Kirsten L. Siebach, Ph.D.

Assistant Professor at Rice University
317 Keith-Weiss Geological Laboratory | Houston, TX 77005
ksiebach@rice.edu | kirstensiebach.com

EDUCATION

Ph.D. in Geology, California Institute of Technology, June 2016, Advisor: John Grotzinger, Thesis: Formation and Diagenesis of Sedimentary Rocks in Gale Crater, Mars.

B. A. in Earth & Planetary Science and Chemistry, Washington University in St. Louis, minor in English Literature, *summa cum laude*, May 2011, Advisor: Raymond Arvidson.

PROFESSIONAL EXPERIENCE

Assistant Professor *Dept of Earth, Environmental, and Planetary Sci., Rice University*	2018 – present
Visiting Assistant Professor, *McDonnell Center for Space Sciences, Wash U in St. Louis*	2021 – present
Mars 2020 Perseverance Science and Operations Team Participating Scientist *NASA*	2020 – present
Mars Science Laboratory Science and Operations Team Collaborator *NASA JPL*	2011 – present
Mars Panel, Planetary Science Decadal Survey, *National Academy of Science*	2020 – 2021
Mars Exploration Rover Science and Operations Team Collaborator *NASA JPL*	2010, 2012 – 2019
Postdoctoral Associate *Department of Geosciences, Stony Brook University*	2016 – 2017
Graduate Research Assistant *Division of Geological and Planetary Sci., Caltech*	2011 – 2016
NASA Student Airborne Research Program Intern *NASA Airborne Science Program*	2011
Undergraduate Research Assistant *Washington University in St. Louis*	2007 – 2011
Undergraduate Research Intern *Smithsonian Air and Space Museum*	2010
Mars Phoenix Lander Science and Operations Team Collaborator *University of Arizona*	2008
Science and Engineering Apprenticeship Program Intern *Naval Research Laboratory*	2006 – 2007

ACHIEVEMENTS AND HONORS

- Rice University Outstanding Undergraduate Research Mentor Award (2020, 2024)
- American Association of Petroleum Geologists Harrison Schmitt Award (2023)
- Rice University Natural Sciences Award for Excellence in Outreach (2022)
- Editors' Citation for Excellence in Refereeing - JGR-Planets (2020)
- New Orleans Geological Society Best Presentation Award (2019)
- Early Career Scholarship from NASA Astrobiology Institute for partial support to attend Astrobiology Grand Tour in Western Australia (2018)
- NASA Group Achievement Award: MSL Extended Mission-1 Science and Operations Team (2017)
- NASA Group Achievement Award: MSL Prime Mission Science and Operations Team (2015)
- ExxonMobil/GSA Student Science Award (2014)
- NASA Group Achievement Award: MER Science Development and Operations Team (2014)
- NASA Group Achievement Award: MSL Science Development and Operations Team (2013)
- National Science Foundation Graduate Research Fellowship Honorable Mention (2013)
- Washington University "Outstanding Graduate" recognition (Fall 2011)
- Courtney A. Werner Memorial Prize for outstanding academic achievement in the Earth and Planetary Sciences at Washington University in St. Louis (Fall 2011)
- NASA Group Achievement Award: Phoenix Mission Team (2008)
- Washington University Dean's list 5 semesters (2007-2011)

- Deans Honorary Scholarship at Washington University (2007-2011)
- Fossett Fellowship: annual funding for research activities (2008-2011)

TEACHING EXPERIENCE

University Courses for Undergraduate and/or Graduate Students

- **EEPS 111** ***Inhabiting Planet Earth,*** developed "flipped classroom" introductory course about why Earth is habitable from formation to climate change, part online, co-taught with Prof. Dee in F20 and F22, taught F21
- **ESCI 435/635** ***Remote Sensing***, developed course on using electromagnetic radiation to learn about Earth, life, and other planets via satellite, airborne, and other remote sensing datasets, F22, S24
- **ESCI 477/677** ***Planetary Surface Processes***, developed course on the processes responsible for the formation and modification of solar system surfaces, Rice University, S19, S23
- **EEPS 537** ***Sedimentology Seminar***, graduate student reading seminar covering planetary and sedimentology papers, S22, F22, S23, S24
- **ESCI 334** ***Geological Field Techniques (co-taught with Prof. Lee),*** undergraduate course covering field methods and geologic mapping with a spring break trip to NM (field trip cancelled for COVID, used ArcGIS remotely to visualize and map the field site), S20
- **ESCI 536** ***Type Locale Field Trip,*** graduate student enrichment course with an early summer field trip to NM, CO, UT, AZ (field trip cancelled COVID-19), S20
- **ESCI 557** ***Special Topics: Water on Mars,*** graduate student reading seminar covering water on Mars from accretion to surface water, atmospheric escape, and to the present, S20
- **Co-taught GIS portion of** ***Geological Field Techniques*** **ESCI 334**, Rice University, S19
- **Guest Lectures** in EEPS 114 Discoveries in EEPS, EEPS 334 Geological Field Techniques, PHYS 145 Traces of Life

Non-traditional Additional Teaching Experience

- **Glasscock School of Continuing Studies at Rice University**
  - ***Missions to Mars: Exploration of the Red Planet***, online short course for continuing education students, F21, S22, F22
  - ***Midweek Medley***, in-person lecture for continuing education students, F19, S22
- **Instructor of Record** ***Exploring Mars***, NASA Endeavor Online Teaching Program (8 week online course for K-12 teachers), S18
- **Instructor of Record** ***Eyes on Earth***, NASA Endeavor Online Teaching Program (8 week online course for K-12 teachers), Summer 2017
- **Geology Teacher** ***Schooling for Life American Frontiers Trip***, 2 week field trip for home-schooled high school students, Summer 2016
- ***Martian Explorations*** Institute for Educational Advancement, developed and taught 8 week after-school classes for gifted elementary school students in Spring 2014, Fall 2014, and Winter 2015

Teaching Assistant Experience

- **Field and Teaching Assistant** ***Ireland Geological Field Course***, James Madison University, 2 weeks, Summer 2015
- **Teaching Assistant** ***Remote Sensing***, Caltech Graduate Course, Spring 2013 and Spring 2015
- **Teaching and Lab Assistant** ***Intro to Geology***, Caltech Undergraduate Course, Fall 2014
- **Teaching and Lab Assistant** ***Land Dynamics***, Washington University in St. Louis, Spring 2008, Spring 2009, and Spring 2010

STUDENT ADVISING

Current Advisees

- **Undergraduate:**
  - Ariaan Ghatate (advisee Spring 2024-present)
- **PhD Students:**
  - Audrey Putnam (started Fall 2020, passed qualifying exam 11/2022)
  - Eleanor Moreland (started Fall 2021, passed qualifying exam 4/2023)
  - Jack Henry (started Fall 2022, passed qualifying exam 5/2024)

Past Advisees

- **Summer Students:**
  - Abigail Mebane (2023, Rice Planetary Habitability REU Program)
- **Undergraduate:**
  - Marlo Wilcox (2021-2024, researching in Sweden on the Wagoner Foreign Study Scholarship)
    - Senior Honors Thesis: Vikings, Volcanoes, and Satellites: An Analysis of Icelandic NDVI Trends and the Problem of Scale in Vegetation Remote Sensing
  - Sarah Preston (2020- 2023, now PhD student at UCLA)
    - Senior Honors Thesis: Differences between modern and ancient Martian grain size distributions may reveal different paleoatmospheric conditions and provenance
  - Bavan Rajan (2023, now working as a Geochemist at Pacific Northwest National Lab)
    - Senior Honors Thesis (Environmental Science): Report on Degradation of "Scholar's Way" for the Museum of Fine Arts, Houston
  - Astra Burke (advisee Spring 2021)
  - Jessica Sheldon (2018-2021, now Masters Student at Duke University)
    - Senior Honors Thesis: When is Drone Photogrammetry Useful for Flood Risk Assessment?
  - Madison Morris (2019-2021, now PhD student at Stony Brook University)
    - Senior Honors Thesis: Characterizing Multiple Episodes of Fluid Alteration within Stimson Fracture Halos, Gale Crater, Mars
- **Graduate Students:**
  - Rostislav Kovtun (Spring 2020-Fall 2021, now researcher at NASA-JSC)
- **Postdoctoral Scholars:**
  - Valerie Payre (2018-2020, now Assistant Professor at University of Iowa)
  - Michael Thorpe (2018-2020, now Mars Scientist at NASA-Goddard)

