

Lauren Whitney Taylor

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Education

- Rice University**, Houston, TX Aug. 2021
Ph.D. in Chemical and Biomolecular Engineering
Thesis: *Carbon Nanotube Characterization and Processing-Structure-Property Relationships of Solution Spun Fibers for Electronic Clothing*
- Cornell University**, Ithaca, NY May 2014
B.S. in Chemical and Biomolecular Engineering

Research Experience

- Princeton University | Princeton Materials Institute** Princeton, NJ
Princeton Center for Complex Materials (PCCM) Postdoctoral Fellow Aug. 2021 – Present
Advisors: Dr. Richard Register and Dr. Rodney Priestley
- Synthesizing sequence-controlled polymers through anionic polymerization and characterizing phase behavior in solution and bulk polymer dynamics
 - Leads monthly group meetings between graduate students and postdocs funded by Princeton's Materials Research Science and Engineering Center (MRSEC)
 - Register group safety officer
- Rice University | Chemical and Biomolecular Engineering** Houston, TX
National Defense Science and Engineering Graduate Fellow Aug. 2014 – Jul. 2021
Advisor: Dr. Matteo Pasquali
- Optimized carbon nanotube purification and fiber spinning parameters for lightweight wiring and cables
 - Developed soft and flexible electrocardiogram electrodes for continuous heart monitoring
- Cornell University | Materials Science and Engineering** Ithaca, NY
Semiconductor Research Corporation Undergraduate Research Fellow May 2012 – May 2014
Advisor: Dr. R. Bruce van Dover
- Studied bismuth-based electrolyte materials for solid oxide fuel cells
 - Fabricated silicon wafers with silicon nitride membranes for obtaining X-ray absorption spectra of thin films
- Colorado School of Mines | Chemistry** Golden, CO
Research Experiences for Undergraduates (REU) Student May 2013 – Aug. 2013
Advisor: Dr. Yongan Yang
- Researched lithium silicide and lithium germanide encapsulated carbon nanofibers for use as anode materials in lithium ion batteries

Publications

22. **L. W. Taylor**, R. D. Priestley, R. A. Register, Control of Solution Phase Behavior through Block-Random Copolymer Sequence, *Macromolecules*, *Accepted*, 2024.
21. **L. W. Taylor**, O. S. Dewey, E. G. Biggers, and M. Pasquali, Purification of Carbon Nanotubes for Solution Processing in Chlorosulfonic Acid, *In Revision*.
20. R.J. Headrick, S. M. Williams, C. E. Owens, **L. W. Taylor**, O. S. Dewey, C. J. Ginestra, L. Liberman, A. M. Ya'akobi, Y. Talmon, B. Maruyama, G. H. McKinley, A. J. Hart, and M. Pasquali, Versatile Acid Solvents for Pristine Carbon Nanotube Assembly, *Science Advances*, 8, eabm3285, 2022.

