

UNL Department of Physics and Astronomy presents:

## Van der Waals Topological Magnets

PRESENTED BY  
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**MONDAY**  
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**4:30 PM**  
**IN JH 136**

Refreshments will be served in the JH 1st Floor Vending Area at 3:30

### ABSTRACT

The breaking of time-reversal symmetry in topological insulators leads to novel quantum states of matter. One prominent example at the two-dimensional limit is the Chern insulator, which hosts dissipationless chiral edge states at sample boundaries. These chiral edge modes are perfect one-dimensional conductors whose chirality is defined by the material magnetization and backscattering is topologically forbidden. Recently, van der Waals topological magnet  $\text{MnBi}_2\text{Te}_4$  emerged as a new solid-state platform for studies of the interplay between magnetism and topology. In this talk, I will present an overview of our progress in control of topological phase transitions and chiral edge modes in  $\text{MnBi}_2\text{Te}_4$ . First, I will show how topological properties are intimately intertwined with magnetic states. I will then demonstrate electrical control of the number of chiral edge states. Finally, I will show the discovery of chiral edge modes along with the crystalline steps and how these modes can be harnessed for the engineering of simple topological circuits.



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