The Abdus Salam International Centre for Theoretical Physics

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United Nations Educational, Scientific and Cultural Organization

IAEA International Atomic Energy Agency

FRONTIERS OF NANOMECHANICS

(9 - 13 SEPTEMBER 2013)

Miramare – Trieste, Italy

The Abdus Salam International Centre for Theoretical Physics (ICTP, Trieste, Italy), Center for NanoScience (CeNS, Munich, Germany), Nanosystem Initiative Munich (NIM, Munich, Germany) and Initial Training Network - Cavity Quantum Optomechanics (ITN cQOM, Lausanne, Switzerland) are organizing a Workshop on **Frontiers of Nanomechanics,** to be held at the ICTP, from **9** to **13 September 2013**.

The rise of nanomechanical systems is fueled by their astounding potential covering a broad range of fields: While they are solid-state based model systems for investigating fundamental quantum physics, they also receive considerable attention for their potential applications in quantum information technology or as ultrasensitive detectors of mass, force or spin. Across all areas, an ongoing development calls for an ever-increasing control of dissipation and mechanical properties, as well as efficient transduction and tuning schemes. In particular the endeavor to demonstrate quantum properties in nanomechanical systems has revealed unexpected synergies between groups working on mechanical systems ranging in size from nanometer-scale resonators to centimeter-scale optical cavities to kilometer-scale gravitational wave detectors. As a result researchers from backgrounds as diverse as astrophysical gravitational waves, mesoscopic condensed matter physics, and quantum optics are converging on a common set of goals.

This workshop highlights recent experimental and theoretical results at the forefront of international research, including nano-electro- as well as nano-optomechanical systems, and hybrid as well as monolithic devices, covering both the classical and the quantum regime.

A primary goal will be to increase the level of communication and collaboration between researchers from different backgrounds through tutorials and informal discussions as well as invited presentations.

Topics to be covered:

Interaction of nano- or micromechanical structures with electronic circuits, optical radiation or cold atoms;
Dynamics of strongly coupled nanomechanical systems;
Quantum measurement and entanglement involving nanomechanical systems;
Dissipation in nanomechanical systems;
Quantum transport in nanomechanical systems and shuttles;
Amplification, cooling, nonlinear dynamics;
Connections to research in gravitational wave detection.

The goal of the workshop is to bring together active researchers in the field with experts from related areas, to discuss new experimental and theoretical trends in nanomechanics. We plan to attract young scientists (students, PhD students, postdocs) from developing countries to participate in the Workshop. The poster session will give an opportunity for young scientists to present their recent results.

PARTICIPATION

Scientists and students from all countries that are members of the United Nations, UNESCO or IAEA may attend the Workshop. As the event will be conducted in English, participants should have an adequate working knowledge of this language. Although the main purpose of the Centre is to help researchers from developing nations through a programme of training activities within the framework of international cooperation, students and scientists from developed countries are also welcome to attend.

As a rule, travel and subsistence expenses of the participants should be borne by the home institution. Every effort should be made by candidates to secure support for their fare. However, limited funds are available for some participants, who are nationals of, and working in, a developing country, and who are not more than 45 years old. Such support is available only for those who attend the entire activity. **There is no registration fee.**

HOW TO APPLY FOR PARTICIPATION

The application form can be accessed at the activity website
http://agenda.ictp.it/smr.php?2445
Once in the website, comprehensive instructions will guide you step-by-step on how to fill out and submit the application form.

Deadlines for Application:

31 MAY 2013 (if requesting funding)

30 JUNE 2013 (if not requesting funding)

WORKSHOP SECRETARY - Ms. Petra Krizmancic

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Trieste, September 2013

in collaboration with

CeNS Center for NanoScience | LMU

nim nanosystems initiative munich

cQOM

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LOCAL ORGANIZER

Mikhail KISELEV (ICTP, Trieste, Italy)

INVITED SPEAKERS

Adrian Bachtold (Barcelona)
Andrew Cleland (Santa Barbara)
Aashish Clerk (McGill)
Samuel Deleglise (Jussieu)
Klemens Hammerer (Hannover)
Jack Harris (Yale)
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