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10TH CONFERENCE ON HOPPING AND RELATED PHENOMENA

1 - 4 September 2003

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10TH CONFERENCE ON

HOPPING AND RELATED PHENOMENA

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The Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, will organize the 10th Conference on "Hopping and Related Phenomena" (HRP10), to take place from 1 to 4 September 2003. This Bulletin contains preliminary information and the request for participation form.

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I. PURPOSE AND NATURE

The "HRP10" will be the tenth in a series of International Conferences, which so far have taken place in Trieste (1985), Bratislava (1987), Chapel Hill (1989), Marburg (1991), Glasgow (1993), Jerusalem (1995), Rackeve (1997), Murcia (1999), Shefayim (2001). The aim is to bring together theoreticians and experimentalists in the field of charge transport in disordered systems in order to present and discuss new developments, recent applications and systems, in which hopping transport, disorder and many-particle interactions are important. Accordingly, it will cover the following topics:

- ***hopping transport in disordered systems***
- ***Coulomb glass and the impact of interactions on transport***
- ***glassy relaxation of electronic systems***
- ***metal-insulator transitions***
- ***charge transport in biological systems***
- ***mesoscopic systems***

The programme will include the following invited talks:

Igor Aleiner (Stoney Brook, USA)
"Interaction corrections to conductivity in 2 dimensions: from intermediate to low temperatures"

Olaf Bleibaum (Magdeburg, Germany)
"Relaxation of non-equilibrium charge carriers at low temperatures"

Vladimir Dobrosavljevic (Tallahassee, USA)
"2D MIT as a transition to a Mott-Anderson glass"

Alexei L. Efros (Salt Lake City, USA)
"Relaxation of the hopping conductivity"

Vladimir Filinov (Moscow, Russia)
"Wigner approach to quantum dynamics simulations of the interacting carriers in disordered systems"

Erwin Frey (Berlin, Germany)
"Collective phenomena in intracellular transport"

George Gruner (Los Angeles, USA)
"The electrodynamics of electron glasses"
"DNA: An electrical conductor?"

Rolf Haug (Hannover, Germany)
"Hopping conductivity in the quantum hall effect"

Hiroshi Kamimura (Tokyo, Japan)
"Study on the mechanism of superionic conduction in the zero-dimensional hydrogen-bonded crystals M3H(XO4)2 with M=Rb, Cs and X=S, Se"

Peter Kleinert (Berlin, Germany)
"Electric-field-induced hopping transport in superlattices"

Krisztian Kohary (Marburg, Germany)
"Hopping transport in DNA"

Sergey Kravchenko (Boston, USA)
"Metal-insulator transition in two dimensions and possible ferromagnetic instability"

Deepak Kumar (New Delhi, India)
"Role of Coulomb interactions in hopping conduction"

Zvi Ovadyahu (Jerusalem, Israel)
"Non-equilibrium dynamics in the electron glass"

Dragana Popovic (Tallahassee, USA)
"Glass transition in a two-dimensional electron system in silicon"

Vladimir Pudalov (Rutgers, USA)
"Are interaction effects responsible for temperature and magnetic field dependent conductivity in Si-MOSFETs?"

Michael Reznikov (Haifa, Israel)
"The thermodynamic spin magnetization of strongly correlated 2D electrons in a silicon inversion layer"

Wenhao Wu (Rochester, USA)
"Relaxations, nonlinearity, and fluctuations in an electron glass"

Andrei G. Zabrodskii (St. Petersburg, Russia)
"Charge and spin correlations near the metal-insulator transition in doped semiconductors"

The term hopping generally refers to the mode of transport in disordered (non-crystalline) systems, on the insulating side of the metal-insulator transition. Such systems naturally also include biological materials. The hopping mode of transport is much different and more complicated than the conventional transport in crystalline materials. The Conference will put some emphasis on effects of interactions in disordered systems (such systems are commonly called electron glasses or Coulomb Glasses). The presence of interactions adds another degree of complication to the problem of disordered systems, but their inclusion is of great importance because their effect on physical properties is profound, and because they play an important role in many existing strongly disordered systems. The interactions also introduce very interesting fundamental problems, e.g. glassy relaxation. For these reasons a great amount of research activity has revolved around interactions in disordered Anderson insulators. The work can be conveniently divided into three categories:

(i) the effect of interactions on hopping transport,
(ii) the effect of interactions on Anderson localization, and
(iii) the role of interactions in creating non-ergodic (glassy) behaviour.

