

# “Spintronics Preeminent Team Seminar Series”

February 16th, 2015 @ 1:00pm

BRK, ROOM 1001

**Gang XIAO**

Professor of Physics and Engineering  
and Director of the Center for Nanoscience & Soft Matter at Brown University

**Title: Giant Spin Hall Effect and Spintronics**

**Bio:** Professor Xiao joined the faculty at Brown in 1989. He is Professor of Physics and Professor of Engineering and the Director of the Center for Nanoscience and Soft Matter. Prof. Xiao is a fellow of the American Physical Society and an Alfred P. Sloan Research Fellow. He pursued his doctoral and postdoctoral studies at the Johns Hopkins University. He was an Alfred P. Sloan Fellow from 1990 to 1992. He received a five-year National Science Foundation Young Investigator Award in 1992. He was a recipient of the Outstanding Young Scientist Award from the Overseas Chinese Physicists Association in 1995. He received an IBM Partnership Award during 1997 to 1999. He has been a Visiting Scientist at IBM Watson Research Center, and a Visiting Professor at Hong Kong University of Science and Technology. Prof. Xiao is an experimental condensed matter physicist. He conducts research in the area of spintronics, magnetism, and nanoscale materials and devices. His research has been supported by the National Science Foundation, Department of Defense, and industrial sponsors.

**Abstract:** During the last couple of years, Giant Spin Hall Effect (GSHE) has received much attention for its interesting magnetotransport property and promising potential for spintronics applications, in magnetic random access memories (MRAM), spin logics (SL), RF devices, and magneto-optical components. Solids with large atomic numbers and resistivities exhibit very large Spin Hall Angle (SHA), a key and characterizing parameter of GSHE. The origin of GSHE is the enhanced spin-orbit coupling (SOC), based on which the search on solids with even larger SHA continues. I will present our recent research on GSHE in some transition metals which display some of the largest GSHE. These materials have shown the promise for MRAM and SL applications. They are compatible to modern semiconductor fabrication process.