

WILLIAM E. MUSTAIN

HIGHLIGHTED ACHIEVEMENTS

- **170 Publications**
 - 144 Peer reviewed archival publications
 - 23 Peer reviewed proceedings/conference presentations
 - 3 Invited Book Chapters
 - h-index: 58, i10 index: 127 (Google Scholar)
- **Total funding value of \$51.0M, Direct Management of \$26.8M**
 - 50 Funded Grants
 - \$10.8M in research funding for Mustain research group
 - \$15.9M in directed non-research funding for USC
- **2026 Fellow of the Electrochemical Society**
- **2022 USC College of Engineering and Computing Research Achievement Award**
- **2017 UConn Chemical Engineering Faculty Member of the Year Award**
- **United Technologies Corporation Professor of Engineering Innovation**
- **2015-2016 Fulbright Scholar Fellow**
- **2013 DOE Early Career Award**
- **2014 Electrochemical Society Supramaniam Srinivasan Young Investigator Award**
- **2009 Illinois Institute of Technology Young Alumni Award**
- **39 Graduate Students Advised**
 - 24 Ph.D. Students (16 Graduated)
 - 7 M.S. Students (6 Graduated), and 8 M.E. Masters Students (8 Graduated)
- **14 Conference Technical Volumes Edited**
- **112 Invited Talks**
- **168 Conference Presentations**
- **Dedicated Educator with High Marks from Students**
- **Significant Extramural Service**
 - Past Chair of the Energy Technology Division of the Electrochemical Society, Past Chair of Electrochemical Division of AIChE; Conceived and Organized Symposia at ECS, AIChE and ACS
- **Accomplished Internal Service Record**
 - Director of Emerging Energy Programs, Associate Department Head, Chair of the Undergraduate Committee, Chair of the Graduate Committee, ABET Chair during successful reaccreditation
- **Widely Involved in University and Community Outreach**

WILLIAM E. MUSTAIN

EDUCATION

Postdoctoral Fellow, July 2006 to July 2008
Georgia Institute of Technology
Department of Chemical and Biomolecular Engineering

Advisor: Paul Kohl
Atlanta, Georgia

Doctor of Philosophy, Chemical Engineering, June 2006
“Development and Characterization of Cobalt-Palladium Electrocatalysts for Oxygen Reduction in Acid Media”
Illinois Institute of Technology
Department of Chemical and Biological Engineering

Advisor: Jai Prakash
Chicago, Illinois

Bachelor of Science, Chemical Engineering, May 2002
Illinois Institute of Technology
Department of Chemical and Biological Engineering

Chicago, Illinois

ACADEMIC APPOINTMENTS

University of South Carolina
Director, Carolina Institute for Battery Innovation, Nov. 2024-Present
Associate Dean for Research, Nov. 2022-Nov. 2024
Director of Emerging Energy Programs, March-Nov. 2022
Department of Chemical Engineering
Professor, August 2017 – Present
University of Connecticut
Department of Chemical & Biomolecular Engineering
Associate Professor, August 2013 – August 2017
Associate Department Head, 2013 – 2016
Assistant Professor, August 2008 – August 2013

Columbia, South Carolina

Storrs, Connecticut

OTHER APPOINTMENTS

Duracell Global Headquarters
Research and Development
Visiting Scholar, August 2015 – April 2016
University of Surrey
Department of Chemistry
Fulbright Scholar Fellowship, April 2016 – August 2016
Politecnico di Milano
Dipartimento di Energia
Visiting Professor, Spring 2013

Bethel, Connecticut

Guildford, UK

Milan, Italy

RESEARCH INTERESTS

- High Capacity Transition Metal Oxides for Li-ion Batteries
- Electrochemical CO₂ Separation and Concentration
- Room Temperature Electrochemical Inter-conversion of Small Organic Molecules
- Controlling Water and Ion Transport to Achieve High Power, Long-Life AEM Fuel Cells
- Increasing the Energy Density of Alkaline Primary Batteries
- Nanostructured Catalysts for PEM and AEM Electrolyzers and Fuel Cells
- Modeling of Electrochemical Systems

JOURNAL PUBLICATIONS (CORRESPONDING AUTHOR IN BOLD)

144. V.S.S. Mosali, M. Amirsalehi, I. Street, M. Al Murisi, S.K. Balijepalli, P.A. Kohl and **W.E. Mustain**, "Using PTL Architecture and Surface Chemistry to Control the Nucleation, Distribution, and Morphology of Self-Supported PGMFree AEM Cathodes", *ACS Applied Energy Materials*, Accepted. DOI: 10.1021/acsaem.6c01163
143. H. Price and **W.E. Mustain**, "Optimizing and Quantifying the Oxidative Recovery of Mn by Electrochemical Deposition from Simulated Li-ion Battery Recycling Streams", *J. Mat. Chem. A.*, Accepted. DOI: 10.1039/D6TA04479D
142. Y. Cui, C. Miles, M. Amirsalehi, S. Bashiri, I. Street, K. Swider-Lyons and **W.E. Mustain**, "Mitigating CS₂ Poisoning in PEM Fuel Cells: ORR Suppression Effects, MEA Recovery and Protection Strategies", *J. Power Sources*, 691 (2026) 241015.
141. M. Al-Murisi, M. Amirsalehi, V.S.S. Mosali, Y. Tsur, and **W.E. Mustain**, "Revealing the Hidden Role of Divalent Cations in Oxygen Evolution during Alkaline Seawater Electrolysis", *ACS Electrochemistry*, 2 (2026) 1968-1979. DOI: 10.1021/acselectrochem.6c00146.
140. M. Amirsalehi, V.S.S. Mosali, M. Al-Murisi, S. Bashiri, H.G. Kuppusamy, P. Satjaritanun, B. Britton, K. Swider-Lyons, and **W.E. Mustain**, "Beyond Catalysts and Membranes: Using Cell Assembly and Operating Strategies to Significantly Improve the Performance of AEM Electrolyzers", *J. Electrochem. Soc.*, **173** (2026) 054502. DOI: 10.1149/1945-7111/ae4929
139. S.A. Franklin, M. Zehaab, Y. Cui, R. Bance-Soualhi, C. Crean, W.E. Mustain, H. Lin and **J.R. Varcoe**, "Thermal treatment of high-density polyethylene films to increase crystallinity for the fabrication of superior radiation-grafted anion-exchange membranes for fuel cells", *J. Mat. Chem. A*, 14 (2026) 5877-5889. DOI: 10.1039/D5TA08440G.
138. D. Kathan, T. Omasta, D. Gibbons, M. Zuraw, M. Hull and **W.E. Mustain**, "Quantifying the Ionic Conductivity of Redox Active Zinc Slurry Electrodes Using Electrochemical Impedance Spectroscopy", *J. Power Sources*, **666** (2026) 239169. DOI: 10.1016/j.jpowsour.2025.239169.
137. T.L. Bastos, C.C. da Silva, D. Nunes, E. Fortunato, R. Martins, D. Kathan, W.E. Mustain, R.V. Gelamo and **F. Colmati**, "Metal-Free Multilayer Graphene Electrodes Activated by PECVD for Electrochemical Oxidation Enhancement", *ACS Applied Nanomaterials*, **8** (2025) 22586-22604. DOI: 10.1021/acsanm.5c03602.

136. T.L. Bastos, C.C. da Silva, M. Al Murisi, M. Amirsalehi, A.L.G. Biancolli, J.R. Varcoe, R.V. Gelamo, **W.E. Mustain** and **F. Colmati**, “Application of Multi-Layer Graphene (MLG) in the Anion Exchange Membrane Fuel Cells”, *J. Power Sources*, **660** (2025) 238558.
135. S.A. Lateef, J. Chmiola, F. Albano, W.E. Mustain, and **G. Jalilvand**, “Understanding the Effects of Binder Dissolution Dynamics on the Chemistry and Performance of Lithium-Sulfur Batteries”, *EES Batteries*, **1** (2025) 947-963. DOI: 10.1039/D5EB00062A.
134. M. Amirsalehi, N. Ul Hassan, V.S.S. Mosali, I. Street, M. Manjum, S.A. Lateef, J. Bohannon, S. McKinney, A.G. Divekar, P.A. Kohl and **W.E. Mustain**, “Low-Cost, High-Performance Electrodes for PGM-free AEM Water Electrolyzers: Structural Optimization of NiMo-Based Cathodes”, *Applied Catalysis B: Environment and Energy*, **378** (2025) 125558.
133. M. Amirsalehi, C. Miles, J. Jordan, K.E. Swider-Lyons and **W.E. Mustain**, “Understanding the Effects of Ethylene as an Airborne Contaminant in Proton Exchange Membrane Fuel Cells and Its Mitigation via Filtration”, *ChemElectroChem*, **12** (2025) e202500082.
132. M. Al-Murisi, S. Mosali, M. Amirsalehi, P. Ganesan, H.R. Colon-Mercado and **W.E. Mustain**, “Optimizing the PTFE wetproofing of nickel porous transport layers for anion exchange membrane water electrolyzers”, *International Journal of Hydrogen Energy*, **134** (2025) 92–99.
131. J. Wang, **N. Huynh**, R. Dougal and W. Mustain, “Route Optimization for Ships Using Ammonia-Based Fuel: A Hybrid GA-PSO Approach”, *Transportation Research Record*, **2679** (2025), DOI: 10.1177/03611981251338724.
130. R. Tao, Y. Cui, Y. Tian, R. Wang, K. Bang, H. Chen, C. Hu, Y. Yuan, S. Zhu, Y.M. Lee, W.E. Mustain, **M. Shao** and **Y. Kim**, “Poly(Aryl Piperidiniums) with Imidazolium Side Chains for Anion Exchange Membrane Fuel Cells”, *J. Power Sources*, **638** (2025) 236640.
129. Y. Cui, R. van Gorp, T. Bastos, M. Al Murisi, N. Ul Hassan, S. Lateef, Y. Jang, J.R. Varcoe, M. Shao, A. Forner-Cuenca and **W.E. Mustain**, “Electrode-level Water Management Strategies for Anion Exchange Membrane Fuel Cells”, *Electrochimica Acta*, **512** (2025) 145538. DOI: 10.1016/j.electacta.2024.145538.
128. Y. Cui, Y. Wang, G. Liu, F. Yang, S. Zhu, X. Qiu, F. Xiao, G. Chen, M. Farhadpour, W.E. Mustain and **M. Shao**, “Boron-Activated Ruthenium Nanoparticles for Hydrogen Oxidation Reaction in Anion Exchange Membrane Fuel Cells”, *Chem. Catalysis*, **5** (2025) 101197.
127. V.S.S. Mosali, H. Soucie, X. Peng, E. Faegh, M. Elam, I. Street and **W.E. Mustain**, “Mechanistic insights into the electrochemical oxidation of acetate at noble metals”, *Chem Catalysis*, **5** (2025) 101190.
126. L. Lu, J. Huang, A. Guerrero, I. Street, S. Mosali, B.G. Sumpter, W.E. Mustain and **Z. Chen**, “The Significance of the 'Insignificant': Non-covalent Interactions in CO₂ Reduction Reactions with 3C-TM (TM = Sc-Zn) Single-Atom Catalysts”, *ChemSusChem*, **18** (2025) e202401957.

