Sudip Pandey, PhD
(No sponsorship required, willing to relocate)
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Summary

Applied physicist with 8+ years of research experience in design, synthesis, and characterization of multifunctional nanoscale materials with expertise in thin film processing, vacuum systems, materials properties, equipment development, big data analysis, machine learning, half metals, spintronics, superconductors, neutron and Xray measurements. Extensive experience in materials fabrication and characterization at different US National Labs (APS, ALS, NSLS2, NIST, ORNL), Nano3 cleanroom facility of Calit2, and Center for Memory and Recording Research of UC San Diego. Passionate about learning new things and techniques as well as employing knowledge and skills to yield solutions to various challenges in science and technology.

Key Skills

- Materials design and synthesis including bulk and thin films
- Materials characterization techniques such as magnetometry, magnetotransport, x-ray reflectivity & diffraction, electron microscopy, specific heat, thermal analysis
- Ultra-high vacuum technology
- Synchrotron x-ray and neutron measurements
- Spin valve devices processing
- Project management: build plan, technical proposal writing
- Data collection and analysis using Python, R, MATLAB
- Troubleshoot methods and instrumentation
- Machine learning fundamentals with Python and R
- Experiment design, Laboratory management
- Manuscript/report writing, data presentation
- Multi-tasker, experimental excellence
- Independent and fit for team-based work
- Enthusiastic researcher, journal reviewer
- Leadership and time management skills
- Collaborative, creative and productive
- Writing grant proposals
- Deliver results in accurate and timely manner
- Maintain and regulate the safety in the laboratory
- **Characterization tools:** SQUID, VSM, DSC, TEM, SEM, MFM AFM, XRD, XRR, RSXR, XMCD, SAXS, GISAXS, XPCS, NSE, PBR, SANS
- **Software:** MATLAB, C++, Python, Tableau, R, SQL, MSoffice, Origin, IgorPro, SasView

Education

Ph.D., Applied Physics **08/2015-12/2018**
***Department of Physics,* Southern Illinois University, Carbondale, IL**
Dissertation title: Exploring the structural, electronic, and magnetoresponsive properties of novel magnetic materials in bulk, ribbons, and thin films

M.S. Physics **08/2013-08/2015**
***Department of Physics*, Southern Illinois University, Carbondale, IL**
Thesis title: Magnetic, transport, and magnetocaloric properties of boron doped Ni-Mn-In alloys

M.Sc., Physics **11/2009-05/2012**
***Central Department of Physics,* Tribhuvan University, Kathmandu, Nepal**

Honors and Awards

- Outstanding Dissertation Award, Southern Illinois University, Carbondale (2020)
- Outstanding Master's Thesis Award, Southern Illinois University, Carbondale (2015)
- Doctoral Fellowship, Graduate School, Southern Illinois University, Carbondale (2017)
- Graduate School, Dissertation Research Award, SIUC (2018)
- Willis Swartz Award (2017)
- Graduate and Professional Student (GPSC) Research Award (2016 and 2017)
- Robert & Teresa Zitter Physics Scholarship (2017)
- Travel award from APS for CAM Physics Conference, Washington D.C., Aug. 17-19 (2017)
- First place for poster presentation in GSCARF, Southern Illinois University, Carbondale, April 4 (2017)
- Publons Peer Review Award (2018)
- Nominated by International Journal of Hyperthermia for the Editors Award (2018)
- Aldo Migone, Morteza Daneshdoost, Marvin Zeman Scholarship (2016)

Work Experiences

Postdoctoral Scholar **02/2019-present**
Condensed Matter Physics by X-ray and Neutron Scattering Lab
University of California San Diego, La Jolla, CA

- Neutron and x-ray scattering studies on magnetic thin films
- Superconducting spintronics, spin valve devices
- Search for periodic modulations in loop current ordering in the high Tc Cuprate superconductors
- Domain walls dynamics in antiferromagnets and dynamics of spin glass systems
- Extraordinary responsive rare earth magnetic materials
- Ordered gold nanoparticle structures in multilamellar lipid-nanoparticle nanocomposites