Current Thesis Committee Member for

- Anthony Giljum (Rice, Applied Physics/Electrical Engineering, PhD, advisor Kevin Kelly)
- Haolin Zhao (Rice, EEPS, PhD, advisor Mark Torres)
- Jiale Mou (Rice, EEPS, PhD, advisor Rajdeep Dasgupta)

Past Thesis Committee Member for

- Rahul Sudhakar, Masters, Spring 2019 (Rice, EEPS, advisor Andre Droxler)
- Leah Hall, Masters, Spring 2019 (University of Houston)
- Trevor Cole, Masters, Spring 2020 (Rice, EEPS, advisor Mark Torres)
- Chenliang Wu, PhD, Spring 2020 (Rice, EEPS, advisor Jeffrey Nittrouer)
- Tanyel Baykut, Masters, Fall 2020 (Rice, EEPS, MS, advisor Andre Droxler)
- Emily Falkson, Masters, Spring 2021 (Rice, EEPS, MS, advisor Rajdeep Dasgupta)
- Eric Barefoot, PhD, Spring 2021 (Rice, EEPS, advisor Jeffrey Nittrouer)
- Alison Farrish, PhD, Spring 2021 (Rice, Physics & Astronomy, advisor David Alexander)
- Laura Flagg, PhD, Spring 2021 (Rice, Physics & Astronomy, advisor Christopher Johns-Krull)
- Maria Rodriguez, Fall 2023 (Rice, EEPS, MS, advisor Rajdeep Dasgupta)

STUDENT AWARDS

- 2024 Wagoner Foreign Study Scholarship to Marlo Wilcox
- 2022-2023 Allison Henning Teaching Award in EEPS to Eleanor Moreland
- 2022-2023 Peter Vail Fellowship in Earth, Environmental, and Planetary Sciences to Audrey Putnam
- 2021-2022 Outstanding Undergraduate Student Award to Sarah Preston
- 2021 AGU Soffen Memorial Fund Travel Grant to Sarah Preston
- 2021 Top 10% of presentations at Rice Undergraduate Research Symposium to Sarah Preston

PEER-REVIEWED PUBLICATIONS – SUBMITTED AND IN REVISION

**denotes student or postdoctoral author in my group*

Dehouck, E., and 49 coauthors, incl. K. L. Siebach, Diverse Geochemical Environments Recorded in the Jezero Western Fan, Mars, submitted 12-14-2023.

Moreland*, E. L., S. K. Dee, Y. Jiang, G. Bischof, M. Mischna, N. Hartigan*, J. Russell, J. Moores, K. L., Siebach, Lake Modeling on Mars for Atmospheric Reconstructions and Simulations (LakeM2ARS): An intermediate-complexity model for simulating Martian lacustrine environments, *Earth and Space Science*, submitted 2-1-2024.

Putnam*, A. R., K. L. Siebach, C. C. Bedford, S. Simpson, M. T. Thorpe, J. J. Tamborski, E. B. Rampe, Ice-marginal lava delta in Iceland found on a nondescript gradual hillslope: An unexpected record of ice thickness late in deglaciation, *Journal of Volcanology and Geothermal Research*, submitted 2-16-2024.

Preston*, S. L., K. L. Siebach, M. G. A. Lapôtre, S. Banham, Grain Size Measurements of the Eolian Stimson Formation, Gale Crater, Mars and Implications for Sand Provenance and Paleoatmospheric Conditions, Journal of Geophysical Research—Planets, submitted 2-28-2024.

PEER-REVIEWED PUBLICATIONS – ACCEPTED

37. Blake, D., and 42 coauthors, incl. K. L. Siebach, (2024) The Chemistry and Mineralogy (CheMin) X-ray Diffractometer on the MSL Curiosity Rover: A Decade of Mineralogy from Gale Crater, Mars, *Minerals*, DOI: 10.3390/min14060568.
36. Banham, S. G., A. L. Roberts, S. Gupta, J. M. Davis, L. M. Thompson, D. M. Rubin, G. Paar, K. L. Siebach, W. E. Dietrich, A. A. Fraeman, A. R. Vasavada, (2024) Ice? Salt? Pressure? Sediment deformation structures as evidence of late-stage shallow groundwater in Gale crater, Mars, *Geology*, DOI: 10.1130/G51849.1.
35. Thorpe, M. T., and 31 coauthors, incl. K. L. Siebach, (2022) Mars Science Laboratory CheMin data from the Glen Torridon region and the significance of lake-groundwater interactions in interpreting mineralogy and sedimentary history, *J. Geophys. Res.*, DOI: 10.1029/2021JE007099.
34. Liu, Y., and 71 coauthors, incl. K. L. Siebach (2022) An olivine cumulate outcrop on the floor of Jezero crater, Mars., *Science*, DOI: 10.1126/science.abo2756
33. Payre*, V., K. L. Siebach, M. T. Thorpe*, P. Antoshechkina, E. B. Rampe, (2022) Tridymite in a Lacustrine Mudstone in Gale Crater, Mars: Evidence for an Explosive Silicic Eruption during the Hesperian., *EPSL*, DOI: 10.1016/j.epsl.2022.117694.
32. Gwizd, S., C. Fedo, J. Grotzinger, S. Banham, F. Rivera-Hernandez, K. Stack Morgan, K. Siebach, M. Thorpe, L. Thompson, C. O'Connell-Cooper, N. Stein, L. Edgar, S. Gupta, D. Rubin, D. Sumner, A. Vasavada (2022) Sedimentological and geochemical perspectives on a marginal lake environment recorded in the Hartmann's Valley and Karasburg members of the Murray formation, Gale crater, Mars, *J. Geophys. Res.*, DOI: 10.1029/2022JE007280.
31. Watkins, J., J. P. Grotzinger, N. T. Stein, S. G. Banham, S. Gupta, D. M. Rubin, K. Stack Morgan, K. S. Edgett, J. Frydenvang, K. L. Siebach, M. P. Lamb, D. Y. Sumner, and K. W. Lewis, (2022) Burial and Exhumation of Sedimentary Rocks Revealed by the Base Stimson Erosional Unconformity, Gale Crater, Mars, Gale crater., *J. Geophys. Res.*, DOI: 10.1029/2022JE007293.

