

Quanta, Vibrations and Biology

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The exploration of quantum effects in biology is an emerging field of research that concerns itself with the experimental and theoretical exploration of quantum phenomena in biological systems. In this lecture I aim to bring out design principles that nature may be exploiting to make use of quantum effects and I will develop in particular one underlying theme -- the dynamics of quantum dynamical networks in the presence of an environment and the fruitful interplay that the two may enter. For three biological phenomena whose understanding is held to require quantum mechanical processes, excitation and charge transport in photosynthetic complexes, magneto-reception in birds and the olfactory sense, I demonstrate that this underlying theme encompasses them all, thus suggesting its wider relevance for quantum biology.