

## Syed Z. Islam

R&D Staff Scientist  
Soft Materials and Membranes  
Separations and Polymer Chemistry Section  
Chemical Sciences Division  
Oak Ridge National Laboratory (ORNL)  
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### EDUCATION

Ph.D., Chemical Engineering University of Kentucky, Lexington, KY	May 2017
M.S., Chemical Engineering North Carolina A&T State University, Greensboro, NC	July 2012
B.Sc., Chemical Engineering Bangladesh University of Engineering and Technology, Dhaka, Bangladesh	March 2009

### PROFESSIONAL APPOINTMENTS

• R&D Staff Scientist, Oak Ridge National Laboratory	April 2024 - Present
• R&D Associate Staff Scientist, Oak Ridge National Laboratory	January 2021 – March 2024
• Postdoctoral Research Associate, Oak Ridge National Laboratory	August 2018- December 2020
• Postdoctoral Research Associate, Rensselaer Polytechnic Institute (RPI)	August 2017 – July 2018
• Research Assistant, University of Kentucky (UK)	August 2012 - May 2017
• Teaching Assistant, University of Kentucky	August 2012 - May 2013
• Research Assistant, North Carolina A&T State University (NCAT)	August 2010 - July 2012
• Teaching Assistant, North Carolina A&T State University	August 2010 – May 2011

### RESEARCH INTERESTS

Advanced nanostructured materials and novel energy-efficient processes for clean energy and environmental applications; membrane separation and purification (metallic, ceramic, polymeric, and supported liquid membrane/membrane solvent extraction); sorbent materials, recovery and recycling of critical materials; desalination; carbon dioxide capture and separation; bioenergy separation; photocatalysis, solar energy conversion; hydrogen gas production and separation.

### SUMMARY OF RECORDS

- Patents: 3 *U.S. patents*, 3 *U.S. pending patent applications*, 3 *U.S. provisional patent applications*.
- Technologies licensed to industries: 3
- Peer-reviewed journal articles: published: 26

### AWARDS AND SCHOLARSHIPS

1. 2024 R&D100 Award (Direct Lithium Extraction Sorbents)
2. 2024 R&D100 Award Finalist (Membrane Solvent Extraction (MSX) Technology for Critical Battery Materials Recycling)
3. 2023 ORNL Innovation Award, ORNL, 2023

4. 2023 Best Paper Award, *Advanced Engineering Materials*
5. 2020 ORNL Innovation Award, ORNL, 2020.
6. Best Lightning Talk Award, 7<sup>th</sup> Annual ORPA Research Symposium, ORNL, 2019.
7. Outstanding Graduate Student Award, UK, 2017.
8. Outstanding Poster Presentation Award, KY NSF EPSCoR Super Collider Symposium, KY, 2017.
9. Dissertation Enhancement Award, UK, 2016.
10. North American Membrane Society Student Stipend Award, 2016.
11. Center of Membrane Sciences 2016 Ph.D. Student Fellow Award, UK, 2016.
12. Selected for 18<sup>th</sup> U.S. National School on Neutron and X-ray Scattering, ORNL, ANL and DOE, 2016.
13. 1<sup>st</sup> Place Poster Award, Chemical and Materials Engineering Symposium, UK, 2015.
14. UK Graduate School Travel Award, 2014-2016.

