

CONDENSED MATTER SCIENCES SEMINAR

Professor Guillaume Gervais

McGill University

Host

Dr KunYang

Title

Wonder Material, Strange Hall, Funny Liquid

Monday, October 13th, 2025

1st Floor – B101

15:00-16:00

Abstract

In this talk, I will discuss our recent investigations into two physical systems that have historically been rich sources of unexpected and fascinating physics. The first is elemental bismuth, a material where Shubnikov–de Haas oscillations were first observed, and which continues to surprise with its complex and enigmatic electronic behavior. The second is the two-dimensional electron gas (2DEG) with ultra-high mobility—a platform that played a pivotal role in the discovery of the fractional quantum Hall effect.

While both systems present significant challenges in terms of device fabrication, it is striking that the most profound results that we found were not from deliberate design, but by sheer serendipity. These unanticipated discoveries have unveiled entirely new physical phenomena and are now opening promising avenues for further research into two-dimensional electron systems.