

## **Madison Borrelli**

## **Curriculum Vitae**

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ASU School of Earth and Space Exploration (SESE), Tempe, AZ 85287

### **RESEARCH INTERESTS**

Volcanism    Impact Craters    Lithospheric Flexure    Terrestrial Planets    Icy Satellites

### **EDUCATION**

2019–Present    Ph.D. Student in Geological Sciences, Arizona State University

2018            B.A. in Physics, Wheaton College Massachusetts

### **HONORS, AWARDS, AND FELLOWSHIPS**

- 2022            Chateaubriand Fellowship, Embassy of France
- 2022            Zonta International Amelia Earhart Fellowship
- 2022            Physical Volcanology Intern, University of the Azores
- 2022            Graduate Excellence Award, ASU College of Liberal Arts and Sciences
- 2021            GSA Graduate Research Grant, Geological Society of America
- 2021            Honorable Mention, NSF GRFP
- 2021            Nininger Student Travel Award
- 2021-2022      Leadership Scholarship, ASU Graduate and Professional Student Association
- 2020–2021      Student Leader, ASU College of Liberal Arts and Sciences
- 2020–2021      Leadership Scholarship, ASU Graduate and Professional Student Association
- 2020            Patti Grace Smith Scholarship, Commercial Spaceflight Federation
- 2020            ASU GPSA Travel Grant
- 2014–2018      Trustee Scholar, Wheaton College Massachusetts
- 2014–2018      May Fellow, Wheaton College Massachusetts

### **PUBLICATIONS (PUBLISHED)**

- 2023            Blaske, C. H., J. G. O'Rourke, S. J. Desch, **M. E. Borrelli**, "Meteors may masquerade as lightning in the atmosphere of Venus," *Journal of Geophysical Research: Planets*, 128, 9. <https://doi.org/10.1029/2023JE007914>.
- 2023            O'Rourke, J. G., C. F. Wilson, **M. E. Borrelli**, P. K. Byrne, C. Dumoulin, R. Ghail, A. J. P. Gülcher, S. A. Jacobson, O. Korablev, T. Spohn, M. J. Way, M. Weller, F. Westall, "Venus, the Planet: Introduction to the Evolution of Earth's Sister Planet," *Space Science Reviews*, 219, 10. <https://doi.org/10.1007/s11214-023-00956-0>
- 2021            **Borrelli, M. E.**, O'Rourke, J. G., Smrekar, S. E., & Ostberg, C. M. "A global survey of lithospheric flexure at steep-sided domical volcanoes on Venus reveals intermediate elastic thicknesses". *Journal of Geophysical Research: Planets*, 126, 7. <https://doi.org/10.1029/2020JE006756>
- 2020            **Borrelli, M. E.**, and Collins, G. C., "Testing the Cryovolcanism and Plate Bending Hypotheses for Charon's Smooth Plains," *Icarus*, doi: 10.1016/j.icarus.2020.113717

### **PUBLICATIONS (SUBMITTED)**

- Ghail, R., S. E. Smrekar, **M. E. Borrelli**, P. Byrne, A. Gülcher, R. F. Garcia, R. Herrick, T. Gerya, J. G. O'Rourke, A. Davaille, E. Mulyukova, T. Rolf, I. Plesa, G. Shellnutt, M. Ivanov, "Volcanic and Tectonic Constraints on the Evolution of Venus," *Space Science Reviews*, in revision.

### **PUBLICATIONS (IN PREPARATION)**

- **Borrelli, M. E.**, C. J. Bierson, J. G. O'Rourke, S. M. Howell, "Using Crater Statistics to Place Constraints on Resurfacing and Historic Heat Flux of Uranian Satellites Ariel and Miranda"

### **CONTRIBUTED / INVITED TALKS**

- 2023 Borrelli, M. E., C. Michaut, J. G. O'Rourke, "Formation of Pancake Domes on Venus as Viscous Flows Over an Elastic Lithosphere", Venus as a System, #8008
- 2022 Borrelli, M. E., C. J. Bierson, J. G. O'Rourke, S. M. Howell, "Using Crater Statistics to Place Constraints on Resurfacing and Historic Heat Flux of Uranian Satellites Ariel and Miranda", AGU 2022, #1121085
- 2021 Venus Exploration Analysis Group Virtual Colloquium, *invited*
- 2021 Borrelli, M.E., J. G. O'Rourke, S. E. Smrekar, and C. M. Ostberg, "Global Survey of Pancake Domes Reveals Intermediate Elastic Thickness", Lunar and Planetary Science Conference, #1250
- 2021 Borrelli, M.E., J. G. O'Rourke, S. E. Smrekar, and C. M. Ostberg, "Global Survey of Pancake Domes Reveals Intermediate Elastic Thickness", Volcanic and Magmatic Studies Group Conference
- 2020 Borrelli, M. E., J. G. O'Rourke, S. E. Smrekar, and C. M. Ostberg, "A Global Survey of Lithospheric Flexure and Elastic Thickness at Steep-Sided Domes on Venus", VEXAG 2020, #8042
- 2020 Borrelli, M. E., and G. C. Collins., "Charon's Smooth Plains: Flexure or Flow?", NASA New Horizons Science Team Meeting, *invited*

