Kathryn V. Lester

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Education

Ph.D. in Astronomy, Georgia State University 2020
M.S. in Physics, Georgia State University 2017
B.S. in Astrophysics, Lehigh University 2014

Research Interests

Exoplanets, host star properties, transit light curves, binary stars, radial velocity analysis, light curve modeling, fundamental stellar parameters, high resolution spectroscopy, speckle & long baseline interferometry, intermediate mass stars, and stellar evolution.

Research Experience

NASA Postdoctoral Fellow 2020 – present
Ames Research Center, with Dr. Steve Howell
- Searched for companions around TESS exoplanet hosts using high resolution imaging
- Determining visual orbits and astrophysical parameters of close binaries hosting planets

Graduate Research Assistant 2014 – 2020
Georgia State University, with Dr. Douglas Gies
- Determined visual and spectroscopic orbits of A- and F-type binary stars using the CHARA Array.
- Completed photometric, spectroscopic, and apsidal motion analyses of the K2 eclipsing binary, BW Aquarii.

Undergraduate Research Assistant 2013 – 2014
Lehigh University, with Dr. Ginny McSwain
- Fit model spectra to three massive binary stars to determine the atmospheric parameters.

Undergraduate Research Assistant 2013
University of Wyoming, with Dr. Chip Kobulnicky
- Observed and analyzed the radial velocity shifts of massive binary stars in the Cygnus OB2 Association.

First Author Publications

To see my full publication record on ADS, click here. (8 first-author, 29 total, h-index = 11)

8. "Visual Orbits of Spectroscopic Binaries with the CHARA Array. IV. HD 61859, HD 89822, HD 109510, and HD 191692"
K. V. Lester, G. Schaefer, F. Fekel, et al. 2022, AJ, 164, 228

7. "Determining Which Binary Component Hosts the TESS Transiting Planet".
K. V. Lester, S. B. Howell, D. R. Ciardi, & R. A. Matson. 2022, AJ, 164, 56

6. "Speckle Observations of TESS Exoplanet Host Stars. II. Stellar Companions at 1-1000 au and Implications for Small Planet Detection".
K. V. Lester, R. A. Matson, S. B. Howell, et al. 2021, AJ, 162, 75

5. "Visual Orbits of Spectroscopic Binaries with the CHARA Array. III. HD 8374 and HD 24546".
K. V. Lester, F. Fekel, M. Muterspaugh, et al. 2020, AJ, 160, 58

4. "Visual Orbits of Spectroscopic Binaries with the CHARA Array. II. the eclipsing binary HD 185912".
K. V. Lester, D. R. Gies, G. Schaefer, C. Farrington, et al. 2019, AJ, 158, 6

3. "Visual Orbits of Spectroscopic Binaries with the CHARA Array. I. HD 224355".
   K. V. Lester, D. R. Gies, G. Schaefer, C. Farrington, et al. 2019, AJ, 157, 140L

2. "A Photometric, Spectroscopic, and Apsidal Motion Analysis of Eclipsing Binary BW Aquarii".
   K. V. Lester & D. R. Gies. 2018, AJ, 156, 8.

1. "A Young Eclipsing Binary and its Luminous Neighbors in Sh 2-252E".
   K. V. Lester, D. R. Gies, & Z. Guo. 2016, AJ, 152, 194.

Selected Contributed Publications

12. A. W. Mann, M. L. Wood, S. P. Schmidt, et al. 2022, AJ, 163, 156
11. P. Wysocki, D. Gies, K. Shepard, **K. V. Lester**, et al. 2022, AJ, 163, 177
10. L. Wang, D. Gies, G. Peters, et al. 2021, AJ, 161, 248
9. S. B. Howell, N. Scott, R. A. Matson, et al. 2021, Frontiers in Astronomy and Space Sciences, 8, 10
8. D. G. Whelan, S. D. Chojnowski, J. Labadie-Bartz, et al. 2021, AJ, 161, 67
7. D. R. Gies, **K. V. Lester**, L. Wang, et al. 2020, ApJ, 902, 25
6. K. Shepard, D. R. Gies, **K. V. Lester**, et al. 2020, ApJ, 888, 82
5. L. Wang, D. R. Gies, **K. V. Lester**, et al. 2020, AJ, 159, 4
4. S. D. Chojnowski, J. Labadie-Bartz, T. Rivinius, et al. 2018, ApJ, 865, 76.
3. M. C. Bentz, M. Batiste, J. Seals, et al. 2016, ApJ, 831, 2
2. D. R. Gies, R. A. Matson, Z. Guo, **K. V. Lester**, et al. 2015, AJ, 150, 178
1. H. A. Kobulnicky, D. C. Kiminki, M. J. Lundquist, et al. 2014, ApJS, 213, 34

Invited Talks

CHARA & VLTI Science Meeting 2022
Review Talk: "Binary Star Science Using Interferometry".

AAS Splinter Session: Stars and the ISM with Gemini's Fast Turnaround Observations 2022
Talk: "Speckle & Long Baseline Interferometry of Binary Stars". [cancelled due to COVID]

NSF virtual site visit at the CHARA Array 2020
Talk: "Visual Orbits of Spectroscopic Binaries".

CHARA Summer School 2020
Talk: "Observing and Data Reduction with CLIMB".

Agnes Scott College 2019
Colloquium: "Visual & Spectroscopic Orbits of Binary Stars".

