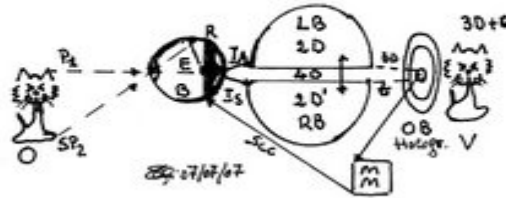


< BIO-Quantum HOLOGRAPHY in Brain Bio-Imaging construction >

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“Bio-Quantum Physics is the best theory to predict fundamental nature of life “

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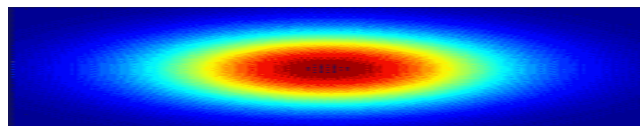


- Legenda : Retinking Quantum- neurobiology of vision

O = Object ; P1= Photon ; SP2 = scattered Photon ; B = ocular Bulb ; E = entangled Photons ;  
R= retina ; IA = Anti- symmetric Information-Signals ; IS = Symmetric Information-Signals ;  
LB = Left Brain Hemisphere; 2D = Two Dimension Anti-symmetric Information ;  
4D = Fourth Dimension Coherent Quantum Information ; 2D' = Two Dimension Symmetric Information ;  
RB = Right Brain Hemisphere ; OB = Occipital Brain - Quantum Holography turning into images light stimuli;  
V= Vision result in 3 D +Time (t) ; MM = Memory Matrix controlling Saccades (Scc) of ocular Bulb.

**Abstract** : The role of entanglement in Quantum Bio-Physics of Vision permits to establish a theory of brain bio-images formation by means of Q. Holography reconstruction. (1)

**Goal** : It is obvious that le light is travelling as **quantum particles** , so that vision construction of the brain need to be conceived as an crucial expression of Bio- quantum –physics .



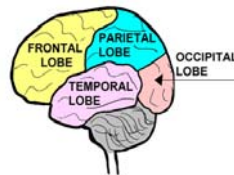
Oscillating Quantum Photon

- Preliminary questions.

- To clarify the previous goal it is important to know: what means “Quantum Entanglement” ? Two quantum Photons , becomes an entangled or gives an hybrid structure with new properties of information exchange. The entanglement of Q. Particles is one of the many “non-intuitive” features of quantum physics. In fact if two photons of light are allowed to properly interact at distance in a with one another, when they become entangled. Those two entangled photons can then be separated, but as soon as one of them interacts with a third particle transforming the quantum state information, the other photon of the pair will change its quantum state instantaneously. This happens according to the random outcome of the interaction, although this photon never did interact with a third particle .
- In this article of the “**Science of Quality**” we propose a simple speculative model to make use of quantum entanglement for extracting holographic information in the occipital brain (**OB**) about a **remote 3-D perception**, starting to take in consideration the Q. State information associated with two photons entanglement (**E**) interacting in a confined space of the multi-layers sensible structure of the Retina (**R**) .(2)



- Light (**P1- photon**) interacting at distance with an object (**O**) enters in the Ocular Bulb (**B**) from which light cannot escape. A second photon of light (**SP2**) follows a scattered path from the not sensible sector of ocular bulb, and successively will be entangled with the previous photon giving a photochemical process in the Retina (**R**). The products of interaction are the four Q. Informational States. They can be subdivided in (**IA**) anti-symmetric and (**IS**) Symmetric signals both directed forward two Hemispheres of the Brain, by means of the selection made by the Bipolar Cells. Since the Informational Signals will be analysed in (**2D**) Dimension within the Left Brain (**LB**) and in simultaneous parallel confrontation of the (**2D'**) Dimensions of the Right Brain (**RB**). So that the information is travelling in the brain in (**4D**) of the fourth -vector relativistic space-time, without the benefit of spatial and time resolution. Quantum-Holography construction of the vision (**V**) in three Dimensional (**3D**) space and in mono-dimensional perceptual -time (**t**) of dynamic events, can be made as a Bio-Quantum Holography result, running as a pre-vision of probable interaction with the environment operated in real time.



