

Curriculum Vitae

Dr. Pradeep Kumar Sharma

Assistant Professor
Department of Physics
Shyam Lal College
University of Delhi



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Present Position:

**Assistant Professor, Department of Physics, Shyam Lal College, University of Delhi,
Since July 2013**

Experience:

**A Total Teaching Experience of 10+ years as Assistant Professor at
Department of Physics, Shyam Lal college, University of Delhi**

**Thesis Title: Synthesis and Characterization of Chalcogenides based Nanomaterials for
Thermoelectric Applications**

Thesis Supervisor: Prof. Sujeet Chaudhary (IIT Delhi) and Dr. T.D. Senguttuvan (NPLDelhi)

Academic Qualifications

Ph.D. in Physics (2016- 2021)

Thin Film Lab

Department of Physics

Indian Institute of Technology Delhi, India

M. Tech. in Physics (Solid State Materials, 2011-2013)

Department of Physics

Indian Institute of Technology Delhi, India

GPA- 8.87/10

M.Sc. in Physics (2007-2009)

Department of Physics

MMH College, Ghaziabad

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CCS University Meerut

Division/Class: I (73.5%)

B.Sc. with Physics, Chemistry and Mathematics (2004-2007) Shyam Lal College, **University of Delhi,**

Delhi 110032, India

Division/Class: I (76.4%)

Research experience

- **Synthesis of Nanostructured materials:** I have synthesized high quality polycrystalline samples of chalcogenides and oxides compounds using solid state reaction route, chemical route and hydrothermal route. I have experience of synthesizing chalcogenides compounds using hydrothermal technique.
- **Structural Characterization:** I have expertise on structural characterization using X-Ray Diffraction. I also have experience on metallographic examinations like Scanning electron microscopy (SEM), TEM, HRTEM and Energy dispersive X-ray spectroscopy.
- **Physical Properties measurements:**
 - **Transport Properties** (Electrical Resistivity, Seebeck coefficient, Hall Measurements)
 - **Thermodynamic properties** (heat capacity, thermal diffusivity and Thermal conductivity)

List of Publications

1. **Pradeep Kumar Sharma**, T.D. Senguttuvan, V.K. Sharma, Pankaj Patro, and Sujeet Chaudhary, "Effect of bismuth doping and SiC Nanodispersion on the thermoelectric properties of solution-processed PbTe", **Journal of Alloys and Compounds**, (2022) **915: 165390**. <https://doi.org/10.1016/j.jallcom.2022.165390>.
Impact Factor 6.2
2. **Pradeep Kumar Sharma**, , T.D. Senguttuvan, V. K. Sharma, M. Saravanan, N.K. Gupta and Sujeet Chaudhary "Thermoelectric properties of Spark plasma sintered lead telluride synthesized without using surfactant and organic solvent" **Material Research Express** (2021), **8(7): 075004**. <https://doi.org/10.1088/2053-1591/ac0d2b>.
Impact Factor 2
3. **Pradeep Kumar Sharma**, T.D. Senguttuvan, V. K Sharma and Sujeet Chaudhary,

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“Revisiting the Thermoelectric properties of Lead telluride” *Material Today Energy* (2021), 21:100713. <https://doi.org/10.1016/j.mtener.2021.100713>

Impact Factor 9.2

4. **Pradeep Kumar Sharma**, Vijay Kumar Sharma, T.D. Senguttuvan and Sujeet Chaudhary “Design, fabrication and calibration of low cost thermopower measurement set up in low- to mid-temperature range” *Measurement* (2020), 150:107054. <https://doi.org/10.1016/j.measurement.2019.107054>

Impact Factor 5.1

5. **Pradeep Kumar**, Subhash Chand Kashyap, H. C. Gupta, and Vijay Kumar Sharma “Improved thermoelectric Properties of Cation Substituted CaMnO_3 ” *Chin. Phy. B* (2015) 24 (9):1-6. [DOI: 10.1088/1674-1056/24/9/098101](https://doi.org/10.1088/1674-1056/24/9/098101)

Impact Factor 1.65

Conferences and Symposium

1. **Pradeep Kumar Sharma**, T. D. Senguttuvan and Sujeet Chaudhary. (2021) *Thermoelectric properties of pristine PbTe synthesized without any surfactant and organic solvent*, Paper Presentation, **Virtual International Conference on Hierarchically Structured Materials**, ICHSM-2021, 8 to 10 April 2021. SRM Institute of Science and Technology Chennai-600089, India.
2. **Pradeep Kumar Sharma**, T. D. Senguttuvan and Sujeet Chaudhary. (2019) *Synthesis and Thermoelectric Properties of Pristine Lead telluride (PbTe)*, Poster Presentation, **International Conference on Atomic, Molecular, Optical and Nano Physics with Applications** (CAMNP-2019), 18-20 December 2019, Delhi Technological University, New Delhi, India.
3. Presented a Poster titled “Synthesis and Thermoelectric Properties of Pristine Lead telluride PbTe” in **3rd International Departmental Symposium on Advances in Physics – 2019 organized by Indian Institute of Technology Delhi**.
4. Presented a Poster titled “Synthesis and characterization of Metal chalcogenides for thermoelectric applications” in **2nd Departmental Symposium on Advances in Physics – 2019 organized by Indian Institute of Technology Delhi**.

Research Highlights

Nanostructured thermoelectric materials have attracted considerable attention of the research community due to their relatively high figure of merit. Seebeck coefficient plays

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a vital role in determining the thermoelectric figure of merit. However, high-temperature Seebeck coefficient measurements are often critical, and the values are marred with inconsistency and irreproducibility due to the difference in ideal and practical measurement geometry. To measure the Seebeck coefficient accurately and to study the variation of Seebeck coefficient with temperature, I have designed and fabricated an entirely automated, compact Seebeck coefficient measurement set up which can perform accurate Seebeck coefficient measurements in a wide temperature range of 300-700 K. The accuracy and sensitivity of the fabricated set up is determined by performing test measurements on various standard reference (both *p* and *n*-type) samples.

In an attempt to increase the thermoelectric performance of lead telluride further, we have synthesized polycrystalline samples of nanostructured bulk PbTe (both *p* and *n*-type) and performed a comprehensive study of the structural properties (X-ray diffraction, E-DAX) and electrical transport properties (electrical resistivity, Seebeck coefficient, and Thermal conductivity). Electron microscopy is used as a tool to study the surface morphology of synthesized samples and particle size distribution.

References

Prof. Subhash Chand Kashyap

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Declaration

I hereby declare that the details stated above are true and correct to the best of my knowledge.

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