



## Weekly Seminar

# Thermal Hall effect in two-dimensional magnets

## Jung Hoon Han

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**Time: 3:00 pm, Oct. 30, 2024 (Wednesday)**

**时间: 2024年10月30日 (周三) 下午3:00**

**Venue: Room w563, Physics building, Peking University**

**地点: 北京大学物理楼, 西563会议室**

### Abstract

Various Hall effects in two-dimensional materials have been a key feature revealing the topological electronic structure in both momentum and real spaces. For insulating materials, analogous phenomena can take place in the thermal transport called the thermal Hall effect (THE). In this talk I discuss theoretical aspects of THE occurring in kagome lattice materials with both ferromagnetic and antiferromagnetic exchanges [1,2]. Time permitting, I also discuss the novel  $h/6e$  oscillation observed in the Little-Parks experiment on a  $\text{CsV}_3\text{Sb}_5$  thin film [3].

Refs.

[1] Thermal Hall effects of spins in a paramagnet, H. Y. Lee, JHH, Patrick A. Lee, Phys. Rev. B 91, 125413 (2015)

[2] Spin thermal Hall conductivity of a kagome antiferromagnet, H. Doki et al. Phys. Rev. Lett. 121, 097203 (2018)

[3] Understanding resistance oscillation in the  $\text{CsV}_3\text{Sb}_5$  superconductor, JHH and Patrick A. Lee, Phys. Rev. B 106, 184515 (2022)

### About the speaker

Jung Hoon Han leads the Theory of Information & Matter Group at Sungkyunkwan University in Suwon, South Korea. He earned his BSc in physics at Seoul National University, South Korea, in 1991 and his PhD in physics at the University of Washington in 1997 under David Thouless. His research focuses on understanding complex quantum behavior in real materials such as quantum Hall, high- $T_c$  cuprates, multiferroics, chiral magnets, multi-orbital bands, spinor Bose-Einstein condensates, and quantum magnets. More recently, he has worked on developing quantum and classical models with dipole symmetry.