WORKSHOP on NOISE and INSTABILITIES in QUANTUM MECHANICS

3 - 7 October 2005

(Miramare, Trieste, Italy)

The Abdus Salam International Centre for Theoretical Physics (ICTP) is organizing a Workshop on Noise and Instabilities in Quantum Mechanics, to be held from 3 - 7 October 2005 in Trieste, Italy.

Open quantum systems have received much attention in recent years. Noise and instabilities are key concepts that have become an active field of research in quantum physics. The interest ranges from quantum foundations to quantum information and computation. For the first area, entanglement with the environment and decoherence, i.e., the process by which the states of the system loose their internal coherence, provide explanations of the emergence of classicality. Regarding the second field, these same processes threaten the correct operation of quantum hardware. In this context, ways to measure, understand and control noise and decoherence have become very important, being an intensive research topic at present. These subjects are relevant for all the experimental areas involved in the development of quantum hardware such as NMR, ion traps and Josephson junctions, for instance.

The relationship between these processes and other well-known quantum phenomena like quantum phase transitions is generating great interest not only from the theoretical point of view but also for its possible future applications. In fact, recent research is guided towards connecting the theory of critical phenomena with quantum information and understanding how entanglement behaves in these cases.

Quantum information is at the very moment of performing the transition from an emerging field to a broad and settled area of physics and computer science. We strongly believe that gathering the people working in these different theoretical and experimental topics is very important. Fruitful discussions are expected to arise among researchers devoted mostly to general theoretical aspects and the ones focused on quantum information theory and its experimental development.

Main Topics:

Stability of quantum protocols;
Quantum fidelity;
Quantum classical correspondence;
Quantum control and error correction;
Entanglement and decoherence;
Quantum phase transitions;
Experimental implementations.

PARTICIPATION

Scientists and students from all countries which are members of the United Nations, UNESCO or IAEA may attend the Workshop. As it 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 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.

The ***Application Form*** *is obtainable from the ICTP WWW server:*
http://agenda.ictp.trieste.it/smr.php?1675
(which will be constantly up-dated) or from the activity Secretariat

It should be completed and returned before ***1 JUNE 2005*** *to:*

the Abdus Salam ICTP
SMR.1675
(c/o Ms. Doreen Sauleek)
Strada Costiera 11, 34014 Trieste, Italy

or via email: ***smr1675@ictp.trieste.it***
(please save and send file attachments in RTF format)

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Trieste, September 2004

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* to be confirmed

DEADLINE
1 JUNE 2005