Veronica Augustyn

Assistant Professor
Dept. of Materials Science & Engineering
North Carolina State University, Raleigh, NC
E-mail: vaugust@ncsu.edu, Phone: (919) 515-3272

EDUCATION

2013	Ph.D.	Materials Science & Engineering University of California, Los Angeles Advisor: Prof. Bruce Dunn Dissertation Title: "*Characterization of Nanostructured Materials for Lithium-Ion Batteries and Electrochemical Capacitors*"
2007	B.S.	Materials Science & Engineering The University of Arizona, Tucson Senior Project: "*Development and Testing of Nafion-Silica Hybrid Polymer Electrolyte Membranes*"

PROFESSIONAL & RESEARCH APPOINTMENTS

8/2015 – present	*Assistant Professor* Materials Science & Engineering, North Carolina State University
8/2013 – 6/2015	*Postdoctoral Fellow* The University of Texas at Austin; Advisor: Prof. Arumugam Manthiram
7/2007 – 6/2013	*Graduate Student Researcher* University of California, Los Angeles; Advisor: Prof. Bruce Dunn
3/2012 – 5/2012	*Visiting Researcher* Chimie ParisTech; Advisor: Prof. Philippe Barboux
6/2009 – 9/2009	*Intern* HRL Laboratories LLC; Advisor: Dr. Ping Liu (now at UC, San Diego)
8/2005 – 12/2005	*Undergraduate Student Researcher* The University of Arizona; Advisor: Prof. B.G. Potter
5/2005 – 7/2005	*Intern* Pacific Northwest National Laboratory; Advisor: Dr. S.K. Sundaram (now at Alfred Univ.)

AWARDS & HONORS

2019	Sloan Research Fellow in Chemistry
2018	*Journal of Materials Chemistry A* Emerging Investigator
2017	*Chemistry of Materials* Reviewer Excellence Award
2017	BASF/VW Award Electrochemistry Finalist
2017	Research Corporation for Science Advancement Scialog Fellow, Advanced Energy Storage
2017	China-America Frontiers of Engineering Symposium Participant
2017	National Science Foundation CAREER Award
2016	ORAU Ralph E. Powe Junior Faculty Enhancement Award

2012 UCLA Graduate Division Dissertation Year Fellowship
2012 1st Joint U.S.-Africa Materials Initiative Fellowship
2008 NSF IGERT: Materials Creation Training Program Fellowship
2007 UC Regents Stipend
2007 1st Place Senior Project, Arizona Chapter of ASM International
2006 Univ. of Arizona William H. Loerpabel Scholarship
2005 Univ. of Arizona Conrad L. Fraps Memorial Scholarship

