

Melissa S. Rice

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OVERVIEW

Education

Ph.D., Cornell University, 2012, Astronomy; Geology and Science Communication (minors)

Thesis title: *Annals of a Former World: The Remnants of Water at Gusev Crater and Eberswalde Crater, Mars* (advisor: Jim Bell)

M.S., Cornell University, 2009, Astronomy

B.A., Wellesley College, 2005, Astrophysics (advisor: Richard French)

Appointments

Assistant Professor of Planetary Science, 2014-present

Geology Department, Physics/Astronomy Department, Western Washington University

Postdoctoral Scholar, 2012-2014

Division of Geological and Planetary Science, California Institute of Technology

Professional Interests

- Surface composition, sedimentology and stratigraphy of terrestrial planets
- Reflectance spectroscopy and multi/hyperspectral imaging (spacecraft, field and laboratory)
- Scientific support for planning and operating robotic planetary missions
- Teaching and curriculum development (astronomy, geology and planetary science)
- Public communication of science through writing and public speaking

NASA Mission Involvement

NASA Mars 2020 Rover Mission, 2014-present, *Mastcam-Z Co-Investigator*

NASA Mars Science Laboratory Mission, 2012-present, *Participating Scientist; Ops Roles: Long-Term Planner, Geology Science Theme Lead, Geology Keeper of the Plan and Documentarian*

NASA Mars Exploration Rover Mission, 2007-present, *Collaborator; Ops Roles: Pancam Payload Downlink Lead, Geology Lead, Microscopic Imager and Engineering Camera Payload Uplink Lead*

NASA K10 Robotic Recon for Lunar Surface Science, 2008-2009, *Science Team Member*

Honors and Awards

SPARK Award for Outstanding Contribution to Science Education, 2018, *SPARK Museum*

Women of Excellence in Male-Dominated Fields Award, 2015, *NW Asian Weekly*

NASA Postdoctoral Program (NPP) Fellowship, 2012-2014, *NASA Astrobiology Institute*

Shoemaker Fellowship (declined offer), 2011, *USGS Astrogeology Research Program*

Buttrick-Crippen Fellowship, 2010-2011, *Cornell University Knight Institute*

James Slevin Assignment Sequence Prize, 2011, *Cornell University Knight Institute*

Outstanding Teaching Assistant Award, 2011, *Cornell University Department of Astronomy*

Graduate Research Fellowship, 2008-2010, *National Science Foundation*

Mars Student Travel Award, 2007, 2010, *NASA Mars Program Office*
Amelia Earhart Fellowship Award, 2008-2009, *Zonta International*
Prof. Elizabeth F. Fisher Geology Fellowship, 2008-2009, *Wellesley College*
Career Development Award, 2008, *Lunar and Planetary Institute*
Susan R. Knafel '52 Fellowship, 2005-2006, *Wellesley College*
Research Award (to support an internship at NASA Ames), 2005, *NASA MA Space Grant*
John Charles Duncan Prize, 2004, *Wellesley College Department of Astronomy*

TEACHING

Courses Taught

Western Washington University

Astr 497: Classic Papers In Planetary Science, Winter 2019
Geol 445/545: Planetary Geology, Winter 2015, Fall 2015, Winter 2017, Winter 2018
Geol 497H/597H: Remote Sensing of Earth and Planetary Surfaces, Spring 2016, Fall 2017
Astr 315: The Solar System, Fall 2015, Fall 2016, Fall 2017, Fall 2018
Honors 101: The Big Picture (Co-Instructor), Fall 2016, Fall 2017, Fall 2018
Geol 497K/597K: Science Communication, Spring 2017, Spring 2019
Academy of Lifelong Learning: The Exploration Of Mars, Winter 2017
Geol 211: Physical Geology, Spring 2015, Winter 2016
Astr 113: Sun, Moon & Planets, Spring 2015

Other Institutions

Instructor, Ad Astra Academy, July 2018, *Instituto Presbiteriano Álvaro Reis, Rio De Janeiro, Brazil*
Instructor, Astro 1110: The Exploration of Mars, Spring 2011, *Cornell University, Ithaca, NY*
Co-Instructor, Comm 566: Science Communication, Spring 2008, *Cornell University, Ithaca, NY*
TA, Astro 102: Our Solar System, Spring 2008, *Cornell University, Ithaca, NY*
TA, Astro 101: The Nature of the Universe, Fall 2007, *Cornell University, Ithaca, NY*
TA, Astro 202: Our Home in the Solar System, Spring 2007, *Cornell University, Ithaca, NY*
TA, Astro 233: Topics In Astronomy & Astrophysics, Fall 2006, *Cornell University, Ithaca, NY*

Advising

Graduate Theses (4 current, 2 completed)

Kristiana Lapo, 2019-present, *Characterization of Ferric Rock Coatings Using Reflectance Spectroscopy and SEM*
Cory Hugues, 2018-present, *Spectral Analysis of the Catchment and Deposit at Eberswalde Crater*
Christina Seeger, 2018-present, *Using Multispectral Imagery to Interrogate Deposition, Alteration, and Weathering Across Curiosity's Traverse*
Kathleen Hoza, 2017-2019, *Spectrogoniometric reflectance spectroscopy measurements of weathering rinds and rock coatings*
Darian Dixon, 2015-2018, *Visible-to-Near-Infrared Spectral Variability of Hydrated Sulfates and Candidate Mars Landing Sites: Implications for the Mastcam-Z Investigation on NASA's Mars-2020 Rover Mission*

Joshua Williams, 2015-2017, *Ongoing Exhumation and Recent Exposure of Sedimentary Outcrops on Mars*

Graduate Committees (3 current)

Amanda Ketting-Olivier, 2018-present; Kris Phillips, 2017-present; Paige Knapp, 2015-present

Undergraduate Senior Theses (2 current, 3 completed)

Mason Starr, 2018-2019 (in progress), *Cluster analysis of the MSL Mastcam multispectral dataset*

Katelyn Frizzell, 2018-2019 (in progress), *Mineral spectroscopy at candidate sites for Mars-2020*

Amanda Rudolph, 2017-2018, *Stratigraphic analysis of Mt. Sharp in Gale Crater, Mars*

Michael Reynolds, 2015-2016, *Surface albedo variations across the Spirit rover traverse*

Genevieve Studer-Ellis, 2015-2016, *Surface albedo variations across the Opportunity rover traverse*

Undergraduate Research Students (4 current, 19 completed)

Jess Mollerup, 2019-present; Baylee Adair, 2019-present; Katelyn Frizzell, 2018-present; Mason Starr, 2016-present; Lena Gibbs, 2018; Adam Hudak, 2018; Abdullah Naimzadeh, 2018; Amanda Rudolph, 2017-2018; Natalie Moore, 2017-2018; Katherine Winchell, 2014-2017; Jack Boyd, 2017; Chloe Dawson, 2017; Kyle Mellander, 2016-2017; Michael Reynolds, 2014-2016; Genevieve Studer Ellis, 2015-2016; Jonathan Pruiett, 2016; Andrew Lindsay, 2016; Matt Losee, 2015-2016; Christian Thomsen, 2014-2016; Chad Stetson, 2015; Huy Nguyen, 2015; Michelle Fields, 2015; Kellen McCollough, 2014-2015.

Professional Development

STEM Equity and Inclusion Workshops (4 total), 2017-2018, *WWU*

Change at the Core Cohort 2 Workshop and Professional Learning Group, 2015-2016, *WWU*

Early Career Geoscience Faculty Workshop, July 2015, *National Association of Geoscience Teachers*

Safe Zone Training Workshop, Feb. 2015, *WWU*

Change at the Core New Faculty in STEM Workshop, summer 2014, *WWU*

SCHOLARSHIP

Grants Awarded

External Funding

PI, Integrating Color, Composition and Stratigraphy to Characterize Paleoenvironments at Mount Sharp and Identify Science Targets Along Curiosity's Traverse, \$379,915, *NASA Mars Science Laboratory Participating Scientist Program*, submitted June 2015 (awarded 2016-2019).