30. Smith, R., S. McLennan, B. Sutter, E. Rampe, E. Dehouck, K. Siebach, and 8 additional coauthors, (2022) X-ray amorphous sulfur-bearing phases in sedimentary rocks of Gale crater, Mars, *J. Geophys. Res.*, DOI: 10.1029/2021JE007128.
29. Lapôtre, M. G. A., J. L. Bishop, A. Ielpi, D. R. Lowe, K. L. Siebach, N. H. Sleep, and S. M. Tikoo (2022) Mars as a Time Machine to Precambrian Earth *Journal of the Geological Society*, jgs2022-047, DOI: 10.1144/jgs2022-047.
28. Smith, R. J., S. M. McLennan, C. N. Achilles, E. Dehouck, B. H. N. Horgan, N. Mangold, E. B. Rampe, M. Salvatore, K. L. Siebach, and V. Sun, (2021) X-ray amorphous components in sedimentary rocks of Gale Crater, Mars: Evidence for ancient formation and long-lived aqueous activity., *J. Geophys. Res*., DOI: 10.1029/2020JE006782.
27. Thorpe*, M. T., J. A. Hurowitz, and K. L. Siebach, (2021) Source-to-Sink Terrestrial Analogs for the Paleoenvironment of Gale Crater, Mars., *J. Geophys. Res.*, DOI: 10.1029/2020JE006530.
26. Edgett, K. E., and 22 coauthors, incl. K. L. Siebach (2020) Extraformational Sediment Recycling on Mars., *Geosphere*, 16 (6): 1508–1537 DOI: 10.1130/GES02244.1.
25. Fraeman, A. A., and 42 coauthors, incl. K. L. Siebach, (2020) Evidence for a Diagenetic Origin of Vera Rubin Ridge, Gale Crater, Mars: Summary and Synthesis of Curiosity's Exploration Campaign, *J. Geophys. Res.*, DOI: 10.1029/2020JE006527.
24. Payre*, V., K. L. Siebach, R. Dasgupta, A. Udry, S. Morrison, E. B. Rampe, (2020) Constraining ancient magmatic evolution on Mars using crystal chemistry of detrital igneous minerals in the sedimentary Bradbury group, Gale crater, Mars., *J. Geophys. Res.*, DOI: 10.1029/2020JE006467.
23. Rampe, E.B., and 28 coauthors, incl. K. L. Siebach, (2020) Mineralogy of Vera Rubin Ridge from the Mars Science Laboratory CheMin Instrument., *J. Geophys. Res.*, DOI: 10.1029/2019JE006306.
22. Lapôtre, M. G. A., J. G. O'Rourke, L. K. Schaefer, K. L. Siebach, C. Spalding, S. M. Tikoo, and R. D. Wordsworth, (2020) Probing space to understand Earth., *Nature Reviews Earth & Environment*, 1, 170-181, DOI: 10.1038/s43017-020-0029-y.
21. Martin, P., K. A. Farley, P. D. Archer, J. V. Hogencamp, K. L. Siebach, J. P. Grotzinger, S. M. McLennan, (2020) Reevaluation of Perchlorate in Gale Crater Rocks Suggests Recent Perchlorate Addition., *EPSL*, DOI: 10.1029/2019JE006156.
20. Rampe, E. B., and 41 coauthors, incl. K. L. Siebach, (2020) Mineralogy and geochemistry of sedimentary rocks and eolian sediments in Gale crater, Mars: A review after six Earth years of exploration with Curiosity., *Geochemistry*, DOI: 10.1016/j.chemer.2020.125605.
19. Stein, N., and 24 coauthors, incl. K. L. Siebach, (2018) Desiccation Cracks Provide Evidence of Lake Drying on Mars, Middle Murray Formation, Gale Crater., *Geology*, 46 (6), pp.515-518, DOI: 10.1130/G40005.1.
18. Ehlmann, B. L. and 38 coauthors, incl. K. L. Siebach, (2017) Chemistry, Mineralogy, and Grain Properties at Namib and High Dunes, Bagnold Dune Field, Gale Crater, Mars: A Synthesis of Curiosity Rover Observations., *J. Geophys. Res*., online 7 Dec 2017, DOI:10.1002/2017JE005267.
17. Rampe, E., and 32 coauthors, incl. K. L. Siebach, (2017) Mineralogy of an ancient lacustrine mudstone succession from the Murray formation, Gale crater, Mars., *EPSL*., 471, pp.172-185 DOI: 10.1016/j.epsl.2017.04.021.
16. Hurowitz, J., and 22 coauthors, incl. K. L. Siebach, (2017) Redox stratification of an ancient lake in Gale Crater, Mars. *Science*, 356, 6341, DOI: 10.1126/science.aah6849.
15. Bristow, T. F., R. M. Haberle, D. F. Blake, D. Des Marais, J. L. Eigenbrode, A. G. Fairen, J. P. Grotzinger, K. M. Stack, M. A. Mischna, E. B. Rampe, K. L. Siebach, B. Sutter, D. T. Vaniman, A. R. Vasavada, (2017) Low Hesperian P_{CO2} constrained from in situ mineralogical analysis at Gale crater, Mars., *PNAS*., online 17 Feb 2017, DOI: 10.1073/pnas.1616649114.
14. Siebach, K. L., M. B. Baker, J. P. Grotzinger, S. M. McLennan, R. Gellert, L. Thompson, J. A. Hurowitz (2017) Sorting out Compositional Trends in Sedimentary Rocks of the Bradbury Group

(Aeolis Palus), Gale Crater, Mars., *J. Geophys. Res.*, online 2 Feb 2017, DOI: 10.1002/2016JE005195.

13. Rice, M., S. Gupta, A. H. Treiman, K. M. Stack, F. Calef, L. A. Edgar, J. Grotzinger, N. Lanza, L. Le Deit, J. Lasue, K. L. Siebach, A. Vasavada, R. C. Weins, and J. Williams, (2017) Geologic Overview of the Mars Science Laboratory Rover Mission at The Kimberley, Gale Crater, Mars., *J. Geophys. Res.*, online 28 Jan 2017, DOI: 10.1002/2016JE005200.
12. Mangold, N., and 32 coauthors, incl. K. L. Siebach, (2016) Composition of conglomerates analyzed by the Curiosity rover: Implications for Gale crater crust and sediment sources. *J. Geophys. Res*., online 15 Apr 2016, DOI: 10.1002/2015JE004977.
11. Grotzinger, J. P., S. Gupta, M. C. Malin, D. M. Rubin, J. Schieber, K. L. Siebach, and 41 additional coauthors, (2015) Deposition, exhumation, and paleoclimate of an ancient lake deposit, Gale Crater, Mars. *Science*, 350, 6257, DOI: 10.1126/science.aac7575.
10. Leveille, R. J. and 20 coauthors, incl. K. L. Siebach, (2014) Chemistry of fracture-filling raised ridges in Yellowknife Bay, Gale Crater: Window into past aqueous activity and habitability on Mars. *J. Geophys. Res.*, online 26 Nov 2014, DOI: 10.1002/2014JE004620.
9. Stack, K. M. and 18 coauthors, incl. K. L. Siebach, (2014) Diagenetic origin of nodules in the Sheepbed member, Yellowknife Bay formation, Gale crater, Mars. *J. Geophys. Res.*, online 22 Jul 2014, DOI: 10.1002/2014JE004617.
8. Siebach, K. L., J. P. Grotzinger, L. C. Kah, K. M. Stack, M. Malin, R. Leveille, and D. Y. Sumner. (2014) Subaqueous Shrinkage Cracks in the Sheepbed Mudstone: Implications for Early Fluid Diagenesis, Gale Crater, Mars. *J. Geophys. Res.*, online 17 Jul 2014, DOI: 10.1002/2014JE004623.
7. Siebach, K. L., and J. P. Grotzinger. (2014) Volumetric Estimates of Ancient Water on Mount Sharp Based on Boxwork Deposits, Gale Crater, Mars. *J. Geophys. Res.*, online 28 Jan 2014, DOI: 10.1002/2013JE004508.
6. Grotzinger, J. P., and 71 coauthors, incl. K. L. Siebach, (2014) A Habitable Fluvio-Lacustrine Environment at Yellowknife Bay, Gale Carter, Mars. *Science*, 343, 6169, DOI: 10.1126/science.1242777.
5. Grant, J., R. P. Irwin III, S. A. Wilson, D. Buczkowski, and K. Siebach (2011) A Lake in Uzboi Vallis and Implications for Late Noachian-Early Hesperian Climate on Mars. *Icarus*, 212, 1, 110, DOI: 10.1016/j.icarus.2010.11.024.
4. Arvidson, R. E., and 36 coauthors, incl. K. L. Siebach, (2010) Spirit Mars Rover Mission: Overview and selected results from the northern Home Plate Winter Haven to the side of Scamander crater. *J. Geophys. Res.*, 115, E00F03, DOI:10.1029/2010JE003633.
3. Morris, R. V., S.W. Ruff, R. Gellert, D.W. Ming, R.E. Arvidson, B.C. Clark, D.C. Golden, K. Siebach, G. Klingelhöfer, C. Schröder, I. Fleischer, A.S. Yen, S.W. Squyres. (2010) Identification of Carbonate-Rich Outcrops on Mars by the Spirit Rover. *Science*, 329, 421-424, DOI: 10.1126/science.1189667.
2. Arvidson, R. E., and 21 coauthors, incl. K. L. Siebach, (2009) Results from the Mars Phoenix Lander Robotic Arm experiment. *J. Geophys. Res.*, 114, E00E02, DOI:10.1029/2009JE003408.
1. Imam, M. A., A. W. Fliflet, K. L. Siebach, A. David, R. W. Bruce, S. B. Qadri, and S. H. Gold. (2009) Continuous Microwave-driven Polyol Process for Synthesizing Ytterbium-doped Yttria Powder. *Processing and Properties of Advanced Ceramics and Composites: Ceramic Transactions*, 3, DOI: 10.1002/9780470522189.ch1.

OTHER PUBLICATIONS AND REPORTS

3. National Academies of Sciences, Engineering, and Medicine., (2022) Origins, Worlds, and Life: Planetary Science and Astrobiology Decadal Survey 2023-2032. *Washington, DC: The National Academies Press*. DOI: 10.17226/26522.

