IAP Seminar

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Tuesday, 20th November 2018, 16:00 s.t.
TU Wien, Institut für Angewandte Physik, E134
1040 Wien, Wiedner Hauptstraße 8-10
Yellow Tower „B“, 5th floor, SEM.R. DB gelb 05 B

Functional 2D materials by electron beam induced synthesis

Electron irradiation of aromatic monolayers and thin films results in their conversion into molecular nanosheets with adjustable electronic, chemical, photonic properties and thickness down to 1 nm [1-5]. Similar to graphene or other atomically thin 2D materials (hBN, MoS_2, etc.) they possess mechanical integrity and be transferred from their growth substrates onto target substrates, fabricated as suspended sheets or stacked into van der Waals heterostructures with a precise control over their thickness. In this talk, some examples of these materials and their device applications will be presented including (i) the field-effect devices for ultrasensitive biodetection; (ii) nanopatterned free-standing atomically thin nanosheets for molecular interferometry; (iii) insulator/metal and insulator/semiconductor type lateral heterostructures; (iv) organic semiconductor nanosheets for hybrid electronic and optoelectronic devices.

[1] A. Turchanin, A. Gölzhäuser, *Adv. Mater.* 28 (2016) 6075
[2] A. Turchanin, *Ann. Phys.* 529 (2017) 1700168
[3] C. Brand et al, *Nat. Nanotech.* 10 (2015) 845
[4] S. J. Noever et al. *Adv. Mater.* 28 (2017) 1606283
[5] A. Winter et al., *Carbon* 128 (2018) 106

Andrey Turchanin is a University Professor at the Friedrich-Schiller-University Jena where he heads the Applied Physical Chemistry & Molecular Nanotechnology Group. He received his PhD in 1998 at the National University of Science and Technology in Moscow in the group of Prof. Tomilin. In 2010 he received his Habilitation at the University Bielefeld in the group of Prof. Gölzhäuser. Prof. Turchanin further received a Alexander-von-Humboldt Fellowship, a Heisenberg Fellowship of the DFG in Physics, and the Bernhard Heß Prize of the University Regensburg among other awards.

All interested colleagues are welcome to this seminar lecture (45 min. presentation followed by discussion)

Friedrich Aumayr
(LVA-Leiter)

Richard Wilhelm
(Seminar Chair)