Monalisha Behera

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Education

2024 (pursuing) — **Ph.D. (Physics)**
Shiv Nadar University Chennai, India

2022- 2024 — **Master of Science (Applied Physics)**
Odisha University of Technology and Research, Bhubaneswar, India
CGPA 7.90

2019- 2022 — **Bachelor of Science (Physics)**
Rama Devi Women's University, Bhubaneswar, India
CGPA 8.77

Current Research Work

#1 Project: Single-phase phosphors for human-centric circadian lighting

- Color tuning through co-doping with Eu^{2+} and Mn^{2+} to achieve desired emission properties.
- Investigation of energy transfer mechanisms between Eu^{2+} and Mn^{2+} ions to enhance efficiency and color quality.
- Thermal stability analysis to ensure reliable performance under LED operating conditions. Application focus on reading room lighting and sleep cycle regulation, aiming to support visual comfort and circadian health through optimized spectral output.

#2 Project: Development of broadband near-infrared emitting phosphors for non- destructive food quality assessment.

- Design and synthesis of single-phase material with broadband near infrared (NIR) emission (900-1200 nm).
- Lead-free composition of material to ensure environmental safety. Enhancement of photoluminescence quantum yield and thermal stability.
- Fabrication of NIR-LED for food quality assessment, especially for pesticide detection.

Technology Readiness Level: We have reached TRL 1 (technology demonstrated in relevant environment)

Academic Research (Master of Science in Applied Physics)

During my master's research, I focused on the theoretical study of superconductors, exploring their electronic structure, pairing mechanisms and phase transitions. I applied various theoretical models to analyze superconducting materials, gaining expertise in mathematical modelling.

Manuscripts submitted

***1. Monalisha Behera**, Somrita Dutta, Sudipta Som, Warit Chaiwattana, Mukesh K Pandey, R K Dubey, Hendrik C Swart, "$Eu^{2+} \rightarrow Mn^{2+}$ energy transfer driven tunable emission in $KMgLa(PO_4)_2$ for human-centric circadian lighting" , Journal of Alloys and Compounds authored by*

*2. Jatin Dhanuka, **Monalisha Behera**, Shivaramu NJ, Sudipta Som, R.E.Kroon, HC Swart,* Cr^{3+}-Cr^{3+} Pairing and Multi-Site Engineering for Broadband Near-Infrared Luminescence, **Chemistry of Materials.**

*3. Jatin Dhanuka, **Monalisha Behera**, Shivaramu NJ, Sudipta Som, R.E.Kroon, HC Swart*, Compositional Engineering of a novel Narrow-Band Green emitting phosphors $Sr_2ZnAl_{22}O_{36}$: Mn^{2+} for Backlight Display Application, **Advanced Optical Materials.**

Book Chapter

***1. Monalisa Behera**, Pachimatla Rajesh, Sudipta Som, Sajjan Kumar*, Green Quantum Dots: Performance in Optoelectronics, Green Nanomaterials: Synthesis, Applications and Recent Developments, Edited by Sampat G Deshmukh, BVS Praveen, Shalini Sharma, **Publishers Bentham Science.**

***2. Monalisha Behera**, Puja Kumari, Sudipta Som, Subrata Das*, Solar concentrators based on inorganic luminescent materials potential to elevate the efficiency, Progress in Optical Science and Photonics, Edited by Prasanth Ravindran, Deepa K G, Adersh Asok, Durga Shankar and Jumlat Ahmed, **Publishers Springer.**

Conference attended

1. National Conference on Luminescence and its Applications (NCLA-2024)
Poster Presentation: "Self-Activated Phosphors for Enhanced Broadband Visible Emission in White LED Technology". ***Awarded the Best Poster Presentation.***

2. 3rd International Conference on Advanced Functional Materials (ICAFM-2024)
Oral Presentation: "Luminescence Characterization of Cr^{3+} Doped Aluminate Phosphors for Broadband Near Infrared Light Emitting Applications".

3. International Conference on Advancements in Material Science for Sustainable Development (AIMS-2025)
Oral Presentation: "Quality Assessment of Produce with Enhanced Broadband Near Infrared Emitters".

4. SHODH SHIKHAR - 2025
Oral Presentation: "Minimizing Export Rejection with Broadband Near Infrared Emitters".

Memberships and Awards

- ✓ **Life Member- Luminescence Society of India**
- ✓ ***The Best Poster Presentation- NCLA 2024***

Technical Skills

- **Spectroscopy Techniques:** Proficient in Luminescence Spectroscopy and Diffuse Reflectance Spectroscopy.
- **Material Synthesis Methods:** Experienced in Solid State Reaction, Hydrothermal Route, Sol-Gel Synthesis, and Spin Coating techniques.
- **Characterization Techniques:** Skilled in X-ray Diffraction, Scanning Electron Microscopy.
- **Software:** Origin, FullProf, VESTA, X-pert HighScore, Canva

Soft Skills

- Strong ability to work both independently and collaboratively within multidisciplinary research teams.
- Adaptable and resilient when working in challenging and dynamic research environments.
- Effective problem-solving and critical thinking skills in experimental design and data interpretation.
- Excellent written and verbal communication skills for presenting research findings and writing scientific reports.
- Detail-oriented with strong time management skills to meet research deadlines efficiently.