Dear Rich,

Thank you for your interest in quantum technologies.
You are asking: Can you imagine designing a quantum photosynthetic solar cell?
Let me remind that all solar cells are working basing on absorption of discrete quanta of light energy. That was discovered by Max Planck on 1900 year.
Our previous consortium worked on the creation of artificial cells absorbing light energy. They grow and divide to the two daughter cells, i.e. we have some kind of your asking quantum photosynthetic solar cell, see http://www.istpace.org/index.html
I have described these processes in my paper:

[1] Tamulis A, Grigalavicius, M, The emergence and evolution of life in a "fatty acid world" based on quantum mechanics. Orig Life Evol Biosph 41:51-71, 2011.

Of course in all these systems exist the quantum vibrations and these systems work only in the case of proper displacement of electron donor and electron acceptor molecules while time by time these systems returning to their own quantum resonance state.

The more complicated question would be: Can you imagine designing a quantum entangled photosynthetic solar cell?

This correlates with your written idea: **Quantum resonance and the photosynthetic solar cell**

I have described possibility of these quantum entangled photosynthetic solar cells in my papers:

[2] Arvydas Tamulis, Mantas Grigalavicius and Jonas Baltrusaitis, (2013) „Phenomenon of Quantum Entanglement in a System Composed of Two Minimal Protocells“, *Origins of Life and Evolution of Biospheres,* 43:49–66.
[3] Arvydas Tamulis, Mantas Grigalavicius, “Quantum Entanglement in Photoactive Prebiotic Systems. journal *Systems and Synthetic Biology”,* vol. 8, p.p. 117-140., 2014.

Actually exist in the nature experimental evidence (Sarovar et al. 2010) which suggests that quantum entanglement may exist in a protein structure that is central to photosynthesis in green an oxygenic bacteria. This bacteria actually is working on your proposed idea: **Quantum resonance and the photosynthetic solar cell.**
[4] Sarovar M, Ishizaki A, Fleming GR, Whaley KB (2010) Quantum entanglement in photosynthetic light harvesting complexes. Nat Phys 6:462–467

As I know, presently are experimental electric power stations near the roads which collect energy of classical vibrations initiated by cars.

With best regards,
Arvydas

Dear Arvydas Tamulis, Paolo Manzelli and friends:

Quantum Entangled Single Bioorganic Supramolecules as Light Absorbing and Light Emitting Logical Devices is a deeply impressive paper. Sir, your level of knowledge and its specificity are rare. Please allow me to ask you, and the rest of the forum a question. Can you imagine designing a quantum photosynthetic solar cell? This could be important for obvious reasons. If you find interest in this notion, and I believe you are uniquely qualified and able to solve this problem, I will dig around and find the possible rough idea I located for the active resonant interface. However: Your more developed and better aimed thoughts regarding that bit of creative engineering, would be key.

Quantum resonance and the photosynthetic solar cell:

Nature herself transfers energy with the greatest efficiency via quantum resonance. Can we demonstrate and use this mechanism of resonant quantum vibratory energetic transfer?

http://m.phys.org/news/2014-01-quantum-mechanics-efficiency-photosynthesis.html

A quantum solar cell of great efficiency could be created based on photosynthesis itself. If an *active artificial resonant interface* were inserted into the system, perhaps the underlying quantum energy could be gathered via this mechanism: "When the energy of a collective vibration of two chromophores matches the energy difference between the electronic transitions of these chromophores a resonance occurs and efficient energy exchange between electronic and vibrational degrees of freedom takes place." Perhaps we can mirror nature and her efficiency? "Energy transfer in light-harvesting macromolecules is assisted by specific vibrational motions of the chromophores," said Alexanda Olaya-Castro (UCL Physics & Astronomy), supervisor and co-author of the research. "We found that the properties of some of the chromophore vibrations that assist energy transfer during photosynthesis can never be described with classical laws, and moreover, this non-classical behaviour enhances the efficiency of the energy transfer." Molecular vibrations are periodic motions of the atoms in a molecule, like the motion of a mass attached to a spring. *Can you devise a way to gather the energy of the vibrational mechanical manifestations and their resultant electronic potential mirroring natural means?* If so, a highly efficient means of energetic collection could be created stemming from basic quantum biological processes.

Rich Norman www.mindmagazine.net

On 1/2/15 12:12 PM, Arvydas Tamulis wrote:

> Dear Colleagues,
>
> I have received good message that our newest article is publishing in the ***Journal of Computational and Theoretical Nanoscience*** (please find attached).
> I have prepared the working plans for WP in the joint project which intend submit to FET Open basing on this and on my previously sent articles.
>
> With best regards,
> Arvydas Tamulis

Independent expert of European Commission

From: <aspsupport@covad.net>
Date: Fri, Jan 2, 2015 at 1:59 PM
Subject: CTN -- Quantum Entangled Single BioOrganic ... [12CTN08-3966]
To: tamulis9@gmail.com
Cc: angpub@covad.net

Dear Dr. Arvydas Tamulis,

Thank you for your excellent contribution to ***Journal of Computational and Theoretical Nanoscience***.

Attached is the typeset chapter which you submitted research article *A. Tamulis et al. "Quantum Entangled Single BioOrganic Supramolecules as Light Absorbing and Light Emitting Logical Devices"* to