

CONTACT INFORMATION	Photogrammetry and Image Processing Scientist Ph.D. Candidate Lunar and Planetary Laboratory University of Arizona 1541 E. University Boulevard Tucson, AZ 85721 USA	Office: (520) 626-0759 ssutton@lpl.arizona.edu
RESEARCH INTERESTS	Planetary surface processes on Mars, Earth, the Moon, Europa, Io, planetary volcanism, geomorphology, digital terrain modeling, geomorphometry, remote sensing, stereophotogrammetry, change detection, image processing, optical instrumentation and calibration, digital signal processing.	
EDUCATION	University of Arizona, Ph.D. student in Planetary Science, 2015–present University of Arizona, Bachelor of Science, Mathematics, May, 2008 University of Arizona, Bachelor of Fine Art, Cum Laude, December, 1994	
EMPLOYMENT	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	2008–present  2006–2008  2005–2006
AWARDS	University of Arizona, University Fellowship Professional Development Grant – 2017 Curson Education Plus Fund Award – 2016 National Science Foundation Graduate Research Fellowship – 2016 Lunar and Planetary Institute Career Development Award – 2016 University of Arizona Graduate Fellowship – 2015 University of Arizona Staff Advisory Council, Emily Krauz Staff Scholarship – Fall 2012 University of Arizona, Dean’s List with Distinction – Spring 2008	
FUNDED GRANT PARTICIPATION	<ul style="list-style-type: none"> <li>• <i>Characterizing Global Sand Flux for Martian Bedform Construction Times and Erosion Rates</i>, MDAP, PI Matthew Chojnacki. DTM and orthoimage production as Other Professional, FY 2015-2017</li> <li>• <i>Ejecta and Melt Interactions During Impact Ejecta Emplacement</i>, LDAP, PI Veronica Bray. DTM production as Other Professional, FY 2015</li> <li>• <i>Recurring Slope Lineae (RSL) on Mars</i>, MDAP, PI Alfred McEwen. DTM and orthoimage production as Other Professional, FY 2013-2015</li> <li>• <i>Advanced Change Detection Studies of Martian Dunes</i>, MDAP, PI Nathan Bridges. DTM production under Co-I S. Byrne, FY 2012-2013</li> <li>• <i>Linking Visible and Radar Stratigraphy in the Martian Polar Deposits</i>, MDAP, PI Patrick Russell. DTM production under Co-I S. Byrne, FY 2009-2012</li> </ul>	
MISSION INVOLVEMENT	<ul style="list-style-type: none"> <li>• Europa Clipper (NASA) – Europa Imaging System (EIS) (2018 – Present) Professional Affiliate</li> <li>• Origins, Spectral Interpretation, Resource Identification, Security, Regolith Explorer (OSIRIS-REx) (NASA) – OCAMS (2015 – Present) Collaborator, DTM Production, Geometric Stereo Planning</li> <li>• Mars Trace Gas Orbiter (ESA) – CaSSIS (2010 - Present) Planning and targeting software development and testing, stereo planning</li> </ul>	

- Lunar Reconnaissance Orbiter (NASA) – LROC (2008 - Present)  
Stereo image processing and jitter analysis
- Mars Reconnaissance Orbiter (NASA) – HiRISE (2006 - Present)  
Image Processing, Lead Digital Terrain Model Production, Spacecraft jitter analysis,  
Planetary Data Service development and archiving

PROFESSIONAL  
SERVICE

Mapping and Planetary Spatial Infrastructure Team (MAPSIT), Steering Committee, 2015–present  
NASA PGG-USGS Cartography Program (PCGMWG) Review panelist 2014–2015  
Reviewer for Photogrammetric Engineering & Remote Sensing  
Reviewer for Space Science Reviews  
Reviewer for Chinese Optics Letters  
NASA ROSES grant programs External Reviewer, multiple years

PROFESSIONAL  
MEMBERSHIPS

American Society of Photogrammetry and Remote Sensing (ASPRS), Member since 2011  
American Geophysical Union (AGU), Member since 2014  
Geological Society of America (GSA), Member since 2016  
International Association of Volcanology and Chemistry of the Earth’s Interior (IAVCEI), Member since 2017

REFEREED  
JOURNAL  
PUBLICATIONS

(Note: Surname changed from Mattson to Sutton January, 2015)

D. N. DellaGiustina, C. A. Bennett, K. Becker, D. R. Golish, L. Le Corre, D. A. Cook, K. L. Edmundson, 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*, (submitted), arXiv:1810.10080 [astro-ph.EP], 2018.

