ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΡΗΤΗΣ

ΤΜΗΜΑ ΦΥΣΙΚΗΣ

ΓΕΝΙΚΟ ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ

PHYSICS COLLOQUIUM

Thursday, 27 September 2012

17:00 -18:00

3rd Floor Seminar Room

"Tweeting Quantum Biology"

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Abstract

Since Schrödinger wondered about the connections of quantum physics with "life" little progress has been made elucidating "non-trivial" quantum effects in biological systems. We have recently established a new venue towards quantum biology. We have shown that the spin-dependent biochemical reactions underlying the avian magnetic compass mechanism are fundamentally described by quantum measurement theory and exhibit quantum coherence, quantum correlations, quantum jumps and the quantum Zeno effect. We also demonstrated that they form the biochemical analog of a nonlinear double slit interferometer. The fundamental theory we developed induced a paradigm-shift in the 40-year old field of spin chemistry dealing with these reactions, rendering the traditional theoretical description central in this field a limiting case when spin relaxation is dominant. We will finally address what we can only guess will be the future of this exciting new synthesis between "quantum" and "bio", the infant steps of which we are currently witnessing.