

DPG - School on Physics
Supported by the Wilhelm and Else Heraeus-Foundation

Nanophotonics meets Quantum Optics

19 - 24 September 2010, Physikzentrum Bad Honnef, Germany

Arno Rauschenbeutel (U Mainz) & Vahid Sandoghdar (ETH Zürich)

The coupling of light and matter in the quantum regime using micro- and nanophotonics components is a highly dynamic and exciting field of research. Possible applications in fundamental science and in technology range from sensing, optical filters, optical switches, and non-linear optics to quantum communication, quantum simulation, and quantum information processing. Some examples of various physical systems that are being explored, both experimentally and theoretically, include cavity quantum electrodynamics (using Fabry-Pérot microresonators, whispering-gallery-mode microresonators, and photonic crystal cavities), strong coupling without cavities (using waveguides, near-fields, and tight focusing), as well as cavity optomechanics.

The objective of the school is to gather world-renowned experts in these fields and to bring them into contact with highly motivated students. The courses are intended for advanced students at the Diplom/M.Sc. level and for PhD students. They will start at an introductory level and lead up to problems of current research. In addition to the lectures, ample time is reserved for informal meetings in order to exchange ideas, to investigate new directions, and to establish cross connections between the various fields and theoretical vistas.

Invited speakers:

Mario Agio (ETH Zürich)

Markus Aspelmeyer (U Wien)

Oliver Benson (HU Berlin)

Carsten Henkel (U Potsdam)

Ed Hinds (Imperial College)

Atac Imamoglu (ETH Zürich)*

Jeff Kimble (Caltech)

Tobias Kippenberg (MPQ Garching & ETH Lausanne)

Gerd Leuchs (MPL Erlangen)

Marko Lončar (Harvard University)

Mikhail Lukin (Harvard University)

Michel Orrit (U Leiden)

Oskar Painter (Caltech)

Jakob Reichel (ENS Paris)

Helmut Ritsch (U Innsbruck)

Fees

Covering full board and lodging at the Physikzentrum Bad Honnef 465 € (for DPG members 365 €), for students 305 €
(for DPG members 205 €), without lodging 205 €.

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Deutsche Physikalische Gesellschaft



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Nano-Spintronics

12 - 17 September 2010, Physikzentrum Bad Honnef, Germany

Jürgen König (University Duisburg-Essen) & Manfred Bayer (TU Dortmund)

During the last couple of years a wealth of novel phenomena concerning spins in condensed matter have been revealed, which promise application in the emerging fields of spin electronics and quantum information technologies. These topics will be addressed by the school, with special emphasis on coherent control of few or even individual spins in nanostructures. The aim is to provide PhD students but also Master/Diplom students and young postdocs an overview of the field. Generation, manipulation and detection of spins may be achieved by electric transport, by optical means, or by combination of the two approaches. Internationally leading scientists have agreed to come to Bad Honnef and give tutorial lectures, introducing the basic concepts, describing major research advancements and opening perspectives for this attractive field of research.

Participants are strongly encouraged to present their research work at a poster session.

Lecturers and topics:

Guido Burkard (University of Konstanz, Germany)
Spin coherence and entanglement in nanostructures

Scott Crooker (Los Alamos National Laboratory, USA)
Imaging optically- and electrically-injected spins in semiconductor spin transport devices

Sophia Economou (Naval Research Laboratory, Washington, USA)
Theory of coherent manipulation of spin in quantum dots

Fedor Jeletzko (University of Stuttgart, Germany)
Spin dynamics of NV-centers in diamond

Jens Paaske (Niels Bohr Institute, Copenhagen, Denmark)
Cotunneling and Kondo effect in quantum dots

Thomas Schäpers (Forschungszentrum Jülich, Germany)
Spin-orbit effects in semiconductors with reduced dimensions

Christian Schoenenberger (University of Basel, Switzerland)
Spin transport in nanodevices and spin physics with Cooper pairs

Lars Schreiber (Kavli Institute of NanoScience, Delft, The Netherlands)
Single electron spin qubits in electrostatically defined GaAs dots

Alexander Shnirman (Karlsruhe Institute of Technology, Germany)
Geometric phases and spin-orbit effects

Duncan Steel (University of Michigan, Ann Arbor, USA)
Quantum information with optically controlled spins in quantum dots

Amir Yacoby (Harvard University, Cambridge, USA)
Two electron logical spin qubits in electrostatically defined GaAs quantum dots

Ulrich Zuelicke (Massey University, New Zealand)
Spin-dependent electronic transport due to spin-orbit coupling

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