



अंतर्राष्ट्रीय सैद्धांतिक विज्ञान केंद्र
International Centre for Theoretical Sciences

टाटा मूलभूत अनुसंधान संस्थान

Tata Institute of Fundamental Research

सर्वे नं.151, शिवाकोटे, हैसराघट्टा, होब्ली, बेंगलुरु, कर्नाटक 560089

Survey No. 151, Shivakote, Hesaraghatta, Hobli, Bengaluru, Karnataka 560089

भारत सरकार के परमाणु ऊर्जा विभाग की एक स्वायत्त संस्थान एवं समविश्वविद्यालय

An Autonomous Institution of the Department of Atomic Energy of Government of India and a Deemed to be University

ICTS Statistical Physics and Condensed Matter Seminar

Title : Thermodynamics and dynamics of spm-3/2 ice

Speaker : Souvik Kundu (ICTS-TIFR, Bengaluru)

Date : Monday, 05 October 2026

Time : 3:30 PM - 5:00 PM (1ST)

Abstract : In rare-earth pyrochlores such as $\text{Tb}_2\text{Ti}_2\text{O}_7$, a low-lying crystal-field doublet calls for an effective spin-3/2 description of spin ice. I will show that the resulting competition between single-site anisotropy and exchange produces two topologically distinct Coulomb liquids, selected by the sign of the anisotropy. They have no local order parameter, but differ in their excitations: monopoles are deconfined in one and bound into composite motifs in the other. After a thermal quench, the first relaxes by ordinary monopole diffusion, while the second shows arrested relaxation, a rare example of dynamical arrest in a disorder-free, short-range model. Finally, I discuss the fate of spin-3/2 ice in an external magnetic field along [111]. Unlike ordinary spin-1/2 ice, which shows only a crossover in a [111] field, spin-3/2 ice undergoes a Kasteleyn transition driven by string proliferation.

Venue : Feynman Lecture Hall

Zoom Link: <https://icts-res-in.zoom.us/j/98485310683?pwd=GZDYFsRy80SNb4s8eCxbRgIjT3ZLct.1>

Meeting D: 984 8531 0683

Passcode: 302060