

EDUCATION

University of California, Berkeley

B.A. Physics and Honors Candidate in Astrophysics GPA: 3.63

Berkeley, CA
expected Dec 2023

SKILLS

Programming Languages Python, \LaTeX , HTML, LabVIEW

Technologies GitHub, Adobe Lightroom and Photoshop, Google Drive.

Libraries Numpy, Scipy, Astropy, PyTorch, Pandas, PYMC, Astroquery, sklearn, Jupyter, Matplotlib

Communication Spanish (Native), English, French (elementary)

RESEARCH EXPERIENCE

Undergraduate Researcher

Feb 2022 — Present

Zwicky Transient Facility (ZTF) and Nickel Observer under Alex Filippenko

Berkeley, CA

- Developed and implemented interactive software in Python to analyze and track the spectral evolution of normal Type Ia Supernovae, leveraging our group's Supernova Database.
- ZTF Remote Checker:** Collaborating with the ZTF team, I contribute to the search for supernova candidates by analyzing transient images from the previous night, and recommending follow-up observation.
- Certified Nickel 1 Meter Telescope Observer:** Monthly overnight photometric observer of supernovas, gamma-ray bursts, and hot Jupiters. Successfully completed certification training, including observations for 20+ nights.

Astromatic Hackathon

Aug 2023

Ciela Institute, Université de Montréal

Montreal, Canada

- Actively participated in lectures, workshops, and a 30-hour hackathon competition exploring the connection between astrophysics and machine learning. The program encompassed career seminars, scientific discussions, programming workshops, and networking opportunities.
- Awarded First Place**, within a group three, by developing a simulation-based inference model designed to predict gravitational lensing parameters and presented our findings to a panel of leading experts in Astronomy from Ciela.

Research intern under Florian Sarron (Ph.D) & Nicolas Clerc (Ph.D)

June 2023 — Aug 2023

Institut de Recherche en Astrophysique et Planétologie (IRAP)

Toulouse, France

- Developed a galaxy cluster matching algorithm to find the Temple Groups from the Sloan Digit Sky Survey (SDSS) associated with an x-ray emission detected by the XCLASS survey with confirmed spectroscopic redshift.
- Performed statistical analysis of the scaling relationship between the mass of the XCLASS galaxy cluster and the cosmic web filament connectivity using the skeleton provided by the SDSS.
- Validated simulations from the Eagle Project by comparing the distribution of the distance between the X-ray emission from the inter-cluster medium to its associated node in the cosmic filament, proving that the distance was proportional to the mass of the galaxy cluster.

PROFESSIONAL EXPERIENCE

Undergraduate Graduate Student Instructor: Astro C10

Aug 2023 — Present

University of California, Berkeley

Berkeley, CA

- Worked under the guidance of Professor Alex Filippenko in teaching Astro C10, a top-rated general astronomy course.
- Facilitated two discussion sections, conducted weekly office hours, facilitated exam review sessions, and organized star parties to engage students from diverse academic backgrounds in the field of astronomy.

Python BootCAMP Instructor

Aug 2023 — Present

Cal New Experiences for Research and Diversity in Science (NERDS)

Berkeley, CA

- Co-instructed a weekend introductory Python workshop, serving over 40 STEM students from diverse backgrounds, including community college students, undergraduates, and graduate students with no prior Python experience.
- Designed curriculum, streamlined and problem-solved the installation process for programs like Anaconda and Jupyter.

Course Reader: Astro 160*University of California, Berkeley***Aug 2022 — Dec 2022***Berkeley, CA*

- Reviewed and assessed student problem sets and final research papers for the Stellar Physics course taught by Professor Raffaella Margutti.
- Provided detailed feedback and comments on student coursework including programming and computational skills.

Academic Mentor*Calculus Round Table***Feb 2021 — Dec 2022***Oakland, CA*

- **Facilitated engaging instruction for K-5 classroomss**, overseeing 20+ students, and conducted personalized one-on-one tutoring sessions with high school students. Covered subjects included biology, math, astronomy, and Python programming, with an emphasis on empowering and supporting underprivileged schools within the West Contra Costa Unified School District.
- **Developing curriculum**, specifically on technology use, to effectively teach classes during the COVID-19 stay-at-home order.
- **Assisted** students at the Juvenile Justice Center in San Leandro, CA by providing valuable guidance and mentorship, aiding them in formulating a post-release plan to embark on a new life.

Wolf Kitchen Manager*Berkeley Student Cooperative***Aug 2021 — Aug 2022***Berkeley, CA*

- **Uphold and Maintain** professional kitchen standards for Wolf House (30 members) working 20 hours per week.
- **Budget \$20,000** worth of Food and Supplies for the House, providing weekly budget reports for members.
- *ServeSafe Certified*

R.I.S.E Mentor*Berkeley High School***Aug 2020 — Sept 2021***Berkeley, CA*

- Mentor and tutor students from underprivileged backgrounds and coach them to be college ready.

RESEARCH PROJECTS**Derivation and Simulation of Photon Trajectory from the Schwarzschild Metric****Spring 2022***Astro 161*

- Derived the photon trajectories in a non-rotating black hole using the Schwarzschild metric and simulated them using a Python code. I presented my project in a research paper format along with a 30-second animation of the photon orbits.

Beat Frequency Metal Detector**Spring 2022***Physics 111a*

- Designed a beat frequency metal detector using circuit elements such as op-amps, mixers, feedback loops, and JFETS. The metal detector was tuned using software programs such as Dilgent, LabView, and SPICE.

Stellar Environment and Its Influence on Super Massive Black Holes**Fall 2021***Astro 160*

- Final Research paper where I contemplated the origins of Super Massive Black Holes at the center of Galaxies by referencing peer-reviewed papers from the Astrophysical Journal and producing an original figure of the $M-\sigma$ Relationship.

AWARDS

- LSAMP NSF International Center of Excellence (NICE) fellowship.
 - Selected to participate in the summer of 2023 at the Institut de Recherche en Astrophysique et Planétologie (IRAP) associated with the Université Paul Sabatier, Toulouse III and the Centre National de la Recherche Scientifique (CNRS).
- NFS CAMP/LSMAP Research and Travel fellowship.
- Rose Hill Foundation Scholarship
- California Middle-Class Scholarship
- Berkeley CARES award
- Berkeley Scholarship
- Simon Family Foundation Scholarship

CONFERENCES

- **2023 NSF CAMP Statewide Symposium & Special Merit Award** recipient for my research presentation: Population Study of the Velocity of Silicon II Lines in Type Ia Thermonuclear Supernova Explosions.
- **2022 & 2023 CAL NERDS NDISTEM** UC Berkeley travel grant recipient for the National Diversity in STEM (NDISTEM) conference. The conference is hosted by the Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS).