Jennifer L. Schaefer

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EDUCATION

Cornell University
Ph.D., Chemical Engineering, January 2014
Thesis: *"Hybrid nanostructured electrolytes for lithium metal batteries"*
Advisor: Lynden A. Archer

Widener University
M.Eng., Chemical Engineering (*Summa Cum Laude*), 2008
Master's Thesis: *"Binding of peptides to collagen sponge for hemostasis"*
B.Ch.E. Chemical Engineering; B.S., Chemistry (*Summa Cum Laude*), 2008

PROFESSIONAL EXPERIENCE

Assistant Professor, Department of Chemical & Biomolecular Engineering, 2015 - present
University of Notre Dame, Notre Dame, IN

NRC Postdoctoral Research Fellow, Materials Science & Engineering Division, 2014 - 15
National Institute of Standards & Technology, Gaithersburg, MD

Adjunct Faculty, Department of Chemistry, Fall 2013
Tompkins Cortland Community College, Dryden, NY

SELECTED HONORS AND AWARDS

- Catherine F. Pieronek Women in Engineering Impact Award, *ND College of Engineering*, 2021
- 35 Under 35, *American Institute of Chemical Engineers*, 2020
- Young Investigator, *ACS Division of Polymer Materials: Science and Engineering*, 2020
- Emerging Investigator, *RSC Polymer Chemistry journal*, 2020
- Scialog Fellow, *Research Corporation for Science Advancement*, 2019
- ECS Young Investigator Fellowship, *Toyota Research Institute of North America*, 2019
- NSF CAREER Award, *National Science Foundation*, 2017
- Postdoctoral Fellowship at NIST, *National Research Council*, 2014 - 2015
- Austin Hooey Graduate Research Excellence Award, *Cornell CBE*, 2013
- Young Investigator Award, *Energy Materials Center at Cornell*, 2013
- NSF GK-12 Fellow (Grass Roots: Advancing Education in Renewable Energy and Cleaner Fuels), *National Science Foundation*, 2011-2013
- Conference Travel Scholarship, *The Electrochemical Society Battery Division*, 2011
- NSF IGERT Fellow (Materials for a Sustainable Future), *National Science Foundation*, 2009-2011

- Distinguished Service Award, *Cornell University Diversity Programs in Engineering*, 2010
- Graduate School Fellow, *Cornell University*, 2008-2009
- Full Tuition Scholarship, *Widener University*, 2004 – 2008
- The Julia B. Blumberg Engineering Award, *Widener University*, 2008
- The Science Award, *Widener University*, 2008
- Lewis A. Caccese Scholarship, *Engineers' Club of Philadelphia*, 2008
- Outstanding Senior Award, *AIChE Delaware Valley Section*, 2008
- Foundation Award, *American Institute of Chemists*, 2008

AWARDS TO MENTEES

† Notre Dame graduate student, ‡ Notre Dame undergraduate student

National Awards

- Hunter Ford† – selected to present in the 2020 AIChE Area 8A Graduate Awards Symposium
- Emily Doyle‡ – one of 20 students nationally selected to present at the Future Leaders in Chemical Engineering Symposium with North Carolina State University in October 2020
- Morgan Seidler‡ – awarded a 2020 National Science Foundation Graduate Research Fellowship
- Laura Merrill† – selected for an ASTRO internship at Oak Ridge National Laboratory in 2019
- Morgan Seidler‡ – one of 21 students nationally selected to present at the Future Leaders in Chemical Engineering Symposium at North Carolina State University in October 2018

Local Awards

- Hannah Collins‡ – awarded a 2020/2021 Vincent P. Slatt Fellowship for Undergraduate Research
- Emma Kerr‡ – awarded a 2020 Vincent P. Slatt Fellowship for Undergraduate Research
- Hunter Ford† – awarded the 2020 Patrick and Jana Eilers Graduate Student Fellowship
- Jiacheng Liu† – poster winner at the ND CBE Graduate Student Research Symposium in September 2019
- Hunter Ford† – awarded the CEST/Bayer Predoctoral Research Fellowship for 2019/2020
- Hunter Ford† – awarded the ND CBE Best Candidacy Award for 2019/2020
- Emily Doyle‡ – awarded a 2019 Vincent P. Slatt Fellowship for Undergraduate Research
- Seancarlos Gonzalez‡ – awarded a 2019 Vincent P. Slatt Fellowship for Undergraduate Research
- Laura Merrill† – awarded the 2019 Patrick and Jana Eilers Graduate Student Fellowship
- Hunter Ford† – poster winner at the Notre Dame – Purdue Polymers and Soft Matter Symposium in October 2018
- Laura Merrill† – awarded the CEST/Bayer Predoctoral Research Fellowship for 2018/2019
- Morgan Seidler‡ – awarded a 2018 Vincent P. Slatt Fellowship for Undergraduate Research
- Colin Brankin‡ – awarded a 2018 Vincent P. Slatt Fellowship for Undergraduate

Research

- Hunter Ford† – poster winner at the ND CBE Graduate Student Research Symposium in September 2017

PUBLICATIONS

32. X. C. Chen, Y. Zhang, L. C. Merrill, C. Soulen, M. Lehmann, F. M. Delnick, **J. L. Schaefer**, Z. Du, T. Saito, and N. J. Dudney, "Gel Composite Electrolyte - An Effective Way to Utilize Ceramic Fillers in Lithium Batteries," *Journal of Materials Chemistry A*, 9, 6555-6566, 2021. https://doi.org/10.1039/D1TA00180A

31. H. O. Ford, E. S. Doyle, P. He, W. C. Boggess, A. Oliver, T. Wu, G. E. Sterbinsky, and **J. L. Schaefer**, "Self-Discharge of Magnesium-Sulfur Batteries Leads to Active Material Loss and Poor Shelf Life," *Energy and Environmental Science*, 14, 890-899, 2021. https://doi.org/10.1039/D0EE01578D

