

CONTACT INFORMATION	Photogrammetry and Image Processing Scientist Lunar and Planetary Laboratory University of Arizona 1541 E. University Boulevard Tucson, AZ 85721 USA	Office: (520) 626-0759 Email: ssutton@lpl.arizona.edu
RESEARCH INTERESTS	Planetary surface processes on Mars, Earth, the Moon, Europa, and Io, planetary volcanism, geomorphology, digital terrain modeling, remote sensing, stereophotogrammetry, change detection of active planetary surfaces, image processing, optical instrumentation and calibration, digital signal processing.	
EDUCATION	University of Arizona, Ph.D., Planetary Sciences “Fissure-fed Volcanism on Mars and Earth” Advisor: Prof. Christopher W. Hamilton University of Arizona, Master of Science, Planetary Sciences University of Arizona, Bachelor of Science, Mathematics University of Arizona, Bachelor of Fine Art, <i>Cum Laude</i>	2022 2019 2008 1994
EMPLOYMENT	NASA Goddard Space Flight Center Intern, Greenbelt, MD Photogrammetry and Image Processing Scientist, University of Arizona HiRISE Operations Center, Lunar and Planetary Laboratory Undergraduate Student Research Assistant, University of Arizona HiRISE Operations Center, Lunar and Planetary Laboratory NASA Space Grant Intern, University of Arizona Office of Arid Lands Studies/Arizona Remote Sensing Center	Summer, 2019 2008–present 2006–2008 2005–2006
AWARDS	University of Arizona, College of Science Galileo Circle Scholarship University of Arizona, Graduate & Professional Student Council Travel Grant NASA Group Achievement Award, OSIRIS-REx Mission Team University of Arizona, University Fellows Professional Development Grant University of Arizona, Curson Education Plus Fund Award National Science Foundation, Graduate Research Fellowship Lunar and Planetary Institute, Career Development Award University of Arizona, University Fellows Award NASA Group Achievement Award, LRO Extended Science Mission Team NASA Group Achievement Award, MRO Comet Siding Spring Observing Team Lunar and Planetary Laboratory Appointed Personnel Excellence Award NASA RHG Exceptional Achievement for Science, LRO Science Mission Team University of Arizona, Staff Advisory Council, Emily Krauz Staff Scholarship NASA Group Achievement Award, MRO HiRISE Science Team University of Arizona, Dean’s List with Distinction	2020 2018 2017 2017 2016 2016–2021 2016 2015 2015 2015 2015 2013 2012 2011 Spring, 2008
MISSIONS	Io Volcano Observer (NASA Discovery Phase A Selection) Europa Clipper (NASA), EIS, Professional Affiliate Origins, Spectral Interpretation, Resource Identification, Security, Regolith Explorer (OSIRIS-REx) (NASA), OCAMS, Collaborator Mars Trace Gas Orbiter (ESA), CaSSIS Lunar Reconnaissance Orbiter (NASA), LROC Mars Reconnaissance Orbiter (NASA), HiRISE	2020 2018–present 2015–2019 2010–present 2008–present 2006–present

