

ICTS Condensed Matter Seminar (HYBRID)

Title : Pseudo-Goldstone modes and order-by-disorder

Speaker : Jeffrey Rau (University of Windsor)

Date : Friday, 21st July 2023

Time : 03:30 PM (IST)

Abstract : In systems with competing interactions, continuous degeneracies can appear which are accidental, in that they are not related to any symmetry of the Hamiltonian. Accordingly, the “pseudo”-Goldstone modes associated with these degeneracies are also unprotected. Indeed, through a process known as “order-by-disorder” fluctuations can lift the degeneracy and induce a gap for these modes. In this talk, I will discuss how these pseudo-Goldstone gaps arise in frustrated magnets when the fluctuations are (i) quantum mechanical and (ii) thermal in origin. I will show that the gap can be exactly computed at leading order using an effective picture where the soft modes move in a potential generated by the fluctuation-induced free energy. Using explicit interacting spin-wave calculations and direct numerical simulation, I will illustrate and validate this framework for several key models of order-by-disorder. Finally, I will discuss some implications for candidate materials exhibiting order-by-disorder.

Venue : **Offline:** Emmy Noether Seminar Room (ICTS)

Online: Please click the below link to join the seminar.

<https://icts-res-in.zoom.us/j/81452320560?pwd=LzVLSXNEOE55Vm5qNWxUVDDlUIVEZz09>

Meeting ID: 814 5232 0560

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