





# James Sunseri

## Astrophysics Graduate Student

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### EDUCATION

<b>Princeton University</b> <i>Hertz Fellow</i> Ph.D. Astrophysical Sciences M.S. Astrophysical Sciences	Princeton, NJ  Expected 2028 2025
<b>University of California Berkeley</b> B.A. Physics; B.A. Astrophysics with High Distinction   Advisors: Prof. Alex Filippenko, Prof. Jia Liu, Prof. Zachary Slepian	Berkeley, CA 2022

### RESEARCH INTERESTS

- Implications of baryonic feedback on cosmology
- Magnetohydrodynamical simulations of high-energy astrophysical phenomena
- Higher-order statistics and N-Point Correlation Functions
- Machine learning and generative models
- Efficient algorithm design for large datasets

### POSITIONS

<b>Visiting Student Researcher, Kavli IPMU</b> <i>The Effects of Massive Neutrinos and Dark Energy on the Cosmic Web</i>   Advisor: Prof. Jia Liu	Kashiwanoha, Japan 2023
<b>Student Researcher, UC Berkeley</b> <i>Transient Based Observational Astronomy</i>   Advisor: Prof. Alex Filippenko	Berkeley, CA 2018 - 2022
<b>Student Researcher, University of Florida</b> <i>SARABANDE: a python package for measuring 3/4 PCFs with FFTs</i>   Advisor: Prof. Zack Slepian	Remote 2021 - 2023
<b>Student Researcher, University of Tokyo</b> <i>The Effects of Baryonic Feedback on the Cosmic Web</i>   Advisor: Prof. Jia Liu	Remote 2020 - 2023
<b>NSF Summer Research Experience for Undergraduates, University of Florida</b> <i>Fast Four Point Statistics of Turbulence in the Interstellar Medium</i>   Advisor: Prof. Zack Slepian	Gainesville, FL 2021
<b>LIGO Summer Undergraduate Research Fellowship, Caltech</b> <i>Measuring The Hubble Constant With Dynamical Tides In Inspiralng Neutron Star Binaries</i>   Advisor: Dr. Hang Yu	Pasadena, CA 2020

### PUBLICATIONS

1. **Sunseri, James**; Amon, Alexandra; Dunkley, Jo; Battaglia, Nicholas; *et al.*, 2025, *Disentangling the Halo: Joint Model for Measurements of the Kinetic Sunyaev-Zeldovich Effect and Galaxy-Galaxy Lensing*, ArXiv ([arXiv:2505.20413](https://arxiv.org/abs/2505.20413)) [2 citations]
2. **Sunseri, James**; Bayer, Adrian E.; & Liu, Jia, 2025, *The Power of the Cosmic Web*, ArXiv ([arXiv:2503.11778](https://arxiv.org/abs/2503.11778)) [1 citation]
3. Williamson, Victoria; **Sunseri, James**; Slepian, Zachary; Hou, Jiamin; & Greco, Alessandro, 2024, *First Measurements of the 4-Point Correlation Function of Magnetohydrodynamic Turbulence as a Novel Probe of the Interstellar Medium*, ArXiv ([arXiv:2412.03967](https://arxiv.org/abs/2412.03967)) [1 citation]
4. Alvarado, Efrain; Bostow, Kate B.; Patra, Kishore C.; Jacobus, Cooper H.; *et al.* (17 other co-authors, incl. **Sunseri, James**), 2024, *Searching for tidal orbital decay in hot Jupiters*, MNRAS, **534**, 800 ([arXiv:2409.04660](https://arxiv.org/abs/2409.04660)) [3 citations]
5. Ailawadhi, B.; Dastidar, R.; Misra, K.; Roy, R.; *et al.* (33 other co-authors, incl. **Sunseri, James**), 2023, *Photometric and spectroscopic analysis of the Type II SN 2020jfo with a short plateau*, MNRAS, **519**, 248 ([arXiv:2211.02823](https://arxiv.org/abs/2211.02823)) [16 citations]
6. **Sunseri, James**; Li, Zack; & Liu, Jia, 2023, *Effects of baryonic feedback on the cosmic web*, Physical Review D, **107**, 23514 ([arXiv:2212.05927](https://arxiv.org/abs/2212.05927)) [15 citations]
7. **Sunseri, James**; Slepian, Zachary; Portillo, Stephen; Hou, Jiamin; *et al.*, 2023, *SARABANDE: 3/4 point correlation functions with fast Fourier transforms*, RAS Techniques and Instruments, **2**, 62 ([arXiv:2210.10206](https://arxiv.org/abs/2210.10206)) [11 citations]

