

Kirsten L. Siebach, Ph.D.

Assistant Professor at Rice University

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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 <i>Dept of Earth, Environmental, and Planetary Sci., Rice University</i>	2018 – present
Visiting Assistant Professor, <i>McDonnell Center for Space Sciences, Wash U in St. Louis</i>	2021 – present
Mars 2020 Perseverance Science and Operations Team Participating Scientist <i>NASA</i>	2020 – present
Mars Science Laboratory Science and Operations Team Collaborator <i>NASA JPL</i>	2011 – present
Mars Panel, Planetary Science Decadal Survey, <i>National Academy of Science</i>	2020 – 2021
Mars Exploration Rover Science and Operations Team Collaborator <i>NASA JPL</i>	2010, 2012 – 2019
Postdoctoral Associate <i>Department of Geosciences, Stony Brook University</i>	2016 – 2017
Graduate Research Assistant <i>Division of Geological and Planetary Sci., Caltech</i>	2011 – 2016
NASA Student Airborne Research Program Intern <i>NASA Airborne Science Program</i>	2011
Undergraduate Research Assistant <i>Washington University in St. Louis</i>	2007 – 2011
Undergraduate Research Intern <i>Smithsonian Air and Space Museum</i>	2010
Mars Phoenix Lander Science and Operations Team Collaborator <i>University of Arizona</i>	2008
Science and Engineering Apprenticeship Program Intern <i>Naval Research Laboratory</i>	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, F25
- **EEPS 114 *Discoveries in EEPS Seminar***, different faculty introduce themselves and their labs each week for undergraduate students. Participated F21, S22, F22, S23, F23, S24, S25, F25, Taught F24
- **EEPS 203 *Undergraduate Field Trip Seminar***, co-taught undergraduate field trip to Portland, Oregon with Prof. Melodie French S25
- **EEPS 425/625 *Planetary Surface Processes***, developed course on the processes responsible for the formation and modification of solar system surfaces, Rice University, S19, S23, S25
- **EEPS 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
- **EEPS 537 *Sedimentology Seminar***, graduate student reading seminar covering planetary and sedimentology papers, S22, F22, S23, S24, F24, S25, F25
- **EEPS 334 *Geological Field Techniques*** undergraduate course covering field methods and geologic mapping with a spring break trip to NM. Helped with trip and GIS teaching in S19 with Prof. Gonnermann, co-taught course in S20 with Prof. Lee but field trip cancelled for COVID, used ArcGIS remotely to visualize and map the field site
- **EEPS 536 *Type Locale Field Trip***, graduate student enrichment course with an early summer field trip to NM, CO, UT, AZ (field trip cancelled due to COVID-19), S20
- **EEPS 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
- **Guest Lectures** in PHYS 145 Traces of Life, Fort Lewis College Sedimentology

Non-traditional Additional Teaching Experience

- **Glasscock School of Continuing Studies at Rice University**
 - ***Driving Curiosity: The Evolution of Martian Science***, recorded lectures and activity session for Lifelong University initiative, F25
 - ***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:**
 - Nat Pujet (expected graduation 5/2027)
- **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)
 - Daniel Sikes (started Fall 2025)

Past Advisees

- **Summer Students:**
 - Abigail Mebane (2023, Rice Planetary Habitability REU Program)
- **Undergraduate:**
 - Seunggyu Shin (Fall 2024)
 - Ariaan Ghatate (Spring 2024)
 - 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 PhD student at WashU)
 - Senior Honors Thesis (Environmental Science): Report on Degradation of “Scholar’s Way” for the Museum of Fine Arts, Houston
 - Astra Burke (Spring 2021)
 - Jessica Sheldon (2018-2021, now Flood Resilience Planner at Arcadis)
 - 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

- 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)
- Anthony Giljum Spring 2020 (Rice, Applied Physics/Electrical Engineering, Masters, advisor Kevin Kelly)
- 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)
- Haolin Zhao Fall 2022 (Rice, EEPS, qualifying exam committee member, advisor Mark Torres)
- Maria Rodriguez, Fall 2023 (Rice, EEPS, MS, advisor Rajdeep Dasgupta)

STUDENT AWARDS

- 2024-2025 Texas Space Grant Consortium Graduate Fellowship to Eleanor Moreland
- 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*

