

# SAMANTHA A. MORUZZI

PhD Candidate | NASA FINESST Fellow | smoruzzi@arizona.edu

## EDUCATION

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- PhD** **The University of Arizona**, Lunar and Planetary Laboratory Expected: 2025  
Thesis Advisor: Dr. Jeffrey Andrews-Hanna  
Planetary Science  
Minor: Geoscience  
GPA: 4.0
- MS** **The University of Arizona**, Lunar and Planetary Laboratory 2023  
Thesis Advisor: Dr. Jeffrey Andrews-Hanna  
Planetary Science  
GPA: 4.0
- BS** **Cornell University**, Earth and Atmospheric Science 2016-2020  
Concentration: Planetary Science  
Minor: Italian  
GPA: 3.63  
Senior Honors Thesis: “Investigating Sub-Resolution Surface Properties of Comet 67P/Churyumov-Gerasimenko from Optical Photometry and Hapke Modeling”

## PUBLICATIONS

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### *Published Papers*

**Moruzzi, S. A.**, Andrews-Hanna, J. C., Schenk, P., & Johnson, B. C. (2023). Pluto's Sputnik basin as a peak-ring or multiring basin: A comparative study. *Icarus*, 405, 115721.

**Moruzzi, S. A.**, Kiefer, W. S., & Andrews-Hanna, J. C. (2022). Thrust faulting on Venus: tectonic modeling of the Vedma Dorsa Ridge Belt. *Icarus*, 115378.

Reath, K., Pritchard, M. E., **Moruzzi, S.**, Alcott, A., Coppola, D., & Pieri, D. (2019). The AVTOD (ASTER Volcanic Thermal Output Database) Latin America archive. *Journal of Volcanology and Geothermal Research*.

Reath, K.A., Pritchard, M., Poland, M., **et al.** (2019). Thermal, deformation, and degassing remote sensing time series (CE 2000–2017) at the 47 most active volcanoes in Latin America: Implications for volcanic systems. *Journal of Geophysical Research-Solid Earth*, 124.

### *Manuscripts in Prep.*

Moruzzi, S.A., Andrews-Hanna, J.C., Schenk, P., Broquet, A. (2024), Structure and Geophysical Evolution of Sputnik Basin on Pluto. *Manuscript in Prep.*

Moruzzi, S.A., et al. (2022). Sub-Resolution Properties of Comet 67P/Churyumov-Gerasimenko using Hapke Modeling. *Manuscript in Prep.*

## HONORS AND AWARDS

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Future Investigators in NASA Earth and Space Science and Technology (FINESST) Grant, 2022-2025  
NSF Graduate Research Fellowship Program Honorable Mention, 2020  
CALS Academic Excellence Award in Earth and Atmospheric Science, 2020  
Michael W. Mitchell Memorial Fund/Cornell EAS Scholarship, 2019  
Society of Exploration Geophysicists/Excel Geophysical Services Scholarship, 2019  
American Association of Petroleum Geologists/L. Austin Weeks Undergraduate Award, 2019  
Society of Exploration Geophysicists/Earl D. & Reba C. Griffin Memorial Scholarship, 2018  
American Institute of Professional Geologists Undergraduate Scholarship, 2018  
Cornell Engineering Learning Initiatives Research Student Grant, Summer 2017  
Society of Exploration Geophysicists/Landmark Scholarship, 2017  
National Organization of Italian American Women Scholarship Award, 2017  
Society of Exploration Geophysicists/Anadarko Scholarship, 2016  
Dean's List 5 Semesters

## INVITED TALKS

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**Geological Society of America** October 2023  
GSA Connects, Pittsburgh, PA | Presentation and Abstract Title: "Thrust Faulting on Venus: Tectonic Modeling of the Vedma Dorsa Ridge Belt"

**New Horizons Mission Science Team Meeting** January 2023  
Johns Hopkins Applied Physics Laboratory, Laurel, MD | Presentation Title: "Pluto's Sputnik Basin as a Peak or Multiring Basin: A Comparative Study"

## CONFERENCE PRESENTATIONS AND SEMINARS

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**The Lunar and Planetary Laboratory Conference** March 2023  
LPSC, Houston, TX | Poster Title: "Structure and Geophysical Evolution of Sputnik Basin on Pluto"

**The Lunar and Planetary Science Conference** March 2022  
LPSC, Houston, TX | Presentation and Abstract Title: "Pluto's Sputnik Basin as a Peak-ring Basin: A Comparative Analysis"

