



**S N BOSE NATIONAL CENTRE
FOR BASIC SCIENCES**

Block JD, Sector III, Salt Lake, Kolkata 700 106

DEPARTMENTAL SEMINAR

Condensed Matter and Materials Physics

19th May, 2023

4.00 PM

ONLINE/ FERMION

SPEAKER

Dr. Abhishek Samanta,
Postdoctoral Researcher, Ohio State University

TITLE OF THE TALK

HALL COEFFICIENT OF MULTI-BAND AND INTERACTING SYSTEMS

ABSTRACT

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 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 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 high-temperature series expansion and Quantum Monte Carlo (QMC) simulations. Finally, we briefly discuss similar anomaly seen also in thermopower, by computing the Seebeck coefficient of the strongly correlated Hubbard model.

HOST FACULTY

Prof. Tanusri Saha Dasgupta, Senior Professor
