



EINLADUNG zum IFP-SEMINAR

Weyl Fermions in HgTe

Christoph Brüne

Universität Würzburg, Germany

Host: Alexey Shuvaev
Termin: Mittwoch, 08. März 2017, 16:00 Uhr
Ort: Institut für Festkörperphysik, TU Wien
Wiedner Hauptstraße 8-10, 1040 Wien
Seminarraum DC rot 07 (roter Bereich, 7. OG)

Abstract:

HgTe is so far mostly known for its topological insulator properties. Recently, however, it became apparent that HgTe should also host a Weyl semimetallic phase. Applying compressive strain to bulk HgTe will result in a band overlap of the Gamma-8 bands with 3-dimensional Dirac points emerging at the band crossings. The inversion symmetry breaking due to the zinc-blende crystal structure will then result in a further splitting into Weyl points.

The experimental realization of such a Weyl semimetallic state relies on controlling the strain in the HgTe layer. For this purpose we developed the growth of HgTe layers on artificial substrate structures based on CdTe/ZnTe superlattices. Magnetoresistance measurements of such HgTe layers reveal a strongly anisotropic negative magnetoresistance consistent with the proposed chiral anomaly in Weyl systems.

I will also give a brief overview on our results on induced superconductivity in the topological insulator phase of HgTe. Here we see indications of unconventional superconductivity resulting from the interplay of topology and s-wave superconductivity.