



ICTS Statistical Physics & Condensed Matter Seminar

Title : Gapped parent Hamiltonians for the strongly deformed toric code

Speaker : Manoj Nandagopal (Caltech, USA)

Date : Monday, 15 June 2026

Time : 11:30 AM (IST)

Abstract : Local non-unitary deformations of topologically ordered wavefunctions can drive quantum phase transitions into trivial phases; however, the resulting states can exhibit peculiar correlations---such as perimeter law of Wilson loops despite being in a vortex-condensed phase---that challenge modern perspectives on gapped quantum matter. In this talk, we will focus on one such example: the strongly deformed toric code "Castelnuovo-Chamon" state. Recent work has argued that no gapped parent Hamiltonian exists for these states; we refute this by constructing one explicitly using the Mayer cluster expansion from classical statistical physics. Beyond settling that these states are fully consistent with the standard framework of gapped quantum phases, this construction comes with a few nontrivial corollaries including a new dual description for the 2D classical Ising ferromagnet.

Venue : Madhava Lecture Hall

Zoom Link: <https://icts-res-in.zoom.us/j/95323923038?pwd=myTlOuWaiAnpeNkbpWxr4Vv0ckNlQl.1>

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