While much progress has been made in all three areas, many controversies remain. In the first category, the main unresolved problem is the importance of dynamic many-body effects. In the second category the main problem of interest revolved around the possibility that interactions may be responsible for a metal-insulator transition in two dimensions. A number of experiments seem to indicate such a transition, while it is known that without interactions any 2d system must always be insulating. In the third category is the problem of non-ergodic relaxation of an excited electron glass. Such a behaviour has been observed in the relaxation of the hopping conductance in several systems. It should be mentioned that this problem is also of interest outside the hopping field as the electron glass constitutes a relatively new glassy system with interesting similarities, and also interesting differences from other well studied glassy systems, e.g. spin glasses. The interest in the electron glass has rapidly increased, in part because it can be monitored by hopping conductance, which is a considerably more sensitive probe than the magnetization used for spin glasses, or viscosity used in structural glasses.

The scientific programme of the Conference will comprise of about 20 invited talks (40 minutes), 15 contributed talks (20 minutes), a poster session, and two panel discussions.

Tentative Program

Sunday Evening:	Welcome/Reception Party
Monday:	Registration - Opening
	Session I (Glassy Behaviour/MIT in 2D) Dobrosavljevic/Popovic +2 N.N. (two contributed papers, 20' each)
	Session II (Glassy Behaviour) Wenhao Wu/Ovadyahu/Efros/Bleibaum +2 N.N.
	18.00-22.00 (interrupted by dinner) Poster Session (all events at the Adriatico Guesthouse)
Tuesday:	Session III (Hopping) Kumar/Kleinert +5 N.N.
	Session IV (MIT in 2D) Aleiner/Kravchenko/Reznikov/Pudalov +3 N.N
	in the evening, after dinner: Panel Discussion I: MIT in 2D
Wednesday:	Session V (DNA/Proton Hopping/Motor Proteins) Gruner/Kohary/Kamimura/Frey +2N.N.
	Afternoon: Excursion
	Evening: Conference Dinner (at the Adriatico Guesthouse)
Thursday:	Session VI (Coulomb Glass/Localisation) Zabrodski/Gruner/Haug/Filinov +2 N.N.
	Afternoon: Panel Discussion II: Hopping/HRP: Quo vadis?

The Conference proceedings will be published in Physica Status Solidi.

II. PARTICIPATION

Scientists and students from all countries that are members of the UN, UNESCO or IAEA can attend the Conference. 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. However, students and post-doctoral scientists from developed countries are also welcome to attend. As the Conference will be conducted in English, participants should have an adequate working knowledge of that language.

As a rule, travel and subsistence expenses of the participants are borne by the home institutions. However, limited funds are available for applicants from, and working in, developing countries only, to be selected by the Organizers. Such financial support is available only to those who attend the entire activity. As scarcity of funds allows travel to be granted only in a few exceptional cases, every effort should be made by candidates to secure support for their fare (or at least half-fare) from their home country. There is no registration fee to attend the Conference.

Mainly for budget reasons, the total attendance will be limited to about 80 participants. Abstracts of papers (not exceeding one A4 or letter sized page) to be presented at the Conference should be submitted via e-mail to: HRP10@physik.uni-magdeburg.de - in PDF format only, **before 15 April 2003**.

Deadline for submitting abstracts and request for participation:

15 April 2003

Candidates should complete and sign the attached "Request for Participation" form (also obtainable from the ICTP WWW server:

http://agenda.ictp.trieste.it/smr.php?1513

(which will be constantly up-dated) or from the activity Secretariat. It should be completed and returned to:

the Abdus Salam International Centre for Theoretical Physics
(SMR:1513) "10th Conference on Hopping and Related Phenomena"
(c/o Ms. Valerie Shaw), Strada Costiera 11
I-34014 Trieste, Italy

Any attachments to the request for participation, relevant to extra information for selection purposes, should not exceed 6 pages.

The decision of the Organizing Committee will be communicated to all candidates as soon as possible.