James Mang

PH.D. CANDIDATE · NSF GRADUATE RESEARCH FELLOW

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James-Mang | NASA ADS | Google Scholar | ORCID: 0000-0001-5864-9599

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*

Select Scientific Presentations

Conference Talks

Contributed	**Cool Stars 23**, Tokyo, JP	*Jun. 2026*
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 Chicago Exoplanet Journal Club**, Chicago, IL	*Sept 2026*
Invited	**Lunar & Planetary Laboratory Colloquium**, Tucson, AZ	*Sept 2026*
Invited	**American Museum of Natural History Seminar**, New York City, NY	*Sept 2026*
Invited	**Carnegie EPL Seminar**, Washington, D.C.	*May 2026*
Invited	**Space Telescope Science Institute Seminar**, Baltimore, MD	*May 2026*
Invited	**UC Santa Cruz PLUNCH Seminar**, Santa Cruz, CA	*Mar. 2026*
Invited	**University of Michigan SPF Seminar**, Ann Arbor, MI	*Apr. 2025*
Invited	**ExoExplorers Science Series**, Virtual	*Apr. 2024*
Invited	**NASA Goddard URAA Summer Series**, Virtual	*Aug. 2020*
Invited	**Dunlap Institute Summer Series**, Toronto, ON	*Jul. 2019*

Observational Programs

Cycle 34	**HST GO 18376**, Extending Accretion Studies into the Sub-Jupiter Regime with TWA 7 b (Co-I)
Cycle 4	**JWST DDT 12628**, Simultaneous Confirmation and Spectral Characterization of a Giant Planet in Alpha Centauri A's Habitable Zone (Co-I)
Cycle 5	**JWST GO 10764**, Once More, With Feeling: Establishing a Robust Sample of JWST Exoplanet Discoveries (Co-I)
Cycle 5	**JWST GO 10758**, The Time Is Now: Last Chance to Snare the Mid-Infrared Glow of Jupiter's Real Twin (Co-I)
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)

Honors & Awards

UT Graduate School Dissertation Writing Fellowship	*2026*
UT Graduate School Professional Development Award	*2026*
OWL Communications Fellow	*2025*
NSF Graduate Research Fellowship	*2023*

Teaching & Mentorship

UT Astronomy Undergraduate Mentor *2022 - Present*
UT Austin NSF REU Informal Mentor *2023 - 2024, 2026*
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

McDonald Observatory Livestream Facilitator *2026 - Present*
McDonald Observatory Teacher Workshop Presenter *2026 - Present*
NASA ExoExplorers Alumni Mentorship Program Organizer *2025 - Present*
Astronomy on Tap ATX Organizing Committee Member *2023 - Present*
Center for Planetary Systems Habitability Reading Group Co-Lead *2023 - 2026*
UT Astronomy Graduate Student Representative *2024 - 2025*

Publications (First-Author Publications: 5, Total Publications: 29 [+12 in review])

Full list: NASA ADS– Google Scholar– ORCID
First-Author Citations: 83. Total Citations: 767. Total h-index: 14

First Author Publications: († indicates co-first authorship/equal contribution)

5. *Can Auroral Heating Explain Brown Dwarf Thermal Inversions?*
   †Zuckerman A. & †**Mang J.**, Pineda J.S., Morley C.V., et al. 2026 ApJ, 1010, 222
4. *The Sonora Substellar Atmosphere Models. VII. Flame Skimmer: Cloud-free Atmospheric and Evolutionary Models for the Coldest Substellar Objects*
   Mang J., Chachan Y., Morley C.V., Batalha N.E., et al. 2026 ApJ, 1008, 254
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, 1000, 98
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:

9. *Exploring the Metal-Poor Atmosphere of the Extreme T Subdwarf WISE 1810–10 with JWST and Atmospheric Retrievals*
   Kothari H., Cushing M.C., **Mang J.**, Burgasser A.J., et al. 2026 ApJ, in review

8. *Evidence for High-Amplitude Variability on the Cold Gas Giant Exoplanet WD 1856+534 b*
   Clark M., **Mang J.**, Limbach M.A., Rauscher E., et al. 2026 ApJ, in review

7. *Water Cloud and Chemical Modulations in the Coldest Brown Dwarf*
   Miles B.E., **Mang J.**, Morley C.V., Skemer A.J.I., et al. 2026 AJ, accepted

6. *An Updated Model for ϵ Eridani b and Prospects for Imaging with the Roman Coronagraph*
   Llop-Sayson J., Fogal A., **Mang J.**, Thompson W., et al. 2026 AJ, 172 292

5. *Atmospheric Signatures of Common Envelope Evolution in White Dwarf Planets*
   Jenkins S.A., Vanderburg A., **Mang J.**, Becker J. et al. 2026 ApJ 1006, 241

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 AJ 172, 115

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, 1002, L5

2. *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 AJ, 171, 225

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:

