



Department of Physics and Astronomy  
FALL 2023 Colloquium Series

# “Combining Topology and Superconductivity: Can We Discover Unconventional Superconductors Methodically?”

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Superconducting materials are materials that can conduct electricity without any resistance. Some of them, called conventional superconductors, are well understood, and their discovery can now be guided using numerical calculations of their electronic and vibrational structure. Unconventional superconductors, on the other hand, resist our theoretical understanding, and their discovery relies mostly on serendipity. In this presentation, I will show that certain symmetries of the crystal structure can guarantee an unusual (topological) electronic band structure, which then enables an unconventional superconducting state.

Our findings provide a route to identify a new type of unconventional superconductors based on nonsymmorphic symmetries and will enable future discoveries of topological crystalline superconductors. I will discuss how a symmetry guided discovery of topological superconductors can be realized.

**Thursday, October 12, 2023**

**4:00 - 5:20PM**

**MND1015**

*Open & Free to all students, faculty and public*