

## **WORK EXPERIENCE**

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- 1. Albemarle Corporation, Kings Mountain, North Carolina, USA.** April 2023 - April 2025  
Advanced Lithium Battery Research Scientist
  - Led liquid electrolyte-based Lithium-ion cells fabrication and testing, achieving energy density improvement.
  - Worked with internal teams and vendors to characterize solid electrolytes, identifying structure-performance correlations, addressing key interfacial challenges.
  - Led a Six Sigma Yellow Belt project that improved lab procedures through 5S, enhanced safety, improved compliance, generating significant cost savings for the organization.
- 2. Rivian Automotive LLC, Palo Alto, California, USA.** Jan. 2022 - Mar. 2023  
Senior Material Engineer - Solid State Battery
  - Lead problem-solving (DOE, Fishbone, FMEA, and Root Cause Analysis) to resolve battery material production issues, resulting in improvement in efficiency and product quality.
  - Collaborated cross-functionally to optimize electrode slurry formulations, analysing the impact of particle size and morphology, etc., leading to improvement in electrochemical performance.
  - Contributed to 3+ synchrotron proposals to study the thermal and electrochemical stability of the various electrodes/electrolytes, accelerating material screening for battery applications.
- 3. Mercedes-Benz Research and Dev. North America, Michigan, USA** Aug. 2021 - Dec. 2021  
Ph.D. Engineering Intern (Battery Research)
  - Contributed to electrochemical characterization, identifying unwanted reactions, leading to improvement in battery performance through innovative solutions and productivity enhancement.
  - Collaborated with U. Mich Battery Lab to conduct experiments, perform failure analysis, and develop control charts, driving improvement in process optimization and enabling data-driven decisions.
  - Conducted literature research on emerging technologies, providing insights to the MBRDNA, leading to strategic alignment with industry trends.
- 4. Tesla, Inc., Palo Alto, California, USA** Aug. 2018 - Dec. 2018  
Ph.D. Intern, Cell Engineering R&D
  - Played a key role in the development, synthesis, and characterization of cobalt-free high-energy cathode materials for Lithium-ion Batteries, achieving cost reduction and advancing battery technology.
  - Facilitated the transition of new materials from research to manufacturing, enhancing energy density and safety for Tesla's lithium-ion batteries through an efficient concept-to-testing approach.
  - Designed and executed experiments to analyse data, identifying critical sources of battery degradation, leading to improvement in battery longevity through targeted optimizations.
- 5. University of Dayton Research Institute, Dayton, Ohio, USA** Aug. 2016 - Aug. 2021  
Doctoral Candidate
  - Innovated and developed a binder-free, thin-film ceramic-coated separator using PVD, improving battery safety through enhanced thermal stability and reduced risk of failure.
  - Led thin-film lithium metal deposition using EBPVD techniques, applying DMAIC methodology to optimize deposition parameters, resulting in increase in process consistency.
  - Investigated and resolved critical issues like capacity retention, electrolyte degradation, and cost reduction, improving battery durability and reliability.

## **EDUCATION**

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- 1. The University of Dayton, Ohio, USA.** Aug. 2014 - Dec. 2021  
Ph.D. and M.S., Electrical and Computer Engineering (Electrical Engineering Major).
- 2. California Institute of Technology (Caltech), Pasadena, California, USA.** Summer 2017  
Participant of Sixth International School for Materials for Energy and Sustainability (ISMES VI).

## SCIENTIFIC CONTRIBUTIONS

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1. **PATENT:** Polymeric solid-state electrolytes and related methods.

