Festkörper-Kolloquium und Sonderseminar TRR 80

am Donnerstag, 27.11.2014

um 17:15 Uhr

spricht

Dr. Elena Hassinger

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im HS 3 im Physik-Department

über das Thema

Anisotropy of thermal conductivity in the superconducting state of Sr2RuO4: evidence for a horizontal line node

There is strong experimental evidence that the superconductor Sr2RuO4 has a chiral p-wave superconducting order parameter. In that case, symmetry does not require that the associated gap has nodes, yet specific heat, ultrasound and thermal conductivity measurements establish the existence of line nodes in the superconducting gap structure of Sr2RuO4. Scenarios have been proposed for the existence of accidental nodes or deep minima in Sr2RuO4. To examine those scenarios, it is essential to know whether the line nodes are vertical (parallel to the tetragonal c-axis) or horizontal (perpendicular to the c-axis). Here we report thermal conductivity measurements in high-quality single crystals of Sr2RuO4 down to 50 mK for currents parallel and perpendicular to the c-axis. We find that there is no quasiparticle transport along the c-axis in the T = 0 limit, in contrast with the large residual conductivity found in the basal plane. The immediate interpretation of this strong a-c-anisotropy is that the line of nodes in Sr2RuO4 is horizontal. We discuss the implications of this finding and compare it with the heavy fermion system CeIrIn5.

ab 17:00 Uhr Kaffee vor dem Hörsaal

Einführung: C. Pfleiderer