## **FUNDED GRANTS**

1. **Syed Z. Islam** (PI) et al., A Novel Energy-Efficient Scalable Membrane Process for Separation and Recovery of Rare Earths from Domestic Sources, DOE AMMTO, Funding: \$1000K, performance period: 2025-2027.
2. **Syed Z. Islam** (Task Lead/PI) et al., Building membrane solvent extraction testbed system, Minerals to Materials Supply Chain Research Facility (METALLIC), DOE FECM, Funding: \$350K, performance period: 2024-2029.
3. **Syed Z. Islam (PI) et al.**, Mining Waste–Driven Carbon Dioxide Capture and Storage, ORNL Laboratory Directed Research and Development funds through DOE’s Office of Science, Funding: \$750K, performance period: 2024-2026.
4. **Syed Z. Islam (PI)**, Nicholas Gregorich, A Novel Membrane Contactor Enabling Energy-Efficient CO<sub>2</sub> Capture using a Green Solvent, DOE Energy I-Corp program, Office of Fossil Energy and Carbon Management (FECM), DOE, Funding: \$80K, performance period: September – November 2024.
5. **Syed Z. Islam (PI)**, Ramesh Bhawe, Separation and Purification of Rare Earths from Domestic Mining Feedstock Concentrates, Strategic Partnership Project, Three-consulting Inc., Funding: \$150K, performance period: 2024.
6. **Syed Z. Islam (Task lead/PI at ORNL)**, Ramesh Bhawe, Enabling SAF production by Adsorptive Denitrogenation, Bioprocessing Separation Consortium, Bioenergy Technologies Office, DOE, Funding: \$170K/year, performance period: 2023-2026 (Project lead: PNNL).
7. Md. Anisur Rahman (PI), **Syed Z. Islam (Co-PI)** et al., CO<sub>2</sub> Capture from Seawater by a Novel Contactor, ORNL Laboratory Directed Research and Development funds through DOE’s Office of Science, total funding; \$1100K, funding for Syed Islam: \$300K, performance period: 2023-2025.
8. Hai-Ying Chen (PI), **Syed Z. Islam (Co-PI)** et al., Energy-efficient removal of O<sub>2</sub> from CO<sub>2</sub> streams, ORNL Laboratory Directed Research and Development funds through DOE’s Office of Science, total funding; \$1200K, funding for Syed Islam: \$90K, performance period: 2023-2025.
9. Ramesh Bhawe (PI), **Syed Z. Islam (Co-PI)** et al., A Novel Approach for Highly Selective Separation and Recovery of Rare Earth Elements for Clean Energy and National Security Applications, Critical Materials Institute/AMMTO/DOE, funding: \$385K/year, performance period: 2023-2028.
10. Ramesh Bhawe (PI), **Syed Z. Islam (Co-PI)**, Recovery of Critical Materials and their Deployment in Remanufacturing of New EV Cells, Specific Partnership Project (SPP)/FECM/DOE, total funding: \$2000K, Performance period: 2023-2026.

11. Ramesh Bhawe (PI), **Syed Z. Islam (Co-PI)**, Recycling of Cathode Active Materials FROM END-of-Life Lithium-ion Batteries, ReCell Center, Vehicle Technologies Office, DOE, Performance period: 2022-2025; Funding: \$350K.
12. Ramesh Bhawe (PI), **Syed Z. Islam (Co-PI)**, Diol Separations, Separation Consortium (SepCon), BETO, DOE, Performance period: 2022-2025, Funding: \$900K.
13. Ramesh Bhawe (PI), **Syed Z. Islam (Co-PI)**, Conversion of 2,3-Butanediol to Biojet Fuel: Scale-up and Technoeconomic Analysis of Energy-Efficient Separations and Fermentative Diol Production, BETO, DOE, Performance period: 2022-2024, Funding: \$450K
14. Gernot Rother, Robert Sacci, **Syed Z. Islam (Co-PI)**, Uncover the Nano-scale Design Principles for Direct Air Capture of CO<sub>2</sub> by Electro-sorption; ORNL Laboratory Directed Research and Development funds through DOE's Office of Science, Performance period: 2022-2023, Funding: \$30K.
15. **Syed Z. Islam (PI)** et al, A novel membrane contactor-based CO<sub>2</sub> separation; ORNL Laboratory Directed Research and Development funds through DOE's Office of Science, DOE; Funding: \$970,000, Duration: 2022-2024.
16. **Syed Z. Islam (PI)** et al., A novel solar energy driven photo-electro-dialysis desalination approach for brackish water desalination, ORNL Laboratory Directed Research and Development funds through DOE's Office of Science, Funding: \$190,000; Duration: 2021-2022.
17. Ramesh Bhawe (PI), **Syed Z. Islam (Co-PI)**, Material testing capabilities for recovery and separation of heavy and light rare earth elements from electronic wastes, DLA/DOD; Funding: \$250,000; Duration: 2021-2022.

