

# James Mang

PH.D. CANDIDATE · NSF GRADUATE RESEARCH FELLOW

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## Research Interest

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My work focuses on studying the physical and chemical processes in the atmospheres of brown dwarfs and temperate giant planets using 1-D atmospheric models. I investigate cloud microphysics and cloud parameterization in ultra-cool substellar objects ( $T_{\text{eff}} < 400$  K) and their impact on observables from JWST. Additionally, I work on the development of [PICASO](#), an open-source Python package to provide the essential tools for the community to study exoplanetary atmospheres.

## Education

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**Ph.D. Astronomy, The University of Texas at Austin** Expected 2027

Dissertation: *Understanding Ultra-Cool Substellar Atmospheres in the Era of JWST*

Advisor: [Dr. Caroline V. Morley](#)

Spring 2024

**M.A. Astronomy, The University of Texas at Austin**

Thesis: *Microphysical Prescriptions for Parameterized Water Cloud Formation on Ultra-cool Substellar Objects*

Advisor: [Dr. Caroline V. Morley](#)

2017 - 2021

**B.A. Astrophysics & B.Sc. Chemistry, University of California, Berkeley**

Mentor: [Dr. Peter Gao](#)

## Appointments

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**The University of Texas at Austin**

NSF GRADUATE RESEARCH FELLOW

GRADUATE RESEARCH ASSISTANT

*Austin, TX*

*2023 - Present*

*2021 - 2023*

**NASA Goddard Space Flight Center**

RESEARCH ASSOCIATE

*Greenbelt, MD*

*Summer 2020*

**Space Sciences Laboratory**

EXPERIMENTAL ASTROPHYSICS RESEARCHER

*Berkeley, CA*

*2018 - 2021*

## Observational Programs

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- Cycle 4 **JWST DDT 9431**, First Images of our Young Jupiter Neighbor (Co-I)
- Cycle 4 **JWST GO 9157**, Probing the Dynamical History of a White Dwarf Planet (Co-I)
- Cycle 4 **JWST GO 9056**, Imaging the Coldest Planets Around the Nearest Accelerating Stars (Co-I)
- Cycle 4 **JWST GO 6915**, Direct Detection and Characterization of a Nearby Temperate Giant Planet (Co-I)
- Cycle 28 **HST GO 16448**, Confirming a tentative detection of an atmosphere around a potentially rocky planet (Co-I)

## Select Scientific Presentations

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### Conference Talks

Contributed	<b>Spirit of Lyot 6</b> , Pasadena, CA	Feb. 2026
Contributed	<b>EAS Annual Meeting</b> , Cork, IE	Jun. 2025
Contributed	<b>Cool Stars 22</b> , San Diego, CA	Jun. 2024
Contributed	<b>237th AAS Winter Meeting</b> , Virtual	Jan. 2021

### Colloquia & Seminar Talks

Invited	<b>University of Michigan SPF Seminar</b> , Ann Arbor, MI	Apr. 2025
Invited	<b>ExoExplorer's Science Series</b> , Virtual	Apr. 2024
Invited	<b>NASA Goddard URAA Summer Series</b> , Virtual	Aug. 2020
Invited	<b>Dunlap Institute Summer Series</b> , Toronto, ON	Jul. 2019

## Honors & Awards

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<b>OWL Communications Fellow</b>	2025
<b>NSF Graduate Research Fellowship</b>	2023

## Publications (First-Author Publications: 3, Total Publications: 19)

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### First Author Publications:

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3. *PICASO 4.0: Clouds and Photochemistry in Climate Models of Brown Dwarfs and Exoplanets*  
**Mang J.**, Batalha N.E., Morley C.V., Wogan N.F., et al. 2026 ApJ, accepted
2. *Microphysical Prescriptions for Parameterized Water Cloud Formation on Ultra-cool Substellar Objects*  
**Mang J.**, Morley C. V., Robinson T. D., Gao P. 2024 ApJ 974, 190
1. *Microphysics of Water Clouds in the Atmospheres of Y Dwarfs and Temperate Giant Planets*  
**Mang J.**, Gao P., Hood C.E., Fortney J.J., Batalha N., Yu X., de Pater I. 2022 ApJ 927, 184

### Second-Author & Third-Author Publications:

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4. *Worlds Next Door. IV. Mapping the Late Stages of Giant Planet Evolution with a Precise Dynamical Mass and Bolometric Luminosity for the Benchmark Cold Gas Giant  $\epsilon$  Ind Ab*  
Sanghi A., Thompson W., **Mang J.**, Xuan J., et al. 2026 ApJ, submitted
3. *A second visit to Eps Ind Ab with JWST: new photometry confirms ammonia and suggests thick clouds in the exoplanet atmosphere of the closest super-Jupiter*  
Matthews E.C., **Mang J.**, Carter A.L., Mâlin M., et al. 2026 ApJL, submitted
2. *Worlds Next Door. III. Indirect Evidence for Enhanced Atmospheric Metallicity or the Presence of Water Clouds in the Nearest Jupiter-analog  $\epsilon$  Eri b*  
Sanghi A., **Mang J.**, Llop-Sayson J., Mamajek E.E., et al. 2026 ApJ, accepted

