Madeline Lucey

m_lucey@utexas.edu ⋄ https://mlucey.github.io
University of Pennsylvania, Dept. of Physics & Astronomy
209 South 33rd Street Philadelphia, PA 19104-6396

RESEARCH INTERESTS

Galactic archaeology, near-field cosmology, population II stars, the Galactic bulge, carbon-enhanced metal-poor stars, red clump stars, stellar evolution, stellar spectroscopy, data mining and machine learning

EDUCATION

The University of Texas at Austin   *August 2023*
Ph.D. Astronomy
Thesis: Ancient Stars and the Inner Galaxy as tracers of the Milky Way's Early Evolution
Advisor: Keith Hawkins

The University of Texas at Austin   *August 2020*
M.A. Astronomy

Colorado College   *May 2018*
B.A. Physics: Astrophysics Emphasis, Magna Cum Laude

APPOINTMENTS

NSF Astronomy and Astrophysics Postdoctoral Fellow   *September 2023-Present*
University of Pennsylvania

FIRST AUTHOR PUBLICATIONS

6. **M. Lucey**, N. Al Kharusi, K. Hawkins, Y.-S. Ting, N. Ramachandra, A.M. Price-Whelan, T. Beers, Y.S. Lee, J. Yoon, *Carbon-enhanced metal-poor star candidates from BP/RP spectra in Gaia DR3*, 2023, MNRAS, 523, 4049

5. **M. Lucey**, S. Pearson, J.A.S. Hunt, K. Hawkins, M. Ness, M.S. Petersen, A.M. Price-Whelan, M.D. Weinberg, *Dynamically constraining the length of the Milky way bar*, 2023, MNRAS, 520, 4779

4. **M. Lucey**, K. Hawkins, M. Ness, T. Nelson, V.P. Debattista, A. Luna, T. Bensby, K.C. Freeman, C. Kobayashi, *The COMBS Survey - III. The Chemodynamical Origins of Metal-Poor Bulge Stars*, 2022, MNRAS, 509, 122

3. **M. Lucey**, K. Hawkins, M. Ness, V.P. Debattista, A. Luna, M. Asplund, T. Bensby, L. Casagrande, S. Feltzing, K.C. Freeman, C. Kobayashi, A.F. Marino, *The COMBS Survey - II. Distinguishing the Metal-Poor Bulge from the Halo Interlopers*, 2021, MNRAS, 501, 5981

2. **M. Lucey**, Y.-S. Ting, N. Ramachandra, K. Hawkins, *From the Inner to Outer Milky Way: A Photometric Sample of 2.6 Million Red Clump Stars*, 2020, MNRAS, 495, 3087

1. **M. Lucey**, K. Hawkins, M. Ness, M. Asplund, T. Bensby, L. Casagrande, S. Feltzing, K.C. Freeman, C. Kobayashi, A.F. Marino, *The COMBS survey - I. The Chemical Origins of Metal-Poor Stars in the Galactic Bulge*, 2019, MNRAS, 488, 2283

CO-AUTHOR PUBLICATIONS

4. A. Carrillo, K. Hawkins, P. Jofré, D. de Brito Silva, P. Das, **M. Lucey**, *The detailed chemical abundance patterns of accreted halo stars from the optical to infrared*, 2022, MNRAS, 513, 1557

3. K. Hawkins, **M. Lucey**, J. Curtis, *The Chemical Nature of the Young 120-Myr-old Nearby Pisces-Eridanus Stellar Stream Flowing through the Galactic Disk*, 2020, MNRAS, 496, 2422

2. K. Hawkins, **M. Lucey**, Y.-S. Ting, A. Ji, D. Katzberg, M. Thompson, K. El-Badry, J. Teske, T. Nelson , A. Carrillo, *Identical or fraternal twins? : The chemical homogeneity of wide binaries from Gaia DR2*, 2020, MNRAS, 492, 1164

1. B. Pope, G. Davies, K. Hawkins, T. White, A. Stokholm, A. Bieryla, D. Latham, **M. Lucey**, C. Aerts, S. Aigrain, V. Antoci, T. Bedding, D. Bowman, A. Chontos, G. Esquerdo, D. Huber, P. Jofré, S. Murphy, T. van Reeth, V. Aguirre, J. Yu, *The Kepler Smear Campaign I: An Asteroseismic Catalogue of Bright Red Giants*, 2019, ApJ, 244, 18

GRANTS, AWARDS AND FELLOWSHIPS

NSF Astronomy and Astrophysics Postdoctoral Fellow	2023-Present
NSF Graduate Research Fellow	2020-2023
CCAPP Price Prize	2022
Raynor L. Duncombe Student Research Prize	2022
Frank N. Edmonds, Jr. Memorial Fellowship in Astronomy	2019
Kavli Summer Program in Astrophysics Fellow	2019
University of Texas at Austin Graduate School Fellowship	2018
David and Karen Smith Cowperthwaite Award for Excellence in Physics	2018
Keller Venture Grant ($1,200)	2016

