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沖縄科学技術大学院大学

THEORETICAL SCIENCES VISITING PROGRAM

# TSVP TALK

## Topological Phases and Universal Fractional Quasiparticles

2023  
FRI.

**Feb. 17**

**16:00–17:00**

**HYBRID**

L4E48, ZOOM



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Topological phases are condensed matter systems whose low-energy ground states are quantum mechanically entangled in real space. Contemporary examples include the integer and fractional quantum Hall effect, topological insulators and superconductors, and chiral spin liquids. A consequence of quantum entanglement is the emergence of exotic quasiparticles - either in the form of intrinsic anyon excitations or extrinsic topological defects - that demonstrate fractional properties such as fractional electric charge and statistics. The spatial exchange and braiding of these quasiparticles give rise to unitary operations on quantum states that may be useful in building a topological quantum computer. In this talk, we explore a new family of topological systems that support fractional quasiparticles whose braiding operations are universal and densely map the quantum space.

University of Virginia

## Jeffrey Teo

Jeffrey Teo is a theoretical physicist specializing in topological phases of electronic condensed matter. This includes topological (crystalline) insulators and superconductors, integer and fractional quantum Hall states, and spin liquids. In particular, he focuses on the emergence of exotic quasiparticles and topological defects that exhibit fractional behaviors, such as electric charge and statistics. Jeffrey Teo completed his Ph.D. at the University of Pennsylvania. He was a Simons postdoctoral fellow at the University of Illinois, Urbana-Champaign. He is now an Associate Professor at the University of Virginia.



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