- Putnam*, A. R., K. L. Siebach, M. T. Thorpe, V. Tu, E. B. Rampe, C. C. Bedford, G. Costin, J. Tamborski, (submitted) Testing the Limits of Provenance Analysis from Basaltic Fluvial Sediment near Sandvatn, Iceland, as a Mars Analog.
- Tamborski, J. S. Rahman, M. T. Thorpe, M. O. Sarker, D. Burdige, A. Putnam*, M. Wilcox*, K. L. Siebach, E. B. Rampe, (in revision) A novel approach to determining chemical weathering rates and secondary phase formation in groundwater-surface water mixing zones.
- Orenstein, B. J., D. T. Flannery, M. W. M. Jones, E. L. Moreland*, K. L. Siebach, M. M. Tice, A. H. Treiman, B. Horgan, B. Kamber, A. Klidas, L. Nothdurft, Y. Liu, E. Cloutis, A. C. Allwood, S. VanBommel, (in revision) Igneous and sedimentary origins of Jezero crater units from X-ray crystal mapping on Mars.
- Caravaca, G., N. Mangold, R. Williams, S. Gupta, K. Siebach, and 23 additional coauthors, (re-submitting), Forced regression in Lake Jezero (Mars), recorded by downstepping deltaic geometries observed by Perseverance rover.

PEER-REVIEWED PUBLICATIONS – ACCEPTED

48. Moreland*, E. L., S. K. Dee, Y. Jiang, G. Bischof, M. Mischna, N. Hartigan, J. Russell, J. Moores, K. L. Siebach, (accepted) Seasonal ice cover could allow liquid lakes to persist in a cold Mars paleoclimate, *AGU Advances*, DOI: [10.1029/2025AV001891](https://doi.org/10.1029/2025AV001891).
47. Ives, L. R. W., K. M. Stack, E. C. Geyman, S. Gupta, G. Caravaca, K. L. Siebach, S. Gwizd, J. P. Grotzinger, M. P. Lamb, N. Mangold, O. Kanine, R. Barnes, P. Russell, J. Núñez, J. I. Simon, B. P. Weiss, A. Yingst, S. Sharma, S. Le Mouélic, J. Huggett, A. Pascuzzo, B. Wogsland, W. W. Fischer, N. Randazzo, (2025) Sedimentology and stratigraphy of the fluvial-deltaic Skrinkle Haven member, Tenby formation, Jezero Crater, Mars, *Journal of Sedimentary Research* 95 (6): 1080–1113, DOI: [10.2110/jsr.2025.019](https://doi.org/10.2110/jsr.2025.019).
46. Henry, J. D.*, K. L. Siebach, M. D. Dyar, K. H. Lepore, C. R. Ytsma, (2025) Predicting Geochemistry in Geological Samples Using Laser-Induced Breakdown Spectroscopy (LIBS):

