



## Dr. Sanjay Sharma

Assistant Professor  
MITVPU, Solapur

- Date of Birth:** March 02, 1994
- MIT Vishwaprayag University, Solapur, Maharashtra
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## Research Interests

- Condensed Matter Physics
- Magnetism in Thin Films
- Magnetism in Topological Insulators
- Magnetism in Heusler alloys
- Magnetism in Weyl Semi-metals
- Thermoelectric generators
- Thermomagnetic generators

## Technical Skills

### Programming:

- C, C++
- FORTRAN, MATLAB
- Python
- Bash scripting

### Calculation Tools:

- Quantum Espresso
- VASP, Wien2k

### Data Analysis Tools:

- Origin, FullProf
- MS Excel, Gnuplot

### Writing & Editing Tools:

- Inkscape, Photoscape
- MS Word, Powerpoint
- LaTeX
- GIMP, Photoshop

## Experience

- Jan. 2024 – **Assistant Professor** MITVPU  
Current at School of Computing, MIT Vishwaprayag University, Solapur, Maharashtra
- Sept. 2023 – **Research Associate** IIT Bombay  
Jan. 2024 for a project entitled "Search for novel topological materials: A joint theoretical and experimental investigation" at the Department of Physics.
- 2018–2022 **Teaching Assistant** IIIT Allahabad  
for the courses of Engineering Physics & General Physics Lab.

## Education

### Postgraduate Studies

- 2018 – 2023 **Ph.D. in Condensed Matter Physics** IIIT-A, India  
**Title:** Experimental and Theoretical study of the Magneto-thermal and Magneto-transport properties in rare-earth based inter-metallic compounds.  
**Supervisor:** Dr. Pramod Kumar  
**Grade:** CGPA: 9.11

- Magnetism
- Magnetocalorics
- Rare-earths
- Intermetallics
- Heusler alloys
- Density Functional Theory

- 2015 – 2017 **M.Sc. in Physics (Computational Physics)** CUPB, Punjab, India  
**Title:** Transportation in Quantum Dots: Basic Need of a Smart World  
**Supervisor:** Dr. Prakash Parida  
**Grade:** CGPA: 7.24

- Nano-junctions
- Model Hamiltonian
- Coulomb Blockade
- Pauli Blockade
- Quantum Transportation

### Undergraduate Study

- 2012 – 2015 **B.Sc. in Physics Honours** University of Delhi, India  
**Percentage:** 77.03%

## Awards and Scholarships

- March 2018 Qualified Graduate Aptitude Test in Engineering (GATE) for Physics MHRD
- July 2018 Awarded Junior Research Fellowship for Ph.D. MHRD
- Nov 2020 Awarded Senior Research Fellowship for Ph.D. MHRD

## Experimental Skill-set

- Expert in bulk sample preparation by using **Vacuum Arc Melting**.
- Well experienced in Thin-film deposition using **RF/DC Sputtering** and **Thermal Evaporation techniques**.
- Adept at magnetic samples characterization using **PPMS (Quantum Design)** and their data analysis.
- Hands-on experience in **XRD characterization** and data analysis.
- An adequate experience in **Hall measurements** (with LakeShore-8400 series) and data analysis.

## Short Intro

Dr. Sanjay Sharma is an Assistant Professor of Physics at MIT Vishwaprayag University, Solapur, India. He earned his Ph.D. in July 2023 and previously worked as a Research Associate at IIT Bombay, focusing on novel topological materials. His research involves the theoretical and experimental analysis of magnetic materials, with a strong emphasis on Density Functional Theory (DFT) and first-principles investigations. He explores the physics of Heusler alloys, Weyl semimetals, and topological materials in both bulk and thin-film forms.

With a passion for teaching and research, he integrates problem-based learning (PBL) and technology-driven methods to enhance student engagement. Beyond academia, he enjoys intellectual discussions, exploring languages and cultures, reading, traveling, music, running, and badminton.

## Competencies

- ✓ Resilient working attitude
- ✓ Diligent Researcher
- ✓ A quick learner
- ✓ Inquisitive Nature
- ✓ Problem solving aptitude
- ✓ Group leading capabilities
- ✓ Project Management abilities
- ✓ Hard work and punctuality

## Languages

Hindi (Mother Tongue)

English (Professional Proficiency)

Punjabi (Native)

## Profiles



## Conferences, Schools and Workshops

### Oral Presentation

19-20 Feb.  
2021

#### International Conference

Online Mode

on **Technological Advancements in Materials Science and Manufacturing** organized by Mechanical Engineering Department, Graphic Era University, Dehradun, Uttarakhand, India.

**Title:** XPS analysis of  $Gd_5Ge_2Si_2$  and its Co-substituted alloy.

### Poster Presentation

20-22 Feb.  
2020

#### International Conference

Noida, India

on **Advanced Materials and Nanotechnology (AMN-2022)** organized by Department of Physics and Material Science and Engineering, Jaypee Institute of Information Technology, Noida, India.

**Title:** A comparative study on magnetocaloric effect in  $NdRu_2Si_2$  and  $NdRu_2Ge_2$ .

10-14 Jan.  
2022

#### 15th Joint MMM-Intermag Conference

Online Mode

based in New Orleans, LA, USA.

