Saira Hamid

Web: https://saira-hamid.com/

Research Interests

Planetary atmospheres and climate dynamics • Surface–atmosphere exchange, volcanism, dust, biological and non-biological aerosols • Lunar exploration

Education

Ph.D., Geological Sciences, Arizona State University | 2024

M.S., Geological Sciences, Arizona State University | 2022

B.S., Geosciences, Georgia State University | 2018

Geographic Information Science Certificate, Georgia State University | 2017

Academic & Research Appointments

Visiting Researcher, Laboratoire de Météorologie Dynamique (LMD) | Oct 2026

- Collaborate on the development and adaptation of Generic, Mars, and Venus planetary climate models to investigate emissions, atmospheric processes, and planetary evolution.

Presidential Postdoctoral Fellow, Arizona State University | Jan 2025–Present

- Lead independent research in planetary atmospheres, volcanology, aerosol transport, and planetary protection using climate modeling and field observations.

NASA Jet Propulsion Laboratory, Intern; Visiting Student Researcher | Jun 2020–Aug 2023

- Investigated effects of volcanic degassing on the Martian climate and water cycle. Adapted the LMD Planetary Climate Model to simulate volcanic water, ash, and sulfuric acid emissions.

NASA Goddard Space Flight Center, Intern | Jan–Apr 2018

- Mapped volcanic features using satellite imagery, topographic data, and geospatial analysis to investigate the volcanic history of Tharsis Montes, Mars.

NASA Ames Research Center, Intern | Aug–Dec 2017

- Investigated the role of water in Martian gully formation using high-resolution satellite imagery, spectral data, and morphometric terrain measurements.

Canary Islands Volcanological Institute, Intern | Jul–Aug 2017

- Conducted magnetotelluric field surveys for geothermal exploration on Gran Canaria.

Fellowships, Funding, & Honors

2025–Present | Presidential Postdoctoral Fellowship, ASU

2021–2024 | National Science Foundation (NSF) Graduate Research Fellowship

2021–2023 | NSF Collaborative Research Proposal (~$300,000 awarded; contributor; PI: A. Clarke)

Nov 2022 | Gerald A. Soffen Memorial Fund Travel Grant, NASA Academy Alumni Association

Apr 2022 | Graduate Excellence Award, ASU

Jan, Nov 2022 | Graduate & Professional Student Association Individual Travel Grant, ASU

Summer 2021 | Summer Exploration Graduate Fellowship, ASU

2020–2021 | Graduate College Fellowship, ASU
2019–2020 | University Graduate Fellowship, ASU
2019–2020 | Interdisciplinary Enrichment Fellowship, ASU
2018 | Sally Ride Internship, NASA Goddard Space Flight Center
2017 | Ernest Fritz Memorial Field Camp Scholarship

Publications

Peer-reviewed articles

1. **Hamid, S. S.,** Kerber, L., & Clarke, A. B. (2025). Precipitation induced by explosive volcanism on Mars and its implications for unexpected equatorial ice. Nature Communications. https://doi.org/10.1038/s41467-025-63518-8. *Led the research, including climate modeling, data analysis, and manuscript preparation. Research conceived by L. Kerber, with mentorship from Kerber and A. B. Clarke. All coauthors contributed to manuscript revisions.*
2. **Hamid, S. S.,** Kerber, L., Varnam, M., Hamilton, C. W., & Clarke, A. B. (2025). Warming, cooling, and surface ice accumulation initiated by the release of water from the Athabasca Valles flood lava eruption on Mars. Earth and Planetary Science Letters, 671, 119651. https://doi.org/10.1016/j.epsl.2025.119651. *Led climate modeling, data analysis, and manuscript preparation. Research conceived by L. Kerber and C. W. Hamilton, with mentorship from Kerber and A. B. Clarke. M. Varnam contributed the background literature review, and all coauthors contributed to manuscript revisions.*
3. Braude, A. S., Kerber, L., Lefèvre, F., Jaziri, A. Y., **Hamid, S. S.**, Millour, E., & Forget, F. (2025). Modelling the effect of volcanic outgassing of sulphur on early Martian surface temperatures using a 3-D Global Climate Model. Icarus, Article 116568. https://doi.org/10.1016/j.icarus.2025.116568. *Contributed model inputs, guidance on model configuration, expertise on volcanic parameters, and manuscript revisions.*
4. **Hamid, S. S.,** Kerber, L., Clarke, A. B., & Forget, F. (2024). The delivery of water ice to the Martian surface by passive degassing. Icarus Special Issue: Ices in the Solar System; origin, evolution, and distribution (416), 116084. https://doi.org/10.1016/j.icarus.2024.116084. *Led climate modeling, data analysis, and manuscript preparation. Research conceived by L. Kerber, with mentorship from Kerber and A. B. Clarke. F. Forget contributed to model development.*
5. **Hamid, S. S.,** O'Rourke, J. G., & Soderlund, K. M. (2023). A long-lived lunar magnetic field powered by convection in the core and a basal magma ocean. Planetary Science Journal, 4(5), Article 88. https://doi.org/10.3847/PSJ/accb99. *Conducted numerical modeling, simulations, and analyses using code and calculations provided by J. G. O'Rourke. Led manuscript preparation, with disciplinary contributions and revisions from O'Rourke and K. M. Soderlund.*