2. National Academies of Sciences, Engineering, and Medicine., (2020) Assessment of the Report of NASA's Planetary Protection Independent Review Board. *Washington, DC: The National Academies Press*. DOI: 10.17226/25773.
1. Siebach, K. L., (2016) Formation and Diagenesis of Sedimentary Rocks in Gale Crater, Mars., *Ph.D. Dissertation, California Institute of Technology*, DOI: 10.7907/Z97D2S4K.

GRANTS SELECTED

NASA NNH19ZDA001N-M2020PSP (Siebach PI): Deriving Mineralogical Data from PIXL using Machine Learning in order to Decipher Ancient Surface and Diagenetic Environments in a Source-To-Sink Framework and Optimize Mars Return Sample Selection. $391,297.

NASA NNH19ZDA001N-SSW (sub-award): Lake Sediments in Basaltic Terrains: Implications for Early Diagenetic Processes on Mars October 1, 2020-September 30, 2023. $307,861 (Rice portion) (Lead PI: Elizabeth Rampe, NASA-JSC; Science PI: Michael Thorpe, NASA-JSC)

Rice University Faculty Initiatives Fund (Siebach Co-PI, Lead PI Prof. Sylvia Dee): $49,960 Planetary Water Cycles: Refining Climate Model Physics using Clues from Massive Lakes.

ACADEMIC TALKS

Carnegie Earth and Planets Laboratory Seminar: *Sedimentary Systems on a Volcanic World: Exploring Mars with Curiosity and Perseverance*. Washington DC, October 5, 2023.

Mars 2020 Perseverance Science Team Meeting: *Upper Fan Sedimentology and Stratigraphy: Curvilinear Units*. Presented with Gwenael Caravaca and Libby Ives. Paris, France, June 27, 2023.

Chevron Social METwork Seminar: *Perseverance on Mars: Selecting the First Samples for Return to Earth*. Houston, TX, July 13, 2023.

University of Iowa, Department of Earth & Environmental Sciences, Department Seminar: *Sedimentary Systems on a Volcanic World: Exploring Mars with Curiosity and Perseverance*. Iowa City, IA, April 28, 2023.

University of Texas at Austin Soft Rock Seminar (virtual): *Sedimentary Systems on a Volcanic World: Exploring Mars with Curiosity and Perseverance*. April 10, 2023.

Mars Science Laboratory Team Meeting: *Fracture Townies" Science Campaign to Visit Boxwork Structures on Mount Sharp*. Pasadena, CA, October 6, 2022.

Mars Science Laboratory Team Meeting (virtual): *Boxwork Structures on Mount Sharp*. October 21, 2021.

IMAGE Conference (merged AAPG and SEG Annual Meetings) Opening Session Keynote: Exploring Mars with *Curiosity* and *Perseverance*. Denver, CO, September 26, 2021.

Harvard University, Department of Earth and Planetary Sciences, Department Seminar (virtual): *Roving with Curiosity and Perseverance: Investigating Sedimentary Processes on Mars*. September 20, 2021.

Keynote at Steepest Descent Conference post-EGU (virtual): *Roving with Curiosity and Perseverance: Investigating Sedimentary Rocks on the Red Planet*. May 3, 2021.

University of Rochester, Department of Earth and Environmental Sciences, Department Seminar (virtual): *Source-to-Sink Processes in Gale Crater: Investigating Sedimentary Rocks on the Red Planet*. November 6, 2020.

Northern Arizona University, Department of Astronomy and Planetary Science, Planetary Surfaces Brown Bag Seminar (virtual): *Source-to-Sink Processes in Gale Crater: Investigating Sedimentary Rocks on the Red Planet*. November 3, 2020.

University of Maryland, Department of Geology Seminar (virtual): *Source-to-Sink Processes in Gale Crater: Investigating Sedimentary Rocks on the Red Planet*. October 23, 2020.

University of Colorado-Boulder, Geological Sciences Colloquium (virtual): *Source-to-Sink Processes in Gale Crater: Investigating Sedimentary Rocks on the Red Planet*. October 14, 2020.

Washington U. in St. Louis, Earth & Planetary Science Department: *Source-to-Sink Processes in Gale Crater: Investigating Sedimentary Rocks on the Red Planet*. St. Louis, MO, February 13, 2020.

BYU Department of Geological Sciences: *Sedimentary Records from Another World: Exploring Gale Crater Basin with the Curiosity Rover*. Provo, UT, October 31, 2019.

Keynote at West Texas Geological Foundation Annual Luncheon: *Sedimentary Records from Another World: Exploring Gale Crater Basin with the Curiosity Rover*. Midland, TX, April 11, 2019.

Mars Science Laboratory Team Meeting: *Compositional and Sedimentary Trends throughout the Murray: how does Glen Torridon fit in?* Columbia, MD, April 2, 2019.

Dinner Keynote at Industry-Rice Earth Science Symposium (IRESS): *Understanding Earth through the Exploration of Other Planets: Mars 2020 and Rice's Planetary Future*. Houston, TX, March 21, 2019.

Rice Visual Communication Symposium: *Exploring Mars through the Eyes of Robots*. Houston, TX, March 2, 2019.

ExxonMobil-Rice Workshop: *Constraining Source-to-Sink Characteristics of a Martian delta system from Mars Science Laboratory rover observations.* The Woodlands, TX, February 22, 2019.

Chevron New Ventures Exploration Team: *Sedimentary Records from Another World: Exploring Gale Crater Basin with the Curiosity Rover*. Houston, TX, December 7, 2018.

Society for Rice University Women, Rice University: *Stories from a Martian Geologist: Exploring Gale crater with the Curiosity Rover.* Houston, TX, October 22, 2018.

LDS Professional Women's Lecture Series: *Stories from a Martian Geologist: Exploring Gale crater with the Curiosity Rover*. Houston, TX, October 3, 2018.

Rice Science Cafe: *Reading the Martian Rock Record: Stories of a previously-habitable world*. Houston, TX, October 2, 2018.

Fort Lewis College Sedimentology Class: *Sedimentary Records from Another World: Exploring Gale Crater Basin with the Curiosity Rover*. Durango, CO, September 21, 2018.

Four Corners Geological Society: *Sedimentary Records from Another World: Exploring Gale Crater Basin with the Curiosity Rover*. Durango, CO, September 20, 2018.

Lunar and Planetary Institute Cosmic Explorations Series: *Curiosity and our Evolving View of the Red Planet*. Houston, TX, September 6, 2018.

New Orleans Geological Society: *Sedimentary Records from Another World: Exploring Gale Crater Basin with the Curiosity Rover*. New Orleans, LA, August 6, 2018.

AAPG URTeC "Topical Breakfast": *Sedimentary Records from Another World: Exploring Gale Crater Basin with the Curiosity Rover*. Houston, TX, July 23, 2018.

iPOLs Annual Biophysics Meeting: *The Curiosity rover and the search for martian life.* Houston, TX, June 26 2018.

Lunar and Planetary Institute Research Seminar: *Sedimentary Records from Another World: Exploring Gale Crater Basin with the Curiosity Rover*. Houston, TX, June 22, 2018.

Sigma Xi Chapter Monthly Dinner: *Sedimentary Records from Another World: Exploring Gale Crater Basin with the Curiosity Rover.* San Antonio, TX, May 24, 2018.

Southwest Research Institute (SwRI) Research Seminar: *Sedimentary Records from Another World: Exploring Gale Crater Basin with the Curiosity Rover*. San Antonio, TX. May 24, 2018.

TEF Education Conference: *Exploration and Discovery on Mars and in the Classroom: Stories from a NASA Geologist*. Istanbul, Turkey, May 18, 2018.

Brown University DEEPS Colloquium: *Formation and Diagenesis of Sedimentary Rocks in Gale Crater, Mars*. Providence, RI, April 12, 2018.

Houston Geological Society "Rice Night" Dinner Speaker: *Sedimentary Records from Another World: Exploring Gale Crater Basin with the Curiosity Rover*. Houston, TX, March 4, 2018.

IRESS Frontiers Seminar Day: *Expanding our horizons: Sedimentary and volatile cycling on Mars*. Rice University, Houston, TX, February 21, 2018.

NASA Community College Aerospace Scholars: *Five Years of Roving on Mars with Curiosity*. Johnson Space Center, Houston, TX, February 14, 2018.

Keynote in Opening Ceremony of AAPG-SEG ICE: *Sedimentary Records from Another World: Exploring Gale Crater Basin with the Curiosity Rover.* London, UK, October 2017.