- SUBMITTED PERRY, J.E., R. Heyd, M. Read, L.L. Tornabene, **S. S. Sutton**, S. Byrne, N. Thomas, A. Fennema, JOURNAL A. McEwen, K. Berry. Geometric Processing of TGO CaSSIS Observations. *Planetary and PUBLICATIONS Space Sciences*, In review, 2021.
- Re, C., E. Simioni, A. Fennema, **S. S. Sutton**, D. Mège, K. Gwinner, M. Józefowicz, G. Munaretto, A. Petrella, A. Pommerol, G. Cremonese, N. Thomas. CaSSIS-based stereo products for Mars after three years in orbit. *Planetary and Space Science*, In review, 2021.
- REFEREED **Sutton, S. S.**, M. Chojnacki, A. S. McEwen, R. L. Kirk, C. M. Dundas, E. I. Schaefer, S. J. Conway, JOURNAL S. Diniega, G. Portyankina, M. E. Landis, N. F. Baugh, R. Heyd, S. Byrne, L. L. Tornabene, PUBLICATIONS L. Ojha, C. W. Hamilton. Revealing active Mars with HiRISE digital terrain models. *Remote Sensing*, 14(10), 2403, doi:10.3390/rs14102403 2022.
- Sutton, S. S.**, C. W. Hamilton, V. Cataldo, D. A. Williams, J. E. Bleacher. Sinuous channels east of Olympus Mons, Mars: Implications for volcanic, hydrological, and tectonic processes. *Icarus*, 374, 114798, doi:10.1016/j.icarus.2021.114798, 2022.
- McEwen, A. S., E. I. Schaefer, C. M. Dundas, **S. S. Sutton**, L. K. Tamppari, M. Chojnacki. Mars: Abundant recurring slope lineae (RSL) following the planet-encircling dust event (PEDE) of 2018. *Journal of Geophysical Research–Planets*, 126, e2020JE006575, doi:10.1029/2020JE006575, 2021.
- Becerra, P., M. M. Sori, N. Thomas, A. Pommerol, **S. S. Sutton**, S. Tulyakov, E. Simioni, G. Cremonese. Timescales of the climate record in the south polar ice cap of Mars. *Geophysical Research Letters*, 46, doi:10.1029/2019GL083588, 2019.
- Schaefer, E. I., A. S. McEwen, **S. S. Sutton**. A case study of recurring slope lineae (RSL) at Tivat crater: Implications for RSL origins. *Icarus*, 317, 621–648, doi:10.1016/j.icarus.2018.07.014, 2019.
- DellaGiustina, D. N., C. A. Bennett, K. Becker, D. R. Golish, L. Le Corre, D. A. Cook, K. L. Edmondson, M. Chojnacki, **S. S. Sutton**, and 32 others. Overcoming the Challenges Associated with Image-based Mapping of Small Bodies in Preparation for the OSIRIS-REx Mission to (101955) Bennu. *Earth and Space Science*, 5, 929–949, doi:10.1029/2018EA000382, 2018.
- Dundas, C. M., A. M. Bramson, L. Ojha, J. J. Wray, M. T. Mellon, S. Byrne, A. S. McEwen, N. E. Putzig, D. Viola, **S. S. Sutton**, E. Clark, J. W. Holt. Exposed subsurface ice sheets in the Martian mid-latitudes *Science*, 359:6372, doi:10.1126/science.aao1619, 2018.
- Tornabene, L. L., F. P. Seelos, A. Pommerol, N. Thomas, C. M. Caudill, P. Becerra, J. C. Bridges, S. Byrne, and 16 others, including **S. S. Sutton**. Image Simulation and Assessment of the Colour and Spatial Capabilities of the Colour and Stereo Surface Imaging System (CaSSIS) on the ExoMars Trace Gas Orbiter. *Space Science Reviews*, 214:1, doi:10.1007/s11214-017-0436-7, 2017.
- Becerra, P., S. Byrne, M. M. Sori, **S. S. Sutton**, K. E. Herkenhoff. Stratigraphy of the North Polar Layered Deposits of Mars from High-Resolution Topography. *Journal of Geophysical Research: Planets*, doi:10.1002/2015JE004992, 2016.
- Chojnacki, M., A. S. McEwen, C. Dundas, L. Ojha, A. Urso, **S. S. Sutton**. Geologic context of recurring slope lineae in Melas and Coprates Chasmata, Mars. *Journal of Geophysical Research*, 121:7, 1204–1231, doi:10.1002/2015JE004991, 2016.
- Diot, X., M. R. El-Maarry, L. Guallini, F. Schlunegger, K. P. Norton, N. Thomas, **S. S. Sutton**, P. M. Grindrod. An ice-rich flow origin for the banded terrain in Hellas basin, Mars. *Journal of Geophysical Research*, 120:12, 2258–2276, doi:10.1002/2015JE004956, 2015.

Bramson, A. M., S. Byrne, N. E. Putzig, **S. S. Sutton**, J. J. Plaut, T. C. Brothers, J. W. Holt. Widespread excess ice in Arcadia Planitia, Mars. *Geophysical Research Letters*, 42, 6566–6574, doi:10.1002/2015GL064844, 2015.

(Note: Name change from Mattson to Sutton January, 2015)

Ding, N., V. Bray, A. S. McEwen, **S. Mattson**, C. H. Okubo, M. Chojnacki, L. L. Tornabene. The central uplift of Ritchey crater, Mars. *Icarus*, 252, 255–270, doi:10.1016/j.icarus.2014.11.001, 2014.

Ojha, L., A. S. McEwen, C. M. Dundas, S. Byrne, **S. Mattson**, J. J. Wray, M. Masse, and E. I. Schaefer. HiRISE observations of Recurring Slope Lineae (RSL) during southern summer on Mars. *Icarus*, 231, 365–376, doi:10.1016/j.icarus.2013.12.021, 2014.

McEwen, A. S., C. M. Dundas, **S. Mattson**, A. D. Toigo, L. Ojha, J. J. Wray, M. Chojnacki, S. Byrne, S. L. Murchie, and N. Thomas. Recurring slope lineae in equatorial regions of Mars. *Nature Geoscience*, 7, 53–58, doi:10.1038/ngeo2014, 2014.

