



The Abdus Salam International Centre for Theoretical Physics



Conference on Superconductor-Insulator Transitions

18 to 23 May 2009
Miramare, Trieste, Italy

The Abdus Salam International Centre for Theoretical Physics is organizing a **Conference on Superconductor-Insulator Transitions** from 18 to 23 May 2009. It will be directed by Professors **M. Feigelman** (Landau Institute, Moscow, Russia), **M. Müller** (University of Geneva, Switzerland), **Z. Ovadyahu** (Hebrew University, Jerusalem, Israel) and **M. Sanquer** (CEA, Grenoble, France).

Local Organiser: **Prof. V. Kravtsov** (ICTP, Trieste)

The subject of quantum phase transitions between superconducting and insulating states (SIT for short) has developed substantially over the last several years. This is due to new experimental techniques (low-temperature STM measurements, Nernst effect measurements), and due to the substantial extension of traditional transport measurements into the lowest-temperature range (down to 10-20 mK), in the presence of strong magnetic fields. These investigations are also important and of great interest in the context of high temperature superconductivity, since a rather deep similarity between nearly-critical SIT systems and underdoped cuprates with their famous "pseudo-gap state" has been uncovered. The results of all these studies suggest that SIT phenomena are still poorly understood, and new theoretical approaches as well as experimental studies are necessary for further elucidation of their properties.

PURPOSE:

Bringing together about 25 leading experts of experimental and theoretical aspects of the above described subject, and offering the opportunity for detailed discussions and the exchange of ideas.

Format of the Conference: 4-5 detailed reports per day plus extensive time for free discussions.

TOPICS:

- Giant magnetoresistance peak in nearly-critical systems close to a SIT
- Sharp threshold behaviour in lowest-temperature current-voltage characteristics
- Anomalous Nernst signal near the SIT
- Simply activated low-temperature conductivity in insulating but nearly-critical systems
- Anomalous evolution of density of states as seen by Scanning Tunnelling Microscopy
- Pseudogap phenomenology near the SIT and its analogy with underdoped cuprates
- Anderson insulators (electron glasses) and long-range proximity effects in heterostructures of superconductors and Anderson insulators

PARTICIPATION: Scientists and students from all countries that are members of the United Nations, UNESCO or IAEA may attend the activity. 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 co-operation, scientists from developed countries are also welcome to apply. As the activity will be conducted in English, participants should have an adequate working knowledge of this language.

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 (or at least half-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?2035>

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

Deadline for requesting participation: 25 January 2009

ACTIVITY SECRETARIAT:

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E-mail: smr2035@ictp.it ICTP Home Page: <http://www.ictp.it/>

Directors

M. Feigelman	Moscow, Russia
M. Müller	Geneva, Switzerland
Z. Ovadyahu	Jerusalem, Israel
M. Sanquer	Grenoble, France

Invited Speakers

P. Adams	Louisiana, USA
A. Ardavan	Oxford, UK
N.P. Armitage	Baltimore, USA
H. Aubin	Paris, France
* T. Baturina	Novosibirsk, Russia
C. Chapelier	Grenoble, France
K. Efetov	Bochum, Germany
O. Entin-Wohlman	Beer Sheva, Israel
A. Finkelstein	Texas A&M, USA
A. Frydman	Ramat Gan, Israel
S. Ganapathy	Buffalo, USA
V. Gantmakher	Chernogolovka, Russia
M. Gershenson	Piscataway, USA
A. Goldman	Minneapolis, USA
T. Grenet	Grenoble, France
L. Ioffe	Piscataway, USA
* Y. Imry	Rehovot, Israel
A. Kapitulnik	Stanford, USA
S. Kivelson	Stanford, USA
B. Sacepe	Geneva, Switzerland
M. Skvortsov	Chernogolovka, Russia
D. Shahrar	Rehovot, Israel
B. Spivak	Seattle, USA
N. Trivedi	Ohio, USA
J. Valles	Providence, USA
A. Yazdani	Princeton, USA

* to be confirmed

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25 January 2009