PEER-REVIEWED PUBLICATIONS

*: invited contribution, +: corresponding author

Independent Career

1. **V. Augustyn**,+ M.T. McDowell,+ & A. Vojvodic.+ "Toward an Atomistic Understanding of Solid-State Electrochemical Interfaces for Energy Storage." *Joule*, 2 (2018) 2189-2193.
2. S. Boyd, R. Dhall, J.M. LeBeau, & **V. Augustyn**.*+ "Charge Storage Mechanism and Degradation of P2-Type Sodium Transition Metal Oxides in Aqueous Electrolytes." *Journal of Materials Chemistry A*, 6 (2018) 22266-22276.
3. R. Wang, J.B. Mitchell, Q. Gao, W.-Y. Tsai, S. Boyd, M. Pharr, N. Balke, & **V. Augustyn**.+ "*Operando* AFM Reveals Mechanics of Structural Water Driven Battery-to-Pseudocapacitor Transition." *ACS Nano*, 12 (2018) 6032-6039.
4. S. Boyd & **V. Augustyn**.*+ "Transition Metal Oxides for Aqueous Sodium-Ion Electrochemical Energy Storage." *Inorganic Chemistry Frontiers*, 5 (2018) 999-1015.
5. **V. Augustyn***+ & Y. Gogotsi. "2D Materials with Nanoconfined Fluids for Electrochemical Energy Storage." *Joule*, 1 (2017) 443-452.
6. S. Niu, R. McFeron, F. Godínez-Salomón, B.S. Chapman, C.A. Damin, J.B. Tracy, **V. Augustyn**, & C.B. Rhodes. "Enhanced Electrochemical Lithium-Ion Charge Storage of Iron Oxide Nanosheets." *Chemistry of Materials*, 29 (2017) 7794-7807.
7. R. Wang, C.-C. Chung, Y. Liu, J.L. Jones, & **V. Augustyn**.*+ "Electrochemical Intercalation of Mg^{2+} into Anhydrous and Hydrated Crystalline Tungsten Oxides." *Langmuir*, 33 (2017) 9314-9323.
8. J.S. Daubert, R. Wang, J.S. Ovental, H.F. Barton, R. Rajagopalan, **V. Augustyn**, & G.N. Parsons. "Intrinsic Limitations of Atomic Layer Deposition for Pseudocapacitive Metal Oxides in Porous Electrochemical Capacitor Electrodes." *Journal of Materials Chemistry A*, 5 (2017) 13086-13097.
9. J.B. Mitchell, W.C. Lo, A. Genc, J. LeBeau, & **V. Augustyn**.+ "Transition from Battery to Pseudocapacitive Behavior via Structural Water in Tungsten Oxide." *Chemistry of Materials*, 29 (2017) 3928-3937.
10. **V. Augustyn**.*+ "Tuning the Interlayer of Transition Metal Oxides for Electrochemical Energy Storage." *Journal of Materials Research*. 32 (2017) 2-15.

Postdoctoral & Graduate Research

11. **V. Augustyn** & A. Manthiram. "Effects of Chemical *vs*. Electrochemical Delithiation on the Oxygen Evolution Reaction Activity of Nickel-rich Layered LiMO_2." *The Journal of Physical Chemistry Letters*, 6 (2015) 3787-3791.

12. **V. Augustyn**, S. Therese, T.C. Turner, & A. Manthiram. "Nickel-Rich Layered $LiNi_{1-x}M_xO_2$ (*M* = Mn, Fe, and Co) Electrocatalysts with High Oxygen Evolution Reaction Activity." *Journal of Materials Chemistry A*, 3 (2015) 16604-16612.

13. N. Colligan, **V. Augustyn**, & A. Manthiram. "Evidence of Localized Lithium Removal in Layered and Spinel $Li_{1-x}CoO_2$ ($0 \leq x \leq 0.9$) under Oxygen Evolution Reaction Conditions." *Journal of Physical Chemistry C*, 119 (2015) 2335-2340.

14. **V. Augustyn** & A. Manthiram. "Characterization of Layered LiMO_2 Oxides for the Oxygen Evolution Reaction of Metal-Air Batteries." *ChemPlusChem*, 80 (2015) 422-427.

15. I.E. Rauda, **V. Augustyn**, L.C. Saldarriaga-Lopez, X. Chen, L.T. Schelhas, G.W. Rubloff, B. Dunn, & S.H. Tolbert. "Nanostructured Pseudocapacitors based on Atomic Layer Deposition of V_2O_5 onto Conductive Nanocrystal-Based Mesoporous ITO Scaffolds." *Advanced Functional Materials*, 24 (2014) 6717-6728.

16. **V. Augustyn**, P. Simon, & B. Dunn.* "Pseudocapacitive Oxide Materials for High-Rate Electrochemical Energy Storage." *Energy & Environmental Science*, 7 (2014) 1597-1614.

17. J. Come, **V. Augustyn**, J.W. Kim, P. Rozier, P.-L. Taberna, P. Gogotsi, J.W. Long, B. Dunn, & P. Simon. "Electrochemical Kinetics of Nanostructured Nb_2O_5 Electrodes." *Journal of The Electrochemical Society*, 161 (2014) A718-A725.

18. **V. Augustyn**, E.R. White, J. Ko, G. Grüner, B.C. Regan, & B. Dunn. "Lithium-Ion Storage Properties of Titanium Oxide Nanosheets." *Materials Horizon*s, 1 (2014) 219-223.

