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Workshop or Conference

Mardi 6 Juin 2017, 09 :00
IPHT, Amphi Claude Bloch, Bât. 774(https ://indico.in2p3.fr/event/1474)
Domaines : physics

Titre : *22th Itzykson Conference (June 06-08, 2017) : Manipulation of Simple Quantum Systems*

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Résumé : *The Itzykson Conference is held every year at the Institut de Physique Théorique in Saclay to honour the memory of Claude Itzykson.*
The 22nd edition of this conference, will take place on June 06-08, 2017 and will be devoted to the manipulation of simple quantum systems.
Simple quantum systems, with few "effective" degrees of freedom, have a privileged place in our understanding of quantum mechanics because they are often found at the heart of the Gedanken experiments of the founding fathers. After a century of development of the field and technical progress, they are now implemented in many systems (quantum electrodynamics in cavity or in circuits, for example). Two-level systems, which are the simplest examples, are candidates to be the basic bricks, the qubits, of a future quantum computer.
Manipulating a simple quantum system is, for example, addressing it, applying transformations to it, entangling it with another, or entangling its parts, controlling and reading its state. In all these operations, measurements play a fundamental role in one form or another.
For example, continuous measurement of a quantum system without loss of information now allows the tracking of the quantum trajectory of its state which remains pure, a deep change of point of view on the interaction of a quantum system with its environment.
Because simple quantum systems allow profound tests of the foundations of quantum mechanics, but are also at the origin of breakthrough technologies, they involve very different communities : experimental and theoretical physics, of course, but also mathematics (from algebraic geometry to control

through combinatorics and stochastic processes), and now engineering.

Topics include :

- Model systems, experimental and theoretical - Measurement and feedback - Entanglement - Information - Decoherence - Quantum control and feedback - Quantum trajectories and jumps

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