PI, Course Development Remote Sensing of Earth and Planetary Surfaces, \$4,946, *Washington NASA Space Grant Consortium*, submitted Oct. 2016 (awarded for Spring 2017).

Co-I, Mastcam-Z: A Geologic, Stereoscopic, Multispectral Imaging Investigation, \$96,060 (subcontract from Arizona State University), *NASA Mars2020 Rover Mission*, submitted Jan. 2014 (awarded June 2015 – Aug 2020).

PI, Travel Grant to Attend the First Landing Site/Exploration Zone Workshop for Human Missions to the Surface of Mars, \$1,700, *Jet Propulsion Laboratory Mars Program Office*, submitted Sept. 2015 (awarded for Rice and student Chad Stetson, Oct. 2015).

Co-I, Time After Time: An Analogue Geochronology Mission to Mars, \$16,293 (subcontract from NASA Goddard Spaceflight Center), *NASA Planetary Science and Technology Through Analog Research*, submitted Sept. 2014 (awarded 2015 – 2016).

Internal Funding

- Co-PI, Spectrogoniometric and Scanning Electron Microscopy Measurements of Weathered Rock Surfaces and Implications for Spacecraft Observation on Mars, \$5,600 (with Co-PIs Sean Mulcahy and Michael Kraft) *WWU Advanced Materials Science and Engineering Center (AMSEC) Seed Grant*, submitted March 2018 (awarded for Summer 2018).
- PI, Exploring Climate Change on Mars with the NASA Curiosity Rover, \$7,200, *WWU RSP Summer Research Grant*, submitted Nov. 2015 (awarded for Summer 2016).

Invited Talks

- Banquet Talk, May 2019, *Northwest Section of the American Physical Society, Bellingham, WA*
- Earth and Planetary Sciences Colloquium, April 2019, *University of Tennessee, Knoxville, TN*
- Planetary Science Seminar, May 2018, *Imperial College, London, UK*
- Plenary Session, Aug. 2016, *SPIE Photonics + Optics Conference, San Diego, CA*
- NASA Astrobiology Institute, May 2016, *Webinar Series, online*
- Northwest Geological Society, Apr. 2016, *University of Washington, Seattle, WA*
- Physics and Astronomy Colloquium, Apr. 2016, *California State University, Northridge, CA*
- Lunar and Planetary Colloquium, Feb. 2016, *University of Arizona, Tucson, AZ*
- Earth and Space Sciences Seminar, May 2015, *University of Washington, Seattle, WA*
- Keynote Lecture, Apr, 2015, *Washington Hydrogeology Symposium, Tacoma, WA*
- Physics and Astronomy Colloquium, Jan. 2015, *Washington State University, Pullman, WA*

Publications (** graduate advisee; * undergraduate advisee)

Citations statistics as of 5/28/19 from Google Scholar: 2642 citations, h-index = 25, i10-index = 40

Submitted Manuscripts

51. Ruff, S.W., Campbell, K., Van Kranendonk, M., **Rice, M.S.**, Farmer, J., (in revision) The Case for Hot Spring Silica Sinter in The Columbia Hills of Gusev Crater, Mars and Why it Matters, *Astrobiology*.
50. Horgan, B.H.N., Anderson, R.B., Dromart, G., Amador, E.S., **Rice, M.S.** (in revision), The Mineral Diversity of Jezero Crater, Mars: Evidence for Possible Lacustrine Carbonates, *Icarus*.
49. Sorberg, J., Kinch, K.M., Hurowitz, J., Horgan, B.H.N., **Rice, M.S.**, Adler, J. (in revision), Landing on Mars: A Cross-Institutional Research-Based Seminar Series, submitted to *International Journal of Teaching and Learning in Higher Education*.

Peer-Reviewed Papers

48. **Williams, J.****, Day, M., Chojnacki, M., **Rice, M.S.**, Scarp orientation in regions of active aeolian erosion on Mars (2019), *Icarus*, doi:10.1016/j.icarus.2019.07.018.
47. Buz, J., Ehlmann, B.L., Kinch, K.M., Madson, M.B., Johnson, J.R., **Rice, M.S.**, Maki, J., Bell III, J.F. (2019), Photometric Characterization of Lucideon and Avian Technologies Color Standards Including Application for Calibration of the Mastcam-Z Instrument on the Mars 2020 Rover, *SPIE Optical Engineering*, doi:10.1117/1.OE.58.2.027108.
46. Herkenhoff K.E. and 31 coauthors, including **Rice, M.S.** (2018), Overview of Spirit Microscopic Imager Results, *Journal of Geophysical Research - Planets*, doi:10.1029/2018JE005774.
45. **Rice, M.S.**, **Reynolds II, M.J.***, **Studer-Ellis, G.***, Bell III, J.F., Johnson, J.R., Herkenhoff, K.E., Wellington, D. (2018), The Albedo of Mars: Six Mars Years of Observations from Pancam on the Mars Exploration Rovers and Comparisons to MOC, CTX and HiRISE, *Icarus*, 314, 159-174, doi:

10.1016/j.icarus.2018.05.017.