Caudill, C. M., L. L. Tornabene, A. S. McEwen, S. Byrne, L. Ojha, and **S. Mattson**. Layered MegaBlocks in the central uplifts of impact craters. *Icarus*, 221, 710–720, doi:10.1016/j.icarus.2012.08.033, 2012.

Tornabene, L. L., G. R. Osinski, A. S. McEwen, J. M. Boyce, V. J. Bray, C. M. Caudill, J. A. Grant, C. W. Hamilton, **S. Mattson**, and P. J. Mouginis-Mark. Widespread crater-related pitted materials on Mars: Further evidence for the role of target volatiles during the impact process. *Icarus*, 220, 348–368, doi:10.1016/j.icarus.2012.05.022, 2012.

Bridges, N. T., F. Ayoub, J.-P. Avouac, S. Leprince, A. Lucas, and **S. Mattson**. Earth-like sand fluxes on Mars. *Nature*, 485, 339–342, doi:10.1038/nature11022, 2012.

Bridges, N. T., M. C. Bourke, P. E. Geissler, M. E. Banks, C. Colon, S. Diniega, M. P. Golombek, C. J. Hansen, **S. Mattson**, A. S. McEwen, M. T. Mellon, N. Stantzos, and B. J. Thomson. Planet-wide sand motion on Mars. *Geology*, 40, 31–34, doi:10.1130/G32373.1, 2012.

McEwen, A. S., L. Ojha, C. M. Dundas, **S. Mattson**, S. Byrne, J. J. Wray, S. C. Cull, S. L. Murchie, N. Thomas, and V. C. Gulick. Seasonal Flows on Warm Martian Slopes. *Science*, 333, 740–743, doi:10.1126/science.1204816, 2011.

Delamere, W. A., L. L. Tornabene, A. S. McEwen, K. Becker, J. W. Bergstrom, N. T. Bridges, E. M. Eliason, D. Gallagher, K. E. Herkenhoff, L. Keszthelyi, **S. Mattson**, G. K. McArthur, M. T. Mellon, M. Milazzo, P. S. Russell, and N. Thomas. Color imaging of Mars by the High Resolution Imaging Science Experiment (HiRISE). *Icarus*, 205, 38–52, doi:10.1016/j.icarus.2009.03.012, 2010.

McEwen, A. S., and 69 others including **S. Mattson**. The High Resolution Imaging Science Experiment (HiRISE) during MRO's Primary Science Phase (PSP). *Icarus*, 205, 2–37, 2010.

Milazzo, M. P., L. P. Keszthelyi, W. L. Jaeger, M. Rosiek, **S. Mattson**, C. Verba, R. A. Beyer, P. E. Geissler, and A. S. McEwen. Discovery of columnar jointing on Mars. *Geology*, 37, 171–174, doi:10.1130/G25187A.1, 2009.

BOOK
CHAPTERS

Sutton, S. S., A. K. Boyd, R. L. Kirk, D. Cook, J. W. Backer, A. Fennema, R. Heyd, A. S. McEwen, S. D. Mirchandani. Correcting spacecraft jitter in HiRISE images. in *Planetary Remote Sensing and Mapping*, B. Wu, K. Di, J. Oberst, and I. Karachevtseva (Eds.), Taylor & Francis Group/CRC Press, London, Chapter 8, pp. 91–106, ISBN: 978-1-138-58415-0, 2018.

PAPERS IN
PREPARATION

Sutton, S. S., J. A. Richardson, P. W. Whelley, C. W. Hamilton, S. P. Scheidt, et al. Degradation of the 2014–2015 Holuhraun vent edifice.

