



Frontiers of Quantum and Mesoscopic Thermodynamics (FQMT'15)

First Announcement (Dec 3, 2014)

27 July (Monday) – 1 August (Saturday) 2015, Prague, Czech Republic

<http://fqmt.fzu.cz/15/>

Scope of the Conference

The conference will address the foundations of quantum physics, quantum many body physics, and non-equilibrium statistical physics. 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

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

History of the Conference

FQMT'15 is a follow-up to the four previous, successful Prague conferences “Frontiers of Quantum and Mesoscopic Thermodynamics” (FQMT'04, FQMT'08, FQMT'11, and FQMT'13). 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'15 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) Contributions from the FQMT'13 will appear in the *Physica Scripta* journal, as well.

Multidisciplinary Character of the Conference

The aim of FQMT'15 is to create a bridge between the fields of foundations of quantum physics, quantum optics, physics of quantum computing, non-equilibrium statistical physics, astrophysics, condensed matter physics, physics of mesoscopic systems, chemical physics and biophysics.

Following the tradition of the FQMT conferences, FQMT'15 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'15 program will again feature concerts of classical and jazz music performed by world-class musicians, held at outstanding venues of the city. In comparison with the previous FQMT conferences, the FQMT'15 intends to deal also with the fine arts. Special evening talk(s) related to the history of music and fine arts will be 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, Prague*)
Co-Chair: Theo Nieuwenhuizen (*University of Amsterdam*)
Alain Aspect (*Institut d'Optique, Palaiseau*)
Raymond Dean Astumian (*University of Maine, Orono*)
Roger Balian (*IPhT, Saclay*)
Gordon Baym (*University of Illinois at Urbana - Champaign*)
Dietrich Belitz (*University of Oregon*)
Rainer Blatt (*Innsbruck University*)
Miles Blencowe (*Dartmouth College, Hanover*)
Dirk Bouwmeester (*UCSB & Leiden University*)
Amir Ordacgi Caldeira (*Universidade Estadual de Campinas*)
Raymond Chiao (*University of California at Merced*)
Juan Ignacio Cirac (*Max Planck Institute, Garching*)
Claude Cohen-Tannoudji (*École Normale Supérieure, Paris*)
Jean Dalibard (*École Normale Supérieure, Paris*)
Pawel Danielewicz (*Michigan State University, East Lansing*)
Luiz Davidovich (*Universidade Federal do Rio de Janeiro*)
Michel H. Devoret (*Yale University and College de France*)
Daniel Esteve (*CEA-Saclay*)
Peter Hänggi (*University of Augsburg*)
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Andrei Khrennikov (*Linnaeus University, Växjö*)
Hagen Kleinert (*Freie Universität Berlin*)
Peter Knight (*Kavli Royal Society International Centre, Imperial College, London*)
Norbert Kroo (*Hungarian Academy of Sciences, Budapest*)
Pavel Kroupa (*University of Bonn*)
Franck Laloë (*École Normale Supérieure, Paris*)
David Lee (*Texas A&M University*)
Anthony J. Leggett (*University of Illinois at Urbana - Champaign*)
Igor Lerner (*University of Birmingham*)
Heiner Linke (*Lund University*)
Reinhard Lipowsky (*MPI of Colloids and Interfaces, Potsdam*)
Daniel Loss (*University of Basel*)
Angus MacKinnon (*Imperial College, London*)
Henri Orland (*CEA-Saclay*)
Giorgio Parisi (*Dipartimento di Fisica, 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*)
Rudy Schild (*Center for Astrophysics, Harvard*)
Wolfgang Schleich (*University of Ulm*)
Marlan Scully (*Texas A&M University and Princeton University*)
Georgy Shlyapnikov (*University of Amsterdam*)

Gerard 't Hooft (*Spinoza Institute, Utrecht University*)
Jan van Ruitenbeek (*Leiden University, Kamerlingh Onnes Laboratory*)
Vlatko Vedral (*University of Oxford, Clarendon Laboratory*)
Frank Wilczek (*MIT Center for Theoretical Physics*)
Anton Zeilinger (*University of Vienna*)
Peter Zoller (*Institute for Quantum Optics and Quantum Information, Innsbruck*)

Organizing Committee

Conference chair: Václav Špička (*Institute of Physics, Acad. Sci. CR, Prague*)

Members:

Jiří Bok (*Charles University, Prague*)
Howard Brubaker (*Detroit*)
Pavla Bušová (*Prague*)
Barbora Chudíčková (*Institute of Physics, Acad. Sci. CR, Prague*)
Soňa Fialová (*Prague*)
Etienne Hofstetter (*London*)
Pavel Hubík (*Institute of Physics, Acad. Sci. CR, Prague*)
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Jaroslav Šesták (*Institute of Physics, Acad. Sci. CR, Prague*)
Jarmila Šidáková (*Institute of Physics, Acad. Sci. CR, Prague*)
Yuval Waldman (*Music Bridge International, New York*)