#### **TECHNOLOGIES LICENSED TO INDUSTRIES FOR COMMERCIALIZATION**

1. Forward osmosis composite membranes for concentration of lithium containing solutions, *U.S. Patent No. 12,030,017 B2*, July 9, 2024 – Licensed to Element3 Resources, May 2024.
2. Separation of rare earth elements from mining sources (*U.S. Patent 11,293,078 B2*, April 5, 2022) – licensed to Caldara LLC, 2023.
3. Recovery of critical materials from spent lithium-ion batteries (*U.S. Patent 11,811,035 B2*, November 7, 2023) – licensed to Momentum Technologies, 2020.
4. Separation of heavy and light rare earth elements (*U.S. Patent 11,293,078 B2*, April 5, 2022) - licensed to Momentum Technologies, 2019.

#### **PATENT AND PATENT APPLICATIONS**

1. Shailesh Dangwal, Syed Z. Islam, Ramesh R. Bhawe, Blake Trusty, A novel membrane contactor based liquid-liquid extraction process for biofuel separation and recovery from fermentation broth for sustainable aviation fuel, 63/713,253, October 2024.
2. Syed Z. Islam, Ramesh R. Bhawe, Membrane contactor for energy-efficient CO<sub>2</sub> capture from point sources with physical solvents, *U.S. Patent Application No. 18/785,093*, July 26, 2024.
3. Ramesh R. Bhawe, Vishwanath Deshmane, Nicholas N. Linneen, Stephen Harrison, Mariappan Paranthaman, Bruce A. Moyer, Syed Z. Islam, Forward osmosis composite membranes for concentration of lithium containing solutions, *U.S. Patent No. 12,030,017 B2*, July 9, 2024.
4. Ramesh Bhawe, Syed Z. Islam, M. Parans Paranthaman, Priyesh Wagh, A novel energy efficient membrane solvent extraction process for separation of lithium from geothermal brines, *U.S. non-provisional patent application No. 18/734,407*, June 5, 2024.

5. Anisur Rahman, Mary Danielson, Nicholas Gregorich, Syed Z. Islam, CO<sub>2</sub> Capture from seawater by a novel contactor, *U.S. provisional patent application No: 63/650,928*, May 23, 2024.
6. Ramesh Bhawe, Syed Z. Islam, and Priyesh Wagh, Recovery of critical elements from end-of-life lithium-ion batteries with supported membrane solvent extraction. *U.S. Patent 11,811,035 B2*, November 7, 2023.
7. Ramesh Bhawe, Priyesh Wagh, Syed Z. Islam, A novel efficient process for separation of critical materials from primary and secondary sources, *U.S. Provisional Patent Application No: 81949362*, March 2024.
8. Ramesh R. Bhawe, Syed Z. Islam, Priyesh A. Wagh, Method of concentrating lithium-containing solutions and recovering lithium therefrom, *U.S. Patent Application No. 17/836,088*, June 9, 2022.
9. Ramesh Bhawe, Syed Z. Islam, Vishwanath Deshmene, Separation of rare earth elements using supported membrane solvent extraction, *U.S. Patent 11,293,078 B2*, April 5, 2022.

