

Webinar

Exploring novel phases of quantum condensed matter: interplay of topology, entanglement and interactions

Adhip Agarwala

Max Planck Institute for the Physics of Complex Systems, Dresden

Condensed matter phenomena continues to surround and surprise us. That few seemingly simple interactions between basic constituents often lead to nontrivial collective behaviour is generally understood within the Landau paradigm; in recent times, however, we are faced with challenges to understand a new class of novel phases – where topological characteristics, quantum entanglement and strong correlations generate fundamentally distinct features: for instance, one may find Majorana fermions secretly hiding in an insulating magnet! In this talk, while placing in context the various questions, motivations, and ideas that underlie these phenomena, I will discuss some of our recent investigations in trying to understand them. In particular, I will show how the action of mechanical strain on a honeycomb spin model may in fact generate a novel and a highly unusual gapless phase of matter. The talk will end touching upon some of the other explorations which we have undertaken such as realization of topological phases in amorphous systems, and may further risk venturing into.

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4:00 PM