



Les Houches Summer School of Physics in Singapore Ultracold Gases and Quantum Information

29 June – 24 July, 2009

Scientific Direction

Christian MINIATURA (IPAL, INLN, UNS, CNRS)
Benoît GREMAUD (IPAL, LKB, UP6, CNRS)
Martial DUCLOY (LPL, UP13, CNRS)
Leong Chuan KWEK (CQT, NUS, IAS, NTU)
Berthold-Georg ENGLERT (CQT, NUS)

Ultracold Gases

Degenerate Bosons (10h): **David GUERY-ODELIN** (LCAR, UPS, CNRS, Toulouse, France)
Degenerate Fermions (10h): **Patrizia VIGNOLO** (INLN, UNS, Nice, France)
Disorder and Interference (8h): **Dominique DELANDE** (LKB, UP6, CNRS, Paris, France)
Quantum Phase Transitions (6h): **Cord MUELLER** (University of Bayreuth, Germany)
Quantum Hall Effects (6h): **George BATROUNI** (INLN, UNS, Nice, France)
Fermi and Luttinger Liquids (6h): **Mark Oliver GOERBIG** (LPS, UP11, CNRS, Orsay, France)
Thierry GIAMARCHI (DPMC, University of Geneva, Switzerland)

Quantum Information

Quantum Information (10h): **Valerio SCARANI** (CQT, NUS, Singapore)
Quantum Computing (10h): **Chiara MACCHIAVELLO** (University of Pavia, Italy)
Quantum Optics Devices (8h): **Dagmar BRUSS** (University of Düsseldorf, Germany)
Solid-State Devices (6h): **Christian KURTSIEFER** (CQT, NUS, Singapore)
Quantum Cryptography (6h): **Antia LAMAS-LINARES** (CQT, NUS, Singapore)
Trapped Ions and Atoms (6h): **Daniel ESTEVE** (CEA, Saclay, France)
Norbert LÜTKENHAUS (University of Waterloo, Canada)
Jürgen ESCHNER (ICFO, University of Barcelona, Spain)

Scientific Program

Laboratory experiments using degenerate ultracold gases and the unprecedented experimental control gained over inter-particle interactions have recently started a new arena which brings together different cross-fertilizing scientific communities. On the other hand, quantum information covers numerous aspects ranging from fundamental and applied sciences to cutting-edge technology applicable to the economy (e.g. through encryption of secured communications of any kind) and above all to the development of a society increasingly dependent of information technologies. The possibility of loading degenerate gases into optical lattices to implement quantum information processing now offers a fruitful bridge between these two communities. The aim of this Les Houches Summer School in Singapore is to initiate young graduate students and young researchers to these very active and frontier fields of research. The school will offer an overview of the latest developments and allow the participants to share the excitements and challenges of the community with experts in the field.

Registrations

Applications must reach the School **before February 06, 2009** in order to be considered by the selection committee. Thanks to financial support by various funding agencies, the school fees (which include housing, meals and the lectures book) is 1200 SGD per participant. A few additional grants (travel and waiver of registration fees) will be available. Due to limited funding, financial support will be awarded to the selected students on a first-come-first-serve basis. Application forms and additional information can be downloaded from the sites: <http://w3houches.ujf-grenoble.fr/> and <http://www.ntu.edu.sg/ias>. One can also contact the School:

L'ÉCOLE DES HOUCHES A SINGAPOUR
INSTITUTE OF ADVANCED STUDIES
NANYANG EXECUTIVE CENTRE
60 Nanyang View, #02-18, Singapore 639673
Phone (+65) 6790 6491, Fax (+65) 6794 4941
Email ias@ntu.edu.sg

Singapore is located at one of the most important crossroads of the world. Singapore is a vibrant and cosmopolitan city-state where tradition and modernity, East and West, meet and mingle most agreeably and harmoniously. This Les Houches Physics School is organized and hosted by the Institute of Advanced Studies at the Nanyang Technological University and co-organized by the Centre for Quantum Technologies at the National University of Singapore. The Institute of Advanced Studies at the Nanyang Technological University (NTU) is situated within the Yunnan Garden campus of NTU and it is located in the south-western part of Singapore. The Les Houches Physics School is affiliated to the Université Joseph Fourier in Grenoble (France) and is supported by the Ministère de la Jeunesse, de l'Éducation Nationale et de la Recherche, the Centre National de la Recherche Scientifique (CNRS), the Direction des Sciences de la Matière du Commissariat à l'Énergie Atomique (CEA/DSM).

Ecole de Physique des Houches, la Côte des Chavants, F-74310 les Houches
IAS, Nanyang Executive Centre #02-18, 60 Nanyang View, Singapore 639673
CQT, NUS, S15 #03-18, 3 Science Drive 2, Singapore 117543

Director: Prof. Leticia Cugliandolo
Director: Prof. KK Phua
Director: Prof. Artur Ekert

Sponsors