**PEER-REVIEWED PUBLICATIONS** (Total Citation in [Google Scholar](#): 815; H-index: 13)

1. Musfekur Rahman Dihan, Tanzim Ur Rahman, Md Atquj Jaman Riad Khan, Tabassum Sunjida Banhi, Shoumik Sadaf, Md Sumon Reza, Shammia Afroze, **Syed Z Islam**, Md Shahinoor Islam, Photocatalytic and photoelectrochemical H<sub>2</sub> generation for sustainable future: Performance improvement, techno-economic analysis, and life cycle assessment for shaping the reality, *Fuel* 392 (2025) 134356.
2. Jian Liu,\* William L. Kubic, Jr., Eric C. D. Tan, Jacob W. Dempsey, Pahola Thathiana Benavides, Sweta Balchandani, Hakan Olcay, Dupeng Liu, Ning Sun, Shailesh Dangwal, Blake N. Trusty, **Syed Z. Islam**, and Ramesh R. Bhawe, Techno-Economic Analysis and Life Cycle Assessment for the Separation of 2,3-Butanediol from Fermentation Broth Using Liquid–Liquid Extraction, *Industrial and Engineering Chemistry Research*, 2025, <https://doi.org/10.1021/acs.iecr.4c03056>
3. Zachary Coin, Shailesh Dangwal, Mary Hannah Irwin, Thomas Knight, Ramesh Bhawe, Gernot Rother, Robert Sacci, Md. Arifuzzaman, Vera Bocharova, Ilia Ivanov, David S. Sholl, **Syed Z. Islam**, Effect of Viscosity of a Deep Eutectic Solvent on CO<sub>2</sub> Capture Performance in an Energy-Efficient Membrane Contactor–Based Process, *ACS Omega*, 2025, 10, 3407–3417 (Featured in supplementary Cover Page).
4. Priyesh Wagh, **Syed Z. Islam**, Tej Nath Lamichhane, Ramesh Bhawe, Mariappan Parans Paranthaman, Separation of lithium from aluminum containing clay mineral leachate solution using energy-efficient membrane solvent extraction, *ACS Omega*, 2023, 8, 46523–46527 (Featured in supplementary Cover Page).
5. Jacek Jakowski, Jingsong Huang, **Syed Islam**, David Sholl, Quantum chemical simulations of CO<sub>2</sub> and N<sub>2</sub> capture in reline, a prototypical deep eutectic solvent, *Journal of Physical Chemistry B*, 127, 8888–8899, 2023 (Featured in supplementary Cover Page).
6. Hridoy Roy, Tanzim Ur Rahman, Md. Atquj Jaman Riad Khan, Md. Rashid Al-Mamun, **Syed Z. Islam**, Md. Abdul Khaleque, Md. Ikram Hossain, Md. Zaved Hossain Khan, Md. Shahinoor Islam, Hadi M. Marwani, Aminul Islam, Md. Munjur Hasan, Md. Rabiul Awual, Toxic dye removal, remediation, and mechanism with doped SnO<sub>2</sub>-based nanocomposite photocatalysts: A critical review, *Journal of Water Process Engineering*, 2023, 54, 104069.
7. **Syed Z. Islam**\*(corresponding author), Shailesh Dangwal, Ramesh Bhawe, Membrane solvent extraction to recover rare earth elements, *Chemical Engineering Progress*, 2023, March, 31-35.
8. **Syed Z. Islam**\*(corresponding author), M. Arifuzzaman, G. Rother, V. Bocharova, R. Sacci, J. Jakowski, J. Huang, I. Ivanov, R. Bhawe, D. S. Sholl, T. Saito, A membrane contactor enabling energy-

