Calder Lenhart

calderlen@gmail.com
calderlen.github.io

Education

- **The Ohio State University** — Columbus, OH
  B.S. Physics, Astronomy & Astrophysics (Research Distinction) — *2020 - 2024*
  Minors: Mathematics, Philosophy
  Courses: *Honors E&M I/II, Honors Quantum Mechanics I/II, Statistical Mechanics, Advanced Physics Laboratory, Cosmology, Classical Mechanics I/II, Big Data Analytics, Methods of Astronomical Observation & Data Analysis, Real Analysis, Applied Statistics, Python, MATLAB, Flight Vehicle Dynamics, Thermodynamics, Electrical Circuits and Electronic Devices*
  GPA: 3.67/4

Publications

- (In prep.) **Lenhart, C.**, Johnson, M. C., Wang, J., Asnodkar, A. P., Petz, S., Strassmeier, K. G., Ilyin, I. *"High-Resolution Cross-Correlation Transmission Spectroscopy of KELT-20b"*,

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

- **Department of Astronomy - Dr. Marshall C. Johnson** — The Ohio State University
  Undergraduate Researcher (Full-time, Part-time) — *May 2023 - Present*
  - Characterized ultra hot Jupiter atmoshperic dynamics using transmission spectroscopy data
  - Implemented Doppler shadow removal into atomic species detection pipeline
  - Detected novel atomic constituents present in day-to-nightside winds
  - Identified potential three-dimensional equilibrium processes occurring in KELT-20b's atmosphere
- **Department of Materials Science and Engineering - Dr. Sheikh Akbar** — The Ohio State University
  Undergraduate Research Assistant (Part-time) — *June 2022 - May 2023*
  - Synthesized inorganic materials in aqueous media with hydrothermal method to produce crystalline nanostructures, trained in SEM and XRD to identify morphologies and composition
  - Employed sensor fabrication methods for building metal oxide gas sensors; determined sensing properties with electrical measurement instruments
  - Compiled sensor data from current literature into centralized database, with the aim of developing a platform to identify trends in sensor selectivity and sensitivity

Work Experience

- **Wyzant** — Online
  Prviate Tutor (Independent Contractor) — *June 2022 - Present*
  - Created individualized study plans for students, solely managing communications and scheduling; clients ranged from middle school to college students of math, physics, standardized testing
  - Maintained a 5.0/5.0 rating with 6 unsolicited testimonials and 30+ ratings; recommended as a top tutor for in-person tutoring in Columbus, OH and for online tutoring sitewide in calculus and physics
- **Mathematics and Statistics Learning Center** — The Ohio State University
  Math Tutor (Part-time) — *December 2021 - August 2022*
  - Communicated with students, scheduled appointments, and tutored calculus to over 20 students weekly
  - Trained in andragogical methods; approached tutees with focus on inquiry-based learning

Projects

- **Machine Learning Project: Linking Writing Processes to Writing Quality**
  - Predicted the overall writing quality of mock SAT essays using dataset of keystroke logs stripped of alphanumeric information
  - Derived original features and those from current literature concerning the real-time prediction of writing quality with keystroke data
  - Used sk-learn's Histogram-Based Gradient Boosting Regression Tree; tuned hyperparameters, employed cross-validation, analyzed feature importance
  - Placed in the 63rd percentile in my first Kaggle competition
- **Make OH/IO 2023 Competition**
  - Conceptualized 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
  - Received 1st place in the competition
- **Buckeye Solar Racing** — The 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, rover design, system integration, risk mitigation, 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

Skills

- **Languages**: Python, MATLAB, Mathematica, HTML/CSS
- **Tools**: Bash/Linux, Git, LaTeX, High-performance Computing, Machine Learning, Adobe Creative Suite

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) - March 2023
- Dean's List - 5 semesters
- Eagle Scout - July 2020
- Youngstown CityScape Beautification Watch Award - November 2019