SGT-MGG seminar at Lamont-Doherty Earth Observatory of Columbia University: *Formation and Diagenesis of Sedimentary Rocks in Gale Crater, Mars*. Palisades, NY, October 2017.

Rice University Department of Earth, Environmental, and Planetary Sciences Seminar: *Formation and Diagenesis of Sedimentary Rocks in Gale Crater, Mars.* Houston, TX, March 2017.

Dinner Keynote at IRESS: *Sedimentary Records from Another World: Exploring Gale Crater Basin with the Curiosity Rover*. Houston, TX, February 2017.

Department Colloquium at Stony Brook University: *Formation and Diagenesis of Sedimentary Rocks in Gale Crater, Mars*. Stony Brook, NY, October 2016.

Mars Science Laboratory Team Meeting: *APXS Geochemical Trends in the Mount Sharp Rocks: Overview*. Pasadena, CA, April 2016.

Mars Science Laboratory Team Meeting: *Distinguishing Provenance, Sorting, and Diagenetic Effects in Sedimentary Rocks along Curiosity's Traverse*. Paris, France, June 2015.

Rector's Tea at Yale-National University of Singapore: *Exploring Mars with the Curiosity Rover*. Singapore, Singapore, September 2015.

Mars Science Laboratory Team Meeting: *Correlations between Rock Chemistry, Texture, and Stratigraphic Position*. Pasadena, CA, February 2015.

Mars Science Laboratory Team Meeting: *Introduction to Cements at Gale*. Pasadena, CA, September 2014.

Caltech GPS Division "Geoclub" Seminar Series: *Diagenesis of Martian Sediments in Gale Crater*. Pasadena, CA, September 2014.

Mars Science Laboratory Team Meeting: *Sandstone Porosity along Curiosity's Traverse.* Pasadena, CA, April 2014.

Caltech Kliegel Lectures in Planetary Science: *Formation of Boxwork Structures on Mount Sharp, Gale Crater, Mars*. Pasadena, CA, April 2013.

OUTREACH EFFORTS

- Rice Alumni Volunteer Leadership Conference, Houston, TX, 5-18-2024
- HISD Teacher Training on Mars Exploration (virtual), 4-24-2024
- "The Great Owl Eclipse," Bandera, TX, 4-7-2024 and 4-8-2024
- Story Collider Astronomy Night, St. Louis, MO, 9-29-2023 (on national podcast 2-9-2024)
- Ion: Innovation on Tap: Disruptive Technology, Houston, TX, 3-23-2023
- Houston Geological Society Environmental and Engineering Geology, Houston, TX, 11-9-2022
- Serving on the Mars Advisory Council for Tinkering School, virtual, 2022+
- NASA-Rice 60th Anniversary of JFK Moonshot Speech, organized Mars booth materials, ~20 hours at a booth for the public and two short talks, Houston, TX, 9-10-2022 to 9-12-2022
- "Follow the Water" Teacher Development Workshop, Miami-Dade (virtual), 9-3-2022
- NASA Student Airborne Research Program interns (virtual), 7-11-2022
- Rice REU Students in Earth, Environmental, and Planetary Sciences (virtual), 7-7-2022
- Rice Natural Sciences Science Communication Symposium, Houston, TX, 4-25-2022

- National Science Teaching Association Meeting Featured Presentation, Houston, TX, 4-1-2022
- Rice Admitted Students, Panel on Opportunities with NASA (virtual), 3-28-2022
- ComSciCon, Panel on How to Talk to Journalists as a Scientist, Houston, TX, 3-5-2022
- Dinner talk at Lakeside Country Club's "Breakfast Club", Houston, TX, 1-19-2022
- Rice REU Students in Earth, Environmental, and Planetary Sciences, Houston, TX, 7-14-2021
- NASA Student Airborne Research Program interns (virtual), 7-5-2021
- AAPG Virtual Outcrop Field Trip: My Favorite Martian Outcrop (virtual), 4-22-2021
- Keynote at Rice University Reach for the Stars STEM Festival, Houston, TX, 4-17-2021
- Houston Geological Society Environmental and Engineering Geology (virtual), 4-14-2021
- Houston Retired Physicians Organization Luncheon (virtual), 4-13-2021
- Rice "Science Café" (virtual), 3-22-2021
- AAPG "Lunch-n-Learn" with M. T. Thorpe* (virtual), 3-18-2021
- Owls in Space Symposium, Panel on Space Education, Rice University (virtual), 3-6-2021
- Cosmic Companion Discussion of Perseverance Landing (virtual), 2-23-2021
- Perseverance Landing Party, Rice University (virtual), 2-18-2021
- Cosmic Companion Discussion about the Climate of Ancient Mars (virtual), 1-26-2021
- Rice Alumni ROMEO Club Speaker (virtual), 1-15-2021
- NASA Alumni Club Speaker (virtual), 12-3-2020
- Space Center Houston Thought Leaders Panel – Our Future on Mars (virtual), 10-29-2020
- Astronomy Society of Long Island (virtual), 10-28-2020
- Keynote Speaker SEG20 Gravity and Magnetics Luncheon (virtual), 10-13-2020
- Keynote Speaker Tulsa Geological Society and Foundation Awards Lunch (virtual), 10-6-2020
- Perseverance Launch Party, Rice and Houston Museum of Natural History (virtual), 7-30-2020
- NASA Student Airborne Research Program Interns (virtual), 7-8-2020
- STEM High School Girls Physics camp at Rice (virtual), 6-25-2020
- Houston Geological Society dinner lecture (virtual), Houston, TX 6-10-2020
- Astronomy on Tap St. Louis (virtual), 5-11-2020
- Houston Spaceport Frontier Lecture (virtual), Rice University, 4-9-2020
- SEDS Panel Night on Academic Careers in the Space Industry, Rice University, 1-30-2020
- Houston Philosophical Society Dinner panel, 1-16-2020
- National Geographic Documentary Interviewee, filmed 10-15-2019
- STEM High School Girls Physics camp at Rice, 6-18-2019
- Assembly at Yes Prep North Forest High School, 5-30-2019
- Guest speaker on "miniGeology" radio/podcast, 11-13-2018
- Guest speaker on "The Space Show" radio/podcast, 10-29-2018
- American Chemical Society "Program-In-A-Box": *Voyage to Mars: Red Planet Chemistry.* Online, October 23, 2018.
- STEM High School Girls Physics camp at Rice, lunchtime talks for 2 summer sessions, 2018
- Mars Exploration talks for two school assemblies in Istanbul, Turkey associated with LEGO Education, 2018
- Assembly for The Village School middle school students and on-campus visit for 2 classes, 2018
- Astronomical Society of Long Island and Amateur Observers Society of NY keynotes, 2017
- Spark Talk and assemblies at Gulf Coast Exploreum Science Center, Mobile, AL, 2017
- Keynote speaker at GEMS Modern School, Dubai, UAE, 2017
- Geology Open Night at Stony Brook University, 2017

- Finalist in 3 Minute Thesis Competition, Caltech, 2016
- Keynote Speaker at Global Education Supplies & Solutions Conference in Dubai, UAE, 2016
- *Science Sunday* Public Lecture at Caltech, "Road Trips on Mars", 2016
- Invited Lecture for LEGO Education Conference, Singapore 2015
- *Reel Science* Caltech Outreach Program Talks, each to ~500 attendees 9-15 years old: 2013 – Rock my World: the Power of Volcanoes, 2014 – Trial by Fire, 2015 – Ultimate Mars Challenge
- Invited Lecture for NASA Student Airborne Research Program 2012, 2013, 2014, 2015, 2016
- Expert Reader for National Geographic Kids book, "*Mars*", Fall 2014 and Summer 2016
- Developed and ran a one-day seminar for gifted elementary students on William Smith and Geologic Mapping at the Huntington Gardens in Pasadena, November 2014
- Invited Lecture for Siemen's Competition Regional Finals held at Caltech, 2014
- Judge for American Geophysical Institute Award at Intel International Science Fair, 2014
- Organized and staffed Caltech "Exploration Station" booth at the 2013 AGU conference meeting
- High School Teacher Training Talk on Applications of Spectroscopy, DNP Conference 2012
- Caltech Classroom Connection Volunteer (2011-12); aid with school farm soil testing
- Invited Lecture at Central Methodist University Math and Science Competition, 2008
- Various outreach talks to public and school groups *in addition to those listed above*; over 50 talks reaching over 2000 people, and volunteer at 7 NASA booth events

MEDIA AND DOCUMENTARIES

- History Channel's The UnXplained Season 3 Episode 7 "*Mysteries of Mars*" released December 17, 2021.
- CuriosityStream Three Part Documentary Series "*Becoming Martian*" released August 26, 2021.
- Xploration Station Series "*Life 2.0*" Episode "*A New Species of Human Emerges on Mars*" released September 5, 2020.
- National Geographic Documentary "*Mars: One Day on the Red Planet*" released January 5, 2020.

