John A. Lewis

Materials Science Ph.D. Candidate · Georgia Institute of Technology

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Education

Trinity University — San Antonio, TX

B.S. in Engineering Science, Summa Cum Laude — Aug. 2013 - May 2017

- Overall GPA - 3.90/4.00
- Secondary major in Physics and a minor in Mathematics

Georgia Institute of Technology — Atlanta, GA

Ph.D Candidate in Materials Science and Engineering — June 2017 - Present

- Overall GPA - 4.00/4.00

Research Experience

Georgia Institute of Technology — Atlanta, GA

Ph.D. Candidate - School of Materials Science and Eng. — June 2017 - Present

PI: Matthew McDowell

- Design and characterization of solid-state batteries, with an emphasis on understanding the relationship between chemistry and mechanics ("chemo-mechanics") in these systems.

Trinity University — San Antonio, TX

Undergraduate Researcher - Department of Engineering Science — Fall 2015 - Spring 2017

PI: Dany Munoz Pinto

- Investigated empirical models for the size of hydrogel networks and developed corrections to current correlations that can be used to predict the diffusion of molecules in the network.

Boise State University — Boise, ID

Undergraduate Researcher - Micron School of Materials Science and Eng. — May 2016 - July 2016

PI: Claire (Hui) Xiong

- Analyzed the effects of water concentration and additives on electrolyte degradation in sodium-ion batteries using electrochemical techniques and NMR spectroscopy.

Vanderbilt University — Nashville, TN

Undergraduate Researcher - Department of Mechanical Engineering — May 2015 - July 2015

PI: Cary Pint

- Studied bulk and nanostructured transition metal dichalcogenides as anodes for sodium-ion batteries.

Publications

- **7.** Francisco Javier Quintero Cortes, **John A. Lewis**, Jared Tippens, Thomas S Marchese, Matthew T. McDowell, How metallic protection layers extend the lifetime of NASICON-based solid-state lithium batteries, **Journal of The Electrochemical Society (2019)**
- **6. John A. Lewis**, Jared Tippens, Francisco Javier Quintero Cortes, Matthew T. McDowell, Chemo-mechanical challenges in solid-state batteries, **Trends in Chemistry (2019)**
- **5.** Jared Tippens, John C. Miers, Arman Afshar, **John A. Lewis**, Francisco Javier Quintero Cortes, Haipeng Qiao, Thomas S. Marchese, Claudio V. Di LeoChristopher Saldana, Matthew T. McDowell, Visualizing chemomechanical degradation of a solid-state battery electrolyte, **ACS Energy Letters (2019)**
- **4. John A. Lewis**, Francisco Javier Quintero Cortes, Matthew G. Boebinger, Jared Tippens, Thomas S. Marchese, Neha Kondekar, Xiaoming Liu, Miaofang Chi, Matthew T. McDowell, Interphase morphology between a solid-state electrolyte and lithium controls cell failure, **ACS Energy Letters (2019)**

- **3.** Matthew G. Boebinger, David Yeh, Michael Xu, B. Casey Miles, Baolin Wang, Marc Papakyriakou, **John A. Lewis**, Neha P. Kondekar, Francisco Javier Quintero Cortes, Sooyeon Hwang, Xiahan Sang, Dong Su, Raymond R. Unocic, Shuman Xia, Ting Zhu, Matthew T. McDowell, Avoiding fracture in a conversion battery material through reaction with larger ions, **Joule (2018)**
- **2.** Andrea C. Jimenez-Vergara, **John A. Lewis**, Mariah S. Hahn, Dany J. Munoz-Pinto, An improved correlation to predict molecular weight between crosslinks based on equilibrium degree of swelling of hydrogel networks, **Journal of Biomedical Materials Research Part B (2017)**
- **1.** Keith Share, **John A. Lewis**, Landon Oakes, Rachel E. Carter, Adam P. Cohn, and Cary L. Pint, Tungsten Diselenide as a high capacity, low overpotential conversion electrode for sodium ion batteries, **RSC Advances (2015)**

Conferences

- **John A. Lewis**, Jared Tippens, Francisco Cortes, Matthew McDowell, Characterizing chemo-mechanical degradation at solid-state battery interfaces, **Materials Research Society Fall Meeting (2019)**
- **John A. Lewis**, Francisco Javier Quintero Cortes, Jared Tippens, Matthew Boebinger, Thomas Marchese, Neha Kondekar, Matthew McDowell, Interphase morphology between a solid-state electrolyte and lithium controls cell failure, **236th Electrochemical Society Meeting (2019)**

Honors & Awards

2019 **NASA Space Technology Research Fellowship,**
2018 **Honorable Mention,** NSF Graduate Research Fellowship Program.
2016 **University Scholar,** Awarded to top 15 students in class year at Trinity University, based on GPA.
2016 **R.V Andrews Award,** Trinity University
2014 **Abernathy Scholar,** Trinity University

Teaching Experience

Spring 2017 **Peer Tutor,** Partial Differential Equations, Trinity University
Fall 2016 **Peer Tutor,** Circuits I, Trinity University
Fall 2014 **Peer Tutor,** General Physics I, Trinity University

Extracurricular Activity

Communities in Schools San Antonio, TX
VOLUNTEER Sept. 2015 - May 2016

- Volunteered once a week at the Kingsborough Middle School robotics club in San Antonio.