

B R I A N H S U

Ph.D. Candidate in Astronomy and Astrophysics
Steward Observatory, University of Arizona | Tucson, AZ
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Research Positions

Graduate Research Assistant - University of Arizona	2023 - present
Undergraduate Research Assistant - Harvard University	2020 - 2023

Education

University of Arizona	Tucson, AZ
Ph.D. in Astronomy and Astrophysics	Expected 2028
Advisor: Prof. Nathan Smith	
Thesis: "The Swan Song and Demise of Massive Stars Near and Far"	
Certificate in College Teaching	Expected 2026
M.S. in Astronomy and Astrophysics	2025
Advisor: Prof. Nathan Smith	
Harvard University	Cambridge, MA
A.B. in Astrophysics and Physics, secondary in Mathematical Sciences	2023
Cum Laude with Highest Honors in Field	
Advisors: Prof. Edo Berger and Dr. Peter K. Blanchard	
Thesis: "The Offset and Host Light Distributions of Superluminous Supernovae: Archival Deep Dive with the Hubble Space Telescope"	

Awards and Honors

NSF Graduate Research Fellowship Program Honorable Mention	2024
Thomas Temple Hoopes Prize, Harvard University (\$5k)	2023
URAF Conference Funding Grant, Harvard University (\$1k)	2022
FAMOUS Travel Grant, AAS (\$600)	2022
Leo Goldberg Prize for Best Junior Thesis, Harvard Department of Astronomy (\$500)	2021
Harvard College Research Program (\$6k each)	2020, 2022

Academic Teaching Experience

University of Arizona	Tucson, AZ
Graduate Teaching Assistant	
ASTR 170B1-H - Exploring Our Universe (Honors Section)	Fall 2025
ASTR 545 - Astrophysics of Stars and Planets	Spring 2024
Mathnasium of Needham	virtual
K-12 Mathematics Tutor	Feb 2022 - Jun 2022
Harvard University	Cambridge, MA
Team Leader	
Math Fluency Initiative	Summer 2021
Undergraduate Teaching Fellow	
ASTRON 16 - Stellar and Planetary Astronomy	Spring 2021, Spring 2023
Course Assistant	
MATH 21B - Linear Algebra and Differential Equations	Fall 2019, Spring 2020, Fall 2020, Spring 2021

Leadership and Membership

Member , DLT40 Collaboration	2024 - present
Member , Global Supernova Project	2023 - present
Co-President , Harvard College Astronomical Society (AstroSoc)	2022 - 2023
Member , American Astronomical Society (AAS)	2021 - present
Treasurer , Harvard College Astronomical Society (AstroSoc)	2020 - 2022
Member , Harvard College Astronomical Society (AstroSoc)	2019 - 2023
Member , Harvard-Radcliffe Society of Physics Student (SPS)	2018 - 2023

Outreach and Service

UA Sky School Instructor , Mt. Lemmon Sky Center	2025 - present
Session Chair , Superluminous 2025 Conference	2025
Graduate Representative , Steward Observatory Graduate Admissions Committee	2024 - present
Pen Pal - Letters to a Pre-Scientist	2023 - present
Cluster Leader and Mentor - Harvard AstroSoc Mentorship Program	2022 - 2023

Telescope Proposals

Gemini Large and Long Program (LLP) - Co-I: 70.2 hours <i>"Ashes to Ashes: A Long-term Study of Supernova Interaction with GHOST"</i>	2025B - 2028A
SOAR 4.1m Telescope - Co-I: ??? nights/hours <i>"DECam Shadowing of LSST to Discover the Youngest Transients in the Nearby Universe"</i>	2025B - 2028A
SOAR 4.1m Telescope - Co-I: 500 hours <i>"PASSTA: The Public AEON Spectroscopic Survey for Transient Astronomy"</i>	2025B - 2028A
Gemini Large and Long Program (LLP) - Co-I: 150 hrs <i>"Gemini as the Ultimate Time Domain Follow-up Machine: Understanding the Nearest Cosmic Explosions"</i>	2024B - 2027A
LBT Observatory/Multi-Object Double Spectrographs - PI: 2 nights, Co-I: 4 nights	2025A - 2025B
Steward Observatory 90" Bok Telescope/B&C Spectrograph - PI: 12 nights, Co-I: 10 nights	2025A - 2025B
Hubble Space Telescope - Co-I: 252 orbits	GO Cycle 32

Observing Experience

Cerro Tololo Inter-American Observatory Víctor M. Blanco 4m Telescope/DECam - 1 night (remote)
MMT Observatory 6.5m Telescope/Blue Channel spectrograph - 13 nights (remote)
Steward Observatory 90" Bok Telescope/B&C spectrograph - 20 nights
Harvard University 16" Clay Telescope - 7 nights
Fred Lawrence Whipple Observatory 1.2m Telescope/KeplerCam - 1 night (remote)
Harvard College Observatory 1.2m Millimeter-Wave Telescope - 100+ nights

