

KALEY BRAUER

Harvard University, Harvard-Smithsonian Center for Astrophysics
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EDUCATION

Ph.D. in Physics	2023
Massachusetts Institute of Technology Astrophysics Division; GPA: 5.0/5.0	
B.Sc. in Physics	2017
Brown University University honors, departmental honors, GPA: 4.0/4.0	

ACADEMIC POSITIONS

NSF Prize Postdoctoral Fellow	2023 - present
Harvard-Smithsonian Center for Astrophysics	
US Department of Energy Graduate Fellow; Graduate Researcher	2017 - 2023
Massachusetts Institute of Technology	
Visiting Research Fellow	Fall 2021
Lawrence Berkeley National Laboratory	

HONORS & AWARDS

NSF Astronomy & Astrophysics Postdoctoral Fellowship (\$330,000)	2023 - present
Department of Energy Computational Science Graduate Fellowship (~ \$450,000)	2018 - 2022
Spot Awards, MIT, <i>in recognition of community service to School of Science</i>	2020 and 2022
NSF Graduate Research Fellowship (~ \$150,000), <i>offer declined</i>	2018
Whiteman Fellowship (~ \$100,000), MIT	2017 - 2018
R. Bruce Lindsay Award, Brown University, <i>given to senior for excellence in physics</i>	2017
Eva A. Mooar Prize, Brown University, <i>given to woman for academic excellence</i>	2017
Sigma Xi Research Honor Society	2017
Karen T. Romer Undergraduate Teaching and Research Award, Brown University	2015

PUBLICATIONS

REFERREED

Chiti, A., Mardini, M. K., Limberg, G., Frebel, A., Ji, A. P., Reggiani, H., Ferguson, P., Andales, H. D., **Brauer, K.**, Li, T. S., Simon, J. D. (2024). Signatures of Extragalactic First Stars in the Large Magellanic Cloud. *Nature Astronomy*, 8, 637647.

Ji, A. P., Naidu, R., **Brauer, K.**, Ting, Y., & Simon, J. (2022). Chemical Abundances of the Typhon Stellar Stream. *Monthly Notices of the Royal Astronomical Society*, 519, 4467-4478.

Brauer, K., Andales, H., Ji, A. P., Mardini, M., Frebel, A., Gomez, F. A., & O'Shea, B. W. (2022). Possibilities and Limitations of Kinematically Identifying Stars from Accreted Ultra-Faint Dwarf Galaxies. *The Astrophysical Journal*, 937, 14.

Mardini, M., Frebel, A., Chiti, A., Meiron, Y., **Brauer, K.**, Ou, X. (2022). Characterization of the Metal Weak Thick Disk of the Milky Way. *The Astrophysical Journal*, 936, 78.

Brauer, K., Ji, A. P., Drout, M., Frebel, A. (2021). Collapsar R-Process Yields Can Reproduce [Eu/Fe] Abundance Scatter in Metal-Poor Stars. *The Astrophysical Journal*, 915, 81.

Gull, M., Frebel, A., Hinojosa, K., Roederer, I. U., Ji, A. P., **Brauer, K.** (2021). R-process-rich stellar streams in the Milky Way. *The Astrophysical Journal*, 912, 52.

Brauer, K., Ji, A. P., Frebel, A., Dooley, G. A., Gomez, F. A., & O’Shea, B. W. (2019). The Origin of r-process Enhanced Metal-Poor Halo Stars In Now-Destroyed Ultra-Faint Dwarf Galaxies. *The Astrophysical Journal*, 871, 247.

Brauer, K., Vrtillek, S. D., Peris, C., & McCollough, M. (2018). Phase-resolved spectroscopy of the low-mass X-ray binary V801 Ara. *Monthly Notices of the Royal Astronomical Society*, 478, 4894-4904.

NON-REFERREED

Brauer, K. (2021). “I’ll Finish it This Week” And Other Lies. *arXiv April Fools Paper*. arXiv:2103.16574

Brauer, K., Ji, A., Hattori, K., Escobar, S., & Frebel, A. (2019). Kinematics of highly r-process-enhanced halo stars: Evidence for origins in now-destroyed ultra-faint dwarf galaxies. *Proceedings of the International Astronomical Union*, 14(S353), 71-74.

PRESENTATIONS

INVITED

Colloquium Summer Talk at Harvard-Smithsonian CfA Cambridge, MA, USA; July 2023
“The Legacy of the First Galaxies”

Talk at US Department of Energy CSGF Program Review Washington, DC, USA; July 2022
“Studying the Tiniest, Oldest Galaxies That Merged Into the Milky Way Throughout its Formation History”

High Performance Computing Talks at IHPCSS Athens, Greece; June 2022
Invited Mentor at the International High Performance Computing Summer School

Colloquium Talk at University of Melbourne Melbourne, Australia (remote); Oct 2021
“Studying the Tiniest, Oldest Galaxies in the Milky Way’s Assembly History through Chemical Tagging and Kinematics”

Seminar Talk at Computational Research in Boston and Beyond Boston, USA (remote); Oct 2021
“Investigating Galactic Evolution through Ancient Stars & Galaxies”

Seminar Talk at Carnegie Observatories Pasadena, CA, USA (remote); Oct 2020
“Collapsars as a Source of R-Process in Metal-Poor Stars”

CONTRIBUTED

Talk at IAU Symposium 395 on Stellar Populations Paraty, Brazil; Nov 2024
“Highly-Resolved Chemical Abundances of Individual Stars from Simulated Dwarf Galaxies”

Talk at Astrophysical Origins of Carbon Tokyo, Japan; Sep 2024
“Simulating Detailed Chemical Abundances of Key Elements in Early Dwarf Galaxies”

Talk at First Stars VII NYC, NY, USA; May 2024
“Simulating Chemical Enrichment from the First Stars and Galaxies”