- efficient CO<sub>2</sub> capture from point sources with deep eutectic solvents, *Industrial and Engineering Chemistry Research*, 2023, 62 (10), 4455-4465 (Featured in supplementary Cover Page).
9. **Syed Z. Islam\***(corresponding author), David S. Sholl, Janice A. Steckel, Robert L. Thompson, Strong degradation of polycarbonate and polystyrene by the CO<sub>2</sub> capture solvent diethyl sebacate, *Process Safety Progress*, 2023, 1-6.
  10. Tanzim Ur Rahman, Hridoy Roy, Athkia Fariha, Afrina Zaman Shoronika, Md Rashid Al-Mamun, **Syed Z. Islam**, Md Shahinoor Islam, Hadi M Marwani, Aminul Islam, Abdulmohsen KD Alsukaibi, Mohammed M Rahman, Md Rabiul Awual, Progress in plasma doping semiconductor photocatalysts for efficient pollutant remediation and hydrogen generation, *Separation and Purification Technology* 2023, 320, 124141.
  11. **Syed Z. Islam\***, P. Wagh, J. E. Jenkins, C. Zarzana, M. Foster, R. Bhawe\*, Process scale up of an energy-efficient membrane solvent extraction process for rare earth recycling from electronic-waste, *Advanced Engineering Materials*, 2022, 2200390, 1-12 (\*corresponding author) (Featured in Cover Page).
  12. Priyesh Wagh\*, **Syed Z. Islam\*(co-first author)**, Vishwanath G. Deshmane, Pranathi Gangavarapu, Jonathan Poplawsky, Guang Yang, Robert Sacci, Samuel F. Evans, Sidharth Mahajan, M. Parans Paranthaman, Bruce Moyer, Stephen Harrison, Ramesh Bhawe, Fabrication and characterization of composite membranes for the concentration of lithium containing solutions using forward osmosis, *Advanced Sustainable Systems*, 2020, 2000165, 1-12.
  13. Ji Jiang, **Syed Islam**, Qiaobei Dong, Fanglei Zhou, Shiguang Li, Miao Yu, Deposition of an ultrathin palladium (Pd) coating on SAPO-34 membranes for enhanced H<sub>2</sub>/N<sub>2</sub> separation, *International Journal of Hydrogen Energy*, 2020, 45 (58), 33648 - 33656.
  14. M. Arif Khan, **Syed Z. Islam**, Suraj Nagpure, Yuxin He, Namal Wanninayake, Rebecca L. Palmer, Joseph Strzalka, Doo Young Kim, Barbara L. Knutson, Stephen E. Rankin, Epitaxial formation mechanism of multilayer TiO<sub>2</sub> films with ordered accessible vertical nanopores by evaporation-driven assembly, *Journal of Physical Chemistry C*, 2020, 124, 3, 1958-1972.
  15. Shanshan Zhou, Emma Guilfoil, Yuxin He, Suraj Nagpure, **Syed Z. Islam**, M. Arif Khan, Stephen E. Rankin, Barbara L. Knutson, Impedance analysis of ion transport through supported lipid bilayers on accessible mesoporous silica thin films, *Advanced Materials Interfaces*, 2020, 1901787.
  16. Vishwanath Deshmane, **Syed Z. Islam**, Ramesh Bhawe, Selective recovery of rare earth elements from a wide range of e-wastes and process scalability of membrane solvent extraction, *Environmental Science and Technology*, 2020, 54, 550-558.
  17. Nicholas Linneen, Frank Delnick, **Syed Z Islam**, Vishwanath G Deshmane, and Ramesh Bhawe, Application of the macrohomogeneous line model for the characterization of carbon aerogel electrodes in capacitive deionization, *Electrochimica Acta*, 2019, 301, 1-7.
  18. Suraj Nagpure, Jiagang Xu, Md. Arif Khan, **Syed Z. Islam**, Qinglin Zhang, Yang Tse Cheng, and Stephen Rankin, Synthesis of layer-by-layer thick mesoporous titania films with vertically oriented 2D-HCP nanopores and their use in lithium ion batteries as negative electrodes, *Advanced Functional Materials*, 2018, 28 (37), 1801849.
  19. **Syed Z. Islam**, Allen Reed, Suraj Nagpure, James Browning, Joseph Strzalka, Doo-Young Kim, and Stephen Rankin, Hydrogen incorporation by plasma treatment gives mesoporous black TiO<sub>2</sub> thin films with visible photoelectrochemical water oxidation activity, *Microporous and Mesoporous Materials*, 2018, 261, 35-43.
  20. M. Arif Khan, William Wallace, **Syed Z. Islam**, Suraj Nagpure, Joseph Strzalka, John Littleton, Stephen Rankin and Barbara Knutson, Adsorption and recovery of polyphenolic flavonoids using TiO<sub>2</sub>

functionalized mesoporous silica nanoparticles, *ACS Applied Materials and Interfaces*, 2017, 9 (37), 32114–32125.

21. **Syed Z. Islam**, Suraj Nagpure, Doo-Young Kim, and Stephen E. Rankin, Synthesis and catalytic applications of non-metal doped mesoporous titania, *Inorganics*, 2017, 5, 15.
22. **Syed Z. Islam**, Allen D. Reed, Namal Wanninayake, Doo-Young Kim, and Stephen E. Rankin, Remarkable enhancement of photocatalytic hydrogen production in N<sub>2</sub>/Ar plasma treated, mesoporous TiO<sub>2</sub> films, *The Journal of Physical Chemistry C*, 2016, 120(26), 14069–14081.
23. **Syed Z. Islam**, Allen D. Reed, Doo-Young Kim, and Stephen E. Rankin, N<sub>2</sub>/Ar plasma induced doping of ordered mesoporous TiO<sub>2</sub> thin films for visible light active photocatalysis, *Microporous and Mesoporous Materials*, 2016, 220, 120-128.
24. **Syed Z. Islam** and Stephen E. Rankin, Hydrazine-based synergistic Ti(III)/N doping of surfactant-templated TiO<sub>2</sub> thin films for enhanced visible light photocatalysis, *Materials Chemistry and Physics*, 2016, 182, 382-393.
25. **Syed Z. Islam**, Vishwanath G. Deshmane, and Shamsuddin Ilias, Thermal stability study of Pd-composite membrane fabricated by surfactant induced electroless plating (SIEP), *Separation Science and Technology*, 2016, 51(7), 1176-1188.
26. Saikat Das, Suraj Nagpure, Ravinder Garlapalli, Qingliu Wu, **Syed Z. Islam**, Joseph Strzalka, and Stephen E. Rankin, In-Situ GISAXS study of pore orientation effect on thermal transformation mechanism of surfactant templated mesoporous titania thin films, *Physical Chemistry Chemical Physics*, 2016, 18, 2896-2905.

