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

Seminar

Local basis for interacting topological bands

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Topology acts as an obstruction to an exponentially localised, orthonormal, and complete basis in real space. In this talk, I will discuss various ways around this obstruction and construct an optimal basis set using the projected density operator. The spectrum of the operator provides a systematic way to identify local orbitals and uncover a natural hierarchy of interaction scales. This framework applies to both tight-binding and continuum models, and it offers a universal prescription for reducing the single-particle Hilbert space dimension.

Tuesday, Oct 28th 2025

14:30 Hrs (Tea / Coffee 14:15 Hrs)

CR-4, TIFRH