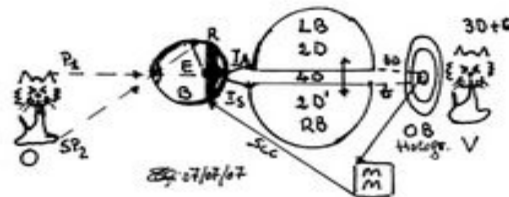


BIO-Quantum HOLOGRAPHY in Brain Bio-Imaging construction

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

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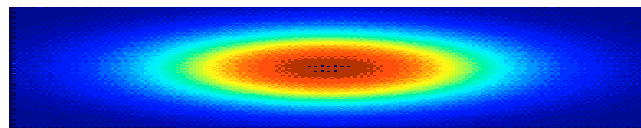


- Legenda : Rethinking Quantum- neurobiology of vision

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 establishing 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 needs to be conceived as a crucial expression of Bio-quantum physics .



Oscillating Quantum Photon

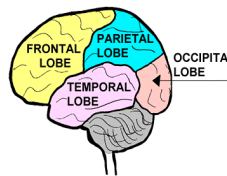
- Preliminary questions.

- To clarify the previous goal, it is important to know the meaning of “Quantum Entanglement”. Two quantum photons become an entangled or provide a 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 a distance with one another, they become entangled. The 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 the 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**), for *remote 3-D perception*, taking into consideration, the Q. State information associated with a two-photon 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 the Ocular Bulb (**B**) from which light cannot escape. A second photon of light (**SP2**) follows a scattered path from the insensible sector of the ocular bulb, and will be entangled with the previous photon creating 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 to two hemispheres of the brain by means of the selection made by the Bipolar Cells. Since the Informational Signals will be analysed in (**2D**) dimensions 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 space and time resolution. Quantum-Holography construction of vision (**V**) in three dimensional (**3D**) space and in mono-dimensional perceptual time (**t**) of dynamic events, can be made into a Bio-Quantum Holography result , running as a pre-vision of probable interaction with the environment operating in real time .



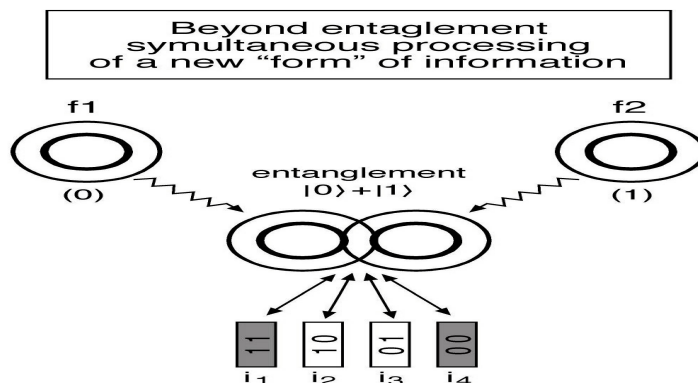
- Article-

This paper demonstrates that it is the natural ability of the Brain to construct perception and this can be understood by means of Bio-Quantum Physics. This is because the brain’s perception is a consequence of the preliminary asset of the fourth-order quantum coherence that is inherent in entangled photon reaction. 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 is able *to make up a 3D vision in linear time dynamics* for bearing in mind the probability of future interaction within the environment.

-Rationale of reasoning : The above rethinking of the quantum-neurobiology of vision is based on a reflection of Bio-Quantum science regarding the concept of space-time “simultaneity”. In fact, the last is an emergent property of information and is very consistent with David Bohm’s(3) quantum **Wave/Particle Structure of Energy and Matter** (<http://www.spaceandmotion.com>) in the issue “*Wholeness and Implicit Order*”. Starting from Bohm’s studies, the Bio-Q. Physics approach is able to reinterpret the Brain’s vision construction taking into consideration the concept of Erwin Schroedinger’s “*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). It will be possible to understand conclusively, that fundamental-level reality is not made of discrete and separate particles. We can state that “*Information Energy*” represents the fundamental quantum level of energy that permits the co-existence of **one interconnected whole thought** “*Non Local Quantum Correlation*”.

