Madeline Lucey

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The University of Texas at Austin, Dept. of Astronomy
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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 2018 - Present*
Ph.D. Astronomy
Thesis: Uncovering Galactic Fossils from the Early Universe
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

FIRST AUTHOR PUBLICATIONS

6. **M. Lucey**, N. Al Kharusi, K. Hawkins, Y.-S. Ting, N. Ramachandra, T. Beers, Y.S. Lee, A.M. Price-Whelan, J. Yoon, *Over 2 million carbon-enhanced metal-poor star candidates from BP/RP spectra in Gaia DR3*, submitted to MNRAS, arXiv:2206.08299

5. **M. Lucey**, S. Pearson, J.A.S. Hunt, K. Hawkins, M. Ness, M.S. Petersen, A.M. Price-Whelan, M.D. Weinberg, *Constraining the length and pattern speed of the Milky Way bar from direct orbit integration of APOGEE and Gaia data*, 2022, submitted to MNRAS, arXiv:2206.01798

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 Graduate Research Fellow	2020-Present
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

Co-I: McDonald Obs 2.7m, 7 nights (PI: Andreia Carrillo)	2022
→*Chemical abundances of distant red clump stars*	
PI: McDonald Obs. 2.7m, 5 nights	2021
→*Chemically Characterizing Blue Lurkers in M67*	
PI: McDonald Obs. 2.7m, 6 nights	2019
→*Chemically Characterizing a Newly Discovered Stellar Stream*	
Co-I: McDonald Obs. 2.7m, 6 nights (PI:Andreia Carrillo)	2019
→*Detailed chemical abundances of Gaia-Enceladus stars*	
Co-I: McDonald Obs. 2.7m, 5 nights (PI:Keith Hawkins)	2018
→*The Chemical Homogeneity of Wide Binaries in Gaia DR2*	
Co-I: WIYN 3.5m, 4 nights (PI:Natalie Gosnell)	2018
→*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

Contributed Talks

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

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

TEACHING EXPERIENCE

Teaching Assistant	
Introductory Astronomy	Fall & Spring 2019
Learning Assistant	
Introductory Physics I & II	2015−2018
Tutoring	
Math and Physics Department	2015−2018

PRESS AND COMMUNITY ENGAGEMENT

Article in WIRED magazine, *The Gaia Mission Keeps Unlocking Secrets of the Galaxy*, LinkJune 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

COMPUTING SKILLS

Languages: Python, IDL, SQL/ADQL, LaTex, bash/shell, git
Packages: TensorFlow, Pytorch, Scikit learn, Pandas
Software: BACCHUS, IRAF, TOPCAT, iSpec, SME