125. M. Al-Murisi, M. Ghasemi, R. Ali, J.R. McCutcheon, P.A. Kohl, S. Shimpalee and **W.E. Mustain**, “Design, Operation and Simulation of a Passive Osmosis-Integrated Electrolyzer for Seawater Electrolysis”, *J. Electrochem. Soc.*, **171** (2024) 114508.
124. B. Lenhart, D. Kathan, M. Hull, T. Omasta, D. Gibbons, M. Zuraw, and **W.E. Mustain**, “Engineering Zinc Slurry Anodes for High-Performance Primary Alkaline Batteries”, *J. Power Sources*, **612** (2024) 234818.
123. J. Lim, J. Klein, S.G. Lee, E.J. Park, S.Y. Kang, S. Maurya, W.E. Mustain, S. Boettcher and **Y.S. Kim**, “Addressing the challenge of electrochemical ionomer oxidation in future anion exchange membrane water electrolyzers”, *ACS Energy Letters*, **9** (2024) 3074-3083, DOI: 10.1021/acsenenergylett.4c00832.
122. J. Quílez-Bermejo, A. Daouli, S. Dalí, Y. Cui, A. Zitolo, J. Castro-Gutiérrez, M. Emo, M.T. Izquierdo, W. Mustain, M. Badawi, A. Celzard, and **V. Fierro**, “Electron Transfer from Encapsulated Fe₃C to the Outermost N-doped Carbon Layer for Superior ORR”, *Advanced Functional Materials*, **34** (2024) 2403810. DOI: 10.1002/adfm.202403810.
121. B. Lenhart, D. Kathan, V. Heimer, M. Zuraw, M. Hull and **W.E. Mustain**, “Statistical Approach to Design Zn Particle Size, Shape, and Crystallinity for Alkaline Batteries”, *Frontiers in Energy*, **18** (2024) 650-664, DOI: 10.1007/s11708-024-0904-1.
120. S. Lateef, M. Manjum, W.E. Mustain and **G. Jalilvand**, “Self-Structured Binder Confinement of Sulfur for Highly Durable Lithium-Sulfur Batteries”, *ACS Applied Energy Letters*, **6** (2023) 9307-9317; DOI: 10.1021/acsaem.3c01205.
119. W. Ni, J.L. Meibom, N. Ul Hassan, M. Chang, Y. Chu, A. Krammer, S. Sun, Y. Zheng, L. Bai, W. Ma, S. Lee, S. Jin, J. Luterbacher, A. Schüler, H.M. Chen, **William E. Mustain** and **Xile Hu**, “A synergistic Pt-Ru-nitrogen-doped-carbon hydrogen oxidation catalyst”, *Nature Catalysis*, **6** (2023) 773-783; DOI: 10.1038/s41929-023-01007-1.
118. B. Lenhart, M. Zuraw and **W.E. Mustain**, “A Scalable Method for Enhancing the Crystallinity of Zn Powder to Reduce Corrosion and Boost Achievable Capacity”, *J. Electrochem. Soc.*, **170** (2023) 070501, DOI: 10.1149/1945-7111/ace082.
117. L. Yu, F. Li, J. Huang, B. Sumpter, W. Mustain, and **Z. Chen**, “Double-Atom Catalysts Featuring Inverse Sandwich Structure for CO₂ Reduction Reaction: A Synergetic First-Principles and Machine Learning Investigation”, *ACS Catalysis*, **13** (2023) 9616-9628.
116. M. Manjum, G. Jalilvand and **W.E. Mustain**, “Electrodeposition of Manganese-based Cathode Materials for Lithium-ion Batteries”, *J. Electrochem. Soc.*, **170** (2023) 062502.
115. H. Soucie, M. Elam and **W.E. Mustain**, “Practical Assessment for At-Scale Electrochemical Conversion of Methane to Methanol”, *ACS Energy Letters*, **8** (2023) 1218-1229.
114. H. Adabi, A. Shakouri, A. Zitolo, T. Asset, A. Khan, J. Bohannon, R. Chattot, C. Williams, F. Jaouen, J.R. Regalbuto and **W.E. Mustain**, “Multi-Atom Pt and PtRu Catalysts for High Performance AEMFCs with Ultra-Low PGM Content”, *Applied Catalysis B: Environmental*, **325** (2023) 122375.
113. D. Petrushenko, Z. Rahmati, D. Barazanchy, W. DeBacker, W.E. Mustain, R.E. White, P. Ziehl and **P.T. Coman**, “Dip-coating of carbon fibers for the development of lithium iron phosphate electrodes for structural lithium-ion batteries”, *Energy & Fuels*, **37** (2023) 711-723. DOI: 10.1021/acs.energyfuels.2c03210.

112. N. Ul Hassan, E. Motyka, J. Kweder, P. Ganesan, B. Brechin, B. Zulevi, H.R. Colon-Mercado, P.A. Kohl and **W.E. Mustain**, “Effect of porous transport layer properties on the anode electrode in anion exchange membrane electrolyzers”, *J. Power Sources*, **555** (2023) 232371.
111. N. Ul Hassan, M.J. Zachman, M. Mandal, H. Adabi, P.A. Kohl, D.A. Cullen and **W.E. Mustain**, “Understanding Recoverable vs Unrecoverable Voltage Losses and Long-Term Degradation Mechanisms in Anion Exchange Membrane Fuel Cells”, *ACS Catalysis*, **12** (2022) 8116-8126.
110. N. Ul Hassan, P. Ganesan, A.A. Lando, **W.E. Mustain** and **H.R. Colón-Mercado**, “Stable, High-Performing Bifunctional Electrodes for Anion Exchange Membrane-Based Unitized Regenerative Fuel Cells”, *J. Power Sources*, 541 (2022) 231599, DOI:10.1016/j.jpowsour.2022.231599.
109. N. Ul Hassan, Y. Zheng, P.A. Kohl and **W.E. Mustain**, “KOH vs. Deionized Water Operation in Anion Exchange Membrane Electrolyzers”, *J. Electrochem. Soc.*, **169** (2022) 044526, DOI: 10.1149/1945-7111/ac5f1d.
108. N. Ul Hassan, M. Mandal, B. Zulevi, P.A. Kohl and **W.E. Mustain**, “Understanding and Improving Anode Performance in an Alkaline Membrane Electrolyzer Using Statistical Design of Experiments”, *Electrochimica Acta*, **409** (2022) 140001. DOI: 10.1016/j.electacta.2022.140001
107. H. Adabi, P.G. Santori, A. Shakouri , X. Peng, K. Yassin, I.G. Rasin, S. Brandon, D.R. Dekel, N. Ul Hassan, M-T Sougrati, A. Zitolo, J.R. Varcoe, J.R. Regalbuto, F. Jaouen and **W.E. Mustain**, “Understanding how Single-Atom Site Density Drives the Performance and Durability of PGM-Free Fe-N-C Cathodes in Anion Exchange Membrane Fuel Cells”, *Materials Today Advances*, **12** (2021) 100179.
106. M.M. Royko, S. Howell, E. Faegh , W.E. Mustain and **Jochen Lauterbach**, “Influence of Preparation Conditions on Platinum and Palladium Catalysts Supported on Anodically Oxidized Stainless Steel Wire Meshes for CO Oxidation”, *Emission Control Science and Technology*, **7** (2021) 210-221, DOI: 10.1007/s40825-021-00196-0.
105. H. Adabi, A. Shakouri, N. Ul Hassan, J.R. Varcoe, B. Zulevi, A. Serov, J.R. Regalbuto, and **W.E. Mustain**, "High-performing commercial Fe–N–C cathode electrocatalyst for anion-exchange membrane fuel cells", *Nature Energy*, **6** (2021) 834-843. DOI: 10.1038/s41560-021-00878-7.
104. E. Faegh, B. Ng, D. B. Lenhart, S. Lateef and **W.E. Mustain**, “Partial deployment of Al in Zn–MnO₂ alkaline battery anodes to improve the capacity and reversibility”, *J. Power Sources*, **506** (2021) 230167.
103. G. Huang, M. Mandal, N. Ul Hassan, K. Groenhout, A. Dobbs, W.E. Mustain and P.A. Kohl, “Ionomer Optimization for Water Uptake and Swelling in Anion Exchange Membrane Electrolyzer: Hydrogen Evolution Electrode”, *J. Electrochem. Soc.*, 168 (2021) 024503.
102. Y. Meng, Y. Liu, J. He, V. Sun, A. Palmieri, Y. Gu, X. Zheng, Y. Dang, X. Huang, W.E. Mustain and **S. L. Suib**, “Large Scale Synthesis of Manganese Oxide/Reduced Graphene Oxide Composites as Anode Materials for Long Cycle Lithium Ion Batteries”, *ACS Appl. Energy Mat.*, **4** (2021) 5424-5433.
101. A. C. Yang-Neyerlin, S. Medina, K.M. Meek, D.G. Strasser, C. He, D.M. Knauss, W.E. Mustain, S. Pylypenko and **B. Pivovar**, “Examining Performance and Durability of Anion Exchange Membrane Fuel Cells with Novel Spirocyclic Anion Exchange Membranes”, *J. Electrochem. Soc.*, **168** (2021) 044525. DOI: 10.1149/1945-7111/abf77f.
100. Y. Zheng, G. Huang, M. Mandal, J.R. Varcoe, P.A. Kohl and **W.E. Mustain**, “Power-Generating Electrochemical CO₂ scrubbing from air Enabling Practical AEMFC Application”, *J. Electrochem. Soc.*, **168** (2021) 024504.

99. Y. Zheng, L.N. Irizarry-Colón, N. Ul Hassan, E.R. Williams, M. Stefik, J.M. LaManna, D.S. Hussey and **W.E. Mustain**, “Effect of Membrane Properties on the Carbonation of Anion Exchange Membrane Fuel Cells”, *Membranes*, **11** (2021) 102. DOI: 10.3390/membranes11020102. Invited Contribution.
98. B. Ng, E. Faegh, S. Lateef, S.G. Karakalos, and **W.E. Mustain**, “Structure and Chemistry of the Solid Electrolyte Interphase (SEI) on a High Capacity Conversion-based Anode: NiO”, *J. Mat. Chem. A.*, **9** (2021) 523-537. DOI: 10.1039/D0TA09683K.
97. E. Faegh, B. Ng and **W.E. Mustain**, “Practical assessment of the performance of aluminium battery technologies”, *Nature Energy*, **6** (2021) 21-29, DOI: 10.1038/s41560-020-00728-y.
96. G. Huang, M. Mandal, K. Groenhout, A. Dobbs, N. Ul-Hassan, W.E. Mustain and **P.A. Kohl**, “Ionomer Optimization for Water Uptake and Swelling in Anion Exchange Membrane Electrolyzer: Oxygen Evolution Electrode”, *J. Electrochem. Soc.*, **167** (2020) 164514. DOI: 10.1149/1945-7111/abcde3.
95. P. Santori, F. Speck, S. Cherevko, H. Firouzjaie, X. Peng, W.E. Mustain and **F. Jaouen**, “High performance FeNC and Mn-oxide/FeNC layers for AEMFC cathodes”, *J. Electrochem. Soc.*, **167** (2020) 134505.
94. N. Ul Hassan, M. Mandal, G. Huang, H. Adabi Firouzjaie, P.A. Kohl and **W.E. Mustain**, “Achieving High Performance and 2000-hour Stability in Anion Exchange Membrane Fuel Cells by Manipulating Ionomer Properties and Electrode Optimization”, *Advanced Energy Materials*, **10** (2020) 2001986. DOI: 10.1002/aenm.202001986.
93. W.E. Mustain, M. Chatenet, M. Page and **Y.S. Kim**, “Durability Challenges of Anion Exchange Membrane Fuel Cells”, *Energy Environ. Sci.*, **13** (2020) 2805-2838, DOI: 10.1039/D0EE01133A.
92. X. Peng, D. Kulkarni, Y. Huang, T.J. Omasta, B. Ng, Y. Zheng, L. Wang, J.M. LaManna, D.S. Hussey, J.R. Varcoe, I.V. Zenyuk and **W.E. Mustain**, “Using Operando Techniques to Understand and Design High Performance and Stable Alkaline Membrane Fuel Cells”, *Nature Communications*, **11** (2020) 3561, DOI: 10.1038/s41467-020-17370-7.
91. E. Faegh, B. Ng, D. Hayman and **W.E. Mustain**, “Design of Highly Reversible Zinc Anodes for Aqueous Batteries Using Preferentially Oriented Electrolytic Zinc”, *Batteries & Supercaps*. **3** (2020) 1220-1232. DOI: 10.1002/batt.202000112.
90. B. Ng, P.T. Coman, E. Faegh, X. Peng, S.G. Karakalos, **W.E. Mustain** and **R.E. White**, “Low-Temperature Lithium Plating/Corrosion Hazard in Lithium-Ion Batteries: Electrode Rippling, Variable States of Charge, and Thermal and Nonthermal Runaway”, *ACS Appl. Energy Mater.*, **3** (2020) 3653–3664.
89. O. Elishav, Y. Shener, V. Beilin, G. E. Shter, B. Ng, W.E. Mustain, Miron V. Landau, Moti Herskowitz and **G. S. Grader**, “Electrospun Nanofibers with Surface Oriented Lamellar Pattern and Potential Applications”, *Nanoscale*, **12** (2020) 12993, DOI: 10.1039/D0NR02641G.
88. Y. Zheng, G. Huang, L. Wang, J.R. Varcoe, P.A. Kohl and **W.E. Mustain**, “Effect of Reacting Gas Flowrates and Hydration on the Carbonation of Anion Exchange Membrane Fuel Cells in the Presence of CO₂”, *J. Power Sources*, **467** (2020) 228350, DOI: 10.1016/j.jpowsour.2020.228350.
87. **W.E. Mustain** and P.A. Kohl, “News and Views: Improving Alkaline Ionomers”. *Nature Energy*, **5** (2020) 359-360. DOI: 10.1038/s41560-020-0619-4. Invited Contribution.
86. M. Mandal, G. Huang, N. Ul-Hassan, W.E. Mustain and **P.A. Kohl** “Poly(norbornene) anion conductive membranes: homopolymer, block copolymer and random copolymer properties and performance”, *J. Mat. Chem. A.*, **9** (2020) 17568-17578.