44. Bell, J.F. III, Farrand, W., Johnson, J.R., Kinch, K., Lemmon, M., Parente, M., **Rice, M.S.**, Wellington, D., (2018) Chapter 27: Compositional and mineralogic analyses of Mars using multispectral imaging on the Mars Exploration Rover, Phoenix, and Mars Science Laboratory missions, *Remote Compositional Analysis: Techniques for Understanding Spectroscopy, Mineralogy, and Geochemistry of Planetary Surfaces*, edited by J. L. Bishop, J. E. Moersch and J. F. Bell III, in press, Cambridge University Press, Cambridge, UK.
43. **Rice, M.S.** and 14 coauthors, including **Williams, J.**** (2017), A Geologic Overview of the Kimberley Waypoint Along Curiosity's Traverse in Gale Crater, Mars, *Journal of Geophysical Research Planets*, 121, doi:10.1002/2016JE005200.
42. Edgar, L. and 24 coauthors, including **Rice, M.S.** (2017), Shaler: in situ analysis of a fluvial sedimentary deposit on Mars, *Sedimentology*, doi:10.1111/sed.12370.
41. Wellington, D.F., Bell III, J.F., Johnson, J.R., Kinch, K.M., **Rice, M.S.**, Godber, A., Ehlmann, B.L., Fraeman, A.A., Hargrove, C. and the MSL Science Team (2017), Visible to near-infrared MSL/Mastcam multispectral imaging: Initial results from select high-interest science targets within Gale Crater, Mars, *American Mineralogist*, doi:10.2138/am-2017-5760CCBY.
40. Frydenvang, J. and 42 coauthors, including **Rice, M.S.** (2017), Diagenetic silica enrichment and late-stage groundwater activity in Gale crater, Mars, *Geophys. Res. Lett.*, doi:10.1002/2017GL073323.
39. Ehlmann, B.L. and 40 coauthors, including **Rice, M.S.** (2016), The sustainability of habitability on terrestrial planets: Insights, questions, and needed measurements from Mars for understanding the evolution of Earth-like worlds, *Journal of Geophysical Research Planets*, 121, 1927–1961, doi:10.1002/2016JE005134.
38. Farrand, W.H., Johnson, J.R., **Rice, M.S.**, Wang, A., Bell, J.F. III (2016), VNIR Multispectral Observations of Aqueous Alteration Materials by the Pancams on the Spirit and Opportunity Mars Exploration Rovers, *American Mineralogist*, 101, 9, doi:10.2138/am-2016-5627.
37. Lapotre, M.G.A. and 16 coauthors, including **Rice, M.S.** (2016), Large wind ripples on Mars and significance for its atmosphere, *Science*, 353, 6294, doi:10.1126/science.aaf3206.
36. Lanza, N.L. and 34 coauthors, including **Rice, M.S.** (2016), Oxidation of manganese in an ancient aquifer, Kimberley formation, Gale Crater, Mars, *Geophysical Research Letters*, 43, doi:10.1002/2016GL069109.
35. Fraeman, A.A., Ehlmann, B.L., Arvidson, R.E., Edwards, C.S., Grotzinger, J.P., Milliken, R.E., Quinn, D. **Rice, M.S.** (2016), The stratigraphy and evolution of lower Mount Sharp from spectral, morphological, and thermophysical orbital data sets, *Journal of Geophysical Research Planets*, 121, 1713–1736, doi:10.1002/2016JE005095.
34. Le Deit, L. and 19 coauthors, including **Rice, M.S.** (2016), The potassic sedimentary rocks in Gale Crater, Mars, as seen by ChemCam on board Curiosity, *Journal of Geophysical Research Planets*, 121, doi:10.1002/2015JE004987.
33. Stack, K.M. and 15 coauthors, including **Rice, M.S.** (2016), Comparison of geologic mapping and interpretation of an ancient sedimentary environment in Aeolis Palus, Gale crater, Mars, *Icarus*, 280, doi:10.1016/j.icarus.2016.02.024.
32. Treiman, A.H. and 33 coauthors, including **Rice, M.S.** (2016), Mineralogy, provenance, and diagenesis of a potassic basaltic sandstone on Mars: CheMin X-ray diffraction of the Windjana sample (Kimberley area, Gale Crater), *Journal of Geophysical Research Planets*, 121, doi:10.1002/2015JE00493.
31. Vasconcelos, P.M., and 7 coauthors, including **Rice, M.S.** (2016), Discordant K-Ar and young exposure dates for the Windjana sand-stone, Kimberley, Gale Crater, Mars, *Journal of Geophysical Research Planets*, 121, 2176–2192, doi:10.1002/2016JE005017.
30. Grotzinger, J.P. and 39 coauthors, including **Rice, M.S.** (2015), Deposition, Exhumation, and

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- Paleoclimatology of an Ancient Lake Deposit, Gale Crater, Mars, *Science*, 350, 6257, aac7575, doi:10.1126/science.aac7575.
29. Johnson, J.R. and 15 coauthors, including **Rice, M.S.** (2015), ChemCam Passive Reflectance Spectroscopy of Surface Materials at the Curiosity Landing Site, Mars, *Icarus*, 249, 74-92, doi: 10.1016/j.icarus.2014.02.028.
 28. Martindale, R.C. and 14 coauthors, including **Rice, M.S.** (2015), Sedimentology, chemostratigraphy, and stromatolites of lower Paleoproterozoic carbonates, Turee Creek Group, Western Australia, *Precambrian Research*, 266, 194-211, doi:10.1016/j.precamres.2015.05.021.
 27. Farrand, W.H., Bell III, J.F., Johnson, J.R., **Rice, M.S.**, Jolliff, B.L., Arvidson, R.E. (2014) Observations of rock spectral classes by the Opportunity rover's Pancam on northern Cape York and on Matijevic Hill, Endeavour Crater, Mars, *Journal of Geophysical Research Planets*, 119, 11, doi:10.1002/2014JE004641.
 26. Stack, K.M. and 18 coauthors, including **Rice, M.S.** (2014), Diagenetic Origin of Nodules and Hollow Nodules of the Sheepbed Member, Yellowknife Bay Formation, Gale Crater, Mars, *Journal of Geophysical Research*, 119, 7, doi:10.1002/2014JE004617.
 25. Nachon, M. and 34 coauthors, including **Rice, M.S.** (2014), Calcium sulfate veins characterized by the ChemCam instrument at Gale Crater, Mars, *Journal of Geophysical Research*, 119, 9, doi: 10.1002/2013JE004588.
 24. Bridges, N.T. and 22 coauthors, including **Rice, M.S.** (2014), The Rock Abrasion Record at Gale Crater: MSL Results from Bradbury Landing to Rocknest, *Journal of Geophysical Research*, 119, 6, doi:10.1002/2013JE004579.
 23. Stromberg, J.M., Applin, D.M., Cloutis, E.A., **Rice, M.S.**, Berard, G., Mann, P. (2014), The Persistence of a Chlorophyll Spectral Biosignature from Martian Evaporite and Spring Analogues under Mars-like Conditions, *Astrobiology*, 13, 3, doi:10.1017/S1473550413000402.
 22. **Rice, M.S.**, Bell III, J.F., Gupta, S., Warner, N.H., Goddard, K., Anderson, R.B. (2013), A Detailed Geologic Characterization of Eberswalde Crater, Mars, *Mars*, 15-59, doi:10.1555/mars.2013.0002.
 21. Grotzinger, J.P. and 69 coauthors, including **Rice, M.S.** (2013), A Habitable Fluvio Lacustrine Environment at Yellowknife Bay, Gale Crater, Mars, *Science*, 342, doi:10.1126/science.1242777.
 20. Vaniman, D.T. and 32 coauthors, including **Rice, M.S.** (2013), Mineralogy of a Mudstone on Mars, *Science*, 342, doi:10.1126/science.1243480.
 19. McLennan, S.M. and 48 coauthors, including **Rice, M.S.** (2013), Elemental Geochemistry of Sedimentary Rocks in Yellowknife Bay, Gale Crater, Mars, *Science*, 342, doi:10.1126/science.1244734.
 18. Smith, M.A., Bandfield, J.L., Cloutis, E.A., **Rice, M.S.** (2013), Hydrated Silica on Mars: Combined Analysis with Near-Infrared and Thermal-Infrared Spectroscopy, *Icarus*, 223, 633-648, doi:10.1016/j.icarus.2013.04.014.
 17. **Rice, M.S.**, Cloutis, E.A., Bell III, J.F., Mertzman, S.A., Bish, D.L., Craig, M., Mountain, B., Renaut, R.W., Gautason, B. (2013), Reflectance Spectra Diversity of Silica-Rich Materials: Sensitivity to Environment and Implications for Detections on Mars, *Icarus*, 223, 2, 633-648, doi:10.1016/j.icarus.2012.09.021.
 16. Farrand, W.H., Bell III, J.F., Johnson, J.R., **Rice, M.S.**, Hurowitz, J.A. (2013), VNIR Multispectral Observations of Rocks at Cape York, Endeavour Crater, Mars, *Icarus*, 225, 709-705, doi:10.1016/j.icarus.2013.01.024.
 15. Bell III, J.F. and 20 coauthors, including **Rice, M.S.** (2013), Calibration and Performance of the Mars Reconnaissance Orbiter Context Camera (CTX), *Mars*, 8, 1-14, 2013, doi:10.1555/mars.2013.0001. (10%)