Contributed Talks & Posters

EPRV5 Meeting, "Orbits & Inclinations of Planet Host Binaries" (poster) 2023

241st AAS Meeting, "Detection Sensitivity of Transiting Planets in Single vs Binary Stars" 2023

NASA Postdoc Program Symposium, "How Does Host Star Multiplicity Affect Planet Formation?" 2022

Bay Area Exoplanet Meeting, "Which Binary Component Hosts the TESS Transiting Planet?" 2022

240th AAS Meeting, "Which Binary Component Hosts the TESS Transiting Planet?" (poster) 2022

Bay Area Exoplanet Meeting, "Close Companions of TESS Exoplanet Host Stars" 2021

237th AAS Meeting, "Close Companions of TESS Exoplanet Host Stars" (poster) 2021

235th AAS Meeting, "Visual Orbits of Spectroscopic Binaries with the CHARA Array" (dissertation talk) 2020

CHARA Science Meeting, "Visual Orbits of Spectroscopic Binaries" 2019

233rd AAS Meeting, "Visual Orbit and Physical Parameters of the Spectroscopic Binary HD 224355" 2019

Georgia Regional Astronomers Conference, "Visual Orbit of the Spectroscopic Binary HD 224355" 2018

GSU Women In STEM Conference, "Visual & Spectroscopic Orbits of Binary Stars" 2018

231st AAS Meeting, "A Photometric, Spectroscopic & Apsidal Motion Analysis of BW Aqrs" (poster) 2018

227th AAS Meeting, "Photometric & Spectroscopic Analysis of EPIC 202062176" (poster) 2016

Lehigh Senior Thesis Fair, "Stellar Parameters of Three Massive Stars in Cygnus OB2" 2014

223rd AAS Meeting, "The Cygnus OB2 Radial Velocity Survey: MT216, MT234, MT485" (poster) 2014

Competitive Observing Time Awarded

Keck Observatory
Spectroscopic orbits of exoplanet host binary stars using HIRES (5 hours) 2023A

Cerro Tololo Inter-American Observatory
Spectroscopic orbits of exoplanet host binary stars using CHIRON (10 hours) 2023A

Las Cumbres Observatory
Spectroscopic orbits of exoplanet host binary stars using NRES (19 hours) 2023A

WIYN Observatory
Spectroscopic orbits of exoplanet host binary stars using NEID (30 hours) 2022A – 2023A

Gemini Observatory
Speckle imaging of binary stars and exoplanet hosts using 'Alopeke & Zorro (33 hours) 2021B – 2023A

Lick Observatory
Spectroscopic orbits of exoplanet host binary stars using APF (10 hours) 2022A

Teaching Experience

Teaching Assistant 2014 – 2017
Taught and graded weekly labs and projects for introductory stellar and extragalactic astronomy courses.

Grading Assistant 2014
Created online homework questions, helped proctor exams, and graded multiple-choice exam questions for introductory astronomy courses.

Private Tutor 2013 – 2014
Lead weekly tutoring sessions for calculus and French to other undergraduate students.

Leadership & Service

Telescope Allocation Committee Member 2022 – 2023
Provided science review, grading, and discussion of NOIRLab telescope proposals.

Grant Proposal Reviewer 2021 – 2022
Provided science review and grading for NASA FINNESST grant proposals.

Panel Member 2019, 2021
Participated in panel discussions about graduate school and career paths for undergraduate physics students.

Journal Referee 2019, 2021
Reviewed submitted manuscripts for JAAVSO and ApJS.

Astronomy Peer Advising Leaders 2016 – 2020
President & Mentor
- Proposed for university funding and maintained the club's budget.
- Lead monthly mentor meetings and delegated tasks for upcoming events.
- Organized and lead new student orientation, professional development workshops, and mock qualifying exams for graduate students.
- Provided advice and support during monthly one-on-one meetings with junior graduate student mentees.

Lehigh Astronomy Club Secretary 2013 – 2014
Arranged officer meetings and managed promotion of club events.

Outreach

Podcast Guest 2021
Spoke about my search for companions to TESS exoplanet hosts on the "365 Days of Astronomy" podcast.

Hard Labor Creek Observatory Volunteer 2014 – 2020
Operated telescopes and answered questions from the public during monthly open houses.

Solar Eclipse Event 2017
Operated solar telescopes and engaged with the public during a solar eclipse viewing party.

Urban Life Observatory Volunteer 2014 – 2017
Operated telescopes during on-campus observing sessions for astronomy lab students.

Girl Scout Workshop Volunteer 2014 – 2017
Assisted with workshop activities, including building pinhole cameras and filter wheels.

GSU Astronomy Night in Grant Park 2016
Operated telescopes during a star party for over 100 elementary school families.

IAU Symposium Volunteer 2015
Assisted with conference registration and a workshop for local high school students building cereal box spectrographs.

Observing Experience

Gemini Observatory 2020 – present
8.1m telescope – 105 nights – speckle interferometry

WIYN Observatory 2022
3.5m telescope – 5 nights – multi-object spectroscopy

The CHARA Array 2017 – 2020
Six 1.0m telescopes – 73 nights – long baseline interferometry

Apache Point Observatory 2016 – 2020
3.5m telescope – 49 nights – echelle spectroscopy

Hard Labor Creek Observatory 2015
0.6m telescope – 7 nights – relative photometry

Wyoming Infrared Observatory 2013
2.3m telescope – 15 nights – longslit spectroscopy

Skills & Tools

Observations	Longslit & echelle spectroscopy, long-baseline & speckle interferometry, relative photometry
Data Analysis	Radial velocities, interferometric visibilities, binary orbit fitting, light curve modeling
Programming	Python, IDL, IRAF, HTML/CSS (basic)
Software	LaTeX, Microsoft Office, MESA, DS9, ELC, Period04, PyKE, Photoshop (basic)
Operating Systems	Mac, Linux, Windows
Foreign Languages	French (intermediate)