

Genesis Mariana Higueros

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Profile

- **Mechanical Engineering & Materials Science doctoral student with interest for energy storage technology specifically porous materials and interfacial transportation**
- **Currently researching vascularization of Li-ion battery electrodes for low-temperature space exploration and fast charging electric vehicles**
- **Multiple experiences presenting research through oral and poster presentations at international conference such as the 2017 SACNAS International Conference**
- **Hosted several diversity initiatives and outreach events including Light, Infrared, and Thermal Energy workshop for students of underrepresented backgrounds**

Education

2019-Present **Duke University**
Expected graduation: May 2024 **Ph.D. in Mechanical Engineering & Materials Science**

2015-2019 **University of California, Merced**
Cumulative GPA: 3.89 **Bachelor of Science in Environmental Engineering**

Awards and Fellowships

2019-Present Alfred P. Sloan Foundation Scholarship, Duke University
2019 Outstanding Student Award for Environmental Engineering, University of California, Merced
2017-19 Summer Undergraduate Research Fellowship, University of California, Merced
2015 Project Recognition Award, The American Association of University Women

Technical Experience

Jun 2019 – Present Hsu Group/Vascular ENabled Advanced (VENA) Batteries

- Currently fabricating dual-porous LiCoO₂ cathodes for increased materials utilization and lowered ionic tortuosity in electric vehicle Li-ion batteries with Dr. Po-Chun Hsu

Jul 2020 – Jun 2021 Hsu Group/X-ray CT Battery Thermal Measurement

- Assembled several Li-ion battery coin (CR2032) and cylindrical (18650) cells with resistant temperature detectors to predict battery thermal gradients using x-ray computed tomography in collaboration with Dr. Cristian Badea and group

Jun 2018 – Aug 2018 Summer Undergraduate Research Fellowship/Supercapacitors

- Drop casted PEDOT:PSS and N2200 polymers onto electrodes for Type IV supercapacitors with Dr. Tse Nga Ng and characterized system utilizing three-electrode electrochemical cells and EC-Lab software
- Results show N2200 contains a higher specific capacitance of 79.9 F/g and as expected, PEDOT:PSS has a higher retention rate of 99.6%. Mass ration of PEDOT:PSS to N2200 found to be 1.3:1

Jun 2017 – Aug 2017 Summer Undergraduate Research Fellowship/Plasma Gasification

- Researched effects of biochar steam activation and its resultant surface properties with Dr. Gerardo Diaz
- Preliminary Results showed significant mass loss for increases in temperature and activation time.
- Activated peach pits demonstrated smaller average pore width and higher pore volume than raw samples
- Operated gas chromatograph and used PeakSimple software to analyze producer gas

Technical Projects

Mujeres Usando Los Pantalones

Summer 2014

- Worked with local organization, Mujeres Usando Los Pantalones, in Nicaragua to build a vegetable garden to support independent businesswomen using a simple yet sustainable irrigation system
- Collaborated with local citizens of Nicaragua to work in a global team whose efforts support women empowerment and entrepreneurship

Extracurricular Activities

Jun 2020 – Present

Materials Research Society at Duke University

- Current President responsible for overseeing club activities, events, and Executive Board
- Outreach Coordinator from 2020-2021 responsible for undergraduate and graduate outreach events, local community engagement, and membership retainment
- Managed advertisement of events and designed all flyers
- Assisted President with his duties on managing executive board and regularly provided advice as a past student organization President

Aug 2017 – Apr 2019

Solar Energy Association at UC Merced

- President from 2018-2019 and responsible for overseeing executive board, general meetings and events
- Vice President from 2017-2018 and assisted President with her duties
- Managed the Solar Charging Station Project from January to May 2018
- Provided key lectures on solar panels and power calculations

University Service

- Lead organizer for Light, Infrared, and Thermal Energy (LITE) Workshop, a one-day outreach event for highschool students from underrepresented backgrounds in STEM. Managed volunteers, created lectures, and designed/implemented virtual-reality thermal-imaging headsets, 2022
- Moderated MRS@Duke Implicit Bias Workshop in collaboration with the University Program in Materials Science and Engineering and the Duke Office for Institutional Equity to promote discussion of racial biases and microaggressions in classrooms to prevent intolerance and foster community, 2020
- Graduate student mentor for first-year graduate students in the Mentorship Network Program at Duke University, 2020
- Member of the Search Committee for the position of Director of Diversity & Inclusion at the Pratt School of Engineering at Duke University, 2019
- Hosted STEM-based workshops in collaboration with the Society of Women Engineers for Expand Your Horizons conference which aims to empower young female students, 2016, 2018, 2019

Membership Activities & Conferences Attended

August 2020 – Present

Materials Research Society at Duke

August 2020 – Present

Materials Research Society

August 2018 – Present

Society of Hispanic Professional Engineers

August 2017 – Present

Society for Advancement of Chicanos/Hispanics and Native Americans in Science

August 2018 – April 2019

American Solar Energy Society

August 2017 – April 2019

Solar Energy Association at UC Merced

Conferences

- SHPE 2018 National Convention, Cleveland, OH, November 7-11, 2018
- 2018 UC Solar Research Symposium, San Francisco, CA, October 19, 2018
- California Solar Power Expo, San Diego, CA, March 27-28, 2018
- 2017 SACNAS International Conference, Salt Lake City, UT, October 19-21, 2017

Verbal & Poster Presentations

- Virtual Presentation “*Vascular ENabled Advanced (VENA) Electrodes for Fast Charging LIBs*” NC Space Symposium, NC, April 8, 2022
- Virtual Presentation “*Vascular ENabled Advanced (VENA) Electrodes for Fast Charging LIBs*” 9th Annual Triangle Student Research Competition, Raleigh, NC, October 7, 2021
- Presentation “*Dual-porosity Electrodes for Fast-Charging Li-ion Batteries*” Energy Materials Seminar, Durham, NC, January 10, 2020
- Poster “*Fabrication and Characterization of Polymers for Type IV Supercapacitors*” SHPE 2018 National Convention, Cleveland, OH, November 9, 2018
- Presentation “*Fabrication and Characterization of Polymers for Type IV Supercapacitors*” Summer Research Conference at UC San Diego, San Diego, CA, August 16, 2018
- Poster “*High Temperature Steam Activation of Peach Pit Biochar*” 2017 SACNAS International Conference, Salt Lake City, UT, October 20, 2017
- Presentation and Poster “*High Temperature Steam Activation of Peach Pit Biochar*” 2017 Annual Summer Undergraduate Research Symposium at UC Merced, Merced, CA, August 4, 2017