Dr. Sebin Devasia
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Physics
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BIOSKETCH

Dr. Sebin Devasia joined PSG Institute of Advanced Studies in October 2023 as an Assistant Professor of Physics. He conducted his doctoral research at the Universidad Autónoma de Nuevo León (UANL), Mexico, where his primary focus was on the synthesis of perovskite-inspired lead-free materials and their thin films via. Ultrasonic spray deposition and fabrication of their photodetectors and photovoltaic devices. In addition, he employed density functional theory to study the structure and electronic properties of the materials. Currently, he is engaged in density functional theory (DFT) calculations to gain an in-depth understanding of structure–property relationships in materials and machine learning approaches for accelerated property prediction and discovery.

Educational Profile

- **Doctor of Philosophy (Ph.D.) in Materials Engineering**
  Year of Passing: 2023
  Thesis title: **Ultrasonic spray deposition of perovskite-inspired lead-free cesium bismuth iodide thin films for optoelectronics**
  Thesis Supervisor: Dr. Bindu Krishnan, Professor, Facultad de Ingeniería Mecánica y Eléctrica (FIME), Universidad Autónoma de Nuevo León (UANL), Mexico
- **Master of Science and Technology (M.Sc.) in Physics**
  Department of Physics
  National Institute of Technology Tiruchirappalli

- **Bachelor of Science (B.Sc.) in Physics**
  Mahatma Gandhi University Kottayam

Positions Held

Jan 2025 – Till Now	Assistant Professor Department of Physics PSG Institute of Technology and Applied Research Neelambur, Coimbatore
Jan 2025 – Till Now	Adjunct Professor Department of Physics PSG Institute of Advanced Studies Peelamedu, Coimbatore
Oct 2023 – Jan 2025	Assistant Professor Department of Physics PSG Institute of Advanced Studies

	Peelamedu, Coimbatore
July 2015 – Mar 2018	Junior/Senior Research Fellow, DAE-BRNS Project 07/2015 - 03/2018 Department of Physics, Union Christian College, Aluva, India

Research Areas

- Lead-free perovskite photodetectors
- Device simulations
- Density Functional Theory
- Machine learning in Materials Science

Awards & Achievements

1. Sciences Academies Summer Research Fellowship 2024
   Indian Academy of Sciences
2. CONACYT Doctoral Fellowship Jan 2019
   CONACYT, Mexico

Laboratories In-charge

1. Laboratory for Atomistic Simulations & Energy materials Research

Invited Talks

1. Beginner's workshop on MedeA-VASP atomistic simulation package for solar cell materials, Instituto de Energ´ıas Renovables, Universidad Nacional Aut´onoma de M´exico (UNAM), Mexico, 9 December 2021
2. (Not Just) Making Things Smaller- Nanoscience and nanotechnology, KMEA engineering college, Edathala, Kerala, India, 21 January 2021

Journal Publications

1. A Das, **S. Devasia**, Nisha Banerjee, RG Nair, "High Aspect Ratio ZnO Nanorods for Improved Photoelectrochemical (PEC) Water Splitting Performances and Efficient Photocatalytic Hydrogen Evolution: An Integrated Experimental and DFT Studies", *Applied Surface Science*, 699 (2025), 163160.
2. SK Nikhil, GR Nair, A Das, **S. Devasia**, RG Nair, "An experimental and theoretical validation of dual role of Fe on improving the photocatalytic performance of doped mixed phase titania", *Advanced Powder Technology* 35 (11) (2024), 104683.
3. John, N., Davis, N., Roshan, J. C., Hussain, S., **S. Devasia**, Srinivasan, B., & Ashok, A. M., "Enhancing thermoelectric properties of spinel ZnFe2O4 by Ni substitution through electron hopping mechanism", *Ceramics International* 50 (22) (2024), 45251-45262.
4. R Raphael, **S. Devasia**, S. Shaji, E.I. Anila, "Characterisation of Sn-Cl co-doped β − Ga2O3 thin films deposited via spray pyrolysis and their application in UV detector devices", *Sensors and Actuators A: Physical* 376 (2024) 115546.