30. L. C. Merrill, X. C. Chen, Y. Zhang, H. O. Ford, K. Luo, Y. Zhang, G. Yang, Y. Wang, Y. Wang, **J. L. Schaefer**, and N. Dudney, "Polymer-Ceramic Composite Electrolytes for Lithium Batteries: A Comparison between Single-Ion-Conducting Polymer Matrix and Its Counterpart," *ACS Applied Energy Materials*, 3, 8871-8881, 2020. https://doi.org/10.1021/acsaem.0c01358

29. M. P. Dugas, G. Van Every, B. Park, J. R. Hoffman, R. J. LaRue, A. M. Bush, Y. Zhang, **J. L. Schaefer**, D. R. Latulippe, and W. A. Phillip, "Resilient hollow fiber nanofiltration membranes fabricated from crosslinkable phase-separated copolymers," *Molecular Systems Design & Engineering*, 2020. https://doi.org/10.1039/C9ME00160C

28. B. Park and **J. L. Schaefer**, "Review—Polymer Electrolytes for Magnesium Batteries: Forging Away from Analogs of Lithium Polymer Electrolytes and Towards the Rechargeable Magnesium Metal Polymer Battery," *Journal of the Electrochemical Society*, 167, 070545, 2020. https://doi.org/10.1149/1945-7111/ab7c71

27. H. O. Ford, B. Park, J. Jiang, M. E. Seidler, and **J. L. Schaefer**, "Enhanced Li+ conduction within single-ion conducting polymer gel electrolytes via reduced cation-polymer interaction," *ACS Materials Letters*, 2, 272-279, 2020. *(On the Most Highly Downloaded list)* https://doi.org/10.1021/acsmaterialslett.9b00510

26. **J. L. Schaefer**, "Toward High-Energy Batteries: High-Voltage Stability via Superstructure Control," *Joule*, 4, 296-298, 2020. *(Invited)* https://doi.org/10.1016/j.joule.2020.01.010

25. H. O. Ford, C. Cui, and **J. L. Schaefer**, "Comparison of Single-Ion Conducting Polymer Gel Electrolytes for Sodium, Potassium, and Calcium Batteries: Influence of Polymer Chemistry, Cation Identity, Charge Density, and Solvent on Conductivity," *Batteries*, 6, 11, 2020. *(Invited; open access at no charge)* https://doi.org/10.3390/batteries6010011

24. J. Liu, P. D. Pickett, B. Park, S. Upadhyay, S. V. Orski, and **J. L. Schaefer**, "Non-solvating, side-chain polymer electrolytes as lithium single-ion conductors: synthesis and ion transport characterization," *Polymer Chemistry*, 11, 461-471, 2020. *(Invited for Emerging Investigators 2020 special issue)* https://doi.org/10.1039/C9PY01035A

23. B. Park, H. O. Ford, L. C. Merrill, J. Liu, L. P. Murphy, and **J. L. Schaefer,** "Dual Cation Exchanged Poly(ionic liquid)s as Magnesium Conducting Electrolytes," *ACS Applied Polymer Materials*, 1, 2907-2913, 2019. https://doi.org/10.1021/acsapm.9b00614

22. L. C. Merrill, H. O. Ford, and **J. L. Schaefer**, "Application of Single-Ion Conducting Gel Polymer Electrolytes in Magnesium Batteries," *ACS Applied Energy Materials*, 2, 6355-6363, 2019. https://doi.org/10.1021/acsaem.9b00991

21. P. He, H. O. Ford, L. C. Merrill, and **J. L. Schaefer**, "Investigation of the Effects of Copper Nanoparticles on Magnesium–Sulfur Battery Performance: How Practical Is Metallic Copper Addition?" *ACS Applied Energy Materials*, 2, 6800-6807, 2019. https://doi.org/10.1021/acsaem.9b01236

20. **J. L. Schaefer** and L. C. Merrill, "Multivalent Metallic Anodes for Rechargeable Batteries," in *Encyclopedia of Inorganic and Bioinorganic Chemistry*, 2019. https://doi.org/10.1002/9781119951438.eibc2678

19. L. C. Merrill and **J. L. Schaefer**, "The influence of interfacial chemistry on magnesium electrodeposition in non-nucleophilic electrolytes using sulfone-ether mixtures," *Frontiers in Chemistry*, 7, 194, 2019. *(Invited for Rising Stars Special Collection; open access at no charge)*

18. H. O. Ford, L. C. Merrill, P. He, S. P. Upadhyay, and **J. L. Schaefer**, "Cross-Linked Ionomer Gel Separators for Polysulfide Shuttle Mitigation in Magnesium–Sulfur Batteries: Elucidation of Structure–Property Relationships," *Macromolecules*, 51, 8333-9068, 2018. (*Cover*) https://pubs.acs.org/doi/10.1021/acs.macromol.8b01717

17. A. M. Bush, H. O. Ford, F. Gao, M. J. Summe, S. Rouvimov, **J. L. Schaefer**, W. A. Phillip, and R. Guo, "Tunable mesoporous films from copolymers with degradable side chains as membrane precursors," *Journal of Membrane Science*, 567, 104-114, 2018. https://doi.org/10.1016/j.memsci.2018.08.069

16. C. T. Elmore, M. E. Seidler, H. O. Ford, L. C. Merrill, S. P. Upadhyay, W. F. Schneider, and **J. L. Schaefer**, "Ion Transport in Solvent-Free, Crosslinked, Single-Ion Conducting Polymer Electrolytes for Post-Lithium Ion Batteries," *Batteries*, 4(2), 28, 2018. (*Invited for Special Issue; open access at no charge*) https://doi.org/10.3390/batteries4020028

15. L. C. Merrill and **J. L. Schaefer**, "Conditioning-Free Electrolytes for Magnesium Batteries Using Sulfone-Ether Mixtures with Increased Thermal Stability," *Chemistry of Materials*, 30(12), 3971-3974, 2018. https://pubs.acs.org/doi/10.1021/acs.chemmater.8b00483

14. L. C. Merrill and **J. L. Schaefer**, "Electrochemical Properties and Speciation in $Mg(HMDS)_2$-Based Electrolytes for Magnesium Batteries as a Function of Ethereal Solvent Type and Temperature," *Langmuir*, 33(37), 9426-9433, 2017. (*Invited for Special Issue*) http://dx.doi.org/10.1021/acs.langmuir.7b01111