Review articles & book chapters

1. **Hamid S.,** O'Rourke J.G. (2022) Modeling of the Lunar Magma Ocean. In: Cudnik B. (eds) Encyclopedia of Lunar Science. Springer, Cham. https://doi.org/10.1007/978-3-319-05546-6_28-1. *Invited chapter author; contributed equally to manuscript preparation and figure development.*
2. Mather, T. A., Shorttle, O., **Hamid, S.**, Gaillard, F., & Noack, L. (Accepted) Volcanism and Planetary Atmospheres: Earth, Our Solar System, and Beyond. The Encyclopedia of Volcanoes, Third Edition. *Authored the subsection: "Volcanism, atmospheres, and long-term planetary climate."*
3. **Hamid, S.** 2019. Global Treks and Adventures Reykjavik Day Hikes, pp. 52-57. Amazon KDP. *Authored the subsection: "Volcanoes."*

Reports

1. Jozwiak, L. M.; Citron, R.; Curran, N.; Elardo, S.; Fassett, C.; Fraeman, A.; **Hamid, S**.; Heffern, L.; James, P.; Moriarty, D.; Righter, K.; Whitten, J.; Vannier, H.; Wilbur, Z.; Keane, J. T.; Morota, T.; Nagaoka, H.; Morisset, C.-E.; Hill, P.; Carpenter, J.; Mcdonald, F. (2026), South Pole-Aitken Basin Sample Return and Exploration Science Definition Team Report. https://ntrs.nasa.gov/citations/20260009103. *Authored Sections 3.1.4 (Objective 1.4), 4.1 (Experiment 6), and 4.3.5 (laboratory measurements of remanent magnetization); coauthored Sections 3.3.1 (Objective 3.1), 4.1.11 (Experiment 11), 4.2.1 (in situ measurement requirements introduction), and 4.2.7 (magnetic field measurement requirements).*
2. Reuter, T., Myers, R., Christensen, P., Dudzinski, L., & Polzin, K. (2023). Accelerating Space Science with Nuclear Technology: The Tempe Workshop. Institute for Space Science and Development. https://i-ssd.org. *Contributed to workshop activities and report development as Executive Secretary.*
3. Space Generation Advisory Council (2021). Space Generation Congress Dubai 2021 Report: Artemis Site Planning and Strategic Goals for a Global Return to the Moon. https://spacegeneration.org/wp-content/uploads/2024/02/SGC-DUBAI-2021-Report-1.pdf. *Served as a delegate to the Artemis Site Planning and Strategic Goals working group, contributing to discussions and recommendations for international lunar exploration.*

Mission Experience, Scientific Programs, & Research Expeditions

Lunar Exploration Analysis Group (LEAG), Exploration Working Group | Oct 2026–Present

- Contribute to Lunar Exploration Roadmap updates, working-group coordination, and community reports.

NASA Proposal Writing and Evaluation Experience (NPWEE), L'SPACE | Sept 2026–Present

- Collaborate with early career professionals on NASA-focused proposal development and solutions.