85. B. Ng, X. Peng, E. Faegh and **W.E. Mustain**, “Using nanoconfinement to inhibit the degradation pathways of conversion-metal oxide anodes for highly stable fast-charging Li-ion batteries”, *J. Mat. Chem. A.*, **8** (2020) 2712-2727. DOI: 10.1039/C9TA11708C.
84. B. Ng, X. Duan, F. Liu, E. Agar, R.E. White, W.E. Mustain and **X. Jin**, “Investigation of Transport and Kinetic Nonideality in Solid Li-ion Electrodes through Deconvolution of Electrochemical Impedance Spectra”, *J. Electrochem. Soc.*, **167** (2020) 020523.
83. T. Zhu, Y. Sha, Ye; H. Adabi Firouzjaie, X. Peng, Y. Cha, D.M.M. Dissanayake, M. Smith, A. Vannucci, W. Mustain and **C. Tang**, “Rational Synthesis of Metallo-Cations Toward Redox- and Alkaline-Stable Metallo-Polyelectrolytes”, *J. Am Chem. Soc.*, **142** (2020) 1083-1089.
82. H. Adabi-Firouzjaie and **W.E. Mustain**, “Catalytic Advantages, Challenges, and Priorities in Alkaline Membrane Fuel Cells”, *ACS Catalysis*, **10** (2020) 225-234.
81. B. Ng, P.T. Coman, W.E. Mustain and **R.E. White**. “Non-Destructive Parameter Extraction for a Reduced Order Lumped Electrochemical-Thermal Model for Simulating Li-ion Full-Cells”, *J. Power Sources*. **445** (2020) 227296.
80. M. Mandal, G. Huang, N. Ul Hassan, X. Peng, T. Gu, A.H. Brooks-Starks, B. Bahar, W.E. Mustain, and **P.A. Kohl**, “The Importance of Water Transport in High Conductivity and High-Power Alkaline Fuel Cells”, *J. Electrochem. Soc.*, **167** (2020) 054501.
79. J.A. Wrubel, A.A. Peracchio, B.N. Cassenti, T.J. Omasta, W.E. Mustain, K.N. Grew, and **W.K.S. Chiu**, “Predicting the Effects of Carbon Dioxide on the Conductivity of Electrospun Anion Exchange Membranes”, *J. Electrochem. Soc.*, **166** (2019) F1047-1054.
78. N. Ralbag, M. Mann-Lahav, E.S. Davydova, U. Ash, R. Galed, M. Handl, R. Hiesgen, E. Magliocca, W. Mustain, J. He, P. Cong, A.M. Beale, G.S. Grader, D. Avnir, and **D.R. Dekel**, “Composite Materials with Combined Electronic and Ionic Properties”, *Matter*, **1** (2019) 959-975; DOI: 10.1016/j.matt.2019.04.007
77. Y. Zheng, T.J. Omasta, X. Peng, L. Wang, J.R. Varcoe, B.S. Pivovar and **W.E. Mustain**, “Quantifying and Elucidating the effect of CO₂ on the Thermodynamics, Kinetics and Charge Transport of AEMFCs”, *Energy Environ. Sci.*, **12** (2019) 2806-2819. DOI: 10.1039/C9EE01334B.
76. E. Faegh, S. Shrestha, X. Zhao and **W.E. Mustain**, “In-depth structural understanding of zinc oxide addition to alkaline electrolytes to protect aluminum against corrosion and gassing”, *Journal of Applied Electrochemistry*, **49** (2019) 895-907. DOI: 10.1007/s10800-019-01330-1
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PATENTS AND PATENT APPLICATIONS

5. Shakouri et al., “Method to Produce High Densities of Isolated Atoms on Support Substrates”, Application Number: 12,226,754.
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INVITED TALKS

112. Plenary – “Catalysts and Cell Designs for AEM-Based (sea)Water Electrolysis”, FDFC 2026, Montpellier, France, May 2026.
111. “Improving the Performance of AEM Electrolyzers with and without New Materials”, Michelin, Ladoux, France, May 2026.
110. “From Lab to Pilot Line – University Resources as a Fast Path to Investor Confidence”, The Battery Show South 2026, Charlotte, NC, April 2026
109. “The “Nexus” of Batteries in SC and the Southeast: Carolina Institute for Battery Innovation (CIBI)”, Siemens Partner Luncheon, Columbia, SC, March 2026.
108. “Brief Summary: Battery Expertise at USC and the Carolina Institute for Battery Innovation (CIBI)”, NAATBatt Annual Meeting 2026, Tucson, AZ, February 2026.
107. “Industry Collaborations in the Carolina Institute for Battery Innovation – Fundamental Research to Pilot Scale Manufacturing”, SC Department of Commerce, SC Nexus Showcase, Columbia, SC, January 2026.
106. “Bridging Battery R&D and Manufacturing: The University of South Carolina Case Study”, ASQ Silicon Valley Tech Talk, Online, November 2025.

105. “Industry Collaborations in the Carolina Institute for Battery Innovation – Fundamental Research to Pilot Scale Manufacturing”, ASME IMECE 2025, Memphis, TN, November 2025.
104. “Batteries: How did we get here and where are we going?”, Department of Chemical and Biomolecular Engineering, University of California-Irvine, October 2025.
103. “Reducing Primary Alkaline Battery Landfill Waste by Increasing Utilization and Recycling”, Department of Civil & Environmental Engineering, University of Nevada-Reno, September 2025.
102. “Before Catalysts and Membranes: Understanding and Improving AEMEL Performance Through Component Design and Controlling Operational Variables”, Gordon Research Conference on Water Electrolysis, Waterville Valley, New Hampshire, June 2025.
101. “Lessons Learned Expanding Battery Pilot Manufacturing in the Southeast”, 2025 Battery Safety Workshop, UNC Charlotte, June 2025.
100. “Understanding How Component Design Affects the Performance of an Osmosis-Driven Direct Seawater Electrolyzer”, 247th Meeting of the Electrochemical Society, Montreal, Canada, May 2025.
99. “Transitioning Materials for PEM and AEM Fuel Cells: Personal Lessons from Shimshon”, 247th Meeting of the Electrochemical Society, Montreal, Canada, May 2025.
98. “Carolina Institute for Battery Innovation (CIBI) – Progress Update, Partnerships and the Path Forward”, SC Competes 2025 Summit – Battery Symposium, Charleston, SC, April 2025.
97. “Understanding how Component and Cell Design Drive AEM and Seawater Electrolyzer Performance and Durability”, Department of Earth and Environmental Engineering, Columbia University, April 2025
96. “Understanding how Materials Tradeoffs Drive Battery Performance and Durability”, 2025 SC EPSCoR State Conference, April 2025
95. “Do I Need Fancy Chemistries and Materials? Using Component Structure, Cell Assembly and Operation to Improve AEM Electrolyzer Performance and Durability”, Department of Energy, Environmental and Chemical Engineering, Washington University in St. Louis. March 2025.
94. “New Materials vs. Reaction Engineering in Anion Exchange Membrane Fuel Cells”, New Materials vs. Reaction Engineering in Anion Exchange Membrane Fuel Cells”, Department of Chemistry, Gyeongsang National University, August 2024.
93. “The “Nexus” of South Carolina’s Battery Future: Research, Education, Outreach and Manufacturing at USC”, SC Battery Symposium, May 2024.
92. “Single-Atom Cu Catalysts for Electrochemical CO₂ Reduction – Combining Theory, Synthesis and Electrochemical Characterization”, 245th Meeting of the Electrochemical Society, San Francisco, CA, May 2024.
91. “Understanding the Effect of Cell Assembly and Operation on AEM Electrolyzer Performance and Durability”, 245th Meeting of the Electrochemical Society, San Francisco, CA, May 2024.
90. “New Materials vs. Reaction Engineering in Anion Exchange Membrane Fuel Cells”, 245th Meeting of the Electrochemical Society, San Francisco, CA, May 2024.

89. “New Materials vs. Reaction Engineering in Electrochemical Systems: Understanding Performance and Durability in Anion Exchange Membrane Fuel Cells”, School of Chemical and Biomolecular Engineering, Georgia Tech, March 2024.
88. “Understanding How Component Chemistry and Structure Impact Anion Exchange Membrane Electrolyzer Performance and Durability”, Department of Chemistry, Duke University, February 2024.
87. “Battery Overview and Battery Activities at the University of South Carolina”, Midlands Branch of the American Society of Civil Engineers, January 2024.
86. “Case Studies: Battery Research at the University of South Carolina”, Argonne Collaborative Center for Energy Storage Science, Argonne National Laboratory, January 2024.
85. “New Materials vs. Reaction Engineering in Electrochemical Systems: Understanding Performance and Durability in Anion Exchange Membrane Fuel Cells”, Department of Chemical and Biological Engineering, University of Alabama, December 2023.
84. “Battery Overview and Battery Activities at the University of South Carolina”, SC Interagency Working Group on EVs, October 2023.
83. “New Materials vs. Reaction Engineering in Electrochemical Systems: Understanding Performance and Durability in Anion Exchange Membrane Fuel Cells and Electrolyzers”, Department of Chemical and Biomolecular Engineering, University of Illinois Urbana-Champaign, September 2023.
82. “Component Design and Electrode Optimization for Anion Exchange Membrane Electrolyzers”, Plug Power, Concord, MA, August 2023
81. “Energy and Battery Research at the University of South Carolina”, Power Sources Group, Sandia National Lab, July 2023.
80. “Experimental and Data Analysis Platforms to Better Understand the Corrosion and Discharge of Powdered Zn”, 243rd Meeting of the Electrochemical Society, Boston, MA, USA. Presenter: William Mustain.
79. “Component Design and Electrode Optimization for AEM Electrolyzers”, 243rd Meeting of the Electrochemical Society, Boston, MA, USA.
78. “Unraveling the Mysteries of Anion Exchange Membrane Fuel Cells: Water, Catalysts and CO₂”, Department of Chemical and Biomolecular Engineering, KAIST, May 2023.
77. “Materials and Electrolyte Advances for Li and Zn-Based Batteries”, SC Battery Summit, Greenville, SC, May 2023.
76. “Understanding and Improving Anode Performance in an Alkaline Membrane Electrolyzers”, Electrochimica Acta International Seminar Series, March 2023.
75. “From the Lab to Commercialization: Component Advances for Anion Exchange Membrane Electrolyzers”, University of Oklahoma, Department of Chemical, Biological and Materials Engineering, February 2023.
74. “Practical Assessment of the Electrochemical Conversion of Methane to Methanol at Scale”, 242nd Meeting of the Electrochemical Society, Atlanta, GA, USA.

73. (Keynote) “Understanding How Porous Transport Layer Properties and Electrode Structure Affect the OER Electrode in an Anion Exchange Membrane Electrolyzer”, 241st Meeting of the Electrochemical Society, Vancouver, Canada, May 2022.
72. “Beyond “Dream” Materials – Engineering Approaches to Understand the Performance Limits of Electrochemical Systems”, Texas Tech University, Department of Chemical Engineering, April 2022.
71. “Generation and Utilization of H₂ in Long-Life, High Performance Anion Exchange Membrane Reactors”, XXVII Congresso Nazionale Della Societa Chimica Italiana, Online, September 2021. Plenary.
70. “Optimizing Electrodes and Polymers for High-Performing, Long-Life AEM Fuel Cells and Electrolyzers”, EMEA 2021 - Workshop on Ion Exchange Membranes for Energy Applications, Online, June 2021.
69. “High Performing ($> 2 \text{ W cm}^{-2}$) Anion Exchange Membrane Fuel Cells with PGM-free Oxygen Reduction Catalysts and Electrodes”, Italian Virtual Workshop on Fuel Cells, March 2021.
68. “Fancy New Materials are not ALWAYS the Answer...Until They are: A case study in how engineering intuition might have saved Anion Exchange Membrane Fuel Cells”, Penn State University, Department of Chemical Engineering, March 2021.
67. “Opportunities and Fundamental Challenges for Anion Exchange Membrane Fuel Cells”, Oklahoma State University, School of Chemical Engineering, October 2020.
66. “Opportunities and Fundamental Challenges for Anion Exchange Membrane Fuel Cells”, Electrochemical Society Webinar Series, September 2020.
65. “Opportunities and Fundamental Challenges for the Development and Deployment of Anion Exchange Membrane Fuel Cells”, United Technologies Research Center, East Hartford, CT, February 2020.
64. “Founding and Emerging Materials for Li-ion Batteries”. University of South Carolina, Department of Physics and Astronomy, December 2019.
63. “Opportunities and Fundamental Challenges for the Development and Deployment of Anion Exchange Membrane Fuel Cells”, ECS Georgia Tech Student Chapter and ECS Georgia Section, Atlanta, GA, September 2019.
62. “New Catalysts and Electrode Designs for High Power, Long-Life AEMFCs”, EFCD2019 - Electrolysis and Fuel Cell Discussions, Towards Catalysts Free of Critical Raw Materials for Fuel Cells and Electrolysers, La Grande Motte, France, September 2019.
61. “Device-Level Considerations for High Performance, Long Life Non-PGM Electrocatalysts for the Oxygen Reduction Reaction in AEMFCs”, Telluride Science Research Center Workshop on Platinum Group Metal-free Electrocatalysts: Structure-to-Property Relations, Materials Synthesis and Integration in Catalysts Layers, June 2019.
60. “Quantitative Understanding of CO₂ Behavior in Anion Exchange Membrane Fuel Cells”, 235th Meeting of the Electrochemical Society, May 2019, Dallas, TX.
59. “Development of High Performance Non-PGM Electrocatalysts and Electrodes for the Oxygen Reduction Reaction in AEMFCs”, 235th Meeting of the Electrochemical Society, May 2019, Dallas, TX.
Presenting Author: William Mustain

