

Wenhao (Jerry) Xuan

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EDUCATION

Ph.D. in Astrophysics, California Institute of Technology	Expected: Feb 2025
Advisor: Prof. Dimitri Mawet	
M. Sc. Astrophysics, California Institute of Technology, USA	June 2023
M.Phil. in Astronomy, University of Cambridge	Oct 2020
Advisor: Prof. Mark Wyatt	
Thesis: Constraining 3D orbital architectures in systems with giant planets	
B.A. in Physics, Pomona College	May 2019
Graduated cum laude, GPA: 3.91/4.00	

OBSERVING TIME & GRANTS

JWST Cycle 3 GO 5342 (NIRSpec) **PI**, 13.2 hours, \$150,900
JWST Cycle 2 GO 3762 (NIRSpec, MIRI) **PI**, 3.8 hours, \$74,911
Future Investigators in NASA Earth and Space Science and Technology (FINESST) **FI**, \$150,000
2018A-2025A Keck II (KPIC, NIRC2): co-I, observed for over 40 nights
P112 + DDT (VLT/GRAVITY) **PI**, 4 hours
P112 (VLT/CRIRES+) **PI**, 12 hours
2023B Gemini South (IGRINS) **PI**, 16.9 hours

SELECTED PUBLICATIONS

Summary: 31 refereed publications. 10 first author, 8 second author. 789 citations. [ADS](#)

1. **Xuan, J.W.**, Hsu, C.-C., Finnerty, L., et al. 2024, ApJ, 970, 71. *Are These Planets or Brown Dwarfs? Broadly Solar Compositions from High-resolution Atmospheric Retrievals of $\sim 10\text{--}30$ MJup Companions*
2. **Xuan, J.W.**, Wang, J., Finnerty, L., et al. 2024, ApJ, 962, 10. *Validation of elemental and isotopic abundances in late-M spectral types with the benchmark HIP 55507 AB system*
3. **Xuan, J.W.**, Wang, J., Ruffio, J.-B., et al. 2022, ApJ, 937, 54. *A Clear View of a Cloudy Brown Dwarf Companion from High-Resolution Spectroscopy*
4. **Xuan, J.W.** & Wyatt, M.C., 2020, MNRAS, 497, 2096. *Evidence for a high mutual inclination between the cold Jupiter and transiting super Earth orbiting π Men*
5. **Xuan, J.W.**, Kennedy, G.M., Wyatt, M.C., Yelverton, B., 2020, MNRAS, 499, 5059. *Mutual inclinations between giant planets and their debris discs in HD 113337 and HD 38529*
6. **Xuan, J.W.**, Bryan, M.L., Knutson, H.A., Bowler, B.P., Morley, C.V., Benneke, B., 2020, AJ, 159, 97. *A Rotation Rate for the Planetary-mass Companion DH Tau b*
7. **Xuan, J.W.**, Mawet, D., Ngo, H. et al. 2018, AJ, 156, 156. *Characterizing the Performance of the NIRC2 Vortex Coronagraph at W. M. Keck Observatory*
8. Ruffio, J.-B.¹, **Xuan, J.W.**¹, Kesseli, A. et al. submitted to ApJ.
9. Zhang, Y., **Xuan, J.W.**, Mawet, D., et al. 2024, AJ, 168, 131. *Atmospheric characterization of the super-Jupiter HIP 99770 b with KPIC*
10. Sanghi, A., **Xuan, J.W.**, Wang, J., et al. 2024, accepted to AJ. *Efficiently Searching for Close-in Companions around Young M Dwarfs using a Multi-year PSF Library*
11. Finnerty, L., **Xuan, J.W.**, Xin, Y., et al. 2024, AJ, 167, 43. *Atmospheric metallicity and C/O of HD 189733 b from high-resolution spectroscopy*
12. Hejazi, N., **Xuan, J.W.**, Cristofari, P., et al. 2024, submitted to ApJL. *Chemical Links between a Young M-type T Tauri star and its Substellar Companion: Spectral Analysis and C/O Measurement of DH Tau A*
13. Costes, J., **Xuan, J.W.**, Vigan, A., et al. 2024, Accepted to A&A. *Fresh view of the hot brown dwarf HD 984 B through high-resolution spectroscopy*
14. Echeverri, D., **Xuan, J.W.**, Monnier, J., et al. 2024, ApJL, 965, L15. *Vortex Fiber Nulling for Exoplanet Observations: First Direct Detection of M Dwarf Companions around HIP 21543, HIP 94666, and HIP 50319*

