

# **SRINIVAS UNIVERSITY**

## **Center for Materials for Energy and Environmental Applications**



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Dr. Sandhya Shenoy U is currently a DST INSPIRE Faculty at College of Engineering and Technology, Srinivas University, Mukka, Mangalore. Her research interests include synthesis and simulations of materials for energy and environment which mainly includes the below:

- Thermoelectrics
- Nanofluids
- 2D materials
- Nanomaterial synthesis
- Computational simulation of materials for energy and environmental applications

The objective of the research work is to develop environmentally friendly materials to tackle the global crisis of escalating demand for renewable energy and to make earth a pollution free planet. This mainly involves synthesis and simulations of thermoelectric materials which are capable of reversibly converting waste heat into electricity. Synthesis of nanofluids which are basically stable dispersions of nanoparticles in base fluid synthesized with an aim to increase the thermal conductivity of the resulting mixture. Synthesis and simulation of nanocomposites for environmental remediation.

## List of Projects:

Sl. No.	Principal Investigator	Title of Project	Funding Agency	Cost in Rupees	Status
1	Dr. Sandhya Shenoy U	DST INSPIRE Faculty Award	DST, New Delhi	~1.07 crore	Ongoing

## List of Publications:

- ❖ Shenoy S.U., Bhat, D.K. (2021). “Vanadium: A Protean Dopant in SnTe for Augmenting its Thermoelectric Performance.” *ACS Sustain. Chem. Eng.*, 9, 13033 – 13038.
- ❖ Shenoy S.U., Bhat, D.K. (2021). “Improving ZT of SnTe by Electronic Structure Engineering: Unusual Behaviour of Bi Dopant in the presence of Pb as a Co-dopant.” *Mater. Adv.*, 2, 6267 – 6271.
- ❖ Bantawal, H., Shenoy, S.U. and Bhat, D.K. (2021). “Vanadium Doped CaTiO<sub>3</sub> Cuboids: Role of Vanadium in Improving the Photocatalytic Activity.” *Nanoscale Adv.*, 3, 5301 – 5311.
- ❖ Kihoi, S.K., Shenoy, S.U., Bhat, D.K. and Lee, H.S. (2021). “Complimentary Effect of Co-doping Aliovalent Elements Bi and Sb in Self-compensated SnTe-based Thermoelectric Materials.” *J. Mater. Chem. C*, 9, 9922 – 9931.
- ❖ Shenoy S.U., Bhat, D.K. (2021). “Electronic Structure Modulation of Pb<sub>0.6</sub>Sn<sub>0.4</sub>Te via Zinc Doping and Its Effect on the Thermoelectric Properties.” *J. Alloys Compd.*, 872, 159681.
- ❖ Sethi, M., Shenoy, S.U. and Bhat, D.K. (2021). “Hassle-free Solvothermal Synthesis of NiO Nanoflakes for Supercapacitor Application.” *Physica B Condens. Mater.*, 611, 412959.
- ❖ Kihoi, S.K., Kahiu, J.N., Kim, H., Shenoy, S.U., Bhat, D.K., Yi, S and Lee, H.S. (2021). “Optimized Mn and Bi Co-doping in SnTe Based Thermoelectric Material: A Case of Band Engineering and Density of States Tuning.” *J. Mater. Sci. Technol.*, 85, 76 – 86.
- ❖ Sethi, M., Shenoy, S.U. and Bhat, D.K. (2021). “Simple Solvothermal Synthesis of Porous Graphene-NiO Nanocomposites with High Cyclic Stability for Supercapacitor Application.” *J. Alloys Compd.*, 854, 157190.
- ❖ Shenoy, S.U. and Bhat, D.K. (2021). “Electronic Structure Engineering of SrTiO<sub>3</sub> via Rhodium doping: A DFT Study.” *J. Phys. Chem. Solids*, 148, 109708.
- ❖ Shenoy, S.U. and Bhat, D.K. (2020). “Vanadium Doped BaTiO<sub>3</sub> as High Performance Thermoelectric Material: Role of Electronic Structure Engineering.” *Mat. Today. Chem.*, 18, 100384.

- ❖ Bhat, D.K., Bantawal, H. and Shenoy, S.U. (2020). “Rhodium Doping Augments Photocatalytic Activity of Barium Titanate: Effect of Electronic Structure Engineering.” *Nanoscale Adv.*, 2, 5688 – 5698.
- ❖ Bhat, D.K. and Shenoy, S.U. (2020). “Resonance Levels in GeTe Thermoelectrics: Zinc as a New Multifaceted Dopant.” *New J. Chem.*, 44, 17664 – 17670.
- ❖ Sethi, M., Shenoy, S.U. and Bhat, D.K. (2020). “Porous Graphene-NiFe<sub>2</sub>O<sub>4</sub> Nanocomposite with High Electrochemical Performance and High Cyclic Stability for Energy Storage Application.” *Nanoscale Adv.*, 2, 4229 – 4241.
- ❖ Bhat, D.K. and Shenoy, S.U. (2020). “Mg/Ca Doping Ameliorates the Thermoelectrics Properties of GeTe: Influence of Electronic Structure Engineering.” *J. Alloys Compd.*, 834, 155989.
- ❖ Bhat, D.K. and Shenoy, S.U. (2020). “SnTe Thermoelectrics: Dual Step Approach for Enhanced Performance.” *J. Alloys Compd.*, 834, 155181.
- ❖ Shenoy, S.U. and Bhat, D.K. (2020). “Enhanced Thermoelectric Properties of Vanadium Doped SrTiO<sub>3</sub>: A Resonant Dopant Approach.” *J. Alloys Compd.*, 832, 154958.
- ❖ Pal, S., Arora, R., Roychowdhury, S., Harnagea, L., Kumar, S., Shenoy, S.U., Muthu, D.V.S., Biswas, K., Waghmare, U.V. and Sood, A.K. (2020). “Pressure-induced Phase Transitions in the Topological Crystalline Insulator SnTe and its Comparison with semiconducting SnSe: Raman and First-principles Studies.” *Phy. Rev. B*, 101, 155202.
- ❖ Bantawal, H., Shenoy, S.U. and Bhat, D.K. (2020). “Vanadium-Doped SrTiO<sub>3</sub> Nanocubes: Insight into Role of Vanadium in Improving the Photocatalytic Activity.” *Appl. Surf. Sci.*, 513, 145858.
- ❖ Sethi, M., Shenoy, S.U., Selvakumar, M. and Bhat, D.K. (2020). “Facile Solvothermal Synthesis of NiFe<sub>2</sub>O<sub>4</sub> Nanoparticles for High Performance Supercapacitor Applications.” *Front. Mater. Sci.*, 14, 120 – 132.
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- ❖ Shenoy S.U., Bhat, D.K. (2020). “Bi and Zn Co-doped SnTe Thermoelectrics: Interplay of Resonance Levels and Heavy Hole Band Dominance Leading to Enhanced Performance and Record High Room Temperature ZT.” *J. Mater. Chem. C*, 8, 2036 – 2042.
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