58. “Enabling Conversion-Based Metal Oxide Anodes for Li Ion Batteries through Material Confinement”, 235th Meeting of the Electrochemical Society, May 2019, Dallas, TX. Presenting Author: William Mustain
57. “Beyond Catalysis and Membranes: Understanding and Solving the Electrode Water Challenge to Achieve High Power Anion Exchange Membrane Fuel Cells”, Savannah River National Lab, January 2019.
56. “The Growing Importance of Electrochemistry and Electrochemical Engineering in Our Everyday Lives”, AIChE Palmetto Local Section, November 2018.
55. “Do Fancy Materials Mean that Batteries and Fuel Cells Automatically Work Better? Two Short Stories in Materials and Electrode Engineering”, Department of Chemical & Biomolecular Engineering, Clemson University, October 2018.
54. “Reaching New Heights in Anion Exchange Membrane Fuel Cell Performance and Stability: Catalysts, Membranes, Water, and Beyond”, 334th Meeting of the Electrochemical Society – PEFC&E18 Plenary Lecture, Cancun, Mexico, October 2018. Plenary.
53. “Catalysts, Membranes, CO₂ and Water: Requirements and Pathways for High Performing AEMFCs”, Gordon Research Conference on Fuel Cells, Bryant, RI, August 2018.
52. “Catalysts, Membranes, CO₂ and Water: Requirements and Pathways for High Performing AEMFCs”, EMEA 2018 - Workshop on Ion Exchange Membranes for Energy Applications. Bad Zwischenahn, Germany, June 2018.
51. “Beyond Catalysis and Membranes: Understanding and Solving the Electrode Water Challenge to Achieve High Power Anion Exchange Membrane Fuel Cells”, Department of Chemical Engineering, Lehigh University, Bethlehem, PA, February 2018.
50. “Understanding and Advancing Metal Oxide Anode Materials for Lithium-Ion Batteries”, Department of Chemical Engineering, Technion University, Israel, December 2017.
49. “Termite-Inspired Electrochemical Processing of Lignocellulose to Chemicals and Fuels”, AIChE Annual Meeting, Minneapolis, MN, October 2017.
48. “Advances in Electrocatalysis of Fuels and Anion Exchange Membrane Fuel Cells – Inspired by Termites?”, Department of Chemical and Biomolecular Engineering, Case Western Reserve University, September 2017.
47. “Understanding Water and Ion Transport in ETFE-based Membranes and Ionomers in Operating Anion Exchange Membrane Fuel Cells”, 21st International Conference on Solid-State Ionics, Padua, Italy, June 2017.
46. “Understanding and Advancing Metal Oxide Anode Materials for Lithium-Ion Batteries”, University of Maryland Energy Research Center, March 2017.
45. “Understanding and Advancing Metal Oxide Anode Materials for Lithium-Ion Batteries”, Department of Chemical Engineering, University of South Carolina, January 2017.
44. “Practical Considerations for Metal Oxide Anode Materials in Lithium-Ion Batteries”, Nanoscale Components, Inc., New Hampshire, January 2017.
43. “Importance of Carbonates in the Low Temperature Electrochemical CO₂ Cycle and New Opportunities”, Beijing Forum 2016 on Electrochemical Frontier – Alkaline Membrane Fuel Cells: Catalysts and Materials. Wuhan, China, December 2016.

42. “An Electrochemical Approach for CO₂ Capture from Fossil Fuel Power Plants”, De Nora Research Symposium, De Nora Global R&D Headquarters, November 2016.
41. “Improvements in the Anion Exchange Membrane Transport of Carbonate and Bicarbonate for Low-Temperature CO₂ Capture and Energy Conversion”, 230th Meeting of Electrochemical Society, October 2016.
40. “Understanding the Behavior of Metal Oxide Anode Materials in Lithium-Ion Batteries”, STFC Batteries Network Annual Meeting, July 2016.
39. “An Electrochemical Approach for CO₂ Capture from Fossil Fuel Power Plants”, US-UK Fulbright Commission, Endcap Event, Glasgow, Scotland, UK, June 2016.
38. “An Electrochemical Approach for CO₂ Capture from Fossil Fuel Power Plants”, Department of Chemical Engineering, Imperial College London, UK, June 2016.
37. “An Electrochemical Approach for CO₂ Capture from Fossil Fuel Power Plants”, Department of Chemical and Process Engineering, University of Surrey, UK, June 2016.
36. “Advanced Carbonate Exchange Membrane Electrochemical Cells to Reduce CO₂ Emissions”, School of Chemical Engineering & Advanced Materials, Newcastle University, UK, May 2016.
35. “Near Room Temperature Electrochemical Methane to Methanol Electrosynthesis”, Department of Chemistry, University of Surrey, UK, May 2016.
34. “Understanding Alkaline Cell Dynamics Leading to Deep Discharge Gassing and Leakage”, Duracell R&D, March 2016.
33. “Importance of Carbonates in the Low Temperature Electrochemical CO₂ Cycle and New Opportunities”, Department of Chemical Engineering, University of South Carolina, February 2016.
32. “Importance of Carbonates in the Low Temperature Electrochemical CO₂ Cycle and New Opportunities”, Department of Chemical & Biological Engineering, Colorado School of Mines, February 2016.
31. “Importance of Carbonates in the Low Temperature Electrochemical CO₂ Cycle and New Opportunities”, National Renewable Energy Laboratory, February 2016.
30. “Low Temperature Electrochemical Upgrading of Methane to Methanol”, AIChE Annual Meeting, Salt Lake City, UT, November 2015.
29. “Metal Oxide Anode Materials for Lithium-Ion Batteries”, Department of Chemical Engineering, City College New York, September 2015.
28. “Metal Oxide Anode Materials for Lithium-Ion Batteries”, Battery Group, Ford Motor Company, Dearborn, MI, July 2015.
27. “Near Room Temperature Electrochemical Upgrading of Methane to Oxygenate Fuels”, DOE Catalysis Science Program Meeting, Annapolis, MD, July 2015.
26. “Understanding the Impact of Particle Size and Distribution for High Activity, High Stability Pt/ITO Fuel Cell Catalysts”, Giner Electrochemical Systems, Inc., May 2015.

25. "Carbonates and Low Temperature Electrochemical Systems", Electrochemical Tutorials Session, AIChE National Meeting, November 2014.
24. "Advances, Challenges and Opportunities for Anion Exchange Membrane Electrochemical Cells", Department of Chemical Engineering and Materials Science, Michigan State University, October 2014.
23. "Recent Advances and Promises for Anion Exchange Membrane Fuel Cells" BIT 4th Annual New Energy Forum. Qingdao, China. September 2014.
22. "Innovative Catalyst Design for Energy Conversion", Connecticut Quality Improvement Award Partnership, 27th Annual Conference on Quality and Innovation, June 2014.
21. "Understanding the Impact of Particle Size and Distribution for High Activity, High Stability Pt/ITO Fuel Cell Catalysts", Workshop for R&D on Fuel Cell and Biofuel Technology, Tokyo University of Science, June 2014.
20. "Purposeful Utilization of Carbonate Anions in AEM-Based Devices", 7th Santa Fe Workshop on Materials for Energy Conversion, Bishop's Lodge, Santa Fe, NM, November 2013.
19. "Influence of Designer Catalyst Supports on the Activity and Stability of Pt in PEM Fuel Cells", Department of Chemical Engineering, Texas A&M University, October 2013.
18. "Room Temperature Electrochemical Production of Oxygenates From Methane Enabled by AEMs", Institute of Advanced Studies workshop on Anion-Exchange Membranes for Energy Generation Technologies, University of Surrey, UK, July 2013.
17. "Low Temperature Electrochemical Conversion and Utilization of CO₂", CO₂Chem Annual Workshop, Guildford, United Kingdom, July 2013.
16. "Influence of Nitrogen Surface Chemistry in Electric Double Layer Capacitance of Nitrogen Doped Ordered Mesoporous Carbon", L-NESS Laboratories, Como, Italy, May 2013.
15. "The Impact of the Catalyst Support on Platinum ORR Activity for PEM Fuel Cells", Dipartimento di Energia, Politecnico di Milano, May 2013.
14. "Room Temperature Conversion of CH₄ to Fuels through a Carbonate Anion Pathway", Department of Chemical Engineering, Worcester Polytechnic Institute, April 2013.
13. "Catalytic advances and electrolyte stability for carbonate exchange membrane fuel cells", Department of Chemistry and Chemical Biology, Northeastern University, January 2013.
12. "Unconventional catalyst support materials for PEMFCs", Department of Chemical and Nuclear Engineering, University of New Mexico, December 2012.
11. "Electrochemical room temperature activation of CH₄ through a carbonate anion pathway", Department of Chemistry, University of New Hampshire, September 2012.
10. "Room temperature activation of CH₄ to syngas through a carbonate anion pathway", 243rd ACS National Meeting, March 2012
9. "Promises and challenges of tungsten carbide electrocatalyst supports for PEMFCs", 243rd ACS National Meeting, March 2012

8. "Design of Novel Electrode Materials for Room Temperature Carbonate Fuel Cells", University of Surrey, UK, August 2011.
7. "Advanced Electrocatalyst Supports for PEM Fuel Cells", Department of Chemical Engineering, Brigham Young University, November 2010.
6. "Advanced Electrocatalyst Supports for PEM Fuel Cells", Department of Chemical and Biological Engineering, Illinois Institute of Technology, November 2010.
5. "Novel Electrocatalysts for Oxygen Reduction in PEM Fuel Cells", Department of Chemical Engineering, Tennessee Tech University, March 2008.
4. "Cobalt-Palladium Electrocatalysts for Oxygen Reduction in Acid Media", Department of Chemical Engineering, Texas A&M University, February 2008.
3. "Glass Based Electrodes and Electrolytes for Micro Direct Methanol Fuel Cells", Department of Chemical, Materials and Biomolecular Engineering, University of Connecticut, February 2008.
2. "Development and Characterization of New Materials for Micro Direct Methanol Fuel Cells", Department of Chemical Engineering, University of South Alabama, November 2007.
1. "Development and Characterization of Cobalt-Palladium Electrocatalysts for Oxygen Reduction in Acid Media", Hydrogen and Fuel Cell Materials Group, Argonne National Lab, May 2006.

CONFERENCE PRESENTATIONS

167. "Mitigating CS₂ Poisoning in PEM Fuel Cells: ORR Suppression Effects, MEA Recovery and Protection Strategies". 249th Meeting of the Electrochemical Society, Seattle, WA. Presenting Author: Yingdan Cui
166. Plenary – "Catalysts and Cell Designs for AEM-Based (sea)Water Electrolysis", FDFC 2026, Montpellier, France, May 2026.
165. "From Lab to Pilot Line – University Resources as a Fast Path to Investor Confidence", The Battery Show South 2026, Charlotte, NC, April 2026
164. "University Pilot Lines: Where Battery Ideas Become Scalable, Market-Ready Technologies", International Battery Seminar 2026, Orlando, FL, March 2026.
163. "Industry Collaborations in the Carolina Institute for Battery Innovation – Fundamental Research to Pilot Scale Manufacturing", ASME IMECE 2025, Memphis, TN, November 2025.
162. "Quantifying the Ionic Conductivity of Redox Active Zinc Slurry Electrodes Using Electrochemical Impedance Spectroscopy", 248th Meeting of the Electrochemical Society, Chicago, IL. Presenting Author: Devadharshini Kathan.
161. "Evaluating PEM Fuel Cell Performance with Industrial Cathode Impurities and Catalyzed Filters", 248th Meeting of the Electrochemical Society, Chicago, IL. Presenting Author: Connor Miles.
160. "Assessment of High-Performance PGM-Free HER Catalysts Under Realistic AEMWE Conditions: Challenges and Optimization Approaches", 248th Meeting of the Electrochemical Society, Chicago, IL. Presenting Author: Sriram Mosali.

