

The Hebrew University of Jerusalem , Colloquium

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Levin building, Lecture Hall No. 8

"Scale-dependent renormalized interactions and anti-Meissner effect in nano-superconductors"

The interaction-induced orbital magnetic response of a nanoscale system, modeled by the persistent current in a ring geometry, is evaluated for a system which is a superconductor in the bulk. The interplay of the renormalized Coulomb and Froehlich interactions is crucial. The diamagnetic response of the large superconductor may become paramagnetic when the finite-size-determined Thouless energy is larger than or on the order of the Debye energy. This should have far-reaching consequences on nano-superconductivity.

Work with: H. Bary-Soroker, O. Entin-Wohlman and A. Aharony, Phys. Rev. Lett. 110, 056801 (2013).