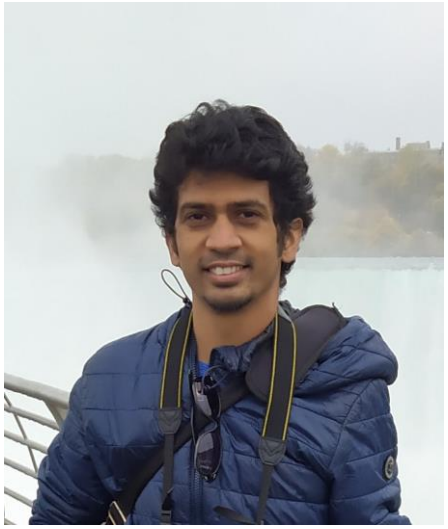
W2S Seminar
(Webinar series on Spintronics)



Spin-Orbit Effects in Spintronics

Speaker:
Dr. Arnab Bose
Department of Applied and Engineering Physics
Cornell University, US

Date and time:
28.01.2021 at
11.00 am
Via
Zoom

Abstract

Since past few years Dirac and Weyl semimetals have been emerged as a new class of topological material. Despite several theoretical predictions the connection between the Dirac nodal lines (DNL) and the spin Hall conductivity (SHC) was not experimentally observed. We report a large anisotropic SHC in single crystal IrO_2 semimetals that originates from the DNLs present in it's band structure. We report that RuO2 which has similar crystal structure of IrO_2, exhibits distinctly different sort of spin-orbit torques (SOT) compared to IrO_2, including the unconventional out of plane damping like torque that depends on the direction of the current flow with respect to the crystal axis. This unconventional SOTs are generated from the broken mirror symmetry due to the anti-ferromagnetic (AFM) coupling between RuO_2 and the adjacent magnet. This work highlights the role of AFM moments in DNL semimetals to generate SOT.

If interested to attend then please visit https://www.niser.ac.in/w2s-seminar/index.php