James Mang

PH.D. CANDIDATE · NSF GRADUATE RESEARCH FELLOW

Department of Astronomy, The University of Texas at Austin, 2515 Speedway, Austin, TX 78712

j_mang@utexas.edu | jamesmang.wixsite.com/jamesmang | James-Mang | James-Mang

Research Interest

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_{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

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

M.A. Astronomy, **The University of Texas at Austin** — Spring 2024
Thesis: *Microphysical Prescriptions for Parameterized Water Cloud Formation on Ultra-cool Substellar Objects*
Advisor: Dr. Caroline V. Morley

B.A. Astrophysics & B.Sc. Chemistry, **University of California, Berkeley** — 2017 - 2021
Mentor: Dr. Peter Gao

Positions

The University of Texas at Austin — *Austin, TX*
NSF GRADUATE RESEARCH FELLOW — *2023 - Present*
GRADUATE RESEARCH ASSISTANT — *2021 - 2023*

NASA Goddard Space Flight Center — *Greenbelt, MD*
RESEARCH ASSOCIATE — *Summer 2020*

Space Sciences Laboratory — *Berkeley, CA*
EXPERIMENTAL ASTROPHYSICS RESEARCHER — *2018 - 2021*

Publications (First-Author Publications: 2, Total Publications: 13)

13. *Condensation Clouds in Substellar Atmospheres with* `Virga`
Batalha N.E., Rooney C.M., Visscher C., Moran S.E., et al. [17 total incl. **Mang J.**] 2025 ApJ, submitted

12. *Simulations of Electron Beam Interactions in Brown Dwarf Atmospheres*
Zuckerman A., Pineda S.J., Brain D., **Mang J.**, Morley C., 2025 ApJ, submitted

11. *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 incl. **Mang J.**] 2025 ApJ, submitted

10. *Worlds Next Door: A Candidate Giant Planet Imaged in the Habitable Zone of α Cen A. I. Observations, Orbital and Physical Properties, and Exozodi Upper Limits*
    Beichman C., Sanghi A., Mawet D., Kervella P., et al. [30 total incl. **Mang J.**] 2025 ApJL, Accepted
9. *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 incl. **Mang J.**] 2025 ApJL 988, L18
8. *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
7. *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
6. *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 incl. **Mang J.**] 2025 ApJL 984, L28
5. *The transmission spectrum of the potentially rocky planet L 98-59c*
    Barclay T., Sheppard K., Latouf N., Mandell A., et al. [35 total incl. **Mang J.**] 2025 AJ 169, 241
4. *Protosolar D-to-H abundance and one part-per-billion PH_3 in the coldest brown dwarf*
    Rowland, M. J., Morley, C. V., Miles, B. E., Suarez, G., et al. [27 total incl. **Mang J.**] 2024 ApJL 977, L49
3. *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
2. *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
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

Observational Programs

Cycle 4	**JWST DD 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)

Scientific Presentations & Posters

Conference Talks

Jun 27 2025	**New Atmospheric Models for Cold Directly-Imaged Planets and Brown Dwarfs**, EAS 2025 (Contributed)	*Cork, Ireland*
Jun 24 2024	**Models for Substellar Objects in Chemical Disequilibrium with Water and Ammonia Clouds**, Cool Stars 22 (Contributed)	*San Diego, CA*
Jan 14 2021	**Microphysics of Water Clouds in the Atmospheres of Brown Dwarfs and Temperate Giant Planets**, AAS 237 (Contributed)	*Virtual*

Colloquia & Seminar Talks

Apr 22 2025	**New Atmospheric Models for the Coldest Directly-Imaged Planets and Brown Dwarfs**, Planets & Star Formation Seminar (Invited)	*University of Michigan*
Apr 12 2024	**Modeling Water Clouds in Substellar Atmospheres in the Era of JWST**, ExoExplorer's Science Series (Invited)	*Virtual*
Aug 8 2020	**Modeling M-Earth Atmospheres in Transit**, NASA Goddard URAA Summer Series (Invited)	*Virtual*
Jul 5 2019	**One Hit Wonders: Searching for Single Transit TESS Planets**, Dunlap Institute Summer Series (Invited)	*University of Toronto*

Posters

Aug 15 2024	**Models for Substellar Objects in Chemical Disequilibrium with Water and Ammonia Clouds**, TAPS II	*UT San Antonio*
Mar 16 2024	**Microphysical Prescriptions for Simplified Water Cloud Formation on Ultra-cool Substellar Objects**, Extreme Solar Systems V	*Christchurch, NZ*
Aug 17 2023	**Microphysical Water Cloud Models in the Era of JWST**, TAPS I	*UT San Antonio*
Jun 19 2023	**Microphysical Water Cloud Models in the Era of JWST**, ERES	*Yale University*
May 1 2022	**Microphysics of Water Clouds in the Atmospheres of Brown Dwarfs and Temperate Giant Planets**, Exoplanets IV	*Las Vegas, NV*

Honors & Awards

2025	**OWL Communications Fellow**, Other Worlds Laboratory
2023	**NSF Graduate Research Fellowship**, National Science Foundation

Teaching & Mentorship

2022 - Present	**Undergraduate Mentor**, UT Austin Astronomy Department
2023 - 2024	**NSF REU Informal Mentor**, UT Austin Astronomy Department
Summer 2022	**TAURUS Mentor**, UT Austin Astronomy Department
Spring 2022	**Graduate Teaching Assistant**, UT Austin Astronomy Department, AST 309R
2020 - 2021	**Peer Advisor**, UC Berkeley Office of Undergraduate Research
2020 - 2021	**Course Reader**, UC Berkeley Astronomy Department, ASTRON C12
Fall 2018	**Teacher-Scholar**, UC Berkeley College of Chemistry, CHEM 1AL

Service & Outreach

2025 - Present	**Alumni Organizer**, NASA ExoExplorers
2023 - Present	**Co-Lead**, Center for Planetary Systems Habitability Joint Reading Group
2023 - Present	**Organizing Committee Member**, Astronomy on Tap ATX
2024 - 2025	**Graduate Student Representative**, UT Austin Astronomy Department