Trent B. Thomas

NSF Fellow, Ph.D. Candidate at the University of Washington

tbthomas@uw.edu – Personal Website
Curriculum Vitae

EDUCATION

Ph.D. in Earth and Space Sciences, Astrobiology	2020-Present
B.S. in Astrophysics	2016-2020
PROFESSIONAL EXPERIENCE	
National Science Foundation Graduate Research Fellow	2020-Presen
Visiting Researcher Massachusetts Institute of Technology (MIT) – Advisor: Prof. Gaia Stucky de Quay	2024
Research Intern	2018-2023
SELECTED FELLOWSHIPS & AWARDS	
Best Paleoclimate and Sedimentology Talk – UW ESS Research Gala	2025
Finalist, Student Poster Competition – Astrobiology Science Conference	2024
Winglee Endowed Graduate Support Fund and Space Physics Fellowship – UW ESS	2023
Best Astrobiology Talk – UW ESS Research Gala	2023
National Science Foundation Graduate Research Fellowship	2020
Dean's Prize for Excellence in Undergraduate Research – UCLA	2020
Early Career Collaboration Award – NASA Astrobiology	
Rudnick-Abelmann Scholarship – UCLA Physics & Astronomy	2019
3 additional travel grants from NASA, AAS, & LPI	
PEER-REVIEWED PUBLICATIONS	
FEEN-NEVIEWED FUDLICATIONS	

4 published (3 first or second author), 1 in review, 2 in prep.

34 citations (Google Scholar)

IN PREPARATION

- 1. **Thomas, T. B.,** Macdonald, F.A., & Catling, D.C. (In prep. for *Geology*). Carbon Cycle Explanations for the Duration of Sturtian and Marinoan Snowball Glaciations.
- 2. **Thomas, T. B.,** Stucky de Quay, G., & Mitchell, W.H. (In prep.). Automatic Image Segmentation of Alluvial Fans and Deltas on Mars with Deep Learning.

IN REVIEW

3. **Thomas, T. B.**, Meadows, V.S., Krissansen-Totton, J., Gialluca, M., Wogan, N., & Catling, D.C. (In review at *The Planetary Science Journal*). Geochemical Constraints on Water Outgassing as a Source of Secondary Atmospheres on the TRAPPIST-1 Planets.

PUBLISHED

- 4. Adams, D., Scheucher, M., Hu, R., Ehlmann, B., **Thomas, T. B.**, Wordsworth, R., Scheller, E., Lillis, R., Smith, K., Rauer, H. & Yung, Y. 2025, *Nature Geoscience*. <u>Episodic Warm Climates on Mars Primed by Crustal Hydration</u>.
- 5. **Thomas, T.B.**, & Catling, D.C. 2024, *Nature Communications*. Three-stage Formation of Cap Carbonates after Marinoan Snowball Glaciation Consistent with Depositional Timescales and Geochemistry.
- 6. **Thomas, T. B.**, Hu, R., & Lo, D.Y. 2023, *The Planetary Science Journal*. Constraints on the Size and Composition of the Ancient Martian Atmosphere from Coupled CO2–N2–Ar Isotopic Evolution Models.
- 7. Hu R., & **Thomas, T.B.** 2022, *Nature Geoscience*. A Nitrogen-Rich Atmosphere on Ancient Mars Consistent with Isotopic Evolution Models.

CONFERENCE PRESENTATIONS

[O] = oral (10), [P] = poster (3), * = presentation award (3)

- 1. *Thomas, T. B., (2025) "Fundamental aspects of Snowball Earth revealed by a global carbon cycle model". UW Earth and Space Science Research Gala. Seattle, Washington. [O]
- 2. *Thomas, T. B., and Catling, D. C., (2024) "A New Model for the Formation of Cap Carbonates after Neoproterozoic Glaciations". Astrobiology Science Conference. Providence, Rhode Island. [P]
- 3. **Thomas, T. B.,** et al., (2024) "Constraints on water outgassing rates on the TRAPPIST-1 planets from interior modeling". Extreme Solar Systems V. Christchurch, New Zealand. [P]
- 4. **Thomas, T. B.**, and Catling, D. C., (2023) "Untangling Planetary Processes in the Neoproterozoic with Cap Carbonates and a Geologic Carbon Cycle Model". Goldschmidt Conference. Lyon, France. [O]
- 5. *Thomas, T. B., (2023) "The 4 Billion Year History of Mars's Atmospheric Evolution Revealed by Isotopic Evolution Models". UW Earth and Space Science Research Gala. Seattle, Washington. [O]
- 6. **Thomas, T. B.**, Hu, R., and Lo, D. Y., (2022) "Constraints on the Evolution and Ancient Composition of the Martian Atmosphere from Coupled CO2-N2-Ar Isotopic Evolution Models". 54th Division for Planetary Science Conference. London, Ontario, Canada. [O]
- 7. **Thomas, T. B.**, and Catling, D. C., (2022) "A Self-Consistent Model for Generating Marinoan Cap Carbonates and Constraining Neoproterozoic Climate". Astrobiology Science Conference. Atlanta, Georgia. [O]

