Jointly organized by the Department of Physics and HK Quantum Institute of Science & Technology

CTCP SEMINAR

Noninvertible Gauge Symmetry in (2+1)d Topological Orders: A String-Net Model Realization

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***Time:* Friday, September 20, 2024, 4:00pm**

Room 522, 5/F, Chong Yuet Ming Physics Building, The University of Hong Kong

Abstract:

We develop a systematic framework for understanding symmetries in topological phases in 2+1 dimensions using the string-net model, encompassing both gauge symmetries that preserve anyon species and global symmetries permuting anyon species, including both invertible symmetries describable by groups and noninvertible symmetries described by categories. As an archetypal example, we reveal the first noninvertible categorical gauge symmetry of topological orders in 2+1 dimensions: the Fibonacci gauge symmetry of the doubled Fibonacci topological order, described by the Fibonacci fusion 2-category. Our approach involves two steps: first, establishing duality between different string-net models with Morita equivalent input fusion categories that describe the same topological order; and second, constructing symmetry transformations within the same string-net model when the dual models have isomorphic input fusion categories, achieved by composing duality maps with isomorphisms of degrees of freedom between the dual models. If time permits, I will also talk about a subsequent work on anyon condensation.

ANYONE INTERESTED IS WELCOME TO ATTEND!

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