

Enigmatic Magnets: Liquid, Glass, and Soliton

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Mapping spins to diverse particles, fields, and solitons is a powerful concept with broad implications, but the materials and tunability are often limited. Frustrated lattices and twisted bilayers are changing this landscape. In this talk, I will introduce a number of novel spin phases, including the first prediction of a quantum glass phase in a Kitaev spin liquid compound and a magnetic phase diagram with distinct ordering behaviors among different spin components, including the coexistence of spin crystalline and spin liquid phases. I will also discuss a model of twisted magnets, revealing a hierarchy of skyrmion phases with topological charge, dipole moments, and higher-order characteristics.

References:

- 1) K. B. Yogendra, T. Das, G. Baskaran, Phys. Rev. B **108**, 165118 (2023)
- 2) S. Ray, T. Das, Phys. Rev. B 104, 014410 (2021)
- 3) K. B. Yogendra, S. Karmakar, T. Das, under preparation.