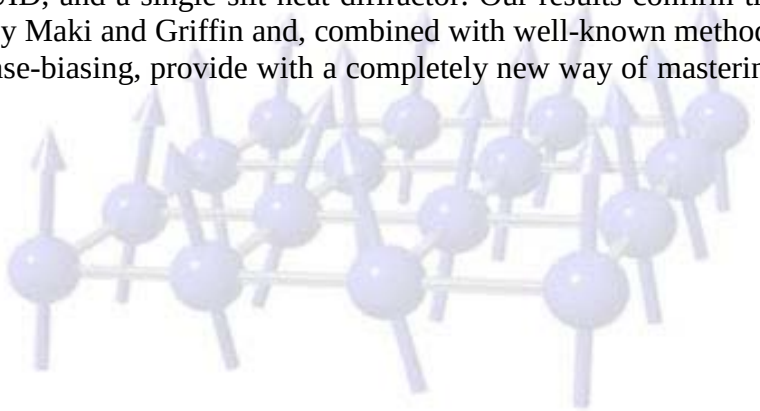
SFB/TRR 21 - Seminar

16. September 2013, Tübingen

Maria José Martínez-Pérez
(NEST, Instituto Nanoscienze-CNR
and Scuola Normale Superiore, I-56127 Pisa, Italy)

Coherent manipulation of heat currents in Josephson circuits

The Josephson effect has implications going beyond electrical transport. In 1965, Maki and Griffin predicted that the interplay between Cooper pairs and quasiparticles in tunneling events would provide heat currents with quantum coherence. This phenomenon manifests as a phase-dependent component of the heat current flowing through a thermally biased Josephson junction but its existence was never confirmed experimentally. Yet, a suitable Josephson-based superconducting circuit should, in principle, enable heat currents to interfere. Here we report the first experimental realization of a double-slit heat interferometer, thermal counterpart of the well-known dc SQUID, and a single-slit heat diffractor. Our results confirm the theoretical predictions by Maki and Griffin and, combined with well-known methods for superconducting phase-biasing, provide with a completely new way of mastering heat at the nanoscale.



16. September 2013, 15:15 Uhr

Universität Tübingen, Raum D4 A19
Auf der Morgenstelle 14, 72076 Tübingen

CO.CO.MAT