

Sachin Kumar
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ACADEMIC QUALIFICATIONS

2022 – Present	PhD, Department of Physics, IIT Kanpur (CPI 8.75, First year course)
2020-2022	M.Sc. (Physics), Department of Physics, IIT Kanpur (CPI 8.15)
2017-2020	B.Sc. (Physics), University of Lucknow (Percentage = 80.8 %)

RESEARCH INTEREST

1. **Spintronics:** Spin Hall effect, Inverse spin Hall effect, Spin pumping, Spin transfer torque (STT) and Spin-orbit torque (SOT) based spin devices.
2. **Nano-magnetism:** Linear and non-linear magnetization dynamics, Magnetic data storage and Perpendicular magnetic anisotropy materials.

Publications (Under preparation/submitted/online)

1. *Dense plasma irradiated platinum with improved spin Hall effect*, **Sachin Kumar**, Sourabh Manna, John Rex Mohan, Utkarsh Shashank, Joseph Vimal, Mayank Mishra, Surbhi Gupta, Rajdeep Singh Rawat, Hironori Asada, Yasuhiro Fukuma and Rohit Medwal* <https://doi.org/10.1142/S2010324723400246> (Published in 2023 SPIN).
2. *Orbital moment-controlled spin relaxation ion the S-implanted NiFe*, **Sachin Kumar**, K. Asokan, Rohit Medwal* (Under preparation)

RESEARCH PROJECTS COMPLETED

1. **M.Sc. Research Project** [3 Jan 2022 to 6 May 2022]: *Dynamics of Polymers in Drying Solutions*, Guide: Prof. Sivasurender Chandran, IIT Kanpur
2. **Summer Project** [21 May 2022 to 9 July 2022]: *Study of Inertial regime in Magnetization dynamics*, Guide: Prof. Rohit Medwal, IIT Kanpur
3. **Research Project** [15 December 2022 to 28 February 2023]: *Investigation of Ferromagnetic Resonance in YIG and YIG/Pt thin films*, Mentor: Prof. Rajdeep Singh Rawat, NTU, Singapore

HAND-ON EXPERIENCE

Characterizations	Techniques
Spin Transport	(1) Spin Torque ferromagnetic resonance (2) Spin Pumping-Inverse Spin Hall effect
Magnetometry	(1) Vibrating Sample Magnetometer (VSM), (2) Ferromagnetic Resonance (FMR) (3) X-ray magnetic circular dichroism (XMCD)
Crystallography	(1) X-ray Diffraction (XRD) (2) X-ray Reflectivity (XRR)
Electronics properties	(1) X-ray Absorption Spectroscopy (XAS) (2) X-ray photoelectron spectroscopy
Programming skill set	(1) Python, MATLAB, Wolfram Mathematica, and OriginLab. (2) Micromagnetic simulation software Mumax ³

EXPERIENCE AND PRESENTATION

1. Poster Presentation in Institute Research Symposium ([IRS 2023](#)) IIT Kanpur (4 to 5 Nov 2023)
2. Participant in Research School Program ([Sakura Science](#)) at Kyushu Institute of technology, Japan (10 to 19 Dec 2023)
3. Poster Presentation in [ICFM 2024](#) at IIT Kharagpur (9 to 11 Jan 2024)
4. Poster Presentation in Research Scholar Day organized by Physics department IIT Kanpur (5 Apr 2024)

ACHIEVEMENTS

IIT JAM Qualified (AIR- 199)

TEACHING ASSISTANSHIP

1. Teaching assistant in PHY111 (UG LAB) and PHY441 (Electronics) in IIT Kanpur
2. Experimental physics demonstration in Chhatrapati Shahu Ji Maharaj University, Kanpur