

# Dennis H. Calderón

PHYSICS · M.S.

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## Education

### The Ohio State University

PH.D IN PHYSICS

Columbus, OH

Expected 2026

### The Ohio State University

M.S. IN PHYSICS

Columbus, OH

Spring 2024

### California State University East bay

B.S. IN PHYSICS

Hayward, CA

Winter 2019

### Chabot Community College

Hayward, CA

Spring 2016

## Experience

### RESEARCH

#### High Energy Cosmic Ray Research Group

The Ohio State University

GRADUATE STUDENT

Summer 2022 - Present

- Work with Prof. Jim Beatty investigating High Energy Galactic Cosmic Rays.
- Current work is on the **H**igh **E**nergy **L**ight **I**sotope **e**xperiment a high altitude balloon-borne particle detector.
- Have designed hardware and electronics for various subsystems on **HELIX** with more focus on the drift chamber tracker.
- Essential team member for HELIX integration, launch, and recovery campaigns in Texas, Sweden, and Canada. Experienced in hardware, electronics, software, cryogenics, communications, and programming

#### Ultra High Energy Neutrino Research Group

The Ohio State University

GRADUATE STUDENT

Spring 2020 - Summer 2022

- Worked with Prof. Amy Connolly investigating Ultra High Energy neutrino interactions that occur in the Antarctic ice.
- Worked on projects related to the **A**skaryan **R**adio **A**rray experiment and the **G**enetically **E**volving **N**euTrIno telescope**S** project.
- **ARA** is an Antarctic deep ice radio neutrino detector. I created and analyzed Monte Carlo simulations based on the ARA experiment.
- **GENETIS** uses genetic algorithms to evolving an antenna design to optimize for deep ice neutrino detection. I simulated and analyzed different evolved antenna designs and compared them to antennas used for the **ARA** experiment.

#### Gamma-Ray Astronomy Research Group

CSUEB

RESEARCH ASSISTANT

Spring 2018 - Summer 2019

- Worked with Dr. Amy Furniss analyzing gamma ray sources, primarily focusing on gamma-ray galactic sources as part of the **V**ery **E**nergetic **R**adiation **I**maging **T**elescope **A**rray **S**ystem (**VERITAS**) collaboration.
- Experienced observation shift at VERITAS in Arizona for 5 nights.
- Wrote analysis pipelines in Python to analyze spectra of Very High Energy gamma-ray sources for a study on the Extragalactic Background Light.

#### Cool Stars Research Group

UCSD

RESEARCH ASSISTANT

Summer 2018

- Worked with Dr. Christopher Theissen creating a catalog of low-mass stars, stars that are less than half the mass of our sun, in the southern hemisphere.
- Used Python and ADQL to query a list of known late-type stars, stars with surface temperatures cooler than our sun, from the Sloan Digital Sky Survey (SDSS), Wide-field Infrared Survey Explorer All-Sky Survey (WISE), The Two Micron All Sky Survey (2MASS), and cross matched that with data taken from the SkyMapper Southern Sky Survey.

## Ultrafast Nanomaterials Lab

CSUEB

RESEARCH ASSISTANT

Fall 2017

- Worked with Dr. Ryan Smith to investigate light-matter interactions in nanoscale-structured samples grown by collaborators in South Korea.
- Created a program in LabView that interfaces with hardware of a dual axis galvo scanner system to perform a raster scan on the samples.

## TEACHING

### Polaris Mentorship Course

The Ohio State University

GRADUATE TEACHING ASSISTANT

Fall 2022 - Spring 2025

- Teaching Assistant for ASTRO 1101 and 1102, general education courses with laboratory component.
- Work closely with Prof. Wayne Schlingman of the Astronomy department helping develop the curriculum and how it is presented.
- Facilitate small group discussions in the laboratory section, covering a wide range of topics in astronomy.
- Have consistently been able to have students engage in lab activities and in thoughtful discussions of topics.

### Physics Department

The Ohio State University

GRADUATE TEACHING ASSISTANT

Summer 2022

- Teaching Assistant for ASTRO 1101 and 1102, general education courses with laboratory component.
- Work closely with Prof. Wayne Schlingman of the Astronomy department helping develop the curriculum and how it is presented.
- Facilitate small group discussions in the laboratory section, covering a wide range of topics in astronomy.
- Have consistently been able to have students engage in lab activities and in thoughtful discussions of topics.