SPARX Science Definition Team, Committee Member | Jan 2025–Sept 2026

- Contributed to lunar sample-return science planning for the Moon's South Pole–Aitken Basin, including sampling strategies, mission architectures, and instrument requirements.

AERosols and Ocean Science Expeditions (AEROSE) | Jan 2024–Present

- Led multidisciplinary shipboard science operations investigating Saharan dust atmospheric transport aboard *NOAA RV Pisces* (2026; 28 days); science team member aboard *NOAA RV Gordon Gunter* (2024; 19 days).

Instrument Operator, Arizona State University | Nov 2019–Apr 2023

- Supported thermal-vacuum testing, telemetry, and validation of infrared imaging and spectroscopy instruments (EMIRS, L'TES, E-THEMIS, and VISIONS) for NASA planetary exploration missions.

Teaching

Astronomy 111, Teaching Assistant, Arizona State University | Fall 2024

Invited Lecture: Introduction to Global Climate Models, Geology of Venus, ASU | Mar 2022

Geology 103, Teaching Assistant, Arizona State University | Aug 2020–May 2021

Supplemental Instruction Leader, Georgia State University | Jan 2016–May 2017

Professional Service

Manuscript referee, Icarus | 2026–Present

Dwornik Award Judge, Lunar and Planetary Science Conference | Mar 2026

Panelist, External Reviewer, & Executive Secretary, NASA and workshops | 2020–2026

Inclusive Community Committee, ASU SESE | Aug 2023–Dec 2024

Peer Reviewer, ASU Graduate & Professional Student Association | 2019–2022

Delegate, Space Generation Congress | Oct 2021

Arizona Science Policy Network | Fall 2019

Mars on the National Mall, Volunteer | Oct 2019

Conference Presentations & Proceedings

1. Hamid, S. S., Kerber, L., & Clarke, A. B. (2026, April). Unexpected Ice on Mars: A Volcanic Explanation. Oral presentation at the Mars Exploration Program and Analysis Group (MEPAG) meeting.
2. Schnell, J., Mardi, A. H., Hamid, S., Zhang, Y., Katz, D., Song, Y. (2025, December). The Living Atmosphere: Advances in Monitoring, Modeling, and Sampling of Airborne Bioaerosols. Oral and Poster Session Convener and Oral Session Chair at the American Geophysical Union Fall Meeting.
3. Braude, A., Kerber, L., Lefèvre, F., Jaziri, Y., Hamid, S. S., Maurice, M., Lefèvre, M., Millour, E., & Forget, F. (2024, September). Modelling the effect of the sulphur cycle on episodic climatic changes on early Mars (EPSC 2024-135). Oral presentation at the Europlanet Science Congress 2024, Berlin, Germany. https://doi.org/10.5194/epsc2024-135
4. Hamid, S. S., Clarke, A. B., & Kerber, L. (2024, July). Precipitation induced by explosive volcanism on early Mars and its implications for ice in unusual equatorial regions (Abstract #3416). Oral presentation at the Tenth International Conference on Mars (LPI Contribution No. 3007). Lunar and Planetary Institute. https://www.hou.usra.edu/meetings/tenthmars2024/pdf/3416.pdf
5. Braude, A. S., Kerber, L., Lefèvre, F., Jaziri, A. Y., Hamid, S. S., Millour, E., & Forget, F. (2024, July). Modelling the sulphur cycle on Early Mars. Poster presentation at the Tenth International Conference on Mars (LPI Contribution No. 3007, Abstract 3030). Lunar and Planetary Institute. https://www.hou.usra.edu/meetings/tenthmars2024/pdf/3030.pdf
6. Braude, A. S., Kerber, L., Lefèvre, F., Jaziri, A. Y., Hamid, S. S., Millour, E., & Forget, F. (2024, March). Modeling the effect of volcanic outgassing of sulfur on early Martian climate and geology (Abstract #1582). Oral presentation at the 55th Lunar and Planetary Science Conference. Lunar and Planetary Institute. https://www.hou.usra.edu/meetings/lpsc2024/pdf/1582.pdf
7. Hamid, S. S., Kerber, L., & Clarke, A. B. (2023, March). Volcanic degassing a potential source of surface water ice near Martian volcanoes (Abstract #2890). Oral presentation at the 54th Lunar and Planetary Science Conference. Lunar and Planetary Institute. https://www.hou.usra.edu/meetings/lpsc2023/pdf/2890.pdf
8. Hamid, S. S., Kerber, L., & Clarke, A. B. (2023, February). Volcanic degassing: A potential source of water ice on Mars (Abstract #1073). Poster presentation at the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) Scientific Assembly. https://www.iavceivolcano.org/content/uploads/2021/03/iavcei-2023-book-of-abstracts.pdf