Research Assistant **10/2013-12/2018**
Magnetic Properties Laboratory, Department of Physics, Southern Illinois University, Carbondale, IL

- Synthesis, and characterization of multifunctional magnetic materials including bulk, ribbons, and thin films
- Designed and developed half-metallic (spin-polarized) materials for spintronics technologies
- Explored exotic phases of Heusler and rear earth compounds in low temperature, high-magnetic field and pressure.
- Investigated giant magnetoresistance, hall effects, and exchange bias in magnetic films and bulks
- Explored magnetocaloric materials for room temperature refrigeration applications
- Synthesized self-controlled magnetic hyperthermia materials
- Trained and supervised undergraduate and graduate students

Teaching Assistant **08/2013-08/2016**
Department of Physics, Southern Illinois University, Carbondale, IL

- Taught- PHYS 253A/255A College Physics Lab, PHYS 253B/255B University Physics lab

Professional Development

- CHRNS Summer School on the Fundamentals of Neutron Scattering at NIST, Gaithersburg, MD (2019)
- National School on Neutron and X-ray Scattering, ORNL & ANL, July 30 – August 13 (2016).
- Advanced Materials Characterization Workshop, UIUC, June 2-3 (2015).

Summary of Publications and Presentations

- Total number of Peer Reviewed Articles: 41 (19 as a lead author)
- Total number of Presentations/Seminars: 45

Selected Presentations

- *Interfacial spin structure and spin-triplet superconductivity in magnetic-superconducting heterostructures*, APS March Meeting, March 15-19 (2021)
- *X-ray magnetic circular dichroism study of the boron substituted Ni-Mn-In thin films*, International Conference on Magnetism (ICM), San Francisco, July 15-20 (2018)
- *Neutron diffraction studies of the boron substituted Heusler alloy* $Ni_{50}Mn_{35}In_{14.25}B_{0.75,}$ Magnetism and Magnetic Materials (MMM) Conference, Pittsburg, Nov. 6-9 (2017)
- *Optimizing magnetic properties for self-controlled hyperthermia applications*, 11th International Conference on the Scientific and Clinical Applications of Magnetic Carriers, Vancouver, Canada, May 31- June 4 (2016)
- *Magnetic and magnetocaloric properties of B doped Ni-Mn-In alloys*, Canadian-American-Mexican Graduate Student Physics Conference, Oaxaca, Mexico, Sep. 9-12 (2015)

Selected Peer- Reviewed Articles

1. *Mn2FeSi: An antiferromagnetic inverse-Heusler alloy*, Journal of Alloys and Compounds, **823**, 153770 (2020)
2. *Drastic Violation of the Basic Correlation Between the Hall Effect and Resistivity in the Heusler alloy* $Ni_{45}Cr_5Mn_{37}In_{13}$, Journal of Magnetism and Magnetic Materials, **481**, 25-28 (2019)
3. *The adiabatic temperature changes in the vicinity of the structural and magnetic phase transitions of the* $Ni_{45}Mn_{43}CoSn_{11}$ *at high magnetic field*, IEEE Transactions on Magnetics **55**(2), 1-5 (2019)
4. *Giant field induced adiabatic temperature changes in In-based off–stoichiometric Heusler alloys*, Journal of Applied Physics, **121**, 133901 (2017)
5. *Enhancement of ferromagnetism by substituting Cu for Mn in Ni-Mn-In-B,* Adv. Mat. Lett., **8**, 702-706 (2017)
6. *Thermosensitive Ni-based magnetic particles for self-controlled hyperthermia applications*, Journal of Magnetism and Magnetic Materials, **427**, 200-205 (2017)
7. *Magnetic and magneto-transport studies of substrate effect on the martensitic transformation in a NiMnIn shape memory alloy*, JETP Letters, **101**, 385–389 (2015)
8. *Multifunctional properties related to magnetostructural transitions in ternary and quaternary Heusler alloys*, Journal of Magnetism and Magnetic Materials, **383**,186-189 (2015)

For complete list of publications: Google Scholar Link