Quantum Technologies Conference

Manipulating photons, atoms, and molecules

Conference Booklet

© Adam Łowicki, Młody Technik

FACULTY OF PHYSICS
WARSAW UNIVERSITY

IP PAN

FAMO

Last update: 29.08.2010

August 29 – September 3, 2010, Toruń, Poland

Quantum Technologies Conference

Scientific Committee

- ✔ **Ennio Arimondo**
  Faculty of Mathematics, Physics and Natural Sciences , University of Pisa (Italy)
- ✔ **Rainer Blatt**
  Institute for Experimental Physics, University of Innsbruck (Germany)
- ✔ **Jean Dalibard**
  Laboratoire Kastler Brossel, CNRS (France)
- ✔ **Dominique Delande**
  Laboratoire Kastler Brossel, CNRS (France)
- ✔ **Maciej Lewenstein**
  Institute of Photonic Sciences (Spain)
- ✔ **Kazimierz Rzążewski**
  Center for Theoretical Physics of the Polish Academy of Sciences (Poland)
- ✔ **Sandro Stringari**
  Department of Physics, University of Trento (Italy)
- ✔ **Peter Zoller**
  Institute for Theoretical Physics, University of Innsbruck (Germany)

Organizing Committee

- ✔ **Piotr Deuar**
  Institute of Physics of the Polish Academy of Sciences, Warsaw
- ✔ **Mariusz Gajda**
  Institute of Physics of the Polish Academy of Sciences, Warsaw
- ✔ **Zbigniew Idziaszek**
  University of Warsaw
- ✔ **Marek Trippenbach**
  University of Warsaw
- ✔ **Tomasz Sowiński**
  Institute of Physics of the Polish Academy of Sciences, Warsaw
- ✔ **Jakub Zakrzewski**
  Jagiellonian University, Krakow

Quantum Technologies Conference

the conference...

The conference is organized by National Laboratory FAMO, University of Warsaw, and the Institute of Physics of the Polish Academy of Sciences, in cooperation with the Center for Quantum Technologies of Atoms and Light.

The meeting focuses on the latest achievements in the rapidly growing field of quantum engineering with a particular emphasis on the broad field of atomic physics, including precision measurements; ultracold Bose and Fermi gases; ultracold molecules; quantum simulators and quantum information with atoms and ions; quantum optics.

All accepted participants are invited to present a 20 minute talk during the conference.

the city...

The conference take place at the Nicolaus Copernicus University in Toruń. Toruń is located 200 km north of Warsaw on the bank of the Vistula River. The city can be easily accessed from Warsaw, Gdańsk or Poznań by train.

Torun is a charming Gothic town with a university atmosphere, and is one of the oldest cities in Poland. The old town is a UNESCO World Heritage Site. It is also known as the birthplace of Nicolaus Copernicus. In the city center, there are many good and realitvely inexpensive restaurants serving tasty food (including traditional polish meals). We hope all participants will enjoy these places.

adressess...

✔ **Conference Hotel**
Hotel Uniwersytecki (Univeristy Hotel)
Szosa Chełmińska 83A, Toruń

August 29 – September 3, 2010, Toruń, Poland

Quantum Technologies Conference

Monday (August, 30)

keynote speaker

Gediminas Juzeliunas

Vilnius University, Lithuania

Slow and stationary light in atomic media

- ✔ **Alessio Recati**
  CNR-INO BEC Center (Italy)
  Spin dipole oscillations of strongly interacting normal Fermi gases
- ✔ **Omjyoti Dutta**
  Institute of Photonics Sciences (Spain)
  Unconventional superfluidity of fermions in Bose-Fermi mixtures
- ✔ **Tomasz Karpiuk**
  Centre for Quantum Technologies (Singapore)
  The fountain effect in a Bose-Einstein condensate
- ✔ **Paulina Grochowska**
  Nicolaus Copernicus University (Poland)
  Superluminal Pulse Propagation In Multi-Level Optically Dressed Atomic System
- ✔ **Marie Bonneau**
  Laboratoire Charles Fabry (France)
  Relative atom number squeezing in atomic spontaneous four wave mixing
- ✔ **Andal Narayanan**
  Raman Research Institute (India)
  Quantifying interacting dark states through higher order probe response
- ✔ **Marco Roncaglia**
  ISI, Institute for Scientific Interchange (Italy)
  Adiabatic trap deformation for preparing quantum Hall states
- ✔ **Julius Ruseckas**
  Institute of Theoretical Physics and Astronomy, Vilnius University (Lithuania)
  Light-induced Gauge Potentials for Cold Atoms

