Katelyn Horstman

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Education

California Institute of Technology (Caltech) — Expected September 2026
Doctor of Philosophy in Astrophysics
Advisor: Dr. Dimitri Mawet

California Institute of Technology (Caltech) — June 2023
Master of Science in Astrophysics

University of California, Los Angeles (UCLA) — June 2021
Bachelor of Science in Astrophysics
Departmental Honors

Selected presentations

Research Presentations

Detection and Dynamics of Exoplanets (DDE) — June 2025
Contributed talk

Extremely Precise Radial Velocities (EPRV6) — June 2025
Poster

PKI Keck Lunch Talk — December 2024
Invited talk

Wang group meeting, CIERA/Northwestern — October 2024
Talk

SPIE Astronomical Telescopes + Instrumentation — June 2024
Poster

American Physical Society (APS) April Meeting — April 2024
Invited talk

Extreme Solar Systems (ExSS V) — March 2024
Poster

ExSoCal — December 2023
Contributed talk

Network of Young Researchers in Instrumentation for Astronomy (NYRIA) — November 2023
Contributed talk

Extremely Precise Radial Velocities (EPRV5) — March 2023
Poster

ESO Disks and Planets — November 2022
Contributed talk

Keck Science Meeting (KSM) — September 2022
Poster

Spirit of Lyot 5 — June 2022
Poster

240th American Astronomical Society (AAS) Meeting, Pasadena — June 2022
Contributed talk

UCLA Undergraduate Research Week — February 2020
Contributed talk

Professional Development Presentations

PATHWAYS Symposium — May 2025
Contributed talk

FUTURE of Physics at Caltech — October 2023
Invited speaker

FUTURE Ignited at Caltech — October 2022
Invited speaker

Public Presentations

Caltech Astronomy Star Gazing Lecture — August 2023
Panel member

Caltech Associates at Jet Propulsion Laboratory (JPL) — May 2023
Invited talk

Fellowships and awards

NSF Graduate Research Fellowship Recipient — 2023

Keck Institute for Space Studies (KISS) Affiliate — 2022

NSF Graduate Research Fellowship Honorable Mention — 2021

Summer Undergraduate Research Fellow (SURF) — 2020

UCLA Clay Trust Physical Science Scholarship — 2020

Teaching and mentorship

Certificate of Practice in University Teaching (CTLO) — Ongoing
Pedagogy development and refinement

Guest lecture on Celestial Mechanics — 2025
Ay 20, Basic Astronomy and the Galaxy

Summer Undergraduate Research Fellow (SURF) Mentor — 2025
Caltech undergraduate Anica Ancheta

Ay 126: Physical processes in the interstellar medium 2023
Teaching assistant

Ay 124: Structure and Evolution of Galaxies 2023
Teaching assistant

Ay 20: Basic Astronomy and the Galaxy 2022
Teaching assistant

Service and leadership

Gender Minorities in Physics, Math, and Astronomy (PMA) 2023-Ongoing
President, organizing committee member

PMA Diversity, Equity, Inclusion, and Outreach committee 2023-Ongoing
Graduate student task force member

Caltech Astrophysics graduate student mentorship chair 2022-2024, 2025-Ongoing
Facilitator for academic and social connections

PATHWAYS Symposium 2025
Organizer and participant

WAVE fellow mentor 2025
Non-academic mentorship to summer students

GWiPMA mentorship chair 2024
Facilitator for academic and social connections

Respect is part of research 2024
Organizer and facilitator

CAPP program mentor 2022
Mentorship to undergraduates applying to graduate school

Zeitschrift für Naturforschung A. 2019
Invited journal reviewer

Selected publications

First or major contributing author

[1] **Katelyn Horstman**, Jean-Baptiste Ruffio, Konstantin Batygin, et al. "RV Measurements of Directly Imaged Brown Dwarf GQ Lup B to Search for Exosatellites". In: *AJ* 168.4, 175 (Oct. 2024), p. 175. DOI: 10.3847/1538-3881/ad73d8. arXiv: 2408.10299 [astro-ph.EP].

[2] **Katelyn Horstman**, Jean-Baptiste Ruffio, Jason J. Wang, et al. "Fringing analysis and forward modeling of Keck Planet Imager and Characterizer (KPIC) spectra". In: *Ground-based and Airborne Instrumentation for Astronomy X*. Ed. by Julia J. Bryant, Kentaro Motohara, and Joël. R. D. Vernet. Vol. 13096. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series. July 2024, 130962E, 130962E. DOI: 10.1117/12.3018020. arXiv: 2408.10173 [astro-ph.EP].

