Juliana S. M. Karp

they/them | juliana.karp@yale.edu | julianakarp.wordpress.com | github juliana-karp

Education

University of Washington — Seattle, WA
PhD in Astronomy, NSF Graduate Research Fellow and ARCS Scholar — *beginning September 2025*

Yale University — New Haven, CT
Bachelor's of Science in Astrophysics — *May 2025*

Research Experience

Senior Thesis: Spectroscopic Gravitational Lens Search — August 2024 – Present
Yale University — *New Haven, CT*

- Searching for strong galaxy-galaxy gravitational lens candidates in Dark Energy Spectroscopic Instrument (DESI) survey data, as a continuation of summer 2024 research at LBNL.
- As Principal Investigator, wrote a Gemini Observatory Fast Turnaround proposal to confirm one lens candidate via Integral Field Unit spectroscopy.
- PIs: Nikhil Padmanabhan and David Schlegel.

SULI Intern: Spectroscopic Gravitational Lens Search — June 2024 – August 2024
Ernest O. Lawrence Berkeley National Laboratory — *Berkeley, CA*

- Identified 168 strong gravitational lens candidates in DESI data via a background [O II] emission line search of luminous red galaxy spectra.
- PI: David Schlegel.

Undergraduate Researcher: Simulating Diffuse Cluster Gas — January 2024 – June 2024
Yale University — *New Haven, CT*

- Explored covering fraction and velocity dispersion of neutral hydrogen in IllustrisTNG Fornax-like galaxy clusters.
- PI: Daisuke Nagai.

SR-EIP Intern: The Environment Around NGC 4993 — June 2023 – Present
Stanford Kavli Institute for Particle Astrophysics and Cosmology — *Stanford, CA*

- Identified 11 new members of the NGC 4993 group, calculated a group halo mass of $10^{13} M_{\odot}$, and evaluated and improved targeting strategies for the DESI Low-Z Secondary Target program.
- PI: Risa Wechsler.

SEA Intern: Anisotropic Satellite Galaxy Quenching — June 2022 – May 2023
Stanford Kavli Institute for Particle Astrophysics and Cosmology — *Stanford, CA*

- Showed that anisotropic satellite galaxy quenching is a natural consequence of hierarchical structure formation in two state-of-the-art cosmological galaxy formation models, UniverseMachine and IllustrisTNG, and is therefore not a reliable indicator of supermassive black hole feedback.
- PI: Risa Wechsler.

Publications

- **Karp, J. S. M.**, Lange, J. U., & Wechsler, R. H. 2023, ApJ Letters, 949, L13. doi:10.3847/2041-8213/acd3e9.
  Anisotropic Satellite Galaxy Quenching: A Unique Signature of Energetic Feedback by Supermassive Black Holes?

Teaching Experience

ASTR 220 Tutor — Spring 2025
Yale University Poorvu Center for Teaching and Learning — *New Haven, CT*

- Teaching one-on-one advanced introductory astronomy focused on galaxies, black holes, and cosmology.

ASTR 110 Tutor — Fall 2024
Yale University Poorvu Center for Teaching and Learning — *New Haven, CT*

- Teaching one-on-one introductory astronomy focused on planetary and stellar evolution.

Asternoise Teaching Tool — Spring 2023
Independent Teaching Project — *New Haven, CT*

- Coded a visualization teaching tool to explain how CCD noise adds and affects data collection under different observing conditions. Used by Prof. Malena Rice in Yale's ASTR 255 course. Web app and github code.

Outreach Experience

AstroSibs Coordinator 2023 – 2025

Department of Astronomy, Yale University *New Haven, CT*

- Paired 40+ Yale astronomy undergraduates, graduate students, and postdocs for small-group mentoring re astronomy careers, academia, coursework, research, applications, and community.
- Organized professional development workshops, e.g. advice for undergraduates applying to REUs and PhDs.
- Hosted bimonthly department-wide holiday parties and socials to increase belonging within the department.
- Met weekly with my matched AstroSibs to share insights, feedback, and advice.

Astronomy Climate and Diversity Committee Member 2024 – 2025

Department of Astronomy, Yale University *New Haven, CT*

- Helped plan Python Research Preparation Series for first-year undergraduates and develop strategies to recruit more astronomy students from underrepresented backgrounds.

