

Calder Lenhart

calderlen@gmail.com
calderlen.github.io
linkedin.com/in/calderlen

EDUCATION

B.S. Physics, Astronomy and Astrophysics

Aug 2020 - Dec 2024

Minors: Mathematics, History
Magna Cum Laude, with Research Distinction in Astronomy and Astrophysics
The Ohio State University

PUBLICATIONS

- **(To be submitted) Lenhart, C.**, Johnson, M. C., Wang, J., et al., "PEPSI Investigation, Retrieval, and Atlas of Numerous Giant Atmospheres (PIRANGA). II. Phase Resolved Cross-Correlation Transmission Spectroscopy of KELT-20b"
- **Lenhart, C.**, 2024. "Phase resolved cross-correlation transmission spectroscopy of KELT-20b" (Undergraduate thesis). The Ohio State University., <https://kb.osu.edu/handle/1811/105450>
- **Lenhart, C.**, Johnson, M. C., Wang, J., et al. 2024, "Analysis of KELT-20b's Atmospheric Dynamics Using PEPSI: Line Profiles During Transit and Velocity Offsets" in American Astronomical Society Meeting Abstracts, Vol. 243, American Astronomical Society Meeting Abstracts, 179.09

PRESENTATIONS

- **Lenhart, C.**, Johnson, M. C., Wang, J., Asnodkar, A. P., Petz, S., Strassmeier, K. G., Ilyin, I. "*Analysis of KELT-20b's Atmospheric Dynamics Using PEPSI: Line Profiles During Transit and Velocity Offsets*" 2024, AAS 243, 135, 179.09
- **Lenhart, C.**, Johnson, M. C. "*Analysis of an Ultra Hot Jupiter's Atmosphere*" Ohio State Department of Astronomy Summer Undergraduate Research Program in Astrophysics Symposium

RESEARCH EXPERIENCE

- **Undergraduate Astrophysics Research** Columbus, OH
Ohio State University, Astronomy — Dr. Marshall C. Johnson May 2023 - Present
 - Developed and optimized Python scripts for processing ultra-hot gas giant exoplanet atmospheric spectroscopy data from the PEPSI spectrograph on the Large Binocular Telescope, refactoring data reduction pipelines and automating multiple processing steps.
 - Discovered new atmospheric elements in KELT-20b using advanced signal processing and data analysis methods; resolved atmospheric dynamics at unprecedentedly high time resolution; presented the first constraint on the magnetic field strength of an exoplanet.
 - Presented findings at the 243rd American Astronomical Society conference; awarded scholarship to conduct research full-time; results published in undergraduate thesis and to be published in a peer-reviewed astronomy journal.
- **Undergraduate Materials Science Research** Columbus, OH
Ohio State University, Materials Science & Engineering — Prof. Sheikh Akbar June 2022 - May 2023
 - Designed and completed hydrothermal synthesis reactions of metal oxide nanostructures to be used in next-generation gas sensors.
 - Measured electrical resistivity, response time, and selectivity of metal oxide gas sensors under exposure to toxic and non-toxic gases.
 - Contributed to development of the Open Database Of Resistive-type Sensors (ODORS) by aggregating experimental data and literature reviews, facilitating trend analysis in sensor selectivity and sensitivity.

HONORS AND AWARDS

Ann Slusher Tuttle Undergraduate Scholarship, Ohio State Department of Astronomy	January 2024
Undergraduate Research Scholarship, Ohio State College of Arts and Sciences	December 2023
MakeOHI/O 2023 1st Place (Intel Competition)	March 2023
Dean's List	7 semesters
Eagle Scout	July 2020
Youngstown CityScape Beautification Watch Award	November 2019

WORK EXPERIENCE

- **Private Tutor** Remote
Wyzant June 2022 - May 2023
 - Created study plans for students, managed all communication and scheduling; clients ranged from middle school to college students of math, physics, standardized tests.
 - Earned a 5.0/5.0 rating across 30+ reviews, earning six unsolicited testimonials; recognized as a top tutor in Columbus, OH, and sitewide for online tutoring in calculus and physics.
- **Mathematics Tutor** Columbus, OH
Ohio State University, Mathematics and Statistics Learning Center December 2021 - August 2022
 - Tutored calculus to over 20 students weekly, effectively communicating complex concepts and providing tailored support to enhance student comprehension and performance.
 - Managed student communications and appointment scheduling; learned and applied andragogical teaching methods.

HIGHLIGHTED PROJECTS

- **Machine Learning: Linking Writing Processes to Writing Quality** Kaggle
November 2023 - December 2023
 - Developed a Histogram-based Gradient Boosting Regression Tree with Scikit-learn to predict writing quality of mock SAT essays using keystroke logs; engineered features from computational linguistics literature, tuned hyperparameters, and analyzed feature importance; placed in 63rd percentile in Kaggle competition.
- **Make OH/IO 2023 Competition** Ohio State University
March 2023
 - Proposed an updated cleanroom garment with tear sensors, improved boot covers, and redesigned masks for use in Intel's semiconductor factories; designed a proof-of-concept using an Arduino board and cleanroom garment materials; won 1st place in the competition.
- **Buckeye Solar Racing Team** Ohio State University
Aerodynamicist August 2021 - August 2022
 - Researched performance of various solar car geometries, designed canopy and aeroshell in SolidWorks, ran CFD with STAR-CCM+.
 - Meshed existing canopy with photogrammetry software, compared prototypes to physical model, finalized design, integrated with remainder of solar car.
- **NASA L'SPACE Mission Concept Academy** Online
Aerospace Engineer May 2021 - August 2021
 - Collaborated with 10-person interdisciplinary team to conceptualize a mission to drill water-ice from the lunar south pole, including site selection with JMARS GIS software, rover design with SolidWorks CAD, development of Risk Management Plan, and success criteria.
 - Modeled entry, descent, and landing of a lunar rover; prototyped compact lunar regolith drill; formulated a CONOPS; budgeted instrumentation; produced a Preliminary Design Review.

COMMUNITY SERVICE

- **Epsilon Tau Pi, Eagle Scout Service Fraternity** Ohio State University
Executive Board Member and General Member
 - Volunteered for 100+ hours of community service events, such as Relay for Life Columbus, assisting local Boy Scout troops located in low-income areas, and metro park cleanups.
 - Responsible for all social media channels in 2021-2022; designed merchandise and produced fraternity composite photographs.

SKILLS AND INTERESTS

Languages: Python, MATLAB, Mathematica, HTML, CSS
Tools: Bash, Linux, Git, L^AT_EX, High-performance Computing
Machine Learning, Deep Learning, Adobe Creative Suite
Interests: Fine-art photographer with work shown in galleries across Ohio, solo show scheduled for 2025