Presentations

Contributed Talk	Superluminous Supernovae at the Dawn of New Surveys, Cambridge, MA, 2025
Conference Talk	241 st American Astronomical Society Meeting, Seattle, WA, 2023
Poster	241 st American Astronomical Society Meeting, Seattle, WA, 2023
Conference Talk	Spoken-WERRD Meeting, virtual, 2022
Conference Talk	240 th American Astronomical Society Meeting, Pasadena, CA, 2022
Invited Talk	BigBoom Meetings, University of Arizona, virtual, 2021
Invited Talk	Supernova Journal Club, University of California, Davis, virtual, 2021

Skills

Software	Languages
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Data Analysis: IRAF, PyRAF, DS9
 Technical: LaTeX, Microsoft Suites
 Programming: Python, Fortran90

Mandarin Chinese (Native proficiency)
 English (Bilingual proficiency)
 Korean (Limited working proficiency)

Refereed Publications

ORCID: 0000-0002-9454-1742

Count: 4 first author; 16 total

h-index: 4 first author; 7 total

Citations: 55 first author; 168 total

First Author

4. **Hsu, B.**, Smith, N., Goldberg, J. A., Bostroem, K. A., Hosseinzadeh, G., et al. Accepted to ApJ. 2025
 One Year of SN 2023ixf: Breaking Through the Degenerate Parameter Space in Light-Curve Models with Pulsating Progenitors
3. **Hsu, B.**, Blanchard, P. K., Berger, E., Gomez, S. ApJ, 961, 169 2024
 An Extensive Hubble Space Telescope Study of the Offset and Host Light Distributions of Type I Superluminous Supernovae
2. **Hsu, B.**, Hosseinzadeh, G., Villar, V. A., Berger, E. ApJ, 937, 13 2022
 Photometrically-Classified Superluminous Supernovae from the Pan-STARRS1 Medium Deep Survey: A Case Study for Science with Machine Learning-Based Classification
1. **Hsu, B.**, Hosseinzadeh, G., Berger, E. ApJ, 921, 180 2021
 Magnetar Models of Superluminous Supernovae from the Dark Energy Survey: Exploring Redshift Evolution

Co-author

12. Bostroem, K. A., et al. (incl. **Hsu, B.**). Submitted to ApJ 2025
 Late-time HST UV Spectra of SN 2023ixf and SN 2024ggi Show Ongoing Interaction with Dense Circumstellar Material
11. Pearson, J., et al. (incl. **Hsu, B.**). Submitted to ApJ 2025
 Mid-Infrared Dust Evolution and Late-time Circumstellar Medium Interaction in SN 2017eaw
10. Boesky, A., Villar, V. A., Gagliano, A., **Hsu, B.** Submitted to ApJS 2025
 SPLASH: A Rapid Host-Based Supernova Classifier for Wide-Field Time-Domain Surveys
9. Singh, M., et al. (incl. **Hsu, B.**). Submitted to ApJ 2025
 Photometry and Spectroscopy of SN 2024pxl: A Luminosity Link Among Type Iax Supernovae
8. Kwok, L., et al. (incl. **Hsu, B.**). ApJL, 989, L33 2025
 JWST and Ground-based Observations of the Type Iax Supernovae SN 2024pxl and SN 2024vjm: Evidence for Weak Deflagration Explosions
7. Shrestha, M., et al. (incl. **Hsu, B.**). ApJL, 982, L32 2025
 Spectropolarimetry of SN 2023ixf Reveals Both Circumstellar Material and Helium Core to be Aspherical
6. Andrews, J. E., et al. (incl. **Hsu, B.**). ApJ, 980, 37 2025
 Asymmetries and Circumstellar Interaction in the Type II SN 2024bch
5. Gomez, S., et al. (incl. **Hsu, B.**). MNRAS, 535, 471-515 2024
 The Type I Superluminous Supernova Catalogue I: Light-Curve Properties, Models, and Catalogue Description
4. Shrestha, M., et al. (incl. **Hsu, B.**). ApJL, 927, L15 2024
 Extended Shock Breakout and Early Circumstellar Interaction in SN 2024ggi
3. Arcand, K. K., et al. (incl. **Hsu, B.**). Frontiers in Communication, Volume 9 2024

- A Universe of Sound: Processing NASA Data into Sonifications to Explore Participant Response
2. Arcand, K. K., et al. (incl. **Hsu, B.**). Communication, Society and Media, 5(3), 17-48 2022
Women in STEM Interview Analysis: Encouraging young female learners in STEM pathways
 1. Eftekhari, T., et al. (incl. **Hsu, B.**). ApJ, 912, 21 2021
Late-time Radio and Millimeter Observations of Superluminous Supernovae and Long Gamma-Ray Bursts: Implications for Central Engines, Fast Radio Bursts, and Obscured Star Formation

References

Prof. Nathan Smith
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