

# CONDENSED MATTER SCIENCES SEMINAR

## Professor Julia Chan

Baylor University

### Host

Dr Kaya Wei

### Title

**Lights, Camera, Diffraction: A Front-Row Seat Seeing Quantum Materials Grow**

**Friday, January 30<sup>th</sup>, 2026**

**1<sup>st</sup> Floor – B101**

**15:00-16:00**

### Abstract

The discovery and design of new materials systems and architectures are critical for advancing the frontier of highly correlated electron systems. Yet, solid-state synthesis remains inherently unpredictable, with challenges in phase formation, temperature control, and reaction ratios. Our research introduces a novel platform for creating “bulk heterostructures” of intermetallic compounds - an approach that opens unexplored pathways to study the interplay between itinerant electrons and localized magnetic moments. This strategy positions us to uncover structural subunits embedded within topological metals exhibiting strong correlations, a domain that has not been systematically explored. While selecting and synthesizing new phases is complex, our extensive experience and targeted candidate selection provide a unique starting point for breakthroughs in magnetism and emergent phenomena. In this talk, I will present our synthetic strategy for identifying and growing the most promising intermetallic candidates, paving the way for discoveries at the intersection of topology, magnetism, and strong correlations.