AUTUMN STEPHENS

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Boulder, CO, United States

EDUCATION

University of Colorado-Boulder *Aug 2023 - Present*
M.Sc. and Ph.D. / Astrophysics & Planetary Science

The Ohio State University *Aug 2019 - May 2023*
Bachelor of Physics / Astronomy & Astrophysics

SKILLS

Languages: English, American Sign Language (ASL)
Programming: Python, Bash, Git, C++, HTML, CSS, JavaScript, LaTeX

RELEVANT COURSEWORK

Observations, Data Analysis and Statistics (ASTR 5550)
Course Description: Introduces multi-wavelength observational techniques, their limitations, and effects of various noise sources. Describes basic data handling, error analysis, and statistical tests relevant to modeling. Topics include probability distributions, model-fitting algorithms, confidence intervals, correlations, sampling, and convolution. Students derive physical measurements and uncertainties with hands-on analysis of real datasets.

Atmospheric Chemistry (ATOC 5151)
Course Description: Thermal, mechanical, quantum, and radiative processes in gases and plasmas, with emphasis on spectroscopy, atomic and molecular physics, statistical mechanics, and kinetic theory, with applications in astrophysics, planetary physics, and plasmas.

Atomic and Molecular Processes (ASTR 5110)
Course Description: Reviews basic kinetics and photochemistry of atmospheric species and stratospheric chemistry with emphasis on processes controlling ozone abundance. Tropospheric chemistry focusing on photochemical smog, acid deposition, oxidation capacity of the atmosphere and global climate change.

RESEARCH EXPERIENCE

Studying TOI-3884's Persistent Polar Spot *August 2023 - Present*
PI: Dr. Zach Berta-Thompson
- Collected long-slit, multi-object spectrograph data from two telescopes
- Built a generalized Python pipeline for time-series spectroscopic observations
- Helped constrain the location, size, and temperature of TOI-3884's polar spot

Gravitational Microlensing *May 2022 - May 2023*
PI: Dr. Scott Gaudi; Secondary Advisor: Dr. Samson Johnson
- Resulted in a successfully-defended as an honors undergraduate thesis
- Simulated blended two-star spectra for stars in microlensing events
- Determined the percentage of microlensing events for which lens star parameters can be extracted from
- Characterized the effect of metallicity and effective temperature blended two-star spectra
- Used in a JWST Cycle 4 proposal

Developing Neutrino Detectors for IceCube *Aug 2021 - May 2022*
PI: Dr. Amy Connolly; Secondary Advisor: Dr. Julie Rolla
- Used genetically-evolving algorithms to generate novel neutrino detectors
- Studied gain patterns for generated detectors to track performance
- Generated 3D models of genetically-evolved neutrino detectors

GITHUB PROJECTS

`specsuite` *Jan 2026*
- Contains several generalized tools for reducing ground-based, multi-object spectrograph data
- Uses parallel processing & linear algebra techniques to significantly optimize runtime
- Provides quick, simple visualizations of each step in the reduction
- Subject to extensive, automated unit and functional testing before being updated

`cosmic-flagger` *Sep 2025*
- Uses 3D-DFT analysis to flag potential cosmic ray contamination in time-series data
- Verifies cosmic ray contamination using an outlier-detecting metric
- Optionally replaces contaminated pixels with the median of surrounding exposures

`ASDtools` *April 2025*
- Cleans and converts `astroquery` results for the NIST ASD into a `Pandas` DataFrame
- Explains the various "tags" associated with individual lines throughout the database
- Capable of generating term symbols, Grotrian diagrams, and Aufbau diagrams for a given element

BlenderBraille *Aug 2024*
- Produces 3D-printable and size-compliant Braille given corresponding to user input
- Automatically generates tactile models from static images
- Allows for single-click conversion of Blender settings to allow users to export 3D-printable models

WORK EXPERIENCE

Sommers-Bausch Observatory *May 2025 - Present*
Graduate Assistant
- Train undergraduate students to operate SBO's 20" and 24" telescopes
- Provide on-call technical assistance to students and professors during telescope operation

CU Boulder Astrophysics & Planetary Science Department *Aug 2023 - Present*
Teaching Assistant
- Mentored and guided undergraduate students through astrophysical final projects
- Guest lectured for several classes (ASTR 1000; ASTR 1030; ASTR 3710; ASTR 3750; ASTR 3800)
- Designed and provided 3D-printed educational models to support learning objectives

OUTREACH / EXTRACURRICULAR

Sommers-Bausch Observatory (SBO) Open House *Aug 2023 - Present*
Telescope Operator / Speaker
- Responsible for the setup and operation of two 20" PlaneWave Telescopes
- Manage large crowds while fielding questions about astronomical topics

SciAccess Zenith Program *Jan 2020 - May 2023*
Mentor / Operations Chair
- Coordinated with See3D to create STEM 3D-models for BLV students
- Mentored K-12 students to prepare them for a STEM education and college life

PRESENTATIONS / POSTERS

The Chromatic Contaminant:
Ground-Based Spectrophotometry of TOI-3884's Persistent Polar Spot *March 2026*
Exoplanet Atmospheres Conference (AAS)

Extracting Lens Star Properties From a Blended Source-Lens Spectra *Nov 2022*
Great Lakes Exoplanet Area Meeting (GLEAM)