



# 524<sup>th</sup> ASRC Seminar



Date: 13:00 ~ 16:30, 18 July

Location: Meeting room 302, ASRC Building

Speaker: Dr. Wei Chen

(Max Planck Institute for Solid State Research)

Title: Flux Quantization and Inductance  
Due to Dipole Currents

We show that two quantities, defined as cross product of electric or magnetic field and the trajectory of the particle, manifest themselves in both quantum systems and classical electromagnetism. Quantum mechanically, they characterize the oscillation of spin current due to interference effect observed in various spintronic devices, including spin-FET, spin Josephson effect, and persistent spin current.

Following the same principle, we also propose a SQUID-like interferometer that uses exciton condensate observed in bilayer quantum Hall systems and bilayer graphene to produce an electric dipole current. In classical electromagnetism, these quantities are related to Faraday's law and Lenz's law of classical dipole currents. Changing these quantities induces an electromotive force, which serves as a new mechanism to generate classical, room temperature spin current or electric dipole current.



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