### Astronomy Department

The Ohio State University

GRADUATE TEACHING ASSISTANT

Spring 2021 - Spring 2022

- Teaching Assistant for ASTRO 1101 and 1102, general education courses with laboratory component.
- Work closely with Prof. Wayne Schlingman of the Astronomy department helping develop the curriculum and how it is presented.
- Facilitate small group discussions in the laboratory section, covering a wide range of topics in astronomy.
- Have consistently been able to have students engage in lab activities and in thoughtful discussions of topics.

## Service & Outreach

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### Physics Department Committees

The Ohio State University

GRADUATE STUDENT REPRESENTATIVE

Fall 2022 - Present

- Served on Climate and Diversity Committee in the physics department. Committee was charged with developing a plan for the department to improve Diversity, Equity, and Inclusion (DEI) efforts.
- Served on Bridge Program Committee in the physics department. The committee is charged with improving the quality of the program and to admit the next year's incoming cohort.
- Served on the Inclusive Graduate Program committee working with students and faculty to better improve the graduate program.

### Polaris

The Ohio State University

LEADERSHIP MEMBER

Fall 2020 - Present

- Mentored first year undergraduate students in the physics and astronomy majors
- Actively works to improve the diversity and equity efforts in the physics and astronomy departments at Ohio State.
- Was a general facilitator for the **Undergraduate Residential Summer Access Program** in Summer 2021. **URSA** is a two-week summer residential program for incoming first year or transfer students taking place directly before the beginning of the 2021 Autumn semester. I coordinated with the other facilitators to ensure that the program ran smoothly and handled logistics for the program and to ensure that the first year students had a smooth transition to life at OSU.
- Instructor on record for the Polaris Mentorship Course overseeing since 2022 overseeing 30 undergraduate mentees and 30 graduate mentors.

### Access Network

COMMITTEE MEMBER

Spring 2021 - Present

- The **ACCESS** Network is an organization of sites where programs like **Polaris** exist. The **ACCESS** Network works towards increasing diversity and equity efforts through these programs.
- I attend meetings and help with efforts within the organization.

## Cal-Bridge

OUTREACH AND RECRUITMENT COMMITTEE MEMBER

Summer 2020 - present

- **Cal-Bridge** is an undergraduate bridge program for students from underrepresented groups in the California State University system.
- I joined the Outreach and Recruitment Committee and help organize and lead workshops for existing Cal-Bridge scholars and those in the application process.
- I also created a bi-weekly event for Cal-Bridge alumni to receive support and community with others from similar backgrounds as many alumni are now spread across universities throughout the nation.

## SPS Chapter President

CSUEB

SOCIETY OF PHYSICS STUDENTS CHAPTER AT CSUEB

Sep 2017 - May 2019

- Revived the club and substantially increased membership while maintaining regular active members.
- Implemented an outreach program where club members visit middle and high school classrooms and give an interactive physics presentation to show students the joy of studying physics.
- Implemented a tutoring program in the SPS club room where students of the general physics series can receive help.
- Volunteered at the local *Science in the Park* event and showcased physics demonstrations to members of the community.
- Head of the committee organizing the SPS Zone 18 Meeting where SPS chapters throughout California can present their research, network with other chapters, and engage undergraduate workshops.

## Skills

**Programming** C++, Python, ROOT, Verilog, SQL, Lisp, LabView, Mathematica, MATLAB, LaTeX

**Technical** HPC Clustering, 3D Modeling, PCB Design, Data Analysis, Electronics, Microcontrollers, FPGAs, Containerization

**Languages** English, Spanish

## Publications

McGrath, C. and **D. H. Calderón** *et. al.* *The HELIX Drift Chamber Tracker Design, Analysis and Calibration.* 39th International Cosmic Ray Conference (ICRC2025) Geneva, Switzerland

McBride, K. *et. al.* (incl. **D. H. Calderón**) *Towards Isotopic Composition of Cosmic Rays with the HELIX Balloon Project.* 39th International Cosmic Ray Conference (ICRC2025) Geneva, Switzerland

Coutu, S. *et. al.* (incl. **D. H. Calderón**) *The High Energy Light Isotope eXperiment program of direct cosmic-ray studies.* 16th Topical Seminar on Innovative Particle and Radiation Detectors (September 2023) Siena, Italy