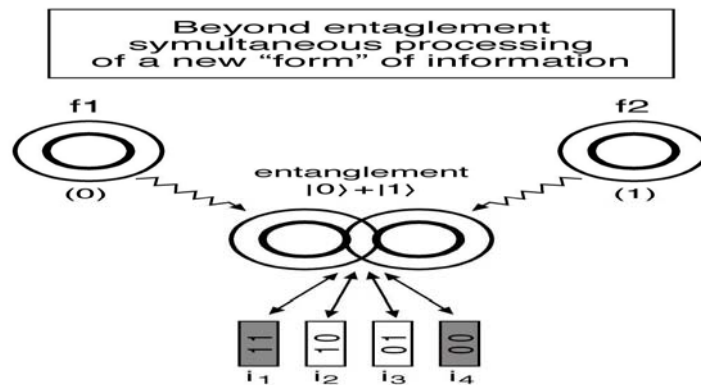
**- Article -**

This paper would demonstrate that this is the natural ability of the Brain to construct the perception and this can be understood by means of Bio-Quantum Physics because the brain's perception is a consequence of the preliminary asset of the fourth-order quantum coherence that is inherent to the entangled photon reactivity. In fact we acquire the perception of distant objects and of their dynamic events as a result of the non-local connections of information energy embodied in the Entangled Photons. Biological brainpower will be able **to make up a 3D vision in a linear time dynamics**, for bearing in mind our probability of future interaction within the environment.

**-Rationale of reasoning** : The above Rethinking of Quantum- neurobiology of vision is based on a reflection about Bio-Quantum Science about the concept of space-time "Simultaneity". In fact the last is the emergent property of information very consistent with the Quantum Wave /Particle Structure of Energy and Matter following the studies of David Bohm (3) on the issue "*Wholeness and Implicate Order*". Starting from those Bohm's studies, the Bio-Q. Physics approach can be able to reinterpret the Brain's Vision construction taking in consideration the concept of Erwin Schroedinger of "*Entanglement*". It is well known in fact that a pair of quantum particles, in an entangled state, can be used as a quantum information channel (4). Conclusively it will be possible to understand how fundamental level reality is not made of discrete and separate particles, because we can admit that "*Information Energy*" represent the fundamental quantum level of Energy, permitting the co-existence of one interconnected whole thought "*Non Local Quantum Correlation*". (5)

Now remembering that Q. Physics has its limit in Classical Physics it is obvious that Entangled states have a low probability of existence into a confined condition for a long time. As a matter of facts this is as an ultimate consequence of the not penetrability of two bodies in classical physics. Hence considering that two Q. Particles cannot remain in the same place at the same time, can be quite obvious that the Entangled State need to be transformed to a lower level of Energy, through the spitting in four overlapping vector states of the fundamental "*Information Energy*".

The ocular Bulb (**B**) is the best biological chamber to close photons in a protected neighbouring within highly reflecting walls which doesn't destroy photons, in a way to allow for much longer periods of extracting quantum information by entangled photons. The ocular Bulb (**B**) serves as an integrating sphere where the sensitive retina is working as a trap locking the entangled photons into a small confined space. In this way the retina is becoming a source of entangled photon where biochemical reactions of the rhodopsin protein converts any photo-event in informational signals based on the superposition of four vector states of Information Energy. (**i1,i2,i3,i4**).



The interacting multilayer cavity of the retina favour the reaction of entangled photons this because single photons are more stable and less photo-reactive; in addition the long wavelength fluctuations of photon pairs can become more efficient by means of the saccades (**Sc**) induced by the memory matrix (**MM**); so that saccades have a function as a perceptual trigger.

The eye bulb is bucket where the photon-event lose the space time resolution of the external world, therefore the outside information need to be reconstructed by the brain in a probability result of an Holography- Vision (**V**).

Then after the coherent decay of entangled photons the Informational biochemical energy, can be codified in four bi-dimensional signals. In this way the neurological system works "**simultaneously**" as a quantum network able to inform the activation of the neuronal metabolism of the various specific areas of the brain, by virtue of the fourth order coherence based on the superposition of the **Q. States ( 1.1.) , (1.0.) , (0.1), (0.0)**.