2. **RESEARCH PUBLICATIONS:**

**Manuscripts (Published)**

- A. Kota, L.W. Kum, K. Vallurupalli, **A. Gogia\*** et al. (2022). Highly Flexible Stencil Printed Alkaline Ag<sub>2</sub>O-Zn Battery for Wearable Electronics, *Batteries*, 8, 74.
- L. Kum, **A. Gogia\*** et al. (2022). Enhancing Electrochemical Performances of Rechargeable Lithium-Ion Batteries via Cathode Interfacial Engineering, *ACS Applied Material & Interface*, 14, 4100-4110.
- **A. Gogia\*** et al. (2021). Binder-Free, Thin-Film Ceramic-Coated Separators for Improved Safety of Lithium-Ion Batteries, *ACS Omega*, 6, 4204-4211.
- **A. Gogia\*** et al. (2021). Proof-of-concept molten Lithium-Selenium Battery Energy Fuels, 35, 20400-20405.
- A. Kota, **A. Gogia\*** et al. (2021). Printed Textile-Based Ag<sub>2</sub>O-Zn Battery for Wearable Sensors, *Sensors*, 21, 2178.

## SCIENTIFIC PRESENTATIONS

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### SELECTED - International Conference Presentations

1. L. W. Kum, **A. Gogia\***, N. Vallo, and J. Kumar, "Cathode Surface Engineering with Ceramic Solid Electrolytes for Li-Ion Batteries Performance Enhancement", 240<sup>th</sup> ECS Meeting, October 10-14, 2021.
2. **A. Gogia\***, L. Estevez, G. Subramanyam, and J. Kumar, "Enhancing the Stability of the Electrode/Electrolyte Interface in Solid State Li-Ion Batteries", 239<sup>th</sup> ECS Meeting with the 18<sup>th</sup> International Meeting on Chemical Sensors, May 30-June 3, 2021.
3. **A. Gogia\***, K. Rishi, A. McGlasson, G. Beaucage, and V. K. Kuppaa, "Nanoparticle Dispersion and Hierarchical Structure in Polymer Nanocomposites: Insights from Dissipative Particle Dynamics (DPD) Simulation", American Physical Society (APS) March Meeting, March 15-19, 2021.
4. **A. Gogia\***, K. Rishi, A. McGlasson, G. Beaucage, and V. K. Kuppaa, "Dissipative Particle Dynamics (DPD) Simulation to understand the Nanoparticle Dispersion and Aggregation behavior in Polymer Nanocomposites", American Physical Society (APS) March Meeting, March 15-19, 2021.
5. K. Rishi, **A. Gogia\***, X. Cui, G. Beaucage, V. K. Kuppaa, and J. Kumar, "Percolation, dispersion and structure-conductivity relationships in carbon black nanocomposites", American Physical Society (APS) March Meeting, March 15-19, 2021.
6. U. Okoli, X. Cui, K. Rishi, **A. Gogia\***, E. Temeche, R. Laine, and G. Beaucage, "The structural impact of sintered and flame-synthesized Li ceramics on ionic conductivity in solid battery electrolytes", American Physical Society (APS) March Meeting, March 15-19, 2021.
7. J. Kumar, L. Estevez, **A. Gogia\***, and Y. Wang, "Molten Lithium Battery for Space (Venus) Applications", Advanced Power Systems for Deep Space Exploration Conference, October 27-29, 2020.
8. B. Shyam, L. W. Kum, **A. Gogia\***, Y. Wang, and J. Kumar, "Rechargeable All Solid-State Lithium Batteries", 49<sup>th</sup> Power Sources Conference, June 15-18, 2020, Florida.
9. L. Estevez, **A. Gogia\***, and J. Kumar, "Molten Lithium Battery for Space Applications", 237<sup>th</sup> ECS Meeting with the 18<sup>th</sup> International Meeting on Chemical Sensors (IMCS 2020), May 10-15, 2020, Montreal, Canada.
10. K. Rishi, **A. Gogia\***, G. Beaucage, V. K. Kuppaa, and A. Tang, "Dielectric & Dynamic response of emergent hierarchical filler networks in polymer nanocomposites", American Physical Society (APS) March Meeting, March 2-6, 2020, Denver, Colorado.
11. **A. Gogia\***, K. Rishi, A. McGlasson, G. Beaucage, and V. K. Kuppaa, "Understanding the Dispersion and Aggregation of fillers in Polymer Nanocomposites using Dissipative Particle Dynamics (DPD) Simulations of Polymer-Filler Blends", American Physical Society (APS) March Meeting, March 2-6, 2020, Denver, Colorado.
12. **A. Gogia\***, K. Rishi, A. M. McGlasson, G. Beaucage, and V. K. Kuppaa, "New Insights into Hierarchical Structures in Polymer Nanocomposites: A Dissipative Particle Dynamics (DPD) Simulation Study", American Physical Society (APS) March Meeting, March 2-6, 2020, Denver, Colorado.
13. **A. Gogia\***, K. Rishi, A. McGlasson, M. Chauby, G. Beaucage, and V. K. Kuppaa, "Dissipative Particle Dynamics (DPD) Simulations of Polymer-Filler Blends: Understanding Dispersion and Hierarchical Structure in Polymer Nanocomposites", American Physical Society (APS) March Meeting, March 4-8, 2019, Boston, Massachusetts.

