

Seminar

Orbitronics with orbital angular momentum magnets: generation, transport, torques, pumping and magnetoresistive effects

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Orbitronics explores the generation and transport of orbital angular momentum (OAM) currents in solids and can be generated directly and efficiently from charge currents in light, abundant materials such as Cu, Al, Cr, for energy efficient applications. We demonstrate strongly enhanced torques on Co layers at Co/Al and Cu/CuO_x interfaces, using Pt for orbital-to-spin conversion when required. These orbital torques reduce the switching power of magnetic memory devices by up to 50%. We also distinguish orbital from spin pumping in Nb/Ni and Nb/CoFeB bilayers. Non-local measurements reveal non-reciprocal OAM transport from Ru and negative orbital torques generated by V. Finally, orbital-dominated magnets enable all-orbitronic devices with effects enhanced by up to two orders of magnitude, promising energy-efficient green technologies.

Monday, Aug 17th 2026

14:30 Hrs (Tea / Coffee 14:15 Hrs)

Auditorium, TIFRH