Department of Physics and Astronomy presents:
Berry Phase and Related Hall Effects

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

ABSTRACT

The Berry phase is a geometric phase in quantum mechanics\(^1\). It underscores many interesting topological phenomena, especially various quantized or extraordinary Hall effects\(^1,2\). The quest for quantum Hall effect (QHE) without external magnetic field leads to the exciting development of quantum spin Hall effect (QSHE)\(^3\), the emergence of topological classification of band insulators\(^4\), and eventually the realization of quantum anomalous Hall effect (QAHE)\(^5\). In parallel to the fascinating evolution of Berry phase phenomena in the momentum space, there is also a real space counterpart, the topological Hall effect (THE) which is associated with non-coplanar spin textures with scalar spin chirality. As such, the THE provides a powerful probe of the ground state and low-energy excitations of magnetic metals. I will present our recent research progress on the QAHE and the THE in magnetic thin films using magnetic imaging technique with \textit{in-situ} transport\(^6,7\).

REFERENCE