

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: Professor Wu Yihong

TOPIC	:	Enhanced Anomalous Hall Effect in Cr Modulation-doped Mn ₃ Sn Thin Films
SPEAKER	:	Mr. Chen Xin Graduate Student, ECE Dept, NUS
DATE	:	Tuesday, 20 December 2022
TIME	:	2.00PM to 2.30PM
VENUE	:	Join Zoom Meeting: https://nus-sg.zoom.us/j/86022331693?pwd=cGhiVStxcFc1UG9QdHA2cDhqZitjdz09 Meeting ID: 860 2233 1693 Passcode: 192141

ABSTRACT

Recently Mn₃X (X = Sn, Ge, Ga, Rh, Ir, Pt) based non-collinear antiferromagnets (AFMs) have attracted significant attention because, unlike the widely studied collinear AFMs, these noncollinear AFMs exhibit large anomalous Hall, anomalous Nernst and magneto-optical Kerr effects at room temperature. As the distribution of the non-zero Berry curvature and their relative positions to the Fermi level play an important role in determining the transport properties of Mn₃X-based AFMs, one of the possible pathways is to tune the Fermi level by chemical doping without significantly affecting the electronic band structures. In this seminar, we report on Cr doping effect in Mn₃Sn polycrystalline films with both uniform and modulation doping. It is found that Cr doping with low concentration does not cause notable changes to the structural and magnetic properties of Mn₃Sn, but it significantly enhances the anomalous Hall conductivity, particularly for modulation-doped samples at low temperature. A Hall conductivity as high as 184.8 $\Omega^{-1} \text{ cm}^{-1}$ is obtained for modulation-doped samples at 50 K, in a sharp contrast to vanishingly small values for undoped samples at the same temperature.

BIOGRAPHY

Chen Xin is currently a Ph.D. student under the supervision of Professor Wu Yihong in Electrical and Computer Engineering Department, National University of Singapore. His research mainly focuses on the characterization of magnetic multilayers and magnetic sensors.

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