27. *JWST Discovery of an Extremely Cold Extra-Solar World*
    Fontanive C., Vandal T., Albert L., Biller B., et al. 2026 Nature, in review

26. *Using New Accurate JWST Luminosities to Improve Constraints on the Local Substellar Mass and Age Functions and Update Evolutionary Models*
    Beiler S.A., Cushing M.C., Davis C.E., Kirkpatrick J.D., et al. 2026 ApJ, in review

25. *Sky Background Contamination Explains the Unexpectedly High Temperature of WD 1856 b*
    Jenkins S., Limbach M., Vanderburg A., Brandt T., et al. 2026 ApJ, in review

24. *Probing the Atmosphere of GJ 504 b at Mid-Infrared Wavelengths with JWST. I. Spectral Cross-Correlation Analysis*
    Mâlin M., Kühnle H., Cugno G., Patapis P., et al. 2026 ApJ, in review

23. *Diversity of Cold Worlds: Disequilibrium Chemistry in WISE 0503 and WISE 0825*
Rowland, M., Morley, C.V., Faherty, J.K., Suárez, G., et al. 2026 ApJ, in review

22. *The deuterium-rich atmosphere of a mature super-Jupiter*
Xuan J., Chachan Y., Ruffio J.B., Ohno K., et al. 2026 Science, in review

21. *Worlds Next Door. V. New Constraints on a Giant Planet and the Stability of Habitable Zone Terrestrial Planets in the 61 Cygni Binary System*
Sanghi A., Quarles B., Lin A.S.J., Shariat C., et al. 2026 ApJL, in review

20. *The accretionally heated atmospheres of protoplanets and brown dwarfs*
Choksi N., Gao P., Balmer W., Xuan J., et al. 2026 ApJ, in review

19. *The Dyn-Atmo Survey: JWST/NIRSpec spectroscopy of dynamical benchmark GJ 758 B*
Madurowicz A., Rickman E., Bardalez Gagliuffi D., **Mang J.**, et al. 2026 ApJ, in review

18. *The Dyn-Atmo Survey: High-contrast Imaging Spectroscopy of the Substellar Companion HD 13724 B with the JWST NIRSpec IFU*
Hoch K.K.W., Madurowicz A., Nasedkin E., Rickman E., et al. 2026 AJ, in review

17. *The JWST Sub-Jupiter Imaging Survey Collaboration: Novel Programs' Sensitivities to the Wide-Separation, Cold, Sub-Jupiter Exoplanet Population*
Strampelli G.M., Carter A.L., Biller B., Fontanive C. et al. 2026 AJ, accepted

16. *The JWST Sub-Jupiters Survey: Direct Imaging Discovery of a Giant Planet and a Debris Disk Around the Young M-dwarf RX J0534.0-0221*
Ferrer-Chavez R., Wang J.J., Wagner K., Lawson K. et al. 2026 ApJL, 1010, L19

15. *Understanding the Energy Input Required for Methane Emission on CWISEP J193518.59-154620.3: A Comprehensive Analysis*
Smith K.J., Marley M.S., Koskinen T.T., **Mang J.** 2026 ApJ, 1009, 192

14. *Time-Resolved JWST Retrieval Analysis of the Coldest Brown Dwarf: Temperature and Chemical Variations in WISE 0855−07*
Kothari H., Morley C.V., Miles B.E., Rowland M.J., et al. 2026 ApJ, 1008, 131

13. *Direct Imaging Discovery of Giant Exoplanet β Pictoris d: A Decade-Long Game of Hide-and-Seek*
Sutlieff B.J., Bonse M.J., Christiaens V., Fontanive C., et al. 2026 ApJL 1006, L10

12. *Impact of Clouds on the Atmosphere-Mantle Interface of Sub-Neptunes*
Mukherjee S., Nixon M.C., Welbanks L., **Mang J.**, et al. 2026 ApJL 1005, L63

11. *Panchromatic view of the Frigid Jovian Exoplanet COCONUTS-2 b*
Ravet M., Bonnefoy M., Chauvin G., Zhang Z., et al. 2026 A&A, 710, A46

10. *Simulations of Electron Beam Interactions in Brown Dwarf Atmospheres*
    Zuckerman A., Pineda S.J., Brain D., **Mang J.**, Morley C., 2026 ApJ, 999, 26

9. *Condensation Clouds in Substellar Atmospheres with* ***Virga***
    Batalha N.E., Rooney C.M., Visscher C., Moran S.E., et al. 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. 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. 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. 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. 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. 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. 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. (2020) AJ 159, 19

Research Notes & White Papers:

2. *Reflected Light Spectra of our Young Jupiter Analog Neighbor*
    Llop-Sayson J., Thompson W., Sanghi A., **Mang J.**, et al. 2026. Roman Coronagraph Community Participation Program (CPP) White Paper

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