

# ELSA B VAZQUEZ

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## EDUCATION

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<b>BS</b>	Physics, University of California, Merced Honors	May 2022
	Astrophysics, University of California, Santa Cruz	March 2020
<b>AS</b>	Physics, Oxnard Community College	May 2019

## HONORS AND AWARDS

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**Postbaccalaureate Award, Cottrell Research Corporation for Science Advancement**  
2022

**Undergraduate Fellow, NASA - Merced nAnomaterial Center for Energy and Sensing**  
2020

**Academic Excellence Award, Oxnard College Foundation**  
For outstanding physics student. 2019

## RESEARCH EXPERIENCE

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**Postbaccalaureate Researcher**, Department of Physics, UC Merced 2022-2023  
PI: David A. Strubbe

“Raman spectroscopy and friction in doped 2D materials”

- Running calculations on simulated Ni-doped MoS<sub>2</sub> and MoS<sub>2x</sub>Se<sub>2(1-x)</sub> alloys nanomaterials to characterize mechanical, electronic, and optical properties.
- Preparing manuscript for publication on this research project.

**Undergraduate Senior thesis**, Department of Physics, UC Merced 2021-2022  
Advisor: David A. Strubbe

“Lubricants for outer space: Properties of nickel doped Molybdenum Disulfide from first-principles”

- Completed my thesis in condensed matter physics using computational methods to investigate contributions to the frictional mechanisms of Ni-doped MoS<sub>2</sub>
- Learned Density-Functional Theory and to use software that implements it.

## Course Based Undergraduate Research Experience, UC Merced

2021

Professor: David A. Strubbe

- Using theory from the condensed matter physics course we investigated the properties of  $\text{MoS}_{2x}\text{Se}_{2(1-x)}$  alloys through the nanoHUB.org utilities
- Ran calculations to find the equilibrium structure, band gap, phonon frequencies and Raman/IR spectra
- Specialized topic: piezoelectricity

## PRESENTATIONS

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**Vazquez EB**, Guerrero E, Strubbe DA. Poster. “Two-dimensional sliding Mechanisms of Ni-doped  $\text{MoS}_2$ ,” National Diversity in STEM Conference, San Juan, Puerto Rico. 2022.

**Vazquez EB**, Guerrero E, Strubbe DA. Oral. “Mapping 2D Sliding Mechanisms of Ni-doped  $\text{MoS}_2$  from First Principles,” Summer Undergraduate Research Institute Symposium, UC Merced. 2022.

**Vazquez EB**, Guerrero E, Strubbe DA. Poster. “Two-dimensional sliding of Ni-doped  $\text{MoS}_2$ ,” Conference for Undergraduate Women in Physics (virtual). 2022.

**Vazquez EB**, Guerrero E, Strubbe DA. Oral. “Ni-doped  $\text{MoS}_2$  for Instruments in Outer Space,” Merced nAnomaterial Center for Energy and Sensing Research Symposium (virtual), UC Merced. 2022.

## PROFESSIONAL EXPERIENCE

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### **NSF Center for Integration of Modern Optoelectronic Materials on Demand, The Optoelectronics Materials Synthesis, Spectroscopy and Systems course**

University of Washington, August 2022.

A weeklong course aimed at creating collaborative/interdisciplinary teams to work on three research thrusts: optoelectronic material synthesis, sensing, and systems.

### **Quantum Design and Integration Testbed Workshop**

Lawrence Livermore National Laboratory, June 2022.

A 2-day workshop where I was introduced to the concepts and challenges of quantum computing. Hands-on experience with their quantum processing chip (control language: python).

### **Workshops for Engineer and Science Transfers**

University of California, Santa Cruz, September 2019.

A 2.5-day workshop where I worked closely with graduate students and postdocs in collaborative and hands-on activities to gain a deeper understanding of research and research skills.

### **NASA Community College Aerospace Scholar**

NASA, Armstrong Flight Research Center, June 2019.

A four-day engineering workshop where I and others worked collaboratively build a rover and develop a campaign.

## **RELEVANT COURSEWORK**

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Electrodynamics; Analytical Mechanics; Quantum Mechanics; Thermodynamics; Condensed Matter Physics; Atomic, Molecular, and Optical Physics; Computational Physics (audited).

## **PROFESSIONAL & ACADEMIC AFFILIATIONS**

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Discipline Based Education Research Journal Club, Member.  
UC Merced, 2022-Present.

Society for Advancement of Chicanos/Hispanics and Native Americans in Science, Member.  
2021-Present.

American Physical Society, Member.  
2021-Present.

Women of Color Journal Club, Member.  
UC Santa Cruz, 2020.

Women in STEM, Co-founder, and president.  
Oxnard College, 2018-2019.

## **PROFESSIONAL SERVICE**

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### **Social Media Representative, UC Merced**

Local organizing committee. Conference for Undergraduate Women in Physics, 2022-2023.

### **Summer Undergraduate Research Institute, UC Merced**

Transfer Student panel member, SURI, 2022.

### **Learning Assistant, Modified Supplemental Instruction, UC Santa Cruz.**

Course: Physics – Classical Mechanics, 2021.

## **LANGUAGES**

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**English:** Native Language

**Spanish:** Native Language. Advanced Speaker, Advanced Reading and Writing.

## **COMPUTER SKILLS**

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**Programming:** Python, Mathematica, Java, R

**Tools:** Microsoft Office, Latex

**Platforms:** macOS, Microsoft Windows, Linux

**INTERESTS**

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Education research and pedagogy.