Dennis H. Calderón

Physics · M.S.

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Education

The Ohio State University — *Columbus, OH*

PhD in Physics — *Expected 2026*

The Ohio State University — *Columbus, OH*

M.S. in Physics — *Spring 2024*

California State University East bay — *Hayward, CA*

B.S. in Physics — *Winter 2019*

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**x**periment a high altitude balloon-borne particle detector.
- Have designed hardware and electronics for various subsystems on **HELIX** with more focus on the drift field 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 - Present*

- Work 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 **NE**u**T**r**I**no telescope**S** project.
- **ARA** is an Antarctic deep ice radio neturino 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 — *2018 - present*

- 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

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 undgergradaute 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 **U**ndergraduate **R**esidential **S**ummer **A**ccess 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.

Conferences, Workshops, & Talks

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**, *Impacting Cultural Change Through Mentorship and Community (Invited Talk)*	*Anaheim, CA*
Mar. 2025	**HELIX Collaboration Meeting**,	*State College, PA*
Sep. 2025	**Astronomy on Tap**, *Adventures in Astroparticle Physics*	*Columbus, OH*
Sep. 2024	**Spitzer Seminar Talk at CSU East Bay**, *Chasing Cosmic Rays and Lasting Impact: My Journey in Physics and Beyond*	*Hayward, CA*
Sep. 2024	**SPS Talk**, From California to the Arctic: Journy of the HELIX Hero	*Columbus, OH*
Sep. 2024	**HELIX Collaboration Meeting**,	*Cincinnati, OH*
July 2024	**International School of Cosmic Ray Astrophysics**,	*Erice, Sicily*
Oct. 2023	**SACNAS NDiSTEM Conference 2023**, *Measuring Light Isotopes with the HELIX Experiment*	*Portland, OR*
Oct. 2023	**CalBridge Research Symposium**, *Measuring Light Isotopes with the HELIX Experiment*	*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**, *Professional development and teaching pedagogy workshop*	*Portland, OR*
May 2023	**HELIX Collaboration Meeting Spring 2023**, *Attended*	*Chicago, IL*
April 2023	**APS EGLS**, *Measuring Light Isotope Cosmic Rays With HELIX*	*Rochester, MI*
Nov. 2022	**Spitzer Seminar Talk at CSU East Bay**, *From Hayward to Ohio and Astroparticle Physics*	*Hayward, CA*
Nov. 2022	**Outreach Talk at Chabot Community College**, *From Hayward to Ohio and Astroparticle Physics*	*Hayward, OH*
Oct. 2022	**SACNAS**, *Attended*	*San Juan, PR*
Oct. 2022	**HELIX Collaboration Meeting Fall 2022**, *Attended*	*Chicago, IL*
Sep. 2022	**SPS Talk**, *Imposter Syndrome and the Path Forward*	*Columbus, OH*
Sep. 2022	**Astro Society Talk**, *Imposter Syndrome and the Path Forward*	*Columbus, OH*
May 2022	**No Jargon Talk at UCSC**, *The Story of UHE Neutrinos and How We Detect Them*	*Santa Cruz, CA*
Oct. 2021	**SPS Talk**, *My Path to Physics Graduate School*	*Columbus, OH*
June 2019	**VERITAS Collaboration Meeting Summer 2019**, *Attended*	*Salt Lake City, UT*
Apr. 2019	**CSR Research Symposium**, *Analyzing Spectrum of Very High Energy Blazars*	*Hayward, CA*
Apr. 2019	**California Diversity Forum**, Attended	*Davis, CA*
Jan. 2019	**AAS 233rd Meeting**, *Searching for New Ultracool Dwarfs in Southern Skies*	*Seattle, WA*
Sep. 2018	**Cal-Bridge, CAMPARE, CHAMP Research Symposium**, *Finding New Cool Stars in the Southern Skies*	*Pomona, CA*
Aug. 2018	**UCSD Student Summer Research Conference**, *Finding New Cool Stars in the Southern Skies*	*San Diego, CA*
Apr. 2018	**CSR Research Symposium**, VERITAS: Very Energetic Radiation Imagaing Telescope Array System	*Hayward, CA*
Apr. 2018	**APS April Meeting**, Attended	*Columbus, OH*
Apr. 2018	**California Diversity Forum**, Attended	*Stockton, CA*
Nov. 2017	**APS Far West**, Attended	*Merced, CA*

Honors & Awards

2024-2025	**Graduate Associate Leadership Award**, Nominated	*OSU*
2025	**CSU CDIP Travel Grant**, Awarded	*CSU*
2024	**CSU CDIP Education Support Grant**, Awarded	*CSU*
2024	**IGEN Travel Grant**, Awarded	
May 2024	**CSU Chancellor's Doctorate Incentive Program**, Fellow	
2023-2024	**Physics Department Service Award**, Awarded	*OSU*
2023	**IGEN Travel Grant**, Awarded	
2023	**SACNAS Travel Scholarship Award**, Awarded	
Fall 2021	**Graduate Associate Teaching Award**, Nominated	*Ohio State*
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*
2017-2018	**LSAMP Scholar**, Louis Stokes Alliances for Minority Participation	*CSUEB*
2017-2018	**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*

Skills

Programming	C++, Python, ROOT, Verilog, SQL, Lisp, LabView, Mathematica, MATLAB, LaTeX
Languages	English, Spanish
Technical	HPC Clustering, 3D Modeling, PCB Design, Data Analysis, Electronics, Microcontrollers, FPGAs, Containerization

Publications

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).