

Rachel Carter, Ph.D.

RESEARCH EXPERIENCE

Research Mechanical Engineer

8/2020-Present

U.S. Naval Research Laboratory

Expertise: Room temperature and low temperature alkali-chalcogenide batteries, in-situ and in operando optical spectroscopy, accelerated rate calorimetry, micro x-ray computed tomography, grid scale battery systems, thermal transients and thermal gradients

Highlights: Applied research on sodium-sulfur low-temperature primary and ambient secondary cells. Basic research on sodium-sulfur discharge mechanism using ultrafast spectroscopy, unique optical microscopy, and nano-carbon design. Accelerated rate calorimetry of commercial sodium-ion cells. Collaborative investigation of thermal gradients and thermal transients in li-ion systems and li-metal systems.

Jerome and Isabella Karle Distinguished Scholar Fellow

8/2019-8/2020

U.S. Naval Research Laboratory

Expertise: Room temperature sodium sulfur batteries, in-situ and in operando optical spectroscopy, micro x-ray computed tomography, grid scale battery systems

Highlights: Investigating discharge mechanisms of room temperature sodium sulfur batteries

Postdoctoral Research Associate- National Research Council

6/2017-8/2019

PI: Dr. Corey T. Love, U.S. Naval Research Laboratory

Expertise: Li-ion battery safety, battery diagnostics, artificial SEI, x-ray computed tomography, accelerated rate calorimetry, thermal gradient

Highlights: Studied Li-ion battery safety for safe implementation in Navy platforms. Diagnosed battery failures using X-ray CT. Characterized the influence of external environment on cell operation and failure. Developed thermal gradient strategy for Li-ion battery “repair.” Utilized external thermal gradient for high energy metal anodes.

Graduate Research Assistant- Vanderbilt University

5/2013-5/2017

PI: Dr. Cary L. Pint, Nanomaterials and Energy Devices Laboratory

Expertise: Energy Storage Materials, Nanomanufacturing, Atomic Layer Deposition, Electrochemistry, Sulfur Cathodes, Electron Microscopy

Highlights: Developed and patented innovative composite processing technique for rapid electrode fabrication; initiated sulfur battery research direction in the group; demonstrated one of the first high performance room temperature sodium sulfur batteries in literature.

Undergraduate Research Assistant- Vanderbilt University

1/2011-5/2011

PI: Dr. Alvin Strauss, Welding Automation Laboratory

Assisted graduate students with research tasks; learned to use C# and wrote code for the automated friction stir welding process; performed and characterized channel and spot welds; studied effects of speed and penetration on welded metals.

Rachel Carter, Ph.D.

EDUCATION

Ph.D., Mechanical Engineering, Vanderbilt University 5/2013- 5/2017

Dissertation: “Room Temperature Sulfur Battery Cathode Design and Processing Techniques”

B.E., Vanderbilt University 8/2009-5/2013

Major: Mechanical Engineering, Minors: Materials Science, Religious Studies;

Dean’s List: Fall 2011, Fall 2012, Spring 2013

AWARDS and CERTIFICATIONS

Highlighted in ACS Energy Letters article “Celebrating Women in Electrochemical Sciences and Engineering (WIESE)”, ACS Energy Lett. 2022, 7, 2105–2112	6/2022
2019 Nature’s 5 Emerging Material Scientists	12/2019
MRS Postdoc Award	12/2019
Clean Energy Leadership Institute Fellow	3/2019-8/2019
NRC Postdoctoral Appointment	6/2017-8/2019
VINSE Graduate Fellowship	8/2016-5/2017
AVS Travel Grant	11/2016
Best Presentation NSF EPSCoR TN-Score	7/2015
Fundamentals of Engineering Exam	5/2013

JOURNAL PUBLICATIONS (Citations: 3862, h-index: 31, i10 index: 49)

