ÉCOLE DE
PHYSIQUE DES HOUCHES

QUANTUM INFORMATION MACHINES

Session CXIII

July 1 - 26, 2019

Organizers: **Michel Devoret** (Yale University, USA)
Benjamin Huard (Ecole Normale Supérieure de Lyon, France)
Ioan M. Pop (Karlsruhe Institute of Technology, Germany)

Overview: Protecting quantum information from decoherence by collective effects in emergent degrees of freedom is the main focus of the design and control of open quantum systems for quantum information processing. The school aims at providing participants with the basic conceptual tools involved in the engineering of quantum information machines, with a focus on quantum error correction, both autonomous and measurement-based.

Website: http://physinfo.fr/houches2019

Introductory courses:

C. Beenakker (Leiden)	Majorana Fermions and their Braiding
A. Cleland (Chicago)	Surface Codes and Opto-microwave Converters
A. Clerk (Chicago)	Non-Reciprocity in Quantum Measurements
J. Eisert (Berlin)	Matrix Product States
S. Girvin (Yale)	Quantum Superconducting Circuits & Error Correction
L. Glazman (Yale)	Protecting Circuit Coherence against Excitations
K. Lehnert (Boulder)	Quantum Sensing and Transduction
F. Marquardt (Erlangen)	Machine Learning and Quantum Devices
M. Mirrahimi (Paris)	Quantum Control and Error Correction
K. Mølmer (Aarhus)	Continuous Quantum Measurements
M. Müller (Vienna)	Quantum Foundations and Probabilistic Theories
D. Poulin (Sherbrooke)	Quantum Error Correction and Fault Tolerance

Colloquia speaker list includes:

P. Bertet (Saclay), A. Blais (Sherbrooke), A. Cottet (Paris), P. Lodahl (Copenhagen), A. Metelmann (Berlin), V. Manucharyan (JQI), W. Oliver (MIT), S. Puri (Yale), N. Roch (Grenoble), I. Siddiqi (Berkeley), B. Terhal (Aachen), A. Wallraff (ETH Zurich), W. Wernsdorfer (Karlsruhe)

Registration: The online application can be found on https://houches.univ-grenoble-alpes.fr/. Applications must reach the School before March 1, 2019, in order to be considered by the selection committee. The full cost per participant, including housing, meals and the book of lecture notes is given on the website. We should be able to provide financial aid to a limited number of students. Further information can be found on the website. One can also contact the School at:

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Location: Les Houches is a village located in Chamonix valley, in the French Alps. Established in 1951, the Physics School is situated at 1150 m above sea level in natural surroundings, with breathtaking views on the Mont-Blanc mountain range, conducive to reflection and discussion.