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

PUBLICATIONS

REFERREED

Brauer, K., Emerick, A., Mead, J., Ji, A. P., Wise, J. H., Bryan, G. L., Mac Low, M. M., Cote, B., Andersson, E., Frebel, A. (2024). AEOS: Star-by-Star Cosmological Simulations of Early Chemical Enrichment and Galaxy Formation. *submitted to ApJ.* arXiv:2410.16366

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., Vrtilek, 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

Seminar Talk at American Museum of Natural History — New York, NY, USA; Oct 2024
"Simulating the Evolution of the First Galaxies"

Seminar Talk at IReNA — East Lansing, MI (remote), USA; Sep 2024
"Simulating Chemical Enrichment from the First Stars and Galaxies"

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 *Linking the Galactic and Extragalactic* — 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 — Spring 2023
Physics Department, Massachusetts Institute of Technology

8.S30 Stellar Archaeology Teaching Assistant — Fall 2022
Physics Department, Massachusetts Institute of Technology

PHYS0220/0270 Astronomy Teaching Assistant — Fall 2014 - Spring 2015
Physics Department, Brown University

PHYS0030 Introductory Physics Workshop Assistant — Fall 2014
Physics Department, Brown University

LEADERSHIP & SERVICE

Leader & Mentor to Postdoc Applicants — 2023 - present
Astronomy Mentorship Program for Upcoming Postdocs (AMP-UP)

Graduate Women in Physics Leader — 2019 - 2023
Massachusetts Institute of Technology

High Performance Computing Mentor — June 2022
*only graduate student to ever serve as a mentor
International High Performance Computing Summer School, Athens, Greece

Reviewer for JOSS — 2022 - present
Journal of Open Source Software

President, MIT Salsa Club — 2018 - 2022
Massachusetts Institute of Technology

Physics Representative, Diversity and Inclusion Committee — 2018 - 2022
MIT Graduate Student Council

Cosmology Volunteer Course Designer and Instructor — Spring 2021
Spark, MIT Educational Studies Program

Treasurer, Students for the Exploration and Development of Space — 2017 - 2021
Massachusetts Institute of Technology

Adopt-a-Physicist Volunteer — 2018 - 2020
Sigma Pi Sigma

***Catalyst* Volunteer Computer Science Instructor** — Spring 2019
Citizen Schools and Mass STEM Hub

Designer & Observer, MIT Sidewalk Astrogazers 2017 - 2019
MIT Kavli Institute for Astrophysics and Space Research

Head of Design Team, The Triple Helix Magazine 2014 - 2017
Brown University

Women in Physics Co-coordinator 2016 - 2017
Brown University

Physics Show Presenter Summer 2014
Physics & Astronomy Department, Texas A&M University