



ADVANCED WORKSHOP ON ENERGY TRANSPORT IN LOW-DIMENSIONAL SYSTEMS: Achievements and Mysteries

**15 - 24 October 2012
(ICTP, Miramare, Trieste, Italy)**

The Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, will organize an *Advanced Workshop on Energy Transport in Low-dimensional Systems: Achievements and Mysteries*, to be held at ICTP, Trieste, Italy, from 15 to 24 October 2012.

The Workshop aims at discussing the latest theoretical and experimental results in the field of energy transport in low-dimensional structures. It was Rudolf Peierls who stated in the early 1930's that the problem of heat transport in low-dimensional systems is a challenge for theoretical and statistical physics. Further developments on this problem have demonstrated that by changing particular conditions and environments, the properties of heat conductivity in low-dimensional materials can be drastically changed from anomalous super-transport of the heat to the thermal insulator regime. Recently, the attention in this topic has tremendously increased due to joint fundamental scientific and practical technological interests in heat conductors and thermoelectric transducers at the nano-scale. Exciting examples of such low-D material are silicon nanowires, graphene nanoribbons and carbon nanotubes. Recent progress in fabrication of low-dimensional materials raises both general academic questions and technological demands in understanding the heat transport through low-dimensional and nano-systems.

This inter-disciplinary Advanced Workshop will bring together leading experts in various fields of modern condensed matter physics, mathematics, computer and material sciences to elaborate a common language and understanding in the challenging problem of heat transport in low-dimensional and nano-systems. It will focus on fundamental concepts and interdisciplinary exchange of ideas, as well as on the novel applications and design of new materials for heat transport.

The Workshop will have a duration of 8 days, and will include not only lectures/seminars aimed at educational purposes, but also allow ample time for participants to discuss their ideas with the invited experts and learn the most latest developments in the field. A Poster Session will also be organized, permitting participants to present their own work results. Applicants are therefore encouraged to submit a short one-page abstract along with their online application form.

TOPICS COVERED:

- 1. LOW-D MATERIALS FOR ENERGY TRANSPORT AT THE NANO-SCALE:**
 - Atomic chains with different nonlinear interatomic potentials in different environments
 - Single- and multi-walled carbon nanotubes
 - Nanoribbons from graphene and its chemical derivatives
 - Semiconductor nanowires
- 2. PERSPECTIVES OF CONSIDERABLE ENHANCEMENT OF THERMOELECTRIC POWER IN LOW-DIMENSIONAL MATERIALS**

PARTICIPATION

Scientists and students from all countries that are members of the United Nations, UNESCO or IAEA may attend the activity. As it will be conducted in English, participants must have an adequate working knowledge of this language. Although the main purpose of the Centre is to help researchers 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 are borne by their home institutions. 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 of age. Such support is available only to those attending the entire event. Every effort should be made by candidates to secure support for their fare (or at least half-fare). There is no registration fee for attending the activity.

HOW TO APPLY FOR PARTICIPATION

The Application Form can be accessed at the activity website: <http://agenda.ictp.it/smr.php?2371>. Once in the website, comprehensive instructions will guide you step-by-step, on how to fill out and submit the application form. Deadline for receipt of applications: **15 JULY 2012**.

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(Trieste, May 2012)

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R. LIVI (Univ. of Florence, Italy)
A. SHAKOURI (Purdue Univ., U.S.A.)

SPEAKERS INCLUDE * :

A. BOUKAI (Michigan, U.S.A.)
A. CANTARERO (Valencia, Spain)
J. CARRETE (Santiago de Compostela, Spain)
G. CASATI (Como, Italy)
S. DENISOV (Augsburg, Germany)
G. GALLI (Davis, CA, USA)
P. E. HOPKINS (Virginia, U.S.A.)
B. HU (Houston, U.S.A.)
S. LEPRI (Florence, Italy)
B. LI (Singapore)
K. MATVEEV (Argonne, U.S.A.)
L.W. MOLENKAMP (Würzburg, Germany)
O. NARAYAN (UC Santa Cruz, U.S.A.)
T. PROSEN (Ljubljana, Slovenia)
K. SAITO (Tokyo, Japan)
D.H. SANTAMORE (Philadelphia, U.S.A.)
M. SASSETTI (Genova, Italy)
H. SPOHN (TU Garching, Germany)
S. VOLZ (EC, Paris, France)
J.S. WANG (Singapore)
H. ZHAO (Xiamen, P.R. of China)

***some to be confirmed**

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