



PhD position in graphene electronics **Collaboration Johannes Gutenberg University Mainz – BASF**

In the Department of Physics, University of Mainz, a PhD position is immediately available in the field of electronics and spintronics in graphene structures. In particular we are working on novel effects that occur due to the doping of graphene, the interaction of charge and spin currents, spin dynamics and quantum effects in novel materials that result from intentional modification of graphene by doping and nanostructuring.

These materials are very topical and highly interesting from scientific point of view (a large number of high impact publications have been published). Furthermore they are also promising for applications in data storage, sensors and other microelectronic devices.

The project is funded by BASF, the leading European Chemical Company and the work is carried out jointly between the University of Mainz and BASF Research. In addition to key growth facilities at BASF, advanced fabrication techniques (full clean room with lithography and pattern transfer techniques), a range of materials deposition tools (molecular beam epitaxy, sputtering, pulsed laser deposition, etc.) and a number of sophisticated characterization techniques are available at Mainz. Low temperature magneto-transport measurements (10mK to room temperatures with fields up to 15T) will be carried out to detect the charge and spin transport properties, spin injection, spin dynamics and quantum transport effects. Structural analysis can be carried out using in-situ electron diffraction as well as ex-situ x-ray diffraction and Raman microscopy. Furthermore scanning probe microscopes are available for surface morphology investigations, local conductivity measurements and magnetic imaging.

While the project will be primarily carried out at Mainz, the PhD student will have the opportunity to stay part of the time at BASF and closely work with the industrial team.

The physics department at the University of Mainz has been consistently ranked as one of the leading physics departments in Germany. In the recent Shanghai and CHE rankings it was selected for the excellence group in Europe and top 5 in Germany. It is particularly strong in the area of condensed matter physics / material sciences and houses the Graduate School of Excellence Materials Science in Mainz. Very good candidates will be considered for this Graduate School that provides a structured graduate education with additional tailored training.

Close collaboration exists with the Max Planck Institute for Polymer Science (Prof. Müllen) as well as industrial partners including BASF.

For enquiries and applications including a full CV contact Prof. Dr. M. Kläui (Email: klaeui@uni-mainz.de, Tel. +49-6131-3924345) and see www.klaeui-lab.de