O 86: Overview Talk: Claudia Felser

Time: Thursday 9:30–10:15 Location: HE 101

Invited Talk O 86.1 Thu 9:30 HE 101

Weyl Semimetals and beyond! — •Claudia Felser — Max Planck Institut Chemische Physik fester Stoffe

Topology a mathematical concept became recently a hot topic in condensed matter physics and materials science. One important criteria for the identification of the topological material is in the language of chemistry the inert pair effect of the s-electrons in heavy elements and the symmetry of the crystal structure. Beside of Weyl and Dirac new fermions can be identified compounds via linear and quadratic 3-, 6- and 8- band crossings stabilized by space group symmetries. Binary phoshides are the ideal material class for a systematic study of Dirac and Weyl physics. Weyl points, a new class of topological phases was also predicted in NbP, NbAs. TaP, MoP and WP2. In NbP microwires we have observed the chiral anomaly. NbP has served as a model system for the gravitational anomaly in astrophysics and WP2 for a hydrodynamic flow of electrons. MoP and WP2 show exceptional properties such as high conductivity (higher than copper), high mobilties and a high magneto-resistance effect. With thermal and magnetoelectric transport experiments, a transition from a hydrodynamic electron fluid below 15 K into a conventional metallic state at higher temperatures is observed. The hydrodynamic regime is characterized by a viscosity-induced dependence of the electrical resistivity on the square of the channel width that coincides with as strong violation of the Wiedemann-Franz law. In magnetic materials the Berry curvature and the classical AHE helps to identify interesting candidates such as in Co2YZ and in Mn3Sn.