57. Carter, R.; Love, C.T.; Using Thermal Energy to Enable Fast Charging of Energy-Dense Batteries. *Joule*, **2022**, 6, 2447-2547.
56. Lefler, M.J.; Yeom, J.; Rudolf, C.; **Carter, R.**; Love, C.T.; Structural and Morphological Analysis of the First Alloy/Dealloy of a Bulk Si-Li System at Elevated Temperature. *ACS Omega*, **2022**, 7, 26, 22317-22325.
55. DeBlock, R.; **Carter, R.**; Lefler, M.J.; Sassin, M.B.; Rolison, D.R.; Long, J.W.; Sodiation-Induced Electrochromism in Carbon Nanofoams-Paper Electrodes. *J Electrochem Soc.* 2022, 169, 6, 060514.
54. Klein, E.J.; **Carter, R.**; Love, C.T.; Accelerating Rate Calorimetry and Complementary Techniques to Characterize Battery Safety Hazards. *JoVE* **2019**, 175, e60342.
53. Guillamon, J.J.; Love, C.T.; **Carter, R.**; Yang, X.; Verma, A.; Electrolyte Conditions in Lithium-ion Batteries in Presence of a Thermal Gradient. *MRS Advances* **2021**, 6, 564-569.
52. **Carter, R.**; Kingston, T.A.; Atkinson, R.W.; Parmananda, M.; Dubarry, M.; Fear, C.; Mukherjee, P.P.; Love, C.T.; Directionality of Thermal Gradients in Li-ion Batteries Dictates Diverging Degradation Modes. *Cell Reports Physical Science* **2021**, 2, 100351
51. Fear, C.; Parmananda, M; Kabra, V.; **Carter, R.**; Love, C.T.; Mukherjee, P.P.; Mechanistic Underpinnings of Thermal Gradient Induced Inhomogeneity in Lithium Plating, *Energy Storage Mater.* **2021**, 35, 500-511.
50. **Carter, R.**; NewRingeisen, A.; Reed, D.; Atkinson, R.W.; Mukherjee, P.P.; Love, C.T.; Optical Microscopy Reveals the Ambient Sodium Sulfur Discharge Mechanism, *ACS Sustainable Chem. Eng.* **2021**, 9, 1, 92–100.

Rachel Carter, Ph.D.

