ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE

ETH zürich

$$\Delta x \Delta p \geq \hbar$$

Cavity & Circuit QED
Optomechanics
Quantum Biology
X-ray Quantum optics
DMRG, Tensor networks

School on
Recent trends in Light-Matter Interaction

4th- 8th September 2017
EPFL, Lausanne

lightmatter2017@epfl.ch
lightmatter2017.epfl.ch

About the School

The study of light-matter interaction forms a core area of research in atomic, molecular and optical physics with applications in various interdisciplinary fields like quantum biology and, very recently, even in quantum neural networks.

The understanding of the fundamental light-matter interaction via photons, atoms, ions and recent developments in quantum tecnhnologies has opened realms of interesting quantum phenomena like macroscopic entanglement, criticality, quantum phase transitions, quantum information etc. in diverse physical systems ranging from optical cavities and superconducting qubits to plasmonics.

In view of the recent progress in the field of light-matter interaction both in theory and experiments, this school aims to expose master and PhD students to some of the modern facets of light-matter interaction through lectures from leading researchers around the world. In addition, this school aims to bring together students from both theoretical and experimental background, giving them ample time and opportunity to discuss and collaborate.

Broad topics of the school

Open Quantum Systems- An Introduction
An introduction to Ultra-strong coupling regime
Theory & Experimental advances in cavity QED
Quantum dynamics with X-rays
Exploring quantum optics with superconducting circuits
Quantum simulations with circuit QED
Theoretical and experimental aspects of Optomechanics
Foundations of Quantum Mechanics
Advanced simulations with DMRG & Tensor Networks

Also includes:

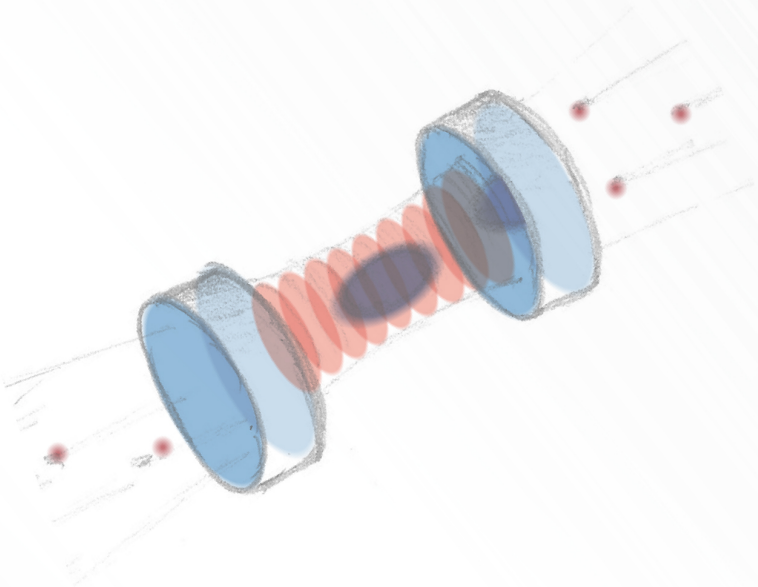
Poster session, oral presentation by students, Lab tours !!!!

Invited Speakers*

Basic lectures
Neill Lambert (An introduction to open quantum systems)
Simone De Liberato (An introduction to ultra-strong coupling regime)

Cavity QED
Giovanna Morigi (Theory)
Tobias Donner (Experiment)
Tatjana Wilk (Experiment)

Circuit QED
Enrique Solano (Theory)
Andreas Wallraff (Experiment)



Optomechanics
Aashish Clerk (Theory)
Tobias Kippenberg (Experiment)

Waveguide quantum optics
Darrick Chang (Theory)
Arno Rauschenbeutel (Experiment)

Foundations of quantum mechanics
Antonio Acin (Theory)
Tim Taminiau (Experiment)

Quantum dynamics with X-rays
Adriana Pálffy

Quantum simulations with DMRG & Tensor Networks
Simone Montangero

Topological Photonics
Jonathan Simon

* More speakers to be invited. Please refer to the website for more updated information

Registration

PhD students: **250 CHF**
Master students: **100 CHF**

Deadline: **15th August 2017**

Please refer to the website http://lightmatter2017.epfl.ch/ for more updated information.

Organizers & Contact Details

Kamanasish Debnath, PhD student, EPFL
Philip Zupancic, PhD student, ETH Zürich
Nishant Dogra, PhD student, ETH Zürich

Supporting professors:- Vincenzo Savona, EPFL
Tilman Esslinger, ETH Zürich

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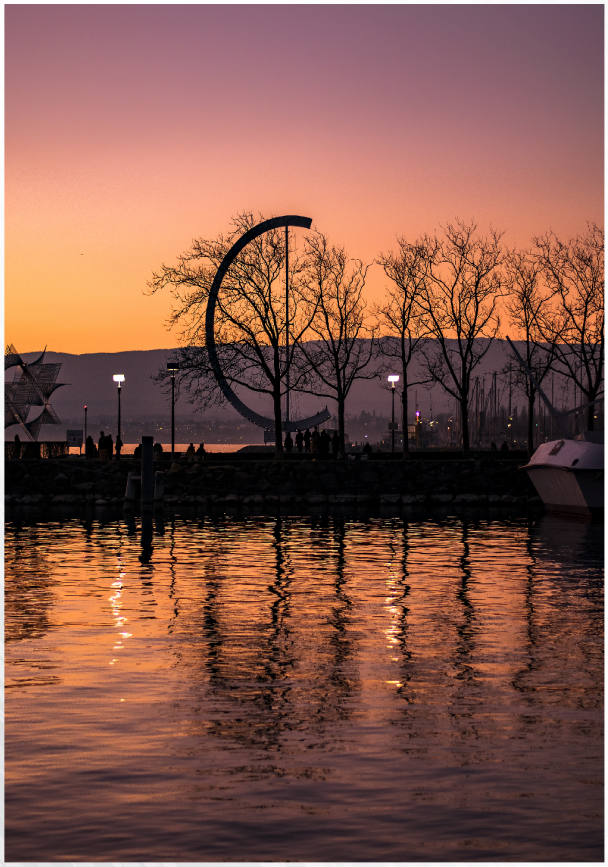

Lake Geneva,
Ouchy, Lausanne

About Lausanne:

Lausanne is in the French speaking part of Switzerland, and the capital and biggest city of the canton of Vaud. The city is situated on the shores of Lake Geneva. September is a pleasant time to visit Lausanne with temperatures ranging between 12 to 20 C. The nearest airport is in Geneva, which is around 60 kms and is very well connected by trains.

Lausanne countryside in winter

Préverenges beach,
Lake Geneva.

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