19. D. Lee, S. G. Kim, S. Hong, C. Madrona, Y. Oh, M. Park, N. Komatsu, **L. W. Taylor**, B. Chung, J. Kim, J. Y. Hwang, J. Yu, D. S. Lee, H. S. Jeong, N. H. You, N. D. Kim, D. Kim, H. S. Lee, K. Lee, J. Kono, G. Wehmeyer, M. Pasquali, J. J. Vilatela, S. Ryu, and B. Ku, Ultrahigh Strength, Modulus, and Conductivity of Graphitic Fibers by Macromolecular Coalescence, *Science Advances*, 8, eabn0939, 2022.
18. A. Dominguez-Alfaro, N. D. Q. Chau, S. Yan, D. Mancino, S. Pamulapati, S. Williams, **L.W. Taylor**, O.S. Dewey, M. Pasquali, M. Prato, and A. Bianco, A. Criado, Electrochemical Modification of Carbon Nanotube Fibres, *Nanoscale*, 14, 9313-9322, 2022.
17. **L. W. Taylor**, S. M. Williams, J. S. Yan, O. S. Dewey, F. Vitale, and M. Pasquali, Washable, Sewable, All-Carbon Electrodes and Signal Wires for Electronic Clothing, *Nano Letters*, 21, 7093-7099, 2021.
16. N. Komatsu, Y. Ichinose, O. S. Dewey, **L. W. Taylor**, M. Trafford, Y. Yomogida, G. Wehmeyer, M. Pasquali, K. Yanagi, J. Kono, Macroscopic weavable fibers of carbon nanotubes with giant thermoelectric power factor, *Nature Communications*, 12, 4931, 2021.
15. J. S. Yan, F. Vitale, M. Orecchioni, J. A. Coco, G. Duret, S. Antonucci, S. Sri Pamulapati, **L. W. Taylor**, O. S. Dewey, M. Di Sante, A. M. Segura, K. Ley, F. Di Lisa, M. D. McCauley, J. T. Robinson, M. Razavi, L. G. Delogu, Matteo Pasquali, Macroscopic Fibers Made from Carbon Nanotubes are Bio- and Immunocompatible: Implications for Carbon Nanotube Macrostructures in Biomedical Applications, *Carbon*, 173, 462-476, 2021.
14. **L. W. Taylor***, O. S. Dewey*, R. J. Headrick, N. Komatsu, N. Marquez Peraca, G. Wehmeyer, J. Kono, M. Pasquali, Improved Properties, Increased Production, and the Path to Broad Adoption of Carbon Nanotube Fibers, *Carbon*, 171, 689-694, 2021.
13. S. Rousselot, P. Antitomaso, L. Savignac, S. Génèreux, **L. W. Taylor**, T. Bibienne, M. Pasquali, S. Schougaard, M. Dolle, PEDOT Assisted CNT Self-Supported Electrodes for High Energy and Power Density, *Electrochimica Acta*, 349, 1364182, 2020.
12. V. Jamali, F. Niroui, **L. W. Taylor**, O. S. Dewey, B. Koscher, M. Pasquali, A. P. Alivisatos, Perovskite-Carbon Nanotube Light Emitting Fibers, *Nano Letters*, 20, 3178-3184, 2020.
11. W. Gao, N. Komatsu, **L. W. Taylor**, G. Naik, K. Yanagi, M. Pasquali, J. Kono, Macroscopically aligned carbon nanotubes for flexible and high-temperature electronics, optoelectronics, and thermoelectrics, *Journal of Applied Physics D: Applied Physics*, 56, 063001, 2019.
10. O. S. Dewey, R. J. Headrick, **L. W. Taylor**, M. Pasquali, G. Prestopino, G. V. Rinati, M. Lucci, M. Cirillo, Transport and photo-conduction in carbon nanotube fibers, *Applied Physics Letters*, 112, 023101, 2019.
9. W. Xie, R. Zhang, R. J. Headrick, **L. W. Taylor**, S. Kooi, M. Pasquali, S. Müftü, J. Lee, Dynamic strengthening of carbon nanotube fibers under extreme mechanical impulses, *Nano Letters*, 19, 3519-3526, 2019.
8. R. J. Headrick, M. A. Trafford, **L. W. Taylor**, O. S. Dewey, R. A. Wincheski, M. Pasquali, Electrical and acoustic vibroscopic measurements for determining carbon nanotube fiber linear density, *Carbon*, 144, 417-422, 2019.
7. E. A. Bengio, D. Senic, **L. W. Taylor**, R. J. Headrick, M. King, P. Chen, C. A. Little, J. Ladbury, C. J. Long, C. L. Holloway, A. Babakhani, J. C. Booth, N. Orloff, M. Pasquali, Carbon nanotube thin film patch antennas for wireless communications, *Applied Physics Letters*, 114, 203102, 2019.
6. S. Yubuchi, W. Nakamura, T. Bibienne, S. Rousselot, **L. W. Taylor**, M. Pasquali, M. Dollé, A. Sakuda, A. Hayashi, M. Tatsumisago, All-solid-state cells with $\text{Li}_4\text{Ti}_5\text{O}_{12}$ /carbon nanotube composite electrodes prepared by infiltration with argyrodite sulfide-based solid electrolytes via liquid-phase processing, *Journal of Power Sources*, 417, 125-131, 2019.