- Effects of Compositional and Textural Outliers, *Spectrochimica Acta Part B: Atomic Spectroscopy*, 235, DOI: [10.1016/j.sab.2025.107376](https://doi.org/10.1016/j.sab.2025.107376).
45. Moreland E. L.*, [K. L. Siebach](#), G. Costin, M. M. Tice, J. A. Hurowitz, A. H. Treiman, J. I. Simon, Y. Liu, Y. Jiang, A. Udry, and E. Dehouck, (2025) Multiple Episodes of Fluid Alteration in Jezero Crater Indicated by MIST Mineral Identifications in PIXL XRF Data From the First 1100 Sols of the Mars 2020 Mission, *J. Geophys. Res.* 130, 9, DOI: [10.1029/2024JE008797](https://doi.org/10.1029/2024JE008797).
 44. Hurowitz, J. A., and 85 co-authors, incl. E. L. Moreland* and [K. L. Siebach](#) (2025) Redox-Driven Mineral and Organic Associations in Jezero Crater, Mars, *Nature*, 645, 332-340, DOI: [10.1038/s41586-025-09413-0](https://doi.org/10.1038/s41586-025-09413-0).
 43. [Siebach, K. L.](#), E. L. Moreland*, G. Costin, Y. Jiang, (2026) MIST: An Online Tool Automating Mineral Identification by Stoichiometry, *Computers & Geosciences*, 206, 106021, DOI: [10.1016/j.cageo.2025.106021](https://doi.org/10.1016/j.cageo.2025.106021).
 42. Kizovski, T. V., M. E. Schmidt, L. O'Neil, M. W. M. Jones, N. J. Tosca, D. A. Klevang, J. A. Hurowitz, C. T. Adcock, E. M. Hausrath, [K. L. Siebach](#), Z. U. Wolf, S. Sharma, S. J. VanBommel, F. M. McCubbin, E. Cloutis, M. L. Cable, Y. Liu, B. C. Clark, A. H. Treiman, M. M. Tice, D. C. Catling, J. Maki, T. J. Bosak, B. P. Weiss, A. G. Fairén, J. R. Christian, A. L. Knight, N. R. Randazzo, P. S. Jørgensen, P. Lawson, L. Wade, C. Heirwegh, W. T. Elam, A. C. Allwood, (2025) Fe-phosphates in Jezero Crater: Chemical, Structural, and Spectral Evidence for an Ancient Habitable Environment on Mars, *Nature Communications*, 16, 6470, DOI: [10.1038/s41467-025-60026-7](https://doi.org/10.1038/s41467-025-60026-7).
 41. Jones, M. W. M., D. T. Flannery, J. A. Hurowitz, M. T. Tice, C. E. Schrank, A. C. Allwood, N. J. Tosca, D. C. Catling, S. J. VanBommel, A. L. Knight, B. Ganly, [K. L. Siebach](#), K. C. Benison, A. P. Broz, M.-P. Zorzano, C. M. Heirwegh, B. J. Orenstein, B. C. Clark, K. P. Sinclair, A. O. Shumway, L. A. Wade, S. Davidoff, P. Nemere, A. P. Wright, A. E. Galvin, N. Randazzo, J. Martinez-Frias, L. P. O'Neil, (2025) In-situ crystallographic mapping constrains sulfate deposition and timing in Jezero crater, Mars, *Science Advances*, DOI: [10.1126/sciadv.adt3048](https://doi.org/10.1126/sciadv.adt3048).
 40. Lee, C.-T., D. Keller, R. Dasgupta, [K. Siebach](#), P. McGovern, J. Borchardt, J. Zhang, (2025) Crustal thickness effects on chemical differentiation and hydrology on Mars, *EPSL*, DOI: [10.1016/j.epsl.2024.119155](https://doi.org/10.1016/j.epsl.2024.119155).
 39. Preston*, S. L., [K. L. Siebach](#), M. G. A. Lapôte, S. Banham, (2024) Grain Size Measurements of the Eolian Stimson Formation, Gale Crater, Mars and Implications for Sand Provenance and Paleatmospheric Conditions, *J. Geophys. Res.*, DOI: [10.1029/2024JE008369](https://doi.org/10.1029/2024JE008369).
 38. Putnam*, A. R., [K. L. Siebach](#), C. C. Bedford, S. Simpson, M. T. Thorpe, J. J. Tamborski, E. B. Rampe, (2024) Ice-marginal volcanic sequence in Iceland found on a nondescript gradual hillslope: An unexpected record of ice thickness late in deglaciation, *Journal of Volcanology and Geothermal Research*, DOI: [10.1016/j.jvolgeores.2024.108195](https://doi.org/10.1016/j.jvolgeores.2024.108195).
 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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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, *J. Geophys. Res.*, DOI: [10.1029/2022JE007293](https://doi.org/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](https://doi.org/10.1029/2021JE007128).
29. Lapôte, 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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/10.1029/2019JE006306).
22. Lapôte, 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](https://doi.org/10.1038/s43017-020-0029-y).
21. Martin, P., K. A. Farley, P. D. Archer, J. V. Hogenkamp, 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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/10.1002/2013JE004508).
6. Grotzinger, J. P., and 71 coauthors, incl. K. L. Siebach, (2014) A Habitable Fluvio-Lacustrine Environment at Yellowknife Bay, Gale Crater, Mars. *Science*, 343, 6169, DOI: [10.1126/science.1242777](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](#).

PUBLISHED DATASETS AND MODELS

Putnam, A., Siebach, K., Thorpe, M., Tu, V., Bedford, C., Rampe, E., Costin, G., & Tamborski, J. (2025). DIGMARS Datasets for Testing the Limits of Provenance Analysis from Basaltic Fluvial Sediment near Sandvatn, Iceland, as a Mars Analog [Data set]. Zenodo. DOI: [10.5281/zenodo.16886950](#).

Siebach, K. L., Moreland, E. L., Costin, G., & Jiang, Y. (2025). MIST-v3.0 Mineral Identification by Stoichiometry Code. In *Computers and Geosciences (MIST-v.3.0)*. Zenodo. DOI: [10.5281/zenodo.16756125](#).

