

## **Entanglement on Photosynthesis**

**Paolo Manzelli, 25/2/11:**

Photosynthesis, violates mechanical physical laws, this because photons can be entangled changing the structure at distance communication generating fields of simultaneity of information. This is not understandable until we look to comprehend the simultaneity of information. The last can be allowed during the formation of photonic fields as a field of constant information over time. In Sintesese is not only important to understand how happens the transition between different quantum energy levels, but we need to reach the reversible formation of stationary states, that form the basic structure the quantized energy levels.

At the practical level, I agree that the green colour of plants is not the only caused by a simple specific absorption/reflexion of light spectrum, but corresponds better to an interference based on a long distance emission of entangled photons light. This problem is not immediate to understand without changing the fixed Euclidean paradigm of Space Time in an emerging general relativity of quantum space/time dimension matrix, where can be possible the simultaneity of information field, as intuitively proposes David Bohm in quantum physics. I am very glad for your cooperation in advancing new concepts in Chemical-Physics of nano-dimensional state,

**Marco Sacilotti 23/2/11**

Subject: Entanglement on Photosynthesis

To: msarovar@berkeley.edu

Dear Paolo Manzelli (for your comments on photosynthesis and entanglement, at <http://www.wbabin.net/science/manzelli8.pdf>)

Dear Mohan Sarovar (Berkeley)

I have seen your work on FMO (photosynthesis and entanglement). Congratulations!

I do not work on entanglement but, may be the enclosed information can be interesting to you (and, may be, for an interesting discussion). I'm a physicist working on semiconductors and bandgap engineering for many years.

A few years ago I could observe that the photosynthesis mechanism, for the electrical charges separation, could be explained by type II (staggered) energetic interfaces between two different molecules. More, I'd found that Forster's theory, for photosynthesis, violates physical laws. This for 3 reason described enclosed (please, see enclosed the ppt in "total screen" motion). May be this is the only energetic configuration able to separate electrical charges under attraction. For this reason I'd prepared a paper, published in Nasa-Arxiv about photosynthesis: <http://arxiv.org/abs/1005.1337>

In your FMO-entanglement work, what bothers me is the fact that molecules are separated from their natural environment. Changing the environment, you change the band-gap relative position. This does not imply that your results are not correct but I'm wondering if you can correlate it with the photosynthesis mechanism. Moreover, a recent work by \* Yen Hsun Su et al (Nanoscale vol. 2, page 2639 2010, enclosed) show that changing the medium (environment) in which molecules are present, you change the colour of the leaves. This means that the green colour of plants is not a reflexion. If the Chl molecules are still there, it means that the green color of plants can be an

emission (interface emission, like in the ppt motion enclosed).

The ppt enclosed is, may be, the only energetic configuration able to separate electrical charges (able to produce an interface electric field, by energy band bending). You have a paper enclosed (OSA-LAOP publication) showing the interface electric field, necessary to separate electrical charges.

Could you please comment about the FMO results you have (changing the molecules medium) and entanglement? Should we relate it to photosynthesis? Or relate it to a new observation of interaction between organic molecules?

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PS

Recently Yen Hsun Su et al (Nanoscale vol. 2, page 2639 2010), doping sea-urchins with gold nanoparticles, showed that is possible to change the leaves' colour to red, yellow or blue, depending on the excitation light and the gold nanoparticle size. Exciting sea-urchins/gold system with white light they could obtain yellow colored leaves. Exciting the sea-urchins/gold system with UV (285 nm) they could obtain blue and red colored leaves. As the Chl-a is still there (in the sea-urchins leaf), if green is a reflexion, due to Chl-a, the sea-urchins should keep green. It means we cannot take Chl-a from leaves and conclude "plants are green because Chl-a do not absorb green light". Gold nanoparticles change the Chl-a environment, changing the emission colour, and the Chl-a is still there. If they are still there and we cannot consider reflexion anymore, what should be the Gold/Chl-a red or blue mechanism: emission or reflexion ?

More, an ancient paper by Steven Boxer from Stanford University (Mita Chatteraj et al, Proc. Natl. Acad. Sci. USA, vol. 93, p. 8362 August 1996, Biophysics), by exciting GFP, it was proposed that the two visible absorption bands correspond to \*two ground-state conformations. The staggered band gap relative position has "two ground-state like" conformations