14. **A. Gogia\***, *B. Shyam, L. Estevez, and J. Kumar*, “Enhancing the stability of the Electrode/Electrolyte interface in Solid-state Lithium-ion batteries”, Beyond Lithium Ion XI, NASA Glenn Research Center, July 24-26, 2018, Cleveland, Ohio.
15. *L. Tongie, L. Estevez, A. Gogia\**, *N. Vallo, P. Bhattacharya, and J. Kumar*, “High Sulfur Loading for a High Energy Lithium Sulfur Battery”, Beyond Lithium Ion XI, NASA Glenn Research Center, July 24-26, 2018, Cleveland, Ohio.
16. *J. Kumar, P. Bhattacharya, A. Gogia\**, *N. Vallo, D. H.-Lugo, and G. Subramanyam*, “Thin-film Protected Lithium Metal Anode for Lithium Batteries”, ECS Meeting Abstract, 2017.
17. **A. Gogia\***, *N. Vallo, P. Bhattacharya, E. Shin, A. Sarangan, G. Subramanyam and J. Kumar*, “Solid-state Li-ion battery, electrolyte/electrode interface engineering”, Sixth International school for materials for Energy and Sustainability (ISMES VI), California Institute of Technology (Caltech), July 16-22, 2017, Pasadena, CA.
18. **A. Gogia\***, *J. Kumar, and G. Subramanyam*, “Study of building Photovoltaic (PV) potential and storage energy management for Emerson Climate Technology’s “Helix Innovation Center”, U.S. Dept. of Energy (DOE) BIRD-IP conference, University of Texas at San Antonio (UTSA), February 2016, Texas.

## HONORS, AWARDS & ACHIEVEMENTS

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| 1. Best Oral Presentation Award (Research), 239 <sup>th</sup> ECS with IMCS, Digital Meeting, USA. | 2021 |
| 2. Outstanding Ph.D. Research Award, University of Dayton, OH, USA.                                | 2021 |
| 3. III <sup>rd</sup> Prize in Sigma XI Poster Competition (Research), University of Dayton, USA.   | 2019 |
| 4. Graduate Student Summer Fellowship Award (Research), University of Dayton, USA.                 | 2019 |
| 5. Sigma XI Poster Award (Research), University of Dayton, USA.                                    | 2018 |
| 6. Graduate Student Summer Fellowship (GSSF 2018) Award, University of Dayton                      | 2018 |
| 7. Pure Idea Generator Challenge Finalist, St. Louis University.                                   | 2017 |
| 8. Graduate Student Summer Fellowship (GSSF 2017) Award, University of Dayton                      | 2017 |
| 9. Krishna M. Pasala, Ph.D. Memorial Scholarship (IEEE) Award, University of Dayton                | 2017 |
| 10. Department of Energy (DOE) BIRP - IP Program Award, University of Dayton                       | 2016 |

*References available upon request*