19. **V. Augustyn**, J. Come, M.A. Lowe, J.W. Kim, P.-L. Taberna, S.H. Tolbert, H.D. Abruña, P. Simon, & B. Dunn. "High Rate Electrochemical Energy Storage via Li^+ Intercalation Pseudocapacitance." *Nature Materials*, 12 (2013) 518-522.

20. I. Rauda†, **V. Augustyn**†, B. Dunn, & S.H. Tolbert. "Enhancing Pseudocapacitive Charge Storage in Polymer Templated Mesoporous Materials." *Accounts of Chemical Research*, 46 (2013) 1113-1124. (†equal contribution)

21. **V. Augustyn** & B. Dunn. "Low-Potential Lithium-Ion Reactivity of Vanadium Oxide Aerogels." *Electrochimica Acta*, 88 (2013) 530-535.

22. M. Hmadeh, Z. Lu, Z. Liu, F. Gándara, H. Furukawa, S. Wan, **V. Augustyn**, R. Chang, L. Liao, F. Zhou, E. Perre, V. Ozolins, X. Duan, B. Dunn, Y. Yamamoto, O. Terasaki, & O.M. Yaghi. "New Porous Crystals of Extended Metal-Catecholates." *Chemistry of Materials*, 24 (2012) 3511-3513.

23. I. Rauda, R. Buonsanti, L.C. Saldarriaga-Lopez, K. Benjauthrit, L.T. Schelhas, M.M. Stefik, **V. Augustyn**, J. Ko, B. Dunn, U. Wiesner, D.J. Milliron, & S.H. Tolbert. "A General Method for the Synthesis of Hierarchical Nanocrystal-Based Mesoporous Materials." *ACS Nano*, 6 (2012) 6386-6399.

24. E.R. White, S.B. Singer, **V. Augustyn**, W.A. Hubbard, M. Mecklenburg, B. Dunn, & B.C. Regan. "*In Situ* Transmission Electron Microscopy of Lead Dendrites and Lead Ions in Aqueous Solution." *ACS Nano*, 6 (2012) 6308-6317.
25. Z. Chen, **V. Augustyn**, X. Jia, Q. Xiao, B. Dunn, & Y.F. Lu. "High-Performance Sodium-Ion Pseudocapacitors Based on Hierarchically Porous Nanowire Composites." *ACS Nano*, 6 (2012) 4319-4327.
26. J.W. Kim, **V. Augustyn**, & B. Dunn. "The Effect of Crystallinity on the Rapid Pseudocapacitive Response of Nb_2O_5." *Advanced Energy Materials*, 2 (2012) 141-148.
27. X. Wang, G. Li, Z. Chen, **V. Augustyn**, X. Ma, G. Wang, B. Dunn, & Y.F. Lu. "High-Performance Supercapacitors Based on Nanocomposites of Nb_2O_5 Nanocrystals and Carbon Nanotubes." *Advanced Energy Materials*, 1 (2011) 1089-1093.
28. Z. Chen, **V. Augustyn**, J. Wen, Y.W. Zhang, M.Q. Shen, B. Dunn, & Y.F. Lu. "High-Performance Supercapacitors Based on Intertwined CNT/V_2O_5 Nanowire Nanocomposites." *Advanced Materials*, 23 (2011) 791-795.
29. **V. Augustyn** & B. Dunn. "Vanadium Oxide Aerogels: Nanostructured Materials for Enhanced Energy Storage." *Comptes Rendus Chimie*, 13 (2010) 130-141.

PATENTS

1. G. Grüner, X. Duan, B.S. Dunn, V. Augustyn. "Interpenetrating Networks of Carbon Nanostructures and Nano-Scale Electroactive Materials." U.S. Patent Application #13963973.

EDUCATION PUBLICATIONS

1. V. Augustyn. "New Materials are Powering the Battery Revolution." *The Conversation*, 4 October 2018.
2. V. Augustyn & J.P. Eneku. "Building the SciBridge between Africa and the United States." *AAAS Science & Diplomacy*, December 2015.

