

Physikalisches Kolloquium

Piet Brouwer, FU Berlin

»Quantum Transport and its Classical Limit«

Einführung: A. Shnirman

The interference of multiply scattered quantum mechanical matter waves causes small but noticeable corrections to the conductance of a metal at low temperatures. Historically, one separates these corrections into 'weak localization', a small negative correction to the conductance averaged over an ensemble of conductors with different impurity configurations, and the 'conductance fluctuations'. What is the fate of quantum interference corrections in the limit that the wavelength of the electrons becomes small in comparison to all other relevant length scales? This limit is a "classical limit" similar to the transition from wave optics to ray optics that occurs when the typical size of optical elements becomes much larger than the wavelength of light. I'll discuss the basic elements of a theory of quantum transport in this classical limit and show that, whereas weak localization disappears in the classical limit, the quantum interference contribution to the conductance fluctuations remains surprisingly unaffected.

Freitag, 10.12.2010, 17 Uhr c.t.,

KIT, Campus Süd,

Otto-Lehmann-Hörsaal, Physik-Flachbau (Geb. 30.22).

Anschließend Nachsitzung im Gastdozentenhaus „Heinrich Hertz“