THE CHINESE UNIVERSITY OF HONG KONG
Department of Physics
SEMINAR

A Klein-Four Way: Minimal Nondegenerate Extensions of $\mathrm{sVec}_{\mathbb{R}}$ and $\mathrm{sVec}_{\mathbb{H}}$

by

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Time: 2:00 - 3:00 p.m.
Place: Rm G26, Science Centre North Block, CUHK

ALL INTERESTED ARE WELCOME
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Abstract

Categories of vector spaces and super-vector spaces behave like fields. They are a base over which higher linear algebra can be defined. One important invariant of these categorified fields is the Witt group of nondegenerately braided fusion categories. In addition to categorifying the classical Witt group of quadratic abelian groups, this construction has been used by Lan, Kong, and Wen to classify (2+1)D topological orders. A key tool in understanding these Witt groups is the group of minimal nondegenerate extensions, which behaves something like a relative Witt group.

In the presence of antiunitary symmetries such as time-reversal, the resulting invariant topological orders ought to be describable using braided fusion categories over $\mathbb{R}$. This necessitates the use of a different categorified field, and it turns out that there are three choices: $\mathrm{Vec}_{\mathbb{R}}$, $\mathrm{sVec}_{\mathbb{R}}$, and the lesser-known $\mathrm{sVec}_{\mathbb{H}}$. We will explore the groups of minimal nondegenerate extensions of these categories, and derive the corresponding real analogues of Kitaev's famous 16-fold way.

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