Also available at: <https://mist.rice.edu/> and <https://github.com/SiebachLab/MIST>

Eleanor Moreland, Siebach, K., Costin, G., Tice, M., Hurowitz, J., Treiman, A., Simon, J., Liu, Y., Jiang, Y., Udry, A., & Dehouck, E. (2025). Multiple Episodes of Fluid Alteration in Jezero Crater Indicated by MIST Mineral Identifications in PIXL XRF Data from the First 1100 Sols of the Mars 2020 Mission [Data set]. Zenodo. [10.5281/zenodo.13754476](#)

Moreland, E., Dee, S., Jiang, Y., Bischof, G., Mischna, M., & Hartigan, N. (2025). Data for LakeM2ARS Simulations [Data set]. Zenodo. DOI: [10.5281/zenodo.14927285](#).

Preston, S. (2024). Supplementary Dataset for "Grain Size Measurements of the Eolian Stimson Formation, Gale Crater, Mars and Implications for Sand Provenance and Paleoatmospheric Conditions" [Data set]. Zenodo. DOI: [10.5281/zenodo.12572878](#).

Payre, V., Siebach, K., Dasgupta, R., Udry, A., Rampe, E., & Morrison, S. (2020). Repository: Constraining ancient magmatic evolution on Mars using crystal chemistry of detrital igneous minerals in the sedimentary Bradbury group, Gale crater, Mars. DOI: [10.5281/zenodo.3890489](#).

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 2020 "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, 10th International Conference on Mars

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

GRANTS SELECTED

NASA JPL PIXL sub-award (Siebach Co-PI): M2020 PIXL: Mineral Identification by Stoichiometry. \$192,500. Start date 1-5-2025.

NASA 80NSSC25K7052 (Siebach PI, Jack Henry FI): Textural Effects of Loose Powders on LIBS Measurements: Implications for ChemCam and SuperCam Analyses of Sand and Drilled Materials on Mars. \$149,120.

NASA 80NSSC21K0331 (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 80NSSC21K1173 (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): Planetary Water Cycles: Refining Climate Model Physics using Clues from Massive Lakes. \$49,960.

INVITED LECTURES

2025

Astronomy Society of Long Island, virtual, April 16.

Perseverance on Mars: Selecting the First Samples for Return to Earth

2024

Houston Philosophical Society, Houston, TX, September 19.

Perseverance on Mars: Selecting the First Samples for Return to Earth

Rice Alumni Volunteer Leadership Conference, Houston, TX, May 18.

Perseverance on Mars: Selecting the First Samples for Return to Earth

2023

Carnegie Earth and Planets Laboratory Seminar, Washington DC, October 5.

Sedimentary Systems on a Volcanic World: Exploring Mars with Curiosity and Perseverance

Chevron Social METwork Seminar, Houston, TX, July 13.

Perseverance on Mars: Selecting the First Samples for Return to Earth

University of Iowa, Department of Earth & Environmental Sciences, Department Seminar, Iowa City, IA, April 28.

Sedimentary Systems on a Volcanic World: Exploring Mars with Curiosity and Perseverance

University of Texas at Austin Soft Rock Seminar, virtual, April 10.

Sedimentary Systems on a Volcanic World: Exploring Mars with Curiosity and Perseverance

Rice ION: Innovation on Tap: Disruptive Technology, Houston, TX, March 23.

Perseverance on Mars: Selecting the First Samples for Return to Earth

2022

Houston Geological Society Environmental and Engineering Geology, Houston, TX, November 9.

Perseverance on Mars: Selecting the First Samples for Return to Earth

NASA Student Airborne Research Program interns, virtual, July 11.

Roving with Curiosity and Perseverance: Investigating Sedimentary Rocks on the Red Planet

Rice Natural Sciences Science Communication Symposium, Houston, TX, April 25.

Experiences with Science Communication

National Science Teaching Association Meeting Featured Presentation, Houston, TX, April 1.

Roving Mars with Curiosity and Perseverance

Lakeside Country Club's "Breakfast Club" Dinner, Houston, TX, January 19.

Roving Mars with Curiosity and Perseverance

2021

IMAGE Conference (AAPG and SEG Annual Meetings) Opening Session Keynote, Denver, CO, September 26. [KEYNOTE]

Exploring Mars with Curiosity and Perseverance

Harvard University, Department of Earth and Planetary Sciences, Department Seminar, virtual, September 20.

Roving with Curiosity and Perseverance: Investigating Sedimentary Processes on Mars

Steepest Descent Conference after the European Geophysical Union annual meeting, virtual, May 3. [KEYNOTE]

Roving with Curiosity and Perseverance: Investigating Sedimentary Rocks on the Red Planet

NASA Student Airborne Research Program interns, virtual, July 5.