5. M. Adnan, R. A Pinnick, Z. Tang, **L. W Taylor**, S. S. Pamulapati, G. R. Carfagni, M. Pasquali, Bending behavior of CNT fibers and their scaling laws, *Soft Matter*, 14, 8284-8292, 2018.
4. E.A. Bengio, D. Senic, **L. W. Taylor**, D.E. Tsentalovich, P. Chen, C. L. Holloway, A. Babakhani, C. J. Long, D. R. Novotny, C. J. Booth, N. D. Orloff, M. Pasquali, High efficiency carbon nanotube thread antennas, *Applied Physics Letters*, 111, 163109, 2017.
3. T. Bibienne, L. Maillaud, S. Rousselot, **L. W. Taylor**, M. Pasquali, M. Dollé, Eco-friendly process toward collector-and binder-free, high-energy density electrodes for lithium-ion batteries, *Journal of Solid State Electrochemistry*, 21, 1407-1416, 2016.
2. J. E. Cloud, Y. Wang, T. S. Yoder, **L. W. Taylor**, Y. Yang, Colloidal nanocrystals of lithiated group 14 elements, *Angewandte Chemie*, 53, 14527-14532, 2014.
1. J. E. Cloud, **L. W. Taylor**, Y. Yang, A simple and effective method for controllable synthesis of silver and silver oxide nanocrystals. *RSC Advances*, 4, 24551-24559, 2014.

Presentations

28. Engineering Materials Across Length Scales: Advanced Materials for Thermoresponsive Polymers and Wearable Electronics, FAMU-FSU College of Engineering, Tallahassee, FL January 2024 (Oral, Invited)
27. Modifying Glass Transition Temperature through Block-Random Copolymer Sequence, *2023 AIChE Annual Meeting*, Orlando, FL November 2023 (Oral)
26. Modulating Solution Phase Behavior through Block-Random Copolymer Sequence, *2023 AIChE Annual Meeting*, Orlando, FL November 2023 (Oral)
25. Engineering Hierarchical Materials for Structural Composites and Advanced Textiles, *2023 AIChE Annual Meeting*, Orlando, FL November 2023 (Poster)
24. Modifying Glass Transition Temperature through Block-Random Copolymer Sequence, *9th International Discussion Meeting on Relaxations in Complex Systems*, Chiba, Japan, August 2023 (Poster)
23. Modulating Solution Phase Behavior through Block-Random Copolymer Sequence, *Princeton Materials Institute Symposium 2023*, Princeton, NJ, April 2023 (Poster)
22. Modulating Solution Phase Behavior through Block-Random Copolymer Sequence, APS March Meeting, Las Vegas, NV, March 2023 (Oral)
21. Effect of Changes in Monomer Sequence on Polymer Phase Behavior, *2022 AIChE Annual Meeting*, Phoenix, AZ, November 2022 (Oral)
20. Effect of Changes in Monomer Sequence on Polymer Phase Behavior, *ACS Middle Atlantic Regional Meeting*, Ewing, NJ, June 2022 (Oral)
19. Converting Hydrocarbons to Recyclable Materials for Metal Replacement with Positive Hydrogen Output, *12th ARPA-E Energy Innovation Summit*, Denver, CO, May 2022 (Poster)
18. Effect of Changes in Monomer Sequence on Polymer Phase Behavior, *Soft Materials Coffee Hour*, Princeton, NJ, April 2022 (Oral, Invited)
17. Effect of Changes in Monomer Sequence on Polymer Phase Behavior, *Princeton Institute of Materials Symposium 2022*, Princeton, NJ, April 2022 (Poster)
Best Poster Award
16. Washable ECG Electrodes from Sewn High Performance Carbon Nanotube Fibers, *MRS Fall Meeting*, Boston, MA, December 2019 (Oral)

