UNL Department of Physics and Astronomy presents:

Quantized Hall States in Emerging Two-dimensional Topological Materials towards Device Applications

PRESENTED BY
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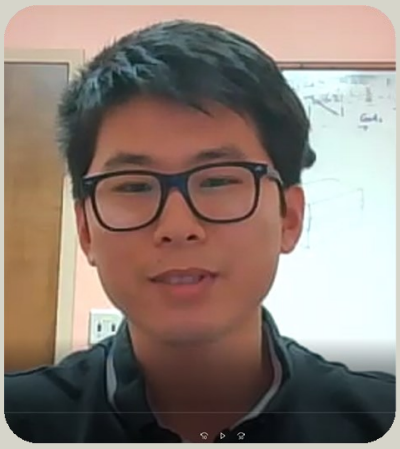

TUESDAY
MARCH 22
4:00 PM
IN JH 136

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

ABSTRACT

Quantum Hall (QH) effect and quantum anomalous Hall (QAH) effect are macroscopic manifestations of quantum phenomena in topological electronics systems. They feature dissipation-less zero longitudinal resistance and quantized Hall resistance that only depends on fundamental physical constants (h/e^2).

In this talk, I will present the material growth, quantum transport, and device applications of two emerging two-dimensional (2D) topological materials, Kramers-Weyl semiconductor 2D tellurene, and magnetic topological insulator Cr-doped $(BiSe)_2Te_3$, which hosts QH and QAH effects respectively. Unique material properties and electronic band structures are revealed by analyzing QH sequences and the scaling behavior in QAH. In addition, the high material quality and loss-less transport in quantized Hall states enable classical and quantum devices in various applications from MOSFETs, cryo-electronics, to quantum computing.