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Experimental Condensed Matter Physics

The dates of the experimental condensed matter physics seminar are also announced via mailing lists. Anyone interested can [join](#) the lists here. Note that many people will automatically receive the announcement via institute lists.

<i>Datum</i>	<i>Sprecher</i>	<i>Title</i>
06/12/2016	Florian Libisch (Institute for Theoretical Physics, Vienna University of Technology)	Dynamically encircling an exceptional point for asymmetric mode switching
14/11/2016	Markus Ternes (Max Planck Institute for Solid State Research, Stuttgart)	Classical and quantum correlations in coupled spin systems and their influence on the tunnelling conductance
19/10/2016	Alexander Poshakinskiy (Ioffe Institute, St. Petersburg)	Spatiotemporal spin fluctuations in 2D electron gas
18/10/2016	Benoit Hackens (Institut de la Matière Condensée et des Nanosciences (IMCN), Université catholique de Louvain (UCL), Louvain-la-Neuve, Belgium)	Imaging charge transport in quantum point contacts and graphene rings
17/06/2016	Yung-Woo Park (Department of Physics and Astronomy, Seoul National University, South Korea)	Magneto Resistance of Low Dimensional Conductors in High Electric Field
12/05/2016	Professor Norbert Koch (Humboldt Universität in Berlin)	Energy level tuning at inorganic/organic semiconductor heterojunctions
28/04/2016	Menno Veldhorst (Technical University of Delft, Netherlands)	Universal quantum logic with silicon quantum dots
21/04/2016	Silvan Schmid (Department of Materials Science and Engineering, National University of Singapore)	Damping dilution in nanomechanical SiN resonators and their applications
21/04/2016	Dr. Sayanti Samaddar (Institut Néel, University of Grenoble, France)	Charge Disorder and Screening in Graphene
15/03/2016	Benedikt Schwarz Institute for Solid State Electronics, TU Wien, Vienna, Austria	Quantum cascade laser/detectors and plasmonics for mid-infrared integrated photonics
01/02/2016	Pol Forn-Diaz (Institute for Quantum Computing, University of Waterloo)	Strong light-matter interaction for superconducting artificial atoms
17/12/2015	Bertold Rasche (Technical University Dresden)	Topological Insulators in Bismuth-Halide and Related Systems: Design, Synthesis, Optimisation and Properties
17/12/2015	Craig Prater, Ph.D. Chief Technology Officer Anasys Instruments	Nanoscale infrared spectroscopy and chemical imaging with AFM-IR
16/12/2015	Larissa Chizhova (Technical University Vienna, Austria)	Graphene-laser interaction: nonlinear and magneto-optical responses
29/09/2015	Juliette Mangeney (Laboratoire Pierre Aigrain, Ecole Normale Supérieure, Paris)	Coherent THz radiation: from ultrafast spectroscopy to emission from graphene

Dienstag, 15.03.2016, 10:00 bis 12:00, MBP2 117

Benedikt Schwarz

Institute for Solid State Electronics, TU Wien, Vienna, Austria

Auf Einladung von Prof. Taubner

The increasing demand of rapid sensing and diagnosis in remote areas requires the development of compact and cost-effective mid-infrared sensing devices. I will present a monolithic integration approach for sensors, combining two major technologies: quantum cascade structures and surface plasmon polaritons [1].

A bi-functional quantum cascade laser/detector is used, where, by changing the applied bias, the device switches between laser and detector operation [2]. Recent results show, that bi-functional operation is not necessarily connected with a performance drawback. Once the layer structure has been grown on the substrate, different parts of the chip can be used for lasers and others for detectors.

The devices are connected via a dielectric-loaded surface plasmon polariton waveguide with a twofold function: it provides a high coupling efficiency and a strong interaction with the environment (e.g., a surrounding fluid). Our improved prototype sensor chip offers real-time monitoring of water in isopropanol with a 10ppm resolution over a large concentration range of 0-60%. An array of such laser/waveguide/detector units, each sensitive to another wavelength can be used as miniaturized spectrometer covering a range of 100-150cm⁻¹.