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Modeling Light and
Environment in Complex
Systems
<http://www.dcci.unipi.it/molecolab/>

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Dr. Tomás Mancal is an internationally well-known scientist thanks to his important contributions in the field of Quantum Biology, namely the application of quantum mechanics to problems related to biology.

His main achievements are in the interpretation of the energy transfer processes in light-harvesting pigment-protein complexes. This is indeed a very important subject as the detailed understanding of the molecular mechanisms beyond the initial steps of photosynthesis represents a fundamental element in our comprehension of solar energy conversion in nature.

The main novelty in the work of Dr. Mancal is the use of theoretical formalisms and computational models, which allow an accurate analysis of the quantum nature of the energy transfer processes, as well as the role played by nuclear (vibrational) degrees of freedom. Such a complete modeling has represented a breakthrough in the field as it has allowed to reveal aspects of the processes, which have never been quantified before in such complex biosystems.

Still following the same theoretical formalisms, Dr. Mancal has given an important contribution to the interpretation of time resolved non-linear spectroscopies (such as 2D electronic spectroscopy). The research developed by Dr. Mancal has rationalized the effects that processes occurring at very different time scales can express themselves in the signals of these spectroscopies.

The results of Dr. Mancal's research in the two areas pointed out above have been presented in many papers published in important international journals. In all these

papers Dr. Mancal has combined an accurate theoretical machinery with a deep physical interpretation of the outputs of the simulations. As a result, the impact of these publications in the international scientific community has been relevant as also shown by the many citations received by the papers during the years.

Once recognized all these aspects, I recommend that Dr. Mancal is appointed as an associate professor.

In truth

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Benedetta Mennucci