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14. Berard G. and 14 coauthors, including **Rice, M.S.** (2013), A Hypersaline Spring Analogue in Manitoba, Canada for Potential Ancient Spring Deposits on Mars, *Icarus*, 224, 399-412, doi: 10.1016/j.icarus.2012.12.024.
 13. Squyres, S.W. and 26 coauthors, including **Rice, M.S.** (2012), Ancient Impact and Aqueous Processes at Endeavour Crater, Mars, *Science*, 336, 570, doi:10.1126/science.1220476.
 12. **Rice, M.S.**, Gupta, S., Bell III, J.F., Warner, N.H. (2011), Influence of Fault-Controlled Topography on Fluvio-Deltaic Sedimentary Systems in Eberswalde Crater, Mars, *Geophysical Research Letters*, doi:10.1029/2011GL048149.
 11. Ruff, S., Farmer, J., Calvin, W., Herkenhoff, K.E., Johnson, J.R., Morris, R.V., **Rice, M.S.**, Arvidson, R.E., Bell III, J.F., Christensen, P.R., Squyres, S.W. (2011), Characteristics, distribution, and significance of opaline silica observed by the Spirit rover in Gusev Crater, Mars, *Journal of Geophysical Research*, 116, E00F23.
 10. Crumpler, L.S. and 34 coauthors, including **Rice, M.S.** (2011), Field Reconnaissance Geologic Mapping of the Columbia Hills, Mars Based on MER Spirit and MRO HiRISE Observations, *Journal of Geophysical Research*, 116, E00F24, doi:10.1029/2010JE003749.
 9. **Rice, M.S.**, Bell III, J.F., Cloutis, E.A., Wray, J.J., Herkenhoff, K.E., Sullivan, R., Johnson, J.R., Anderson, R.B. (2011), Temporal Observations of Bright Soil Exposures at Gusev Crater, Mars, *Journal of Geophysical Research Planets*, 116, E00F14, doi:10.1029/2010JE003683.
 8. Harmon, J.K., Slade, M.A., **Rice, M.S.** (2011), Radar imagery of Mercury's putative polar ice: 1999-2005 Arecibo results, *Icarus*, 211, 37-50, doi:10.1016/j.icarus.2010.08.007.
 7. Arvidson, R.E. and 33 coauthors, including **Rice, M.S.** (2011), Opportunity Mars Rover Mission: Overview and Selected Results from Purgatory Ripple to Traverses to Endeavour Crater. *Journal of Geophysical Research*, 116, E00F15, doi:10.1029/2010JE003746.
 6. **Rice, M.S.**, Bell III, J.F., Cloutis, E.A., Wang, A., Ruff, S., Craig, M., Bailey, D., Johnson, J.R. de Souza Jr., P., Farrand, W.H. (2010), Silica-Rich Deposits and Hydrated Minerals at Gusev Crater, Mars: Vis-NIR Spectral Characterization and Regional Mapping, *Icarus*, doi:10.1016/j.icarus.2009.03.035.
 5. Arvidson, R.E. and 35 coauthors, including **Rice, M.S.** (2010), Spirit Mars Rover Mission: Overview and Selected Results from the Northern Home Plate Winter Haven to the Side of Scamander Crater, *Journal of Geophysical Research*, 115, E00F03, doi:10.1029/2010JE003633.
 4. Bell III, J.F., **Rice, M.S.**, Johnson, J.R., Hare, T. (2008), Surface Albedo Observations at Gusev Crater and Meridiani Planum, Mars, *Journal of Geophysical Research*, 113, E06S18, doi: 10.1029/2007JE002976.
 3. Johnson, J.R., Bell III, J.F., Cloutis, E.A., Staid, M. Farrand, W.H., **Rice, M.S.**, Wang, A., Yen, A. (2007), Mineralogic Constraints on Sulfur-Rich Soils from Pancam Spectra at Gusev Crater, Mars, *Earth and Planetary Science Letters*, 34, L13202, doi:10.1029/2007GL029894.
 2. Harmon, J.K., Slade, M.A., Butler, B., Head, J., **Rice, M.S.**, Campbell, D. (2007), Mercury: Radar Images of the Equatorial and Midlatitude Zones, *Icarus*, 187, 374-405, doi:10.1016/j.icarus.2006.09.026.
 1. **Rice, M.S.**, Martini, P., Greene, J., Pogge, R., Shields, J., Mulchaey, J. Regan, M. (2006), The Spatial Scaling of Gas Kinematics in Active Galaxies, *Astrophysical Journal*, 636, 2.

Non-Refereed Works

3. Ehlmann, B.L and 14 coauthors, including **Rice, M.S.**, Mars as a Linchpin for the Understanding the Habitability of Terrestrial Planets: Discoveries of the Last Decade from Mars and Why a New Paradigm of Multiple, Landed Robotic Explorers is Required for Future Progress in Terrestrial Planet Astrobiology, *A White Paper for the 2017-2018 National Academies Committee on Astrobiology Science Strategy for the Search for Life in the Universe*, 8 January 2018.

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2. Bass, D. and 6 coauthors, including **Rice, M.S.**, In-Situ Resource Utilization and Mars System Recon: Planning Input to Affording Mars IV, *NASA Mars Program Topical Analysis Report*, 6 December 2016.
 1. Beaty, D. and 16 coauthors, including **Rice, M.S.**, Candidate Scientific Objectives for the Human Exploration of Mars, and Implications for the Identification of Martian Exploration Zones, *NASA Mars Exploration Program Analysis Group (MEPAG) Topical Analysis Report*, 24 July 2015.

Recent Conference Abstracts (from work at Western Washington University)

83. **Hughes, C.M.****, **Rice, M.S.**, Spectral Analysis of Stratigraphy at Eberswalde Crater, Mars, WWU Graduate Student Symposium, Bellingham, WA, 15 May 2019.
82. Starr, M.S.* , **Rice, M.S.**, **Hughes, C.M.****, **Seeger, C.H.****, Bell, J.F., Wellington, Methodology for the Creation and Analysis of a Comprehensive Mastcam Multispectral Database of the Curiosity Rover's Traverse, WWU Undergraduate Scholars Showcase, Bellingham, WA, 15 May 2019.
81. **Frizzell, K.R.***, **Rice, M.S.**, Seelos, F.P., Hyperspectral Data Processing in the Jezero Crater Region on Mars: Implications for Mineralogical Analysis, WWU Undergraduate Scholars Showcase, Bellingham, WA, 15 May 2019.
80. **Starr, M.S.***, **Rice, M.S.**, **Hughes, C.M.****, **Seeger, C.H.****, Bell, J.F., Wellington, D.F., Methodology for the Creation and Analysis of a Comprehensive Mastcam Multispectral Database of Curiosity's Traverse, *LPSC*, The Woodlands, TX, 18-22 March 2019.
79. **Rice, M.S.**, **Starr, M.S.***, **Hughes, C.M.****, **Seeger, C.H.****, Fraeman, A.A., Johnson, J.R., Bell, J.F., Wellington, D.F., Science Results from a Comprehensive Mastcam Spectral Database for Curiosity's Traverse, *LPSC*, The Woodlands, TX, 18-22 March 2019.
78. **Hoza, K.M.****, **Rice, M.S.**, An Automated Goniometer System for Reflectance Spectroscopy, *LPSC*, The Woodlands, TX, 18-22 March 2019.
77. **Seeger, C.H.****, **Rice, M. S.**, **Starr, M.***, **Hughes, C.M.****, Mastcam Spectral Characterization of Stratigraphic Units Along Curiosity's Traverse in Gale Crater, Mars, *LPSC*, The Woodlands, TX, 18-22 March 2019.
76. **Frizzell, K.R.***, Seelos, F.P., **Rice, M.S.**, Mars Hyperspectral Data Processing in the Jezero Crater and NE Syrtis Region: Implications for Mineralogical Analysis, *LPSC*, The Woodlands, TX, 18-22 March 2019.
75. Fraeman, A. A., and 12 coauthors, including **Rice, M.S.**, Synergistic Orbital and In Situ Observations at Vera Rubin Ridge: Comparing CRISM and Curiosity Observations, *LPSC*, The Woodlands, TX, 18-22 March 2019.
74. Czarnecki, S., and 14 coauthors, including **Rice, M.S.** and **Starr, M.***, Identification of a High-Silica Layer in Gale Crater, Mars Using In Situ Active Neutron Spectroscopy, *LPSC*, The Woodlands, TX, 18-22 March 2019.
73. Rudolph, A., Horgan, B., Bennett, K., **Rice, M.S.**, Sources of Sand in Mt. Sharp: Possible Volcanic Layers in Gale Crater, Mars, *LPSC*, The Woodlands, TX, 18-22 March 2019.
72. Barber DeGraaff, R., **Rice, M.S.**, Creating Science Education Opportunities in Higher Education, American Astronomical Society Meeting #233, Washington, DC, 6-10 Jan. 2019.
71. **Rice, M.S.**, Preparations for Imaging Science on Mars with Mastcam-Z on NASA's Mars-2020 Rover, Astronomy Northwest by Southwest, Vancouver, BC, 3-4 Nov. 2018.
70. **Starr, M.***, **Rice, M.S.**, Development of Tools for Analysis of a Comprehensive Mastcam Multispectral Database, Astronomy Northwest by Southwest, Vancouver, BC, 3-4 Nov. 2018.
69. **Rice, M.S.**, **Starr, M.***, A Comprehensive Mastcam Multispectral Database, MSL Curiosity Science Team Meeting, Pasadena, CA, 25-27 Sept. 2018.