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, 2019.

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:0.1007/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, July, 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, 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, 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, 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, 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, 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, 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. Mouginiis-Mark. Widespread crater-related pitted materials on Mars: Further evidence for the role of target volatiles during the impact process. *Icarus*, 220, 348–368, 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, 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. Stantzios, and B. J. Thomson. Planet-wide sand motion on Mars. *Geology*, 40, 31–34, 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, 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, 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, 2009.

PAPERS IN  
PREPARATION

**Sutton, S. S.**, C. W. Hamilton, J. E. Bleacher, D. A. Williams, S. P. Scheidt. Sinuous channels east of Olympus Mons, Mars: Implications for volcanic, fluvial, and tectonic activity in the Late Amazonian.

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, ISBN: 978-1-138-58415-0, (submitted).

SELECTED  
CONFERENCE  
PRESENTATIONS

**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.**, 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).
- Needham, D. H., C. W. Hamilton, J. E. Bleacher, P. L. Whelley, K. E. Young, S. P. Scheidt, J. A. Richardson, **S. S. Sutton**. Lava Eruption and Emplacement: Using Clues from Hawaii and Iceland to Probe the Lunar Past. *Annual Meeting of the Lunar Exploration Analysis Group*, Abstract 5039, October, 2016.
- Richardson, J.A., P. Whelley, **S. S. Sutton**, D.H. Needham, S. Byrne, C. Hamilton. Repeat terrestrial lidar mapping of the new volcanic vent at Holuhraun, Iceland. *American Geophysical Union Fall Meeting*, 2016.
- Herkenhoff, K. E. and **Sutton, S. S.** and 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.
- 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.
- 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 *EGU General Assembly Conference Abstracts*, volume 16 of *EGU General Assembly Conference Abstracts*, page 10153, May 2014.
- 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 *Lunar and Planetary Science Conference*, volume 45 of *Lunar and Planetary Inst. Technical Report*, page 2431, March 2014.
- Mattson, S.**, A. S. McEwen, E. Speyerer, and M. S. Robinson. LROC NAC Stereo Anaglyphs. *AGU Fall Meeting Abstracts*, page 709, December 2012.
- 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.
- 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.
- Mattson, S.**, R. Heyd, A. Fennema, R. Kirk, D. Cook, K. Becker, A. McEwen, and A. Boyd. High-Precision Geometrically Corrected HiRISE Images. In *European Planetary Science Congress 2012*, page 481, September 2012.

- 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.
- Mattson, S.**, P. Russell, S. Byrne, R. L. Kirk, K. Herkenhoff, and A. S. McEwen. Production and Error Analysis of Polar Digital Terrain Models from HiRISE. In *Lunar and Planetary Science Conference*, volume 43 of *Lunar and Planetary Inst. Technical Report*, page 2659, March 2012.
- Mattson, S.**, L. Ojha, A. Ortiz, A. S. McEwen, and K. Burns. Regional Digital Terrain Model Production with LROC-NAC. In *Lunar and Planetary Science Conference*, volume 43 of *Lunar and Planetary Inst. Technical Report*, page 2630, March 2012.
- Mattson, S.**, A. S. McEwen, L. Ojha, R. Heyd, E. Howington-Kraus, and R. L. Kirk. High resolution digital terrain models and orthorectified images of Mars from HiRISE and HiSCI. In *EPSC-DPS Joint Meeting 2011*, page 1380, October 2011.
- 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.
- Mattson, S.**, R. L. Kirk, R. Heyd, A. S. McEwen, E. Eliason, T. Hare, R. Beyer, E. Howington-Kraus, C. Okubo, and K. Herkenhoff. Release of HiRISE Digital Terrain Models to the Planetary Data System. In *Lunar and Planetary Science Conference*, volume 42 of *Lunar and Planetary Inst. Technical Report*, page 1558, March 2011.
- 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.
- 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.
- 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.
- 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.
- Mattson, S.**, van Leeuwen, W., Yool, S. Fire Effects on Vegetation Recovery in the Santa Catalina Mountains. In *Graduate and Professional Student Council Student Showcase*, University of Arizona, 2007.
- 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.