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Spin excitation and manipulation in 2D magnets

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Abstract: Recent discoveries identified that long-range magnetic order persists in two-dimensional (2D) crystals down to monolayer atomic thickness. The advent of these 2D magnets has enabled both fundamental studies of electronic and magnetic interactions in reduced dimensions and novel spin manipulation approaches for spintronic device applications. In particular, they can be further combined with other functional van der Waals 2D materials, where their interlayer interactions can open up new optical and electrical pathways for controlling and reading out the spin states. In this talk, I will discuss how the spin states in 2D magnets, including CrI₃ and CrSBr, can be coupled to and manipulated by the pseudospin states in 2D semiconductors, characterized by magneto-optical spectroscopy measurements. Our results demonstrate the on-demand control provided by the spin-dependent charge transfer and tunneling effects across the 2D magnetic interface.

BIO: Dr. Zhang received her Ph.D. degree from Columbia University with Prof. Tony Heinz, followed by a postdoc appointment at Stanford University and then a Kavli postdoc fellow at Cornell University. She joined the Physics Department at the University of Florida in 2020 as an assistant Professor. Her research interest focuses on the optical spectroscopies, optoelectronics and optomechanical measurements of 2D materials, including 2D semiconductors, topological material, magnetic materials, and magnetic molecules.