159. “Toward Durable and Efficient AEM Electrolyzers: Insights from Electrode Structure and Electrolyte Optimization”, 248th Meeting of the Electrochemical Society, Chicago, IL. Presenting Author: Mahmoud Amirsalehi.
158. “Designs and Insights from Operating a Seawater Electrolyzer Continuously for More Than One Year”, 248th Meeting of the Electrochemical Society, Chicago, IL. Presenting Author: Mohammed Al-Murisi.
157. “Understanding and Mitigating the Influence of Ethylene in the Cathode Air Feed on PEM Fuel Cell Performances”, 247th Meeting of the Electrochemical Society, Montreal, Canada, May 2025. Presenting Author: William Mustain.
156. “Understanding How Component Design Affects the Performance of an Osmosis-Driven Direct Seawater Electrolyzer”, 247th Meeting of the Electrochemical Society, Montreal, Canada, May 2025. Presenting Author: William Mustain.
155. “Transitioning Materials for PEM and AEM Fuel Cells: Personal Lessons from Shimshon”, 247th Meeting of the Electrochemical Society, Montreal, Canada, May 2025. Presenting Author: William Mustain.
154. “Lessons Learned Expanding Battery Pilot Manufacturing in the Southeast”, Battery Show South, Atlanta, GA, April 2025.
153. “Understanding the behavior of Zinc slurries in Zn-MnO₂ Alkaline Batteries”, AIChE Annual Meeting, San Diego, CA, October 2024. Presenting Author: Devadharshini Kathan.
152. “Simple, Cost-Effective Synthesis Method of Electrocatalysts for Electrified Hydrocarbon Production”, AIChE Annual Meeting, San Diego, CA, October 2024. Presenting Author: Ian Street.
151. “Understanding the Effects of Electrode Design, Cell Assembly, and Operating Conditions on AEM Electrolyzer Performance”, AIChE Annual Meeting, San Diego, CA, October 2024. Presenting Author: Mahmoud Amirsalehi.
150. “Novel Seawater Electrolyzer Design with High-Rate Passive Water Transport”, AIChE Annual Meeting, San Diego, CA, October 2024. Presenting Author: Mohammed Al-Murisi
149. “Investigating Water and Ion Transport in a Novel Cell Design for Seawater Electrolysis”, 245th Meeting of the Electrochemical Society, San Francisco, CA, May 2024. Presenting Author: Mohammed Al-Murisi.
148. “Simulation of a Passive Osmosis-Integrated Electrolyzer for Seawater Electrolysis”, 245th Meeting of the Electrochemical Society, San Francisco, CA, May 2024. Presenting Author: Masoomah Ghasemi.
147. “Evaluating the Impact of Cell Assembly and Operating Conditions on the Performance of Anion Exchange Membrane Electrolyzers”, 245th Meeting of the Electrochemical Society, San Francisco, CA, May 2024. Presenting Author: Mahmoud Amirsalehi.
146. “In-Situ Diagnostic Tools and Analysis to Identify Root Causes for Voltage Losses in Anion Exchange Membrane Water Electrolyzers”, 245th Meeting of the Electrochemical Society, San Francisco, CA, May 2024. Presenting Author: Noor Ul Hassan
145. “Single-Atom Cu Catalysts for Electrochemical CO₂ Reduction – Combining Theory, Synthesis and Electrochemical Characterization”, 245th Meeting of the Electrochemical Society, San Francisco, CA, May 2024. Presenting Authors: William Mustain and Ian Street

144. “Understanding the Effect of Cell Assembly and Operation on AEM Electrolyzer Performance and Durability”, 245th Meeting of the Electrochemical Society, San Francisco, CA, May 2024. Presenting Author: William Mustain
143. “New Materials vs. Reaction Engineering in Anion Exchange Membrane Fuel Cells”, 245th Meeting of the Electrochemical Society, San Francisco, CA, May 2024. Presenting Author: William Mustain.
142. “The Effect of Carbon Type and Solvent/Binder Ratio on the Structure and Performance of Sulfur Cathodes in Lithium-Sulfur Batteries”, 243rd Meeting of the Electrochemical Society, Boston, MA, USA. Presenter: Saheed Lateef.
141. “Lessons Using an Electrochemical Method to Produce Lithium Manganese Oxide Cathodes for Lithium-Ion Batteries”, 243rd Meeting of the Electrochemical Society, Boston, MA, USA. Presenter: William Mustain.
140. “Experimental and Data Analysis Platforms to Better Understand the Corrosion and Discharge of Powdered Zn”, 243rd Meeting of the Electrochemical Society, Boston, MA, USA. Presenter: William Mustain.
139. “Component Design and Electrode Optimization for AEM Electrolyzers”, 243rd Meeting of the Electrochemical Society, Boston, MA, USA. Presenter: Noor Ul Hassan.
138. “Boron-Activating Ruthenium from Organic-Free Synthesis Process: A Hydrogen Oxidation Reaction Catalyst for Anion Exchange Membrane Fuel Cells”, 243rd Meeting of the Electrochemical Society, Boston, MA, USA. Presenter: Yingdan Cui.
137. “Practical Assessment of the Electrochemical Conversion of Methane to Methanol at Scale”, 242nd Meeting of the Electrochemical Society, Atlanta, GA, USA. Presenter: Hanna Soucie.
136. “Engineering of Electrodes and Operating Conditions for Pure-Water-Fed Anion Exchange Membrane Water Electrolyzers”, 242nd Meeting of the Electrochemical Society, Atlanta, GA, USA. Presenter: Noor Ul Hassan.
135. “High Performance AEM Water Electrolysis with PGM-Free Electrocatalysts”, 242nd Meeting of the Electrochemical Society, Atlanta, GA, USA. Presenter: Noor Ul Hassan.
134. “Multi-Atom PGM Based Catalyst for Highly Efficient Oxygen Reduction Reaction(ORR) and Hydrogen Oxidation Reaction (HOR) in Alkaline Environment”, 242nd Meeting of the Electrochemical Society, Atlanta, GA, USA. Presenter: William Mustain.
133. “Electrodeposition of Lithium Manganese Oxide Cathodes for Lithium-Ion Batteries”, 242nd Meeting of the Electrochemical Society, Atlanta, GA, USA. Presenter: Marjanul Manjam.
132. “The Effect of Binder on the Structure and Performance of Sulfur Cathodes in Lithium-Sulfur Batteries”, 242nd Meeting of the Electrochemical Society, Atlanta, GA, USA. Presenter: Saheed Lateef.
131. “Low-Cost Processing of Highly Durable (>1000 cycles) Sulfur Cathodes for Li-S Batteries”, 242nd Meeting of the Electrochemical Society, Atlanta, GA, USA. Presenter: Golareh Jalilvand.
130. “Statistical Approach to Design Zn Particle Size, Shape, and Crystallinity for Alkaline Batteries”, 242nd Meeting of the Electrochemical Society, Atlanta, GA, USA. Presenter: Brian Lenhart.
129. “Cycle-Induced Structural Evolution of Sulfur Cathodes in Lithium-Sulfur Batteries”, 242nd Meeting of the Electrochemical Society, Atlanta, GA, USA. Presenter: Golareh Jalilvand.

128. “Catalyst Advances for Highly Performing and Durable Anion Exchange Membrane Fuel Cells”, 12th International Conference on Environmental Catalysis, Osaka, Japan, August 2022. Presenter: William Mustain.
127. “Highly Efficient Multi-Atom Pt and PtRu Catalysts for Anion Exchange Membrane Fuel Cells”, 241st Meeting of the Electrochemical Society, Vancouver, Canada, May 2022. Presenter: William Mustain.
126. (Keynote) “Understanding How Porous Transport Layer Properties and Electrode Structure Affect the OER Electrode in an Anion Exchange Membrane Electrolyzer”, 241st Meeting of the Electrochemical Society, Vancouver, Canada, May 2022. Presenter: William Mustain.
125. “Generation and Utilization of H₂ in Long-Life, High Performance Anion Exchange Membrane Reactors”, XXVII Congresso Nazionale Della Societa Chimica Italiana, Online, September 2021. Presenter: William Mustain.
124. “Optimizing Electrodes and Polymers for High-Performing, Long-Life AEM Fuel Cells and Electrolyzers”, EMEA 2021 - Workshop on Ion Exchange Membranes for Energy Applications, Online, June 2021. Presenter: William Mustain.
123. “Understanding the Influence of Fe-N-C Cathode Catalyst Structure on Their Performance and Durability in High Performing Anion Exchange Membrane Fuel Cells”, 239th Meeting of the Electrochemical Society. Online, May 2021. Presenter: Hori Adabi.
122. “Understanding and Enhancing Catalyst Performance in AEM Electrolyzers Using a Statistical Approach”, 239th Meeting of the Electrochemical Society. Online, May 2021. Presenter: Noor Ul Hassan.
121. “Power-Generating Electrochemical Anion Exchange CO₂ Separator for Practical AEMFC Application”, 239th Meeting of the Electrochemical Society. Online, May 2021. Presenter: Yiwei Zheng.
120. “Enhancing the Discharge Capacity and Rechargeability of Zn-MnO₂ Alkaline Batteries through Partial Inclusion of Al into Zn”, 239th Meeting of the Electrochemical Society. Online, May 2021. Presenter: Ehsan Faegh.
119. “High Performing (> 2 W cm⁻²) Anion Exchange Membrane Fuel Cells with PGM-free Oxygen Reduction Catalysts and Electrodes”, Italian Virtual Workshop on Fuel Cells, March 2021. Presenter: William Mustain
118. “Evaluating the Deployment of Al Anodes in Primary and Secondary Batteries: Current Status, Future Prospects?”, 238th Meeting of the Electrochemical Society, October 2020, Honolulu, HI (held virtually due to Covid-19 pandemic). Presenting Author: Ehsan Faegh.
117. “Understanding the Mechanisms for Recoverable Vs. Unrecoverable AEMFC Degradation”, 238th Meeting of the Electrochemical Society, October 2020, Honolulu, HI (held virtually due to Covid-19 pandemic). Presenting Author: William Mustain.
116. “Integrating Hands-on Battery Design into a Chemical Engineering Unit Operations Laboratory”, 236th Meeting of the Electrochemical Society, October 2019, Atlanta, GA. Presenting Author: Hori Adabi-Firouzjaie.
115. “Mechanistic Study of the Electrochemical Pathways for Methyl Surface Intermediates during Organic Oxidations”, 236th Meeting of the Electrochemical Society, October 2019, Atlanta, GA. Presenting Author: William Mustain.

114. “Novel Insights in the Activity, Selectivity and Durability of FeNC, Mn-Oxides and Fenc/Mn-Oxide Composites for ORR Catalysis in Alkaline Electrolyte and AEMFC”, 236th Meeting of the Electrochemical Society, October 2019, Atlanta, GA. Presenting Author: Frederic Jaouen.
113. “Mechanistic Study of the Electrochemical Pathways for Methyl Surface Intermediates during Organic Oxidations”, 236th Meeting of the Electrochemical Society, October 2019, Atlanta, GA. Presenting Author: William Mustain.
112. “Experimental Validation of a Simplified Electrochemical-Thermal Model for a NCM532 Large Format Battery Cell”, 236th Meeting of the Electrochemical Society, October 2019, Atlanta, GA. Presenting Author: Benjamin Ng.
111. “Design of Preferentially Faceted Zinc to Improve the Rechargeability of Alkaline Batteries”, 236th Meeting of the Electrochemical Society, October 2019, Atlanta, GA. Presenting Author: Ehsan Faegh.
110. “New Catalysts and Electrode Designs for High Power, Long-Life AEMFCs”, EFCD2019 - Electrolysis and Fuel Cell Discussions, Towards Catalysts Free of Critical Raw Materials for Fuel Cells and Electrolysers, La Grande Motte, France, September 2019. Presenting Author: William Mustain
109. “Quantitative Understanding of CO₂ Behavior in Anion Exchange Membrane Fuel Cells”, 235th Meeting of the Electrochemical Society, May 2019, Dallas, TX. Presenting Author: William Mustain
108. “Development of High Performance Non-PGM Electrocatalysts and Electrodes for the Oxygen Reduction Reaction in AEMFCs”, 235th Meeting of the Electrochemical Society, May 2019, Dallas, TX. Presenting Author: William Mustain
107. “Enabling Conversion-Based Metal Oxide Anodes for Li Ion Batteries through Material Confinement”, 235th Meeting of the Electrochemical Society, May 2019, Dallas, TX. Presenting Author: William Mustain
106. “Ultra-Low PGM and PGM-Free High-Performance Electrodes for AEMFCs”. AIChE Annual Meeting, Fall 2018. Pittsburgh, PA. Presenting Author: Xiong Peng
105. “Fundamental Drivers and Mechanisms for Dendritic Zn Growth, Electrolyte Leakage and Hydrogen Gassing in Zn-MnO₂ Batteries”. AIChE Annual Meeting, Fall 2018. Pittsburgh, PA. Presenting Author: William Mustain
104. “Deconvolution of the solid-electrolyte interphase growth patterns on conversion-based transition metal oxides”. AIChE Annual Meeting, Fall 2018. Pittsburgh, PA. Presenting Author: Benjamin Ng
103. “Catalysts, Membranes, CO₂ and Water: Requirements and Pathways for High Performing AEMFCs”, EMEA 2018 - Workshop on Ion Exchange Membranes for Energy Applications. Bad Zwischenahn, Germany, June 2018. Presenting Author: William Mustain
102. “Reaching New Heights in Anion Exchange Membrane Fuel Cell Performance and Stability: Catalysts, Membranes, Water, and Beyond”, 234th Meeting of the Electrochemical Society – PEFC&E18 Plenary Lecture, Cancun, Mexico, October 2018. Presenting Author: William Mustain
101. “Catalysts, Membranes, CO₂ and Water: Requirements and Pathways for High Performing AEMFCs”, Gordon Research Conference on Fuel Cells, Bryant, RI, August 2018. Presenting Author: William Mustain
100. “Electrolytic Recycling of Primary Alkaline Batteries”, 233rd Meeting of the Electrochemical Society, Seattle, WA, May 2018. Presenting Author: William Mustain.

