



Quantum Effects in Biological Systems 2016

6-9 June 2016

Program

Sunday, 5th June

18³⁰ – 20³⁰ Welcome reception

Monday, 6th June

9⁰⁰ – 9³⁰ Opening

Session Chair: Francesco Petruccione

9³⁰ – 10³⁰ **Paul Davies**. Quantum Biology: just a few quirks or the tip of an iceberg?

10³⁰ – 11⁰⁰ Coffee/Tea

11⁰⁰ – 11⁴⁰ Chern Chuang, Chang-Yu Hsieh, Jeremy Moix and **Jianshu Cao**. Quantum transport in low dimensions: Universal scaling relation of exciton dynamics in light-harvesting chromophore arrays

11⁴⁰ – 12⁴⁰ **Richard Cogdell**. Exploiting natural variation in purple bacterial light harvesting complexes: a test bed for the importance of coherence?

12⁴⁰ – 14⁰⁰ Lunch

Session Chair: Paul Davies

14⁰⁰ – 15⁰⁰ **Elisabet Romero**, Vladimir Novoderezhkin, and Rienk van Grondelle. The Quantum Design of Solar-Energy Conversion in Photosynthesis: Experiment and Modelling

15⁰⁰ – 15³⁰ **Tjaart Krüger**, Maxime Alexandre, Pavel Maly, Claudia Büchel, Tomas Mancal and Rienk van Grondelle. Single-molecule excitonic dynamics for robust functionality of plant and diatom light-harvesting complexes

15³⁰ – 16⁰⁰ **Miquel Huix-Rotllant**. Ultrafast Heme-CO dissociation in myoglobin is triggered by strong vibronic couplings

16⁰⁰ – 16³⁰ Coffee/Tea

16³⁰ – 17⁰⁰ **David Coker**, Mi Kyung Lee and Pengfei Huo. Exploring effects of electronic, vibrational, and vibronic coherence in models of photosynthetic energy transfer and charge separation

17⁰⁰ – 17³⁰ **P. Kurian** and T. J. A. Craddock. Photoexcitation of Tryptophan Chromophore Networks in Tubulin Polymers

17³⁰ – 18⁰⁰ **Stefano Iubini** and Francesco Piazza. Structural and dynamical determinants of exciton transport in coarse-grained models of light-harvesting complexes

18⁰⁰ – 18³⁰ **Marco Merkli**. Dynamics of a chlorophyll dimer in collective and local thermal environments

Tuesday, 7th June

Session Chair: Richard Cogdell

- 9⁰⁰ – 10⁰⁰ **Efthimios Skoulakis**. Smelling vibrations
- 10⁰⁰ – 10³⁰ **Leonas Valkunas**. Coherence and Excitation Dynamics in Molecular Aggregates and Photosynthetic Pigment-Proteins
- 10³⁰ – 11⁰⁰ Coffee/Tea
- 11⁰⁰ – 11⁴⁰ **Nir Keren**. Control over photosynthetic energy transfer by rearrangements of its basic building blocks
- 11⁴⁰ – 12¹⁰ **Darius Abramavicius** and Olga Rancova. Correlated fluctuations in excitonic model
- 12¹⁰ – 12⁴⁰ **George Ellis**. Quantum biology and collapse of the wave function
- 12⁴⁰ – 14⁰⁰ Lunch

Session Chair: Ilya Sinayskiy

- 14⁰⁰ – 15⁰⁰ **Albrecht Haase**. Differential Odour Coding of Isotopomers in the Insect Brain
- 15⁰⁰ – 16³⁰ Rapid-fire session
- 16³⁰ – 19⁰⁰ Poster session

Wednesday, 8th June

Session Chair: Nir Keren

- 9⁰⁰ – 10⁰⁰ **Peter Hore**. A quantum needle for the avian magnetic compass
- 10⁰⁰ – 10³⁰ **Ilya Solov'yov**. Theoretical insights into cryptochrome magnetoreception
- 10³⁰ – 11⁰⁰ Coffee/Tea
- 11⁰⁰ – 11⁴⁰ **James Lim**, Antonietta De Sio, Filippo Troiani, Ephraim Sommer, Margherita Maiuri, Julien Réhault, Susana F. Huelga, Martin B. Plenio, Giulio Cerullo, Elisa Molinari and Christoph Lienau. Coherent charge separation and non-equilibrium vibrational motion in organic photovoltaics
- 11⁴⁰ – 12¹⁰ **David Holdaway**, Alexandra Olaya-Castro and Elisabetta Collini. Probing exciton coherences with chiral pump-probe spectroscopy
- 12¹⁰ – 12⁴⁰ **Howe-Siang Tan**. Studying the Excitation Energy Transfer Dynamics of LHCII complexes using 2D and 3D Electronic Spectroscopy
- 12⁴⁰ – 14⁰⁰ Lunch
- 14³⁰ – 17⁰⁰ Excursion “Durban city tour”
- 18³⁰ – 21³⁰ Conference dinner

Thursday, 9th June

Session Chair: Yoshitaka Tanimura

- 9⁰⁰ – 10⁰⁰ **Alexandra Olaya-Castro**. Quantum coherence photosynthetic proteins: insights for emerging energy technologies
- 10⁰⁰ – 10³⁰ **Tomáš Mančal**. Non-secular Modified Redfield Theory of Energy Transfer in Pigment-Protein Complexes
- 10³⁰ – 11⁰⁰ Coffee/Tea
- 11⁰⁰ – 11⁴⁰ **Bruno Robert**. Identifying vibrational modes coupled with electronic transitions in light-harvesting systems: phycobiliproteins
- 11⁴⁰ – 12¹⁰ **Erik Gauger**, Amir Fruchtmann, Rafael Gomez-Bombarelli, Kieran Higgins and Brendon Lovett. Design principles for quantum-enhanced photocells inspired by biological systems
- 12¹⁰ – 12⁴⁰ **Giuseppe Luca Celardo**, Fausto Borgonovi, Mohan Sarovar and Giulio Giuseppe Giusteri. Interplay of cooperativity and disorder: from natural light harvesting complexes to quantum devices
- 12⁴⁰ – 14⁰⁰ Lunch

Session Chair: Peter Hore

- 14⁰⁰ – 15⁰⁰ **Yoshitaka Tanimura**. Quantum efficiency probed by nonlinear measures
- 15⁰⁰ – 15³⁰ **Florian Schroeder** and Alex Chin. Many-body simulation of exciton-phonon dynamics of an organic dimer
- 15³⁰ – 16⁰⁰ **Daniel Manzano Diosdado**, Juzar Thingna and Jianshu Cao. Symmetries and energy transport in open quantum systems
- 16⁰⁰ – 16³⁰ Coffee/Tea
- 16³⁰ – 17⁰⁰ **Lev Mourokh**. Coupled Proton-Pumping Complexes: Natural and Artificial Structures
- 17⁰⁰ – 17³⁰ **Davinder Singh** and Shubhrangshu Dasgupta. Role of pigment-protein coupling in energy transfer in FMO complex
- 17³⁰ – 18⁰⁰ **Cristina Chavarriaga**, Pablo R. Castello, Ian McClure, Maria Procopio, Robert Usselman and Carlos Martino. The role of spin biochemistry in bioenergetics and reactive oxygen species product channeling
- 18⁰⁰ – 18³⁰ **Ilya Sinayskiy** and Francesco Petruccione. Application of Open Quantum Walks to the transport in biological systems