[3] Jean-Baptiste Ruffio, **Katelyn Horstman**, Dimitri Mawet, et al. "Detecting Exomoons from Radial Velocity Measurements of Self-luminous Planets: Application to Observations of HR 7672 B and Future Prospects". In: *AJ* 165.3, 113 (Mar. 2023), p. 113. DOI: 10.3847/1538-3881/acb34a. arXiv: 2301.04206 [astro-ph.EP].

[4] **Katelyn Horstman**, Michael P. Fitzgerald, James E. Lyke, et al. "Using Non-negative Matrix Factorization to Improve Calibration of the Keck OSIRIS Integral Field Spectrograph". In: *PASP* 134.1036, 064504 (June 2022), p. 064504. DOI: 10.1088/1538-3873/ac7905. arXiv: 2206.04070 [astro-ph.IM].

[5] **Katelyn Horstman**, Alice E. Shapley, Ryan L. Sanders, et al. "The MOSDEF survey: differences in SFR and metallicity for morphologically selected mergers at z $\sim$ 2". In: *MNRAS* 501.1 (Feb. 2021), pp. 137–145. DOI: 10.1093/mnras/staa3502. arXiv: 2008.04327 [astro-ph.GA].

[6] **Katelyn Horstman** and Virginia Trimble. "Correlation of Time from Submission to Acceptance of Astronomical Papers with Gender of Lead Author". In: *Bulletin of the American Astronomical Society*. Vol. 52. Apr. 2020, 0204, p. 0204. DOI: 10.3847/25c2cfeb.907653b3.

[7] **Katelyn Horstman** and Virginia Trimble. "A citation history of measurements of Newtons constant of Gravity". In: *arXiv e-prints*, arXiv:1811.10556 (Nov. 2018), arXiv:1811.10556. DOI: 10.48550/arXiv.1811.10556. arXiv: 1811.10556 [physics.hist-ph].

Nth author

[8] Luke Finnerty, Yinzi Xin, Jerry W. Xuan, et al. "True Mass and Atmospheric Composition of the Nontransiting Hot Jupiter HD 143105 b". In: *AJ* 169.2, 94 (Feb. 2025), p. 94. DOI: 10.3847/1538-3881/ada1d9. arXiv: 2412.04552 [astro-ph.EP].

[9] Luke Finnerty, Yinzi Xin, Jerry W. Xuan, et al. "Water Dissociation and Rotational Broadening in the Atmosphere of KELT-20 b from High-resolution Spectroscopy". In: *AJ* 169.6, 333 (June 2025), p. 333. DOI: 10.3847/1538-3881/adce02. arXiv: 2503.01946 [astro-ph.EP].

[10] Nemanja Jovanovic, Daniel Echeverri, Jacques-Robert Delorme, et al. "Technical description and performance of the phase II version of the Keck Planet Imager and Characterizer". In: *Journal of Astronomical Telescopes, Instruments, and Systems* 11, 015005 (Jan. 2025), p. 015005. DOI: 10.1117/1.JATIS.11.1.015005. arXiv: 2502.01863 [astro-ph.IM].

[11] Daniel Echeverri, Nemanja Jovanovic, Jacques-Robert Delorme, et al. "Recent upgrades to the Keck Planet Imager and Characterizer". In: *Ground-based and Airborne Instrumentation for Astronomy X*. Ed. by Julia J. Bryant, Kentaro Motohara, and Joël. R. D. Vernet. Vol. 13096. Society of Photo-Optical

Instrumentation Engineers (SPIE) Conference Series. July 2024, 130962D, p. 130962D. DOI: 10.1117/12.3019085.

[12] Daniel Echeverri, Jerry W. Xuan, John D. Monnier, et al. "Vortex Fiber Nulling for Exoplanet Observations: First Direct Detection of M Dwarf Companions around HIP 21543, HIP 94666, and HIP 50319". In: *ApJL* 965.2, L15 (Apr. 2024), p. L15. DOI: 10.3847/2041-8213/ad3619. arXiv: 2403.17295 [astro-ph.EP].

