

DIESE WOCH

PHYSIKALISCHES KOLLOQUIUM

des Fachbereichs Physik
der Johann Wolfgang Goethe-Universität Frankfurt

Mittwoch, den 15.01.2014, 16 Uhr c.t.
Großer Hörsaal, Raum _0.111,
Max-von-Laue-Str. 1

Prof. Dr. Mischa Bonn

Max Planck Institute for Polymer Research
Department of Molecular Spectroscopy, Mainz

*„ Carrier Dynamics in Graphene
and Graphene Nanostructures studied using
Ultrafast TeraHertz Spectroscopy “*

Owing to its 2 2-dimensional structure, vanishing bandgap and high electron mobility, graphene is a promising material for many optoelectronic applications. An important open question has been how photon energy is converted into electronic energy: initially, each photon creates one excited electron-hole pair, but this initially excited pair can get rid of its excess energy either by generating phonons, or by generating additional electrons and holes, in a process similar to carrier multiplication in conventional semiconductors. We quantify the efficiency of carrier multiplication, the transfer of energy from a single optical photon to multiple hot charge carriers, in monolayer graphene.

We further investigate how the quantum confinement in graphene nanostructures (carbon nanotubes and graphene nanoribbons) affect the photoconductive properties. The presence of a bandgap in these nanostructures make them promising candidates for, e.g., photovoltaic devices, but the photoconductivity in these materials has been debated.

Nature Chemistry doi:10.1038/nchem.1819 (2013). Nano Letters doi: 10.1021/nl402978s (2013). Nature Physics 9, 248-252 (2013).

Die Dozenten der Physik

Kolloquium