Centre for Research & Development

Research Supervisor (Guide) Profiles
Discipline of Supervision: Physics

Dr. Benjamin Hudson Baby
Assistant Professor
Department of Physical Sciences
School of Computational & Physical Sciences

Areas of Specialisation:
Thin-Film Solar Cell Fabrication and Characterization,
Metal Chalcogenide Semiconductor Materials

Dr. Benjamin Hudson Baby is an accomplished expert in materials science and device engineering, with a research focus on enhancing the efficiency of thin-film solar cells through advanced material synthesis and innovative device architectures. His distinguished academic journey includes affiliations with leading global institutions such as Incheon National University, the Indian Institute of Technology (IIT) Madras, IIT Kanpur, and the National Institute of Technology Warangal. Complementing his academic experience, he has also worked in industry at the Centre for Innovation and Technology Excellence, Titan Jewellery Division, where he gained valuable insights into bridging fundamental materials science with practical device applications. His current research centres on band structure tuning in p-type absorber layers of metal chalcogenides, a critical aspect in achieving high-efficiency solar devices. To support this work, he utilizes advanced wet chemical synthesis techniques alongside physical vapor deposition methods to fabricate high-quality thin films with precisely controlled structural and optoelectronic properties. A dedicated educator, He previously served as an Assistant Professor in the Department of Physics at MES College Marampally, Kerala, where he successfully supervised 21 M.Sc. theses. His broader research interests include next-generation optoelectronic technologies, contributing to the development of sustainable and energy-efficient solutions.

Selected Publications:

1. **Baby, B. H.**, Shajan, N. T., Paul Joseph, D., C A, F., Varghese, G. K., & Bharathi Mohan, D. (2024). Phase stabilization of Fe doped SnS by solvothermal method and its structural, morphological and optoelectronic properties for photovoltaic applications. Solid State Communications, 386, 115525. https://doi.org/10.1016/j.ssc.2024.115525

2. **Baby, B. H.**, Shajan, N. T., Biju Balan, N., Joseph, D. P., Mohan, D. B., & Mumthas, S. (2024). Effect of Bi doping in tuning the structural, morphological and optoelectronic properties of solvothermally synthesized SnS nanorods. Materials Today Communications, 39, 109041. https://doi.org/10.1016/j.mtcomm.2024.109041

3. Jayavelu, Y., Maharana, G., Rajender, G., Muniramaiah, R., Divyadharshini, S., **Baby, B. H.**, Kovendhan, M., Fernandes, J. M., & Joseph, D. P. (2024). Defect-mediated time-efficient photocatalytic degradation of methylene blue and ciprofloxacin using tungsten-incorporated ternary perovskite BaSnO3 nanoparticles. Chemosphere, 351, 141128. https://doi.org/10.1016/j.chemosphere.2024.141128