Hanna, D. *et. al.* (incl. **D. H. Calderón**) *Electron-beam calibration of aerogel tiles for the HELIX RICH Detector.* Nuclear Inst. and Methods in Physics Research, A 1055 (2023) 168549

Wakely, S. P. *et. al.* (incl. **D. H. Calderón**) *Cosmic-ray Isotope Measurements with HELIX.* 38th International Cosmic Ray Conference (ICRC2023) Nagoya, Japan

Jeon, H. B. *et. al.* (incl. **D. H. Calderón**) *The Design and Status of the HELIX Ring Imaging Cherenkov Detector and Hodoscope Systems.* 38th International Cosmic Ray Conference (ICRC2023) Nagoya, Japan

McBride, K. *et. al.* (incl. **D. H. Calderón**) *The HELIX Drift Chamber Tracker Design and Implementation.* 38th International Cosmic Ray Conference (ICRC2023) Nagoya, Japan

Abeysekara, A. U. *et. al.* (incl. **D. Calderon-Madera**) *Measurement of the Extragalactic Background Light Spectral Energy Distribution with VERITAS.* The Astrophysical Journal, Volume 885, Issue 2, article id. 150, 8 pp. (2019).

## Conferences, Workshops, & Talks

Oct. 2025	<b>SACNAS NDiSTEM Conference 2025</b> , <i>HELIX Balloon-Borne Experiment: Probing the Galaxy with Light Isotopes</i> (Invited)	Columbus, OH
Oct. 2025	<b>HELIX Collaboration Meeting</b> , McGill University	Montreal, Canada
Oct. 2025	<b>Santa Monica Community College Talk</b> , <i>There and Back Again: Community College to the Arctic</i> (Invited)	Los Angeles, CA
Oct. 2025	<b>HEAP Seminar at UCLA</b> , <i>Probing the Galaxy Using Light Cosmic Ray Isotopes</i> (Invited)	Los Angeles, CA
Aug. 2025	<b>Student Leadership Development Summit</b> , Hosted by NSBP	Washington D.C
Jul. 2025	<b>International Cosmic Ray Conference 2025</b> , <i>The HELIX Drift Chamber Tracker Design, Analysis and Calibration</i> (Poster)	Geneva, Switzerland
Mar. 2025	<b>APS Global Summit 2025</b> , <i>Impacting Cultural Change Through Mentorship and Community</i> (Invited)	Anaheim, CA
Mar. 2025	<b>HELIX Collaboration Meeting</b> , Penn State University	State College, PA
Dec. 2024	<b>HELIX Analysis Workshop</b> , Hosted at OSU	Columbus, OH
Sep. 2024	<b>Astronomy on Tap</b> , <i>Adventures in Astroparticle Physics</i>	Columbus, OH
Sep. 2024	<b>Spitzer Seminar Talk at CSU East Bay</b> , <i>Chasing Cosmic Rays and Lasting Impact: My Journey in Physics and Beyond</i>	Hayward, CA
Sep. 2024	<b>SPS Talk</b> , From California to the Arctic: Journy of the HELIX Hero	Columbus, OH
Sep. 2024	<b>HELIX Collaboration Meeting</b> , Northern Kentucky University	Cincinnati, OH
Aug. 2024	<b>Student Leadership Development Summit</b> , Hosted by NSBP	Washington D.C
July 2024	<b>International School of Cosmic Ray Astrophysics</b> ,	Erice, Sicily
Oct. 2023	<b>SACNAS NDiSTEM Conference 2023</b> , <i>Measuring Light Isotopes with the HELIX Experiment</i>	Portland, OR
Oct. 2023	<b>CalBridge Research Symposium</b> , <i>Measuring Light Isotopes with the HELIX Experiment</i>	Berkeley, CA
July 2023	<b>International Cosmic Ray Conference 2023</b> , <i>The HELIX Drift Chamber Tracker Design and Implementation</i> (Poster)	Nagoya, Japan
Oct. 2023	<b>CalBridge Summer Institute</b> , <i>Professional development and teaching pedagogy workshop</i>	Portland, OR
May 2023	<b>HELIX Collaboration Meeting</b> , University of Chicago	Chicago, IL
April 2023	<b>APS ECLS</b> , <i>Measuring Light Isotope Cosmic Rays With HELIX</i>	Rochester, MI
Nov. 2022	<b>Spitzer Seminar Talk at CSU East Bay</b> , <i>From Hayward to Ohio and Astroparticle Physics</i> (Invited)	Hayward, CA
Nov. 2022	<b>Outreach Talk at Chabot Community College</b> , <i>From Hayward to Ohio and Astroparticle Physics</i> (Invited)	Hayward, OH
Oct. 2022	<b>SACNAS</b> , Attended	San Juan, PR
Oct. 2022	<b>HELIX Collaboration Meeting</b> , University of Chicago	Chicago, IL
Sep. 2022	<b>SPS Talk</b> , <i>Imposter Syndrome and the Path Forward</i>	Columbus, OH
Sep. 2022	<b>Astro Society Talk</b> , <i>Imposter Syndrome and the Path Forward</i>	Columbus, OH
May 2022	<b>No Jargon Talk at UCSC</b> , <i>The Story of UHE Neutrinos and How We Detect Them</i>	Santa Cruz, CA
Oct. 2021	<b>SPS Talk</b> , <i>My Path to Physics Graduate School</i>	Columbus, OH
June 2019	<b>VERITAS Collaboration Meeting Summer 2019</b> , University of Utah	Salt Lake City, UT
Apr. 2019	<b>CSR Research Symposium</b> , <i>Analyzing Spectrum of Very High Energy Blazars</i>	Hayward, CA
Apr. 2019	<b>California Diversity Forum</b> , Attended	Davis, CA
Jan. 2019	<b>AAS 233rd Meeting</b> , <i>Searching for New Ultracool Dwarfs in Southern Skies</i> (Poster)	Seattle, WA
Sep. 2018	<b>Cal-Bridge, CAMPARE, CHAMP Research Symposium</b> , <i>Finding New Cool Stars in the Southern Skies</i>	Pomona, CA
Aug. 2018	<b>UCSD Student Summer Research Conference</b> , <i>Finding New Cool Stars in the Southern Skies</i>	San Diego, CA
Apr. 2018	<b>CSR Research Symposium</b> , VERITAS: Very Energetic Radiation Imaging Telescope Array System	Hayward, CA
Apr. 2018	<b>APS April Meeting</b> , Attended	Columbus, OH
Apr. 2018	<b>California Diversity Forum</b> , Attended	Stockton, CA
Nov. 2017	<b>APS Far West</b> , Attended	Merced, CA

