# Weekly Seminar

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## Abstract

We develop a self-consistent theory for current-induced spin wave excitations in normal metal|magnetic insulator bilayer structures. We compute the spin wave dispersion and dissipation, including dipolar and exchange interactions in the magnet, the spin diffusion in the normal metal, as well as the surface anisotropy, spin-transfer torque, and spin pumping at the interface. We find that: 1) the spin transfer torque and spin pumping affect the surface modes more than the bulk modes; 2) spin pumping inhibits high frequency spin-wave modes, thereby red-shifting the excitation spectrum; 3) easy-axis surface anisotropy induces a new type of surface spin wave, which reduces the excitation threshold current and greatly enhances the excitation power. We propose that the magnetic insulator surface can be engineered to create spin wave circuits utilizing surface spin wave as information carrier.

## About the Speaker

Jiang Xiao obtained his B.S. in Physics from from Peking University in 2001, and Ph.D. in Physics as well as M.S. in Applied Mathematics from Georgia Institute of Technology in 2006. After performing postdoctoral research in the Kavli Institute of NanoScience at Delft University of Technology in The Netherlands, he joined Fudan University in 2009 as associate professor, and has been professor since 2012. His research is on the theoretical condensed matter physics, and focuses on spintronics, including spin transport in magnetic nanostructures, magnetization dynamics, parametric pumping, spin wave excitation, etc.