Remembering that Q. Physics has its limit in classical physics, it is obvious that entangled states have a low probability of existence in a confined condition for a long period. As a matter of fact, this is as an ultimate consequence of the impenetrability of two bodies in classical physics. Hence, considering that two Q. Particles cannot remain in the same place at the same time, it is quite obvious that the entangled state needs to be transformed to a lower level of energy, through the splitting in four overlapping vector states of fundamental “**Information Energy**”.

The ocular Bulb (**B**) is the best biological chamber to enclose photons in a protected neighbourhood within highly reflecting walls which does not destroy photons, This allows entangled photons much longer periods to extract quantum information. 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 becomes a source of entangled photons where biochemical reactions of the rhodopsin protein converts any photo-event into informational signals based on the superposition of four vector states of Information Energy. (**i1,i2,i3,i4**).



The interacting multilayer cavity of the retina favours the reaction of entangled photons. This is 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 (**Sec**) induced by the memory matrix (**MM**); so that saccades have a function as a perceptual trigger.

The eye bulb is a bucket where the photon-event lose the space time resolution of the external world. Therefore, outside information needs to be reconstructed by the brain through a probability result of 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 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 the brain’s global organization of quantum informational signals.

First Phase : Split out of the two anti-symmetric information vector states (**i2**) and (**i3**) forward into 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 the 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 signal analysis will be controlled by a simultaneous interaction, facilitated by the easier interchanges through the “Corpum Callosum” channels. In this phase, it is important to emphasize the changing 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 a visual probabilistic result. In fact, the holography-outcome represents a **predictive** simulation in real time of the future of the probable interaction with an at-distance environment. The brain’s perception is generated by means of the quantum imaging construction of probability, and realized by brainpower in three dimension (3D) of space, and by the perception of the linearity of local-time. This result differs to a great extent from the classical idea of a **descriptive** vision of an objective reality realised by the optical reconstruction of transmitted light wave-front. As a matter of fact, if the cerebral bases of the perception would work according to classic physics' system of reconstruction of the imagination, we would always be unnaturally allowed to only see the past. Following this simple formulation, the final 3D-Holography-space, separated by a linear succession of time, is effectively a virtual artefact of brainpower. It is able to determine the product of the probability amplitudes of the information signals, generated by means of multi entangled phonons in construction of visual imaging, forecasting our future interactivity with the natural world.

In fact, the Occipital Brain utilizes a “**Natural Mathematics**”, in the same way that the product of two symmetric vectors, like ($\mathbf{i1} \times \mathbf{i4} = \mathbf{i4} \times \mathbf{i1}$), gives a scalar result as a representation of time ,i.e. a linear succession of numbers (from left to right), that is independent of the choice of the space coordinates. The product of the other two anti-symmetric vectors ($\mathbf{i2} \times \mathbf{i3} \neq \mathbf{i3} \times \mathbf{i2}$) gives two results describing the space dimensions of visual imaging and the **Up** or **Down** direction of the movement . Therefore the brain’s power is able to foresee a **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 plays a not-trivial role in advanced Bio-Quantum Physics. This is because the classical conception of vision is becoming a final result of a more complete paradigm of “**general science of understanding**”.

Some final consideration can be used to support the above rethinking of the brain’s visual process in Bio-quantum-Physics. In fact, during sleep, the brain can dream with very clear perceptions of virtual surroundings. In the case of dream photons, before being embodied in the ocular bulb, they can be forced to be entangled through rapid eye movement, so that it would also be possible to begin the Brain’s Holography construction in 3D during sleep. This interpretation of dreams can be proof of the importance of entangled photons in the brain’s construction of quantum anticipation of probable interactions 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 the fundamental nature of life. Also, I think that modern art can be integrated in a more complete creative mental-change to give an evolutionary aesthetic 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 fact, modern art understood before knowing, that our perception has a probabilistic character, so the fashion of modern art is very close to the revision of visual process as the 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 .