

Alexander Michael Morgan

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EDUCATION

- November 2017 **Doctor of Philosophy**
Dept. of Environmental Sciences, University of Virginia
Dissertation: *Sedimentology, hydrology, and climatic environment of alluvial fans on Earth and Mars*, Advisor: Professor Alan D. Howard
- December 2010 **Bachelor of Science**
Dept. of Earth and Planetary Sciences, University of California Santa Cruz

APPOINTMENTS

- 2021 – Present **Research Scientist**, Planetary Science Institute
- 2020 – Present **Research Associate**, Smithsonian Institution
- 2017 – 2020 **Post-Doctoral Research Geologist**, Center for Earth and Planetary Studies, National Air and Space Museum, Smithsonian Institution
- 2015 – 2017 **Research Fellow**, Center for Earth and Planetary Studies, National Air and Space Museum, Smithsonian Institution
- 2011 – 2015 **Research and Teaching Assistant**, Department of Environmental Sciences, University of Virginia
- 2010 – 2011 **Research Associate**, SETI Institute & NASA Ames Research Center

PEER-REVIEWED PUBLICATIONS

16. **Morgan, A.M.** (2024) New maximum constraints on the era of martian valley network formation. *Earth and Planetary Surface Letters*. DOI: 10.1016/j.epsl.2023.118509
15. M. C. Palucis, **A. M. Morgan**, J. B. Strauss, F. Rivera-Hernandez, J. A. Marshall, E. Menio, R. Miller (2022) Rates and processes controlling periglacial alluvial fan formation: Implications for martian fans. *Geological Society of America Bulletin*. DOI: 10.1130/B36459.1
14. **A. M. Morgan**, S. A. Wilson, A. D. Howard (2022), Geospatial data from a global survey of martian fan-shaped sedimentary landforms, *Data in Brief*. DOI: 10.1016/j.dib.2022.108494.
13. Kite, E.S., M.M. Mischna, B. Fan, **A.M. Morgan**, S.A. Wilson, M.I. Richardson (2022), Changing spatial distribution of water flow charts major change in Mars's greenhouse effect, *Science Advances*, DOI: 10.1126/sciadv.abo5894.
12. **A. M. Morgan**, S. A. Wilson, A. D. Howard (2022), The global distribution and morphologic characteristics of fan-shaped sedimentary landforms on Mars, *Icarus*. DOI:10.1016/j.icarus.2022.115137.
11. S. J. Holo, E. S. Kite, S. A. Wilson, **A. M. Morgan** (2021) The timing of alluvial fan formation on Mars. *Planetary Science Journal*. DOI: 10.3847/PSJ/ac25ed
10. T. A. Goudge, **A. M. Morgan**, G. S. de Quay, C. I. Fassett (2021) The importance of lake breach floods for valley incision on early Mars. *Nature*. DOI: 10.1038/s41586-021-03860-1

9. A. D. Howard, S. A. Wilson, **A. M. Morgan**, J. M. Moore, O. L. White (2021) Light-toned deposit in the northeastern Hellas basin formed by terrain-conforming airfall sedimentation. *Icarus*. DOI: 10.1016/j.icarus.2021.114356
8. S. A. Wilson, **A. M. Morgan**, A. D. Howard, J. A. Grant (2021) The global distribution of craters with alluvial fans and deltas on Mars. *Geophysical Research Letters*. DOI: 10.1029/2020GL091653
7. M. P. Pfeiffer, **A. M. Morgan**, A. Heimsath, T. Jordan, A. D. Howard, R. Amundson (2021). A century scale rainfall in the absolute Atacama Desert: landscape response and implications for past and future rainfall magnitudes. *Quaternary Science Reviews*. DOI: 10.1016/j.quasci-rev.2021.106797
6. M. C. Palucis and **A. M. Morgan** (2020). *Extraterrestrial Fluvial Environments. Treatise on Geomorphology*, 2nd Edition. DOI: 10.1016/B978-0-12-818234-5.00006-7
5. **A. M. Morgan**, R. A. Craddock (2019) Assessing the accuracy of paleodischarge estimates for rivers on Mars. *Geophysical Research Letters*. DOI: 10.1029/2019GL084921
4. **A. M. Morgan**, R. A. Craddock (2017). Depositional processes of alluvial fans along the Hilina Pali fault scarp, Island of Hawaii. *Geomorphology* 296, 104-112. DOI: 10.1016/j.geomorph.2017.08.028
3. J. M. Moore, A. D. Howard, **A. M. Morgan** (2014). The Landscape of Titan as Witness to its Climate Evolution. *Journal of Geophysical Research-Planets* 119, 2060-2077, DOI: 10.1002/2014JE004608
2. **A. M. Morgan**, A. D. Howard, D. E. J. Hobley, J. M. Moore, W. E. Dietrich, R. M. E. Williams, D. M. Burr, J. A. Grant, S. A. Wilson, Y. Matsubara, (2014). Sedimentology and climatic environment of alluvial fans in the martian Saheki crater and a comparison with terrestrial fans in the Atacama Desert. *Icarus* 229, 131-156, DOI: 10.1016/j.icarus.2013.11.007
1. D. Durda, N. Movshovitz, D. Richardson, E. Asphaug, **A. Morgan**, A. R. Rawlings, C. Vest (2009). Experimental determination of the coefficient of restitution for meter scale granite spheres. *Icarus* 211, 849-855. DOI: 10.1016/j.icarus.2010.09.003

AWARDED RESEARCH GRANTS

2021-2024 *Reconstructing basaltic sediment transport on Mars using terrestrial analogues.*

NASA Solar Systems Workings Program. **A. M. Morgan (PI)**, M. C. Palucis (Co-I, Dartmouth), R. A. Craddock (Co-I, Smithsonian). \$394,465 total over three years.