This coherent process of Information Energy, can be subdivided, from beginning to end, by means three fundamental contemporaneous phases of Brain 's global organization of Quantum informational signals.

**First Phase** : Split out of the two anti-symmetric information vector states (**i2**) and (**i3**) forward the Left Hemisphere and to address the two symmetric ones (**i1**) and (**i4**), versus the Right Hemisphere, through the polar cell activity and via the optical chiasm.

**Second Phase** : Parallel working of two Brain's Hemispheres, via bio-nervous interactive travelling of Anti-symmetric (**IA = i2 x i3**) and Symmetric (**IS = i1 x i4**) of information energy. The signals analysis will be controlled by an simultaneously interaction facilitated by the easier interchanges through the "Corpus Callosum" channels. In this phase it is important to emphasize the changing of the nature of "**local information to delocalized information**" in Q. Biology. In fact information energy signals due to the superposition of Q. States, are travelling between left and right brains in parallel by means a non local interactivity into a global (**4D**) Dimension of a continuous relativistic fourth -vector of space-time.

**Third Phase**: The "Quantum Holography" construction, made by the Occipital Brain (OB), is a kind of focusing process giving as a Visual probabilistic result. In fact the Holography-outcome represent an **predictive** simulation in real time of the future of the probable interactions with an at distance environment. The brain's perception is generated by means the quantum imaging construction of probability realized by the brain-power in three dimension (3D) of space spitted by the perception of an linearity of local- time. This result differ to a great extent from the classical idea of a **descriptive** Vision of an objective reality, realised by the optical reconstruction of the light wave-fronts transmission. As a matter of facts, if the cerebral bases of the perception would work according to the classic physics system of reconstruction of the imaging, we perennially would be unnaturally affected to only see the past. Differently following this simple formulation the final 3D-Holography-space, separated by a linear succession of time, is effectively a virtual artefact of the brainpower that it is able to determine the product of the probability amplitudes of the Information signals, generated by means of multi entangled phonons in a construction of visual imaging forecasting our future interactivity with the natural world.

In fact Occipital Brain utilize a "**Natural Mathematics**", in similar way that the product of two symmetric vectors like (**i1 x i4 = i4 x i1**), gives as result a scalar as a representation of time, i.e. a linear succession of numbers (from left to right), that is independent from the choice of the position of the space coordinates. Contemporarily the product of the other two anti- symmetric vectors (**i2 x i3 # i3 x i2**) gives two results describing the space dimensions of the visual imaging and the **Up** or **Down** direction of the movement. Therefore brain's power is able to foresee an **3D Hologram** of perceptual vision as a probable scenario of our possible interactions with the environment inclusive of a separated time chronology.

Thinking in this manner, Bio-Quantum Physics play a not trivial role in advanced Bio-Quantum Physics this because the classical descriptive conception of vision is becoming a final result of a more complete paradigm of “**general science understanding**”.

Some final consideration can be used to sustain the above rethinking of brain’s visual process in Bio-quantum-Physics . In fact during the sleep brain can dream with very clear perceptions of virtual surroundings. In the case of dreaming photons, before embodied in the ocular bulb, can be forced to be entangled through the Rapid Eye Movement , so that it would become possible to begin the Brain’s Holography construction in 3D also during the sleep. This interpretation of dreams can be a proof of the importance of entangled photons in the brain’s construction of quantum anticipation of the perspective of probable interaction with the environment in our life.

Ultimately I think that advanced Bio-Quantum Physics is an expression of neurological power to express the best theory to predict fundamental nature of life and also I think that modern art can be integrated in a more complete creative mental - change to give an evolutional aesthetical response to beauty, in a way that this trans-disciplinary amalgamation, can favour the contemporary development of the “Science of Quality”. As a matter of facts modern art understand before knowing, that our perception has a probabilistic character. So that the fashion of modern art it is very close to the revision of visual process as an brain’s holography construction described in simple form in this brief article.

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***NOTE : To develop as an international project on The Science of Quality , on the basis of those preliminary approaches , I am interested to find an “HOSTING INSTITUTION” to propose an IDEE European Project on the Title: <“Bio-Quantum Physics a link between advanced science and modern art “> , aiming to ask for a trans-disciplinary research grant .***