- 8. **Thomas, T. B.,** (2022) "A Self-Consistent Model for Generating Marinoan Cap Carbonates and Constraining Neoproterozoic Climate". UW Earth and Space Science Research Gala. Seattle, Washington. [O]
- 9. **Thomas, T. B.**, Hu, R., and Lo, D. Y., (2022) "Joint Models for the Evolutionary History of Carbon, Nitrogen, and Argon in the Martian Atmosphere". 53rd Lunar and Planetary and Science Conference. The Woodlands, Texas. [O]
- 10. **Thomas, T. B.**, and Hu, R., (2020) "A Nitrogen-Rich Atmosphere on Ancient Mars Indicated by Isotopic Evolution". American Geophysical Union Fall Meeting. Virtual. [O]
- 11. **Thomas, T. B.**, and Hu, R., (2020) "A Nitrogen-Rich Atmosphere on Ancient Mars Indicated by Isotopic Evolution. 52nd Division for Planetary Science Conference. Virtual. [O]
- 12. **Thomas, T. B.**, and Hu, R., (2020) "A Nitrogen-Rich Atmosphere on Ancient Mars Indicated by Isotopic Evolution". UCLA Undergraduate Research Week. Virtual. [O]
- 13. **Thomas, T. B.**, and Hu, R., (2019) "Evolutionary History of the Isotopic Composition of Nitrogen in the Martian Atmosphere". 9th International Conference on Mars. Pasadena, California. [P]

SELECTED LECTURES

Earth Science Department Seminar – Dartmouth College	2025
Astrobiology Department Seminar – UW	2024
Planetary Lunch Seminar – UW	2024
Planetary Climate and Habitability Research Group Seminar – Harvard University	2024
Gaia Lab Seminar – MIT	2024
Virtual Planetary Laboratory Seminar – NASA/UW	2023
High Performance Computing Seminar – NASA JPL	2022
ROCKE-3D Planetary Climate Seminar – NASA GISS	2022
Mars Atmosphere Group Seminar – Caltech	2020

TEACHING & MENTORSHIP

CLASSES TAUGHT

MENTORSHIP

Undergraduates: Veronica Fula (UW), Jasmine Singh (Purdue)

ADDITIONAL TRAINING

Sagan Summer Workshop – NASA Exoplanet Science Institute	2023
	2023
Origin of Life Workshop – UW Astrobiology	2022
Storytelling Fellows Podcasting Workshop – UW Libraries	
Planetary Exploration Mission Design Workshop – UW Astrobiology	
VPLanet Developers Workshop – Virtual Planetary Laboratory	
ROCKE-3D GCM Tutorial – NASA GISS	
Quantitative Habitability Workshop – NASA NExSS	
Exoclimes Simulation Platform Summer School – University of Bern	
SERVICE	
Peer review: Nature Communications	
Early Career Committee – NASA "LIFE" Research Coordination Network	2025-Present
Expert Screener – CDRXIV, Preprints and Data for Carbon Dioxide Removal	
Department Representative – UW CoEnv Student Advisory Council	
Committee Member – UW ESS	
Awards, computing, graduate-nominated speaker (x2), retreat, peer mentor, planetary so	
Primary Convener & Session Chair – Astrobiology Science Conference, Provi	
Session title: "Global Environmental Changes and Increased Biological Complexity in the Paleozoic".	Neoproterozoic and
PUBLIC ENGAGEMENT	
COMMUNITY OUTREACH	
Guest Speaker – Everett Rock and Gem Club	
Science Guest – Bandit Theater, <u>Mad Science Improv</u>	2025
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Science Guest – Bandit Theater, Mad Science Improv Classroom Mentor (20 hours, 8 students) – Coyote Central Youth Arts Organi Contributor – NASA NEXSS & NASA NFoLD Science Communication Speaker (Mars: Why the Hype?) – Astronomy on Tap, Seattle Volunteer Teacher (8 hours, 120 students) – Nelson Middle School, Seattle Page Creator (Prebiotic atmosphere) – Wikipedia	2025 zation 2024 2022 – 2023 2022 2022 2022
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