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68. Horgan, B.H.N., **Rice, M.S.**, Possible Evidence for Murray-Like Mineralogies Higher on Mt. Sharp, MSL Curiosity Science Team Meeting, Pasadena, CA, 25-27 Sept. 2018.
 67. **Moore, N.***, **Rice, M.S.**, **Frizzell, K.***, Collecting Spectra from Gale Crater, Mars, WWU Undergraduate Scholars Showcase, Bellingham, WA, 15-16 May 2018.
 66. **Rudolph, A.***, **Rice, M.S.**, Horgan, B., Mineralogic and Stratigraphic Analysis of Mount Sharp in Gale Crater, Mars, WWU Undergraduate Scholars Showcase, Bellingham, WA, 15-16 May 2018.
 65. **Rice, M.S.**; **Dixon, D.****; Bell, J. F.; Wellington, D.; Johnson, J. R., Spectral Variability of Sulfate Veins Observed by Mastcam Along Curiosity's Traverse in Gale Crater, Mars, *LPSC*, The Woodlands, TX, 19-23 Mar. 2018.
 64. Barber DeGraaff, R.G., **Rice, M.S.**, Science Communication: An Essential Skill for STEM Majors, *AAAS Annual Meeting*, Austin, TX, 15-19 Feb. 2018.
 63. Horgan, B.H.N., **Rice, M.S.**, Fraeman, A.A., Wellington, D.F., Johnson, J.R., Fox, V.K., Arvidson, R.E., Bell, J.F., III, Constraints on Aqueous Environments for Hematite Formation in Gale Crater from Mastcam and CRISM Spectra, *AGU Fall Meeting*, New Orleans, LA, 11-15 Dec. 2017.
 62. **Dixon, D.****, **Rice, M.S.**, Distinguishing Geologic Units and Alteration Mineralogy at Mars 2020 Candidate Landing Sites with Visible-to-Near-Infrared (VNIR) Orbital Spectroscopy: Implications for the Mastcam-Z Instrument, *GSA Annual Meeting*, Seattle, WA, 22-25 Oct. 2017.
 61. **Rudolph, A.***, Kraft, M., **Rice, M.S.**, Spectral, Mineralogical, and Textural Changes Associated with Olivine Alteration in Weathered Dunite, *GSA Annual Meeting*, Seattle, WA, 22-25 Oct. 2017.
 60. **Winchell, K.***, **Rice, M.S.**, Characterizing the Extent of Hydrothermal Activity in Gusev Crater, Mars, *GSA Annual Meeting*, Seattle, WA, 22-25 Oct. 2017.
 59. **Reynolds, M.***, **Rice, M.S.**, **Studer-Ellis, G.***, Bell III, J.F., Johnson, J.R., Herkenhoff, K.E., Wellington, D., The Albedo of Mars: Six Mars Years of Observations from Pancam and Comparisons to HiRISE, *GSA Annual Meeting*, Seattle, WA, 22-25 Oct. 2017.
 58. Kraft, M., **Rice, M.S.**, Fristad, K., Variability in Basaltic Weathering Rinds from a Single Weathering Environment: Interpreting Color Differences on Weathered Rocks on Earth and Mars, *GSA Annual Meeting*, Seattle, WA, 22-25 Oct. 2017.
 57. **Winchell, K.***, **Rice, M.S.**, Recreating Intercalated Clays of Chondritic Meteorites, WWU Undergraduate Scholars Showcase, Bellingham, WA, 17-18 May 2017.
 56. Wellington, D.F., Bell, J.F. III, Ehlmann, B.A., Horgan, B.N., Johnson, J.R., **Rice, M.S.**, Spectral Variability Along Curiosity's Traverse Through the Murray Formation from Mars Science Laboratory/Mastcam Multispectral Observations, *GSA Cordilleran Section Meeting*, Honolulu, HI, 23-25 May 2017.
 55. Horgan, B.N.H., Fraeman, A. A., **Rice, M. S.**, Bell, J. F., Wellington, D., Johnson, J. R., New Constraints from CRISM and Mastcam Spectra on the Mineralogy and Origin of Mt. Sharp Geologic Units, Gale Crater, Mars, *LPSC*, The Woodlands, TX, 20-24 Mar. 2017.
 54. Ehlmann, B.L. and 18 coauthors, including **Rice, M.S.**, Mars Exploration Science in 2050, *Planetary Science Vision 2050 Workshop*, Washington, D.C., 27-28 Feb. 2017.
 53. **Rice, M.S.**, Gupta, S., Warner, N., Deltas, Lakes, Megabreccia and Giant Veins: Interrogating Geologic Diversity for a NASA 2020 Mission to Eberswalde Crater, *3rd Mars-2020 Landing Site Workshop*, Monrovia, CA, 8-10 Feb. 2017.
 52. **Williams, J.M.****, **Rice, M.S.**, Evaluating the Proposed Mars 2020 Sedimentary Landing Sites for Ongoing Exhumation and Recent Exposure, *3rd Mars-2020 Landing Site Workshop*, Monrovia, CA, 8-10 Feb. 2017.
 51. Bass, D. and 6 coauthors, including **Rice, M.S.**, In-Situ Resource Utilization and Mars System Recon: Planning Input to Affording Mars IV, *Mars Program Topical Analysis Report*, 6 Dec. 2016.
 50. Lapotre, M.G.A. and 16 coauthors, including **Rice, M.S.**, Origin of the Two Scales of Wind Ripples on Mars, *AGU Fall Meeting*, San Francisco, CA, 12-16 Dec. 2016.