99. "AEMFC Catalyst Layer Engineering to Maximize Water Management and Performance While Reducing PGM Catalyst Loading", 233rd Meeting of the Electrochemical Society, Seattle, WA, May 2018. Presenting Author: William Mustain.
98. "New Insight into Acetic Acid Electrochemical Oxidation for the Synthesis of Chemicals and Fuels on Platinum Electrodes in Mild Alkaline Media", 233rd Meeting of the Electrochemical Society, Seattle, WA, May 2018. Presenting Author: Xiong Peng.
97. "Understanding the Dynamics of Primary Zn-MnO₂ Alkaline Battery Gassing with Operando Visualization and Pressure Cells", 233rd Meeting of the Electrochemical Society, Seattle, WA, May 2018. Presenting Author: Ehsan Faegh.
96. "Approaching 2W/cm² AEMFCs through Electrode Engineering and Controlling the Cell Water Content and Balance", AIChE Annual Meeting, Minneapolis, MN, October 2017. Presenting Author: William Mustain
95. "Termite-Inspired Electrochemical Processing of Lignocellulose to Chemicals and Fuels", AIChE Annual Meeting, Minneapolis, MN, October 2017. Presenting Author: William Mustain.
94. "Approaching 2W/cm² AEMFCs through Electrode Engineering and Controlling the Cell Water Content and Balance", 232nd Meeting of the Electrochemical Society, National Harbor, MD, October 2017. Presenting Author: Travis Omasta.
93. "Design of Metal Oxide Anode Materials for Lithium-Ion Batteries", 232nd Meeting of the Electrochemical Society, National Harbor, MD, October 2017. Presenting Author: Alessandro Palmieri.
92. "Approaching 2W/cm² AEMFCs through Electrode Engineering and Controlling the Cell Water Content and Balance", 68th Annual Meeting of the International Society of Electrochemistry, Providence, RI, August 2017. Presenting Author: William Mustain
91. "Integrating Hands-on Battery Design into a Chemical Engineering Unit Operations Laboratory", 68th Annual Meeting of the International Society of Electrochemistry, Providence, RI, August 2017. Presenting Author: William Mustain
90. "Design of Metal Oxide Anode Materials for Lithium-Ion Batteries", 21st International Conference on Solid-State Ionics, Padua, Italy, June 2017. Presenting Author: William Mustain
89. "Approaching 2W/cm² AEMFCs through Electrode Engineering and Controlling the Cell Water Content and Balance", 2017 New England Catalysis Society Meeting. Presenting Author: Travis Omasta.
88. "High Performance Pt-Ni Nanocage Catalyst for the Oxygen Reduction Reaction in Proton Exchange Membrane Fuel cells (PEMFCs)", Electrochemical Society, New Orleans, LA, May 2017, Presenting Author: Xiong Peng
87. "Advances in PEM and Phosphoric Acid Fuel Cells", Electrochemical Society, New Orleans, LA, May 2017, Presenting Author: William Mustain
86. "Approaching 2W/cm² AEMFCs through Electrode Engineering and Controlling the Cell Water Content and Balance", New England Catalysis Society Annual Meeting, Storrs, CT, May 2017, Presenting Author: Travis Omasta

85. "Composite Metal Oxide/Nanocarbon Materials As High Performance Anodes for Next-Generation Automotive Li-Ion Batteries", AIChE National Meeting, San Francisco, CA, November 2016, Presenting Author: Alessandro Palmieri
84. "Improving Performance in Alkaline Membrane Fuel Cells through Enhanced Water Management", AIChE National Meeting, San Francisco, CA, November 2016, Presenting Author: Travis Omasta
83. "Improvements in the Anion Exchange Membrane Transport of Carbonate and Bicarbonate for Low-Temperature CO₂ Capture and Energy Conversion", AIChE National Meeting, San Francisco, CA, November 2016, Presenting Author: Travis Omasta
82. "Reducing Greenhouse Gasses Using Low Temperature AEM Electrochemical Devices", AIChE National Meeting, San Francisco, CA, November 2016, Presenting Author: Travis Omasta
81. "Influence of Cobalt and Sodium Doping on MnO/CNT Composite Anode Materials for Li-Ion Batteries", AIChE National Meeting, San Francisco, CA, November 2016, Presenting Author: Alessandro Palmieri
80. "Influence of Cobalt and Sodium Doping on MnO/CNT Composite Anode Materials for Li-Ion Batteries", The Electrochemical Society, Honolulu, HI, October 2016, Presenting Author: William Mustain
79. "Metal Oxide Nanocrystals Supported on Carbon Nanotubes As Bifunctional Electrocatalysts in Reversible Alkaline Membrane Fuel Cells", The Electrochemical Society, Honolulu, HI, October 2016, Presenting Author: Hui Xu
78. "Improving Performance in Alkaline Membrane Fuel Cells through Enhanced Water Management", The Electrochemical Society, Honolulu, HI, October 2016, Presenting Author: William Mustain
77. "Improvements in the Anion Exchange Membrane Transport of Carbonate and Bicarbonate for Low-Temperature CO₂ Capture and Energy Conversion", The Electrochemical Society, Honolulu, HI, October 2016. Presenting Author: William Mustain
76. "High Performance and Target Modeling for MnO and NiO Anodes for Li-Ion Batteries", The Electrochemical Society, San Diego, CA, June 2016. Presenting Author: Mohan Karulkar
75. "Activity and Microstructure of Ultra-Low Iridium Loading Catalyst for PEM Electrolyzer MEA", The Electrochemical Society, San Diego, CA, June 2016. Presenting Author: Radenka Maric
74. "Metal Oxides Supported on Carbon Nanotubes As Bifunctional Electrocatalysts for Reversible Alkaline Membrane Fuel Cells", The Electrochemical Society, San Diego, CA, May 2016. Presenting Author: Shuai Zhao
73. "Low Temperature Electrochemical Upgrading of Methane to Methanol", AIChE Annual Meeting, Salt Lake City, UT, November 2015. Presenting Author: William Mustain
72. "Reaction Dependent Transport of Carbonate and Bicarbonate through Anion Exchange Membranes in Electrolysis and Fuel Cell Operations", The Electrochemical Society, October 2015. Presenting Author: William Mustain
71. "Determining the Electrochemically Active Area of IrO_x Powder Catalysts in an Operating Proton Exchange Membrane Electrolyzer", The Electrochemical Society, October 2015. Presenting Author: Shuai Zhao

70. "Ultra-Low Pt Loading Catalyst Layers for PEMFC Using Reactive Spray Deposition Technology". The Electrochemical Society, October 2015. Presenting Author: Radenka Maric
69. "Metal Oxide Anode Materials for Lithium-Ion Batteries", The Electrochemical Society, Chicago, IL, May 2015. Presenting Author: William Mustain
68. "In Situ Oxygen Gradient Generation, Control and Model inside a Microfluidic Habitat", The Electrochemical Society, Chicago, IL, May 2015. Presenting Author: William Mustain
67. "Near-Room Temperature Conversion of Methane to Methanol", The Electrochemical Society, Chicago, IL, May 2015. Presenting Author: William Mustain
66. "Design, fabrication, and performance of synthetic microbial habitat systems", ACS National Meeting, Dallas, TX, November 2014. Presenting Author: Leslie Shor
65. "Importance of Conductivity and Structure in the Capacity Retention of NiO Anodes in Li Batteries", AIChE National Meeting, Atlanta, GA, November 2014. Presenting Author: William Mustain
64. "In Situ Oxygen Gradient Generation and Control inside a Microfluidic Habitat", AIChE National Meeting, Atlanta, GA, November 2014. Presenting Author: Andrea Kadilak
63. "Carbonates and Low Temperature Alkaline Electrochemical Systems", AIChE National Meeting, Atlanta, GA, November 2014. Presenting Author: William Mustain
62. "Understanding Pt Particle Growth and Distribution on ITO: Impact on ORR Activity and Stability", AIChE National Meeting, Atlanta, GA, November 2014. Presenting Author: Ying Liu
61. "Structural and Electrochemical Properties of Pt Supported on Sn-doped Indium Oxide", AIChE National Meeting, Atlanta, GA, November 2014. Presenting Author: Shuai Zhao
60. "Understanding the Growth of Pt Nanoparticles by Galvanic Displacement on ITO Nanocubes for ORR", The Electrochemical Society, Cancun, Mexico, October 2014. Presenting Author: William Mustain
59. "Identical-location TEM Studies on Conductivity vs. Structure in Metal Oxide Anodes", The Electrochemical Society, Orlando, FL, May 2014. Presenting Author: William Mustain
58. "Developing Quantifiable Assessments in Advance of an ABET Visit", AIChE Annual Meeting, San Francisco, November 2013. Presenting Author: Daniel Burkey
57. "Exploring the Activity and Stability Limits for Pt/ITO ORR Electrocatalysts", The Electrochemical Society, San Francisco, October 2013. Presenting Author: William Mustain.
56. "One Step Direct Deposition of Durable Cathodes for High Temperature Proton Exchange Membrane Fuel Cells", The Electrochemical Society, San Francisco, October 2013. Presenting Author: Haoran Yu.
55. "High Stability, High Activity Pt/ITO Oxygen Reduction Electrocatalysts", The Electrochemical Society, Toronto, May 2013. Presenting Author: Ying Liu.
54. "Hydrogen Evolution on Combustion Catalyzed Electrodes with Low Loadings for PEM Electrolyzers", The Electrochemical Society, Toronto, May 2013. Presenting Author: Justin Roller.
53. "Evaluation of Tungsten Carbide and Tungsten Oxide as Pt Supports for Oxygen Reduction Reaction", The Electrochemical Society, Toronto, May 2013. Presenting Author: Ying Liu.

52. "Effect of Morphology on the Li⁺ Diffusion Coefficient for Nickel Oxide Anodes in Li-Ion Batteries", The Electrochemical Society, Toronto, May 2013. Presenting Author: Neil Spinner.
51. "Influence of Nitrogen Surface Chemistry in Electric Double Layer Capacitance of Nitrogen Doped Ordered Mesoporous Carbon", The Electrochemical Society, Toronto, May 2013. Presenting Author: William Mustain
50. "Electrochemical Methane Activation and Conversion to Oxygenates at Room Temperature", The Electrochemical Society, Toronto, May 2013. Presenting Author: Neil Spinner
49. "Effect of surface chemistry in electric double layer capacitance of nitrogen doped ordered mesoporous carbon" AIChE National Meeting, Pittsburgh, October 2012. Presenting Author: S. Shrestha
48. "Influence of chemistry and structure of nitrogen doped mesoporous carbon support on the ORR activity of platinum for fuel cell applications" AIChE National Meeting, Pittsburgh, October 2012. Presenting Author: S. Shrestha
47. "Oxygenate production using a carbonate anion electrochemical cell at room temperature", AIChE National Meeting, Pittsburgh, October 2012. Presenting Author: N. Spinner
46. "Catalytic advances and electrolyte stability for carbonate exchange membrane fuel cells", AIChE National Meeting, Pittsburgh, October 2012. Presenting Author: S. Shrestha
45. "Evaluating the contribution of direct vs. indirect carbonate production in anion exchange membrane fuel cells", AIChE National Meeting, Pittsburgh, October 2012. Presenting Author: N. Spinner
44. "Non-carbon electrocatalyst supports for PEM fuel cells", AIChE National Meeting, Pittsburgh, October 2012. Presenting Author: Y. Liu
43. "Microstructure and durability of non-carbon supported cathode prepared by a direct dry deposition technique", The Electrochemical Society, Honolulu, October 2012. Presenting Author: W.E. Mustain
42. "Influence of Chemistry and structure on the ORR activity of Pt supported on N-doped mesoporous carbon", The Electrochemical Society, Honolulu, October 2012. Presenting Author: S. Shrestha
41. "Room temperature electrochemical synthesis of oxygenates through a carbonate anion pathway", The Electrochemical Society, Honolulu, October 2012. Presenting Author: N. Spinner
40. "Catalytic advances and electrolyte stability for carbonate exchange membrane fuel cells", The Electrochemical Society, Honolulu, October 2012. Presenting Author: W.E. Mustain
39. "Evaluating the Direct vs. Indirect carbonate production in anion exchange membrane fuel cells", The Electrochemical Society, Honolulu, October 2012. Presenting Author: W.E. Mustain
38. "Room temperature activation of CH₄ to syngas through a carbonate anion pathway", 243rd ACS National Meeting, March 2012. Presenting Author: W.E. Mustain
37. "Promises and challenges of tungsten carbide electrocatalyst supports for PEMFCs", 243rd ACS National Meeting, March 2012. Presenting Author: W.E. Mustain
36. "Electrochemical Investigation of Carbonate Selective Catalyst for Room Temperature Carbonate Fuel Cells", The Electrochemical Society, Boston, October 2011. Presenting Author: J.A. Vega