Roving with Curiosity and Perseverance: Investigating Sedimentary Rocks on the Red Planet

AAPG Virtual Outcrop Field Trip, virtual, April 22.

My Favorite Martian Outcrop

Rice University Reach for the Stars STEM Festival, Houston, TX, April 17. [KEYNOTE]

Roving Mars with Curiosity and Perseverance

Houston Geological Society Environmental and Engineering Geology, virtual, April 14.

Roving Mars with Curiosity and Perseverance

Houston Retired Physicians Organization Luncheon, virtual, April 13.

Roving Mars with Curiosity and Perseverance

Rice "Science Café," virtual, March 22.

Roving Mars with Curiosity and Perseverance

AAPG "Lunch-n-Learn" with M. T. Thorpe*, virtual, March 18.

Perseverance and Mars Sample Return

University of New Mexico, Department of Earth and Planetary Sciences Seminar, virtual, January 22.

Source-to-Sink Processes in Gale Crater: Investigating Sedimentary Rocks on the Red Planet

Rice Alumni ROMEO Club Speaker, virtual, January 15.

Sedimentary records from another world: Exploring Gale crater with the Curiosity rover

2020

NASA Alumni Club, virtual, December 3.

Reading the Martian Rock Record: Stories from a Previously Habitable World

University of Rochester, Department of Earth and Environmental Sciences, Seminar, virtual, November 6.

Source-to-Sink Processes in Gale Crater: Investigating Sedimentary Rocks on the Red Planet

Northern Arizona University, Department of Astronomy and Planetary Science, Planetary Surfaces Brown Bag Seminar, virtual, November 3.

Source-to-Sink Processes in Gale Crater: Investigating Sedimentary Rocks on the Red Planet

Astronomy Society of Long Island, virtual, October 28.

Reading the Martian Rock Record: Stories from a Previously Habitable World

University of Maryland, Department of Geology Seminar, virtual, October 23.

Source-to-Sink Processes in Gale Crater: Investigating Sedimentary Rocks on the Red Planet

University of Colorado-Boulder, Geological Sciences Colloquium, virtual, October 14.

Source-to-Sink Processes in Gale Crater: Investigating Sedimentary Rocks on the Red Planet

SEG20 Gravity and Magnetism Luncheon Keynote Speaker, virtual, October 13. [KEYNOTE]

Sedimentary Records from Another World: Exploring Gale Crater Basin with the Curiosity Rover

Tulsa Geological Society and Foundation Awards Lunch Keynote Speaker, virtual, October 6. [KEYNOTE]

Reading the Martian Rock Record: Stories from a Previously Habitable World

NASA Student Airborne Research Program Interns, virtual, July 8.

Reading the Martian Rock Record: Stories from a Previously Habitable World

Houston Geological Society dinner lecture, virtual, Houston, TX, June 10.

Curiosity – the Science, the People, the Future of Mars Exploration

Houston Spaceport Frontier Lecture (virtual), Rice University, April 9.

Reading the Martian Rock Record: Stories from a Previously Habitable World

Washington University in St. Louis, Earth & Planetary Science Department Seminar, St. Louis, MO, February 13.

Source-to-Sink Processes in Gale Crater: Investigating Sedimentary Rocks on the Red Planet

Houston Philosophical Society Dinner, Houston, TX, January 16.

The Destination: What do we know about Mars?

2019

Brigham Young University Department of Geological Sciences, Provo, UT, October 31.

Sedimentary Records from Another World: Exploring Gale Crater Basin with the Curiosity Rover

Keynote at West Texas Geological Foundation Annual Luncheon, Midland, TX, April 11.

[KEYNOTE]

Sedimentary Records from Another World: Exploring Gale Crater Basin with the Curiosity Rover

Industry-Rice Earth Science Symposium (IRESS) Dinner Keynote, Houston, TX, March 21.

[KEYNOTE]

Understanding Earth through the Exploration of Other Planets: Mars 2020 and Rice's Planetary Future

Rice Visual Communication Symposium, Houston, TX, March 2.

Exploring Mars through the Eyes of Robots

2018

Chevron New Ventures Exploration Team, Houston, TX, December 7.

Sedimentary Records from Another World: Exploring Gale Crater Basin with the Curiosity Rover

Society for Rice University Women, Rice University, Houston, TX, October 22.

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

Stories from a Martian Geologist: Exploring Gale crater with the Curiosity Rover.
Rice Science Café, Houston, TX, October 2.

