



ΓΕΝΙΚΟ ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ

PHYSICS COLLOQUIUM

Thursday, 22 October 2009
17:00-18:00

3rd Floor Seminar Room

Towards the Quantum Foundations of the "Tree of Life"

Prof. Ioannis Kominis (Univ. of Crete)

Abstract

Non-trivial quantum effects in biological systems have been sought after for a long time. We will show that radical-ion pairs exhibit the full machinery of quantum-information-science concepts and effects, namely quantum coherence, quantum jumps, the quantum Zeno effect and quantum correlations. Radical-ion pairs are biomolecules understood to underlie the biochemical compass of migratory birds navigating by use of the geomagnetic field. More important, radical-ion pairs are at the heart of photosynthesis. We will argue that our recent elucidation of the quantum nature of radical-ion-pair reactions has the potential to unravel nature's design concepts of photosynthetic reaction centers, the biochemical reactors converting sun's photons into "life".