## INVITED TALKS

1. **Syed Z. Islam**, Ramesh Bhawe, Shailesh Dangwal, Zachary Coin, Energy Efficient Membrane Separations for Clean Energy Technologies, From Concept to Commercialization, *Joint Seminar, Department of Mining Engineering, and Department of Chemical and Biomedical Engineering, West Virginia University*, February 2024.
2. **Syed Z. Islam**, Ramesh Bhawe, Priyesh Wagh, Shailesh Dangwal, Zachary Coin, John Klaehn, Membrane separation process for recovery of critical materials, *11th Annual Japan – U.S. Bilateral Meeting on Rare Metals organized by US DOE and Japan Counterpart*, December, 2023.
3. **Syed Islam**, Engineered nanostructured metal oxide thin films for energy applications, *Center for Nanophase Materials Sciences Seminar Series*, Oak Ridge National Laboratory, March 2021.
4. Ramesh Bhawe, **Syed Z. Islam** (co-presenter), Recovery and separation of rare earth elements from e-waste, Webinar, Critical Materials Institute, an Energy Innovation Hub of U.S. DOE, July 2019.
5. **Syed Z. Islam**, J. Jiang, Q. Dong, S. Li, M. Yu, Synthesis of modified SAPO-34 membranes on ceramic hollow fibers for high temperature separation of H<sub>2</sub>/N<sub>2</sub>, *Membranes: Materials and Processes, Gordon Research Seminar 2018*, New Hampshire, USA.
6. **Syed Z. Islam**, A. D. Reed, N. Wanninayake, D. Y. Kim, S. E. Rankin, Synthesis and energy applications of mesoporous titania thin films, *2017 Materials and Chemical Engineering Graduate Student Association (MACE) Symposium*, UK, Lexington, KY.

## PRESS/MEDIA

- WVLT News, [Breaking Ground: Saved from the scrapyard, a big Tennessee economic boost](#), January 15, 2025
- ORNL Press: [Seven ORNL inventions licensed to Texas-based lithium recovery firm](#), May 2024.

- ORNL Press: [Revolutionizing resource renewal: Scaling up sustainable recycling for critical materials](#), December 2023.
- ORNL Press Release- [Owner of US heavy rare earth mine licenses ORNL separation technology](#), December 2023.
- ORNL highlights Syed Z. Islam's research: [Saving e-waste scraps](#), 2022.
- *Industry and Energy* featured Syed Z. Islam's research: [Researchers scaling up technology for recycling rare earth elements](#), 2022
- Novel Membrane Solvent Extraction technology for LIB recycling placed the second position among the top ten technologies revolutionizing the space of Materials Sciences evaluated by the World Materials Forum, 2020.
- ORNL Review Magazine featured Syed Z. Islam, 2020.
- STEM Magazine featured Syed Z. Islam's research on rare earth recovery, 2020.
- ORNL published a short video on Syed Z. Islam's research on rare earth recovery, 2019.
- Phys.org featured Syed Z. Islam's research on rare earth recovery, 2019.
- ORNL featured Syed Z. Islam's research on rare earth recovery, 2019.
- Eurekalert.org featured Syed Z. Islam's research on rare earth recovery, 2019.
- Newswise.com featured Syed Z. Islam's research on rare earth recovery, 2019.

