



The Abdus Salam

**International Centre
for Theoretical Physics**

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WORKSHOP on INTERFEROMETRY and INTERACTIONS in NON-EQUILIBRIUM MESO- and NANO- SYSTEMS

(8 - 12 APRIL 2013)

Miramare, Trieste, Italy

The Abdus Salam International Centre for Theoretical Physics (ICTP, Trieste, Italy), Center for NanoScience (CeNS, Munich, Germany) and Nanosystem Initiative Munich (NIM, Munich, Germany) are organizing a **Workshop on Interferometry and Interactions in Non-Equilibrium Meso- and Nano- Systems** to be held at the ICTP, from 8 - 12 April 2013.

The fields of quantum interference and interactions in meso- and nano- out-of-equilibrium systems are both rapidly developing and of decisive importance for the development of a semiconductor based quantum information technology. The goal of this Workshop is to bring together leading experimentalists and theorists to bundle expertise of the still mostly separated two fields. The interplay between interactions, disorder and out-of-equilibrium conditions in low-dimensional systems has attracted much of attention from theorists and experimentalists alike. Dramatic advances in experimental solid state physics took place in recent years, which facilitate the design and construction of novel quantum interferometers. The latter are based on electronic Quantum Hall edge states, quantum dots, phonons, magnons etc.

Interferometry-without-light provides a powerful tool for studying fundamental physical quantities (e.g. fractional charge and fractional statistics) and basic phenomena (e.g. dephasing, phase averaging, quantum noise, correlations and non-equilibrium spectroscopy) on the meso- and nano- scale. The understanding of these effects is invaluable for the development of topological quantum computation and the science of quantum information processing.

Topics to be covered:

Interferometry out of equilibrium;

Phonon interferometry;

Detector back-action;

Non-equilibrium and interactions on the nanoscale;

Aharonov-Bohm and Landau-Zener interferometry;

Magnetic interferometry;

Interference effects involving electron and/or nuclear spins in nanostructures;

Electron interferometry: from Abelian to non-Abelian statistics;

Exotic quasiparticles for topological computations.

The Workshop's aim is to attract the interest of young researchers (students, PhD-students and postdocs) from both developed and developing countries working or planning to study quantum interference effects and its implementation for topological quantum information processing. Pedagogical lectures/seminars are planned with the aim of providing a strong background for scientists from developing countries to initiate or extend this research area in their home countries. In addition, the Workshop setting and atmosphere will permit young scientists to discuss their ideas with and to learn from leading experts working at the interface of quantum information, quantum transport and the physics of strong correlations. The planned poster sessions will give the opportunity for young scientists to present their most recent results.

PARTICIPATION:

Scientists and students from all countries that are members of the United Nations, UNESCO or IAEA may attend. 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 research workers from developing countries, through a programme of training activities within a framework of international cooperation, a limited number of students and post-doctoral scientists from developed countries are also welcome to attend.

As a rule, travel and subsistence expenses of the participants should be borne by their home institution. Every effort should be made by candidates to secure support for their fare. However, very limited funds are available for partial support of 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 Workshop. **There is no registration fee for attending this activity.**

HOW TO APPLY FOR PARTICIPATION

An Online Application Form can be accessed through the Workshop website

<http://agenda.ictp.it/smr.php?2451>

Once in the website, comprehensive instructions will guide you step-by-step on how to fill out and submit the Application Form.

Deadline for Application: FEBRUARY 2013

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in collaboration with:



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LOCAL ORGANIZER:

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INVITED SPEAKERS:

Alex Altland (Cologne)

Wolfgang Belzig (Konstanz)

Piet Brouwer (Berlin)

Guido Burkard (Konstanz)

Markus Buttiker (Geneva)

John Chalker (Oxford)

Hugh Churchill (Harvard)

Jan von Delft (Munich)

Ora Entin-Wohlman (Ben Gurion)

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Kensuke Kobayashi (Osaka)

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