SELECTED
CONFERENCE
PRESENTATIONS

- Sutton, S. S.**, M. Chojnacki, A. S. McEwen, R. L. Kirk, C. M. Dundas, E. I. Schaefer, S. J. Conway, S. Diniega, G. Portyankina, M. E. Landis, N. F. Baugh, R. Heyd, S. Byrne, L. L. Tornabene, L. Ojha, C. W. Hamilton, Revealing active Mars with HiRISE digital terrain models and orthoimages. *53rd Lunar and Planetary Science Conference*, Abstract 2509, 7–11 March 2022, The Woodlands, Texas, Poster.
- Sutton, S. S.**, C. W. Hamilton, V. Cataldo, D. A. Williams, J. E. Bleacher, Channels and fossae east of Olympus Mons as indicators of Late Amazonian volcanic, hydrological, and tectonic processes. *53rd Lunar and Planetary Science Conference*, Abstract 1226, 7–11 March 2022, The Woodlands, Texas, Poster.
- Richardson, J. A., **S. S. Sutton**, P. L. Whelley, S. P. Scheidt. Vent development at the Holuhraun lava flow (Northern Iceland) and small Martian volcanoes. Geological Society of America Abstracts with Programs. Vol 53, No. 6, Invited Presentation, doi: 10.1130/abs/2021AM-370494
- Sutton, S. S.**, J. A. Richardson, P. L. Whelley, C. W. Hamilton, S. P. Scheidt. K. E. Young, A. Höskuldsson, I. Jónsdóttir, T. Thordarson. The onset of degradation of a large spatter rampart in Iceland. *51st Lunar and Planetary Science Conference*, Abstract 1527, 15–20 March 2020, The Woodlands, Texas, Talk.
- Sutton, S. S.**, J. A. Richardson, P. W. Whelley, C. W. Hamilton, K. E. Young, S. P. Scheidt, J. Voigt, J. E. Bleacher. The onset of degradation of the Holuhraun spatter rampart. *Geological Society of America*, 25 September 2019, Phoenix, Arizona, Talk.
- Sutton, S. S.**, C. W. Hamilton, J. E. Bleacher, S. P. Scheidt, V. Cataldo, D. A. Williams. Late Amazonian channelized flows east of Olympus Mons, Mars: Implications for volcanism and aqueous flooding. *Late Mars Workshop*, 1–2 October 2018, Houston, Texas, Talk.
- Sutton, S. S.**, C. W. Hamilton, J. E. Bleacher, D. A. Williams. Channelized flows east of Olympus Mons, Mars. *2017 Meeting of the International Association of Volcanology and Chemistry of the Earth's Interior*, 13–16 August 2017, Portland, Oregon, Talk.
- Sutton, S. S.**, S. Byrne, K.E. Herkenhoff, A.S. McEwen. Seasonal and interannual changes in meter-scale pits in Mars' north polar layered deposits. *48th Lunar and Planetary Science Conference*, Abstract 2592, March, 2017, The Woodlands, Texas, Poster.
- Sutton, S. S.**, A. Boyd, A. S. McEwen, R. Heyd, A. Fennema, R. Kirk, D. Cook, and S. Mirchandani. Correcting Spacecraft Jitter in HiRISE Images. *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, XLII-3/W1, 2017 International Symposium on Planetary Remote Sensing and Mapping, 13–16 August 2017, Hong Kong, Talk (given by R. Kirk).
- Herkenhoff, K. E., **Sutton, S. S.**, and the HiRISE Science Team. MRO HiRISE Observations of Recent Phenomena in the North Polar Region of Mars. *LPI Contributions*, The Sixth International Conference on Mars Polar Science and Exploration, held 5-9 September, 2016 in Reykjavik, Iceland. LPI Contribution No. 1926, id.6040.
- Sutton, S. S.**, C.W. Hamilton, J.E. Bleacher. Investigating channel morphologies in the eastern Olympus Mons region of Mars: Implications for volcanic and fluvial processes. *47th Lunar and Planetary Science Conference*, Abstract 2759, March, 2016, The Woodlands, Texas, Poster.
- Sutton, S. S.**, M. Chojnacki, A. Kilgallon, and HiRISE Team. Precision and Accuracy of Simultaneously Collected HiRISE Digital Terrain Models. *46th Lunar and Planetary Science Conference*, Abstract 3010, March, 2015, Poster.

