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

Appointments

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*

Observational Programs

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

Conference Talks

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

Colloquia & Seminar Talks

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

Honors & Awards

OWL Communications Fellow *2025*
NSF Graduate Research Fellowship *2023*

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

First Author Publications:

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:

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 ϵ Ind Ab*
   Sanghi A., Thompson W., **Mang J.**, Xuan J., et al. 2026 ApJ, submitted
3. *Worlds Next Door. III. Indirect Evidence for Enhanced Atmospheric Metallicity or the Presence of Water Clouds in the Nearest Jupiter-analog ϵ Eri b*
   Sanghi A., **Mang J.**, Llop-Sayson J., Mamajek E.E., et al. 2026 ApJ, accepted
2. *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

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:

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 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] 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_3 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:

1. *The Sonora Substellar Atmosphere Models. V. A Correction to the Disequilibrium Abundance of CO_2 for Sonora Elf Owl*

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

Teaching & Mentorship

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

Service & Outreach

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