35. "Addition and Influence of Zirconia to Transition Metal Oxide Electrocatalysts in Alkaline Media", The Electrochemical Society, Boston, October 2011. Presenting Author: N.S. Spinner
34. "Non-Carbon Supports for Energy Applications", The Electrochemical Society, Boston, October 2011. Presenting Author: Y. Liu
33. "High Surface Area Tungsten Carbide and Its Evaluation as an Electrocatalyst Support", The Electrochemical Society, Boston, October 2011. Presenting Author: Y. Liu
32. "Effect of Nickel Oxide Synthesis Conditions on its Electrochemical Behavior in Alkaline Media", The Electrochemical Society, Montreal, May 2011. Presenting Author: N.S. Spinner
31. "High Selectivity Cathode Catalysts Enabling Room Temperature Carbonate Fuel Cells", The Electrochemical Society, Montreal, May 2011. Presenting Author: J.A. Vega
30. "Low Temperature Synthesis of Calcium Ruthenate Perovskites and Pyrochlores", AIChE, Salt Lake City, November 2010. Presenting Author: J.A. Vega
29. "Novel Approach to CO₂ Utilization for Power Generation Using an Electrochemical Reactor", AIChE, Salt Lake City, November 2010. Presenting Author: J.A. Vega
28. "Novel Properties of Surface Modified Ordered Mesoporous Carbon Supports for Electrochemical Applications", AIChE, Salt Lake City, Accepted for November 2010. Presenting Author: S. Shrestha
27. "Stability and ORR Activity of Nitrogen Functionalized Mesoporous Carbon Supports", AIChE, Salt Lake City, November 2010. Presenting Author: S. Shrestha
26. "Effect of Carbonate on Oxygen Reduction, Hydrogen Oxidation and Anion Exchange Membrane Chemical Stability", *The Electrochemical Society*, Vancouver, October 2010. Presenting Author: J.A. Vega
25. "Surface Modified Ordered Mesoporous Carbon Supports for Electrochemical Applications", *The Electrochemical Society*, Las Vegas, October 2010. Presenting Author: S. Shrestha
24. "Promising Alternative for a CO₂ Tolerant Anion Exchange Membrane Fuel Cell", *The Electrochemical Society*, Vancouver, Canada, April 2010. Presenting Author: J.A. Vega
23. "Nitrogen Functionalized Mesoporous Carbon for PEM Fuel Cells", *The Electrochemical Society*, Vancouver, Canada, April 2010. Presenting Author: S. Shrestha
22. "Performance of a Direct Borohydride Fuel Cell Stack", *The Electrochemical Society*, Vienna, Austria, October 2009. Presenting Author: W.E. Mustain
21. "Effect of Carbon Dioxide on the Reduction of O₂ in Anion Exchange Membrane Fuel Cells, *The Electrochemical Society*, Vienna, Austria, October 2009. Presenting Author: S. Prakash
20. "Pt/N/C and Pd/N/C Oxygen Reduction Catalysts for PEM Fuel Cells", *The Electrochemical Society*, San Francisco, May 2009. Presenting Author: W.E. Mustain
19. "Deposition of Pt_xRu_{1-x} Catalysts for Methanol Oxidation In Micro Direct Methanol Fuel Cells", *AIChE*, Philadelphia, November 2008. Presenting Author: W.E. Mustain
18. "Micro Direct Methanol Fuel Cells", *AIChE*, Philadelphia, November 2008. Presenting Author: W.E. Mustain

17. "Glass-Based MEA for Micro Direct Methanol Fuel Cells" *The Electrochemical Society*, Honolulu, October 2008. Presenting Author: W.E. Mustain
16. "Phosphonium and Ammonium Based Membranes for Carbonate and Alkaline DMFC", *The Electrochemical Society*, Phoenix, May 2008. Presenting Author: J.A. Vega
15. "Development and Electrochemical Characterization of a Glass-Based Micro DMFC - Li Ion Power Source" *The Electrochemical Society*, Honolulu, October 2008. Presenting Author: S. Prakash
14. "Hybrid Micro DMFC-Li Ion Power Source for Wireless Devices" *The Electrochemical Society*, Honolulu October 2008. Presenting Author: W.E. Mustain
13. "Micro DMFC-Lithium Ion Hybrid Power Source for Low Power Applications", *The Electrochemical Society*, Washington D.C., October 2007. Presenting Author: W.E. Mustain
12. "Inorganic Glass Proton Exchange Membranes", *The Electrochemical Society*, Washington D.C., October 2007. Presenting Author: S. Prakash
11. "CO₂ Vent for Closed Direct Methanol Fuel Cells", *The Electrochemical Society*, Washington D.C., October 2007. Presenting Author: S. Prakash
10. "Thin-Film Pt and PtRu Glass Composite Catalyst Layers for Micro Direct Methanol Fuel Cells", *AICbE*, Washington D.C., November 2007. Presenting Author: W.E. Mustain
9. "A Hybrid Fuel Cell - Thin-Film Lithium Ion Power Source", *AICbE*, Washington D.C., November 2007. Presenting Author: W.E. Mustain
8. "Physical and Electrochemical Characterization of Thin-Film Electrodes on Proton-Conducting Glass Membranes for Micro DMFC Applications", *The Electrochemical Society*, Chicago, IL, May 2007. Presenting Author: W.E. Mustain
7. "Cobalt-Palladium Electrocatalysts for the Oxygen Reduction Reaction", *The Electrochemical Society*, Chicago, IL, May 2007. Presenting Author: W.E. Mustain
6. "Thermal Imaging for In-Situ Combinatorial Characterization of Fuel Cell Catalyst Arrays", *The Electrochemical Society*, Chicago, IL, May 2007. Presenting Author: K. Kepler
5. "The Asymmetric Electrode Technique in a Polymer Electrolyte Membrane Fuel Cell", *The Electrochemical Society*, Quebec City, Canada, May 2005. Presenting Author: W.E. Mustain
4. "Low Temperature Electrodeposition of CoPd_x Alloys in a Mixed Ligand System", *The Electrochemical Society*, Quebec City, Canada, May 2005. Presenting Author: W.E. Mustain
3. "Development of the Asymmetric Electrode Technique in a Polymer Electrolyte Membrane Fuel Cell: Application to Methanol Oxidation", Quebec City, Canada, May 2005. Presenting Author: W.E. Mustain
2. "Using the Asymmetric Electrode Technique to Elucidate Methanol Oxidation Electrokinetics on Pt and PtRu (50:50) in a DMFC, The Electrochemical Society, Quebec City, Canada, May 2005. Presenting Author: W.E. Mustain
1. "One Dimensional, Diffusion-Controlled Kinetic Model for Oxygen Reduction", *The Electrochemical Society*, Orlando, FL, October 2003. Presenting Author: W.E. Mustain

INVITED BOOK CHAPTERS

T. Omasta and W.E. Mustain, “Water and Ion Transport in Anion Exchange Membrane Fuel Cells“, in “Anion Exchange Membrane Fuel Cells“, Ed: L. An and T.S. Shao, Springer, 2018, pp. 1-31

S. Shrestha and W.E. Mustain, “Promises and Challenges of Unconventional Electrocatalyst Supports” in: Electrocatalysis and Fuel Cells: A Non and Low Platinum Approach, M. Shao (editor), Springer, 2013.

S. Prakash, W.E. Mustain and P.A. Kohl, “Electrolytes for Long-Life, Ultra-Low-Power Direct Methanol Fuel Cells” in: Micro Fuel Cells: Principles and Applications, T.S. Zhao (editor), Elsevier, 2009.

PROPOSALS FUNDED

“Digital Engineering for Army Battery Design and Manufacturing”, \$2,365,206, U.S. Army, PI (33% effort)

“Battery Innovation – University of South Carolina”, \$4,352,479, U.S. Department of Energy, PI (100% effort)

“Electrochemical Decarbonization of Limestone”, \$120,000, Savannah River National Lab, PI (100% effort)

“Carolina Institute for Battery Innovation”, \$11,595,140, U.S. Economic Development Administration. PI (100% Effort).

“Data science enabled investigation of mechanisms for multiscale ion transport in polymer electrolytes as anion-exchange membranes”, \$600,000, U.S. Department of Energy. Co-PI (8% Effort).

“Scaleup and Demonstration of a Direct Seawater Electrolyzer”, \$30,000, South Carolina Research Authority. PI (100% Effort).

“Durable, Low-Cost, Manufacturable AEM Electrolyzer Components”, \$3,600,000, U.S. Department of Energy. Co-PI (30% Effort).

“Understanding and Mitigation Fuel Cell Contamination in Fuel Cells”, \$260,000, Plug Power, PI (100% effort)

“Alkaline stable, non-porous, anion exchange ionomer and membrane separator scale-up for liquid alkaline electrolysis”, \$7,600,000, U.S. Department of Energy. Co-PI (16% Effort).

“Baseline Performance of Commercial AEM Materials”, \$120,000, Plug Power. PI (100% Effort).

“High Capacity and Longevity Cathodes for Li-S Batteries”, \$750,000, NantGPower. Co-PI (10% Effort).

“High Fidelity Digital Twins for Large Scale Energy Storage Batteries”, \$772,947. SC-Fraunhofer Alliance/Pomega Energy Storage Solutions. PI (30% Effort).

“Fuel Flexible Engine Technology Integrated with Carbon Capture and Utilization”, \$2,000,000, Office of Naval Research. Co-PI (1 % Effort – Advisory Role)

“Theory-guided Innovation of High-performance Electrocatalysts for Carbon Dioxide Reduction”, U.S. Department of Energy, \$750,000. Co-PI (45% Effort).

“Development, Assessment and Simulation of Enabling Fuels for Naval Decarbonization”, \$3,000,000, Office of Naval Research. PI (20% effort).

“Cathodes for Li-S Batteries”, \$350,000, NantEnergy, Active Dates: 5/1/2022/4/30/2023. Co-PI (25% Effort).

“Bipolar plates design and testing for alkaline electrochemical systems”, \$400,000, Savannah River National Lab – Laboratory Directed Research and Development Grant, Active Dates: 10/1/2021-9/30/2023. Co-PI (30% effort).

“Electrodeposition of Low-Cost Cathodes for High Performance EVs”, Lordstown Motors, \$150,000, Active Dates: 9/1/2021-12/31/2022. PI (100% Effort).

“Engineering of Scalable Platinum-free Electrodes for Pure-Water AEM Electrolysis”, U.S. Department of Energy, ARPA-E, \$500,000, Active Dates: 10/1/2021-03/30/2023. Co-PI (26 % Effort)

“Understanding the Role of Activated Oxygen Species in the Room Temperature Conversion of Methane to Methanol”, National Science Foundation, \$350,000, Active Dates: 01/01/2021-12/31/2023. PI (100 % Effort).

“Component Development for Alkaline URFCs”, \$480,000, Savannah River National Lab – Laboratory Directed Research and Development Grant, Active Dates: 10/1/2019-9/30/2021. Co-PI (30% effort)

“Interface and Electrode Engineering for Durable, Low Cost Alkaline Anion Exchange Membrane Electrolyzers”, \$999,997, U.S. Department of Energy, Active Dates: 05/01/2020-04/30/2023. Co-PI (23.5% effort)

“Novel Anion Exchange Membranes for High-Performance Fuel Cell Devices”, \$996,000, U.S. Department of Energy, Active Dates: 11/1/2018-10/31/2021. Co-PI (32% effort)

“GOALI: Collaborative Research: Electrochemical CO₂ Separation and Capture through Design of Carbonate-Selective Catalysts and Ionomers”, \$550,000, National Science Foundation, Active Dates: 09/01/2018 - 08/31/2022. PI (50% effort)

“Additive Manufacturing for Lithium-Ion Batteries”, \$30,000, Physical Sciences, Inc./DOD SBIR, Active dates: 7/10/2018-10/5/2018. PI

“Alkaline Battery Anodes – several projects, proprietary titles”, \$1,135,000, Duracell, Active dates: 11/01/2016 – 12/31/2026. PI

“Metal Oxide Anodes as Enablers for Advanced Automotive Li-ion Batteries”, \$120,000 – overhead free through University Research Program, Ford Motor Company, Active dates: 01/01/2016 – 12/31/2018. PI

“i-Corps: Novel flame-based precursors for controlled catalyst structure”, \$50,000, NSF, Active dates: 02/2015-07/2015. Co-PI (50% effort)

“Single Step Manufacturing of Low catalyst Loading Electrolyzer MEAs”, Proton Onsite/DOE Phase II SBIR, \$330,000 to UConn (\$1,000,000 total), Active dates: 7/14 – 07/16. Co-PI (40% effort)

“Conversion of Methane to Methanol in Intermediate Temperature Alkaline Electrochemical Cells”, \$130,000, Gas Technology Institute – Subcontract under ARPA-e Phase II, Active dates: 3/2014 – 3/2015.

DOE Early Career Award, “Room Temperature Electrochemical Upgrading of Methane to Oxygenate Fuels”, \$800,000, US Department of Energy – Office of Basic Energy Sciences, Active dates: 9/2013-8/2018. PI

“GOALI: One Step Direct Deposition of Durable Cathode for High Temperature Proton Exchange Membrane Fuel Cell (PEMFC)”, \$423,204, NSF-CMMI, Active dates: 06/13 – 05/16. Co-PI (30% effort)

“Single Step Manufacturing of Low catalyst Loading Electrolyzer MEAs”, Proton Onsite/DOE Phase I SBIR, \$50,000 to UConn (\$150,000 total), Active dates: 12/12 – 07/13. Co-PI (25% effort)

“CHEG 1200: Introduction to Food Science and Engineering”, University of Connecticut Provost General Enhancement Competition Grant”, \$10,000, Active dates: 05/12 – 05/14. PI

“EFRI-MIKS: Innovations for Next-Generation Biomanufacturing and Microengineering”, National Science Foundation, \$2,000,000, Active dates: 08/11 – 07/14. Co-PI (20% effort)

“Nanostructured Catalyst-Support Systems for Next Generation Electrolyzers”, UConn School of Engineering/Proton OnSite via congressional earmark from US Department of Energy, Office of Energy Efficiency & Renewable Energy, \$50,000, Active dates: 07/11 – 03/12. PI.

“Understanding the Effects of Surface Chemistry and Microstructure on the Activity and Stability of Pt Electrocatalysts on Non-Carbon Supports”, US Department of Energy – Office of Basic Energy Sciences, \$480,000, Active dates: 08/10 – 08/13. PI.

“Functionalized Graphitic Supports for Improved Fuel Cell Catalyst Stability”, Physical Sciences Inc./NASA Phase I STTR, \$100,000, Active dates: 02/11 – 02/12. PI

“EAGER: Electrochemical Reactor for Spontaneous Conversion and CO₂ Capture”, NSF-CBET, \$97,721, Active dates: 01/10 – 06/11. PI.

