



Informal Seminar

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

赵雨

复旦大学

Time: 10:30 am, Oct. 16, 2024 (Wednesday)

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Venue: Room w563, Physics building, Peking University

地点: 北京大学物理楼, 西563会议室

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.

About the speaker

赵雨, 复旦大学物理系学士学位, 复旦大学理论物理在读博士, 导师万义顿教授, 研究兴趣是 topological order 的 symmetry structure.