13. P. T. Dirlam, J. Park, A. G. Simmonds, K. J. Domanik, C. B. Arrington, **J. L. Schaefer**, V. P. Oleshko, T. S. Kleine, K. Char, R. S. Glass, C. L. Soles, C. Kim, N. Pinna, Y.-E. Sung, and J. Pyun, "Elemental Sulfur and Molybdenum Disulfide Composites for Li-S Batteries with Long Cycle Life and High-Rate Capability," *ACS Applied Materials & Interfaces*, 8(21), 13437-13448, 2016. http://dx.doi.org/10.1021/acsami.6b03200

12. S. Takeuchi, W. R. McGehee, **J. L. Schaefer**, T. M. Wilson, K. A. Twedt, E. H. Chang, C. L. Soles, V. P. Oleshko, and J. J. McClelland, "Editors' Choice Communication -

Comparison of Nanoscale Focused Ion Beam and Electrochemical Lithiation in β-Sn Microspheres," *Journal of the Electrochemical Society*, 163(6), A1010-A1012, 2016. http://dx.doi.org/10.1149/2.1161606jes

11. V. P. Oleshko, J. Kim, **J. L. Schaefer**, S. D. Hudson, C. L. Soles, A. G. Simmonds, J. G. Griebel, R. S. Glass, K. Char, and J. Pyun, "Structural origins of enhanced capacity retention in novel copolymerized sulfur-based composite cathodes for high-energy density Li–S batteries," *MRS Communications*, 5(3), 353-364, 2015.
10. Y. H. Wen, **J. L. Schaefer**, and L. A. Archer, "Dynamics and Rheology of Soft Colloidal Glasses," *ACS Macro Letters*, 4(1), 119-123, 2015.
9. R. Khurana, **J. L. Schaefer**, L. A. Archer, and G. W. Coates, "Suppression of Lithium Dendrite Growth Using Cross-Linked Polyethylene/Poly(ethylene oxide) Electrolytes: A New Approach for Practical Lithium-Metal Polymer Batteries," *Journal of the American Chemical Society*, 136(20), 7395-7402, 2014.
8. S. Srivastava, **J. L. Schaefer**, Z. Yang, Z. Tu, and L. A. Archer, "Polymer-Particle Composites: Phase Stability and Applications in Electrochemical Energy Storage," *Advanced Materials*, 26(2), 201-234, 2014.
7. **J. L. Schaefer**, D. A. Yanga, and L. A. Archer, "High lithium transference number electrolytes via creation of 3-dimensional, charged, nanoporous networks from dense functionalized nanoparticle composites," *Chemistry of Materials*, 25, 834-839, 2013.
6. Y. Lu, S. S. Moganty, **J. L. Schaefer**, and L. A. Archer, "Ionic liquid-nanoparticle hybrid electrolytes," *Journal of Materials Chemistry*, 22, 4066-4072, 2012.
5. **J. L. Schaefer**, Y. Lu, S. S. Moganty, P. Agarwal, N. Jayaprakash, and L. A. Archer, "Electrolytes for high-energy lithium batteries," *Applied Nanoscience*, 2012.
4. S. S. Moganty, S. Srivastava, Y. Lu, **J. L. Schaefer**, S. A. Rizvi, and L. A. Archer, "Ionic liquid-tethered nanoparticle suspensions: A novel class of ionogels." *Chemistry of Materials*, 24, 1386-1392, 2012.
3. **J. L. Schaefer**, S. S. Moganty, D. A. Yanga, and L. A. Archer, "Nanoporous hybrid electrolytes," *Journal of Materials Chemistry*, 21, 10094-10101, 2011.
2. S. S. Moganty, N. Jayaprakash, **J. L. Nugent**, J. Shen, and L. A. Archer, "Ionic-liquid-tethered nanoparticles: Hybrid electrolytes," *Angewandte Chemie International Edition*, 49(48), 9158-9161, 2010.
1. **J. L. Nugent**, S. S. Moganty, and L. A. Archer, "Nanoscale organic hybrid electrolytes," *Advanced Materials*, 22(33), 3677-3680, 2010.

PATENTS

2. L. A. Archer, L. L. Olenick, **J. L. Schaefer**, A. E. Corona, "Nanoparticle Organic Hybrid Materials (NOHMs)," *United States Patent*, 9,440,849 B2 (2016).
1. L. A. Archer, L. L. Olenick, **J. L. Schaefer**, A. E. Corona, and D. Kim. "Nanoparticle Organic Hybrid Materials (NOHMs) and Compositions and Uses of NOHMs," *United States Patent*, 9,142,863 B2 (2015).