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49. Wellington, D.F., Bell, J.F. III, Johnson, J.R., Kinch, K., **Rice, M.S.**, Hardgrove, C., Godber, A., MSL/Mastcam Multispectral Observations of Lower Mt. Sharp Units: Spectral Evidence of Distinct Alteration Environments, *AGU Fall Meeting*, San Francisco, CA, 12-16 Dec. 2016.
 48. **Reynolds, M.J. II***, **Rice, M.S.**, Bell, J.F. III, Johnson, J.R., Studer-Ellis, G.*, MER Spirit Albedo Observations: Insights to Surface Processes and Atmospheric Phenomena at Gusev Crater, Mars, *Northwest Astronomy Meeting*, Bellingham, WA, 29 Oct. 2016.
 47. Bell, J.F. III, Wellington, D., Hardgrove, C., Godber, A., **Rice, M.S.**, Johnson, J.R., Fraeman, A.A., Multispectral Imaging of Mars from the Mars Science Laboratory Mastcam Instruments: Spectral Properties and Mineralogic Implications Along the Gale Crater Traverse, *AAS DPS Meeting*, Pasadena, CA, 16-21 Oct. 2016.
 46. **Rice, M.S.**, Gupta, S., Warner, N., Sediment Sources for the Eberswalde Delta: Stratigraphy and Mineralogy of the Crater Catchment, *GSA Annual Meeting*, Denver, CO, 25-28 Sept. 2016.
 45. **Williams, J.M.****, **Rice, M.S.**, Defining Geomorphologic Criteria to Identify Sites with High Biosignature Preservation Potential on Mars, *GSA Annual Meeting*, Denver, CO, 25-28 Sept. 2016.
 44. **Dixon, D.T.****, **Rice, M.S.**, Cloutis, E.A., Hydrated Sulfates on Mars: Characterizing Visible to Near-Infrared Spectra and Implications for Rover-Based Multispectral Imagers, *GSA Annual Meeting*, Denver, CO, 25-28 Sept. 2016.
 43. **Pruett, J.W.***, **Rice, M.S.**, Gupta, S., Warner, N., Mapping the Distribution of Potential Lacustrine Deposits Across Eberswalde Crater, *GSA Annual Meeting*, Denver, CO, 25-28 Sept. 2016.
 42. Gupta, S., Sumner, D.Y., **Rice, M.S.**, Rubin, D., Edgar, L.A., Lewis, K., Stack, K.M., Barnes, R., Possible Upper Flow Regime Sedimentary Structures in the Dillinger Member of the Kimberley Formation, Gale Crater, Mars: Implications for Martian Fluvial Processes, *GSA Annual Meeting*, Denver, CO, 25-28 Sept. 2016.
 41. Calef III, F.J. and 14 coauthors, including **Rice, M.S.**, Development and Use of the Mars Science Laboratory Landing Ellipse Geologic Map, *GSA Annual Meeting*, Denver, CO, 25-28 Sept. 2016.
 40. Farrand, W.F., Bell III, J.F., Johnson, J.R., Arvidson, R.E., Mittlefehldt, D.W., Ruff, S.W., **Rice, M.S.**, Multispectral VNIR Observations by the Opportunity Rover Pancam of Multiple Episodes of Aqueous Alteration in Marathon Valley, *GSA Annual Meeting*, Denver, CO, 25-28 Sept. 2016.
 39. Calef III, F.J. and 14 coauthors, including **Rice, M.S.**, Geologic Mapping of the Mars Science Laboratory Landing Ellipse, *Planetary Geologic Mappers Meeting*, Flagstaff, AZ, 13-15 June 2016.
 38. **Rice, M.S.**, Geologic Mapping of Candidate Landing Sites for the Mars-2020 Rover Mission, *GSA Rocky Mountain Section Meeting*, Moscow, ID, 18-19 May 2016.
 37. Conrad, P., Arevalo, R.D., Farley, K.A., **Rice, M.S.**, Gupta, S., Brinckerhoff, W.B., Getty, S.A., Interrogation of Temporal Planetary Analogs for Biosignature Detection, *Biosignature Preservation and Detection in Mars Analog Environments*, Lake Tahoe, NV, 16-18 May 2016.
 36. **Losee, M.***, **Rice, M.S.**, Geologic Mapping of Gusev Crater, Mars, Using High-Resolution Spacecraft Imagery, WWU Undergraduate Scholars Showcase, Bellingham, WA, 19-20 May 2016.
 35. **Thomsen, C.***, **Rice, M.S.**, Characterizing the Effects of Viewing Geometry on the Vis-NIR Spectral Properties of Coated Rocks and Other Surfaces, WWU Undergraduate Scholars Showcase, Bellingham, WA, 19-20 May 2016.
 34. **Winchell, K.***, **Rice, M.S.**, Anomalous Soils in Gusev Crater as Imaged by the Mars Exploration Rover Spirit, WWU Undergraduate Scholars Showcase, Bellingham, WA, 19-20 May 2016.
 33. **Reynolds, M.J. II***, **Rice, M.S.**, Bell, J.F. III, Johnson, J.R., Studer-Ellis, G.*, MER Spirit Albedo Observations: Insights to Surface Processes and Atmospheric Phenomena at Gusev Crater, Mars, *LPSC*, The Woodlands, TX, 21-25 Mar. 2016.
 32. Frydenvang, J. and 40 coauthors, including **Rice, M.S.**, Discovery of Silica-Rich Lacustrine and Eolian Sedimentary Rocks in Gale Crater, Mars, *LPSC*, The Woodlands, TX, 21-25 March 2016.

