



Shaheed Rajguru College of Applied Sciences for Women
University of Delhi
Faculty Profile

Name	Dr. Rajan Goyal	
Designation	Assistant Professor	
Email	rajangoyal68@gmail.com	
Degree	Institution	Year
B.Sc(H) Physics	KiroriMal College, University of Delhi	2007-2010
M.Sc Physics	IIT Delhi	2010-2012
Ph.D.	Department of Physics and Astrophysics, University of Delhi	2013-2018
Areas of Interest / Specialization		
My research interests lie at the intersection of experimental condensed matter physics and magnetism, focusing on the fabrication, advanced characterization, and computational modeling of magnetic thin films and nanostructures. I am particularly interested in investigating magnetization reversal mechanisms, effective magnetic anisotropy, and the influence of ion-beam irradiation on the structural and magnetic properties of transition metals and their alloys.		
Core Research Competencies		
• Thin Film Fabrication: Synthesis of high-quality thin films using RF and DC magnetron sputtering. • Computational & Micromagnetic Modeling: ○ Simulation of hard/soft magnetic nanostructures. ○ Investigation of effective anisotropy and spin reversal mechanisms using Monte Carlo simulations. ○ Micromagnetic modeling using the Object Oriented Micromagnetic Framework (OOMMF) package. • Structural & Compositional Characterization: ○ X-ray Diffraction (XRD) with Rietveld refinement for phase quantification. ○ Rutherford Backscattering Spectrometry (RBS) and Energy Dispersive X-ray Spectroscopy (EDS) for compositional analysis. • Magnetic & Morphological Analysis: ○ Magnetic property measurements using Vibrating Sample Magnetometry (VSM). ○ Surface morphology and topography studies via Scanning Electron Microscopy (SEM) and Atomic Force Microscopy (AFM). • Ion-Beam Modification: Expertise in studying the effects of ion irradiation and implantation on		

materials

Research Publications

- **R. Goyal**, N. Sehdev, S. Lamba, S. Annapoorni "Nucleation controlled magnetization reversal mechanism in oriented L1₀FeCoPt ternary alloys" Solid State Communication, 226 (2016) 44-50
- **R. Goyal**, S. Lamba, S. Annapoorni "Growth of Cobalt nanoparticles in Co-Al₂O₃ thin films deposited by RF sputtering." Physica Status Solidi (A) Applications and Materials Science, 213 (2016) 1309-1316
- **R. Goyal**, A. Kapoor, S. Lamba, S. Annapoorni "Origin of open recoil curves in L1₀-A1 FePt exchange coupled nanocomposites thin films." Journal of Magnetism and Magnetic Materials, 418 (2015) 200-205
- **R. Goyal**, N. Arora, A. Kapoor, S. Lamba, S. Annapoorni "Exchange hardening in FePt/Fe₃Pt dual exchange spring magnet: Monte Carlo Modelling." Journal of Alloys and Compounds, 695 (2017) 1014-1019
- **R. Goyal**, R. Gupta, A. Negi, K. Asokan, D. Kanjilal, S. Lamba, S. Annapoorni "Modelling of pinning-depinning reversal mechanism in ion irradiated Co/Al₂O₃ thin films." Physica Status Solidi (A) Applications and Materials Science, 215 (2018) 1800141
- **R. Goyal**, S. Lamba, S. Annapoorni "Modelling of pinning-depinning reversal mechanism in ion irradiated Co/Al₂O₃ thin films" Progress in Natural Science: Materials International 29 (2019) 517-524.
- Garima Vashisht, **R. Goyal**, Manju Bala and S. Annapoorni "Studies of Exchange Coupling in FeCo/L1₀-FePt Bilayer Thin Films." IEEE Trans. on Magnetics 55 (2019) 1-5
- R. Gupta, **R. Goyal**, R. Medwal and S. Annapoorni, "Optimizing Fe₃Pt/Pt Thin Films with Ag Additives: Structural and Magnetic Analysis" 34 (2025) 23680-23687
- R. Gupta, **R. Goyal**, R. Medwal and S. Annapoorni "Structural and magnetic transformation in electrochemically synthesized FePt thin films on Si/Pt electrodes." AIP Conf. proceedings 1591 (2014) 107-109
- G. Vashisht, **R. Goyal**, S. Annapoorni "Exchange Stiffness Variation for Thermally Annealed FeCo Thin Films." AIP Conf. proceedings (2017)
- P. Kumar, G. Rana , G. Dixit , A. Kumar , V. Sharma, **R. Goyal**, K. Sachdev , S. Annapoorni , K. Asokan "Structural, electrical and magnetic properties of dilutely Y doped NiFe₂O₄ nanoparticles." J. Alloys and Compounds 685 (2016) 492-497.
- P. Kumar, V. Sharma, A. Sarwa, A. Kumar, Surbhi, **R. Goyal**, K. Sachdev, S. Annapoorni, K. Asokan and D. Kanjilal. "Understanding the origin of Ferromagnetism in Er doped ZnO System." RSC

Adv. 6 (2016) 89242.
Books Published
• R. Goyal, M. Dhingra “Programming in Scilab”, Narosa Publishing House, ISBN: 978-81-8487-647-5
Awards and Distinctions
Sh. N. S. Khare Memorial Award for obtaining 1st position in College in academic year 2009-2010. Dr. N. Subrahmanyam Award for obtaining 1st position in College in academic year 2009-2010. SCILAB TOOLBOX HACKATHON CHAMPIONSHIP CERTIFICATE an initiative of the FOSSEE (Free/Libre and Open Source Software in Education) project, IIT Bombay.
Other Qualifications
• Domain Certification in Data Science, NPTEL, October 2021