

Lily L. Zhao

CONTACT INFORMATION

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EDUCATION

Yale University Aug. 2016 - Present
M.S., M.Phil., Astronomy May 2018
Ph.D. Astronomy Expected June 2021

University of Chicago Jun. 2016
B.S. Mathematics
B.A. Physics
B.A. Biological Sciences

RESEARCH POSITIONS

Yale Exoplanet Group New Haven, CT
Doctoral Candidate Sep. 2016 - Present

- Implemented *EXPRES* (**EX**treme **P**recision **S**pectrograph) hardware adjustments and developed data reduction pipeline and observing software
- Simulated planet detectability based on archival data or survey design
- Conducting a radial-velocity survey of bright/nearby K and M stars
- Leading a community-wide project on mitigating spectral stellar signals

Center for Computational Astrophysics, Flatiron Institute New York, NY
Pre-Doctoral Fellow Sep. 2019 - Jan. 2020

- Developed *excalibur*, a non-parametric, hierarchical wavelength-calibration method
- Contributing to *wobble*, a data-driven method for extracting RVs and inferring the underlying spectral components

Bean Exoplanet Group Chicago, IL
Undergraduate Researcher Jun. 2015 - Jun. 2016

- Analyzed spectroscopic transit observations of WASP-12b with the Hubble Space Telescope *STIS* (Space Telescope Imaging Spectrograph) instrument

NASA Goddard Space Flight Center Greenbelt, MD
Summer Intern Jun. 2014 - Aug. 2014

- Generated a satellite tracking application for *JPSS2* (Joint Polar Satellite System 2)
- Assisted in systems engineering tasks for *JPSS2* and associated contractors

Kavli Institute for Cosmological Physics/Argonne National Laboratory
Undergraduate Researcher Jun. 2013 - Jun. 2015

- Analyzed polarization of Centaurus A with South Pole Telescope data
- Used Microwave Office to simulate options for a microwave band-pass filter

AWARDS

Sheldon Wise Pre-Doctoral Fellowship, Yale University (2018)
Graduate Research Fellow, National Science Foundation (2016)
Google Earth Engine Scholarship, Google (2015)

PUBLICATIONS

11. **Zhao, L.L.**, Hogg, D.W., Bedell, M., Fischer, D.A. "*Excalibur: A Non-Parametric, Hierarchical Wavelength-Calibration Method for a Precision Spectrograph*" 2020, AJ, 161, 2
10. Holzer, P.H., Cisewski-Kehe, J., **Zhao, L.L.**, Fischer, D.A., Ford, E.B. "A Stellar Activity F-statistic for Exoplanet Surveys (SAFE)" 2020, In Review
9. Cabot, S.H., Roettenbacher, R.M., Henry, G.W., **Zhao, L.L.**, et al. "*EXPRES. II. Searching for Planets Around Active Stars: A Case Study of HD 101501*" 2020, AJ, 161, 1
8. **Zhao, L.L.**, Fischer, D.A., Ford, E., Henry, G.W., Rottenbacher, R.M., Brewer, J.M. "The *EXPRES* Stellar-Signals Project I. Description of Data" 2020, RNAAS, 4, 9
7. Brewer, J.M., Fischer, D.A., Blackman, R.T., et al. [incl. **Zhao, L.L.**] "*EXPRES I. HD 3651 an Ideal RV Benchmark*" 2020, AJ, 160, 67
6. Holzer, P., Cisewski-Kehe, J., Fischer, D.A., **Zhao, L.L.** "A Hermite-Gaussian Based Radial Velocity Estimation Method" 2020, in Review, arXiv:2005.14083
5. Blackman, R.T., Fischer, D.A., Jurgenson, C.A., et al. [incl. **Zhao, L.L.**] "Performance Verification of the EXtreme PREcision Spectrograph" 2020, AJ, 159, 238
4. Hoeijmakers, H.J., Cabot, S.H.C., **Zhao, L.L.**, et al. "High-Resolution Transmission Spectroscopy of MASCARA-2 b with *EXPRES*" 2020, A&A, 641, A120
3. Petersburg, R.R., Ong, J.M.J., **Zhao, L.L.**, et al. "An Extreme-Precision Radial-Velocity Pipeline: First Radial Velocities from *EXPRES*" 2020, AJ, 159, 187
2. Gaudi, S., Blackwood, G., Howard, A., et al. [incl. **Zhao, L.L.**] "Extreme Precision Radial Velocity Working Group" 2019, BAAS 51, 232
1. **Zhao, L.L.**, Fischer, D., Brewer, J., Giguere, M., & Rojas-Ayala, B. "Planet Detectability in the Alpha Centauri System." 2018, AJ, 155, 24

CONFERENCES & WORKSHOPS

7. "Planet Detectability with Next-Generation Spectrographs" *Exoplanets III.* (Jul. 2020)
6. *Sagan Exoplanet Summer Workshop: Extreme Precision Radial Velocity* (Jul. 2020)
5. "*EXPRES*" (**Invited talk**) *Extreme Precision Radial Velocity IV.* (Mar. 2019)
4. *Building Early Science with TESS Workshop* (Mar. 2019)
3. "*EXPRES, the Extreme Precision Spectrograph.*" *HoRSE: High Resolution Spectroscopy for Exoplanet atmospheres.* (Oct. 2018)
2. "*EXPRES Precision and First Light Results*" *Exoplanets II.* (Jul. 2018)
1. "Planet Detectability in the Alpha Centauri System" *European Week of Astronomy and Space Science (EWASS).* (Apr. 2018)

SEMINARS

6. *Fall 2020 Seminar*, Columbia University (Nov. 2020)
5. *Exoplanet Journal Club*, University of Chicago (Nov. 2020)
4. *Center for Exoplanets and Habitable Worlds (CHEW) Virtual Seminar*, Pennsylvania State University (Nov. 2020)
3. *Galaxies, Cosmology, Stars & Planets Seminar*, Harvard University (Oct. 2020)
2. *ORIGINS Seminar*, University of Arizona (Sep. 2020)
1. *Tuesday Seminar*, University of Delaware (Apr. 2020)

TEACHING & OUTREACH

<i>Executive Board: Astronomy Climate and Diversity Committee</i>	Jul. 2020 - Present
<i>Fellow: Office of Graduate Student Diversity and Development</i>	Aug. 2018 - Present
<i>Founder, Member: Astronomy Student Council</i>	Aug. 2018 - Present
<i>Co-Instructor: "Origins and the Search for Life in the Universe"</i>	Fall 2017
<i>Demonstrations, Group Leader: Girls Science Investigation</i>	Nov. 2017 - Present
<i>Presenter, Volunteer, Public Relations Committee: Open Labs</i>	Sep. 2016 - Present