Shweta

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Professional Summary

Ph.D. candidate in Chemical Physics at the University of Puerto Rico, Río Piedras Campus, specializing in battery safety modeling and energy storage systems. Experienced in lithium-ion and lithium-sulfur battery research and advanced electrochemical characterization techniques.

Education

Ph.D. in Chemical Physics
University of Puerto Rico, Río Piedras Campus | 2022–Present

M.Sc. in Physics (Condensed Matter Physics)
Deenbandhu Chhotu Ram University of Science and Technology (DCRUST), India

B.Sc. in Physics
Maharshi Dayanand University, India

Research Experience

- Investigating failure mechanisms and thermal runaway in lithium-ion batteries.
- Synthesizing and evaluating Li_2MnO_3-coated spinel layered cathode materials.
- Enhancing rate capability of lithium-sulfur batteries using hybrid carbon nanotubes and advanced separator coatings.
- Inventor of a novel alloy-based anode material aimed at improving high-rate lithium-ion battery performance (Invention Disclosure No. 25-025-DISC-UPR).
- Skilled in operating inert glovebox systems, coin cell assembly, and battery testing (CV, EIS, galvanostatic cycling).

Technical Skills

- Battery Testing: CV, EIS, Charge/Discharge Profiling, Safety Evaluation
- Characterization Tools: SEM, XRD, FTIR, Raman, UV-Vis, NMR, ESR
- Programming & Software: Python, FORTRAN, C++, OriginPro, MS Office

Publications

View full list of publications: Google Scholar Profile

- **S. Shweta**, M.K. Bhattarai, S. Kumar, S. Choudhary, G. Morell, R.S. Katiyar, "Enhanced Rate Capability in Lithium-Sulfur Batteries Using Hybrid Carbon Nanotubes and NZFO-Coated Separator," *Journal of Electroanalytical Chemistry*, vol. 966, p. 118396, 2024.
- S. Choudhary, N. Oli, **S. Shweta**, S. Kumar, M.K. Bhattarai, C.A. Malca-Reyes, G. Morell, R.S. Katiyar, "Encapsulation Engineering of Sulfur into Magnesium Oxide for High Energy Density LiS Batteries," *Molecules*, vol. 29, no. 21, p. 5116, 2024.
- M.K. Bhattarai, **S. Shweta**, M.D. Ashie, S. Guddehalli Chandrappa, B. Ale Magar, B.P. Bastakoti, U.M. Córdova Figueroa, B.R. Weiner, R.S. Katiyar, G. Morell, "Unveiling Potential of Gallium Ferrite (GaFeO3) as an Anode Material for Lithium-Ion Batteries," *ACS Omega*, vol. 9, no. 38, pp. 39863–39872, 2024.
- M.K. Bhattarai, B. Tripathi, **S. Shweta**, S. Kumar, C.C. Zuluaga-Gómez, R.K. Katiyar, B.R. Weiner, R.S. Katiyar, G. Morell, "Effective Polysulfide Control in Lithium-Sulfur Batteries Utilizing BiFeO3 Nanoparticles," *APL Materials*, vol. 12, no. 5, 2024.
- M.K. Bhattarai, **S. Shweta**, S. Choudhary, H.M. Meyer III, B.P. Thapaliya, B.R. Weiner, R.S. Katiyar, G. Morell, "Exploring Lead Zirconate Titanate: The Potential Advancement as an Anode for Li-Ion Batteries," *ACS Omega*, vol. 9, no. 17, pp. 19219–19226, 2024.

Extracurricular Activities

- Public speaking, poetry writing, Indian classical dance, painting, and badminton.
- Regular practice of yoga and meditation.

Languages

- English (TOEFL Score: 97)
- Hindi (Fluent)