INVITED PRESENTATIONS AND SEMINARS

***** Presenting author, † Notre Dame graduate student, ‡ Notre Dame undergraduate student

49. **J. L. Schaefer**,***** "Polymers for next generation electrochemical energy storage devices: understanding ion transport." *Virtually at Pennsylvania State University*, Polymer Physics Seminar, April 2021.
48. **J. L. Schaefer**,***** *Materials Research Society Fall Meeting*, "Magnesium Metal Electrodeposition and Electrodissolution with Polymer Electrolytes." December 2020.
47. H. O. Ford,†***** P. He,† and **J. L. Schaefer**, "Elucidating the relationships between performance, transport phenomena, and materials properties for functional components of multivalent-ion batteries." *Materials Research Society Spring/Fall Meeting*, December 2020.
46. **J. L. Schaefer**,***** "Next generation electrochemical energy storage based upon magnesium." *Mexican Energy Storage Network (Red de Almacenamiento de Energía)*, November 2020.
45. **J. L. Schaefer**,***** "Single-Ion Conducting Polymer Electrolytes for Rechargeable Batteries." *American Institute of Chemical Engineers Annual Meeting*, 8A Area Plenary: Emerging Areas in Polymer Science and Engineering, November 2020.
44. H. O. Ford, †***** P. He, † and **J. L. Schaefer**, "Understanding the Interplay of Polymer Chemistry and Morphology on Polysulfide Transport in Metal-Sulfur Rechargeable Batteries." *American Institute of Chemical Engineers Annual Meeting*, Area 8A Graduate Awards Symposium, November 2020.
43. E. Doyle, ‡***** H. O. Ford, and **J. L. Schaefer**, "Polysulfide Dissociation Mechanisms and Self-Discharge within Magnesium-Sulfur Batteries." *Virtually at North Carolina State University*, Future Leaders in Chemical Engineering Symposium, October 2020.
42. **J. L. Schaefer**,***** "Polymer Electrolytes and Metal Anodes: Ion Transport and Interfacial Impedance." *The Electrochemical Society 236th Meeting*, Special session for Toyota Young Investigators, October 2020. *(withdrawn re: COVID-19)*
41. **J. L. Schaefer**,***** "Polymers for next generation electrochemical energy storage devices: understanding ion transport." *Virtually at University of Illinois Urbana-Champaign*, Department of Materials Science and Engineering Soft Materials Seminar, September 2020.
40. **J. L. Schaefer**,***** "Polymers for next generation electrochemical energy storage devices: understanding ion transport." *Virtually at Tufts University*, Department of Chemical and Biological Engineering, September 2020.
39. **J. L. Schaefer**,***** "Polymers for next generation electrochemical energy storage devices: understanding ion transport." *260th American Chemical Society National Meeting*, PMSE Young Investigators Symposium, August 2020.
38. **J. L. Schaefer**,***** "Perspectives on polymer-containing solid-state batteries." *NSF Sponsored 2020 CBET Energy Storage Workshop: Frontiers of Materials, Architectures and Techniques*, August 2020.
37. **J. L. Schaefer**,***** *Telluride Science Research Center Workshop: Molecular Chemistry in Electrochemical Energy Storage*, July 2020. *(cancelled Re: COVID-19)*
36. **J. L. Schaefer**,***** "Solvent-Free, Non-Solvating, Side-Chain, Single-Ion Conducting Polymer Electrolytes." *International Symposium on Polymer Electrolytes*, June 2020. *(rescheduled Re: COVID-19)*
35. **J. L. Schaefer**,***** "Polymers in energy storage devices: Structure and ion transport." *Syracuse University*, Department of Biomedical and Chemical Engineering, April 2020. *(cancelled Re: COVID-19)*

34. H. O. Ford and **J. L. Schaefer**,***** "Structure-Property Relationships of Ionomeric Coatings for Application in Metal-Sulfur Batteries." *259th American Chemical Society National Meeting*, March 2020. *(cancelled Re: COVID-19)*
33. **J. L. Schaefer**,***** "Polymers in energy storage devices: Structure and ion transport." *Utah State University*, Department of Chemistry & Biochemistry, February 2020.
32. **J. L. Schaefer**,***** "Next generation electrochemical energy storage based upon magnesium." *Rochester Institute of Technology*, Department of Chemical Engineering, January 2020.
31. P. He,† H. O. Ford,† E. Doyle,‡ S. Gonzalez,‡ and **J. L. Schaefer**,* "Amazon Catalyst at ECS Award Address: Investigations of Magnesium Polysulfide Flow Batteries," *The Electrochemical Society 234th Meeting*, October 2019.
30. J. Liu,† B. Park,† H. O. Ford,† and **J. L. Schaefer**,***** "Characterization of ion transport and functional polymers in next generation electrochemical energy storage devices." *258th American Chemical Society National Meeting*, August 2019.
29. L. C. Merrill,† B. Park,† and **J. L. Schaefer**,***** "Speciation and Electrochemical Properties of Magnesium-Ion Electrolytes." *The Electrochemical Society 233rd Meeting*, May 2019.
28. **J. L. Schaefer**,***** "Polymers in energy storage devices: Structure and ion transport." *University of Maryland at College Park*, Department of Chemical & Nuclear Engineering, May 2019.
27. **J. L. Schaefer**,***** "From NIST Postdoc to Tenure-Track Faculty: Tips on the Transition." *National Institute of Standards and Technology*, May 2019.
26. **J. L. Schaefer**,***** "Next generation electrochemical energy storage based upon magnesium." *University of California Riverside*, Department of Chemical & Environmental Engineering, May 2019.
25. **J. L. Schaefer**,***** "Next generation electrochemical energy storage based upon magnesium." *University of California Los Angeles*, Department of Chemical & Biomolecular Engineering, May 2019.
24. **J. L. Schaefer**,***** "Next generation electrochemical energy storage based upon magnesium." *Cornell University*, Department of Chemical & Biomolecular Engineering, April 2019.
23. J. Liu,† B. Park,† and **J. L. Schaefer**,***** "Cation conduction in solvent-free ionomers for rechargeable batteries." *257th American Chemical Society National Meeting*, March 2019.
22. **J. L. Schaefer**,***** "Next generation electrochemical energy storage based upon magnesium." *Clemson University*, Department of Chemical & Biomolecular Engineering, February 2019.
21. **J. L. Schaefer**, ***** "Nanotechnology and Electrochemical Energy Storage." *Muskegon Community College*, Muskegon Think Tank, virtual, February 2019.
20. **J. L. Schaefer**,***** "Next generation electrochemical energy storage based upon magnesium." *Case Western Reserve University*, Department of Chemical & Biomolecular Engineering, January 2019.
19. L. C. Merrill† and **J. L. Schaefer**,***** "Magnesium deposition from sulfone-ether electrolytes." *American Institute of Chemical Engineers Annual Meeting*, October 2018.

