

# Jerry (Wenhao) Xuan

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## EDUCATION

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- 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

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- 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 (VLTI/GRAVITY) **PI**, 4 hours
- P112 (VLT/CRIFRES+) **PI**, 12 hours
- 2023B Gemini South (IGRINS) **PI**, 16.9 hours

## SELECTED PUBLICATIONS

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**Summary: 32 refereed publications. 9 first author, 8 second author. 824 citations. ADS**

(\*\* student paper supervised by J.W.X.)

1. **Xuan, J.W.**, Mérand, A., Thompson, W. et al. Nature. *The cool brown dwarf Gliese 229B is a close binary*
2. **Xuan, J.W.**, Perrin, M., Mawet, D. et al. under review at ApJL. *Atmospheric abundances and bulk properties of the binary brown dwarf Gliese 229 Bab from JWST/MIRI spectroscopy*
3. **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  $\sim 10\text{--}30 M_{\text{Jup}}$  Companions*
4. **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*
5. **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*
6. **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  $\pi$  Men*
7. **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*
8. **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*
9. **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*
10. Zhang, Y., **Xuan, J.W.**, Mawet, D., et al. 2024, AJ, 168, 131. *Atmospheric characterization of the super-Jupiter HIP 99770 b with KPIC*
11. \*\*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*
12. 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*
13. 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*
14. 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*
15. 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*

16. 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*
17. Echeverri, D., **Xuan J.W.**, Jovanovic, N. et al. 2023, JATIS. *Vortex Fiber Nulling for Exoplanet Observations: Implementation and First Light*
18. 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

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### Invited

- Atmospheric compositions and binarity of directly imaged exoplanets and brown dwarfs*  
**UCSD/SDSU Astronomy & Astrophysics Colloquium**, San Diego, CA Oct 2024
- Atmospheric compositions and binarity of directly imaged exoplanets and brown dwarfs*  
 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

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- Gavin Wang (Caltech SURF, JHU undergraduate) 2024-  
 Aniket Sanghi (Caltech SURF, UT Austin undergraduate, now Caltech graduate student) 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

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- 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