Poster Presentations

- **245th Meeting of the American Astronomical Society (January 2025):** Spectroscopic Identification of Strong Gravitational Lensing Candidates with DESI.
- **The Department of Energy's Student Undergraduate Laboratory Internships at Lawrence Berkeley National Laboratory (August 2024):** Toward a Catalog of Strong Gravitational Lenses with the Dark Energy Spectroscopic Instrument.
- **243rd Meeting of the American Astronomical Society (January 2024):** Characterizing the Environment around NGC 4993 and the Coma Cluster to Determine the Conditions for the Formation and Merger of Binary Neutron Stars.
- **The Leadership Alliance's Summer Research Early Identification Program at Stanford University (August 2023):** Characterizing the Environment around NGC 4993 and the Coma Cluster with the Dark Energy Spectroscopic Instrument.

Talks

- **Yale Undergraduate Kickoff (September 2024):** Spectroscopic Identification of Strong Gravitational Lens Candidates with DESI.
- **Meeting of Astrophysics Students at Stanford University (July 2023):** Anisotropic Satellite Galaxy Quenching: A Unique Signature of Energetic Feedback by Supermassive Black Holes?
- **Yale Galaxy Lunch (March 2023):** Anisotropic Satellite Galaxy Quenching: A Unique Signature of Energetic Feedback by Supermassive Black Holes?
- **Yale Undergraduate Kickoff (September 2022):** Exploring the Causes of Anisotropic Satellite Galaxy Quenching in UniverseMachine and IllustrisTNG.
- **Stanford Summer Undergraduate Research Program Final Presentation (August 2022):** Exploring the Causes of Anisotropic Satellite Galaxy Quenching in UniverseMachine and IllustrisTNG.

Awards & Fellowships

- **National Science Foundation (NSF) Graduate Research Fellowship Program** ($159,500, 2025-2030)
- **Achievement Rewards for College Scientists (ARCS) Foundation Fellowship** ($22,000, 2025-2028)
- **AAS Chambliss Astronomy Achievement Student Awards, Winner** (2025)
- **U.S. Department of Energy's Science Undergraduate Laboratory Internships** ($9,500, 2024)
- **AAS Chambliss Astronomy Achievement Student Awards, Honorable Mention** (2024)
- **The Leadership Alliance's Summer Research Early Identification Program** ($4,000, 2023)
- **Yale French Department Henry W. Scott Prize, 2nd Place** ($250, 2022)
- **Yale Summer Experience Award** ($4,000, 2022)
- **French Baccalaureate Diploma with International Option and Highest Honors** (2021)

Relevant Coursework

Yale University
ASTR 610: Theory of Galaxy Formation
ASTR 465: The Evolving Universe
ASTR 356: Astrostatistics and Data Mining
ASTR 360: Interstellar Matter and Star Formation
ASTR 330: Scientific Computing in Astrophysics
ASTR 320: Physical Processes in Astronomy
ASTR 310: Galactic and Extragalactic Astronomy
ASTR 255: Research Methods in Astrophysics
ASTR 210: Stars and Their Evolution
PHYS 439: Basic Quantum Mechanics
PHYS 430: Electromagnetic Fields and Optics
PHYS 410: Advanced Classical Mechanics
MATH 246: Ordinary Differential Equations
MATH 225: Linear Algebra
MATH 120: Multivariable Calculus
UC Berkeley Summer Session
ASTR 9: Select Topics in Astronomy: Python Programming

Other Interests

- **Swimming**: Yale Club Swim Team, USA Masters Swimming, & USA Swimming (2012–Present).
- **Figure Skating**: Co-Captain, Board Member, and Skater, Yale Collegiate Figure Skating Club (2021–2025). Supervised practice sessions, handled $15,000 annual budget, organized team social events, planned trips to competitions, ran annual ice show, choreographed programs for competition and ice show.

Skills & Qualifications

Memberships: American Astronomical Society (2023-present), San Francisco Amateur Astronomers (2015-2022)
Programming Languages: Python, Unix
Languages: English (native), French (fluent), Spanish (proficient)