

# Elizabeth M. Spiers, PhD

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## ***Education***

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**Ph.D. Earth & Atmospheric Sciences – Planetary Science** (May 2023)

*Georgia Institute of Technology*

**Thesis:** *Habitable Ocean World Box (HOWBox) Model: Linking Europa's Thermal - Geochemical Evolution*

**Advisor:** *Prof. Britney Schmidt*

**Doctoral Minor:** *Geochemical Modeling*

**Astrobiology Graduate Certificate** (2022), *Georgia Institute of Technology*

**B.S. Applied Physics** (2017), *Purdue University*

**B.S. Planetary Science** (2017), *Purdue University*

## ***Journal Publications***

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1. Joshi, K., Wright, C. S., Ziegler, K. F., **Spiers, E. M.**, et.al. & Iyer-Biswas, S. (*submitted*). Emergent Simplicities in Stochastic Intergenerational Homeostasis. *bioRxiv*, <https://doi.org/10.1101/2023.01.18.524627>
2. **Spiers E. M.** & Schmidt B. E. (*in revision*). Variable Salinity and Hydrogen Production in Europa's Ocean. *Journal of Geophysical Research – Planets*.
3. Schmidt B. E., et. al. (incl. **Spiers E. M.**) (*in revision*). Vertical Entry Robot for Navigating Europa (VERNE): an ocean profiling thermo-mechanical subsurface mission concept for searching for life. *Planetary Science Journal*.
4. Vance S. D., Craft K., Shock E., et. al. (incl. **Spiers E. M.**) (*in revision*) Habitability Science with Europa Clipper. *Space Science Reviews*.
5. Roberts J.H., McKinnon W.B., Elder C., et. al. (incl. **Spiers E. M.**) (2023) Exploring the Interior of Europa with the Europa Clipper. *Space Science Reviews*. 219(6), 46
6. Lawrence J.D., Mullen A. D., et. al. (incl. **Spiers E. M.**) (2023). Subsurface Science and Search for Life in Ocean Worlds. *Planetary Science Journal*, 4(2), 22. <https://doi.org/10.3847/PSJ/ACA6ED>
7. **Spiers E. M.**, et al. (2021). Tiger: Feasibility Study for a New Frontiers Enceladus Habitability Mission. *Planetary Science Journal*, 2(5), 195. <https://doi.org/10.3847/PSJ/ac19b7>

## ***Other Published Works (e.g. book chapters, white papers)***

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1. Stockton, A. M., et. al. (incl. **Spiers E. M.**) (2023). The Fermi Paradox and Astrobiology. In L. Johnson & K. Roy (Eds.), *Interstellar Travel: Purpose and Motivations* (pp. 209–266). Elsevier.
2. Schmidt B. E., et. al. (incl. **Spiers E. M.**) (2021). Dive, dive, dive: Accessing the Subsurface of Ocean Worlds. *Bulletin of the American Astronomical Society* 53 (4), 246
3. Schmidt B. E., et. al. (incl. **Spiers E. M.**) (2021). Enabling progress towards life detection on NASA missions. *Bulletin of the American Astronomical Society* 53 (4), 260
4. Bryson F. E., et. al. (incl. **Spiers E. M.**) (2020). Vertical Entry Robot for Navigating Europa (VERNE): Mission concept and system design. In *Accelerating Space Commerce, Exploration, and New Discovery Conference, ASCEND 2020*. American Institute of Aeronautics and Astronautics Inc, AIAA.

### ***Professional Experience***

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- Research Associate** - University of Texas at Austin, *Institute for Geophysics*  
Sept. 2023 – Present
- Summer Researcher** - Cornell University, *Center for Astrophysics and Planetary Science*  
May. 2023 – Aug. 2023
- Visiting Researcher** - University of Texas at Austin, *Institute for Geophysics*  
Feb. 2023 – Aug. 2023
- Graduate Student Affiliate** - NASA Europa Clipper Science Team, *Radar for Europa Assessment & Sounding: Ocean to Near-surface (REASON)*  
2018 – Present
- Graduate Research Assistant** - Georgia Institute of Technology, *Earth & Atmospheric Sciences*  
2017 – May 2023
- Undergraduate Research Assistant**, Purdue University - *Physics Department*  
2014 - 2017

### ***Other Professional Activities***

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- Future of the Search for Life Workshop**, *NASA’s Network for Life Detection*, 2022
- BioX2 Microfluidic Minlon Primer Loading System Student Team**, *Georgia Tech AE 8803 – Space Instrumentation for Life Detection*, 2021
- Science Team Member (2019-2021), Lead (2019)**, “Vertical Entry Robot for Navigating Europa (VERNE)”, *NASA SESAME program PI: Britney Schmidt, 2019-2021*
- Principal Investigator**, “Tiger: A New Frontiers Mission Concept to Enceladus”, *NASA JPL Planetary Science Summer School*, 2020
- GeoPlanet Thematic School: Fluid-Rock Interactions in the Solar System**, *Laboratoire de Planétologie et Géodynamique; Nantes, FR*, 2018

### ***Invited Talks***

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1. NASA Jet Propulsion Laboratory - "Quantifying Oxidant Delivery to Europa's Ocean via Basal Melt" (June 2023)
2. *Georgia Tech Planetary Science and Astrobiology Seminar*– "How to Apply to Planetary Science PhD Programs" (October 2022)
3. *Georgia Tech Explorigins Student Group*– "How to Apply to Planetary Science PhD Programs" (September 2022)

