"Exciton and electron transport in bacterial membranes"

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AFM images of the organisation of the photosynthetic apparatus in purple photosynthetic bacteria have raised many fundamental questions concerning the formation and function of these membranes. These problems have lead to many studies by theoretical and experimental physicists. Photosynthetic organisms capture light energy using specialised nanometric light-harvesting pigment protein complexes and transfer this energy in the form of excitons to the photochemical reaction center where the energy is used to generate chemical potential energy. This process occurs in specialised biological membranes where the various pigment protein complexes involved are located. I will present our work describing the organisation of these remarkable membranes and the implications of this organisation for exciton and electron transport properties of the membranes. I will also present some recent results on the implications of these transport phenomena for the biological system and the ecology of the organisms concerned.