of Energy.



Illustraction of a Black Hole:
http://chandra.harvard.edu/resources/illustrations/blackholes.html

One solution to signify this apparently misterious new form of Information Energy **(I)** can be found in understanding the space time paradigm shift generated by Quantum Entanglement. As noted earlier in the previous articles of the series "***The Science of Quality***", "Q.Entanglement" is a concept initiated to be considered in the context of quantum information (3). In general, "Q.Entanglement" plays a key role in many of the most interesting at-distance applications, including quantum teleportation. Besides, in recent years there has been an extraordinarious effort to better understand the properties of "Q.Entanglement" as a fundamental conceptual resource for contemporary physics and hence, a renewed emphasis in re-evaluating by Bio-Q. Physics, in order to develop a more complete theory of "Q.Entanglement" which is not limited to quantum computation .

"Q.Entanglement" will also be interesting from the standpoint of evolving space-time dynamics in a way that, the classical paradigm that combines space and time into a single construct called the "**space-time continuum**", can be deeply modified. In fact, in the case of quantum mechanics and relativity, both theories do not provide concrete theories that affirm space-time relationships cannot be uniform all over the Universe, both in macro and micro dimensions at different levels of energy.

In particular taking into consideration the new form of Information Energy **(I)** into the **Generalised Conservation Energy Principle ,** it is now possible to argue that the temporal events of dynamic transformation cannot only be associated with a four-vertor space-time, where only one component is dimensioned a time sequence of instants. Space-time in classical physics is interpreted with space being three-dimensional and time playing the role of the fourth dimension. In relativistic contexts, however, time cannot be separated from the three dimensions of space. In fact, time depends on an object's velocity relative to the constant speed of light. In its way, special relativity, by combining space and time into a single four-vector diagram, gets significantly simplified in physics theory, as well as described in a more uniform way, the workings of the universe at both the supergalactic and subatomic levels. In any case, in contemporary physics, the time dimension remains a single coordinate where the duration is the difference of a linear sequency of intervals. This traditional timing scale represents only one of the possibility of space-time permutations in the matrix-structure of the relativistic four-vector. The other compositions of the four-vector, need to be considered, because some different temporal order of events are compatible with the different environments that are working as complemented evolutionary strategies of the universe as described by the formulas : ***A),B),C.***

The cognitive frame of Permutations among space -time coordinates.

Traditionally, space-time as system of reference of energy-mater interactions, is referred to a local system. In fact, the system of local reference, according to the Euclidean perception of the world, is composed og three coordinates of space and one of time , where the space coordinates are orthogonal in classic mechanics, while they are relative to one considered curved space in the special relativity. Surely such conformation space-time is not imaginable as a structure of universal

reference. As an example, in "*black holes*", a direction of movement of energy and matter in the implosion of a star, turns out to be monodimensional in space. Besides, space seems to become one dimensional in various cases that can be described by a worm-hole structure (5) as well as in the quantistic hypothesis of the tunnelling effect. (6). Therefore, remembering that space and time appear as separate entities in classical physics they are no more separate in the relativity context. The dimensional changes of space need to effect extraordinary modifications in time and visa versa. (7) On this basis, we can propose that the effect of permutation of space in time and visa versa, can be quantized, giving place to three fundamentally different geometries of space-time, each of them in correspondence with the previously mentioned complementary strategy of evolution of the **"generalized principle of energy conservation**".

The permutation of the matrix of the four vector happens in all cases where we need to assume a monodimensional space where energy and matter are travelling. In these cases, the other vectors become changed into three time-affine dimensions. This for instance, is the case with black holes (8) in the cosmological macro-systems, where the loop of three time lines (past, present and future) converge, expanding and accelerating the central orbit by means of twisting the curvature of space untill a critical point of the horizon, where space and time exchange their characteristics, inside any extremely collapsed star that becomes a "black hole" (9). Visa versa, the "*black hole timing vortex*" permits evaporation of other forms of energy as well as forecasted in equation ***C)***, and the "*black hole" trasforms its self, collapsing into a "white hole*", as a prelude to new star generation, in order to restore as the effect of an internal mirror, the normal structure of space.time.

At first this anti-symmetric space-time composition, where the three space coordinates are substituted by three time coordinatez in a "black hole", seems to be a very strange construction for our common sense, that is traditionally accustomed to believe in a classical scenario where space and time are two abolute independent and different quantities. Today, this antique mental scenario of an uniform space-time dimension of events seems incompatible with the effective possibility to understand experimental phenomena of coordinate diagram-transformation in order to understand the effective (i.e. not only probabilistic event) of "*quantum tunnelling effect"* in the microcosm. In fact, q. particles (photons, phonons and also atoms ...) that can penetrate, jumping at a distance into a forbidden region by means of a hill of energy, passing through a tunnel from two separate local position of space, without any interference by any intermediate point.