CONFERENCE ABSTRACTS FROM MY GROUP

Excludes abstracts with primary authors outside my group
**denotes student or postdoctoral author in my group*

57. Putnam*, A. R., K. L. Siebach, C. C. Bedford, S. Simpson, E. B. Rampe, J. J. Tamborski, and M. T. Thorpe (2024) Ice-marginal lava delta in Iceland found on a nondescript shallow slope: An unexpected record of ice thickness late in deglaciation. EGU General Assembly, Abstract EGU24-13612.
56. Siebach, K. L., M.M. Tice, J.A. Hurowitz, E.L. Moreland, J.K. Van Beek, T.V. Kizovski, M. Schmidt, L.P. O'Neil, A.H. Treiman, A.C. Allwood, M.L. Cable, M. Nachon, and S. Gupta (2024) PIXL Analyses of Sedimentary Rocks in the Mars 2020 Perseverance Upper Fan Campaign in Jezero Crater. LPSC 55, Abstract 2365.
55. Henry*, J. D., K. L. Siebach, M. D. Dyar, K. H. Lepore, and C. R. Ytsma (2024) Grain Size Effects on LIBS Measurements of Mineral Powders, Experimental Results and Applications to Martian Sands and Drilled Materials. LPSC 55, Abstract 1759.
54. Moreland*, E. L., K. L. Siebach, G. Costin, Y. Jiang, and B. C. Clark (2024) How does Instrument Uncertainty affect Stoichiometric Identification of Minerals in the Jezero Crater Floor? LPSC 55, Abstract 1987.

53. Moreland*, E. L., K. L. Siebach, Y. Liu, M. M. Tice, J. A. Hurowitz, P. J. Gasda, T. V. Kizovski, B. C. Clark, G. Costin, and A. Allwood (2024) Falcon_Lake: an Olivine-Rich Boulder in Jezero Crater, Mars. LPSC 55, Abstract 2030.
52. Siebach, K. L., M. Nachon, S. Sholes, V. Z. Sun, T. Del Sesto, B. P. Weiss, K. A. Farley, K. Stack, G. Caravaca, E. Dehouck, T. Fouchet, Y. Goreva, J. Hurowitz, L. Ives, L. C. Kah, J. Maki, N. Mangold, M. E. Minitti, J. I. Nuñez, N. Randazzo, D. L. Shuster, J. I. Simon, A. J. Williams, and Mars 2020 Science and Operations Team (2023) Overview of Perseverance's Upper Fan Campaign. AGU 104, Fall Meeting, Abstract P41E-3232.
51. Moreland*, E., S. Dee, Y. Jiang, G. Bischof, M. Mischna, J. M. Russell, N. Hartigan, and K. Siebach (2023) An Intermediate-Complexity Model for Simulating Lacustrine Environments on Early Mars. AGU 104, Fall Meeting, Abstract EP53B-08.
50. Siebach, K. L., S. L. Preston*, J. D. Henry*, M. G. A. Lapotre, V. Payre, S. Banham (2023) Coarse grains in the lithified ancient Stimson dune field interpreted as recycled grains from eroding fluvial conglomerates in Gale crater, Mars. *FAIRPLAY*, ESA conference, abstract p. 46.
49. Siebach, K. L., E. L. Moreland*, G. Costin, and Y. Jiang (2023) MIST: An Online Tool Automating Mineral Identification by Stoichiometry in Geochemical Datasets. *LPSC 54*, Abstract 2253.
48. Moreland*, E. L., K. L. Siebach, G. Costin, Y. Jiang, M. Tice, T. V. Kizovski, Y. Liu, and A. J. Brown (2023) Crystal Chemistry of Primary and Secondary Minerals in the Jezero Crater Floor. *LPSC 54*, Abstract 2196.
47. Preston*, S. L., K. L. Siebach, and M. G. A. Lapotre (2023) Was Ancient Windblown Sand Larger than Modern Windblown Sand on Mars? Grain Size Distributions in the Stimson Formation, Gale Crater Mars, and Implications for the Martian Paleoatmosphere. *LPSC 54*, Abstract 2978.
46. Siebach, K. L., G. Costin, E. Moreland*, and Y. Jiang (2022) MIST: An Online Tool Automating Mineral Identification by Stoichiometry in Geochemical Datasets. *AGU 103*, Fall Meeting, Abstract V42A-04.
45. Moreland*, E., K. Siebach, G. Costin, Y. Jiang, S. VanBommel, T. Kizovski, J. Hurowitz, Y. Liu, and M. Tice (2022) Stoichiometric Mineral Identifications in Mars 2020 Perseverance PIXL Data using the Automated MIST Algorithm. *AGU 103*, Fall Meeting, Abstract P55A-06.
44. Putnam*, A. R., K. L. Siebach, C. C. Bedford, S. Simpson, M. Thorpe, and the DIGMARS Team (2022) Ice-dammed Lake Recorded by Basaltic Lava Deltas above Sandvatn, a Lake in Iceland. *AGU 103*, Fall Meeting, Abstract EP33C-06.
43. Siebach, K. L., G. Costin, E. Moreland*, and Y. Jiang, (2022) MIST: An Algorithm for Automating Mineral Identification by SToichiometry. *Int. Mineralogical Assoc. Meeting 2022*, OL40_5.
42. Preston*, S. L., K. L. Siebach (2022) New Grain Size Measurements of Windblown Sand in the Stimson Sandstone, Gale Crater, Mars and Implications for the Climate of Ancient Mars. *Rice Undergraduate Research Symposium 2022*, Poster Session B 267, p. 62.
41. Putnam*, A. R., M. T. Thorpe, C. C. Bedford, V. Tu, G. Costin, M. Wilcox*, R. Kovtun*, E. B. Rampe, J. J. Tamborski, K. Lynch, D. Leeb, G. Gundjonsson, and K. L. Siebach (2022) Characterizing the Basaltic Igneous and Volcaniclastic Provenance at a Mars Analog Site in Iceland with the DIGMARS Team. *LPSC 53*, Abstract 1614.
40. Preston*, S. L., K. L. Siebach, and M. G. A. Lapotre (2021) New Constraints on Grain Size of Eolian Sediments in the Stimson Sandstone, Gale Crater, Mars and Implications for Paleoclimate. *AGU 102*, Fall Meeting, Abstract MR45A-0077.
39. Siebach, K. L., G. Costin, Y. Jiang, S. VanBommel, and A. J. Brown (2021) Mineral Identification from SToichiometry (MIST) Model with Application to PIXL on Mars 2020 Perseverance. *AGU 102*, Fall Meeting, Abstract EP15B-1333.