AWARDED TELESCOPE TIME

PI: McDonald Obs. 2.7m, 4 nights	2023
$\rightarrow$*Characterizing Candidate Carbon-Enhanced Metal-Poor Stars*	
PI: Gemini South, IGRINS, 15 hours	2022
$\rightarrow$*Carbon-Enhanced Metal-Poor Stars in the Inner Galaxy*	
Co-I: McDonald Obs 2.7m, 7 nights (PI: Andreia Carrillo)	2022
$\rightarrow$*Chemical abundances of distant red clump stars*	
PI: McDonald Obs. 2.7m, 5 nights	2021
$\rightarrow$*Chemically Characterizing Blue Lurkers in M67*	
PI: McDonald Obs. 2.7m, 6 nights	2019
$\rightarrow$*Chemically Characterizing a Newly Discovered Stellar Stream*	
Co-I: McDonald Obs. 2.7m, 6 nights (PI:Andreia Carrillo)	2019
$\rightarrow$*Detailed chemical abundances of Gaia-Enceladus stars*	
Co-I: McDonald Obs. 2.7m, 5 nights (PI:Keith Hawkins)	2018
$\rightarrow$*The Chemical Homogeneity of Wide Binaries in Gaia DR2*	
Co-I: WIYN 3.5m, 4 nights (PI:Natalie Gosnell)	2018
$\rightarrow$*Clusters with K2: systematics from membership and binarity*	

NOTABLE PRESENTATIONS

Invited Talks
CCAPP Price Prize Seminar, Ohio State University, *Ancient Stars and the Inner Galaxy as tracers of the Milky Ways Early Evolution*, 2022
Board of Visitors Meeting, University of Texas at Austin, *Uncovering Galactic Fossils from the Early Universe*, 2020

Colorado College Across the Country: Change-makers Who are Defining the CC Experience, *Astronomy in Thailand: Inspiring Young Scientists*, 2018
Colorado College Venture Grant Forum, *Astronomy in Thailand: Inspiring Young Scientists*, 2017

Colloquia
Yale University, *The Milky Way's Big Data Revolution*, 2023

Contributed Talks
Gaia XPloration: Discovery and measurement with low-resolution spectroscopy, *Detecting Carbon-Enhanced Metal-Poor Stars*, 2023
IAUS 377: Early Disk-Galaxy Formation from JWST to the Milky Way, *Using Metal-Poor Stars in the Inner Galaxy to Uncover the Ancient Milky Way*, 2023
American Astronomical Society Meeting, 241, *Ancient Stars and the Inner Galaxy as tracers of the Milky Way's Early Evolution*, 2023
Division on Dynamical Astronomy Meeting, *Constraining the length and pattern speed of the Milky Way bar from direct orbit integration*, 2022
Inward bound: bulges from high redshifts to the Milky Way, *The chemodynamics of the (metal-poor) Milky Way Bulge stellar populations*, 2022

Poster Presentations
Cool Stars 21, *CEMP Stars in Gaia DR3*, 2022
American Astronomical Society Meeting Abstracts, 237, *The COMBS Survey - II. Distinguishing the Metal-Poor Bulge from the Halo Interlopers*, 2021
Frank N. Bash Symposium, *Selecting a Pristine Sample of 5 Million Red Clump Stars*, 2019
American Astronomical Society Meeting Abstracts, 231, *Cataloging the Praesepe Cluster: Identifying Interlopers and Binary Systems*, 2018
Colorado College Summer Collaborative Research Experience Symposium, *Cataloging the Praesepe Cluster: Identifying Interlopers and Binary Systems*, 2017

Seminars
Max Planck Institute for Astronomy, *Constraining the length of the Milky Way's bar from direct orbit integration*, 2023
University of Texas at Austin, *Ancient Stars and the Inner Galaxy as tracers of the Milky Ways Early Evolution*, 2022
University of Texas at Austin, *The COMBS Survey*, 2021
Big Apple Dynamics School, *The Interplay of Potentials and Orbits in the Milky Way Bar*, 2021
University of Texas at Austin, *The COMBS Survey*, 2020
Kavli 2019 Alumni Event, *The COMBS Survey*, 2020
University of Texas at Austin, *Galaxy Formation with the Milky Way*, 2020
Kavli Summer Program in Astrophysics, *Declumping the Red Clump*, 2019
University of Texas at Austin, *The COMBS Survey*, 2019
Senior Thesis Presentation, *Cataloging the Praesepe Cluster*, 2018

Public Talks
Astronomy on Tap ATX, *Why Stars are Better than Everything Else*, 2020
Frank N. Bash Visitor's Center at McDonald Observatory, *Uncovering Galactic Fossils from the Early Universe*, 2019

STUDENT MENTORSHIP

Nariman Al Kharusi, undergraduate, UT Austin	2021-2022
Alice Luna, undergraduate, now PhD student at U. Chicago	2020-2021

SERVICE

Referee: ApJ, AJ, MNRAS	2021-Present
Task Force to Reform the Qualifying Exam, University of Texas at Austin	January-May 2022
Graduate Recruitment, University of Texas at Austin	2021 & 2022
Leader of Equity and Inclusion Book Club, University of Texas at Austin	2021
Task Force to Reform the Graduate Program, University of Texas at Austin	August 2020−May 2021

TEACHING EXPERIENCE

Guest Lecturer

Introductory Astronomy (University of Pennsylvania)	Fall 2023

Teaching Assistant

Introductory Astronomy (University of Texas at Austin)	Fall & Spring 2019

Learning Assistant

Introductory Physics I & II (Colorado College)	2015−2018

Tutoring

Math and Physics Department (Colorado College)	2015−2018

PRESS AND COMMUNITY ENGAGEMENT

Forbes, *Our Milky Way Galaxy Likely Formed In Relative Isolation, Says Study*, Link	Jan. 2023
WIRED magazine, *The Gaia Mission Keeps Unlocking Secrets of the Galaxy*, Link	June 2022
GUMMY, Graduate Mentor	January 2018−2020
Astronomy on Tap ATX, Social Media Coordinator	May 2018−Present
Girl Day, Organizer, University of Texas at Austin	February 2019−Present
AWARE, University of Texas at Austin	September 2018−Present
Women in STEM, Colorado College	January 2017−May 2018
Astronomy in Thailand: Inspiring Young Scientists,	October 2016−January 2017