18. H. O. Ford,[†]* L. C. Merrill,[†] P. He,[†] and **J. L. Schaefer**, "Crosslinked Ionomers for Use as Magnesium-Sulfur Battery Cathode Coatings." *Argonne National Laboratory,* APS User Seminar Series, October 2018.
17. **J. L. Schaefer**,* "Next-generation electrochemical energy storage devices." *Xavier University of Louisiana,* Department of Chemistry, October 2018.
16. **J. L. Schaefer**,* "Magnesium electrolytes based on thermally stable solvents and polymer gels." *Telluride Science Research Center Workshop: Molecular Chemistry in Electrochemical Energy Storage*, July 2018.
15. **J. L. Schaefer**, (invitation declined) *4th International Symposium on Sustainable Secondary Battery Manufacturing and Recycling at the 2017 Sustainable Industrial Processing Summit & Exhibition* in Cancun, Mexico, October 2017.
14. **J. L. Schaefer**,* "From NIST Postdoc to Tenure-Track Faculty: Tips on the Transition." *National Institute of Standards and Technology,* October 2017.
13. **J. L. Schaefer**,* "Next-generation electrochemical energy storage devices, and opportunities for study and research at the University of Notre Dame." *Franciscan University of Steubenville,* STEM Seminar Series, September 2017.
12. L. C. Merrill,[†] H. O. Ford,[†] and **J. L. Schaefer**,* "Studies on complex electrolytes for magnesium batteries." *254th American Chemical Society National Meeting*, August 2017.
11. **J. L. Schaefer**,* "Ion transport in single-ion conducting polymer electrolytes for lithium batteries." *253rd American Chemical Society National Meeting*, April 2017.
10. **J. L. Schaefer**,* "Materials and Opportunities for Advanced Energy Storage Devices." *Saint Mary's College*, STEM Symposium, October 2016.
9. **J. L. Schaefer**,* "Studies on Electrolytes for Lithium Metal Batteries." *Florida State University*, Energy & Materials Initiative, February 2014.
8. **J. L. Schaefer**,* "Studies on Electrolytes for Lithium Metal Batteries." *Virginia Commonwealth University*, Department of Chemical & Life Science Engineering, February 2014.
7. **J. L. Schaefer**,* "Studies on Electrolytes for Lithium Metal Batteries." *University of Virginia*, Department of Chemical Engineering, February 2014.
6. **J. L. Schaefer**,* "Studies on Electrolytes for Lithium Metal Batteries." *University of Notre Dame*, Department of Chemical & Biomolecular Engineering, February 2014.
5. **J. L. Schaefer**,* "Studies on Electrolytes for Lithium Metal Batteries." *Wayne State University*, Department of Chemical Engineering & Materials Science, January 2014.
4. **J. L. Schaefer**,* "Studies on Electrolytes for Lithium Metal Batteries." *Iowa State University*, Department of Chemical & Biological Engineering, January 2014.
3. **J. L. Schaefer**,* "Studies on Electrolytes for Lithium Metal Batteries." *Clarkson University*, Department of Chemical & Biomolecular Engineering, January 2014.
2. **J. L. Schaefer**,* "Studies on Electrolytes for Lithium Metal Batteries." *Cornell University*, School of Chemical & Biomolecular Engineering, Austin Hooey Lecture, May 2013.

1. **J. L. Schaefer**,***** "Studies on Electrolytes for Lithium Metal Batteries." *Pennsylvania State University*, Polymer Physics Seminar Series, April 2013.

CONTRIBUTED PRESENTATIONS

***** Presenting author
† Notre Dame graduate student, ‡ Notre Dame undergraduate student, ^ Notre Dame postdoctoral associate, # Visiting / co-mentored graduate student

51. J. Liu,† L. Yang, H. Collins, E. Kerr, and **J. L. Schaefer**, "Investigation of ionic liquid crystal materials as non-solvating lithium-ion conductors." *Materials Research Society Spring Meeting*, April 2021.
50. J. Liu,† and **J. L. Schaefer**, "Examination of side-chain length and backbone chemistry effects in ionic liquid crystal polymer electrolytes." *American Chemical Society National Meeting*, April 2021.
49. P. He,† H. O. Ford,† S. Gonzalez,‡ S. Rodriguez,‡ and **J. L. Schaefer**, "A systematic study of the role of Mg polysulfides in the Mg-S battery." *American Chemical Society National Meeting*, April 2021.
48. B. Park,† J. Liu,† and **J. L. Schaefer**, "Viscous star polymer electrolytes for Li metal anodes." *American Chemical Society National Meeting*, April 2021.
47. T. Dev, #***** B. Karami, L. Cabras, **J. L. Schaefer**, and A. Salvadori, "Multi-Physics Modeling and Empirical Investigation of Active Polymer Binder for Thick Cathode of Li-Ion Battery." *International Society of Electrochemistry Annual Meeting*, September 2020.
46. B. Boz,#***** H. O. Ford,† **J. L. Schaefer**, and A. Salvadori, "The Impact of Polymer Gel Electrolytes with Varying Transport Properties on Cycling of Lithium Ion Battery Systems." *International Society of Electrochemistry Annual Meeting*, September 2020.
45. B. Park,†***** J. Mindemark, and **J. L. Schaefer**, "Polycarbonate-based electrolytes for magnesium batteries." *259th American Chemical Society National Meeting*, March 2020. *(cancelled Re: COVID-19)*
44. B. Park†***** and **J. L. Schaefer**, "Magnesium ion conduction in dual cation conducting poly(ionic liquid)-based electrolytes." *259th American Chemical Society National Meeting*, March 2020. *(cancelled Re: COVID-19)*
43. J. Liu†***** and **J. L. Schaefer**, "Synthesis and Fundamental Characterization of Ionic Liquid Crystals and Liquid Crystalline Polymers as Lithium Conductors." *259th American Chemical Society National Meeting*, March 2020. *(cancelled Re: COVID-19)*
42. J. Liu†***** and **J. L. Schaefer**, "Lithium Transport in Non-Solvating Single-Ion Conducting Polymer Electrolytes: Influence of Side-Chain Length and Backbone Chemistry." *259th American Chemical Society National Meeting*, March 2020. *(cancelled Re: COVID-19)*
41. H. O. Ford,†***** Peng He,† and **J. L. Schaefer**, "Mitigation of the Polysulfide Shuttle Effect through Use of Crosslinked Ionomer Coatings." *American Institute of Chemical Engineers Annual Meeting*, November 2019.

40. J. Liu[†] and **J. L. Schaefer**,***** "Cation Conduction in Nanostructured Side-Chain Ionomers." *American Institute of Chemical Engineers Annual Meeting,* November 2019.

