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

DEPARTMENTAL SEMINAR

Condensed Matter and Materials Physics

31st October,2022 **4.00 PM** **ONLINE/ FERMION**

SPEAKER

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TITLE OF THE TALK

CHALLENGES AND PROSPECTS IN TWO-DIMENSIONAL FENGETE2 (N=3, 4, 5) MAGNETS

ABSTRACT

The FenGeTe2 (n=3, 4, 5) family of two-dimensional magnets has attracted a lot of attention recently as they exhibit high temperature ferromagnetism along with complex temperature dependent magnetization and structural reconstructions, skyrmionic features etc. The complexity is enriched due to the presence of electron correlation and intricate magnetic interactions, where systematic theoretical studies are inadequate to have a consensus. I will present a systematic study of this family using (i) standard density functional theory (DFT), (ii) static electron correlation (DFT+U) and (iii) dynamic electron correlation effect (DFT+DMFT) methods including discussions on complex structural aspects in Fe5GeTe2. I will show that DFT+DMFT is the most accurate method to correctly reproduce the magnetic interactions and experimentally observed transition temperatures. Moreover, peculiar magnetic structures obtained from Monte Carlo simulations at low temperatures will be shown. Finally, the effect of Ni doping in Fe5GeTe2 will be discussed.

HOST FACULTY

Prof. Manoranjan Kumar & Prof. Prabhat Mandal

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