Charlie Tolley

Education

2021-2025 **Bachelor of Arts**, *University of California, Berkeley*, Berkeley, CA, *GPA - 3.3*
Astrophysics

Research Experience

Electromagnetically Isolated Global Signal Estimation Platform (EIGSEP)

RF and Electronics Engineering — I worked on iterating antenna designs with postdoc Bahram Khalichi in Aaron Parsons's group. This involved developing Printed Circuit Boards (PCBs) for RF (Radio Frequency) signals, including a Balun board for the antenna on the EIGSEP experiment. I have also designed PCBs and power supplies for the RF signal chain.

Deployment and Observing — I have been a part of 3 separate trips into the Marjum Pass canyon in Western Utah where the EIGSEP telescope is deployed, assisting with lifting, testing and troubleshooting. In the lab, I have set up and run calibration measurements on the full system as deployed on site.

Data Analysis — I am analyzing data from the most recent (July 2025) deployment, specifically with respect to in-situ calibration measurements and radio frequency interference.

Optical Observing at CTIO

Dark Energy Calibration Survey — I ran observing at the Blanco 4m telescope mounted with the Dark Energy Camera in person and remotely for the Dark Energy Calibration Survey (DECaLS). I gained proficiency troubleshooting from the system GUIs and the terminal where we run our targeting script.

0.9m Telescope — Alongside grad students Aman Kar and Sebastian Carrazco working under Todd Henry at Georgia State University, I helped to run and ran solo observing for their research group.

PSF Outlier Spectra Analysis at DESI

Secondary Target Analysis — I worked at Lawrence Berkeley Lab with the DESI cosmology group under David Schlegel to identify and analyze astronomical objects in the secondary target set that lie off of the stellar main sequence.

Visual Inspection Campaign with NOIRLab

Subaru and ODIN LAE Galaxies — With data from Subaru telescopes and ODIN, I worked with Arjun Dey and others to visually inspect possible Lyman Alpha Emitters, providing necessary insight into the depths possible for DESI-II.

Research Talks

Field Outreach Talks — While in the field with EIGSEP, I gave several 5-10 minute impromptu talks to the public as they walked through our deployment site.

2682 Sacramento St – Berkeley, CA 94702
(530)309-5588 • *tolley412@berkeley.edu*

Rare Gems in Big Data Conference
I presented a poster at the inaugural gathering of the Rare Gems in Big Data Conference hosted by Noirlab. I gave a 2 minute lightning poster talk on my work with the DESI collaboration on outlier spectral analysis.

Teaching Experience

Python DeCal
I am a current Instructor for the Introduction to Python for Astronomers DeCal (a class run by and for undergraduates) in the start of my 4th year of teaching. Throughout my tenure with the instructional team, I have mentored students in research, developed curriculum in conjunction with faculty, and run the course as the Head Instructor.

UCB Undergraduate Student Instructor
I was a uGSI/TA for the Introduction to General Astronomy course under Alex Filippenko in Fall 2024 and the Radio Astronomy Laboratory under Aaron Parsons in Spring 2025. I helped develop curriculum, I held office hours, and navigated working with students in both a large lecture setting and a smaller lab setting.

Skills

Software and Analysis Skills
Python (Proficient), Java (Beginner), Fourier Analysis, Signal Processing

Hardware Skills
Soldering, woodworking, some metal work, electronics, PCB design.

Soft Skills
Critical Thinking, Thoughtful Critique, Cooperating in a Team Environment, Teaching/Mentoring

Languages:
English - First Language, Spanish - Second Language (Intermediate)

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