UNL Department of Physics and Astronomy presents:

Magnetic Matchmaking: Hybrid Magnon Modes

PRESENTED BY

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ABSTRACT

Magnons are the fundamental excitations of magnetically ordered materials and span frequencies from GHz to THz at wavelengths down to the nm-regime. Because of their convenient frequencies and wavelengths, they have been considered for computational applications by encoding information into their phase and amplitude. Concurrently, magnons readily interact with a wide variety of different excitations, including microwave and optical photons, phonons, and other magnons. Such hybrid magnon dynamic excitations have recently gained increased interest due to their potential impact on coherent information processing [1]. This in turn opens new pathways for hybrid quantum information systems [2,3]. I will discuss two specific examples, where we developed fully integrated devices to demonstrate strong magnon-photon coupling in scalable coplanar devices [4], as well as magnon-magnon hybrid modes, which reveal new damping-like torques due to coherent spin pumping [5]. Lastly, I will show how we demonstrated strongly nonreciprocal magnon transduction using nano-scale microwave antennae [6]. This provides a practical way for implementing high performance magnon isolation in magnetic thin-film devices integrated with other microwave based devices.

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