49. Atkinson, R.W.; Kingston, T.A.; Klein, E.; NewRingeisen, A.; **Carter, R.**; Love, C.T.; Minimizing Lithium Deactivation during High-Rate Electroplating via Sub-Ambient Thermal Gradient Control, *Materials Today Energy*, **2020**, 18, 100538.
48. Fear, C.; Adhikary, T.; **Carter, R.**; Mistry, A.N; Love, C.T.; Mukherjee, P.P.; In-Operando Detection of the Onset and Mapping of Lithium Plating Regimes during Fast Charging of Lithium-ion Batteries. *ACS Appl. Mater. & Interfaces* **2020**, 12, 30438-30448
47. **Carter, R.**; Parker, J.F.; Sassin, M.B.; Klein, E.J.; Wolak, M.A.; Love, C.T.; Long, J.W.; Initiated Chemical Vapor Deposition of Ultrathin Polymers at Graphite Electrodes for Enhanced Performance in Li-ion Batteries. *J Electrochem. Soc.* **2020**, 167, 060510.
46. **Carter, R.**; Klien, E. K.; Kingston, T. A.; Love, C. T. Detection of Lithium Plating During Thermally Transient Charging of Li-ion Batteries, *Front. Energy Res.* **2019**, 7, 144. **Invited**
45. Atkinson, R. W.; **Carter, R.**; Love, C. T., Operational Strategy to Stabilize Lithium Metal Anodes by Applied Thermal Gradient, *Energy Storage Mater* **2019**, 22, 18-28.
44. **Carter, R.**; Klein, E. K.; Atkinson, R. W.; Love, C.T., Mechanical Collapse as Primary Degradation Mode in Mandrel-Free 18650 Li-ion cells Operated at 0 °C. *J Power Sources* **2019**, 437, 226820.
43. Moyer, K.; **Carter, R.**; Hanken, T.; Douglas, A.; Oakes, L.; Pint, C. L., Electrophoretic deposition of LiFePO₄ onto 3-D current collectors for high areal loading battery cathodes. *Materials Science and Engineering: B* **2019**, 241, 42-47.
42. Mistry, A.; Fear, C.; **Carter, R.**; Love, C. T.; Mukherjee, P. P., Electrolyte Confinement Alters Lithium Electrodeposition. *ACS Energy Letters* **2018**, 156-162.
41. **Carter, R.**; Love, C. T., Modulation of Lithium Plating in Li-Ion Batteries with External Thermal Gradient. *ACS Applied Materials & Interfaces* **2018**, 10 (31), 26328-26334.
40. A. Douglas, **R. Carter**, M. Li, and C.L. Pint, "Toward Small Diameter Carbon Nanotubes Synthesized from Captured Carbon Dioxide: Critical Role of Catalyst Coarsening" *ACS Applied Materials and Interfaces* 10, 19010-19018 (2018).
39. **R. Carter**, B. Huhman, C.T. Love, I.V. Zenyuk, "X-ray computed tomography comparison of individual and parallel assembled commercial lithium iron phosphate batteries at end of life after high rate cycling," *Journal of Power Sources*, 2018, 381, 46-55
38. **R. Carter**, B. Davis, L. Oakes, M. Maschmann, and C.L. Pint, "High Areal Capacity Lithium Sulfur Battery Cathode by Site-Selective Vapor Infiltration of Hierarchical Carbon Nanotube Arrays," *Nanoscale*, 2017,9, 15018–15026.
37. N. Muralidharan[^], M. Li[^], **R. Carter**, N. Galioto, and C.L. Pint, "Ultralow Frequency Electrochemical – Mechanical Strain Energy Harvester using 2D Black Phosphorus Nanosheets," *ACS Energy Letters* 2, 1797-1803 (2017).
36. A. Douglas, N. Muralidharan, **R. Carter**, and C.L. Pint, "Sustainable Capture and Conversion of Carbon Dioxide into Valuable Multi-Walled Carbon Nanotubes using Metal Scrap Materials," *ACS Sustainable Chemistry and Engineering*, 2017, 5 (8), pp 7104–7110
35. N. Muralidharan, C. Brock, A.P. Cohn, D. Schauben, **R. Carter**, L. Oakes, D.G. Walker, and C.L. Pint, "Tunable MechanoChemistry of Lithium Battery Electrodes," *ACS Nano* 11, 6243-6251 (2017).
34. M. Li, **R. Carter**, A. Douglas, L. Oakes, C.L. Pint, "Sulfur vapor-infiltrated 3-D carbon nanotube foam for binder-free high areal capacity composite lithium sulfur battery cathodes," *ACS Nano* 11, 4877-4884 (2017).

Rachel Carter, Ph.D.