### ***Select Conference Presentations – \*denotes oral presentation***

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1. \***Spiers, E. M.**, and Schmidt B. E. (2023) "Quantifying Oxidant Flux to Europa's Ocean via Basal Melt." *54th Lunar and Planetary Science Conference*. No. 2987
2. \***Spiers, E. M.**, and Schmidt B. E. (2022) "Using a Thermally-Linked Box Model to Examine Europa's Ocean Evolution." *Astrobiology Science Conference*. 126(3)
3. Miller, S., et al. (incl. **Spiers, E.M.**) (2022) "Ice-ocean Boundary Layer Dynamics at Europa and Its Effect on Global Circulation." *Astrobiology Science Conference*. 104(6)
4. Schmidt, B.E., et al. (incl. **Spiers, E.M.**) (2022) "Ocean Worlds in Our Backyard." *Astrobiology Science Conference*. 126(1)
5. Schmidt, B.E., et al. (incl. **Spiers, E.M.**) (2022) "Vertical Entry Robot for Navigating Europa (VERNE): An ice- and ocean- profiling thermomechanical mission to search for life on Europa." *Astrobiology Science Conference*. 502(2)
6. \***Spiers, E. M.**, and Schmidt B. E. (2022) "Variability in Europa's Ocean Composition due to Oscillatory Orbital Eccentricity." *Ocean Sciences Meeting*. No. 8440.
7. Ahrens, C.J., **Spiers, E. M.**, et al. (2022) Future Leaders of Ocean Worlds (FLOW): Diversity, Equity, Inclusion, and Accessibility. *LPI Contributions 2679*, 2018
8. \***Spiers, E. M.**, and Schmidt B. E. (2021) "Water Activity of Europa's Ocean: Temporal Variability and Implications." *52nd Lunar and Planetary Science Conference*. No. 2548.
9. **Spiers, E. M.**, et al. (2021) "TIGER: JPL PSSS Architecture and Feasibility Study for a New Frontiers 5 Mission Concept to Enceladus." *52nd Lunar and Planetary Science Conference*. No. 2548.
10. **Spiers, E. M.**, et al. (2020) "VERNE Sample Intake and Processing (SIP): Investigation and Development of Liquid Water Sampling for Subsurface Probe on Europa." *AGU Fall Meeting Abstracts*. Vol. 2020.
11. \***Spiers, E. M.** and Szot, P. ( 2020) "Vertical Entry Robot for Navigating Europa (VERNE) Mission and System Design." *Georgia Tech Explorigins Colloquium*
12. \***Spiers, E. M.**, and Schmidt, B.E. (2019) "Thermal Influencing on Europa's Ocean Hydrogen Budget", *Georgia Tech Earth & Atmospheric Science Graduate Student Seminar*

## ***Awards & Recognition***

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2023: **Schmidt Science Fellow Nominee**, Georgia Institute of Technology  
2022: **Travel Award**; Outer Planets Assessment Group (OPAG) June Meeting, \$1000  
2019: **Overall Best Poster Presentation**; GT Space Innovations Symposium, \$500  
2019: **2<sup>nd</sup> Place Oral Presentation**, Georgia Tech EAS Graduate Student Seminar, \$50  
2018: **Science Communication Fellow**; Science ATL, \$600  
2017: **Lijuan Wang Memorial Award**, Purdue University, \$500  
2016: **Summer Stay Scholar**, Purdue University  
2016: **Jandos Scholar**, Purdue University, \$5,000  
2016: **Alan and Sharon Levy Scholarship**, Purdue University, \$1,000  
2015: **Margie and Don Bottorff Physics Scholarship**, Purdue University, \$1,000  
2014: **Gianni Ascarelli Student Award**, Purdue University  
2013-2017: **Purdue Presidential Scholarship**, Purdue University, \$10,000/year

## ***Teaching Experience***

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2023, Spring: **Grader, EAS 4307/6307 – “Physics of Planets”**, Georgia Tech  
2022, Fall: **Teaching Assistant, EAS 1601 - “Habitable Planet”**, Georgia Tech  
2020, Fall: **Lecture TA, EAS 1601 - “Habitable Planet”**, Georgia Tech  
2019, Fall: **Tutor, Georgia Tech Athletics**  
2018, September: **Substitute Lecturer, EAS 1601 - “Habitable Planet”**, Georgia Tech  
2018, Fall: **Teaching Assistant, EAS 1601 - “Habitable Planet”**, Georgia Tech  
2018, Spring: **Teaching Assistant, EAS 1601 - “Habitable Planet”**, Georgia Tech

## ***Professional Service***

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**Workshops & Meetings Working Group, NASA Network for Ocean Worlds** (2023)  
**Future Leaders of Ocean Worlds (FLOW) Lead, NASA Network for Ocean Worlds** (2022)  
**Workshops & Meetings Working Group, NASA Network for Ocean Worlds** (2021)  
**Conference Committee, Astrobiology Graduate Conference** (2018 - 2019)  
**Conference Committee, Georgia Tech EAS Graduate Student Symposium** (2018)  
**Geophysics Seminar Chair, Georgia Tech Earth & Atmospheric Sciences** (2018)  
**Space & Planetary Science Representative, Georgia Tech EAS Graduate Students** (2017-2020)  
**Professional Development Chair, Georgia Tech EAS Graduate Students** (2017-2018)

## ***Outreach & Other Service***

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**Outreach Talk: Atlanta Science Tavern - “Searching for Habitable Planets: Europa”** (Oct. 2019)  
**President: Georgia Tech Triathlon Team** (2018 – 2020)  
**Founding Interim President: Purdue University Planetary Science Club** (2017)