[13] Chih-Chun Hsu, Jason J. Wang, Geoffrey A. Blake, et al. "PDS 70b Shows Stellar-like Carbon-to-oxygen Ratio". In: *ApJL* 977.2, L47 (Dec. 2024), p. L47. DOI: 10.3847/2041-8213/ad95e8. arXiv: 2411.15117 [astro-ph.EP].

[14] Chih-Chun Hsu, Jason J. Wang, Jerry W. Xuan, et al. "Rotation and Abundances of the Benchmark Brown Dwarf HD 33632 Ab from Keck/KPIC High-resolution Spectroscopy". In: *ApJ* 971.1, 9 (Aug. 2024), p. 9. DOI: 10.3847/1538-4357/ad58d3. arXiv: 2405.08312 [astro-ph.SR].

[15] Jason J. Wang, Dimitri Mawet, Jerry W. Xuan, et al. "The high-contrast performance of the Keck Planet Imager and Characterizer". In: *Ground-based and Airborne Instrumentation for Astronomy X*. Ed. by Julia J. Bryant, Kentaro Motohara, and Joël. R. D. Vernet. Vol. 13096. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series. July 2024, 130961X, p. 130961X. DOI: 10.1117/12.3019114.

[16] Jerry W. Xuan, Chih-Chun Hsu, Luke Finnerty, et al. "Are These Planets or Brown Dwarfs? Broadly Solar Compositions from High-resolution Atmospheric Retrievals of ∼10–30 M_{Jup} Companions". In: *ApJ* 970.1, 71 (July 2024), p. 71. DOI: 10.3847/1538-4357/ad4796. arXiv: 2405.13128 [astro-ph.EP].

[17] Jerry W. Xuan, Jason Wang, Luke Finnerty, et al. "Validation of Elemental and Isotopic Abundances in Late-M Spectral Types with the Benchmark HIP 55507 AB System". In: *ApJ* 962.1, 10 (Feb. 2024), p. 10. DOI: 10.3847/1538-4357/ad1243. arXiv: 2312.02297 [astro-ph.SR].

[18] Yapeng Zhang, Jerry W. Xuan, Dimitri Mawet, et al. "Atmospheric Characterization of the Super-Jupiter HIP 99770 b with KPIC". In: *AJ* 168.3, 131 (Sept. 2024), p. 131. DOI: 10.3847/1538-3881/ad6609. arXiv: 2407.20952 [astro-ph.EP].

[19] Daniel Echeverri, Jerry Xuan, Nemanja Jovanovic, et al. "Vortex fiber nulling for exoplanet observations: implementation and first light". In: *Journal of Astronomical Telescopes, Instruments, and Systems* 9, 035002 (July 2023), p. 035002. DOI: 10.1117/1.JATIS.9.3.035002. arXiv: 2309.06514 [astro-ph.IM].

[20] Luke Finnerty, **Katelyn Horstman**, Jean-Baptiste Ruffio, et al. "Characterization of hot Jupiter atmospheres with Keck/KPIC". In: *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series*. Vol. 12680. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series. Oct. 2023, 1268006, p. 1268006. DOI: 10.1117/12.2677777.

[21] Yinzi Xin, Jerry W. Xuan, Dimitri Mawet, et al. "On-sky speckle nulling through a single-mode fiber with the Keck Planet Imager and Characterizer". In: *Journal of Astronomical Telescopes, Instruments, and Systems* 9, 035001 (July 2023), p. 035001. DOI: 10.1117/1.JATIS.9.3.035001. arXiv: 2307.11893 [astro-ph.IM].

[22] Daniel Echeverri, Nemanja Jovanovic, Jacques-Robert Delorme, et al. "Phase II of the Keck Planet Imager and characterizer: system-level laboratory characterization and preliminary on-sky commissioning". In: *Ground-based and Airborne Instrumentation for Astronomy IX*. Ed. by Christopher J. Evans, Julia J. Bryant, and Kentaro Motohara. Vol. 12184. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series. Aug. 2022, 121841W, 121841W. DOI: 10.1117/12.2630518. arXiv: 2210.15915 [astro-ph.EP].

[23] Jerry W. Xuan, Jason Wang, Jean-Baptiste Ruffio, et al. "A Clear View of a Cloudy Brown Dwarf Companion from High-resolution Spectroscopy". In: *ApJ* 937.2, 54 (Oct. 2022), p. 54. DOI: 10.3847/1538-4357/ac8673. arXiv: 2208.01657 [astro-ph.EP].