

Plenary Talk

PV XV Thu 16:30 Audimax 2

Cavity Magnonics — ●CAN-MING HU — University of Manitoba, Winnipeg, Canada

Cavity Magnonics (also known as Cavity Spintronics and Spin Cavitytronics) is an emerging field that studies the light-matter interactions involving cavity photons and magnons [1-3]. Via the quantum physics of spin-photon entanglement on the one hand, and classical electrodynamic coupling on the other, magnon-photon coupling connects some of the most exciting modern physics, such as quantum information and quantum optics, with one of the oldest science on the earth, the magnetism.

This talk aims to introduce this frontier to the general audience of condensed matter physics. Starting with the intuitive example of cou-

pled harmonic oscillators, I will explain the concepts of coherent and dissipative coupling, based on which two streams of research will be presented: (i) The development of diverse quantum transducers utilizing coherent coupling. (ii) The study of dissipative coupling governed by a non-Hermitian Hamiltonian, which leads to intriguing effects such as level attraction, nonreciprocal microwave transmission, exceptional points, and bound state in continuum. Students who are looking for frontier research opportunities are encouraged to attend.

[1] C.-M. Hu, Phys. in Canada, 72, No. 2, 76 (2016); arXiv: 1508.01966 (2015).

[2] D. Lachance-Quirion, et al., Appl. Phys. Express 12, 070101 (2019).

[3] Babak Zare Rameshti, et al., arXiv: 2106.09312 (2021).