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Universität Zürich, Irchel Campus

Réunion annuelle commune à Zürich
26 - 30 août 2019

Programmübersicht
Aperçu du programme

in Zusammenarbeit mit - en collaboration avec

MaNEP Switzerland

QSIT Quantum Science and Technology
National Centre of Competence in Research

SSSN SGN

Universität Zürich UZH

17:30	**123**	**Van der Waals magnetic materials: growth and characterization** *Dumitru Dumcenco, Enrico Giannini* *Department of Quantum Matter Physics, University of Geneva* Novel properties and exciting perspectives are offered by two-dimensional magnetic materials, like binary MX_2 and ternary MYZ_3 (M is a metal element; X is a halogen; Y = Si, Ge or P; Z is a chalcogen). Various complementary growth techniques are employed to produce these materials in crystalline form, namely the Chemical Vapor Transport and the high temperature solution (flux) growth. Here we summarize the growth techniques and conditions, as well as the recent advances in the crystal growth of magnetic van der Waals materials. The quality of the bulk crystals is proven by structural and chemical investigations and the study of magnetic properties. These materials can be successfully exfoliated and are being applied in atomically thin devices.
17:45	**124**	**ARPES study of few layer black phosphorus crystals** *Florian Margot, Felix Baumberger, Irène Cucchi, Anna Tamai, Simone Lisi, Ignacio Gutiérrez-Lezama, Alberto Morpurgo, Université de Genève* The electronic structure of 2D materials undergoes significant changes as their thickness is reduced down to the atomic limit. In few layer black phosphorus (BP) crystals, a promising semiconductor for optoelectronic and electronic applications, the bandgap increases drastically and the effective mass at the valence band and conduction band edges changes significantly. Here, we present the first direct electronic structure measurements on ultrathin BP. As BP is an air sensitive material, this is achieved by encapsulating exfoliated flakes in graphene or hBN. Our results reveal the quantum well states in the valence band and give a mapping of the anisotropic bandstructure of thin BP flakes. In particular, we determine the anisotropic effective mass at the valence band edge.
18:00	**125**	**Three Dimensional Lithography on Silicon Nanowire Arrays - An Electrochemical Approach** *Gilles Bourret [1], Fedja Wendisch [1], Michael Saller [1], Alex Eadie [1], Andreas Reyer [1], Maurizio Musso [1], Marcel Rey [2], Nicolas Vogel [2], Oliver Diwald [1]* *[1] University of Salzburg, [2] Erlangen-Nürnberg University* We will report on a templated electrochemical technique for patterning arrays of single-crystalline Si nanowires with feature dimensions down to 5 nm. This technique, termed three-dimensional electrochemical axial lithography (3DEAL) [1], allows the design and parallel fabrication of hybrid silicon nanowire arrays decorated with complex metal nanoring architectures in a flexible and modular approach. 3DEAL is based on simple chemical and electrochemical approaches that were developed previously [2] and can produce homogeneous macroscale metal-Si wire arrays. [1] F. J., Wendisch, M. Saller, A. Eadie, A. Reyer, M. Musso, M. Rey, N. Vogel, O. Diwald, G. R. Bourret Nano Letters 2018, 18, 11, 7343-7349 [2] T. Ozel, G. R. Bourret and C. A. Mirkin Nat. Nanotech. 2015, 10, 319–324
18:15	**126**	**Optically active nanowires nucleated via a novel focused ion beam implantation method** *Suzanne Lancaster [1], Markus Schinnerl [1], Aaron Maxwell Andrews [1], Masiar Sistani [1], Alois Lugstein [1], Werner Schrenk [2], Gottfried Strasser [1,2], Hermann Detz [3]* *[1] Institute of Solid State Electronics, TU Wien, [2] Center for Micro- and Nanostructures, TU Wien, [3] Brno University of Technology* We have previously demonstrated a novel approach for the growth of III-V nanowires on Si, using focused ion beam (FIB)-implanted Ga as nucleation points for self-catalysed GaAs nanowire growth. In this work, we have further investigated the possibility of growing optically active nanowires using this technique, via the growth of GaAs nanowires containing single InGaAs quantum wells in the shell. The nanowires show good emission, proving the high material quality of NWs grown via FIB-implantation. By comparison with randomly nucleated NWs, we find some C-doping of the NW core, attributed to the implantation process.