15. Understanding the Effect of Solution Spinning Processing Parameters on the Structure and Properties of Carbon Nanotube Fiber, *MRS Fall Meeting*, Boston, MA, November 2019 (Poster)
14. Understanding the Effect of Solution Spinning Processing Parameters on the Structure and Properties of Carbon Nanotube Fiber, *2019 AIChE Annual Meeting*, Orlando, FL, November 2019 (Oral)
13. Understanding the Effect of Solution Spinning Processing Parameters on the Structure and Properties of Carbon Nanotube Fiber, *Carbon 2019*, Lexington, KY, July 2019 (Oral, Keynote Address)
C-Journal of Carbon Research Young Scholar Award
12. Washable ECG Electrodes from Sewn High Performance Carbon Nanotube Fibers, *Carbon Fibers & Composites Workshop*, Oak Ridge, TN, July 2019 (Oral)
11. The Importance of Classical Soft Matter Physics in the Development of New Nanomaterials, *Monash University Distinguished Seminar*, Clayton, Australia, February 2019 (Oral)
10. The Importance of Classical Soft Matter Physics in the Development of New Nanomaterials, *Australian Colloid and Interface Conference*, Hobart, Australia, February 2019 (Oral, Keynote Address)
9. Tuning Process Parameters to Optimize Carbon Nanotube Fibers for High Performance Conductors, *The Society of Rheology 90th Annual Meeting*, Houston, TX, October 2018 (Oral)
8. High Performance Carbon Nanotube Fibers for Ultra High-Strength Materials, *Defense Advanced Research Projects Agency Rapunzel Materials Science Workshop*, Arlington, VA, September 2018 (Oral)
7. Solution Spun MnO₂ Doped Carbon Nanotube Fibers for Sewable Supercapacitors, *Carbon 2018*, Madrid, Spain, July 2018 (Oral)
6. Washable ECG Electrodes from Sewn High Performance Carbon Nanotube Fibers, *International Workshop on Multi-Functional Nanocarbon Fibers*, Madrid, Spain, June 2018 (Oral)
5. Carbon Nanotubes are the New Black: Mending the Gap Between Metals and Soft Materials, *Technology Collaboration Center Wearable Technologies Workshop*, NASA Johnson Space Center, Houston, TX, April 2018 (Oral)
4. Solution Spun MnO₂ Doped Carbon Nanotube Fibers for Sewable Supercapacitors, *Smalley-Curl Institute Transdisciplinary Symposium*, Houston, Texas, February 2018 (Oral)
3. MnO₂ doped Carbon Nanotube Fibers for Sewable Supercapacitors, *Texas Soft Matter*, Houston, Texas, August 2017 (Oral)
2. Bismuth-Based Oxygen Ion Conductors for Micro Fuel Cells, *Engineering Learning Initiatives Poster Session*, Ithaca, NY, April 2014 (Poster)
1. Electrospinning Lithium Silicide and Lithium Germanide Encapsulated Carbon Nanofibers for Lithium Ion Batteries, *Research Experience for Undergraduates Symposium*, Golden, CO, August 2013 (Poster)

Fellowships & Awards

2023 Dale Grieb Safety Award Princeton University School of Engineering and Applied Science	Dec. 2023
2023 Women in Chemical Engineering Travel Award Women in Chemical Engineering, an AIChE Community	Oct. 2023
2022 Carbon Journal Prize Elsevier	Jul. 2022

Soft Matter Future Faculty Workshop Attendee 2022 University of Delaware	Jun. 2022
Best Poster Award Princeton Institute of Materials Symposium 2022	Apr. 2022
11th Highest Altmetric Score of All Time in <i>Nano Letters</i> Washable, Sewable, All-Carbon Electrodes and Signal Wires for Electronic Clothing	Aug. 2021
Princeton Center for Complex Materials Postdoctoral Fellowship Princeton Institute for the Science and Technology of Materials, Princeton University	Aug. 2021
International Fiber Journal Student Spotlight International Fiber Journal, Issue 3 of 2021	Apr. 2021
Rising Star in Chemical Engineering Department of Chemical Engineering, Massachusetts Institute of Technology	Oct. 2019
Rice University School of Engineering Future Faculty Fellow Dean of Engineering, Rice University	Aug. 2019
C-Journal of Carbon Research Young Scholar Award C — Journal of Carbon Research Journal, MDPI	Jul. 2019
Riki Kobayashi Award: Best Thesis Proposal – Honorable Mention Department of Chemical and Biomolecular Engineering, Rice University	Feb. 2017
National Defense Science and Engineering Graduate Fellow American Society for Engineering Education	Aug. 2015
Best Teaching Assistant CHBE 403 and CHBE 404 Department of Chemical and Biomolecular Engineering, Rice University	May 2015
Interdisciplinary Research in Science and Engineering Fellow Rice University School of Engineering	May 2014
ChemE Car 2012 National Champion and Most Consistent Car 2012 AIChE National Student Conference	Sep. 2012
Semiconductor Research Corporation Undergraduate Research Fellow Intel Corporation	Aug. 2012