33. **R. Carter**[^], L. Oakes[^], N. Muralidharan, and C.L. Pint, “Isothermal sulfur condensation into carbon scaffolds: Improved loading, performance, and scalability for lithium sulfur battery cathodes,” *Journal Physical Chemistry C*, 2017, *121* (14), pp 7718–7727
32. M. Li, **R. Carter**, L. Oakes, A. Douglas, N. Muralidharan, and C.L. Pint, “Role of carbon defects in the reversible alloying states of red phosphorus composite anodes for efficient sodium ion batteries,” *Journal of Materials Chemistry A*, 5, 5266-5272 (2017).
31. A. Douglas, **R. Carter**, N. Muralidharan, L. Oakes, and C.L. Pint, “Iron catalyzed growth of crystalline,” *Carbon*, 116, 572-578 (2017).
30. **R. Carter**, L. Oakes, N. Muralidharan, A.P. Cohn, A. Douglas, and C.L. Pint, “Polysulfide anchoring mechanism revealed by atomic layer deposition of V₂O₅ and sulfur filled carbon nanotubes for lithium-sulfur batteries,” *ACS Applied Materials and Interfaces*, 9, 7185-7192 (2017).
29. **R. Carter**, L. Oakes, A. Douglas, N. Muralidharan, A. Cohn, C. L. Pint, “A Sugar Derived Room Temperature Sodium Sulfur Battery with Long Term Cycling Stability,” *Nano Letters*, 17, 1863-1869 (2017)
28. A.P. Cohn, N. Muralidharan, **R. Carter**, K. Share, and C.L. Pint, “An anode-free sodium battery through in-situ plating of sodium metal,” *Nano Letters*, 17, 1296–1301 (2017).
27. N. Muralidharan[^], A.S. Westover[^], H. Sun, N. Galioto, **R. Carter**, A.P. Cohn, L. Oakes, and C.L. Pint, “From the junkyard to the power grid; Ambient processing of scrap metals into nanostructured electrodes for ultrafast rechargeable batteries,” *ACS Energy Letters*. *1*, 1034–1041 (2016).
26. L. Oakes, **R. Carter**, and C.L. Pint, “Nanoscale Defect Engineering of Lithium-Sulfur Battery Composite Cathodes for Improved Performance,” *Nanoscale* **8**, 19368-19375 (2016).
25. K. Share, A.P. Cohn, **R. Carter**, B. Rodgers, and C.L. Pint, “Role of nitrogen doped graphene for improved high capacity potassium ion battery anodes,” *ACS Nano* **10**, 9738-9744, (2016).
24. A.P. Cohn, N. Muralidharan, **R. Carter**, K. Share, L. Oakes, and C.L. Pint, “Durable potassium ion battery electrodes from high-rate cointercalation into graphitic carbons,” *Journal of Materials Chemistry A* **4**, 14954 – 14959 (2016).
23. **R. Carter**, D. EJORH, K. Share, A.P. Cohn, A. Douglas, N. Muralidharan, T. Tovar, and C.L. Pint, “Surface oxidized mesoporous carbons derived from porous silicon as dual polysulfide confinement and anchoring cathodes in lithium sulfur batteries,” *Journal of Power Sources* **330**, 70-77, (2016).
22. K. Share, A.P. Cohn, **R. Carter**, and C.L. Pint, “Mechanism of Electrochemical Potassium Ion Intercalation Staging in Few Layered Graphene from *In-Situ* Raman Spectroscopy,” *Nanoscale* **8**, 16435-16439 (2016).
21. M. Li, A. Westover, **R. Carter**, L. Oakes, N. Muralidharan, T. Boire, H-J. Sung, and C.L. Pint, “Noncovalent pi-pi stacking at the carbon-electrolyte interface; Controlling the voltage window of electrochemical supercapacitors.” *ACS Applied Materials and Interfaces* **8**, 19558-19566 (2016).
20. K. Share, **R. Carter**, P. Nikoleav, D. Hooper, L. Oakes, A.P. Cohn, R. Rao, A.A. Poretzky, D.B. Geohegan, B. Maruyama, and C.L. Pint, “Nanoscale silicon as a catalyst for graphene growth; Mechanistic insight from in-situ Raman Spectroscopy,” *Journal of Physical Chemistry C* **120**, 14180-14186 (2016).
19. N. Muralidharan, **R. Carter**, L. Oakes, A.P. Cohn, and C.L. Pint, “Strain engineering to modify the electrochemistry of energy storage electrodes,” *Scientific Reports* **6**, 27542 (2016).

Rachel Carter, Ph.D.