## Honors & Awards

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2025	<b>Graduate Associate Leadership Award</b> , Nominated	OSU
2025	<b>CSU Chancellor's Doctorate Incentive Program</b> , Fellow	
2024	<b>Graduate Associate Leadership Award</b> , Nominated	OSU
2025	<b>CSU CDIP Travel Grant</b> , Awarded	CSU
2024	<b>CCAPP Workshop Proposal</b> , Awarded funds to host HELIX Analysis Workshop	OSU
2024	<b>CSU CDIP Education Support Grant</b> , Awarded	CSU
2024	<b>IGEN Travel Grant</b> , Awarded	
2024	<b>CSU Chancellor's Doctorate Incentive Program</b> , Fellow	
2023	<b>Physics Department Service Award</b> , Awarded	OSU
2023	<b>Cal-Bridge Doctoral Scholar</b> , Cohort 1	
2023	<b>IGEN Travel Grant</b> , Awarded	
2023	<b>SACNAS Travel Scholarship Award</b> , Awarded	
2021	<b>Graduate Associate Teaching Award</b> , Nominated	OSU
2018	<b>Cal-Bridge Scholar</b> , Cal-Bridge North Cohort 5	
2018	<b>Sally Casanova Scholar</b> , CSU Pre-Doctoral Program Recipient	
2018	<b>Physics Student of the Year Scholarship</b> , Unanimously nominated by the Physics Department	CSUEB
2018	<b>CSR Travel Grant</b> , Grant awarded for travel to APS April Meeting in Columbus, OH	CSUEB
2017	<b>LSAMP Scholar</b> , Louis Stokes Alliances for Minority Participation	CSUEB
2017	<b>CSR Scholar</b> , Center for Student Research at CSUEB	CSUEB
2018	<b>CAMPARE Program</b> , Program designed to increase minority representation in physics research	
2018	<b>UCSD STARS Program</b> , Summer Training Academy for Research Success	UCSD