Reading the Martian Rock Record: Stories of a previously-habitable world.
Four Corners Geological Society, Durango, CO, September 20.

Sedimentary Records from Another World: Exploring Gale Crater Basin with the Curiosity Rover
Lunar and Planetary Institute Cosmic Explorations Series, Houston, TX, September 6.

Curiosity and our Evolving View of the Red Planet
New Orleans Geological Society New Orleans, LA, August 6.

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

Sedimentary Records from Another World: Exploring Gale Crater Basin with the Curiosity Rover.
iPOLs Annual Biophysics Meeting, Houston, TX, June 26.

The Curiosity rover and the search for martian life
Lunar and Planetary Institute Research Seminar, Houston, TX, June 22.

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

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

Sedimentary Records from Another World: Exploring Gale Crater Basin with the Curiosity Rover
TEF Education Conference, Istanbul, Turkey, May 18, 2018.

Exploration and Discovery on Mars and in the Classroom: Stories from a NASA Geologist
Brown University Dept of Earth, Environmental, and Planetary Sciences Colloquium, Providence, RI,
April 12.

Formation and Diagenesis of Sedimentary Rocks in Gale Crater, Mars
Houston Geological Society "Rice Night" Dinner Houston, TX, March 4.

Sedimentary Records from Another World: Exploring Gale Crater Basin with the Curiosity Rover
NASA Community College Aerospace Scholars, Johnson Space Center, Houston, TX, February 14.

Five Years of Roving on Mars with Curiosity

2017

University of South Alabama Seminar with Dr. Kathryn Stack, Mobile, AL, December 1.

Exploring Mars with the Mars Science Laboratory and Mars 2020 Rovers
Gulf Coast Exploreum Science Center Spark Talk with Dr. Kathryn Stack, Mobile, AL, November 30.

Exploring Mars with the Mars Science Laboratory and Mars 2020 Rovers
GEMS Modern School, Dubai, UAE, November 8.

Five Years of Exploring Mars with the Curiosity rover
AAPG-SEG ICE Opening Ceremony Keynote, London, UK, October 2017. [KEYNOTE]

Sedimentary Records from Another World: Exploring Gale Crater Basin with the Curiosity Rover
Lamont-Doherty Earth Observatory of Columbia University SGT-MGG seminar, Palisades, NY,
October 4.

Formation and Diagenesis of Sedimentary Rocks in Gale Crater, Mars
Astronomical Society of Long Island, Centerport, NY, July 5.

Exploring Mars with Curiosity

Rice University Department of Earth, Environmental, and Planetary Sciences Seminar, Houston, TX, March 28.

Formation and Diagenesis of Sedimentary Rocks in Gale Crater, Mars

Industry-Rice Earth Science Symposium Dinner Keynote, Rice University, Houston, TX, February 23. [KEYNOTE]

Sedimentary Records from Another World: Exploring Gale Crater Basin with the Curiosity Rover

2016

Stony Brook University Geoscience Department Colloquium, Stony Brook, NY, September 22.

Formation and Diagenesis of Sedimentary Rocks in Gale Crater, Mars

Global Education Supplies & Solutions Conference, Dubai, UAE, March 3. [KEYNOTE]

The Process of Discovery, on Mars and in the Classroom

Los Angeles Valley College Planetarium, Valley Glen, CA, March 13.

Exploring Mars

Science Sunday Public Lecture at Caltech, Pasadena, CA, January 25.

Road Trips on Mars: Rovers Explore the Red Planet

2015

Rector's Tea at Yale-National University of Singapore, Singapore, September 14.

Exploring Mars with the Curiosity Rover

LEGO Education Conference, Singapore, Singapore, September 15. [KEYNOTE]

Exploring Mars with the Curiosity Rover

2014

Caltech Geological and Planetary Science Division "Geoclub" Seminar Series, Pasadena, CA, September 4.

Diagenesis of Martian Sediments in Gale Crater

Siemen's Competition Regional Finals held at Caltech, November 7.

Exploring Mars

2013

Caltech Kliegel Lectures in Planetary Science, Pasadena, CA, April.

Formation of Boxwork Structures on Mount Sharp, Gale Crater, Mars

TEAM MEETINGS, WORKSHOP, AND SYMPOSIUM PRESENTATIONS

Mars Science Laboratory Team Meeting, virtual, October 28, 2025.

Synthesis of Boxwork Campaign "Phase 3" and Current Formation Hypotheses

Workshop on Secondary Minerals on Earth and Mars, Houston, TX, December 3-4, 2024.