**The Lunar and Planetary Laboratory Conference** August 2021, 2023  
LPLC, Tucson, AZ | Presentation Title: "Constraining the Compensation State, Structure and Geophysical Evolution of Sputnik Basin on Pluto"

**The Lunar and Planetary Science Conference** March 2021  
LPSC, Houston, TX- Virtual due to COVID-19 Pandemic | Presentation and Abstract Title: "Constraining the Compensation State, Structure and Geophysical Evolution of Sputnik Basin on Pluto"

**The Lunar and Planetary Science Conference** March 2021  
LPSC, Houston, TX- Virtual due to COVID-19 Pandemic | Poster and Abstract Title: "Investigating Sub-Resolution Surface Properties of Comet 67P/Churyumov-Gerasimenko from Optical Photometry"

**The Lunar and Planetary Science Conference** March 2020  
LPSC, Houston, TX- Canceled due to COVID-19 Pandemic | Poster and Abstract Title: "Investigating Sub-Resolution Surface Properties of Comet 67P/Churyumov-Gerasimenko from Optical Photometry"

**American Geophysical Union Conference Fall Meeting** December 2019  
AGU Fall Meeting, San Francisco | Poster and Abstract Title: “Investigating Sub-Resolution Surface Properties of Comet 67P/Churyumov-Gerasimenko from Optical Photometry”

**The 2019 LPI Summer Intern Conference** August 2019  
The Lunar and Planetary Institute, Houston, TX | Presentation and Abstract Title: “Thrust Faulting on Venus: Tectonic Modeling of the Vedma Dorsa Ridge Belt”

**The Scientista Symposium** March 2019  
The Scientista Symposium, Boston, MA | Poster Title: “Investigating the Surface Properties of Comet 67P/Churyumov-Gerasimenko from Optical Photometry”

**Earth and Atmospheric Science Student Association Fall 2018, Spring 2019 Symposium**  
December 2018  
Cornell University, Ithaca, NY | Poster Title: “Characterizing Morphologies of Comet 67P/Churyumov-Gerasimenko”  
Coordinator and mediator for Undergraduate Research Presentations

**Science of Earth Systems Student Association Spring 2017, Fall 2017, Spring 2018 Symposium**  
May 2018  
Cornell University, Ithaca, NY | Poster Title: “Satellite Detection of Thermal Anomalies at Latin American Volcanoes”  
Coordinator and mediator for Honors Thesis Presentations

## **PUBLIC TALKS**

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**Sun City Oro Valley Astronomy Club** November 2022  
Oro Valley, AZ | Presentation “Planet Wars: A New Horizon(s) and Pluto Strikes Back”

## **RESEARCH EXPERIENCE**

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**Lunar and Planetary Laboratory-University of Arizona, Tucson, AZ** August 2020-Present  
**Graduate Research Assistant**, Advisor: Dr. Jeff Andrews-Hanna

- Geophysical and flexure modeling of Sputnik Planum Basin on Pluto to constrain its compensation state and crustal ice shell thickness using the stereo-topographic Digital Elevation Model (DEM) over Sputnik Planitia.
- Analyzing the topography and morphological parameters of Sputnik Basin and 23 inner solar system peak/multi-ring basins to support the hypothesis that Sputnik Basin may be a peak/ring basin.

**Cornell University, Ithaca, NY** Sept. 2018-Present  
**Student Research Assistant**, Supervisor: Dr. Alexander Hayes  
**Senior Honors Thesis Research**

- Analyzing photometric properties of characteristic terrain types of Comet 67P/Churyumov-Gerasimenko as observed by the European Space Agency (ESA) Rosetta’s OSIRIS narrow angle camera.
- Creating high resolution phase curves comparing radiance factor, I/F, with phase angles for 11 available filter wavelengths and fitting them to Hapke photometric models to derive the best fit coefficients.

- Constraining roughness factors and dielectric constants in each region indicative of erosional and active surface processes.

**LPI Summer Intern Program in Planetary Science**, Houston, TX

Summer 2019

**LPI Summer Intern**, Supervisor: Dr. Walter S. Kiefer

- Performed elastic dislocation modeling of thrust faulting along the Vedma Dorsa Ridge Belt in Llorona and Vellamo Planitiae on Venus in order to constrain faulting parameters such as fault displacement, faulted layer thickness and fault dip angle.
- Determined estimates for paleothermal gradient and lithospheric heat flux at the time of ridge belt formation based on best fit values for faulted layer thickness, improving our understanding of the lithospheric properties and conditions under which the ridge belt formed.