- Delamere, A., A. S. McEwen, **S. Mattson**, R. Heyd, A. T. Polit, C. Schaller, R. W. Zurek, S. M. Miilkovich, K. Block, L. K. Tamppari, J. Li, T. Farnham, C. M. Lisse, and M. S. Kelley. Observation of Comet Siding Spring by the High Resolution Imaging Science Experiment (HiRISE) on Mars Reconnaissance Orbiter (MRO). In *AAS/Division for Planetary Sciences Meeting Abstracts*, volume 46 of *AAS/Division for Planetary Sciences Meeting Abstracts*, page 110.04, November 2014.
- Mattson, S.**, A. McEwen, R. Kirk, E. Howington-Kraus, M. Chojnacki, K. Runyon, G. Cremonese, and C. Re. Martian Landscapes in Motion. In *European Geophysical Union General Assembly Conference*, volume 16 of *EGU General Assembly Conference Abstracts*, page 10153, May 2014, Vienna, Austria, Talk/PICO poster.
- Mattson, S.**, A. Kilgallon, S. Byrne, A. S. McEwen, K. Herkenhoff, C. Okubo, N. E. Putzig, and P. Russell. Meter-Scale Pits in Mars' North Polar Layered Deposits. In *45th Lunar and Planetary Science Conference*, Abstract 2431, March 2014, The Woodlands, Texas, Poster.
- Mattson, S.**, A. S. McEwen, E. Speyerer, and M. S. Robinson. LROC NAC Stereo Anaglyphs. *AGU Fall Meeting Abstracts*, page 709, December 2012, Poster.
- Mattson, S.**, A. S. McEwen, L. Ojha, N. T. Bridges, R. L. Kirk, E. Howington-Kraus, and N. Mogk. Mars' Active Surface: Observing Changes with Orthorectified HiRISE Images. *AGU Fall Meeting Abstracts*, page C1849, December 2012, Poster.
- Mattson, S.**, A. S. McEwen, M. S. Robinson, E. Speyerer, and B. Archinal. Exploring the Moon with LROC-NAC Stereo Anaglyphs. In *European Planetary Science Congress 2012*, page 486, September 2012, Talk.
- Mattson, S.**, N. T. Bridges, R. L. Kirk, E. Howington-Kraus, N. Mogk, and L. Ojha. Studying Martian Dune Changes with HiRISE DTMs and Orthoimages. *LPI Contributions*, 1673:68–69, June 2012, Poster.
- Mattson, S.**, A. Bartels, A. Boyd, P. Calhoun, O. Hsu, A. McEwen, M. Robinson, J. Siskind, and T. Tran. Continuing Analysis of Spacecraft Jitter in LROC-NAC. In *Lunar and Planetary Science Conference*, volume 42 of *Lunar and Planetary Inst. Technical Report*, page 2756, March 2011, Poster.
- Mattson, S.**, B. Archinal, R. Beyer, K. Edmundson, B. Gaskell, I. Haase, E. Howington-Kraus, R. Li, N. Mastrodemos, A. McEwen, Z. Moratto, J. Oberst, L. Ojha, A. Ortiz, M. Robinson, M. Rosiek, F. Scholten, T. Tran, and LROC Team. High Resolution Topography from LROC-NAC Geometric Stereo Images. *LPI Contributions*, 1595:38, September 2010, Poster.
- Mattson, S.**, M. Robinson, A. McEwen, A. Bartels, E. Bowman-Cisneros, R. Li, J. Lawver, T. Tran, K. Paris, and LROC Team. Early Assessment of Spacecraft Jitter in LROC-NAC. In *Lunar and Planetary Science Conference*, volume 41 of *Lunar and Planetary Inst. Technical Report*, page 1871, March 2010, Poster.
- Mattson, S.**, A. Boyd, R. L. Kirk, D. A. Cook, and E. Howington-Kraus. HiJACK: Correcting spacecraft jitter in HiRISE images of Mars. In *European Planetary Science Congress 2009*, page 604, September 2009, Poster.
- Mattson, S.**, van Leeuwen, W., Yool, S. Fire effects on vegetation recovery in the Santa Catalina Mountains. In *U.S. Regional Association of the International Association of Landscape Ecology conference*, Tucson, Arizona, 2007, Talk.
- Mattson, S.**, Yool, S., van Leeuwen, W. Monitoring Post-Wildfire Forest Recovery Using Landsat And Modis Remote Sensing Data. In *50th Annual Meeting of the Arizona–Nevada Academy of Sciences*, University of Arizona, 2006, Poster.

GRANTS *Characterizing Global Sand Flux for Martian Bedform Construction Times and Erosion Rates*, MDAP, PI Matthew Chojnacki, 2015–2017.
Ejecta and Melt Interactions During Impact Ejecta Emplacement, LDAP, PI Veronica Bray, 2015.
Recurring Slope Lineae (RSL) on Mars, MDAP, PI Alfred McEwen, 2013–2015.
Advanced Change Detection Studies of Martian Dunes, MDAP, PI Nathan Bridges, 2012–2013.
Linking Visible and Radar Stratigraphy in the Martian Polar Deposits, MDAP, PI Patrick Russell, 2009–2012.

PROFESSIONAL Mapping and Planetary Spatial Infrastructure Team, Steering Committee 2015–2021
SERVICE NASA PGG-USGS Cartography Program Review panelist 2014–2015
 NASA ROSES grant programs External Reviewer
 Reviewer for *Earth and Space Science*
 Reviewer for *Photogrammetric Engineering & Remote Sensing*
 Reviewer for *Space Science Reviews*
 Reviewer for *Chinese Optics Letters*

PROFESSIONAL American Geophysical Union (AGU)
MEMBERSHIPS Geological Society of America (GSA)
 International Association of Volcanology and Chemistry of the Earth’s Interior (IAVCEI)