

Claudia Negulescu: "Decoherence rhapsody in the photosynthesis process"

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It is said that classical theories are sometimes inappropriate to describe very efficient biological processes in nature, which seem to be better understood via quantum mechanical models. We are however still very far from understanding how quantum features can survive in open quantum systems. In this talk I shall present two simple mathematical models for the illustration of the excitation energy transfer in photosynthesis complexes, and study numerically the environmental induced decoherence effect and its influence on the emergence of classicality in nature. The models are based on the Schrödinger equation, describing the propagation of an absorbed excitation through a spin-chain towards a reaction center, and this in permanent interaction with a vibrational environment.