5. **S. Devasia**, S. Shaji, D.A. Avellaneda, J.A. Aguilar Martinez, B. Krishnan, "In situ grown Bi_2S_3 nanorods in $Cs_3Bi_2I_9$ thin films as broadband self-driven photodetector with improved photostability", Optical Materials 152 (2024) 115532.
6. **S. Devasia**, S. Shaji, D.A. Avellaneda, J.A. Aguilar Martinez, B. Krishnan, "Ultrasonically sprayed $Cs_3Bi_2I_9$ thin film based self-powered photodetector", Mater. Chem. Phys. 296 (2023) 127295.
7. R.Raphael, **S. Devasia**, S. Shaji, Anila EI "Effect of substrate temperature on the properties of spray deposited Ga_2O_3 thin films, for solar blind UV detector applications", Optical Materials 133 (2022), 112915.
8. **S. Devasia**, S. Shaji, D.A. Avellaneda, J.A.A. Martinez, B. Krishnan, "In situ crystallization of 0D perovskite derivative $Cs_3Bi_2I_9$ thin films via ultrasonic spray", J. Alloys Compd. 893 (2021) 162294.
9. **S. Devasia**, S. Shaji, D.A. Avellaneda, J.A. Aguilar Martinez, B. Krishnan, "Tin antimony sulfide ($Sn_6Sb_{10}S_{21}$) thin films by heating chemically deposited Sb_2S_3/SnS layers: Studies on the structure and their optoelectronic properties", J. Alloys Compd. 827 (2020) 154256.
10. A. Nadukkandy, **S. Devasia**, P. Abraham, S. Shaji, D.A. Avellaneda, J.A. Aguilar-Mart´ınez, E.G. Martinez, R.F. Cienfuegos-Pelaes, B. Krishnan, "Monoclinic $AgSbS_2$ thin films for photovoltaic applications: Computation, growth and characterization approaches", Mater. Sci. Semicond. Process. 135 (2021) 106074. doi:10.1016/j.mssp.2021.106074.
11. A.A. Ramachandran, B. Krishnan, **S. Devasia**, D.A. Avellaneda, M.I. Mendivil Palma, J.A. Aguilar Martinez, S. Shaji, "Photosensitive antimony triiodide thin films by rapid iodization of chemically deposited antimony sulfide," Mater. Res. Bull. 142 (2021) 111382. doi:10.1016/j.materresbull.2021.111382.1/3
12. J. Mathew, **S. Devasia**, S. Shaji, E.I. Anila, "Metal–semiconductor–metal visible photodetector based on Al-doped (Cd:Zn)S nano thin films by hydrothermal synthesis," Optik (Stuttg). 241 (2021) 166878. doi:10.1016/j.ijleo.2021.166878.
13. P. J. Joffy, V. G. Sreeja, **S. Devasia** and E. I. Anila, "Spectral and nonlinear optical characterization of blue light emitting gahnite nanorods synthesized through radiation assisted sol-gel method," Solid State Sci., 2019, 96, 105947.
14. **S. Devasia**, P. V. Athma and E. I. Anila, "Controlling the zinc oxide unipolarity through dual acceptor doping for spray-cast homojunction diode," Mater. Lett., 2019, 238, 112–115.
15. **S. Devasia**, P. V. Athma, M. Shaji, M. C. S. Kumar and E. I. Anila, "Post-deposition thermal treatment of sprayed ZnO:Al thin films for enhancing the conductivity," Phys. B Condens. Matter, 2018, 533, 83–89.
16. R. Amiruddin, **S. Devasia**, K. Mohammedali, M. C. Santhosh Kumar, "Investigation on P-N dual acceptor doped p-type ZnO thin films and subsequent growth of pencil-like nanowires," Semiconductor Science and Technology 30 (2015) 035009.

Total Number of Conference Papers/Proceedings: 7