

OMT



OPTOMECHANICAL
TECHNOLOGIES

Ph.D. position: Joint project between EPFL and IBM
Research on Quantum Optomechanical Technologies

Project description

Within the framework of the recently funded Marie Skłodowska-Curie European Training Network OMT – Optomechanical Technologies (<http://www.omt-etn.net/>) – the Laboratory of Photonics and Quantum Measurements at the EPFL (Swiss Federal Institute of Technology in Lausanne) led by Tobias Kippenberg is offering a joint PhD position between the EPFL and IBM Research in Rueschlikon, near Zurich. Research in this domain aims at creating and utilizing the interaction of light and mechanical motion at the nanoscale to create novel functional devices that connect optical, electrical and mechanical signals, while offering also the ability to study quantum effects of mechanical systems.

The specific research project will be focused on developing nano-optomechanical devices using advanced silicon nano-fabrication and their characterization using optical techniques at milli-Kelvin temperatures. The goal is to explore the properties of these systems at ultra-low temperatures. As the project is joint between two institutions, the Ph.D. student is expected to spend a substantial fraction of time working in the Quantum Technologies group at IBM Research GmbH (<http://www.zurich.ibm.com/>) mentored by Dr. Paul Seidler, where access is provided to world-leading cleanroom facilities and expertise in nanofabrication of silicon-based photonic devices. The low temperature measurements and quantum optomechanical experiments will be conducted with the research group of Prof. Tobias J. Kippenberg at the École Polytechnique Fédérale de Lausanne (<http://k-lab.epfl.ch>), who will serve as the official Ph.D. advisor. The experiments are at the interface of nanophysics and quantum optics, closely linking experiment and theory. The Ph.D. student will thus acquire a broad knowledge in several fields of research and in a range of experimental techniques.

The successful candidate will enjoy an internationally competitive salary and work with collaborative and creative groups in an exclusive research environment. The position is available immediately.

Requirements

- A master's degree in engineering or physics
- An outstanding academic record
- Willingness to spend a substantial portion of time at IBM Research – Zurich (up to 50%)
- Good communication and English language skills (French and/or German beneficial but not required).

Application is open to both EU and non-EU nationals. The rules for this position require that the candidate has not resided or carried out his/her main activity (work, studies, etc.) in Switzerland for more than 12 months during the last three years. Preference will be given to applicants with at least one publication in a peer-reviewed journal. Previous research experience in optics, numerical simulation or nanoscale fabrication would be beneficial.

We offer

The position provides an excellent international working environment with access to world-class facilities. The Ph.D. student will participate in all training activities of the Marie Curie network, which includes complementary skills on patenting, innovation transfer, and public presentation as well as writing for scientific outreach. There will also be technical workshops on finite element simulation, quantum measurements, and others. The EPFL is only a few steps from Lake Geneva as is the IBM laboratory from the Lake of Zurich, and from both you quickly reach the Swiss Alps. The position is a full time graduate research assistantship (typically 4 years), including a full time salary and social employer charges. Optional participation in intensive French language courses is offered and paid by the employer.

Diversity

EPFL and IBM are both committed to diversity in the workplace. We offer an open, multicultural environment. Excellent, flexible working arrangements enable both women and men to strike the desired balance between their professional development and their personal lives.

How to apply

Please send in a single PDF file: motivation letter, curriculum vitae, transcripts of undergraduate and graduate education, and contact information from at least two references to Tobias J. Kippenberg (tobias.kippenberg@epfl.ch).