2021-2024 *Timing and spatial variability of post-Noachian fluvial erosion on Mars.* NASA Mars Data Analysis Program. R. P. Irwin III (PI, Smithsonian), **A. M. Morgan (Co-I)**. \$120,345 to PSI over three years.

2021-2023 *Do delta deposits around the martian crustal dichotomy record an ancient northern ocean?* NASA Mars Data Analysis Program. M. C. Palucis (PI, Dartmouth), **A.M. Morgan (Co-I)**, Rivera-Hernandez, F. (Co-I, Georgia Tech). \$26,242 to PSI over two years.

2020-2022 *Linking alluvial fan morphology and sedimentology with formation processes via Martian analog studies in the Atacama Desert, Chile.* NASA Solar Systems Workings Program. **A. M. Morgan (PI)**, M. C. Palucis (Co-I, Dartmouth), R. M. E. Williams (Co-I, PSI), R. A. Craddock (Co-I, Smithsonian). \$263,661 total over two years.

- 2019-2020** Reconstructing basaltic sediment transport on Mars using a Hawaiian Analogue. Smithsonian Institution Scholarly Studies Program. **A. M. Morgan (PI)**, R. A. Craddock (Co-I, Smithsonian). \$37,790 total over one year.
- 2016-2019** *High-Resolution Mapping and Geomorphological Studies of Martian Valley Networks*. NASA Mars Data Analysis Program. R. A. Craddock (PI, Smithsonian), **A. M. Morgan (Post-doc)** (wrote and executed proposal). \$302,976 total over three years.
- 2015-2017** *Investigating alluvial fan formation processes and the implications for Mars' climate*. Smithsonian Institution Earth and Space Sciences Predoctoral Fellowship. **A. M. Morgan (PI)**, R. A. Craddock (Co-I, Smithsonian). \$70,400 total over two years.
- 2015** *Characterizing the Sedimentology and Hydrology of Death Valley Alluvial Fans through a Field Analogue and Landform Evolution Modeling*. University of Virginia Department of Environmental Sciences Moore Research Award. \$5,000 total.
- 2015** *Modeling alluvial fan avulsion*. Geologic Society of America Graduate Student Research Grant. \$1,176 total.
- 2014** Investigating Flow Processes and Sedimentology in the Death Valley Region. University of Virginia Department of Environmental Sciences Exploratory Research Award. \$1,500 total.

TEACHING AND MENTORING

Courses taught:

- Fundamentals of Geology Laboratory (Fall 2011, Spring 2012, Fall 2013, Fall 2014)
- Planetary Geology/Astronomy Laboratory (Spring 2013, Spring 2014, Spring 2015)

Academic committee member:

- Emma Rae Rogers, Dartmouth College (Ph.D., 2022-present)

Summer undergraduate interns supervised at the Smithsonian Institution:

- Charlie Detelich, NC State (2017) (now Ph.D. student at Cornell)
- Nhut Nguyen, Santa Monica College (2018) (now B.S. student at UC Berkeley)
- Sophia Sanders, University of Georgia (2019) (now at SC Dept. of Health and Env. Control)
- Nicole Law, Mercyhurst University (2020, remote due to Covid-19) (now at Argo AI)

SERVICE AND OUTREACH

- 2023 – Present Geological Society of America Planetary Geology Division Board
- 2023 – Present Geological Society of America Grants Committee
- 2021 – Present Editor, Planetary Exploration Newsletter
- 2021 – Present Participating Scientist, Scientist in Every Florida School
- 2018 – 2021 Program Committee, Lunar and Planetary Science Conference
- 2017 – 2022 AGU OSPA & LPSC Dwornik Award judge
- 2015 – 2020 Various public outreach activities at the National Air and Space Museum
- 2015 – 2022 Convener/Session Chair for various sessions at AGU Fall Meeting and LPSC
- 2015 – 2017 Graduate Student Representative to AGU Planetary Science Section
- 2014 – 2015 Graduate School of Arts and Sciences Representative to the University of Virginia Honor Committee

Journal Reviewer for *Earth and Planetary Science Letters*, *Earth Surface Dynamics*, *Geomorphology*, *Geosciences*, *Icarus*, *Journal of Geophysical Research: Planets*, *Nature Communications*, *Remote Sensing*, *Science Advances*

Panel Reviewer (including Group Chief) for multiple NASA Science Mission Directorate and National Science Foundation programs

INVITED TALKS

May 4, 2023: Department of Earth Sciences, Dartmouth College, Hanover, NH

June 28, 2022: Florida Space Institute, University of Central Florida, Orlando, FL

January 14, 2021: Department of Geological Sciences, University of Florida, Gainesville, FL

March 11, 2020: Geological Society of Washington, Cosmos Club, Washington, DC

November 13, 2019: Solar System Exploration Division, NASA Goddard Space Flight Center, Greenbelt, MD

October 30, 2019: Department of Mineral Sciences, National Museum of Natural History, Smithsonian Institution, Washington, DC

July 19, 2019: Apollo 50 Festival, National Mall, Washington, DC

October 18, 2018: Department of Earth and Environmental Sciences, Macquarie University, Sydney, Australia

Last updated 1/30/2024