Seminar

Hall coefficients beyond single-band Boltzmann equation

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The Hall coefficient (R_H) has been traditionally used to measure the charge carrier density of metals. This can be calculated using a recently derived formula which solely depends on static equilibrium susceptibilities and is applicable to general interacting and disordered Hamiltonians. Using this, first we determine the deviation of R_H from Drude's inverse carrier density formula in spin-split semiconductor bands. Next, we study the Hall anomaly in lightly doped Mott insulators; we obtain the doping and temperature dependence of R_H for the square lattice tJ-model using a high-temperature series expansion, supplemented by Determinant Quantum Monte Carlo (DQMC) simulations. Finally, we briefly discuss similar anomaly, also seen in thermopower, by computing the Seebeck coefficient of the strongly correlated Hubbard model.

Monday, May 8th 2023

4:00 PM (Tea/Coffee at 03:45 PM)

Auditorium, TIFR-H