38. Preston*, S. and K. L. Siebach (2021) An Intuitive Method for Approximating Grain Sizes on Mars. *Rice Undergraduate Research Symposium 2021*, NSCI 10, p. 29.
37. Siebach, K. L., G. Costin, Y. Jiang (2021) Identifying Mineral Candidates in High-Resolution Geochemical Data with Application to PIXL on Mars 2020. *LPSC 52*, Abstract 1263.
36. Siebach, K. L., S. M. McLennan, K. E. Edgett, S. Gupta (2020) Provenance and Groundwater Lithification of the Stimson Sandstone, Gale crater, Mars. *AGU 101*, Fall Meeting, Abstract P038-06.
35. Morris*, M. and K. L. Siebach (2020) Characterizing Multiple Episodes of Fluid Alteration within Stimson Fracture Halos, Gale Crater, Mars. *AGU 101*, Fall Meeting, Abstract P028-05.
34. Payre*, V., K. L. Siebach, M. T. Thorpe*, P. Antoshechkina, and E. B. Rampe (2020) Tridymite in Gale Crater: a Witness of Explosive Volcanism on Early Mars? *AGU 101*, Fall Meeting, Abstract P069-0011.
33. Kovtun*, R., and K. L. Siebach (2020) Constraining the Extent of Groundwater Alteration of Martian Sedimentary Deposits: An Investigation of Mg-sulfate Formation Mechanisms. *AGU 101*, Fall Meeting, Abstract P045-0003.
32. Thorpe*, M., T. Bristow, E. B. Rampe, D. F. Blake, D. T. Vaniman, A. Yen, C. Achilles, S. Chipera, R. T. Downs, D. W. Ming, R. V. Morris, S. M. Morrison, V. Tu, D. J. Des Marais, K. Siebach, J. P. Grotzinger, R. Hazen, A. H. Treiman, N. Castle, P. L. Craig, G. W. Downs and T. Peretyazhko (2020) Mineralogy of the Glen Torridon Region as detailed by the Mars Science Laboratory CheMin Instrument. *AGU 101*, Fall Meeting, Abstract P070-03.
31. Sheldon*, J. L., and K. L. Siebach. (2020) Using Drone Photogrammetry to Detect Change over Time in Houston and Aid in Flood Mitigation. *Rice Undergraduate Research Symposium 2020*, NSCI 25.
30. Morris*, M., and K. L. Siebach. (2020) Chemical Analysis of Altered Stimson Sandstones on Mars. *Rice Undergraduate Research Symposium 2020*, NSCI 24.
29. Siebach K. L., C. N. Achilles, R. J. Smith, S. M. McLennan, and E. Dehouck. (2020) Using Curiosity Drill Sites to Test the Chemical Index of Alteration. *LPSC 51*, Abstract 3028.
28. Payre*, V., K. L. Siebach, R. Dasgupta, A. Udry, E. B. Rampe, and S. M. Morrison. (2020) Investigation of Magmatic Activities on Early Mars Using Igneous Mineral Chemistry in Gale Crater, Mars. *LPSC 51*, Abstract 2822.
27. Thorpe*, M. T., E. B. Rampe, K. L. Siebach, C. C. Bedford, R. C. Ewing, R. Christoffersen, P. Sinha, B. Horgan, M. Lapotre, M. Nachon, K. Mason, E. Champion, and the SAND-E team (2020) Clay Sediments from Basaltic Terrains: Implications for Sedimentary Processes on Mars. *LPSC 51*, Abstract 1566.
26. Payre*, V., K. L. Siebach, R. Dasgupta, P. M. Antoshechkina, and E. B. Rampe. (2019) Explosive Volcanism on Early Mars: Explaining the Tridymite Layer in Gale Crater. *AGU 100*, Fall Meeting, Abstract P43D-3495.
25. Thorpe*, M., E. B. Rampe, and K. L. Siebach. (2019) Clays and X-ray amorphous material in fine-grained basaltic sediments, Implications for the weathering history of Gale Crater, Mars. *AGU 100*, Fall Meeting, Abstract P51F-3420.
24. Siebach, K. L., C.M. Fedo, E.B. Rampe, J.P. Grotzinger, L.M. Thompson, C. O'Connell-Cooper, L. E. Edgar, and A. A. Fraeman. (2019) Untangling Source-to-Sink Geochemical Signals in a ~3.5 Ga Martian Lake: Sedimentology and Geochemistry of the Murray Formation. *9th International Conference on Mars*, Abstract 6048.
23. Payre*, V., K. L. Siebach, R. Dasgupta, S. M. Morrison, E. B. Rampe, and A. Udry. (2019) Constraints on Martian Ancient Magmatic Processes Using Mineral Chemistry of Sedimentary Rocks in Gale Crater, Mars. *9th International Conference on Mars*, Abstract 6231.

22. Siebach, K. L., C.M. Fedo, L.E. Edgar, K. Edgett, J.P. Grotzinger, A.A. Fraeman, L.M. Thompson, S. Gupta, C.H. House, C. O'Connell-Cooper. (2019) Overview of Gale crater Stratigraphy and Sedimentology from 6 Years of Roving with Mars Science Laboratory. *LPSC 50*, Abstract 1479.
21. Thorpe*, M. L., J. A. Hurowitz, and K. L. Siebach. (2019) Constraining the Climate of Ancient Mars Using Terrestrial Analogs. *LPSC 50*, Abstract 1266.
20. Payre*, V., K. L. Siebach, R. Dasgupta, and E.B. Rampe. (2019) Using Mineralchemistry in Gale Crater Sedimentary Rocks to Constrain Ancient Igneous Processes on Mars. *LPSC 50*, Abstract 2562.
19. Sheldon*, J. L., K. L. Siebach, M. T. Thorpe*. (2019) How Drones can Enhance Visualization of Geological Data and Understanding of Environmental Processes. *Rice Undergraduate Research Symposium 2019*, NSCI B65.
18. Siebach, K. L., E. B. Rampe, and S. M. Morrison. (2018) Source Characteristics, Chemical Weathering, and Lithification of the Stimson Sandstone and Lessons for the Martian Sedimentary Record. *GSA Annual Meeting 2018*, Paper no. 15-9.
17. Siebach, K. L., and S. M. McLennan. (2018) Re-Evaluating the CIA Paleoclimate Proxy on Mars at Curiosity's Drill Sites. *LPSC 49*, Abstract 2694. (served as session chair)
16. Siebach, K. L., M. B. Baker, J. P. Grotzinger, S. M. McLennan, R. Gellert, L. M. Thompson, and J. A. Hurowitz. (2017) Mineral Fractionation during Sediment Comminution and Transport in Fluvio-Deltaic and Lacustrine Rocks of the Bradbury Group, Gale Crater, Mars. *AGU 98*, Fall Meeting, Abstract EP12B-05. (Invited Talk)
15. Siebach M. B. Baker, J. P. Grotzinger, S. M. McLennan, R. Gellert, L. M. Thompson, J. A. Hurowitz. (2017) Untangling Provenance Signals in Fluvio-Deltaic-Lacustrine Facies, Gale Crater, Mars. *SEPM Research Conference: Propagation of Environmental Signals within Source-to-Sink Stratigraphy*.
14. Siebach, K. L., S. M. McLennan, and C. M. Fedo. (2017) Geochemistry of the Stimson Sandstone, Gale Crater, Mars. *LPSC 48*, Abstract 2499.
13. Siebach, K. L., S. M. McLennan, J. P. Grotzinger, R. Gellert, J. A. Hurowitz, and W. W. Fischer. (2016) Causes of Geochemical Diversity in Three Gale Crater Sedimentary Rock Formations. *GSA Annual Meeting 2016*, Paper no. 20-12.
12. Siebach, K. L., J. P. Grotzinger, J. A. Hurowitz, S. M. McLennan, W. W. Fischer, and R. Gellert. (2016) Sedimentary Petrology of the Murray Mudstone, Gale Crater, Mars. *Goldschmidt 2016*, Abstract.
11. Siebach, K. L., J. P. Grotzinger, S. M. McLennan, M. B. Baker, R. Gellert, J. A. Hurowitz, and D. L. Blaney. (2015) Sorting out APXS Compositional Variations in Gale Crater Sedimentary Rocks, Mars. *GSA Annual Meeting 2015*, Paper no. 94-2.
10. Siebach, K. L., J. P. Grotzinger, S. M. McLennan, J. A. Hurowitz, D. W. Ming, D. T. Vaniman, E. B. Rampe, D. L. Blaney, L. C. Kah, and the MSL Science Team. (2015) Constraining the Texture and Composition of Pore-Filling Cements at Gale Crater, Mars. *LPSC 46*, Abstract 2234.
9. Siebach, K. L., J. P. Grotzinger, S. M. McLennan, J. A. Hurowitz, L. C. Kah, K. S. Edgett, R. M. E. Williams, R. C. Wiens, and J. Schieber. (2014) Sandstone Diagenesis at Gale Crater, Mars, As Observed by *Curiosity*. *AGU 95*, Fall Meeting, Abstract P42C-07.
8. Siebach, K. L., and J. P. Grotzinger. (2014) Characterizing Sandstone Porosity using MAHLI Imagery along Curiosity's Traverse. *8th International Conference on Mars*, Abstract 1466.
7. Siebach, K. L., J. P. Grotzinger, L. C. Kah, K. Stack, R. J. Leveille, D. Y. Sumner, L. A. Edgar, and the MSL Science Team. (2013) Raised Ridges in the Sheepbed Member as Evidence for Early Subaqueous Diagenesis at Yellowknife Bay, Gale Crater, Mars. *AGU 94*, Fall Meeting, Abstract P13D-07.

