Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad – 500 046

Seminar

Understanding condensed matter systems using multipolar theory

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Understanding and foreseeing novel features of condensed matter systems, while of immense interest for their advanced functional usage, have always been a challenge from a theoretical perspective. In my talk, I will discuss the *"multipole analysis"* approach that allows a complete characterisation of the charge and magnetisation density and consequently provides a systematic and potent way to understand and predict a wide range of physical phenomena, ranging from magnetoelectric effect in topological magnetic skyrmions[1] to orbital Hall transport[2-4], and the recently proposed altermagnetism[5], within a unified framework.

References:

[1] S. Bhowal and N. A. Spaldin, Phys. Rev. Lett. (Editors' suggestion) **128,** 227204 (2022).
[2] S. Bhowal, S. P. Collins and N. A. Spaldin, Phys. Rev. Lett. **128,** 116402 (2022).
[3] S. Bhowal and S. Satpathy, Phys. Rev. B (Rapid Comm.) **101,** 121112 (2020).
[4] S. Bhowal and G. Vignale, Phys. Rev. B (Editors' suggestion) **103,** 195309 (2021).
[5] S. Bhowal and N. A. Spaldin, arXiv:2212.03756 (2022).

Tuesday, May 30th 2023

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

Auditorium, TIFR-H