INVITED SEMINARS & GORDON CONFERENCES

1. Texas A&M University, Dept. of Materials Science & Engineering, College Station, TX. February 2019.
2. 2018 Gordon Research Conference on Water and Aqueous Solutions: Water: Driving Life, Medicine, Energy and Environment, Holderness, NH. July 2018.
3. Massachusetts Institute of Technology, Dept. of Materials Science & Engineering, Cambridge, MA. May 2018.
4. 2018 Gordon Research Conference on Batteries: The Opportunity in the Invisible: Integrating Theory, Synthesis, Characterization and System Validation for the Battery of Tomorrow, Ventura, CA. February 2018.
5. Northwestern University, Dept. of Materials Science & Engineering, Evanston, IL. November 2017.
6. Virginia Tech University, Dept. of Chemistry, Blacksburg, VA. September 2017.
7. University of North Carolina at Chapel Hill, Dept. of Chemistry, Chapel Hill, NC. September 2017.
8. Wake Technical Community College, Raleigh, NC. August 2017.
9. Shanghai Normal University, Dept. of Chemistry, Shanghai, China. June 2017.

10. University of New South Wales, School of Chemical Engineering, Sydney, Australia. June 2017.
11. University of Technology Sydney, Clean Energy Technology Centre, Sydney, Australia. June 2017.
12. University of Wollongong, Institute for Superconducting and Electronic Materials, Wollongong, Australia. May 2017.
13. Oak Ridge National Lab, Materials Science Division, Oak Ridge, TN. May 2017.
14. University of Arizona, Dept. of Materials Science & Engineering, Tucson, AZ. April 2017.
15. Wake Forest University, Dept. of Physics, Winston-Salem, NC. February 2017.
16. Texas State University, Dept. of Chemistry, San Marcos, TX. October 2016.
17. Shaw University Science Colloquium Series, Raleigh, NC. August 2016.
18. North Carolina State University, Dept. of Physics. April 2016.
19. Dept. of Green and Sustainable Chemistry, Tokyo Denki University, Tokyo, Japan. June 2016.
20. CSIRO Manufacturing, Lindfield, Sydney, Australia. March 2016.
21. University of New South Wales, Dept. of Materials Science & Engineering, Sydney, Australia. March 2016.
22. North Carolina State University, Dept. of Chemical & Biomolecular Engineering. October 2015.

INVITED CONFERENCE & WORKSHOP PRESENTATIONS

1. 256th ACS National Meeting & Exposition, Boston, MA. August 2018 (*3*).
2. Telluride Science Research Workshop on Water: Grand Challenges for Molecular Science and Engineering, Telluride, CO. July 2018.
3. Chalmers University of Technology, Workshop on Supercapacitors: Store for the Future, Gothenburg, Sweden. June 2018
4. 9th International Conference of the African Materials Research Society, Gaborone, Botswana. December 2017.
5. 2017 Southeast Regional Meeting of the American Chemical Society, Charlotte, NC. November 2017.
6. 232nd Electrochemical Society Meeting, National Harbor, MD. October 2017 (*2*).
7. 26th International Materials Research Congress, Cancun, Mexico. August 2017.
8. 2017 ACS National Meeting, San Francisco, CA. April 2017.
9. ACerS Electronic Materials & Applications 2017 Conference, Orlando, FL. January 2017.
10. 25th International Materials Research Congress, Cancun, Mexico. August 2016.
11. Telluride Science Research Center Workshop on Interfacial Chemistry and Charge Transfer for Energy Storage and Conversion, Telluride, CO. July 2016.
12. NSF Center for Dielectrics & Piezoelectrics Spring 2016 Meeting, Kyoto, Japan. June 2016.
13. ASM International Carolinas Central Chapter Meeting, North Carolina State University. April 2016.
14. WITec Confocal Raman Imaging Workshop, Rutgers University, Newark, NJ. April 2016.
15. 40th International Conference and Exposition on Advanced Ceramics and Composites (ICACC), Daytona Beach, FL. January 2016.
16. NSF Center for Dielectrics & Piezoelectrics Fall 2015 Meeting, Raleigh, NC. October 2015.
17. University of Texas at Austin Electrochemical Society Student Chapter. April 2014.
18. 7th International Conference of the African Materials Research Society. Addis Ababa, Ethiopia. December 2013.

