

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

GRADUATE STUDENT

The Ohio State University

Summer 2022 - Present

- Work with Prof. Jim Beatty investigating High Energy Galactic Cosmic Rays.
- Current work is on the **High Energy Light Isotope** experiment 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

GRADUATE STUDENT

The Ohio State University

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 **Askaryan Radio Array** experiment and the **Genetically Evolving NEuTrino telescopeS** 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

RESEARCH ASSISTANT

CSUEB

Spring 2018 - Summer 2019

- Worked with Dr. Amy Furniss analyzing gamma ray sources, primarily focusing on gamma-ray galactic sources as part of the **Very Energetic Radiation Imaging Telescope Array System (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

RESEARCH ASSISTANT

UCSD

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

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, A1055 (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	SACNAS NDiSTEM Conference 2025 , <i>HELIX Balloon-Borne Experiment: Probing the Galaxy with Light Isotopes (Invited)</i>	Columbus, OH
Oct. 2025	HELIX Collaboration Meeting , <i>McGill University</i>	Montreal, Canada
Oct. 2025	Santa Monica Community College Talk , <i>There and Back Again: Community College to the Arctic (Invited)</i>	Los Angeles, CA
Oct. 2025	HEAP Seminar at UCLA , <i>Probing the Galaxy Using Light Cosmic Ray Isotopes (Invited)</i>	Los Angeles, CA
Aug. 2025	Student Leadership Development Summit , <i>Hosted by NSBP International Cosmic Ray Conference 2025, The HELIX Drift Chamber Tracker Design, Analysis and Calibration (Poster)</i>	Washington D.C
Jul. 2025	International Cosmic Ray Conference 2025, The HELIX Drift Chamber Tracker Design, Analysis and Calibration (Poster)	Geneva, Switzerland
Mar. 2025	APS Global Summit 2025 , <i>Impacting Cultural Change Through Mentorship and Community (Invited)</i>	Anaheim, CA
Mar. 2025	HELIX Collaboration Meeting , <i>Penn State University</i>	State College, PA
Dec. 2024	HELIX Analysis Workshop , <i>Hosted at OSU</i>	Columbus, OH
Sep. 2024	Astronomy on Tap , <i>Adventures in Astroparticle Physics</i>	Columbus, OH
Sep. 2024	Spitzer Seminar Talk at CSU East Bay , <i>Chasing Cosmic Rays and Lasting Impact: My Journey in Physics and Beyond</i>	Hayward, CA
Sep. 2024	SPS Talk , <i>From California to the Arctic: Journey of the HELIX Hero</i>	Columbus, OH
Sep. 2024	HELIX Collaboration Meeting , <i>Northern Kentucky University</i>	Cincinnati, OH
Aug. 2024	Student Leadership Development Summit , <i>Hosted by NSBP</i>	Washington D.C
July 2024	International School of Cosmic Ray Astrophysics ,	Erice, Sicily
Oct. 2023	SACNAS NDiSTEM Conference 2023 , <i>Measuring Light Isotopes with the HELIX Experiment</i>	Portland, OR
Oct. 2023	CalBridge Research Symposium , <i>Measuring Light Isotopes with the HELIX Experiment</i>	Berkeley, CA
July 2023	International Cosmic Ray Conference 2023, The HELIX Drift Chamber Tracker Design and Implementation (Poster)	Nagoya, Japan
Oct. 2023	CalBridge Summer Institute , <i>Professional development and teaching pedagogy workshop</i>	Portland, OR
May 2023	HELIX Collaboration Meeting , <i>University of Chicago</i>	Chicago, IL
April 2023	APS EGLS , <i>Measuring Light Isotope Cosmic Rays With HELIX</i>	Rochester, MI
Nov. 2022	Spitzer Seminar Talk at CSU East Bay , <i>From Hayward to Ohio and Astroparticle Physics (Invited)</i>	Hayward, CA
Nov. 2022	Outreach Talk at Chabot Community College , <i>From Hayward to Ohio and Astroparticle Physics (Invited)</i>	Hayward, OH
Oct. 2022	SACNAS , <i>Attended</i>	San Juan, PR
Oct. 2022	HELIX Collaboration Meeting , <i>University of Chicago</i>	Chicago, IL
Sep. 2022	SPS Talk , <i>Imposter Syndrome and the Path Forward</i>	Columbus, OH
Sep. 2022	Astro Society Talk , <i>Imposter Syndrome and the Path Forward</i>	Columbus, OH
May 2022	No Jargon Talk at UCSC , <i>The Story of UHE Neutrinos and How We Detect Them</i>	Santa Cruz, CA
Oct. 2021	SPS Talk , <i>My Path to Physics Graduate School</i>	Columbus, OH
June 2019	VERITAS Collaboration Meeting Summer 2019 , <i>University of Utah</i>	Salt Lake City, UT
Apr. 2019	CSR Research Symposium , <i>Analyzing Spectrum of Very High Energy Blazars</i>	Hayward, CA
Apr. 2019	California Diversity Forum , <i>Attended</i>	Davis, CA
Jan. 2019	AAS 233rd Meeting , <i>Searching for New Ultracool Dwarfs in Southern Skies (Poster)</i>	Seattle, WA
Sep. 2018	Cal-Bridge, CAMPARE, CHAMP Research Symposium , <i>Finding New Cool Stars in the Southern Skies</i>	Pomona, CA
Aug. 2018	UCSD Student Summer Research Conference , <i>Finding New Cool Stars in the Southern Skies</i>	San Diego, CA
Apr. 2018	CSR Research Symposium , <i>VERITAS: Very Energetic Radiation Imaging Telescope Array System</i>	Hayward, CA
Apr. 2018	APS April Meeting , <i>Attended</i>	Columbus, OH
Apr. 2018	California Diversity Forum , <i>Attended</i>	Stockton, CA
Nov. 2017	APS Far West , <i>Attended</i>	Merced, CA

Honors & Awards

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