**Title:** Modifications in the magnetocaloric effect owing to composition changes in  $Gd_2In_{1-x}Ge_x$  ( $0 \leq x \leq 0.2$ ) system of compounds.

### Attended

14-20 Jan.  
2019

#### National Workshop

Himachal Pradesh, India

on **In-Silico approach for modelling new materials: Methodology & Applications** organized by Department of Physics and Astronomical Science, Central University of Himachal Pradesh, India.

13-15 Oct.  
2019

#### XXXIV Annual IAPT Convention

Prayagraj, India

on **Recent Advances & Innovations in Physics Teaching & Research** organized by Department of Applied Sciences, IIIT Allahabad, India.

23-25 Feb.  
2021

#### 20th International Workshop

Online Mode

on **Computational Physics and Materials Science: Total Energy and Force Methods** organized by the Abdus Salam International Centre for Theoretical Physics, Italy.

6-17 Sept.  
2021

#### The European School on Magnetism 2021

Online Mode

**:from fundamental properties of matter to magnetic materials and applications** organized by the European Magnetism Association.

## References

Ref. 1

**Dr. Pramod Kumar**

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Ref. 2

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IIT Patna, India

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# Publications




## Journals

- **Anomalous Magnetic Properties in  $LaFe_{11.5}Al_{1.5}$**   
 **Sanjay Sharma**, F. Ahmad, A. Singh, A. K. Patel, P. Kumar  
 *Physical Chemistry Chemical Physics*  January 2020  [doi](#)
- **Critical analysis of chemical and hydrostatic pressure-induced  $Gd_5Si_2Ge_2$  alloy**  
 **Sanjay Sharma**, A. K. Patel, P. Kumar  
 *Materials Today Communications*  February 2021  [doi](#)
- **Modifications in the magnetocaloric effect owing to composition changes in  $Gd_2In_{1-x}Ge_x$  ( $0 \leq x \leq 0.2$ ) system of compounds**  
 **Sanjay Sharma**, P. Kumar  
 *AIP Advances*  March 2022  [doi](#)
- **Effect of Ni substitution on the structural, magnetic, and thermodynamic properties in  $Gd_{2-x}Ni_xIn$  ( $0 \leq x \leq 1$ ) intermetallic compounds: An experimental and theoretical study**  
 **Sanjay Sharma**, S. Singh, A. K. Patel, S. K. Gupta, P. N. Gajjar, P. Kumar  
 *Intermetallics*  October 2022  [doi](#)
- **$Bi_2Te_2Se$  and  $Sb_2Te_3$  heterostructure based photodetector with high responsivity and broadband photoresponse: Experimental and theoretical analysis**  
 S. K. Verma, **Sanjay Sharma**, G. K. Maurya, V. Gautam, R. Singh, A. Singh, K. Kandpal, P. Kumar, A. Kumar, C. Wiemer  
 *Physical Chemistry Chemical Physics*  September 2023  [doi](#)
- **Strain induced photocurrent enhancement in thin films of topological insulators ( $Bi_2Te_3$ )**  
 A. Pandey, **Sanjay Sharma**, A. Gangwar, M. Kaur, P. Singh, S. Husale  
 *Journal of Materials Chemistry C*  September 2023  [doi](#)
- **Bulk induced photo-current in topological insulating materials ( $Bi_2Se_3/Si$ ) heterojunction for highly responsive photodetectors**  
 V. Gautam, S. Gautam, **Sanjay Sharma**, S. K. Verma, G. K. Maurya, S. Kushvaha, P. Kumar  
 *Journal of Physics D: Applied Physics*  November 2024  [doi](#)
- **Understanding the mysterious nature of Sb substitution on structural, magnetic and transport properties in  $FeMnSn_{1-x}Sb_x$  ( $0 \leq x \leq 0.5$ ): An experimental and theoretical study**  
 **Sanjay Sharma**, A. K. Patel, P. Kumar  
 *Under Preparation*

## Conference Proceedings

- **A comparative study on magnetocaloric effect in  $NdRu_2Si_2$  and  $NdRu_2Ge_2$**   
 **Sanjay Sharma**, R. Singh, G. K. Maurya, F. Ahmad, A. Singh, A. Tiwari, P. Kumar  
 *Materials Today: Proceedings*  February 2020  [doi](#)
- **XPS analysis of  $Gd_5Ge_2Si_2$  and its Co-substituted alloy**  
 **Sanjay Sharma**, P. Kumar  
 *Materials Today: Proceedings*  February 2021  [doi](#)

## Book Chapters

- **Inverse magneto-caloric effect in single crystal of  $Ca_3Ru_3O_7$**   
 P. Kumar, R. Singh, F. Ahmad, **Sanjay Sharma**, A. Singh, R. Kumar  
 Recent Advances & Innovations in Physics Teaching & Research: Proceedings of the 34th IAPT Convention 2019  
 1-4 **ISBN:**978-620-0-78765-1 **Publisher:** Lambert Academic Publishing

*Sanjay Sharma*