Automated Mineral Identification by Stoichiometry (MIST): A Tool for Geochemical Dataset Standardization

Mars Science Laboratory Team Meeting, Pasadena, CA (presented virtually), October 24, 2024.

Scientific Objectives of the Boxwork Investigation

Mars 2020 Perseverance Science Team Meeting, Pasadena, CA July 19, 2024.

Western Fan Update

Mars 2020 Perseverance Science Team Meeting, with Gwenael Caravaca and Libby Ives, Paris, France, June 27, 2023.

Upper Fan Sedimentology and Stratigraphy: Curvilinear Units

Mars Science Laboratory Team Meeting, Pasadena, CA, October 6, 2022.

Fracture Townies" Science Campaign to Visit Boxwork Structures on Mount Sharp

Mars Science Laboratory Team Meeting, virtual, October 21, 2021.

Boxwork Structures on Mount Sharp

Mars Science Laboratory Team Meeting, Columbia, MD, April 2, 2019.

Compositional and Sedimentary Trends throughout the Murray: how does Glen Torridon fit in?

ExxonMobil-Rice Workshop, The Woodlands, TX, February 22, 2019.

Constraining Source-to-Sink Characteristics of a Martian delta system from Mars Science Laboratory rover observations

IRESS Frontiers Seminar Day, Rice University, Houston, TX, February 21, 2018.

Expanding our horizons: Sedimentary and volatile cycling on Mars

Mars Science Laboratory Team Meeting, Pasadena, CA, April 2016.

APXS Geochemical Trends in the Mount Sharp Rocks: Overview

Mars Science Laboratory Team Meeting, Paris, France, June 2015.

Distinguishing Provenance, Sorting, and Diagenetic Effects in Sedimentary Rocks along Curiosity's Traverse

Mars Science Laboratory Team Meeting, Pasadena, CA, February 2015.

Correlations between Rock Chemistry, Texture, and Stratigraphic Position

Mars Science Laboratory Team Meeting, Pasadena, CA, September 2014.

Introduction to Cements at Gale

Mars Science Laboratory Team Meeting, Pasadena, CA, April 2014.

Sandstone Porosity along Curiosity's Traverse

OUTREACH EFFORTS

- Community College "Take Flight" Scholars at Rice, Houston, TX, 10-31-2025
- "Science Salon" with Rice alumni, Houston, TX, 3-27-2025
- HISD Teacher Training on Mars Exploration (virtual), 3-26-2025
- "Traveling Owls" trip to Churchill, CA, two lectures, 10-28-2024 and 10-31-2024
- 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)
- 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
- Rice REU Students in Earth, Environmental, and Planetary Sciences (virtual), 7-7-2022
- Rice Admitted Students, Panel on Opportunities with NASA (virtual), 3-28-2022
- Rice REU Students in Earth, Environmental, and Planetary Sciences, Houston, TX, 7-14-2021
- 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
- Space Center Houston Thought Leaders Panel – Our Future on Mars (virtual) 10-29-2020
- Perseverance Launch Party, Rice and Houston Museum of Natural History (virtual), 7-30-2020
- STEM High School Girls Physics camp at Rice (virtual), 6-25-2020
- Astronomy on Tap St. Louis (virtual), 5-11-2020
- SEDS Panel Night on Academic Careers in the Space Industry, Rice University, 1-30-2020

- 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
- Geology Open Night at Stony Brook University, 2017
- Invited Lecture for NASA Student Airborne Research Program 2012, 2013, 2014, 2015, 2016
- Finalist in 3 Minute Thesis Competition, Caltech, 2016
- *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
- 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
- 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 Mysteries of the Universe: Season 1 Episode 2 “*Alien Earthlings*” released May 10, 2024.
- 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*

70. Siebach, K. L., E. L. Moreland*, G. Costin, Y. Jiang (2025) Automated Mineral Identification by Stoichiometry (MIST): A Tool for Geochemical Dataset Standardization. *GSA Connects 2025*, [Abstract 10698](#).
69. *Moreland, E. L., S. Dee, Y. Jiang, G. Bischof, M. Mischna, N. Hartigan, J. Russell, J. Moores, K. L. Siebach (2025) Persisting Lakes on a Cold Mars: the Potential Role of Seasonal Ice Cover. *GSA Connects 2025*, [Abstract 10282](#).