18. L. Oakes, **R. Carter**, T. Hanken, A.P. Cohn, K. Share, B. Schmidt, and C.L. Pint, "Interface strain in vertically stacked two-dimensional heterostructured carbon-MoS₂ nanosheets controls electrochemical reactivity," *Nature Communications* 7, 11796 (2016).
17. M. Li, **R. Carter**, A.P. Cohn, and C.L. Pint, "Interconnected foams of helical carbon nanofibers grown with ultrahigh yield for high capacity sodium ion battery anodes," *Carbon* 107, 109-115 (2016).
16. T. Metke[^], A.S. Westover[^], **R. Carter**, L. Oakes, A. Douglas, and C.L. Pint, "Particulate-free porous silicon networks for efficient capacitive deionization water desalination," *Scientific Reports* 6, 24680 (2016).
15. A. Douglas[^], N. Muralidharan[^], **R. Carter**, K. Share, and C.L. Pint, "Ultrafast triggered transient energy storage by atomic layer deposition into porous silicon for integrated transient electronics," *Nanoscale* 8, 7384-7390 (2016).
14. S. Licht, A. Douglas, J. Ren, **R. Carter**, M. Lefler, and C.L. Pint, "Carbon nanotubes produced from ambient carbon dioxide for environmentally sustainable lithium-ion and sodium-ion battery anodes," *ACS Central Science* 2, 162-168 (2016).
13. A.P. Cohn, K. Share, **R. Carter**, L. Oakes, and C.L. Pint, "Ultrafast solvent-assisted sodium ion intercalation into highly crystalline few-layered graphene," *Nano Letters* 16, 543-548 (2016).
12. K. Share, J. Lewis, L. Oakes, **R. Carter**, A.P. Cohn, and C.L. Pint, "Tungsten Diselenide (WSe₂) as a high capacity, low overpotential conversion electrode for sodium ion batteries," *RSC Advances* 5, 101262-101267 (2015).
11. A. Douglas, **R. Carter**, L. Oakes, K. Share, A.P. Cohn, and C.L. Pint, "Ultrafine iron pyrite (FeS₂) nanocrystals improve sodium-sulfur and lithium-sulfur conversion reactions for efficient batteries," *ACS Nano* 9, 11156-11165 (2015).
10. **R. Carter**, S. Chatterjee, E. Gordon, K. Share, W.R. Erwin, A.P. Cohn, R. Bardhan, and C.L. Pint, "Corrosion resistant three-dimensional nanotextured silicon for water photo-oxidation," *Nanoscale* 7, 16755-16762 (2015).
9. L. Oakes, D. Zukifli, H. Azmi, K. Share, T. Hanken, **R. Carter**, and C.L. Pint, "One Batch Exfoliation and Assembly of Two-Dimensional Transition Metal Dichalcogenide Nanosheets using Electrophoretic Deposition," *Journal of the Electrochemical Society* 162, D3063-D3070 (2015). (*JES Special Focus Issue on Electrophoretic Deposition*)
8. L. Oakes, T. Hanken, **R. Carter**, W. Yates, and C.L. Pint, "Roll-to-roll nanomanufacturing of hybrid nanostructures for energy storage device design," *ACS Applied Materials and Interfaces* 7, 14201-14210 (2015).
7. A.P. Cohn[^], W.R. Erwin[^], K. Share, L. Oakes, A.S. Westover, **R. Carter**, R. Bardhan, and C.L. Pint, "All silicon electrode photo-capacitor for integrated energy storage and conversion," *Nano Letters* 15, 2727-2731, (2015).
6. A.S. Westover, D. Freudiger, Z.S. Gani, K. Share, L. Oakes, **R. Carter**, and C.L. Pint, "On-chip high power porous silicon lithium ion batteries with stable capacity over 10,000 cycles," *Nanoscale* 7, 98-103, (2015).
5. **R. Carter**, L. Oakes, A. Cohn, J. Holzgrafe, H.F. Zarick, S. Chatterjee, R. Bardhan, and C.L. Pint, "Solution assembled single walled carbon nanotube foams; Superior performance in supercapacitors, lithium ion, and lithium air batteries," *Journal of Physical Chemistry C* 118, 20137-20151 (2014).
4. A.S. Westover, K. Share, **R. Carter**, A.P. Cohn, L. Oakes, and C.L. Pint, "Direct integration of a supercapacitor into the backside of a silicon photovoltaic device," *Applied Physics Letters* 104, 213905 (2014).

Rachel Carter, Ph.D.

