CARL VON OSSIETZKY universität OLDENBURG

Fakultät II *Informatik, Wirtschafts- und Rechtswissenschaften*
Department für Informatik

Sondervortrag

Am **Montag, dem 06. Februar 2012,** um **16:15 Uhr** hält

PD Dr. Andrey Turchanin
Universität Bielefeld, Fakultät für Physik
Bielefeld Institute of Biophysics and Nanoscience (BINAS)

einen Vortrag mit dem Titel

From organic monolayers to carbon nanomembranes and graphene with tunable structural, chemical and electrical properties

Der Vortrag findet im OFFIS, Escherweg 2, Konferenzraum F02 statt.

Zusammenfassung:

Two-dimensional (2D) assemblies of molecules in monolayer films are of longstanding interest due to their ability to control physical and chemical properties of material surfaces and interfaces. Most of the work has been focused on the monolayers bonded to their supporting substrates by chemical interactions or van der Waals forces. Examples include Langmuir-Blodgett films, self-assembled monolayers (SAMs) as well as more recently 2D metal-organic networks. For a long time mechanically stable free-standing sheets with a thickness of only one atom or molecule, that are films existing without any supporting surface, were not imaginable. However, the situation has recently changed with emergence of this new class of nanomaterials. The most prominent example of such materials is graphene – a single free-standing sheet of carbon atoms arranged into a honeycomb structure. In this talk, I will present the large area fabrication and characterization of molecular thin carbon nanomembranes and graphene sheets made by electron-radiation induced cross-linking of organic self-assembled monolayers (SAMs) and their subsequent annealing. In this process, the SAM is converted into a homogenous nanocrystalline graphene sheet with well-defined thickness and arbitrary dimensions. Electric transport data demonstrate that this transformation is accompanied by an insulator to metal transition that can be utilized to control electrical properties such as conductivity, electron mobility and ambipolar electric field effect as well as optical properties of the fabricated 2D carbon sheets. The suggested route opens broad prospects towards the engineering of advanced 2D carbon materials with novel physical and chemical properties on various solid substrates and on holey substrates as suspended nanomembranes.

Eingeladen von: Prof. Dr. Sergej Fatikow