68. Siebach, K. L., C. Seeger, C. A. Mondro, S. Schwenzer, C. O'Connell-Cooper, P. Gasda, L. M. Thompson, G. Caravaca, L. A. Scuderi, A. S. Yen (2025) Curiosity's Investigation of the Distinctive "Boxwork" Interval in Gale Crater, Mars. *GSA Connects 2025*, [Abstract 10634](#).
67. *Putnam, A. R., K. L. Siebach, M. T. Thorpe, V. M. Tu, C. C. Bedford, E. B. Rampe, G. Costin, T. J. Tamborski (2025) Selective sorting of basaltic fluvial sand revealed through coordinated mineralogy and geochemistry near Sandvatn, Iceland as a Mars analog. *GSA Connects 2025*. [Abstract 10051](#).
66. *Moreland, E. L., K. L. Siebach, G. Costin, M. Tice, J. Hurowitz, A. Treiman, J. Simon, Y. Liu, Y. Jiang (2025) Stoichiometric Minerals in PIXL Data from the Mars 2020 Mission. *GSA Connects 2025*, [Abstract 10307](#).
65. *Henry, J. D., K. L. Siebach, M. D. Dyar, K. H. Lepore, C. R. Ytsma (2025) How Low Can You Go: Testing the Limits of LIBS Calibration Data with Respect to Laser Power, Texture, and Spectral Intensity. *GSA Connects 2025*, [Abstract 10027](#).
64. *Moreland, E. L., K. L. Siebach, J. A. Hurowitz, C. C. Bedford, A. H. Treiman (2025) Stoichiometric Mineral Identifications and Uncertainties from Sols 900–1400 of the Mars 2020 Mission with PIXL and MIST. *LPSC 56*, [Abstract 2474](#).
63. *Putnam, A. R., K. L. Siebach, M. T. Thorpe, V. M. Tu, C. C. Bedford, E. B. Rampe, G. Costin, and J. J. Tamborski (2025) Do coarse-grained river sediments reflect the chemistry and mineralogy of their sources in an Icelandic Mars analog watershed? Sometimes! *LPSC 56*, [Abstract 2123](#).
62. Siebach, K. L., E. L. Moreland* (presenter), G. Costin, and Y. Jiang (2024) Automated Mineral Identification by Stoichiometry (MIST): A Tool for Geochemical Dataset Standardization. *Goldschmidt*, [Abstract 23779](#).
61. *Putnam, A. R., K. L. Siebach, C. C. Bedford, G. Costin, M. T. Thorpe, E. B. Rampe, J. Tamborski, and S. Simpson (2024) Sorting Out Syn-Eruptive Hydrothermal Alteration of Volcaniclastic Rocks in a Mars Analog Basaltic Watershed in Iceland. *10th International Conference on Mars*, [Abstract 3358](#).
60. *Moreland, E. L., K. L. Siebach, G. Costin, Y. Jiang, M. M. Tice, J. A. Hurowitz, A. H. Treiman, J. I. Simon, Y. Liu, A. Udry, E. Dehouck (2024) Identifying Stoichiometric Minerals in PIXL Data from the First Three Years of the Mars 2020 Mission Using the MIST Algorithm. *10th International Conference on Mars*, [Abstract 3077](#).
59. *Henry, J. D., K. L. Siebach, M. D. Dyar, K. H. Lepore, and C. R. Ytsma (2024) Textural Effects of Loose Powders on LIBS Measurements: Implications for ChemCam and SuperCam Analyses of Dust, Soil, and Drilled Materials on Mars. *10th International Conference on Mars*, [Abstract 3080](#).
58. Siebach, K. L., M. M. Tice, J. A. Hurowitz, E. L. Moreland, J. I. Simon, M. E. Schmidt, T. V. Kizovski, G. Caravaca, A. Klidas (2024) Observations of Coarse-Grained Fluviodeltaic Rocks in the Jezero Western Fan and Gale Crater: Implications for Sedimentary Rock Formation and Mars Sample Return. *10th International Conference on Mars*, [Abstract 3076](#).
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.

UNIVERSITY SERVICE

- EEPS Field Trip Committee (2023-)
- EEPS Liaison for Rice NTT Research Project (2022-)
- EEPS Visualization Committee chair (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-)
- Faculty Sponsor for the Rice AWG Student Chapter (2024-)
- Advisory Board Member for Boniuk Institute (2024-)
- EEPS Ombudsperson (2020-2024)
- EEPS Seminar Committee member (2018-2024)
- 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

Churchill, CA with Rice Traveling Owls	5 days, 10/2024
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