3. S. Chatterjee, **R. Carter**, L. Oakes, W.R. Erwin, R. Bardhan, and C.L. Pint, “Electrochemical and corrosion stability of nanostructured silicon by graphene coatings; Toward high power porous silicon supercapacitors,” *Journal of Physical Chemistry C*, 118, 10893-10902 (2014).
2. A.S. Westover, F.N. Shabab, J. Tian, S. Bernath, L. Oakes, W.R. Erwin, **R. Carter**, R. Bardhan, and C.L. Pint, “Stretching ion conducting polymer electrolytes; in-situ correlation of mechanical, ionic transport, and optical properties,” *Journal of the Electrochemical Society* 161, E112 – E117 (2014).
1. A.P. Cohn, L. Oakes, **R. Carter**, S. Chatterjee, A. Westover, K. Share, and C.L. Pint, “Assessing the improved performance of freestanding, flexible graphene and carbon nanotube hybrid foams for lithium-ion battery anodes,” *Nanoscale* 6, 4669-4675 (2014).

^ denotes equal contributing first author.

CONFERENCE PRECEEDINGS

3. **R. Carter**, J.W. Long, J.F. Parker, M.B. Sassin, C.T. Love “Ultrathin Polymer Coatings to Improve Electrode Stability under Abusive Conditions,” 2018 Power Sources Conference Proceedings, 23-4.
2. A. S. Westover, D. Freudiger, Z. Gani, K. Share, L. Oakes, **R. Carter**, C.L. Pint, "On-chip high-power porous silicon lithium ion batteries with stable capacity over 10000 cycles (Presentation Recording)", *Proc. SPIE 9552, Carbon Nanotubes, Graphene, and Emerging 2D Materials for Electronic and Photonic Devices VIII*, 95520E (5 October 2015)
1. **R. Carter**, L. Oakes, and C.L. Pint, “Three-dimensional single-walled carbon nanotube foams for ultrahigh energy density lithium-air battery cathodes,” *Proceedings of the ASME 2015 International Mechanical Engineering Congress and Exposition*, Paper No. IMECE2015-52333, pp. V06AT07A042. (2015).

PATENTS

- Powell, B.; Dixon, M.R.; Maxwell, J.R.; **Carter, R.E.**; Method and System for Detecting, Activating, and Cooling Runaway Batteries with Carbon Dioxide Three-Phase Impinging Jets. Application Number 210791-W01.
- Powell, B.; Dixon, M.R.; Maxwell, J.R.; **Carter, R.E.**; Two Phase Exothermic Quenching. Provisional. Application Number 113298.
- Love, C.T.; **Carter, R.** Battery Internal Short Circuit Trigger and Improved Performance Method, *Pending*. US20200014079A1
- Pint, C. L.; **Carter, R.**; Oakes, L. Composite Materials and Methods of Making Thereof, *Provisional*. Application Number 6235605

SELECTED PRESENTATIONS

CMU Battery Modeling Webinar Series

6/2022

Carter, R.; Atkinson, R.W.; Kingston, T.A.; Klein, E.; Paramanada, M.; Fear, C.; Mukherjee, P.; Dubarry, M.; Love, C.T. “Interactions Between Temperature and Battery Performance”
Invited.

Rachel Carter, Ph.D.

Tennessee Tech University Mechanical Engineering Seminar

3/2022

Carter, R.; Lefler, M.J.; Sarkar, S.; Atkinson, R.W.; Kingston, T.A.; Klein, E.; Parmanada, M.; Fear, C.; Mukherjee, P.; Dubarry, M.; Love, C.T.; "Interactions Between Temperature and Battery Performance and Enabling Sodium Sulfur Batteries." *Invited*

Purdue University ECS Student Chapter

2/2022

Carter, R.; Reed, D.; Sarkar, S.; NewRingeisen, A.; Lefler, M.; Mukherjee, P.; Love, C.T.; "Enabling Ambient Sodium-Sulfur Batteries." *Invited*