8. Murakami, Yukei S.; Jennings, Connor; Hoffman, Andrew M.; Savel, Arjun B.; *et al.* (6 other co-authors, incl. **Sunseri, James**), 2022, *PIPS, an advanced platform for period detection in time series - I. Fourier-likelihood periodogram and application to RR Lyrae stars*, MNRAS, **514**, 4489 ([arXiv:2107.14223](#)) [[3 citations](#)]
9. Zheng, WeiKang; Stahl, Benjamin E.; de Jaeger, Thomas; Filippenko, Alexei V.; *et al.* (84 other co-authors, incl. **Sunseri, James**), 2022, *The Lick Observatory Supernova Search follow-up program: photometry data release of 70 SESNe*, MNRAS, **512**, 3195 ([arXiv:2203.05596](#)) [[13 citations](#)]
10. Kilpatrick, Charles D.; Coulter, David A.; Arcavi, Iair; Brink, Thomas G.; *et al.* (79 other co-authors, incl. **Sunseri, James**), 2021, *The Gravity Collective: A Search for the Electromagnetic Counterpart to the Neutron Star-Black Hole Merger GW190814*, ApJ, **923**, 258 ([arXiv:2106.06897](#)) [[43 citations](#)]

## POSTERS & RESEARCH TALKS

- **The Effects of Baryons on the Cosmic Web:** Kavli IPMU, Chiba University, University of Tokyo, Nagoya University - 2023 [[Slides](#)]
- **LIGO SURF Caltech Summer Talk:** Presented my research to fellow SURF participants, LIGO research scientists, and mentors of the program.
- **237th American Astronomical Society Meeting iPoster Presentation:** Presented a research project via iPoster about gravitational wave cosmology I had done over summer in the LIGO SURF Program. (Featured on [AstroBites](#))
- **238th American Astronomical Society Meeting iPoster+ Presentation:** Our group presented a research project via iPoster+ on a new four band photometry approach of measuring the temperature of variable stars over a period cycle.

## OUTREACH

**TEDxAustin Youth** Austin, TX  
*Guest Speaker, "The Essential Skill You Can't Afford To Ignore In Today's Digital World"* Spring 2023

**World of Wonders Science Museum** Lodi, CA  
*The local science museum of the San-Joaquin County* Summer 2017 - Present

- Co-wrote and Wrote 5 lessons for the WOW Education Programming. *Art of Alchemy, Narrowing on Newton, Solar System and Beyond II, What is Gravity, and Lunar School* and compiled 80+ Lessons for summer camps
- Helped plan and teach several summer camps for the past few years. *Astronaut Training, Science Wizards, Science Detectives, Terrific Tinkering, etc...*
- Trained to operate Lodi Unified School District's portable planetarium known as the StarLab
- Taught several Lunar School lessons for the WOW during the Apollo 11 50th Anniversary
- Helped teach with the outreach program for the WOW known as WOW on Wheels and helped run both Forensics and Astronaut Camps
- In the promotional video for the huge future expansion of the WOW
- Successfully taught two lessons at the local middle school during my senior year of high school
- Was on the news network known as Good Day Sacramento for the WOW Museum to celebrate the Apollo 11 50th Anniversary

**SPLASH at UC Berkeley** Berkeley, CA  
*student led High School outreach program at UC Berkeley* Spring 2021

- **Video Games & Simulations 101:** A talk where I teach high school students the basics of Python and walk through how to build a video game using only Python followed by a discussion of how it all relates to Astrophysical Simulations in research.

