21 Dec Tuesday 2:15 – 3:00 Chair: WANG Qinghai (王清海)

Cavity Magnonics: Interplay Between Spins and Photons

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Professor WANG Yi-Pu received his B. S in Physics from Tongji University in 2013 and the Ph.D. in condensed matter physics from the China Academy of Engineering Physics in 2018. He was a post-doctoral fellow at University of Manitoba from 2018 to 2020. In Nov. 2020, he joined the Department of Physics, Zhejiang University, as an assistant Professor. His current research interests include the cavity magnonics, hybrid quantum system, and non-Hermitian physics.

Abstract:

Cavity magnonics is a new field of solid-state quantum information science, which is built on coherently or dissipatively coupled cavity photons and spin collective excitations (magnons) in a ferromagnetic spin ensemble. Due to the cavity magnonic system's flexible adjustability, it provides exceptional advantages in fundamental and applied research. At the moment, a number of novel achievements in cavity magnonics have been realized, including coherent coupling between magnon mode and superconducting qubit, magnon polariton bistability, magnon dark mode, magnon-based microwave to optical photon transduction, PT-symmetric and anti-PT-symmetric cavity magnonics, and non-reciprocal microwave transmission. These advancements have gradually elevated the cavity magnonic system to a vital platform for constructing quantum networks, hybrid quantum systems, and a variety of functional devices. This talk will review the development of cavity magnonics and discuss recent advances in non-Hermitian and non-linear cavity magnonics. Finally, the blueprint of the magnon-bridged quantum network will be presented.