FRONTIERS OF QUANTUM MATTER

量子物质前沿讲座

Conference Hall 322
Science Building
Tsinghua University

Intrinsic Noisy Topological Orders from Symmetry and Tensor Network Perspectives

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Realizing fault-tolerant quantum computation with topological phases requires understanding the behaviors of the latter under noise. Interestingly, even in the strong-noise limit where the topological quantum memory is lost, the resultant mixed states can still exhibit intrinsic topological signatures. This talk examines such decohered topological phases through the lens of spontaneous breaking of generalized symmetries and their entanglement features. We also present exact tensor network representations of a broad class of mixed-state topological phases at strong decoherence, which are fixed points under renormalization. Examples include both Abelian and non-Abelian topological phases subject to various decoherence channels.