## MENTORING

- *Postdoctoral research associates*
  - Nicholas Gregorich, mentoring period: January 2024 - present
  - Blake Trusty, mentoring period: September 2023 - present
  - Shailesh Dangwal, mentoring period: June 2022 - present
- *Technician*
  - Zachary Coin, mentoring period: January 2023 – present
  - Larry Powell, and Dale Adcock, mentoring period: August 2018 – present (part time)
- *Science Undergraduate Laboratory Internship (SULI):*
  - Joseph Kalla, University of Tennessee at Knoxville, January 2025 – May 2025).
  - Frank Savor, Farmingdale State College, August – December, 2024
  - Stephanie Cho, University of Tennessee at Knoxville, June 2024 – August 2024).
  - Erik Head, Texas A&M University, College Station, TX, June 2024 – August 2024).
  - Mary Hannah Irwin, University of Tennessee at Knoxville, August 2023 – present).
  - Thomas Knight, Vanderbilt University, May 2023 – July 2023, and June 2022 – August 2022.
  - Gregory Gorobet, University of California, Los Angeles, June 2022 – August 2022.
  - Sidharth Mahajan, University of Tennessee, Knoxville, TN, June 2019 - August 2019; January 2020 – May 2020
  - Eli James Jenkins, University of Tennessee, Knoxville, TN, Summer 2019.
- *Post-Master's Research Associate:*
  - Pranathi Gangavarapu, ORNL, August 2018 – April 2019.
- Two undergraduate senior students, University of Kentucky, Spring 2017.
- Two students of Research Experience for Undergraduate (REU), UK, Summer 2016.
- *High school student:* Michael Danner, UK, Summer 2015.

## PROFESSIONAL SERVICES AND OUTREACH

- Reviewer of BES DOE DOE proposals; SBIR/STTR DOE proposals; NSF proposals.
- Panelist, student workshop, North American Membrane Society 2024 annual meeting, Santa Fe, NM.
- Session co-chair, Process Intensification and Decarbonization, North American Membrane Society 2024 annual meeting, Santa Fe, NM.
- Panelist, Bioenergy Career Bridge Workshop, July 2023, Separation Consortium, Bioenergy Technologies Office, U.S. Department of Energy.
- Member of the organizing committee on United Engineering Forum (UEF) Critical Materials, organized by AIChE, Houston, TX, September 2023.
- Session co-chair, Highly Selective Separations, North American Membrane Society annual meeting 2023, Tuscaloosa, AL.
- Member of 2022 Critical Materials Institute (CMI) Leadership Academy, an energy innovation hub of U.S. Department of Energy.
- Co-developed a short course on rare earth elements, titled “Rare Earth Elements: Mine to Magnet and Beyond,” supported by the CMI hosted at the Colorado School of Mines, Golden, CO, February, 2023.
- Organizer, Separations and Polymer Chemistry Section seminar series, Chemical Sciences Division, ORNL (January 2023 – present).
- Moderator, an ACS webinar, titled “Role of Polymer Sciences in Water Purification Membranes” organized by the American Chemical Society, 2022.
- Panelist, Career Workshop 2022, North American Membrane Society annual meeting 2022, Tempe, AZ.
- Panelist, Career Workshop 2022, National Alliance for Water Innovation, a water innovation hub of U.S. Department of Energy.
- Secretary of the Oak Ridge Postdoc Association (ORPA) 2020.
- Session Chair, Oak Ridge Postdoctoral Association Research Symposium, 2020.
- Reviewer of North American Membrane Society Student Award applications, 2020 - present.
- Executive member of the ORPA Committee 2019.
- Served as a judge in student poster session, NAMS 2019 Annual Meeting, and undergraduate poster session, AIChE Annual Meeting (2015-2016).
- Review manuscripts for *Membranes*, *Solvent Extraction and Ion Exchange*, *Materials Research Bulletin*, *Separation Science and Technology*, *Journal of Sol-Gel Science and Technology*, *Journal of Saudi Chemical Society*, *Journal of Nanomaterials*, *International Journal of Photoenergy*, *Advanced Powder Technology* and *Thin Solid Films*.

## PROFESSIONAL AFFILIATIONS

- American Institute of Chemical Engineers (AIChE)
- North American Membrane Society (NAMS)
- American Chemical Society (ACS)