Priscilla Vazquez

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EDUCATION

California Institute of Technology   Pasadena, CA
B.S. in Mechanical Engineering (Expected June 2026)   GPA: 3.7/4.0

Research Interests
Sustainable aerospace systems; adaptive and deployable structures; mechanics of photovoltaic materials; systems integration for space-based power and climate-relevant technologies.

SELECTED AWARDS AND FELLOWSHIPS

Hispanic Scholarship Fund Fellow   2025
Hispanic Scholarship Fund
Cadence First Generation Scholar   2025
Cadence Design Systems
Named SURF Scholar   2023
California Institute of Technology
Questbridge National Match Scholar   2022
Questbridge National

RESEARCH EXPERIENCES

California Institute of Technology
   Undergraduate Research Thesis   June 2025 - Present
Atwater Research Group
- Designing, fabricating, and characterizing a mechanical test stand to investigate the thermal and tensile behavior of thin-film photovoltaic cells for space solar energy systems made for the Caltech SSPP (Space Solar Power Project)
- Developing a Kapton fixture with adjustable turnbuckles to apply controlled biaxial tension to thin-film solar cell samples.
- Investigating methods to mechanically and thermally stably attach thin-film solar cells to a flexible Kapton substrate.
- Preparing a formal thesis and defense synthesizing experimental, modeling, and design insights toward deployable, sustainable energy structures for space applications.

   Summer Undergraduate Research Fellowship   2023
Ruby Fu's Porous Media Flow Research Lab
- Conducted controlled quasi-2D flow experiments using layered glass beads simulating snow analogs to study preferential meltwater infiltration and flow instabilities.
- Executed experiments simulating hydraulic and capillary barriers to model distinct snow layer interactions.
- Processed and analyzed image data using ImageJ, MATLAB, and Python to quantify finger width distributions and infiltration velocities.
- Contributed findings to a fellowship report analyzing porous flow dynamics, highlighting the dynamics of ponding and flow transitions across snow layer interfaces.

APPLIED EXPERIENCES

GE Aerospace
Manufacturing Engineering & Supply Chain Intern 2025
Product Engineering Team
- Supported manufacturing operations and supply chain logistics in aerospace systems, focusing on tooling coordination, vendor communication, and quality control processes.
- Collaborated with engineers and technicians on design, production, and rework projects, helping manage the flow of testing units on the shop floor through direct communication and daily coordination.
- Shadowed product and design engineers contributing to the development of next-generation GE Aerospace technologies and testing workflows.
- Partnered with facilities/EHS managers to develop a site energy map, analyzing consumption to identify high-impact reduction opportunities in support of GE Aerospace's 2030 net-zero emissions goal

Southern California Edison
Substation Systems & Applications Mechanical Engineering Intern 2025
Electrical Engineering Team
- Developed a Python script for electric load management initiatives to streamline customer energy usage analysis and support ENCORE load management projects, improving customer data analysis efficiency.
- Supported system analysis/testing for next-generation substation projects, ensuring reliable integration of emerging technologies into SCE's grid.
- Completed Hardware-in-the-Loop (HIL) software training, enabling real-time simulation and testing of substation automation systems using Typhoon and RSCAD software.
- Completed a short Battery Storage course, gaining insight into energy storage, grid stability, and distributed energy resource management.

PROJECTS

California Institute of Technology
Engineering Capstone Design Laboratory 2025
- Participated in a competitive, team-based robotics design course integrating mechanical design, electronics, and control systems.
- Designed and fabricated three autonomous hockey-playing robots using CAD, laser cutting, and manual machining to meet competition performance goals.
- Co-led mechanical design and fabrication of the intake/outtake subsystem for three autonomous hockey-playing robots, focusing on puck handling, puck launch, and system integration.
- Utilized CAD, laser cutting, and precision machining to prototype and assemble key components, coordinating closely across subteams for systems integration and testing.

California Institute of Technology
    Mechanical Design & Fabrication   2024

- Learned the basics of mechanical design and fabrication, including material selection, manufacturing processes, and safety protocols.
- Designed, simulated, and built a gearbox transmission for a competitive project, adhering to strict material and size constraints.
- Completed Arduino programming tutorials, gaining experience in microcontroller programming and circuit design.

TEACHING AND LEADERSHIP

Engineering Capstone Design Laboratory Teaching Assistant   Sep 2025 - Present
California Institute of Technology

- Assist student teams with modeling, fabrication, and control integration for autonomous robotic competition.

Caltech Y Rise Tutoring in Science and Math   Oct 2024 - Present
California Institute of Technology

- Tutor local students struggling in math and science courses.

Caltech Hispanic & Latino Association Social Manager   May 2024 - Present
California Institute of Technology

- Organize community-building events and manage social programming to strengthen Caltech's Latino network.

Caltech Admissions Ambassador   May 2024 - Present
California Institute of Technology

- Lead campus tours, participate in outreach events, staff office shifts, and represent Caltech to prospective students and families.

Caltech Questbridge Chapter Vice President   Sep 2023 - Present
California Institute of Technology

- Coordinate chapter operations communication, supporting low-income and first-generation Caltech students.

PRESENTATIONS

Priscilla Vázquez, Nathan D. Jones, Xiaojing (Ruby) Fu. "Controlled 2.5D Analog Experiments to Investigate Preferential Flow of Meltwater in Layered Snowpack."

- **Poster Presentation** at the Caltech Summer Undergraduate Research Fellowship Seminar

RELEVANT COURSES

Mechanical: Thermal Science, Mechanics, CNC Machining, Engineering Design, Senior Thesis
Modeling & Analysis: Applied Math Methods, Exp. & Modeling in ME, Data Analysis in Eng.
Energy & Systems: Exp. Methods in Solar Energy, Energy Tech. & Policy, Exp. Methods in APh

SKILLS

Mechanical Design: CAD (Solidworks, Inventor, Onshape), GD&T, 3D Printing, CNC Machining, Laser Cutter, Mill, Lathe, Water Jet
Programming & Data: Python, Matlab, Mathematica, SQL
Simulation & Analysis: Ansys (CFD, FEA), Modal Analysis, Structural Testing, Cyme, ImageJ