39. P. He, [†]***** H. O. Ford, [†] and **J. L. Schaefer**, "The Magnesium-Sulfur Battery with High Rate and Improved Capacity Using Cu Nanoparticle Additives." *The Electrochemical Society 235th Meeting,* May 2019.

38. H. O. Ford, [†]***** P. He, [†] and **J. L. Schaefer**, "Mitigation of the polysulfide shuttle effect through use of single-ion conducting polymer films." *Materials Research Society Spring Meeting,* April 2019.

37. B. Park[†] and **J. L. Schaefer**,***** "Multivalent cation conduction in dual cation-exchanged polyanions." *American Physical Society March Meeting,* March 2019.

36. J. Liu, [†]***** S. Upadhyay, [^] M. Winkler, [‡] Y. Xia, and **J. L. Schaefer**, "Ionic Phase-segregated Liquid Crystal/Polymer Electrolyte for Lithium-ion Transport." *American Physical Society March Meeting,* March 2019.

35. L. C. Merrill[†]***** and **J. L. Schaefer**, "Electrodeposition from Electrolytes with Increased Thermal Stability for Magnesium Batteries." *American Institute of Chemical Engineers Annual Meeting,* November 2018.

34. H. O. Ford, [†] L. C. Merrill,[†]***** P. He,[†] and **J. L. Schaefer**, "Crosslinked Ionomers for Use as Magnesium-Sulfur Battery Cathode Coatings." *American Institute of Chemical Engineers Annual Meeting,* November 2018.

33. M. E. Seidler,[‡]***** H. O. Ford,[†] C. T. Elmore,[‡] and **J. L. Schaefer**, Poster, "Crosslinked Single- Ion Conducting Polymer Electrolytes for Post Lithium-Ion Batteries." *American Institute of Chemical Engineers Annual Meeting,* October 2018.

32. C. Brankin,[‡]***** L. C. Merrill, [†] **J. L. Schaefer**, Poster, "Magnesium Ion Transport and Electrodeposition in Gel Polymer Electrolytes for Rechargeable Magnesium Batteries." *American Institute of Chemical Engineers Annual Meeting,* October 2018.

31. L. C. Merrill, [†] H. O. Ford, [†] C. Brankin, [‡] **J. L. Schaefer**,***** "Polymer Gel Electrolytes for Magnesium Batteries: Ion Transport and Electrochemical Characterization." *The Electrochemical Society 234th Meeting,* October 2018.

30. **J. L. Schaefer**,***** H. O. Ford, [†] L. C. Merrill, [†] and P. He, [†] "Crosslinked Ionomers for Use as Magnesium-Sulfur Battery Cathode Coatings." *69th Meeting of the International Society of Electrochemistry*, September 2018.

29. L. C. Merrill[†] and **J. L. Schaefer**,***** "Magnesium deposition from sulfone-ether electrolytes." *256th American Chemical Society National Meeting,* August 2018.

28. H. O. Ford,[†] L. C. Merrill,[†] P. He,[†] and **J. L. Schaefer**,***** "Crosslinked ionomers for use as magnesium-sulfur battery cathode coatings." *256th American Chemical Society National Meeting,* August 2018.

27. J. Liu,[†] M. Winkler,[‡] S. P. Upadhyay,[^] and **J. L. Schaefer**,***** Poster, "Side-Chain Ionomers and Related Liquid Crystals for Study of Ion Transport in Ionic Aggregates." *Gordon Research Conference: Polymer Physics,* July 2018.

26. **J. L. Schaefer**,***** L. C. Merrill,[†] Hunter O. Ford,[†] and Colin Brankin,[‡] "Ion Transport and Electrochemical Characterization of Polymer Gel Electrolytes for Magnesium Batteries." *The 16th International Symposium on Polymer Electrolytes*, June 2018.
25. H. O. Ford,[†]***** L. C. Merrill,[†] and **J. L. Schaefer**, "Crosslinked Ionomer Films for Use As Magnesium-Sulfur Battery Cathode Coatings." *The Electrochemical Society 233rd Meeting*, May 2018.
24. L. C. Merrill,[†]***** H. O. Ford,[†] and **J. L. Schaefer**, "Chemical equilibrium and electrochemical deposition of thermally stable electrolytes for magnesium batteries." *Material Research Society Fall Meeting*, December 2017.
23. L. C. Merrill,[†] H. O. Ford,[†] and **J. L. Schaefer**,***** "Studies on Complex Electrolytes for Magnesium Batteries." *American Institute of Chemical Engineers Annual Meeting*, October 2017.
22. L. C. Merrill[†] and **J. L. Schaefer**,***** "Speciation and Electrochemical Properties of Electrolytes for Mg-Ion Batteries." *The Electrochemical Society 232nd Meeting*, October 2017.
21. L. C. Merrill,[†]***** S. P. Upadhyay,[^] and **J. L. Schaefer**, "Studies on Complex Electrolytes for Divalent Batteries." *The Electrochemical Society 231st Meeting*, June 2017.
20. S. P. Upadhyay[^] and **J. L. Schaefer**,***** "Ion Transport in Single-Ion Conducting Polymer Electrolytes for Lithium Batteries." *The Electrochemical Society 231st Meeting*, May 2017.
19. **J. L. Schaefer*** and S. P. Upadhyay,[^] "Single-Ion Conducting Side-Chain Polymer Electrolytes for Lithium Batteries." *Materials Research Society Fall Meeting*, November 2016.
18. **J. L. Schaefer**,***** S. V. Orski, R. Nieuwendaal, C. R. Snyder, V. P. Oleshko, L. R. Middleton, K. I. Winey, and C. L. Soles, Poster, "Ion transport and structure of comb copolymer single-ion conducting electrolytes PSTFSI-ran-PEGMA." *Gordon Research Conference: Polymer Physics*, July 2016.
17. **J. L. Schaefer**,***** S. V. Orski, R. Nieuwendaal, V. P. Oleshko, L. R. Middleton, and C. L. Soles, "Structure and Li^+ Dynamics of the Single-Ion Conducting Polymer Electrolyte P(STFSI)-Ran-PEGMA." *The Electrochemical Society 228th Meeting*, October 2015.
16. **J. L. Schaefer*** and C. L. Soles, "Structure and dynamics of single-ion conducting P(STFSILi)-ran-P(EGMA) copolymer electrolytes." *American Physical Society March Meeting*, March 2015.
15. **J. L. Schaefer**,***** J. Kim, K. Char, J. Pyun, V. P. Oleshko, and C. L. Soles, "Characterization of polymerized sulfur cathodes upon cycling." *The Electrochemical Society 226th Meeting*, October 2014.
14. **J. L. Schaefer**,***** R. Khurana, G. W. Coates, and L. A. Archer, Poster. "Characterization of cross-linked polyethylene/poly(ethylene oxide) electrolytes and evaluation in lithium metal batteries." *Gordon Research Conference: Polymer Physics*, July 2014.