## TEACHING

**Head Undergraduate Student Instructor for Astro C10** Berkeley, CA  
*Astro C10 - Introduction to Astronomy* Fall 2022

- I am the first undergrad to be the head student instructor that oversees the logistics of the Introduction to Astronomy course at UC Berkeley containing 900+ students. In this role I teach students, plan the logistics for the entire course, and oversee other student instructors and graders for the course.

**Undergraduate Student Instructor for Astro C10** Berkeley, CA  
*Astro C10 - Introduction to Astronomy* Fall 2020

- I was a UGSI for the Introduction to Astronomy course taught by Professor Alex Filippenko at UC Berkeley. I taught 4 sections, hosted office hours, prepared lessons and quizzes, and proctored exams

**Head Facilitator for the Python Decal: Astro 98** Berkeley, CA  
*Python Decal - Introduction to Computational Methods for Astronomers* Fall 2020 - Present

- As head facilitator for this course I have planned the entire course with the help of other facilitators, developed the curriculum, given lectures, hosted office hours, and assigned and graded homework and projects. I also secured funding to pay the course staff and interns with the funds of the Berkeley Discover grant.

## MENTORSHIP

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### ULAB Research Mentor: Numerical Spin Analysis of Relativistic Bondi Accretion in M87\*

Berkeley, CA

ULAB - Undergraduate Laboratory at Berkeley

Fall 2021 - Spring 2022

- I mentored a group of undergraduate students to complete a year long research project where they explored the effects of black hole spin on relativistic Bondi Accretion for a simple model of M87\*. In this project I taught basic fundamentals of relativity and computational hydrodynamics. Their poster can be found [here](#).

### UC Berkeley Compass Mentor

Berkeley, CA

Served as a mentor for a younger undergraduate student

Spring 2021

### Berkeley High School RISE Mentor

Berkeley, CA

A tutor and mentor to struggling high school students from underprivileged families

Fall 2018 - Spring 2020

## SKILLS & ASSETS

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- **Programming Languages:** Python, UNIX, Julia, Java, C++, HTML, Javascript, CSS
- **Clusters:** Anvil Rosen Center for Advanced Computing, HiPerGator3.0 at University of Florida, Savio at UC Berkeley
- **Astrophysical Simulation Codes:** Athena++, Modules for Experiments in Astrophysics (MESA)
- **Technologies:** GitHub, SLURM, OpenMP, MPI, Adobe Illustrator, Adobe Photoshop, Adobe Premier Pro, Microsoft Office Programs, Google Drive
- **Libraries:** Numpy, Scipy, Pandas, astropy, yt, H5py, Jupyter, PyGame, Matplotlib, ffmpeg
- **Languages:** English, French

## AWARDS

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- Fannie and John Hertz Foundation Fellowship
- Department of Energy Computational Science Graduate Research Fellowship (DOE CSGF) - (**Declined**)
- Outstanding (U)GSI Teaching Award
- Chambliss Award for Best Research Poster at 238th AAS Meeting (shared)
- Recipient of the Northern California Scholarship Foundations Award
- Q728 Lui, P & Chang, J Phys Scholarship
- Berkeley Scholarship
- 7 Separate Astronomy Departmental Scholarships for Teaching
- Ehrman, Albert Scholarship
- Berkeley CARES Award
- Edward Frank Kraft Award

## EXTRACURRICULARS

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- Undergraduate Student Representative for the Astronomy Department at UC Berkeley
- Undergraduate Peer Advisor for the Astronomy Department at UC Berkeley
- Camp Kesem Berkeley Counselor, Unit Leader, and Program Coordinator
- Society of Physics Students member
- Undergraduate Astronomy Society member
- Member of the Cercle de Français at UC Berkeley