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31. Fraeman, A.A., Ehlmann, B.L., Arvidson, R.E., Edwards, C.S., Grotzinger, J.P., **Rice, M.S.**, The Stratigraphy and Evolution of Lower Mt. Sharp from Spectral, Morphological, and Thermophysical Orbital Datasets, *LPSC*, The Woodlands, TX, 21-25 Mar. 2016.
 30. Heydari, E., Calef, F., Parker, T., Rowland, S.K., Williams, R.M.E., Rubin, D., **Rice, M.S.**, Van Beek, J., Unconformity Surfaces of the Kimberley Region and Their Significance on Sedimentological Evolution of Gale Crater, Mars, *LPSC*, The Woodlands, TX, 21-25 Mar. 2016.
 29. Le Deit, L., and 29 coauthors, including **Rice, M.S.**, The Potassic Sedimentary Rocks in Gale Crater, Mars as Seen by ChemCam Onboard Curiosity, *LPSC*, The Woodlands, TX, 21-25 March 2016.
 28. **Studer-Ellis, G***, **Rice, M.S.**, Bell, J.F. III, Johnson, J.R., **Michael, M.J. II***, Surface Albedo Variations Across Opportunity's Traverse, *AGU Fall Meeting*, San Francisco, CA, 12-16 Dec. 2015.
 27. **Rice, M.S.**, Horgan, B.N., Fraeman, A., Ackiss, S., New Constraints on the Deposition and Alteration History of Mt. Sharp in Gale Crater, *AGU Fall Meeting*, San Francisco, CA, 12-16 Dec. 2015.
 26. Wellington, D.F., Bell, J.F. III, Johnson, J.R., Kinch, K., **Rice, M.S.**, Hardgrove, C., Godber, A., Insights Into the Mineralogic Diversity of Lower Mount Sharp Units from Mars Science Laboratory Mastcam Multispectral Observations, *AGU Fall Meeting*, San Francisco, CA, 12-16 Dec. 2015.
 25. Rubin, D., Grotzinger, J.P., Gupta, S., Sumner, D., Williams, R., Dietrich, W., Edgar, L., Lewis, K., Oehler, D., **Rice, M.S.**, Schieber, J., Stack, K., Sedimentary Facies as Indicators of Changing Lake Levels in Gale Crater, Mars, *AGU Fall Meeting*, San Francisco, CA, 12-16 Dec. 2015.
 24. Frydenvang, J. and 31 coauthors, including **Rice, M.S.**, ChemCam First Discovery of High Silica Sediments in Gale Crater, *AGU Fall Meeting*, San Francisco, CA, 12-16 Dec. 2015.
 23. Niles, P. and 16 coauthors, including **Rice, M.S.**, Science Objectives and Site Selection Criteria for a Human Mission to Mars, *AGU Fall Meeting*, San Francisco, CA, 12-16 Dec. 2015.
 22. Fraeman, A.A., Edwards, C.S., Ehlmann, B.L., Arvidson, R.E., Horgan, B.N., **Rice, M.S.**, A Detailed Investigation of Lower Mt. Sharp Using Coordinated Orbital Datasets, *GSA Annual Meeting*, Baltimore, MD, 1-4 Nov. 2015.
 21. Beaty, D.W., Levy, J., **Rice, M.S.**, Niles, P.B., Rice, J.W., Bleacher, J.E., Eppler, D.B., Hays, L., Bass, D.S., Geology-Related Science Objectives and Site Selection Criteria for a Human Mission to Mars, *GSA Annual Meeting*, Baltimore, MD, 1-4 Nov. 2015.
 20. Gupta, S., Sefton-Nash, E., Adler, J., **Rice, M.S.**, Fawdon, P., Warner, N.H., Grindrod, P., Davis, J., Bell, J.F. III, **Stetson, C.***, Richard, J., The Hypanis Fluvial-Deltaic-Lacustrine System in Xanthe Terra: A Candidate Exploration Zone for the First Human Mission to Mars, *First Landing Site Workshop for Human Missions to the Surface of Mars*, Houston, TX, 27-30 Oct. 2015.
 19. Le Deit, L. and 19 coauthors, including **Rice, M.S.**, Chemostratigraphy of Potassic Sediment in Gale Crater, Mars, as Seen by ChemCam Onboard Curiosity, *European Planetary Science Congress*, Nantes, France, 27 Sept. - 2 Oct. 2015.
 18. **Rice, M.S.**, Irwin, R., Warner, N.H., Gupta, S., Adler, J., Eberswalde Crater: Habitability and Geologic Diversity, *2nd Mars-2020 Landing Site Workshop*, Monrovia, CA, 4-5 Aug. 2015.
 17. Beaty, D.W. and 16 coauthors, including **Rice, M.S.**, Planning Ahead for Mars Sample Science in the Human Exploration Era, *Annual Meeting of the Meteoritical Society*, Berkeley, CA, 27-31 July 2015.
 16. Gupta, S. and 14 coauthors, including **M.S. Rice**, From Kimberley to Pahrump_Hills: Toward a Working Sedimentary Model for Curiosity's Exploration of Strata from Aeolis Palus to Lower Mount Sharp in Gale Frater, *EGU General Assembly*, 12-17 April 2015, Vienna, Austria.
 15. Horgan, B., **Rice, M.S.**, Ackiss, S., Constraints on the Formation and Alteration History of Mt. Sharp, Gale Crater, from a New CRISM Mineral Map, *LPSC*, The Woodlands, TX, 16-20 March 2015.
 14. Hardgrove, C., Johnson, J.R., **Rice, M.S.**, Bell, J.F. III, Kinch, K., Wellington, D., Arvidson, R., Godber, A. Detecting High Manganese Phases in Curiosity Mastcam Multispectral Images and Chemcam Passive Visible to Near Infrared Spectra, *LPSC*, The Woodlands, TX, 16-20 March 2015.
 13. Williams, R.M.E., Rubin, D., Gupta, S., Grotzinger, J.P., Stack-Morgan, K.M., Edgar, L.A., **Rice, M.S.** Sumner, D.Y., Lewis, K., Calef, F., Unraveling Curiosity Observations of Sedimentary Rocks at

Kylie, *LPSC*, The Woodlands, TX, 16-20 March 2015.

12. Lanza, N.L. and 34 coauthors, including **Rice, M.S.**, Oxidation of Manganese at Kimberley, Gale Crater: More Free Oxygen in Mars' Past? *LPSC*, The Woodlands, TX, 16-20 March 2015.
11. Fraeman, A.A., Edwards, C.S., Ehlmann, B.L., Arvidson, R.E., Johnson, J.R., **Rice, M.S.** Exploring Curiosity's Future Path from Orbit: The View of Lower Mt. Sharp from Integrated CRISM, HiRISE, and THEMIS Datasets, *LPSC*, The Woodlands, TX, 16-20 March 2015.
10. Le Deit, L. and 19 coauthors, including **Rice, M.S.**, The Potassic Sedimentary Rocks in Gale Crater, Mars as Seen by ChemCam Onboard Curiosity, *LPSC*, The Woodlands, TX, 16-20 March 2015.
9. Wellington, D.F., Bell, J.F. III, Godber, A., Kinch, K.M., Fraeman, A.A., Ehlmann, B.L., Arvidson, R.E., **Rice, M.S.**, Johnson, J.R., Visible to Near-IR Spectral Units Along the MSL Gale Crater Traverse: Comparison of In Situ Mastcam and Orbital CRISM Observations, *AGU Fall Meeting*, San Francisco, CA, 15-19 Dec. 2014.
8. Edgar, L. and 10 coauthors, including **M.S. Rice**, Curiosity in Situ Observations at Kylie, a Preview of the Kimberley Drill Site Geology, *AGU Fall Meeting*, San Francisco, CA, 15-19 Dec. 2014.
7. Edgar, L. and 13 coauthors, including **M.S. Rice**, Reconstructing Ancient Fluvial Environments at the Balmville and Dingo Gap Outcrops, Gale Crater, Mars, *AGU Fall Meeting*, San Francisco, CA, 15-19 Dec. 2014.
6. Gupta, S. and 11 coauthors, including **M.S. Rice**, Making Sense of Martian Sediments at the Kimberley, Gale Crater, *AGU Fall Meeting*, San Francisco, CA, 15-19 Dec. 2014.
5. Grotzinger, J. and 17 coauthors, including **M.S. Rice**, Geologic Framework for Aeolis Palus Bedrock, and Its Relationship to Mt. Sharp, Mars, *AGU Fall Meeting*, San Francisco, CA, 15-19 Dec. 2014.
4. Lanza, N.L. and 29 coauthors, including **Rice, M.S.**, Observations of High Manganese Layers by the Curiosity Rover at the Kimberley, Gale Crater, Mars, *AGU Fall Meeting*, San Francisco, CA, 15-19 Dec. 2014.
3. **Rice, M.S.** and 10 coauthors, Geology of the Kimberley Waypoint, Gale Crater: Observations from Orbit and MSL Curiosity, *GSA Annual Meeting*, Vancouver, BC, 19-23 October 2014.
2. Stack, K.M. and 10 coauthors, including **Rice, M.S.**, Synthesizing MSL Curiosity Rover Observations and Orbital Geologic Mapping to Build a Regional Stratigraphy for Aeolis Palus, Gale Crater, *GSA Annual Meeting*, Vancouver, BC, 19-23 Oct. 2014.
1. Calef III, F.J. and 10 coauthors, including **Rice, M.S.**, Stratigraphic Context of Bradbury Rise Conglomerates in the MSL Landing Ellipse, *GSA Annual Meeting*, Vancouver, BC, 19-23 Oct. 2014.

Media Coverage (links available at wp.wvu.edu/mars/media)

Interview for WeMartians Podcast, Sept. 2018; Western Today, Aug. 2018; Interview for Planetary Radio Podcast, Feb. 2018; Bellingham Herald, Nov. 2017; King 5 TV News, May 2017; Bellingham Alive! Magazine, Apr. 2017; Interview with Everett Public Radio, KSER-FM, Mar. 2017; Western Today, Mar. 2017; WWU's The Planet, Mar. 2017; KPLU Sound Effect, Aug. 2016; Quincy Valley Post Register, July 2016; Western Front, July 2016; Cascadia Weekly, June 2016; Alaska Airlines Magazine, Dec. 2015; Bellingham Herald, Apr. 2015; Western Window, Apr. 2015; NW Asian Weekly, Feb. 2015; Western Front, Jan. 2015; Seattle Times, Dec. 2014; Wellesley College Magazine, 2014.