13. **J. L. Schaefer*** and L. A. Archer, "Transport Properties of Lithiated Nanocomposite Electrolytes." *Materials Research Society Fall Meeting,* December 2013.
12. **J. L. Schaefer*** and L. A. Archer, "Studies on Dendrite Growth in Lithium Metal Batteries," *American Institute of Chemical Engineers Annual Meeting,* November 2013.
11. **J. L. Schaefer** and L. A. Archer, "Tunable Electrolytes for Studies on Dendrite Growth in Lithium Metal Batteries," *The Electrochemical Society 224th Meeting,* October 2013.
10. Y. Lu,***** S. S. Moganty, K. Korf, **J. L. Schaefer**, S. K. Das, and L. A. Archer, "Ionic Liquid-Nanoparticle Hybrid Electrolytes and Their Applications in Rechargeable Lithium Metal Batteries," *The Electrochemical Society 224th Meeting,* October 2013.
9. **J. L. Schaefer** and L. A. Archer,***** "Tunable Electrolytes for the Study of Dendrite Growth in Lithium Metal Batteries," *Materials Research Society Fall Meeting,* December 2012.
8. **J. L. Schaefer*** and L. A. Archer, Poster. "Hybrid Electrolytes for Lithium Metal Batteries," *Gordon Research Conference: Batteries,* March 2012.
7. **J. L. Schaefer*** and L. A. Archer, "Transport properties of nanoparticle-organic hybrid composite electrolytes," *Materials Research Society Fall Meeting,* November 2011.
6. **J. L. Schaefer**,***** P. A. Agarwal, and L. A. Archer, "Nanoporous Hybrid Electrolytes," *The Electrochemical Society 220th Meeting,* October 2011.
5. **J. L. Nugent**,***** S. S. Moganty, P. A. Agarwal, and L. A. Archer, "Nanoscale Hybrid Electrolytes," *The Electrochemical Society 219th Meeting,* May 2011.
4. **J. L. Nugent**,***** S. S. Moganty, D. A. Yanga, and L. A. Archer, "Nanoscale Hybrid Electrolytes for Lithium Metal Batteries," *Materials Research Society Fall Meeting,* December 2010.
3. S. S. Moganty,***** N. Jayaprakash, **J. L. Nugent**, J. Shen and L. A. Archer, "Ionic Liquid Tethered Nanoparticle Hybrid Electrolytes for Li Batteries," *Materials Research Society Fall Meeting,* December 2010.
2. **J. L. Nugent**,***** S. S. Moganty, and L. A. Archer, "Nanoscale Organic Hybrid Electrolytes for Lithium Metal Batteries," *American Institute of Chemical Engineers Annual Meeting,* November 2010.
1. **J. L. Nugent*** and L. A. Archer, "Nanoparticle Organic Hybrid Electrolytes," *The Electrochemical Society 217th Meeting,* April 2010.

EXTERNAL FINANCIAL SUPPORT

- "CAREER: Fundamental materials studies on fast ion diffusion in model side-chain ionomers," Schaefer, *National Science Foundation,* $495,604, 2017 – 2022.
- "Rational Design of Barrier Films to Enable Rechargeable Mg-S Batteries," Schaefer, *National Science Foundation,* $298,894, 2017 – 2021.
- "Development of Energy Conversion/Storage Device using Flexible Solid State Piezoelectrolyte," Myung and Schaefer, *Hanyang University,* $323,043, 2021 – 2024.

- "Use of Liquid-Free, Deformable Electrolytes for Lithium Metal Batteries with Porous Anodes," Schaefer, *Toyota Research Institute of North America – ECS Young Investigator Fellowship*, $50,000, 2019 – 2020.
- "Magnesium-Polysulfide Flow Batteries," Schaefer, *Amazon Catalyst at ECS*, $36,000, 2018 – 2019.

INTERNAL FINANCIAL SUPPORT: NOTRE DAME

- "Developing a new polymer platform for alkaline fuel cell membranes," Schaefer and Gao, *NDnano Seed Funding*, $50,000, 2019 – 2021.
- "Replacement and expansion of campus soft and biological material sample preparation and transmission electron imaging capabilities," Schaefer (lead) and Guo, Hanjaya-Putra, Phillip, Roeder, Smith, Stack, Webber, *ND Equipment Restoration and Renewal program*, $190,535, 2019 – 2020.

