EINLADUNG zum IFP-SEMINAR

Heat propagation in liquid ^{3}He and in metallic Fermi liquids

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Host: Karsten Held

Termin: Mittwoch, 2. Oktober 2024, 16:00 Uhr

Ort: TU Wien, Freihausgebäude

            Wiedner Hauptstraße 8-10, 1040 Wien

            Seminarraum DC rot 07 (roter Bereich, 7. OG)

            Oder via ZOOM
            https://tuwien.zoom.us/j/63020566887?pwd=RmYvRmVwOGU5YVBrOHpodWRKaHFWQT09
            Vor dem Vortrag gibt es ab 15:30 Kaffee und Kekse

Abstract:

The normal liquid ^{3}He conforms to Landau's Fermi liquid picture, but only at very low temperature. We have recently shown that its thermal conductivity [1] can be accounted for in the whole temperature range (0.01 K-3 K), by assuming that it is the sum of two contributions: one by quasi-particles (varying as the inverse of temperature) and another by a hydrodynamic sound mode (following the square root of temperature) [2]. The first component has been known for decades. The second is a collective [sound] mode [3] with a ~$2k_F$ wave-vector in the hydrodynamic limit. Our expression for it, derived from Landauer's formula, is a quantum version of the Bridgman equation for thermal conductivity of classical liquids. It may be relevant to transport in strongly correlated Fermi liquids whose resistivity deviates from a quadratic behavior well below the Fermi temperature.

[1] D. S. Greywall, Phys. Rev. B **29**, 4933 (1984).
[2] K. Behnia & K. Trachenko, Nature Commun. **15**, 1771 (2024).
[3] F. Albergamo *et al.*, Phys. Rev. Lett. **99**, 205301 (2007).

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Q-M&S Correlated Quantum Materials & Solid State Quantum Systems