

Zero Announcement (March 14, 2016)

## **Frontiers of Quantum and Mesoscopic Thermodynamics (FQMT'17)**

**9 July (Sunday) – 15 July (Saturday) 2017, Prague, Czech Republic**

<http://fqmt.fzu.cz/17/>

### **Scope of the Conference**

The conference will address non-equilibrium statistical physics, quantum many body physics, foundations of quantum physics and quantum thermodynamics. The systems considered will be mainly on the order of mesoscopic (nanoscale) size, and include those of both natural and artificial origin. The main goal of the conference is to contribute to a better understanding of the behavior of mesoscopic systems, and to provide insight into the problems of the foundations, relying on the theoretical and experimental methods of condensed matter physics and quantum optics. Special attention will be given to non-equilibrium quantum systems, physics of quantum information and manifestation of quantum effects in biological systems, in terms of both theory and experiment. Subjects from astrophysics, gravitation or cosmology related to the above scope will also be included.

### **Topics**

Non-equilibrium statistical physics  
Quantum many body physics, quantum field theory  
Foundations of quantum physics  
Quantum thermodynamics  
Quantum optics  
Photonics, plasmonics, atomtronics  
Quantum simulations  
Physics of quantum information and computing  
Cosmology, gravitation and astrophysics  
Quantum measurement, entanglement and coherence  
Dissipation, dephasing, noise and decoherence  
Topological states of quantum matter, quantum phase transitions  
Macroscopic quantum behavior  
Cold atoms and molecules, Bose-Einstein condensates  
Mesoscopic, nano-electromechanical and nano-optical systems  
Biological systems, molecular motors and quantum biology

## **History of the Conference**

FQMT'17 is a follow-up to the five previous, successful Prague conferences “Frontiers of Quantum and Mesoscopic Thermodynamics” (FQMT'04, FQMT'08, FQMT'11, FQMT'13, and FQMT'15). For the details of their programs and the history of the FQMT conferences see the www pages: <http://fqmt.fzu.cz/>. The title of the conference is historical and survives due to tradition. Today its meaning corresponds only partly to the actual topics of the FQMT'17 conference, see above.

The contributions from the previous conferences have been published in *Physica E* (vol. 29, issues 1-2, 2005, and vol. 43, issue 3, 2010), and *Physica Scripta* (vol. T151, 2012, and vol. T165, 2015) Contributions from the FQMT'15 will appear in the special volume of *Fortschritte der Physik* (Progress of Physics).

## **Multidisciplinary Character of the Conference**

The aim of FQMT'17 is to create a bridge between the fields of non-equilibrium statistical physics, quantum many body physics, foundations of quantum physics, quantum thermodynamics, quantum optics, physics of quantum information, astrophysics, condensed matter physics, physics of mesoscopic systems, chemical physics and biophysics.

Following the tradition of the FQMT conferences, FQMT'17 will again bring together a unique combination of both young and experienced scientists across a disciplinary spectrum covering the above mentioned topics. The interdisciplinary character of the conference will be supported by the choice of key speakers who, apart from their specializations, are not only able to report specific results within their fields, but are also able to discuss the state of the art of their fields from the standpoint of a broader perspective of overlap with other fields. It is an objective to gather important scientists from overlapping branches of physics who can mutually benefit from the exchange of different views and ideas, experiences from studies of many different systems and various theoretical and experimental approaches to the study of current problems in physics. It is intended that this arrangement of the scientific program of the conference will again significantly contribute to the formulation of challenging questions and problems, as well as their related answers that are nowadays essential to improve the understanding of the foundations of quantum physics, many body physics, quantum statistical physics of systems far from equilibrium, the physics of nanoscale and biological systems, and further, will motivate new collaboration and intensive discussions between experts from differing fields of physics, chemistry, and biology.

## **Musical, Art and Social Programs**

In keeping with the multidisciplinary character of the scientific program, the cultural richness of the city of Prague and the tradition of the previous FQMT conferences, the FQMT'17 program will again feature concerts of classical and jazz music performed by world-class musicians, held at outstanding venues of the city. Special evening talk(s) related to the history of music and fine arts will be maybe included in the evening program. The scientific, the fine arts, and the musical programs are intended as a complement to one another, where scientists, historians of the arts and musicians are encouraged to mingle and share their knowledge and experience. An encompassing social program is planned which will include tours and a number of very special events unavailable to the general tourist.

## Scientific Committee

**Chair:** Václav Špička (*Institute of Physics, Czech Academy of Sciences, Prague*)

**Co-Chair:** Theo Nieuwenhuizen (*University of Amsterdam*)

Raymond Dean Astumian (*University of Maine, Orono*)

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Peter Hänggi (*University of Augsburg*)

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Dudley Herschbach (*Harvard University*)

Gregg Jaeger (*Boston University*)

Christopher Jarzynski (*University of Maryland, College Park*)

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Peter Knight (*Kavli Royal Society International Centre, Imperial College, London*)

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Igor Lerner (*University of Birmingham*)

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Daniel Loss (*University of Basel*)

Angus MacKinnon (*Imperial College, London*)

Henri Orland (*CEA-Saclay*)

Giorgio Parisi (*Università di Roma I. La sapienza*)

Martin Plenio (*University of Ulm, Imperial College, London*)

Jean Michel Raimond (*École Normale Supérieure, Paris*)

Christophe Salomon (*Laboratoire Kastler Brossel, Paris*)

Marlan Scully (*Texas A&M University and Princeton University*)

Georgy Shlyapnikov (*Université Paris Sud*)

Wolfgang Schleich (*University of Ulm*)

Gerard 't Hooft (*Institute for Theoretical Physics, Utrecht University*)

Jan van Ruitenbeek (*Leiden University, Kamerlingh Onnes Laboratory*)

Anton Zeilinger (*University of Vienna*)

Peter Zoller (*Institute for Quantum Optics and Quantum Information, Innsbruck*)

## The conference is organized by

Institute of Physics, the Academy of Sciences of the Czech Republic

### Organizing Committee

**Conference chair:** Václav Špička (*Institute of Physics, Czech Academy of Sciences, Prague*)

**Members:**

Jiří Bok (*Charles University, Prague*)

Howard Brubaker (*Detroit*)

Pavla Bušová (*Prague*)

Barbora Chudíčková (*Institute of Physics, Czech Academy of Sciences, Prague*)

Soňa Fialová (*Prague*)

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Yuval Waldman (*Music Bridge International, New York*)