UL Battery Safety Science Symposium

8/2021

Carter, R.; Atkinson, R.W.; Kingston, T.A.; Klein, E.; Parmanada, M.; Fear, C.; Mukherjee, P.; Dubarry, M.; Love, C.T.; "Electrode Specific Degradation Tailored by the Directionality of Thermal Gradients in Li-ion Batteries"

Interagency Advanced Power Group (IAPG) Chemical Working Group (CWG) Safety Panel Meeting, Virtual

2/2021

Carter, R.; Powell, B.; Dixon, R.; Khrustalev, D. "Targeted Two Phase Exothermic Quenching (TPEQ) Spray to Prevent Thermal Runaway of 18650 Li-ion Cells"

66th AVS International Symposium Columbus, OH

10/2019

Carter, R.; Love, C. T.; Atkinson, R. W.; "Enabling High Cycle Life Alkali Metal Anodes through Imposed Thermal Gradients," *Invited.*

235th ECS Meeting, Dallas, TX

5/2019

R. Carter, E. Klein, R. Atkinson, Corey T. Love, "Influence of Cell Design Features on Low Temperature Cycling Performance and Safety Assessed with Accelerated Rate Calorimetry and Micro X-ray Computed Tomography" *Invited.*

Gordon Research Conference- Batteries, Ventura, CA

2/2018

R. Carter, E. Klein, C.T. Love, "Study of Lithium Dendritic Electrodeposition under Thermal Gradients Using Electrochemical Impedance Spectroscopy and *In-Situ* Optical Microscopy" *Invited*

Interagency Advanced Power Group (IAPG) Chemical Working Group (CWG) Safety Panel Meeting- Key West, FL

2/2018

R. Carter, B. Huhman, I. Zenyuk, C.T. Love, "X-ray micro CT Comparison of Individual and Parallel Assembled LFP 26650s at End of Life after High Rate Cycling"

NSF TN-Score, Nashville, TN

6/2015

R. Carter, N. Muralidharan, M. Durstock, B. Maruyama, B. Schmidt, A.P. Cohn, C.L. Pint, "Core/Shell Ni/Ni(OH)₂ Foam for a Highly Effective Pseudocapacitor Electrode" *Best Presentation Award*

Rachel Carter, Ph.D.

TEACHING EXPERIENCE

Teaching Assistant- Vanderbilt University **8/2013-12/2014**

Modern Manufacturing, Fall 2013

Senior Design- Capstone, Spring 2014

Thermodynamics, Fall 2014

Presented lectures for various class sizes, held exam preparation sessions and bi-weekly office hours, completed grading requirements. Assisting student teams with capstone projects.

Counselor- PAVE Program, Vanderbilt University **5/2009-8/2010**

Co-Coordinator of Vector Mechanics Team, Summer 2010

International Student Ambassador, Summer 2009

Held team staff meetings to orchestrate lectures and grading; presented lectures to a class of 50 each day; conducted lab report writing and exam help sessions; promoted interest in STEM degrees and an inclusive cultural environment.

LEADERSHIP AND OUTREACH

Seminar Working Group, NRL Inclusion and Diversity Council **6/2020-Present**

Georgetown Energy and Cleantech Club Panelist **4/2020**

“CELI’s Careers in Clean Energy Panel and Networking Event”

Partnership of Women across the Naval Research Enterprise Committee Member **3/2018-Present**

Women in Science and Engineering Professional Development Panel Chair **9/2017-Present**

Women in Science and Engineering NRL chapter, plan and orchestrate Professional Development panel for lab-wide event.

Postdoctoral Network Coordinator **6/2017-8/2019**

Coordinate professional development and social events.

VINSE Student Selected Seminar Committee **2017**

Judge of Vanderbilt 3rd Annual Undergraduate Research Fair **9/2016**

Graduate Student Representative on ME Faculty Selection Committee **8/2015-12/2015**

STEM Outreach Vanderbilt, VINSE **5/2013-5/2017**

Leads under-privileged high school science students through fabrication of solar cells and teaches fundamentals of renewable energy.

Vanderbilt University Cheerleading **8/2009-5/2010**