Izzy Perez

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PROFILE

I aspire to apply my physics, astronomy, programming and engineering expertise to graduate-level research that advances our understanding of the universe.

EDUCATION

B.A. Astrophysical and planetary sciences, Physics emphasis

University of Colorado Boulder, 2020-2025

Physics and Astrophysics

- Physics: classical mechanics, electromagnetism, quantum mechanics, and thermodynamics
- Astrophysics: coursework in planetary science, stellar structure and evolution, solar and space physics, galactic and extragalactic astronomy, and cosmology

Scientific Computing

- Gained extensive experience in Python programming, data analysis, simulations, and model fitting, through CU Boulder's astronomy programming and applied math courses

Instrumentation

- Operated interferometers, spectrometers, phototubes, Helmholtz coils, and oscilloscopes for experiments in optics, electromagnetism, and modern physics
- Gained hands-on experience with telescopes at the Sommers-Bausch Observatory, using TheSky software

RESEARCH

Design and Development of a Low-Cost Magnetometer for Monitoring Earth's Magnetic Field

Fall 2025-present

- Develop a three-axis magnetometer to measure variations in Earth's magnetic field over long timescales.
- Design a weatherproof housing using 3D modeling and 3D printing
- Integrate an AMR sensor with a microcontroller and solar power system
- Write MicroPython software for sensor–microcontroller communication, data logging, and live visualization
- Interpret magnetic field variations in relation to solar activity
- Prepare an open-source build guide to support public participation in citizen science.
- Submit a poster presentation to the AAS 2026 conference

Analyzing Quasar and Stellar Color Indices and Improving Techniques for Aperture-Limited Observations

Fall 2025-present

- Conduct observational research using the 24″ LETO telescope at Sommers-Bausch Observatory to analyze quasars and foreground stars in g′, r′, and i′ filters
- Collect and calibrate photometric data, perform aperture photometry and chi-squared model fitting, and construct color–color diagrams to distinguish quasars from stars
- Evaluate how effectively small ground-based telescopes reproduce quasar–star color differences, and develop improved reduction techniques to overcome aperture limitations and enhance data quality

Silicic Volcanism in the Lunar Compton–Belkovich Volcanic Complex and Near-Side Calderas

Fall 2024

- Co-authored a study investigating silicic volcanism on the Moon using gravitational, albedo, spectral, and KREEP element data
- Analyzed the Compton–Belkovich Volcanic Complex and near-side calderas, finding elevated KREEP enrichment consistent with radiogenic heating–driven silicic volcanism.

EXPERIENCE

Engineer and Production Manager

Fathom Ocean Inc. 2024-Present

- Design and assemble underwater camera and LED systems, surface enclosures, hydrophones, and umbilical cables, including wiring, programming, and ensuring full waterproofing through mechanical assembly
- Design custom 3D components in FreeCAD, produce engineering drawings for manufacturing, and 3D-print parts for in-house production
- Refurbish existing camera and LED systems
- Oversee project timelines and coordinate assembly schedules to meet production goals
- Create and maintain an automated google-sheets inventory system for parts and products
- Collect performance data to extend product longevity and inform design improvements
- Develop detailed assembly guides and writing diagrams to document manufacturing processes and ensure consistency across builds

Instructor's Assistant

University of Colorado, Boulder 2021-2022

- Assisted in teaching Calculus I, attending lectures to support instruction and answer student questions
- Provided one-on-one tutoring to guide students through homework and strengthen conceptual understanding
- Developed strategies to address student math skill gaps that emerged during online instruction in the COVID period
- Collaborated weekly with instructors to plan class activities, create worksheets, and review assignments

SKILLS

Programming: Python, MicroPython, HTML, Latex, MATLAB

Software: freeCAD, Google Sheets, Excel, TheSky, VS Code, Jupyter Notebook, GitHub Adobe suite (Illustrator, Photoshop, Animate, Premiere Pro, After Effects)

Engineering: soldering, wiring, 3D printing

Other: piano, technical writing, climbing

REFERENCES

Trevor Mendelow
CEO of Fathom Ocean Inc.
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David Brain
Department Chair, Astrophysical & Planetary Sciences
david.brain@colorado.edu

Gary Phillis
Sequoyah Fellow at AISES;
Lockheed Martin Fellow Ret.
g.phillis@comcast.net