SYNERGISTIC ACTIVITIES: NOTRE DAME

Professional Service

Professional Society and Conference Service

- *Technical Programming Committee,* American Chemical Society Division of Polymeric Materials: Science and Engineering (ACS PMSE), 2018 – present
- *Symposium Organizer*, ACS Spring 2021 PMSE Symposium – Designing Polymers for Electrochemical Energy Conversion and Storage
- *Session Chair*, AIChE Fall 2020 Section 8A Session – Polymers for Energy Storage and Conversion
- *Symposium Organizer*, MRS Spring 2020 Symposium EN08 – Multivalent-Based Electrochemical Energy Storage *(rescheduled to December 2020 Re: COVID-19)*
- *Symposium Organizer*, ACS Fall 2018 ENFL Symposium – Nanoscience of Energy Storage
- *Session Chair*, AIChE Fall 2017 Transport and Energy Processes Session - Rechargeable / Secondary Battery Technologies for Energy Storage
- *Symposium Organizer*, MRS Fall 2016 Symposium EC2 - Facilitating Charge Transport in Electrochemical Energy Storage Materials

Editorial and Review Service

- *Associate Editor*, Frontiers in Chemistry – Electrochemistry Section, 2019 – present
- *Journal Reviewer*, Chemical Reviews, Energy & Environmental Science, Joule, Journal of the American Chemical Society, Angewandte Chemie, Advanced Materials Interfaces, Science Advances, Chemistry of Materials, Journal of Materials Chemistry A, Electrochimica Acta, Macromolecules, Physical Chemistry Chemical Physics, Journal of Polymer Science Part B: Polymer Physics, Polymer, RSC Advances

- *Proposal Reviewer*, DOE-BES, NSF-DMR, NSF-CBET, NSF-CMMI, Swiss NSF, Swiss Federal Lab, RGC of Hong Kong

University Service

- *Faculty Mentor*, Building Bridges Mentoring Program, 2018 – present
- *Faculty Mentor*, Science and Engineering Scholars Program, 2020 – present
- *Faculty Mentor*, Freshman Merit Scholar Program, 2018 – 2019
- *Faculty Mentor*, Women Leaders in STEM Program, 2018 – 2019
- *Faculty Interviewer*, Freshman Merit Scholar Program, 2018

College Service

- *Department Representative*, College Council, 2020 – present
- *Member*, Diversity, Equity, & Inclusion Committee, 2020 – present

Department Service

- *Faculty Mentor & Founder*, ND CBE Graduate and Postdoctoral Women's Group, 2016 – present
- *Member*, ND CBE Graduate Curriculum Committee, 2019 – present
- *Member*, ND CBE Graduate Student Recruitment & Admissions Committee, 2015 – 2020
- *Member*, ND CBE Faculty Recruitment Committee, 2018 – 2020

Teaching and Outreach Activities

- *Developer*, Polymers in Our World module and kit for local schools
- *Participant*, Science Alive! annual event with St. Joseph County Library, 2017– 2020
- *Attendee*, ASEE Summer School for Chemical Engineering Faculty, July 2017
- *Attendee*, Effective Teaching: A Workshop by Felder and Brent, May 2016

TEACHING EXPERIENCE: NOTRE DAME

Classroom Teaching

- Instructor of *CBE 20255: Introduction to Chemical Engineering Analysis*
  - Spring 2017, Fall 2017, Spring 2018, Fall 2019, Fall 2020
- Designed new senior technical elective *CBE 40425: Energy, Economics, & Environment*
  - Fall 2015, Fall 2016, Spring 2019, Spring 2020, Spring 2021

Research Mentoring

- Graduated Graduate Student
  - Laura C. Merrill (Ph.D *'20*, currently at Sandia National Laboratories)
- Current Graduate Students
  - Hunter O. Ford, Jiacheng Liu, Bumjun Park, Peng He, Lingyu Yang, Jizhou Jiang
- Research Advisor to Postdoctoral Scholar, 2016 – 2017
  - Sunil P. Upadhyay
- Co-mentor to Graduate Students at the University of Brescia, Italy, 2017 – present

- Buket Boz, Tanmay Dev

- Research advisor to Visiting Graduate Student, 2019
  - Chuanchuan Cui
- Research Advisor to Undergraduate Students, 2015 – present
  Ryan Meder (B.S. *'18*), Connor Tomshack (B.S. *'18*), Clay Elmore (B.S. *'19*), Morgan Seidler (B.S. *'19*, current graduate student at U.C. Berkeley), Daniel Hardiman (B.S. *'19*), Colin Brankin (B.S. *'19*), Christopher Ray (B.S. *'19*), Olivia Garcia-Velez (B.S. *'20*), Pedro Navarro (B.S. *'20*), Jacob Thilman (B.S. *'20*), Matthew Winkler (B.S. *'20*), Loyal Murphy (B.S. *'20*, current graduate student at Auburn University), Emily Doyle (B.S. *'21*), Seancarlos Gonzalez (B.S. *'21*), Peter Giannini (B.S. *'21*), Sophia Rodriquez (B.S., *'21*), Devon Ngo (B.S., *'21*), Josiah Viitala (B.S. *'22*), Andrew Scott Manning (B.S. *'22*), Cara Kilmartin (B.S. *'22*), Emma Kerr (B.S., *'22*), Tara Senn (B.S., *'22*), Hannah Collins (B.S., *'22*), Kelsey Kennedy (B.S., *'22*), Nathaniel Moller (B.S., *'23*), David Webster (B.S., *'23*), YaChen Qin (Tsinghua U., B.S. *'17*), Alisha Agrawal (IIT Delhi, B.S./M.S. *'18*), Yuting Xia (Sichuan U., B.S. *'20*), Hannah Himes (Purdue U., B.S. *'20*), Blair Fuchs (IUPUI, B.S. *'21*), Shichen Wu (Zhejiang U., B.S. *'20*), Jizhou Jiang (Sichuan U., B.Eng. *'20*), Ebrima Komma (U. Miss., B.S. *'20*)

TEACHING EXPERIENCE: PRE-NOTRE DAME

- Lecture Instructor for Principles of Chemistry, Fall 2013
  Tompkins Cortland Community College, Dryden, NY
- Research Mentor to Undergraduate Students, 2010 – 2013
  Cornell University, Ithaca, NY
  - Dennis Yanga (B.S. *'12*), Brianna DeRooy (B.S.*'14*), Orbi Ish-Shalom (B.S.*'14*)
- Research Mentor to Junior Graduate Students, 2011 – 2013
  Cornell University, Ithaca, NY
  - Yingying Lu (Ph.D. *'14*), Kerianne Dobosz (M.Eng. *'13*)
- Mentor to Science Olympiad Team, 2012 – 2013
  Deposit Middle-High School, Deposit, NY
- Tutor for General Chemistry, 2005 – 2006
  Widener University, Chester, PA
- Tutor for SAT Mathematics Preparation to local high school students, 2004
  Widener University, Chester, PA