SERVICE

Service to Profession

Analysis Groups

Mars System Recon Analysis Team, *Affording Mars IV*, 2016, *NASA JPL Mars Program Office*
Science Analysis Group, *Human Mission Objectives for Mars*, 2015, *NASA MEPAG*

Editorial Work and Manuscript Review

Special Issue Guest Editor, 2017, *Journal of Geophysical Research – Planets*
Reviewer, 2011-present, *Geology, Journal of Geophysical Research – Planets, Icarus, Planetary and Space Science, GSA Bulletin, International Mars Exploration Working Group*

Proposal Review

Panelist (2012, 2014, 2016, 2018, 2019) and Group Chief (2016) for NASA Science Mission Directorate Programs, *Solar System Workings, Mars Data Analysis Program, Mars Fundamental Research*

External reviewer, 2014-present, *NASA Earth and Space Science Exploration Fellowship Program, Jet Propulsion Laboratory Requests for Proposals, NASA Solar System Workings Program, NASA Mars Data Analysis Program.*

Session Convening at Professional Meetings

Planetary Science Splinter Session, Nov. 2018, *Astronomy Northwest by Southwest, Vancouver, BC*

“Early Career Faculty in the Planetary Sciences Meeting” (with B.H.N. Horgan), 2018 and 2016, *Lunar and Planetary Science Conference, The Woodlands, TX*

“Basalt Weathering on Earth and Mars” (with L.L. Baker and M. Kraft), 2017, *Geological Society of America Meeting, Seattle, WA*

“Sedimentary Records in the Solar System” (with R.A. Yingst and S. Gupta), 2016, *Geological Society of America Meeting, Denver, CO*

“Reconstructing Habitable Environments on Ancient Mars” (with B.H.N. Horgan), 2014, *American Geophysical Union Meeting, San Francisco, CA*

“Weaving General-Audience Communication Training Into Earth and Space Science Curricula,” 2012, *American Geophysical Union Meeting, San Francisco, CA*

Service to Western Washington University

Committees

University Research and Advisory Committee, 2018-present

Search committee chair, 2018-present

4 additional search committees for faculty and staff positions, 2015-present

Geology Department Curriculum Assessment Committee, 2016-present

Physics Department Development Committee, 2016-present

College of Science and Engineering Technical Operations Committee, 2017-present

College of Science and Engineering Diversity Working Group, 2016

Talks and Panel Presentations at WWU Events

“Mapping Mars - Part II: Our Evolving Vision of the Red Planet,” May 2019, *Map Collection*

Faculty to Faculty Tenure Information Panel, May 2019, *New Faculty Mentoring Initiative*

Presentation at WWU Alumni/Donor Event, April 2019, *Chateau Montelena, Calistoga, CA*

Mars Exploration Demos, June 2018, *Geology Alumni Weekend*

“Meet Your Professor Brown Bag,” Nov. 2017, *Women in Geology Club*

Commentary on the Movie *The Martian*, Sept. 2016, Sept. 2017, *Honors Program Orientation*

Mars Exploration Demos, Apr. 2017, *Montlake Terrace High School STEM Program visit*

“The Past, Present and Future of Mars Exploration,” Apr. 2017, *Retirement Association*

“REU Internship Panel,” Nov. 2015, *Women in Physics Club*
“Faces of STEM,” Nov. 2015, *Mix It Up Diversity Event*
“NASA’s Mars Rovers,” Oct. 2015, *Compass 2 Campus Mentoring Symposium*
“The Secrets of Mars,” Sept. 2015, *Legacy Lunch*
“An Evening of Light,” Keynote Presentation, Sept. 2015, *International Year of Light*
Mars Exploration Demos, June 2015, *Whatcom Robotics Expo*
“Women in STEM Careers Panel,” May 2015, *Women in Science Club*
“STEM into Grad School,” Apr. 2015, *Society for Advancement of Hispanics/Chicanos and Native Americans in Science (SACNAS)*
“Mapping Mars: Our Evolving Vision of the Red Planet,” Apr. 2015, *Map Collection*
“Bringing Earth to Mars,” Apr. 2015, *TEDx Conference*
Science & the UniverCity Lecture, Apr. 2015, *Bellingham City Hall*
“NASA’s Mars Rovers,” Oct. 2014, *Family Open House*

Other WWU Service

Mentor for the 2017-2018 Advancing Excellence and Equity in Science program for new WWU STEM students from under-represented groups
Represented WWU at the “Positioning Washington State in the Emerging Space Frontier” Roundtable, May 2018, *University of Washington*

Talks and Outreach Events for the Broader Community

Science Cafe, March 2019, *Museum of Flight, Seattle, WA*
Keynote Address, December 2019, *LEGO Robotics Competition, Mt. Vernon, WA*
Post-Performance Talk, “Rovers!” Musical, Aug. 2018, *Annex Theater, Seattle, WA*
Commencement Address, June 2018, *Forest Ridge School of the Sacred Heart, Bellevue, WA*
Bellingham Space Enthusiasts Meetup, May 2018, *Brandywine Kitchen, Bellingham, WA*
Yuri’s Night Celebration, Apr. 2018, *The Shakedown, Bellingham, WA*
Talks (2) for the INSPIRE! Presentation Series, Apr. 2018, *The Resort at Paws Up, Greenough, MT*
“Preparing for Mars-2020: NASA’s Next Mars Rover Mission,” WCC STEM Club, March 2018, *Whatcom Community College, Bellingham, WA*
Keynote Address, SPARK Museum Gala Fundraiser, Feb. 2018, *Bellingham Technical College, Bellingham, WA*
“A Conversation with Andy Weir, Author of *The Martian*,” Presented by Village Books, Nov. 2017, *Bellingham High School, Bellingham, WA*
“Transmissions: A Wake for Cassini,” Sept. 2017, *The Shakedown, Bellingham, WA*
“Exploring Mars with NASA’s Rover Missions,” Presentation to Mars Camp, Aug. 2017, *Central Washington University, via Skype*
Commentary on the Movie *Apollo 13* for “Science on the Screen,” *Pickford Theater, Bellingham, WA*
“Cosmic Nights” Presentation, Apr. 2017, *H.R. MacMillan Space Centre, Vancouver, BC, Canada*
Keynote Speaker, March for Science, Apr. 2017, *Bellingham, WA*
“The Past, Present and Future of Mars Exploration,” Apr. 2017, *Public Library, Everett, WA*
“Driving Cars on Mars,” Dec. 2016, *Rotary Club of Bellingham, Bellingham, WA*
“Mars Invasion!” Public Event, June 2016, *Mt. Baker Theater, Bellingham, WA*
Keynote Address, Girls Go Tech, Apr. 2016, *Whatcom Community College, Bellingham, WA*

"NASA's Mars Rovers," Mar. 2016, *St. Paul's Academy, Bellingham, WA*

"NASA's Mars Rovers," Feb. 2016, *Bellingham Bay Rotary Club, Bellingham, WA*

Keynote Address, Creators and Innovators Club, May 2015, *Kulshan Middle School, Bellingham, WA*

"An Inside Look at the Science and Engineering of NASA's Mars Rover Missions," Class of 1953
Lecture, Apr. 2015, *Darlington School, Rome, GA*

"NASA's Mars Rovers," Feb. 2015, *Kiwanis Club, Golf and Country Club, Bellingham, WA*

Interview for "Entre Terre et Ciel" Documentary Series, Oct. 2014, *Arte TV Channel, France*