Leadership & Service

Carbon Journal Extended Advisory Board Member <i>Elsevier</i>	Mar. 2023 - Present
Women in CBE <i>Department of Chemical and Biological Engineering, Princeton University</i> <ul style="list-style-type: none"> • Founder and committee chair • Develops programming to promote community and leadership skills 	Dec. 2022 – Present
Poster Judge <i>2022 AIChE Annual Meeting, Princeton Graduate Student Symposium, 2023 AIChE Annual Meeting</i>	Nov. 2022 – Present
Diversity, Equity, Climate, and Inclusion Committee Member <i>Department of Chemical and Biological Engineering, Princeton University</i> <ul style="list-style-type: none"> • Addressed concerns about department climate and inclusion • Organized DECI Seminars and inclusion events 	Dec. 2021 – Jul. 2023
Peer Reviewer <i>ACS Applied Nanomaterials, ACS Nano, Sensors, and NSF</i>	Feb. 2021 – Present
Session Chair <i>ACS Middle Atlantic Regional Meeting, Australian Colloid and Interface Conference</i>	Feb. 2019 – Present

ARES G2 Rheometer Equipment Manager

May 2016 – July 2021

Shared Equipment Authority, Rice University

- Trained new users on the instrument and developed experimental procedures specific to the sample of interest
- Maintained and calibrated the instrument

Leadership Development Training

Nov. 2016 – Apr. 2017

Doerr Institute for New Leaders, Rice University

- Received individualized training by a professional leadership coach over the course of a semester
- Developed understanding of my emotional intelligence and how to use my strengths to be an effective leader and mentor

CHBE Graduate Student Association

May 2015 – May 2017

*Department of Chemical and Biomolecular Engineering, Rice University**President, May 2016 – May 2017*

- Liaised between the ChBE graduate students and the faculty and staff
- Oversaw meetings and executive board members to ensure that the GSA supported graduate student professional, personal and social development

Mentoring Chair, May 2015 – May 2016

- Instituted and developed the mentoring program for ChBE graduate students

Mentoring & Outreach**Princeton University Laboratory Learning Program Mentor***Caroline Gu, Princeton High School Student*

2022

Graduate Student Research Mentor*Samantha Fowler, Rice University Undergraduate Student*

2021

Raidah Ahmed, Rice University Undergraduate Student

2021

Katherine Gehring, Rice University Undergraduate Student

2020

Elain Yao, Science Academy of South Texas High School Student

2019

David Zhao, Rice University Undergraduate Student

2018

Jamie Mana-ay, Research Experience for Community College Student

2017

Karla Rosas, Research Experience for Teachers

2016

Tammy Hendrix-Doucette, Research Experience for Community College Student

2015

Scouts 'n Science Graduate Student Mentor*Department of Chemistry, Rice University*

2017 – 2020

K-12 Science Outreach

2013 – Present

*Ithaca Science Center, Museum of the Earth, Society of Rheology**Outreach Day, Día de la Ciencia, Spring into Science***Teaching Experience****Department of Chemical and Biomolecular Engineering, Rice University, Houston, TX***Graduate Teaching Assistant*

Rheology (CHBE 603)

Spring 2016

Numerical Methods for Differential Equations in Engineering and Biology (CHBE 692)

Fall 2015

Chemical Engineering Design (CHBE 404)

Spring 2015

Design Fundamentals (CHBE 403)

Fall 2014

Department of Chemical and Biomolecular Engineering, Cornell University, Ithaca, NY

Undergraduate Teaching Assistant

Chemical Kinetics and Reactor Design (CHEME 3900)

Introduction to Chemical Engineering (ENGRI 1120)

Spring 2014

Fall 2013

Selected Media Coverage

Materials Today: *Carbon nanotubes benefit from a gentle separation* (5/4/2022)

Physics World: *Textile clinic: stretchable fabrics tailored with carbon nanotube electrodes monitor the heart* (10/1/2021)

CNN Business: *This new material could measure your heart rate through your shirt* (9/3/2021)

Phys.org: *Woven nanotube fibers turn heat into power* (08/16/2021)

Phys.org: *Team makes case for high-performance carbon nanotube fibers for industry* (08/17/2020)

Materials Today: *Carbon nanotube films trump copper as antenna material* (06/25/2019)

Eureka Alert: *Nanotube fiber antennas as capable as copper* (10/23/2017)