SEMINAR ANNOUNCEMENT

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
COLLEGE OF DESIGN AND ENGINEERING
Website: https://cde.nus.edu.sg/ece

Area: Microelectronic Technologies & Devices

Host: Dr. Zhang Chenhui

TOPIC	:	**Antiferromagnetic Spin Hall Effect in Noncollinear AFM $IrMn_3$**
SPEAKER	:	**Mr. Pu Yuchen** **Graduate Student, ECE Dept, NUS**
DATE	:	**Friday, 30 June 2023**
TIME	:	**9:00AM to 9:30AM**
VENUE	:	**Join Zoom Meeting:** **https://nus-sg.zoom.us/j/81282698228?pwd=NWFsd0NvOFVYVW5vZEtJQ2U1cjFzQT09** **Meeting ID: 812 8269 8228** **Passcode: 430367**

ABSTRACT

Due to spin-orbit interactions, a transverse spin current can be generated by an electric current, with spin perpendicular to the plane of the two currents, which is called Spin Hall effect. This spin current can switch the magnetization of adjacent ferromagnetic layer. However, the spin current with in-plane components cannot switch the ferromagnetic layer with perpendicular magnetization without an in-plane external magnetic field. To achieve field-free switching, spin currents with more general spin orientations are required. The spin current can be generated by noncollinear antiferromagnet because of the broken spin rotation symmetry induced by the noncollinear magnetic structure. Here, we deposited the noncollinear antiferromagnet $IrMn_3$ and measured the spin Hall effect using spin-torque ferromagnetic resonance (ST-FMR). Spin currents with out-of-plane component was observed and field-free switching was achieved.

BIOGRAPHY

Pu Yuchen received his Bachelor's degree from Xi'an Jiaotong University in 2018 and his Master's degree from Tsinghua University in 2021. He is currently a Ph.D. student in Prof. Hyunsoo Yang's group in School of Electrical and Computer Engineering at NUS. His research interests include spin orbit torques and stochastic computing.