S N BOSE NATIONAL CENTRE
FOR BASIC SCIENCES
Block JD, Sector III, Salt Lake, Kolkata 700 106

DEPARTMENTAL SEMINAR

Physics of Complex Systems

17th January, 2024 **3.00 PM** **ONLINE / FERMION**

SPEAKER

Dr. Nishchhal Verma,
Postdoc, Columbia University

TITLE OF THE TALK

Chiral Textures in Magnetic Materials and Moire Heterostructures

ABSTRACT

In magnetic materials with broken time-reversal symmetry, Hall resistivity is finite even without external magnetic fields. While often analyzed as a sum of anomalous and topological Hall contributions from spin-orbit coupling and skyrmion textures, the decoupling has lacked a theoretical basis. In this talk, using a controlled semiclassical approach incorporating phase-space Berry curvatures, we will see how, and under what assumptions, the Hall resistivity separates into anomalous and topological contributions, now related to momentum and real-space curvatures. We will present complementary numerical results from the Kubo formalism supporting the semiclassical analysis. Lastly, we will step back and analyze the minimal model as a window to study ideal bands in moiré heterostructures.

HOST FACULTY

Dr. Arijit Haldar,

Assistant Professor, Dept. of Physics of Complex Systems
And
Adjunct Faculty, Dept. of Condensed Matter & Materials Physics

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