¹ Dual-first author

15. Xin Y., **Xuan, J.W.**, Mawet, D., Wang, J. et al. 2023, JATIS 9(3), 035001. *On-sky speckle nulling through a single-mode fiber with the Keck Planet Imager and Characterizer*
16. Echeverri, D., **Xuan J.W.**, Jovanovic, N. et al. 2023, JATIS. *Vortex Fiber Nulling for Exoplanet Observations: Implementation and First Light*
17. Mawet, D., Ruane, G., **Xuan, W.** et al. 2017, ApJ, 838, 92. *Observing Exoplanets with High-dispersion Coronagraphy. II. Demonstration of an Active Single-mode Fiber Injection Unit*

SELECTED TALKS

Invited

TBD

UCSD/SDSU Astronomy & Astrophysics Colloquium, San Diego, CA Oct 2024

TBD

UCLA Tuesday Lunch Seminar, Los Angeles, CA Oct 2024

Retrieving Atmospheric Compositions of Directly Imaged Companions with High-Resolution Spectroscopy

Cloud Zwei Con Workshop, Ringberg Castle, Bavaria, Germany Jan 2023

Atmospheric abundances of directly imaged companions from KPIC and JWST

Other Worlds Laboratory Summer Program, Santa Cruz, CA July 2023, 2024

A Clear View of a Cloudy Brown Dwarf Companion from High-Resolution Spectroscopy

Max Planck Institute for Astronomy exocoffee, virtual Nov 2022

Unlocking the Science Potential of Keck Planet Imager and Characterizer (KPIC) Phase II

Keck Visiting Scholars Program Exit Talk, Waimea, HI Oct 2022

A Clear View of a Cloudy Brown Dwarf Companion from High-Resolution Spectroscopy

Plenary and Contributed

The first methane brown dwarf Gliese 229 B is a close binary

Plenary talk at Cool Stars 22, San Diego, CA June 2024

High-resolution spectroscopy of imaged planets and brown dwarfs with KPIC: abundances, spins, and RVs

Plenary talk at Exoplanets 5, Leiden, Netherlands June 2024

Are These Planets or Brown Dwarfs? Elemental Abundances in the Atmosphere of Substellar Companions

Keck Science Meeting, Berkeley, CA Sept 2023

Early Science Results from Phase II of the Keck Planet Imager and Characterization

Keck Science Meeting, Pasadena, CA Sept 2022

High resolution spectroscopy of directly imaged exoplanets with KPIC

Spirit of Lyot, Leiden, Netherlands June 2022

Atmospheric composition of a cloudy brown dwarf companion from high and low resolution spectroscopy

Keck Science Meeting, San Diego, CA Sept 2021

ADVISING AND SERVICE

Gavin Wang (Caltech SURF program, JHU undergraduate) 2024-

Aniket Sanghi (Caltech SURF program, UT Austin undergraduate) 2021-2023

Luke Handley (Caltech Astro Peer Mentoring, graduate student) 2023-

Referee for MNRAS (3), ApJ/AJ (3), A&A (4), and Scientific Reports (1)

AWARDS, HONORS AND FELLOWSHIPS

Keck Visiting Scholars Program (funded visit from July-Oct 2022) 2022

Caltech Center for Comparative Planetary Evolution Fellow 2021

Phi Beta Kappa & Sigma Xi May 2019

Downing Scholarship (Full scholarship for M.Phil. at Cambridge) May 2019

The Brackett Prize in Astronomy, Pomona College May 2019

Tileston Physics Prize, Department of Physics and Astronomy, Pomona College Nov 2018