KIT
Karlsruher Institut für Technologie

Physikalisches Kolloquium

Leonid Glazman, Yale University

**»Topology of the Fermi surface wavefunctions
and magnetic oscillations in metals«**

Einführung: J. Schmalian

The Fermi surface of a metal is "the stage where the drama of the life of the electron is played out," wrote physicists Lifshitz and Kaganov in 1980. This surface in momentum space, which separates occupied and unoccupied electron states, allows one to derive all properties unique to metals, including electric conduction. A detailed characterization of the Fermi surface is essential for understanding these properties. While known experimental methods exist to extract the shape of the Fermi surface, we propose how to extract information about the wave functions of electrons on the Fermi surface. In some metals, this information is surprisingly robust and may be viewed as a topological invariant.

When a magnetic field is applied to a metal, the Lorentz force pushes electrons into circular motion. In quantum mechanics, such periodic motion leads to discrete energy levels; this ultimately results in field-induced oscillations of the magnetization of a metal. Measuring their period for decades served as a tool for finding the Fermi surface shapes. It turns out the phase offset of the same oscillations encodes the properties of wave functions of the Fermi surface electrons.

Freitag, 08.06.2018, 15:45 Uhr,

**KIT, Campus Süd,
Otto-Lehmann-Hörsaal, Physik-Flachbau (Geb. 30.22).
Anschließend Nachsitzung im Gastdozentenhaus „Heinrich Hertz"**