Talk at Galaxies from Scratch 2024	Vienna, Austria; Feb 2024
“Early Chemical Enrichment and Formation of the Smallest Dwarf Galaxies”	
Talk at 243rd Meeting of the American Astronomical Society	New Orleans, LA, USA; Jan 2024
“Early Chemical Enrichment and Formation of the Smallest Dwarf Galaxies”	
Talk at NSF Postdoctoral Fellows Symposium 2024	New Orleans, LA, USA; Jan 2024
“Simulating Chemical Enrichment and the First Galaxies”	
Talk at Flatiron CCA Galactic Frontiers	NYC, NY, USA; July 2023
“Understanding Accreted Ultra-Faint Dwarf Galaxies”	
Talk at IAU Symposium 377 on Early Disk Galaxy Formation	Kuala Lumpur, Malaysia; Feb 2023
“The Smallest, Earliest Galaxies and their Contributions to the Milky Way”	
Talk at 241st Meeting of the American Astronomical Society	Seattle, WA, USA; Jan 2023
“The Smallest Galaxies in the Milky Way’s Assembly History and the Origin of Heavy Elements”	
Talk at JINA-CEE Frontiers in Nuclear Astrophysics Meeting	South Bend, IN, USA; May 2022
“Simulating the Astrophysical Origins of Metal-Poor R-Process Stars”	
Talk at 2021 GALAH Science Meeting	Sydney, Australia (remote); June 2021
“Modeling Galactic Chemical Evolution in Dwarf Galaxies with Individual Stars”	
Talk at <i>Linking the Galactic and Extragalactic</i>	Wollongong, Australia (remote); Dec 2020
“Exploring the Low-Mass End of the Assembly History of Milky Way-Mass Galaxies”	
Talk at 235th Meeting of the American Astronomical Society	Honolulu, HI, USA; Jan 2020
“Chemical Tagging of Halo Stars From Ultra-Faint Dwarf Galaxies”	
Talk at IAU Symposium 353 on Galactic Dynamics	Shanghai, China; July 2019
“Kinematics of Highly r-Process-Enhanced Halo Stars”	
Poster at JINA-CEE Frontiers in Nuclear Astrophysics Meeting	East Lansing, MI, USA; May 2019
“Origin of r-Process-Enhanced Stars in Ultra-faint Dwarf Galaxies”	
Talk at JINA-CEE Frontiers in Nuclear Astrophysics Meeting	South Bend, IN, USA; May 2018
“Metallicity and Mass Distributions of Accreted Dwarf Satellites in Milky Way-Mass Halos”	
Poster at 229th Meeting of the American Astronomical Society	Grapevine, TX, USA; Jan 2017
“The Structures of X-ray Binary Systems V801 Ara and Cyg X-3 from Doppler Tomography”	
Poster at 47th Meeting of the Division of Planetary Science	Washington, DC, USA; Nov 2015
“The Shape of Near-Earth Asteroid 275677 (2000 RS11) From Inversion of Arecibo and Goldstone Radar Images”	

SKILLS

Programming	Python, C/C++, Julia, Java, HTML/CSS, SQL
High Performance Computing	OpenMP, MPI, OpenACC, experience with the National Energy Research Scientific Computing Center (NERSC)
Graphic Design	Adobe Creative Cloud, illustration and layout design

STUDENTS ADVISED

Christine Gyure (Harvard REU student)	Summer 2024 - present
Hillary Diane Andales (MIT undergraduate)	Summer 2020 - Spring 2023
Joseph Merkel (MIT undergraduate)	Summer 2020

TEACHING

8.03 Vibrations and Waves Teaching Assistant <i>Physics Department, Massachusetts Institute of Technology</i>	Spring 2023
8.S30 Stellar Archaeology Teaching Assistant <i>Physics Department, Massachusetts Institute of Technology</i>	Fall 2022
PHYS0220/0270 Astronomy Teaching Assistant <i>Physics Department, Brown University</i>	Fall 2014 - Spring 2015
PHYS0030 Introductory Physics Workshop Assistant <i>Physics Department, Brown University</i>	Fall 2014

LEADERSHIP & SERVICE

Leader & Mentor to Postdoc Applicants <i>Astronomy Mentorship Program for Upcoming Postdocs (AMP-UP)</i>	2023 - present
Graduate Women in Physics Leader <i>Massachusetts Institute of Technology</i>	2019 - 2023
High Performance Computing Mentor *only graduate student to ever serve as a mentor <i>International High Performance Computing Summer School, Athens, Greece</i>	June 2022
Reviewer for JOSS <i>Journal of Open Source Software</i>	2022 - present
President, MIT Salsa Club <i>Massachusetts Institute of Technology</i>	2018 - 2022
Physics Representative, Diversity and Inclusion Committee <i>MIT Graduate Student Council</i>	2018 - 2022
Cosmology Volunteer Course Designer and Instructor <i>Spark, MIT Educational Studies Program</i>	Spring 2021
Treasurer, Students for the Exploration and Development of Space <i>Massachusetts Institute of Technology</i>	2017 - 2021
Adopt-a-Physicist Volunteer <i>Sigma Pi Sigma</i>	2018 - 2020
Catalyst Volunteer Computer Science Instructor <i>Citizen Schools and Mass STEM Hub</i>	Spring 2019
Designer & Observer, MIT Sidewalk Astrogazers <i>MIT Kavli Institute for Astrophysics and Space Research</i>	2017 - 2019
Head of Design Team, The Triple Helix Magazine <i>Brown University</i>	2014 - 2017
Women in Physics Co-coordinator <i>Brown University</i>	2016 - 2017
Physics Show Presenter <i>Physics & Astronomy Department, Texas A&M University</i>	Summer 2014