



Institute Colloquium

S. N. Bose National Centre for Basic Sciences

(An Autonomous Research Institute established under DST, GOI)

Title: Altermagnetism, its variances, and possible applications



17th Sept.,
2026



12.00 noon



FERMION
HALL



YouTube Link



Webinar Link



Abstract: The discovery of altermagnetism, characterised momentum dependent non-relativistic spin splitting of the bands, has opened up a new dimension of intertwining magnetism with momentum space phenomena, thereby enabling the exploration of fundamental concepts and futuristic device applications. In this talk, we will discuss the origin of altermagnetism and its natural extension to other binary quantum states such as orbital altermagnetism and magnon altermagnetism.

In the second half of the talk, we will analyze the possible tunability of altermagnetism through external means, such as strain and chemical doping. Our discussion on the application prospect will be largely restricted to anomalous Hall effect.

References:

1. Berry Curvature Driven Transport in Silicon-Compatible Altermagnetic α -MnTe Thin Films, Rajib Sarkar et al., arXiv:2605.25953
2. Effect of symmetry breaking on altermagnetism in CrSb and Formation of fragmented nodal curves, A. Das, A. Mandal, N. Devraj, and B. R. K. Nanda, PRB, 113, 184443 (2026)
3. Unlocking Doping Effects on Altermagnetism in MnTe: Emergence of Quasi-altermagnetism, N. Devaraj, et al., PRB, 113, 104438 (2026)
4. Deterministic role of chemical bonding in the formation of altermagnetism: Reflection from the correlated electron system NiS, A. Mandal, A. Das, and B. R. K. Nanda, Phys. Rev. B, 112, 014420 (2025).

Speaker: Prof. B. R. K. Nanda

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Short Biography of the Speaker: Prof. B. R. K.

Nanda began his research career under the supervision of Prof. Indra Dasgupta and received his PhD from IIT Bombay in the year 2005. Thereafter he did his postdoctoral research under the mentorship of Prof. Sashi Satpathy at University of Missouri, Columbia. In 2011, he joined IIT Madras, where he currently serves as a Professor.

Prof. Nanda is the founder and principal investigator of the Center of Excellence for Atomistic, Modelling and Materials design (CAMMD). He also leads the consortium on integrated clean energy materials acceleration platform (IC-MAP) funded by DST through Mission Innovation initiative.

Prof. Nanda's primary domain of research is quantum condensed matter and many-body physics. Of late, he is carrying out amateur research in the field of energy, surface science, and photonics.