6. Siebach, K. L. and J. P. Grotzinger. (2013) Formation of Boxwork Structures on Mount Sharp, Gale Crater, Mars. *LPSC 44*, Abstract 1875.
5. Siebach, K. L. and J. P. Grotzinger. (2012) Boxwork Structures and Groundwater Volume Estimates on Mount Sharp, Mars. *GSA Annual Meeting 2012*, Paper no. 69-7. (Invited Talk)
4. Siebach, K. L., S. Kefauver, and S. Ustin. (2011) Monitoring evapotranspiration of almond orchards using a METRIC model with MASTER imagery. *NASA booth at the AGU Fall Meeting 92*.
3. Siebach, K. L., R. E. Arvidson, J. Boettger, S. Bova, P. Murrey, M. Rudd, S. Spera, T. Stein, and M. Witchger. (2010) Testing Planetary Radiative Transfer Models via Remote Sensing of Gypsum Sands in White Sands National Monument. *AGU 91*, Fall Meet. Suppl., Abstract P53A-1491.
2. Siebach K., R. Arvidson, N. Cabrol, and Athena Science Team. (2010) Recent Spirit Results: Microscopic Imager Analysis of Particle Properties in Scamander Crater, West of Home Plate. *LPSC 41*, Abstract 2548.
1. Siebach, K., R. E. Arvidson, R.V. Morris, R. Gellert, and A. Wang. (2009) Recent Spirit Rover Results: Morphological and Textural Analysis of Sulfate-Rich Soils to the West of Home Plate *AGU*, *90*(52), Fall Meet. Suppl., Abstract P13A-1250.

PROFESSIONAL SERVICE

Serving on the National Academy of Sciences A Science Strategy for the Human Exploration of Mars: Panel on Geosciences (2024-present)

Served as Campaign Science Leader for Mars 2022 "Upper Fan" Campaign (2022-2023)

Served on the Mars Sample Return advisory "Rock Team" to identify and collect terrestrial analog samples as engineering analogs for Mars Sample Return samples; led field campaigns for sedimentary analogs (2022-2023)

Served as Campaign Science Leader for Long-Term Planning MSL Boxwork Campaign ("Fracture Townies") (2022-2023)

Served on the National Academy of Sciences Decadal Survey for Planetary Science Mars Panel (2020-2021)

Served on the Caching Strategy Steering Committee for the joint NASA-ESA Mars Sample Return Project (2020-2021)

Served on the National Academies of Science, Engineering, and Medicine committee for "Review of the Report of the NASA Planetary Protection Independent Review Board" (2019-2020)

Served on the Science Review Panel for NASA New Frontiers 4 Mission Selection Phase 2 (2019)

Served on NASA proposal Review Panels: Exobiology, Solar System Workings, and a Participating Scientist Selection Panel

Session Chair at meetings: LPSC 2018, 9th International Conference on Mars, AGU 2022

Peer-reviewer for: Earth and Planetary Science Letters, Icarus, Science Advances, Earth and Space Sciences, GSA Bulletin, Journal of Geophysical Research-Planets, Canadian Journal of Earth Sciences, Leverhulme Foundation

UNIVERSITY SERVICE

EEPS Field Trip Committee (2023-)

EEPS Liaison for Rice NTT Research Project (2022-)

EEPS Ombudsperson (2020-)

EEPS Visualization Committee chair (2018-)

EEPS Seminar Committee member (2018-)

EEPS Computation and IT Committee member (2018-)

EEPS Undergraduate Curriculum and Recruiting Committee member (2021-)

ENVS Curriculum Committee member (2018-)

Faculty Sponsor for the Rice AAPG Student Chapter (2021-)
EEPS Search Committee for Tenure-Track Planetary Science Professor (2022-23)
Advisory Board Member for Ken Kennedy Institute (2020-2023)
Faculty Sponsor for the Rice Latter-Day Saint Student Association (LDSSA) (2018-2022)
EEPS Search Committee for Assistant Teaching Professor (2021)
EEPS Co-chair for Search Committee for Data Scientist (2019)
Managed Restoration and Update of 3D Chevron Visualization Laboratory (2019)

SCIENCE TEAM AND PROFESSIONAL MEMBERSHIPS

Mars 2020 Perseverance Rover Science and Operations Team Participating Scientist
Mars Science Laboratory Science and Operations Team Collaborator
Mars Exploration Rover Science and Operations Team
Phoenix Lander Geology Science and Operations Team
American Geophysical Union (AGU)
Geological Society of America (GSA)
American Association of Petroleum Geologists (AAPG)
Society for Sedimentary Geology (SEPM)
Houston Geological Society (HGS)
Ken Kennedy Institute (KKI)

FIELD AND TECHNICAL WORKSHOP EXPERIENCES

Ridge Basin and Salton Sea, CA for Mars Analog Sampling	2 days, 5/2023
Iceland, Sandvatn and Apavatn, DIGMARS team	2 weeks, 6/2022
Iceland, Sandvatn Lake, Field work for SSW Proposal, DIGMARS team	9 days, 8/2021
Early Career Geoscience Faculty Workshop (virtual)	4 days, 7/2020
Albuquerque, NM, Rice ESCI 334 Geological Field Techniques Field Trip (TA)	4 days, 3/2019
Pix4D Software user workshop, Houston, TX	1 day, 1/2019
Belize Barrier Reef, Belize, Rice ESCI 516 Carbonates Field Trip	5 days, 10/2018
Western Australia, “Astrobiology Grand Tour”, NASA Astrobiology Institute	9 days, 7/2018
Mason, TX, Carbonate Reef trip led by Prof. Andre Droxler	3 days, 4/2018
Ainsa Basin, Spanish Pyrenees, SEPM Source-to-Sink Conference	5 days, 6/2017
Maine Bedrock, New England Intercollegiate Geological Conference	2 days, 9/2016
WY-MT-CO-SD, American Frontiers Trip, Schooling for Life (teacher)	2 weeks, 8/2016
Ireland Geological Field Camp, James Madison University (TA)	2 weeks, 6/2015
Mojave Desert, CA, Ge157 Remote Sensing Field Trip (TA)	2 days, 5/2015
Guadalupe Mountains, NM, ExxonMobil Geoscience Trip	7 days, 4/2015
Iceland, Geophysics and Planetary Surfaces Enrichment Trip, Caltech	2 weeks, 8/2014
Turks and Caicos, Ge110 Sedimentology Field Course, Caltech	10 days, 2/2014
Mojave Desert, CA, Ge151 Planetary Surfaces Field Trip, Caltech	2 days, 11/2013
Utah Sedimentology and Diagenesis GSA Field Trip, U. Nebraska	4 days, 10/2013
Greece, Geophysics Enrichment Course, Caltech	3 weeks, 9/2013
Belt Basin, MT, Agouron Field Course	10 days, 7/2013
Mojave Desert, CA, Ge157 Remote Sensing Field Trip (TA)	2 days, 5/2013
California Coast, CA, Ge136 Field Course, Caltech	3 days, 11/2012
Death Valley, CA, Ge110 Geomorphology Field Course, Caltech	9 days, 3/2012

Guadalupe Mountains, NM, Ge110 Sedimentology Field Course, Caltech	7 days, 3/2012
Baja Peninsula, Mexico, Ge136 Field Course, Caltech	3 days, 11/2011
Death Valley, CA, Ge112 Sedimentology, Caltech	3 days, 11/2011
White Sands NM, Pathfinder Program, Wash. U. St. Louis	7 days, 8/2010
The Big Island, HI, Volcano Seismology Field Camp, New Mexico Tech	2 weeks, 7/2010
Ireland Geological Field Camp, James Madison University	6 weeks, 5/2010
The Big Island, HI, Pathfinder Program, Wash. U. St. Louis	9 days, 1/2010
Ozarks, MO, Pathfinder Program, Wash. U. St. Louis	2 days, 10/2009
American Southwest, Survey Geological Trip, Wash. U. St. Louis	9 days, 5/2009
The Big Island, HI, Pathfinder Program, Wash. U. St. Louis	9 days, 1/2009
Mojave Desert, CA, Pathfinder Program, Wash. U. St. Louis	9 days, 3/2008

TECHNICAL SKILLS

Computer Programs: ArcGIS, ENVI, Matlab, Microsoft Office, NASA-MSLICE, NASA-MAESTRO, Tableau, Adobe Lightroom, Pix4D

Programming Languages: Matlab, IDL, some Java