



## Numerical Approaches to Quantum Many-Body Systems

**January 22-24, 2009: Lectures and Tutorials**  
**January 26-30, 2009: Workshop**

**ORGANIZING COMMITTEE:** **ULRICH SCHOLLWÖCK** (RWTH AACHEN), **SIMON TREBST** (MICROSOFT RESEARCH, STATION Q), **GUIFRE VIDAL** (UNIVERSITY OF QUEENSLAND)

### Scientific Overview

Interacting quantum many-body systems can give rise to remarkable collective states of matter without classical counterpart. Computational approaches have established themselves as vital in understanding these phenomena and connecting theory with experiment. Recent years have seen tremendous progress in algorithmic developments driven by advances in computational condensed matter physics, quantum information theory, statistical physics, and applied math.

It is the aim of this workshop to bring together an interdisciplinary group of researchers from mathematics, physics, chemistry, computer science, and other related disciplines, to discuss recent advances in the computational description of quantum many-body systems. The workshop will consist of two parts: During the first three days we will have a short course for young researchers with lectures and hands-on tutorials on state-of-the-art numerical techniques. In the second week, there will be a more regular workshop with five days of lectures and discussions by experts in the field.

### Confirmed Speakers

**Tutorials and Workshop:** **Werner Krauth** (École Normale Supérieure); **Andreas Läuchli** (MPI-PKS Dresden); **Anders Sandvik** (Boston University); **Ulrich Schollwöck** (RWTH Aachen); **Thomas Schulthess** (Oak Ridge National Laboratory); **Simon Trebst** (Microsoft Research); **Matthias Troyer** (ETH Zürich); **Guifre Vidal** (University of Queensland); **Steve White** (University of California, Irvine)

**Workshop:** **Fakher Assaad** (University of Würzburg); **Kevin Beach** (University of Alberta); **Sandy Irani** (University of California, Irvine); **Corinna Kollath** (École Polytechnique); **Gabi Kotliar** (Rutgers University); **Alexander Lichtenstein** (Universität Hamburg); **Ian McCulloch** (University of Queensland); **Hartmut Monien** (Rheinische Friedrich-Wilhelms-Universität Bonn); **Roman Orus** (University of Queensland); **Olivier Parcollet** (Commissariat à l'Énergie Atomique); **Didier Poilblanc** (Université de Toulouse III); **Nikolai Prokof'ev** (University of Massachusetts Amherst); **Norbert Schuch** (Max-Planck-Institut für Quantenoptik); **Rajiv Singh** (University of California, Davis); **Frank Verstraete** (California Institute of Technology); **Philipp Werner** (Columbia University); **Uwe-Jens Wiese** (Universität Bern)

### Participation

Additional information about this workshop, including links to register and to apply for funding, can be found on the webpage listed below. Encouraging the careers of women and minority mathematicians and scientists is an important component of IPAM's mission, and we welcome their applications.

[www.ipam.ucla.edu/programs/qs2009](http://www.ipam.ucla.edu/programs/qs2009)



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