**Cornell University**, Ithaca, NY

Summer 2018

**Student Research Assistant**, Supervisor: Dr. Matthew Pritchard and Dr. Rowena Lohman

- Acquired and analyzed InSAR data of Ithaca, Lansing and Tully Valley, NY to identify deformation and subsidence signals in these areas. Research in conjunction with CLEAN and Cornell University's Earth Source Heat Project

**Cornell University**, Ithaca, NY

Jan. 2017-May 2018

**Student Research Assistant**, Supervisor: Dr. Matthew Pritchard

- Created a database of temperature time series for approximately 330 volcanoes in Latin America using thermal images from the NASA/Japan funded ASTER (Advanced Spaceborne Thermal Emission Reflection Radiometer) mission.
- Studied thermal anomalies as precursors to eruptions and comparing the manual detection to the algorithmic detection by JPL created and run AVA (ASTER Volcano Archive)

## TEACHING EXPERIENCE

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**Cornell University**, Ithaca NY

Fall 2017-Present

EAS 1540/1560: Introduction to Oceanography (Teaching Assistant)

- Graded labs, homework and proctored examinations for undergraduate course of approx. 1100 students
- Facilitated weekly laboratory sections.
- Worked with other teaching assistants and professor to develop projects and newsletters to engage students' interest in the course material.

**The Lunar and Planetary Institute**, Houston, TX

July 2019

Sky Fest-Apollo 11: Looking Back to Move Forward

- Led educational activities on lunar phases and the Earth's interior for elementary and middle school students.

**Cornell University**, Ithaca NY

April 2019

Cornell University SPLASH!: Introduction to Earth and Space Sciences

- Taught an introductory course on Earth and Space Sciences to middle school and high school students from around the northeast.
- Course emphasized the connections between aspects of the environment as well as the solar system.

**Cornell University**, Ithaca NY

April 2019

## Expanding Your Horizons: How to Make a Comet

- Taught a course on the importance of comets in our solar system and their role in the origin of life to middle school girls from the Ithaca area.
- Course included a hands-on experiment on how to artificially make a comet.

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## ADDITIONAL SKILLS

**Proposal Writing:** NASA FINESST Grant (Received); NSF Graduate Research Fellowship (2020 Honorable Mention); Cornell University Engineering Learning Initiatives Summer Research Grant (Received)

**Programming:** Unix/Linux, Python, MATLAB

**Applications:** Coulomb 3.3, ArcGIS, ENVI, USGS Glovis, NASA Reverb Echo, ASF Vertex Data Portal, ISCE, Seismic Unix, Oasis Montage: Geosoft, Google Earth Engine

**Languages:** Italian – Writing/Reading/Conversational Proficiency: Intermediate

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## AFFILIATIONS

**LPL Graduate Student Colloquium Co-Chair** May 2023-Present

- Organize graduate student colloquium throughout the semester and act as mediator for the seminars

**The Art of Planetary Science (TAPS) Committee Member and Social Media Chair** January 2021-Present

- Organize and run annual TAPS show held at the Lunar and Planetary Laboratory in Tucson, AZ, including advertising, intake and selection of exhibition submissions, and exhibition guidance during show
- Create engaging content for the TAPS social media pages to advertise the exhibition, highlight the in-depth space science history of the University of Arizona and Tucson, and interact with the local community.

**Society of Exploration Geophysicists Student Member** June 2016-2020

- Mentored by society member from University of Texas at Austin. Discussed internship opportunities and future career goals.

**The Scientista Foundation** Fall 2016-Spring 2020

Cornell University Chapter

- Present research at the annual national symposium.
- Organize leadership summits for middle school and high school female students to encourage their interest in STEM.
- Network with professionals in fields of interest.

**Earth and Atmospheric Science Student Association (EASSA)** Fall 2016-Spring 2020

Co-President | Cornell University

- Organize biannual undergraduate research symposiums.
- Coordinate information sessions regarding graduate school, course selections and networking events for Earth and Atmospheric Science majors.

**Cornell Undergraduate Research Board Peer Mentorship Program** Fall 2016, Spring 2017

- Worked with student mentors and gained CV/Resume writing and interview skills.

**Hudson Mohawk Professional Geologists Association and NYSCPG Student Member**

August 2015-Spring 2020 | Albany, NY

- Attend meetings and discuss careers and geological research with professional geologists in the Capital District.

**Phi Sigma Sigma Philanthropy Chair-Cornell Chapter** Fall 2017-Spring 2018

- Coordinated and organized all philanthropy events for Phi Sigma Sigma Sorority-Cornell Chapter, including campus wide fundraising galas.