

Colloquium

Dr. Marcel Griesemer
Institute for Analysis, Dynamics and
Modeling University of Stuttgart, Germany

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2:00p.m., HH-3017

Spectral Theory of the Fermi Polaron

Abstract:

The Fermi polaron refers to a system of free fermions interacting with an impurity particle by means of two-body contact forces. In this talk we present a general mathematical framework for defining many-body Hamiltonians with two-body contact interactions by means of a renormalization procedure. For the Fermi polaron in a twodimensional box a novel variational principle, established within the general framework, links the low-lying eigenvalues of the system to the zero-modes of a Birman-Schwinger type operator. It allows us to show, e.g., that the polaron- and molecule energies, computed in the physical literature, are indeed upper bounds to the ground state energy of the system. This is joint work with Ulrich Linden.