Nowadays "**Entanglement theory**", based on the transformation of entangled q.particles in q.bits near the zero point at the ground level of Q.Energy, permits transfoming "*q.particles into q.bits*" and visa versa so that "Q.Entanglement" can work as an universal intermediate exchange of space time dimensions, in order to connect the two previously anti-symmetric geometries of space-time through a base of two-dimensions in space and time.

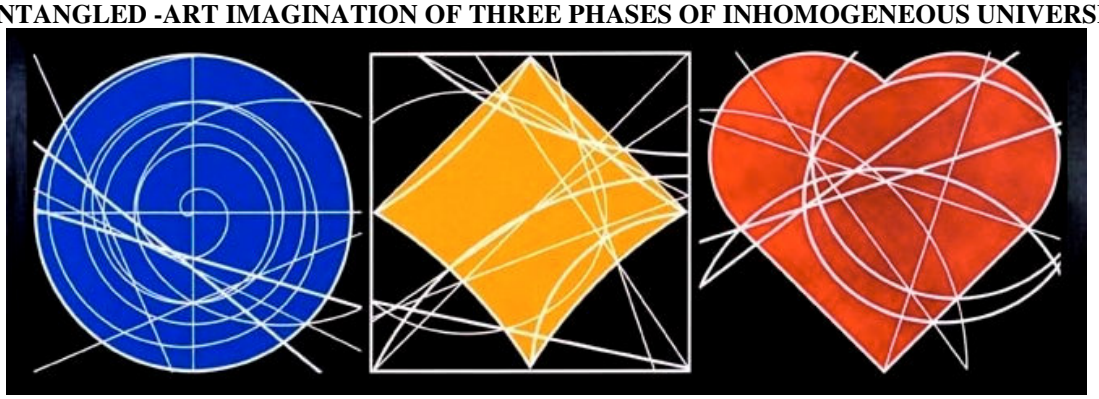
For this proposal, it is important to remember that from the studies of Quantum entanglement and quantum Teleportation, the basic unit of quantum information is a "q.bit"; the last is a so-called "*super dense coding of q.states"*, because they exist as a linear combination of four virtual states. However, a "q.bit", following the traditional Q.Mechanics, maintains such a superposition state only as long as no measurements of the state are taken. Once a measurement is taken, the state of the "q.bit" goes back to being either 0 or 1 (On-Off positions). This Q.Mechanics approach simply does not take into account that the coupling of two entangled "q.particles" needs to lower the energy of the q.particle pairs, near to ground energy fluctuation, where the dimension of space-time assumes a new configuration in relation to the virtual particles of "Information Energy" **(I)**. The last, as written in the pevious articles,(10), is dimensioned by means of two space coordinates and two time coodinates so that the matrix of the four-vector coordinates through entanglement action can assume a flat geometry of space and also a two dimensional definition of time. This is the space-time context of the "Virtual Particles of Information Energy", through which, it becomes possible

to communicate simultaneously at distance between two lines of time coodinates in both macro and micro tunnelling regions. This scientific approach gives an explanation for the possibility that entangled particles can be separated far apart from each other, and yet still maintain the characteristics of the state of the group, in a way that a better definition of entanglement methods can be useful as a resource for solving information-processing problems in new ways, based on "Quantum Teleportation". This last, untill now has been verified in a number of experiments, including one involving a fiber optic cable over a 10 kilometer distance between the two entangled particles.

In conclusion, starting from these consideration and results, the above mentioned original research proposal on the ***"Science of Quality***", giving a new view to a large ammount of self-organised multiply-critical phenomena in an "***inhomogeneous space-time dimension***s", can have a great impact on understanding and predicting the competitive universal distribution of living and non-living zones, that on the basis of Information Energy, are always in simultaneous communication. As a matter of fact, "**life**" is a strategy validated by the section ***A)*** of the total energy evolution, while living existence is forbidden in the natural complemental evolutionary strategies of ***B)*** and ***C)***. Besides, the dynamics of changes in the space-time matrix, can give new insight into fundamental questions about the nature of space-time in an universal cooperative network, based on three fundamental forms of energy **(I),(E),(M)** related to permutations of referring coordinates of their interactive events.

In this coneptual context, the "E**ntangled Theory**" permits us to understand the critical-switch near the ground state of Information Energy happening between two encoding and de-coding structures, e.g. from the one traditionally-based three space-affine coordinates plus a mono-dimensional time-line to the mirror of such a structure, with three time-affine coordinates and a monodimensional space line; the last in fact, is more adequate, for example, to understand the "*black-white hole cosmological transformation*" and other physical phenomena interpreted by Bio-Quantum Physics, in order to understand their strong implications in a great range of contemporary culture and art, following the aim towards a better understanding of the "Evolution of Life in the Universe".

ENTANGLED -ART IMAGINATION OF THREE PHASES OF INHOMOGENEOUS UNIVERSE



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