1. *NIRCam yells at cloud: JWST MIRI imaging can directly detect exoplanets of the same temperature, mass, age, and orbital separation as Saturn and Jupiter*  
Bowens-Rubin R., **Mang J.**, Limbach M., Carter A.L., et al. 2025 ApJL 986, L26

## Additional Co-Author Publications:

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12. *Panchromatic view of the Frigid Jovian Exoplanet COCONUTS-2 b*  
Ravet M., Bonnefoy M., Chauvin G., Zhang Z., [27 total], et al. 2026 A&A, submitted
11. *Diversity of Cold Worlds: Disequilibrium Chemistry in WISE 0503 and WISE 0825*  
Rowland, M., Morley, C.V., Faherty, J.K., Suárez, G., et al. [14 total] 2026 ApJ, submitted
10. *Simulations of Electron Beam Interactions in Brown Dwarf Atmospheres*  
Zuckerman A., Pineda S.J., Brain D., **Mang J.**, Morley C., 2026 ApJ, Accepted
9. *Condensation Clouds in Substellar Atmospheres with Virga*  
Batalha N.E., Rooney C.M., Visscher C., Moran S.E., et al. [17 total] 2026 AJ, 171, 98
8. *A Deep Search for Exomoons around WISE 0855 with JWST*  
Wilson M.J., Limbach M.A., Skemer A.J., Vos J.M., et al. [14 total] 2025 AJ 170, 357
7. *Worlds Next Door: A Candidate Giant Planet Imaged in the Habitable Zone of  $\alpha$  Cen A. I. Observations, Orbital and Physical Properties, and Exozodi Upper Limits*  
Beichman C., Sanghi A., Mawet D., Kervella P., et al. [30 total] 2025 ApJL 989, L22
6. *JWST Coronagraphic Images of 14 Her c: a Cold Giant Planet in a Dynamically Hot, Multi-planet System*  
Bardalez Gagliuffi D.C., Balmer W.O., Pueyo L., Brandt T.D., et al. [19 total] 2025 ApJL 988, L18
5. *Follow-up Exploration of the TWA 7 Planet-Disk System with JWST NIRCam*  
Crotts K.A., Carter A.L., Lawson K., **Mang J.**, et al. 2025 ApJL 987, L41
4. *Thermal Emission and Confirmation of the Frigid White Dwarf Exoplanet WD 1856+534 b*  
Limbach M., Vanderburg A., MacDonald R. J., Stevenson K., et al. [15 total] 2025 ApJL 984, L28
3. *The transmission spectrum of the potentially rocky planet L 98-59c*  
Barclay T., Sheppard K., Latouf N., Mandell A., et al. [35 total] 2025 AJ 169, 241
2. *Protosolar D-to-H abundance and one part-per-billion PH<sub>3</sub> in the coldest brown dwarf*  
Rowland, M. J., Morley, C. V., Miles, B. E., Suarez, G., et al. [27 total] 2024 ApJL 977, L49
1. *SOAR TESS Survey. I: Sculpting of TESS planetary systems by stellar companions*  
Ziegler C., Tokovinin A., Briceno C., **Mang J.**, Law N., Mann A. (2019) AJ 159, 19

## Research Notes & White Papers:

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1. *The Sonora Substellar Atmosphere Models. V. A Correction to the Disequilibrium Abundance of CO<sub>2</sub> for Sonora Elf Owl*

Wogan N.F., **Mang J.**, Batalha N.E., Zahnle K., et al. 2025 RNAAS 9, 108

## Teaching & Mentorship

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<b>UT Astronomy Undergraduate Mentor</b>	<i>2022 - Present</i>
<b>UT Austin NSF REU Informal Mentor</b>	<i>2023 - 2024</i>
<b>UT Astronomy TAURUS Mentor</b>	<i>Summer 2022</i>
<b>UT Astronomy Graduate Teaching Assistant, AST 309R</b>	<i>Spring 2022</i>
<b>UC Berkeley Peer Advisor</b>	<i>2020 - 2021</i>
<b>UC Berkeley Astronomy Course Reader, ASTRON C12</b>	<i>2020 - 2021</i>
<b>UC Berkeley Chemistry Teacher-Scholar, CHEM 1AL</b>	<i>Fall 2018</i>

## Service & Outreach

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<b>NASA ExoExplorers Alumni Organizer</b>	<i>2025 - Present</i>
<b>Center for Planetary Systems Habitability Reading Group Co-Lead</b>	<i>2023 - Present</i>
<b>Astronomy on Tap ATX Organizing Committee Member</b>	<i>2023 - Present</i>
<b>UT Astronomy Graduate Student Representative</b>	<i>2024 - 2025</i>