“Electrochemical Conversion of CO₃²⁻ Anions for Power Generation and Removal of Atmospheric CO₂”, UConn Research Foundation, \$24,112, 01/09 – 12/09. PI.

HONORS & AWARDS

2026 Fellow of the Electrochemical Society

2024 ECS Energy Technology Division Research Award

2022 USC College of Engineering and Computing Research Achievement Award

2018 University of South Carolina Department of Chemical Engineering Publication Award

2017 UConn Chemical Engineering Faculty of the Year Award

2016 United Technologies Professor of Engineering Innovation

2015-2016 Fulbright Scholar Fellow

2014 Supramaniam Srinivasan Young Investigator Award

2014 CQIA Platinum Innovation Prize (Shared with R. Maric, C.B. Carter and J. Roller)

2013 DOE Early Career Award

2009 Illinois Institute of Technology Young Alumni Award

2007 Invited Alumni Speaker for Collens Scholarship Program Benefit Dinner

2004 Illinois Institute of Technology Outstanding Teaching Assistant of the Year Award

2004 Hamid Arastoopour Excellence in Education Award

2002 Illinois Institute of Technology Graduate Research Fellowship

1998 – 2002 Illinois Institute of Technology Heald Scholar

PROFESSIONAL MEMBERSHIPS

Electrochemical Society

International Society of Electrochemistry

American Chemical Society

American Institute of Chemical Engineers

American Society of Mechanical Engineers

GRADUATE STUDENTS AND POSTDOCS

Postdocs

Yingdan Cui – June 2025-Present

Sriram Mosali – October 2023-Present

Hari Gopi – October 2022-December 2023

Surachet Duanghathaipornsuk, October 2021-April 2022

Marjanul Manjum, October 2021-March 2023

Sujan Shrestha, November 2017-February 2018 – Admiral Instruments

William A. Rigdon, July 2014-June 2015 – Stanley Black&Decker

Ying Liu – January 2014-April 2015 – SF Motors, Inc.

Graduated Ph.D. Students

Jose A. Vega, Summer 2011 – Envate Corporation

Sujan Shrestha, December 2013 – EnerSys

Ying Liu, December 2013 – Apple

Neil Spinner, December 2013 – Pine Instrument Company

Shuai Zhao, September 2016 – EvolOH

Haoran Yu, May 2017 – Oak Ridge National Laboratory

Travis Omasta, May 2018 – Metro-North Railroad

Alessandro Palmieri, May 2018 – Eldor Corporation

Xiong Peng, May 2019 – Lawrence Berkeley National Lab

Benjamin Ng, December 2020 – Bottled Lighting Corp

Ehsan Faegh, May 2021 – CCL Design

Yiwei Zheng, December 2021 – Postdoctoral Researcher, Northwestern University
Horie Adabi, May 2022, H2U Technologies, Inc.
Noor Ul Hassan, October 2022 – Fotescue
Brian Lenhart, December 2023 – Pajarito Powder
Saheed Lateef, August 2024 – Underwriters Laboratories

Current Ph.D. Students

Mahmoud Amirsalehi, Expected Graduation Date, Expected May 2027
Devadharshini Kathan, Expected December 2027
Mohammed Al-Murisi, Expected December 2026
Ian Street, Expected December 2027
Belinda Agamah, Expected December 2028
Yekta Bashiri, Expected May 2028
Harrison Price, Expected May 2029
Connor Miles, Expected May 2029

Graduated M.E. Masters Students

Hanna Soucie, December 2023 – NEL Hydrogen
Lyzmarie Irizarry-Colon, December 2023 - Halocarbon
Alessandro Palmieri, May 2014 – Eldor Corporation
Nicholas Osepowicz, May 2014 – HyAxiom
Matteo Bramilla, May 2013 – Process Service Srl
Roopnarine Sukhram, May 2012 – Doosan Fuel Cell
Jeffrey Collett, May 2010 – Gemma Power Systems
Jonathan O'Neill, May 2010 – Starlab

Graduated Master's (MS) Students

Najmaddin Bashirzada, December 2025 – Green Chemicals, Inc.
Jasmine Bohannon, December 2022 – GEL Laboratories
Xinyi Zhao, June 2019 – Unknown
Mark Williams, December 2012 – Ingredion Incorporated
Gregory Crettol, July 2013 – Port of Seattle
Monica Dahl – December 2015 – Shamrock Technologies
Mengchen Liu – May 2016 – Ph.D. Student, UCSD

COURSES TAUGHT

University of South Carolina

ECHE 430 – Chemical Engineering Kinetics. Spring 2020-2023. Concepts of chemical kinetics, batch and flow reactors, catalysis and reactor design.

ECHE 589 – Hands-on Applications of Chemical and Electrochemical Engineering. Fall 2022. Using Chemical Engineering principles of thermodynamics, kinetics, and mass transport to design, build and test bench-top scale physical systems.

ECHE 770 – Electrochemical Engineering. Fall 2019, Fall 2021, Spring 2025. Electrochemical engineering principles developed from thermodynamic, kinetic, mass transfer, and potential theory. Numerical analysis and design of electrochemical systems. Statistical analysis of experimental data and industrial experimental designs.

ECHE 310 – Introductory Chemical Engineering Thermodynamics. Spring 2018, Spring 2019, Fall 2020, Spring 2024. First law and second law of thermodynamics. Thermodynamic properties of single component systems. Analysis of power and refrigeration cycles. Average Student Evaluation: 4.8/5.0.

ENCP 290 – Honors Thermodynamic Fundamentals. Fall 2018. Definitions, work, heat, and energy. First law of analyses of systems and control volumes. Second law analysis. Average Student Evaluation: No statistics available (only 6 students).

ECHE 202 – Exploring the Chemical Engineering Workplace. Fall 2017. This course focuses on mentoring sophomore-level undergraduate students to help them identify their of career interests and active exploration of careers in chemical engineering. Average Student Evaluation: 4.9/5.0.

BMEN 202 - Professional Development and Ethics in Biomedical Engineering II. Fall 2017. Communication in the field of biomedical engineering, including technical writing and oral presentations with emphasis on professional development, articulation of a critical position, and productive intellectual exchange. Careers in the field of biomedical engineering. Planning and managing group projects. Ethical issues associated with biomedical engineering. Average Student Evaluation: 4.8/5.0.

University of Connecticut

CHEG 2103 – Introduction to Chemical Engineering. Fall 2012 - Fall 2014. This course focuses on the implications of material and energy balances. Students also learn about reaction equilibria, elementary kinetics and the construction of process flow diagrams as well as systems-level degree of freedom analysis. Average Student Evaluation: 8.5/10.

CHEG 4995 – Special Topics: Biokinetics Relevant for the Food Industry, Spring 2011, Spring 2012. This course is an introduction to food science and engineering, with a particular focus on extraction of starches from foodstuffs, decomposition to sugars and fermentation. Average student evaluation: 9.2/10

CHEG 3112 – Undergraduate Thermodynamics II. Reactions and Phase Equilibria. Fall 2009, Fall 2010 & Fall 2011. This course focuses on multicomponent chemical systems and understanding the role of conditions on phase behavior and equilibria. Professor Mustain introduced several new team-building modules into the course where complex problems were attacked in groups. Also, Professor Mustain developed Excel based computational tools, which allow the undergraduate students to manually input information and iterate solutions, which helps them to better understand how process simulators function. Average student evaluation: 9.0/10

CHEG 4995 – Special Topics: Undergraduate Electrochemical Engineering and Energy, Fall 2008, Spring 2010 & Spring 2012. Redox processes, electrochemical kinetics, transport phenomena in electrochemical systems and electrochemical fundamentals applied to energy generation and storage. Professor Mustain introduced a laboratory component to this course to give students hands-on experience with electrochemical systems. Also, several flash videos were developed and introduced to help students visualize phenomena. Average student evaluation: 8.8/10

CHEG 5395/5363 – Special Topics: Graduate Electrochemical Engineering and Energy, Fall 2008, Spring 2010, Spring 2011 & Spring 2012. Redox processes, electrochemical kinetics, transport phenomena in electrochemical systems and electrochemical fundamentals applied to energy generation and storage. Professor Mustain introduced a laboratory component to this course to give students hands-on experience with

electrochemical systems. Also, several flash videos were developed and introduced to help students visualize phenomena. Average student evaluation: 9.0/10

UNIVERSITY SERVICE

University of South Carolina

Director, Carolina Institute for Battery Innovation, 2024-Present

Associate Dean for Research, 2023-Present

Faculty Advisor for AIChE Chem E Car Team, 2023-2024

Director for Emerging Energy Programs, 2022-2023

Faculty Advisor for ECS Student Chapter, 2017-present

Graduate Recruiting Committee, 2017-2022

Chair, Chemical Engineering Search Committee, 2018-2019, 2019-2020, 2024-20225, 2025-2026

College of Engineering Energy Search Committee and Chair, 2017-2018

University of Connecticut

Associate Department Head – Department of Chemical & Biomolecular Engineering, 2103-2016

Chair, ABET Committee – Department of Chemical & Biomolecular Engineering, 2012-2017

Chair, Operations and Safety Committee – Center for Clean Energy Engineering, 2013-2016

UConn SoE Graduate Committee, 2011-2015

Chair, Graduate Committee – Chemical Engineering Program, 2009-2012

Faculty Advisor for AIChE Student Chapter – ChemE Car Competition, 2010-2017

Sustainable Energy Initiative Faculty Search Committee, 2008-2009

EXTRAMURAL SERVICE

Editor, Applied Catalysis B: Environmental, 2020-2025

Editorial Board, Applied Catalysis B: Environmental, 2018-2020

Associate Editor, Journal of Electrochemical Energy Conversion and Storage, 2015-2018

Chair, Energy Technology Division, Electrochemical Society, May 2021-May 2023

Vice Chair, Energy Technology Division, Electrochemical Society, May 2019-May 2021

Secretary, Energy Technology Division, Electrochemical Society, May 2017-May 2019

Treasurer, Energy Technology Division, Electrochemical Society; May 2015-May 2017

Chair, Electrochemical Division, American Institute of Chemical Engineers, Nov. 2016-Nov. 2018

Vice Chair, Electrochemical Division, American Institute of Chemical Engineers, Nov. 2014-Nov. 2016.

Secretary, Electrochemical Division American Institute of Chemical Engineers, Nov. 2012-Nov. 2014.

Executive Committee Member-at-Large, Energy Technology Division, Electrochemical Society, May 2012-May 2015.

Member, Individual Membership Committee, Electrochemical Society, May 2014-May 2021

Member, New Technology Subcommittee, Electrochemical Society, October 2012-October 2014.

Symposia Organizer – Electrochemical Society
Dozens of sessions, 2018-present

Symposium Organizer – American Chemical Society
Electro/Photocatalysis, Catalysis Division – Spring 2012

Symposium Organizer – AIChE
Engineering Fundamentals, ~15 sessions, 2012-2018

JOURNAL REVIEW COMMITMENTS (ABBREVIATED LIST)

Journal of the Electrochemical Society

Journal of the American Chemical Society

Journal of Physical Chemistry

Journal of Power Sources

Electrochemistry Communications

ECS Electrochemistry Letters

Journal of Materials Chemistry A

Applied Catalysis B: Environmental

Electrochimica Acta

Journal of Solid State Electrochemistry

Bioresource Technology

Solid State Ionics

ACS Catalysis

ACS Applied Materials and Interfaces

ACS Nano

Industrial & Engineering Chemistry Research

International Journal of Hydrogen Energy

Nature Communications

Nature Energy

Nature Materials

Carbon

Energy & Environmental Science

Elsevier Books

PROPOSAL REVIEWER COMMITMENTS (ABBREVIATED LIST)

NSF CBET Catalysis

Department of Energy EFRC Review

Hong Kong Research Grants Council

Netherlands Organization for Scientific Research

AAAS Research Competitiveness Program

SBIR/STTR Program, National Science Foundation

DOE Office of Science Graduate Fellowship Program

CBET Process and Reaction Engineering, National Science Foundation

CBET Energy for Sustainability, National Science Foundation

Partner University Fund

DMR Solid State and Materials Chemistry Program, National Science Foundation

ASC Chemistry Division, National Science Foundation

NASA Postdoctoral Fellowship Program

DOE Early Career Research Program

OUTREACH ACTIVITIES

USC Duke TIPS Program Lecturer (2019-date)

REU Site Mentor (Summer 2012-2014)

Judge for GK-12 Mousetrap Car Competition (Spring 2012)

UConn Mentor Connection (Summer 2011 & 2012)

Joule-Fellows Program Faculty Advisor and Teacher Host (Summer 2009-2017)

daVinci Program Faculty Workshop Leader (Summer 2010, 2014)

Lecturer and Demonstration Leader for Explore Engineering (E²) Program (Summers 2009 & 2010)

C2E2 Industrial Outreach Faculty Lecturer (2008-2017)

UConn representative CT Junior Science and Humanities Symposium (2009-2013)

Habitat for Humanity - Construction of new homes in South Atlanta (2007).

6TH Grade Career Day Workshop – Bednarcik Junior High School, Oswego, IL (2006).