### **CONTRIBUTED POSTERS**

- 2023 Borrelli, M. E., C. Michaut, J. G. O'Rourke, "Formation of Pancake Domes on Venus as Viscous Flows Over an Elastic Lithosphere", AGU 2023, #1286722
- 2022 Borrelli, M.E., D. A. Williams, J. G. O'Rourke, Investigating the Formation of Lava Channels on Venus with New Models and New Topography, LPSC 2022, #1699
- 2022 Borrelli, M. E., C. J. Bierson, J. G. O'Rourke, Crater Statistics on Ariel and Miranda Using Newly Processed Imagery and Topography, LPSC 2022, #1649
- 2021 Borrelli, M. E., D. A. Williams, J. G. O'Rourke, Investigating the Formation of Lava Channels on Venus with New Models and New Topography, VEXAG 2021, #8014
- 2020 Borrelli, M. E., J. G. O'Rourke, S. E. Smrekar, and C. M. Ostberg, "Lithospheric Thickness and Heat Flow on Venus: Results from a Global Survey of Flexure at Steep-Sided Domes", AGU Fall Meeting, #742176
- 2020 Borrelli, M. E., J. G. O'Rourke, and S. E. Smrekar, "Venus: Are Elastic Thicknesses Inferred at Coronae Globally Representative?", Lunar and Planetary Science Conference, #2580

- 2018 Borrelli, M. E. and Collins, G. C., “Testing the Cryovolcanism Hypothesis for Vulcan Planum, Charon,” Cryovolcanism Workshop, Lunar and Planetary Science Institute
- 2018 Borrelli, M. E. and Collins, G. C., “Volcanism in Vulcan Planum: Topographic Tests for the Emplacement of Smooth Plains on Charon,” Lunar and Planetary Science Conference, #2874

### ATTENDED WORKSHOPS

- 2022 Planetary ReaCH Workshop, Hosted by the Lunar and Planetary Institute at ASU, Tempe, Arizona
- 2021 “Venus Evolution Through Time”, International Space Science Institute, Bern, Switzerland
- 2018 Cryovolcanism in the Solar System, Lunar and Planetary Institute, Houston, Texas

### TEACHING, COMMUNITY SERVICE, AND POLICY

- Fall 2023 Teaching Assistant, Solar System Astronomy, Prof. Jacqueline Monkiewicz  
*Held office hours and assisted ~400 online students in a class with both majors and non-majors.*
- 2021-2022 Chief of Staff, ASU Graduate and Professional Student Association  
*Assist the President in implementing the Advocacy Agenda, and manage the three directors comprising the GPSA Public Relations Team.*
- 2020–2021 Director of Advocacy, ASU Graduate and Professional Student Association  
*Advocate for institutional-level changes on behalf of the graduate student community to both administration and federal legislators*
- 2020–2021 Secretary, SESE Graduate Council  
*Elected to serve as a liaison between graduate students and department faculty and administration*
- 2020–2021 Graduate Student Peer Mentor, SESE  
*Provide support and mentorship to a first-year graduate student*
- 2020-2021 Co-founder and facilitator, Facilitators for Inclusion  
*Run peer-led workshops on bystander intervention. This program was awarded a Justice, Equity, Diversity, and Inclusion (JEDI) Seed Grant*
- 2020–2021 Instructor and Course Designer, SESE Prison Education Program  
*Create and implement curricula on geology and planetary science for incarcerated individuals at Eyman State Prison*
- Fall 2020, 2019 Teaching Assistant, Introduction to Geology, Prof. Julia Johnson  
*Taught laboratory sections and graded assignments for three laboratory sections of ~30 students each.*
- Summer 2020 ASU Sexual Violence Prevention Leadership Program  
*Participated in a workshop focused on gaining leadership skills and sexual harassment intervention/prevention techniques*
- Summer 2017 Lloyd V. Berkner Space Policy Intern, Space Studies Board, National Academy of Sciences  
*Wrote highlights on SSB reports for wide distribution, provided meeting minutes for the Planetary Science Decadal Survey Midterm Review*