CONTRIBUTED CONFERENCE PRESENTATIONS

1. 2018 Materials Research Society Spring Meeting, Phoenix, AZ. April 2018 (*2*).
2. 2017 Materials Research Society Spring Meeting, Phoenix, AZ. April 2017.

3. 2016 Materials Research Society Spring Meeting, Phoenix, AZ. April 2016.
4. 227th ECS Meeting, Chicago, IL. May 2015.
5. 2013 U.S. Department of Energy Energy Frontier Research Center Principal Investigators' Meeting. Washington, D.C. July 2013.
6. 2013 Materials Research Society Spring Meeting, San Francisco, CA. April 2013.
7. 2013 TMS Annual Meeting, San Antonio, TX. March 2013.
8. U.S. Department of Energy Energy Frontier Research Center Science Review. Aurora, CO. January 2012.
9. Gordon Research Seminar in Electrochemistry, Ventura, CA. January 2012.
10. U.S. Department of Energy Energy Frontier Research Center Summit, Washington, D.C. May 2011.
11. 2011 Materials Research Society Spring Meeting, San Francisco, CA. April 2011.
12. Materials Creation Training Program Seventh Annual Symposium, UCLA, Los Angeles, CA. November 2009.
13. 2009 Materials Research Society Spring Meeting, San Francisco, CA. April 2009.

ADVISING

Postdoctoral, Graduate, & Undergraduate Research Assistants

Name	Position	Years	Next Position
Simon Fleischmann	Postdoctoral Fellow	2/2019 - present	
Michael Spencer	Ph.D. student	7/2017 – present	
James Mitchell	Ph.D. student	8/2016 – present	
Shelby Boyd	Ph.D. student	1/2016 – present	
Ruocun Wang	Ph.D. student	8/2015 – present	
William C. Lo	M.S. student	8/2015 – 8/2016	grad, Physics, NC State
Frank Di Lustro	undergraduate student	5/2018 – 8/2018	undergrad, EE, NC State
Ellie Scott	undergraduate student	1/2018 – present	
Andie Matten	undergraduate student	11/2017 – present	
Ming Lee	undergraduate student	11/2017 – 2/2018	undergrad, MSE, UNSW
Klarissa Baranyk	undergraduate student	6/2017 – 8/2017	undergrad, EE, NC State
Kevin Matthews	undergraduate student	5/2017 – present	
Kaynan Goldberg	undergraduate student	3/2017 – 11/2017	undergrad, MSE, NC State
Matthew Powell	undergraduate student	1/2017 – 5/2017	grad, Chemistry, Clemson
Ashwin Bhargava	undergraduate student	5/2016 – 8/2016	undergrad, MSE, NC State
Anna Costine	undergraduate student	3/2016 – 5/2017	grad, MSE, Virginia
Mikayla Moody	undergraduate student	9/2015 – 9/2016	undergrad, MSE, NC State
Éowyn Lucas	undergraduate student	8/2015 – 6/2017	grad, MSE, CalTech

TEACHING

Dept. of Materials Science & Engineering, NC State University

- MSE 201: Structure and Properties of Engineering Materials, Instructor (undergraduate: Fall 2015, Spring 2017, Fall 2017, Spring 2018, Spring 2019)
- MSE 465/565: Introduction to Nanomaterials, Guest Lecturer (undergraduate/graduate: Spring 2017, Spring 2018)
- MSE 791: Materials for Electrochemical Technologies, Instructor (graduate: Fall 2016)

Dept. of Mechanical Engineering, The University of Texas at Austin
- ME 386Q-14: Electrochemical Energy Materials, Guest Lecturer (graduate: Spring 2014, Spring 2015)

