

Laboratoire de Physique Théorique et Hautes Energies

Unité Mixte de Recherche (UMR 7589) de Sorbonne Université et du CNRS

SEMINAIRE du LPTHE

Jeudi 20 Fevrier 2025, 11:00

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IHES

A non-semisimple non-invertible symmetry

After reviewing the action of fusion category symmetries on spin chains, I will discuss the action of a non-semisimple, non-invertible symmetry whose topological defects encode the category of modules over the Taft algebra of dimension 4. I will present several non-Hermitian, symmetric, frustration-free, gapped Hamiltonians with real spectra and analyse their ground state subspaces. I will then reveal two intriguing phenomena. First, the identification of an $S1$ -parametrised family of symmetric states, all of which belong to the same gapped phase with respect to the invertible subsymmetry, yet transform inequivalently under the non-semisimple symmetry. Second, I will highlight a model where a product state and the so-called W state spontaneously break the symmetry, and argue that indistinguishability of these two states in the infinite volume limit stems from the notion that they are associated with a simple object and its projective cover, respectively, in a non-semisimple module category.

Bibliothèque du LPTHE, tour 13/14, 4^{ème} étage

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