



# QUEB 2019

## MEXICO

Quantum Effects in Biological Systems

# PUEBLA

Edificio Carolino



INSTITUTO DE CIENCIAS FÍSICAS



UNIVERSITÀ CATTOLICA del Sacro Cuore

### I-LAMP

Interdisciplinary Laboratories for Advanced Materials Physics

## 27 TO 31 OCTOBER

# P R O G R A M



## SUNDAY 27



18:00 - 21:00

REGISTRATION AND WELCOME COCKTAIL PARTY (Hotel Colonial)



## MONDAY 28



9:00 - 9:20

Inauguration



**Monday 28**



 **TUESDAY 29** 

**Chair: David Jonas**

9:00 - 9:40

Jianshu Cao, MIT, USA,  
Quantum Coherence in Light-harvesting Energy Transfer.

9:40 - 10:00

Georg Engelhardt, Beijing Computational Science Research Center, China,  
Analytical calculation of the 2D spectrum in a vibrationally coupled homodimer based on the polaron transformation.

10:00 - 10:20

Lev Mourokh, CUNY, USA,  
Physical nanoscale models for biological and bio-inspired structures.

10:20- 11:00

Tomas Mancal, Charles University, Czech Republic,  
System-bath entanglement and thermodynamic behaviour of Frenkel exciton systems.

11:00- 11:30

**COFFEE BREAK**

11:30- 12:10

Jasper Knoester, University of Groningen, The Netherlands,  
Structure-function relationship of tubular molecular aggregates.

12:10- 12:30

Francesco Mattiotti, UCSC, Italy,  
Macroscopic coherence as an emergent property in molecular nanotubes.

12:30- 12:50

Anton Trushechkin, Steklov Mathematical Institute, Russia,  
Calculation of coherences in Förster and modified Redfield theories with applications in spectroscopy.

12:50- 13:30

Philip Kurian, Howard University, USA,  
New horizons in quantum biology: Emergence and coherence in living matter.

13:30- 15:40

**LUNCH**

**Chair: Philip Kurian**

15:40- 16:00

Sourabh Kumar, University of Calgary, Canada,  
Are there optical communication channels in the brain?

16:00- 16:20

Betony Adams, University of KwaZulu-Natal,  
South Africa, An open quantum systems approach to entangled Posner molecules.

16:20- 16:40

Christopher Rourk, Indication of quantum mechanical electron transport in substantia nigra tissue from conductive atomic force microscopy tests.

**27 TO 31**  
**OCTOBER**

**P R O C E E D I N G S**

 **TUESDAY 29** 

16.40 - 17:10

**COFFEE BREAK**

17.10 - 19:30

**POSTER SECTION AND COCKTAIL PARTY (Edificio Carolino)**

 **WEDNESDAY 30** 

**Chair: Jianshu Cao**

9:00- 9:40

**David Jonas, University of Colorado, Boulder, USA**  
**Insights into Photosynthetic Light Harvesting from 2D Femtosecond Spectroscopy.**

9:40- 10:00

**Yuval Kolodny, The Hebrew University of Jerusalem, Israel,**  
**Do Vibrational Modes Assist Energy Transfer? Experimental Evidence in Quantum Dot Dimers.**

10:00- 10:20

**Andrea Mattioni, Ulm University, Germany,**  
**Impact of phonon-mediated excitonic interaction on absorption spectra in Photosynthesis.**

10:20- 11:00

**Vladimiro Mujica, Arizona State University, USA**  
**Long Distance Electron Transfer in Chiral Bio-Molecules.**

11:00- 11:30

**COFFEE BREAK**

11:30- 11:50

**Daniel Finkelstein-Shapiro, Lund University, Sweden,**  
**Relaxation Mechanisms of Chromophores Strongly Coupled to Metals in Plasmonic Realizations of Cavity Quantum Electrodynamics.**

11:50- 12:10

**Lorenzo Cupellini, University of Pisa, Italy,**  
**Charge-transfer excitons in light-harvesting complexes.**

12:10- 12:30

**Thorsten Hansen, University of Copenhagen, Denmark,**  
**Coherent spectroscopy of electron transfer processes.**

12:30- 13:10

**Libai Huang, Purdue University, USA,**  
**Exciton transport in molecular aggregates imaged by ultrafast microscopy.**

13:10- 13:30

**LUNCH BOX**

14:30- 20:00

**EXCURSION TO CHOLULA**

20:30

**SOCIAL DINNER (CASA DEL MENDRUGO)**



 **THURSDAY 31** 

**Chair: Shaul Mukamel**

9:00 - 9:40

Erik Gauger, Heriot-Watt University, UK,  
Biologically-inspired quantum-enhanced photocells.

9:40 - 10:20

Francois Leonard, Sandia National Laboratories, USA,  
Novel Quantum and Bio-inspired Designs for Photon Detection.

10:20 - 11:00

Nicola Piovella, University of Milan, Italy,  
Sun-light pumped lasing with dimers.

11:00- 11:30

**COFFEE BREAK**

11:30- 11:50

Joseph Broz, Berkeley University, USA,  
On Analog Simulation of the Spin-Boson Model in a Trapped Ion Platform.

11:50- 12:10

Giulio Giusteri, University of Padova, Italy,  
Interplay of different environments in open quantum systems.

12:10- 12:30

Adrian Ortega, University of Guadalajara, Mexico,  
Robustness of optimal transport in disordered interacting many-body networks.

12:30- 12:50

Philipp Stegmann, University of Duisburg-Essen, Germany,  
Hidden dynamics in stochastic processes revealed by full counting statistics.

12:50- 13:10

Aleksei Melkikh, Ural Federal University, Russia,  
Energy conversion efficiency in the cell and non-trivial quantum effects in the work of molecular machines.

13:10- 15:20

**LUNCH**

**Chair: Erik Gauger**

15:20- 15:40

Zhedong Zhang, Texas A&M, USA  
Collective motion of THz phonons in living matters.

15:40- 16:00

Howe-Siang Tan, Nanyang Technological University, Singapore,  
Revealing the Ultrafast Excitation Energy Transfer Network in LHCII.

16:00- 17:00

**CLOSING CONFERENCE**  
Shaul Mukamel, University of California, Irvine, USA,  
Ultrafast spectroscopy and imaging of molecules with x-ray pulses and quantum light.

17:00- 17:30

**COFFEE BREAK**