9. Hamid, S. S., O'Rourke, J. G., & Soderlund, K. M. (2021, December). A Lunar Dynamo Powered by Core Convection and a Basal Magma Ocean. Oral presentation at the American Geophysical Union Fall Meeting. https://agu.confex.com/agu/fm21/meetingapp.cgi/Paper/900575
10. Hamid, S. S., O'Rourke, J. G., & Soderlund, K. M. (2021, March). A lunar dynamo powered by core convection and a basal magma ocean (Abstract #2038). Oral presentation at the 52nd Lunar and Planetary Science Conference (LPI Contribution No. 2548). Lunar and Planetary Institute. https://www.hou.usra.edu/meetings/lpsc2021/pdf/2038.pdf
11. M. García-Merino, B. Douglas, S. Hamid, S. Mead, K. Slezak, H. Larnier, J. Ledo, A. Marcuello, E. Gorriz, G. V. Melián, N. M. Perez (2018. March). Comparison of Magnetotelluric and Soil Gas Geochemistry Data for Geothermal Exploration at Gran Canaria, Canary Islands; EGU General Assembly; Vienna, Austria. https://ui.adsabs.harvard.edu/abs/2018EGUGA..2015144G/abstract
12. Hamid, S. S., & Gulick, V. C. (2018, March). Geomorphological analysis of gullies along western slopes of Palikir Crater. Poster presentation at the 49th Lunar and Planetary Science Conference (LPI Contribution No. 2083, Abstract #2644). Lunar and Planetary Institute. https://www.hou.usra.edu/meetings/lpsc2018/pdf/2644.pdf

Outreach & Media

Invited talks

1. "Real stories, Real Impact", Science Opportunities and Profession Exploration (SCOPE), invited talk, Scottsdale Community College, 13 February 2026.
2. "Circumstances." Story Collider, invited talk, ASU Kerr, 5 May 2025.
3. "What a Trip." Gather Storytelling, invited talk, ASU Kerr, 12 April 2024.

Interviews & coverage

1. Interview with Sebastian Müller, Geo-log (YouTube), "Explosive volcanic eruptions and ice deposition on early Mars", published October 14 2025. https://www.youtube.com/watch?v=ICai9z2CG5s
2. SPARX SDT featured in NASA, ASU News.
3. Nature Communications 2025 study featured in NewScientist; ASU News; Space.com, Scimex; Phys.org; Universe Today; Earth.com.
4. Earth and Planetary Science Letters 2025 study featured in ASU News.
5. Icarus 2024 study featured in ASU News.
6. Graduate College Fellowship featured in ASU News.
7. Mars on National Mall service featured in ASU News.

Technical & Field-Based Training

ASU Volcanology Field Research | 2019–2023

University of Arizona Planetary Photogrammetry Workshop | Sept 2023

IAVCEI Volcano–Ice Interaction Short Course, New Zealand | Feb 2023

NASA Goddard SSERVI RIS4E, Field Assistant | Apr 2018

Field Geology Program, Georgia State University | Jun–Jul 2017

Field Volcanology Study Abroad in Costa Rica, Georgia State University | May 2017

Geographic Information Science Study Abroad in Belize, Georgia State University | May 2015

Technical Skills

Planetary climate modeling (LMD PCM); lunar interior convection modeling; Python, MATLAB, Fortran; GIS and remote sensing (ArcGIS, QGIS, JMARS, ENVI); DEM generation (Ames Stereo Pipeline, SOCET SET); SEM/EDS; Geologic mapping; Logging stratigraphic sections; Atmospheric sampling; First Aid/CPR/AED.