Quantum Technologies Conference

Tuesday (August, 31)

keynote speaker

Yehuda Band

Ben-Gurion University, Israel

Correlation and Entanglement of Multipartite States, and Application to Atomic Clocks

- ✔ **Giulia Ferrini**
  Laboratoire de Physique et Modélisation des Milieux Condensés, LPMMC, UMR5493 (France)
  Useful quantum states in the presence of classical noise in a Bose Josephson junction
- ✔ **Philipp Hauke**
  ICFO – Institut de Ciències Fotòniques (Spain)
  Complete devil's staircase and crystal–superfluid transitions in a dipolar XXZ spin chain: A trapped ion quantum simulation
- ✔ **Philipp Hyllus**
  INO-CNR BEC Center and Dipartimento di Fisica, Universita di Trento (Italy)
  Sub shot-noise interferometry and multiparticle entanglement
- ✔ **Marcin Kurpas**
  Instytut Fizyki, Uniwersytet Śląski (Poland)
  Entanglement swapping with artificial atoms
- ✔ **Lucas Lamata**
  Max-Planck-Institut für Quantenoptik (Germany)
  Towards electron-electron entanglement in Penning traps
- ✔ **Krzysztof Pawłowski**
  Center for Theoretical Physics PAS (Poland)
  Statistical properties of ultracold atoms in a 1D harmonic trap
- ✔ **Bryan Dalton**
  Swinburne University of Technology (Australia)
  Theory of Two Component BEC Interferometry
- ✔ **Valdimir Yurovsky**
  School of Chemistry, Tel Aviv University (Izrael)
  Restricted Thermalization and the Memory of Initial Conditions in Incompletely-Chaotic Quantum Systems

Quantum Technologies Conference

Wendesday (September, 1)

keynote speaker

Paul Julienne

Joint Quantum Institute, NIST and the University of Maryland, USA

Ultracold polar molecules in gases and lattices

✔ **Philipp-Immanuel Schneider**
AG Moderne Optik, Humboldt-Universitaet zu Berlin (Germany)
Feshbach resonances of harmonically trapped ultracold atoms

✔ **Karolina Słowik**
Nicolaus Copernicus University (Poland)
Nonlinear phase shifts in a periodically dressed tripod atomic medium

✔ **Krzysztof Sacha**
Institute of Physics, Jagiellonian University (Poland)
Anderson Localization of Solitons

✔ **Christoph Zipkes**
University of Cambridge (UK)
A trapped single ion inside a Bose-Einstein condensate

✔ **Chao Hang**
Centro de Física Teórica e Computacional, Complexo Interdisciplinar da Universidade de Lisboa (Portugal)
All-optical steering of light via spatial Bloch oscillations in a gas of three-level atoms

✔ **Michał Krych**
Instytut Fizyki Teoretycznej, Uniwersytet Warszawski (Poland)
Ion in an ultracold buffer gas

✔ **Emilia Witkowska**
Institute of Physics, Polish Academy of Sciences (Poland)
Phase spreading of a Bose-Einstein condensate at nonzero temperature

✔ **Jan Chwedenczuk**
Department of Physics, University of Warsaw (Poland)
Phase Estimation With Interfering Bose-Condensed Atomic Clouds

Quantum Technologies Conference

Thursday (September, 2)

keynote speaker

Luis Santos

Univeristy of Hannover, Germany

Spinor quantum gases: from non-classical states of matter to strongly-correlated gases

- ✔ **Tomasz Świsłocki**
  Institute of Physics, Polish Academy of Sciences (Poland)
  Einstein-de Haas effect in a plaquette - vortex superfluid
- ✔ **Thomas Busch**
  University College Cork (Ireland)
  Structural Transitions in Vortex Lattice in Bose-Einstein Condensates
- ✔ **Michał Matuszewski**
  Institute of Physics, Polish Academy of Sciences (Poland)
  Rotonlike instability and pattern formation in non-dipolar Bose Einstein condensates
- ✔ **Michael Wall**
  Colorado School of Mines (USA)
  Tunable Molecular Many-Body Physics and the Hyperfine Molecular Hubbard Hamiltonian
- ✔ **Joanna Pietraszewicz**
  Institute of Physics, Polish Academy of Sciences (Poland)
  Dipolar spinor condensate in an optical lattice
- ✔ **Krzysztof Gawryluk**
  Wydział Fizyki, Uniwersytet w Białymstoku (Poland)
  Dipolar resonances in an oscillating magnetic fields
- ✔ **Piotr Szankowski**
  Department of Physics, University of Warsaw (Poland)
  Oscillating Spinor Solitons
- ✔ **Tomasz Sowiński**
  Institute of Physics, Polish Academy of Sciences (Poland)
  Exact dynamics and decoherence of two cold bosons in a harmonic trap