Dept. of Materials Science & Engineering, The University of Arizona
- MSE 110: Solid State Chemistry, Teaching Assistant (undergraduate: Fall 2005, Spring 2006, Fall 2006, Spring 2007)

SERVICE

SciBridge Project
- Co-Founder & Faculty Advisor of SciBridge, a multi-university project that aims to connect African and U.S. scientists by utilizing experiment kits and web-based seminars
- Award-Winning Project: 2014 MRS Foundation Grassroots Grant Award ($10,000), 2015 NC State Diversity Mini Grant Award ($3,000), 2016 NC State East Africa Strategic Initiative Award ($12,000), Spring 2016 Materials Research Society "Sustainability in My Community" 2nd Place Poster Award ($300)

Symposium Organizer:
- Symposium on "ECS Student Slam 3," 235th ECS Meeting, Dallas, TX. May 2019.
- Symposium on "Advanced Materials for the Water-Energy Nexus," 2019 MRS Spring Meeting, Phoenix, AZ. April 2019.
- Symposium on "Materials Education, International Networking, & Entrepreneurship/Innovation," 9th International Conference of the African Materials Research Society, Gaborone, Botswana. December 2017.
- Symposium on "Materials for Multivalent Electrochemical Energy Storage," 2017 MRS Spring Meeting, Phoenix, AZ. April 2017.

Session Chair:
- Symposium on "Battery Technology: Vehicle to Grid," 256th ACS National Meeting, Boston, MA. August 2018.
- Symposium on "Materials Science and Engineering for Safe and Long-Life Electrochemical Energy Storage," 2018 MRS Spring Meeting, Phoenix, AZ. April 2018.
- Symposium on "Multi-electron Redox Systems for Next Generation Batteries," 232nd Electrochemical Society Meeting, National Harbor, MD. October 2017.
- Symposium on "Fast Electrochemical Processes and Devices," 232nd Electrochemical Society Meeting, National Harbor, MD. October 2017.
- Symposium on "Advances in Electrochemical Energy Storage," 26th International Materials Research Congress, Cancun, Mexico. August 2017.
- Symposium on "Synthesis and Characterization of Materials for Energy Applications," 2017 ACS National Meeting, San Francisco, CA. April 2017.

Co-Editor: Transition Metal Oxides for Electrochemical Energy Storage (Publisher: Wiley), with Jagjit Nanda

Peer Reviewer: *ACS Applied Materials & Interfaces, ACS Energy Letters, ACS Nano, ACS Sustainable Chemistry & Engineering, Advanced Materials, Advanced Sustainable Systems, Applied Physics A, Applied Surface Science, Batteries & Supercaps, Carbon, Chemical Communications, Chemical Science, Chemistry of Materials, Communications Chemistry, Electrochimica Acta, Electrochemical Communications, Energy & Environmental Science, Energy Storage Materials, Environmental*

Science & Technology, Inorganic Chemistry, Journal of the American Chemical Society, Journal of Electroanalytical Chemistry, Journal of the Electrochemical Society, Journal of Physical Chemistry, Journal of Physical Chemistry C, Journal of Power Sources, Materials Horizons, Materials Letters, Materials Science & Engineering B, Materials Today, Nano Energy, Nano Letters, Nanoscale, Nature Communications, Nature Scientific Reports, NPG Asia Materials, Small Method, Solid State Ionics

Proposal & Fellowship Reviewer:
- U.S. Department of Energy (2016, 2017, 2018)
- U.S. National Science Foundation (2017, 2018)
- Stanford Synchrotron Radiation Light Source (2018)
- National Science Centre of Poland (2015)
- Kentucky Science & Technology Corp. (2017)
- U.S. Department of Defense NDSEG Fellowship (2016)

Invited Panelist: 2017 DOE BES Workshop on Basic Research Needs for Next Generation Electrical Energy Storage

External Advisory Board Member: Project Smart MEMs Piezo Based Energy Harvesting with Integrated Supercapacitor and Packaging (smart-MEMPHIS)

PROFESSIONAL AFFILIATIONS

Materials Research Society, Electrochemical Society, American Ceramic Society, American Chemical Society