Stanford

Eva L. Scheller

Assistant Professor of Earth and Planetary Sciences

Earth & Planetary Sciences

Curriculum Vitae available Online

Bio

BIO

Prof. Scheller leads the Planetary Chemistry and Spectroscopy group. Her research focuses on working with and developing instrumentation (spectroscopy and stable isotope mass spectrometry) on spacecraft missions designed to study the chemistry of planetary surfaces and materials, combining laboratory spectroscopy experiments with spacecraft dataset analysis and instrument development. She has a keen interest in exploring limitations and detectability challenges in spacecraft instrumentation, such as refining mineral, volatile, and organic detection methods for spacecraft instrumentation. The main focus of her research is using these datasets and experiments in order to understand the global volatile cycles of planetary bodies and their effects on controlling the evolution of atmospheres, crusts, and habitability of planets.

Prof. Scheller is currently developing the Stanford Planetary Chemistry and Spectroscopy computational and experimental laboratory, which will focus on UV to longwave infrared spectroscopy at ambient and ultrahigh vacuum, cryogenic conditions as well as AI methodologies applied to the analysis of spectral datasets.

ACADEMIC APPOINTMENTS

- Assistant Professor, Earth & Planetary Sciences

ADMINISTRATIVE APPOINTMENTS

- Assistant Professor, Stanford University, (2025- present)
- Heising-Simons 51 Pegasi b Postdoctoral Fellow, MIT, (2022-2025)
- Perseverance rover Sample Sciences collaborator, NASA, (2022-2025)
- Perseverance rover SHERLOC Science Team collaborator, NASA, (2020-2025)
- Perseverance rover Strategic Process Planning Lead, NASA, (2020-2025)
- Curiosity rover SAM Science Team collaborator, NASA, (2019-2021)
- Mars Reconnaissance Orbiter CRISM Science Team collaborator, NASA, (2017-2020)

HONORS AND AWARDS

- Heising-Simons Foundation 51 Pegasi b Fellowship, Heising-Simons Foundation (2022)
- NASA Group Achievement Award, SHERLOC, NASA (2021)
- NASA Group Achievement Award, Mars 2020 mission, NASA (2021)
- NASA Earth and Space Science Fellowship, NASA (2018)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Scientific advisor, https://matter.com (2023 - present)

PROFESSIONAL EDUCATION

- Ph.D., California Institute of Technology (Caltech) , Geological and Planetary Sciences (2022)
- M.Sc., California Institute of Technology (Caltech) , Geology (2020)
- B.Sc., Copenhagen University , Geosciences (2017)

LINKS

- Personal website - lab site to come: https://evascheller.com
- Google Scholar: https://scholar.google.com/citations?user=E3iqvF8AAAAJ&hl=en

Teaching

COURSES

2025-26

- Planetary and Geological Optical Remote Sensing: AA 132, AA 232, EPS 195, EPS 245, GEOPHYS 192, GEOPHYS 244 (Spr)

Publications

PUBLICATIONS

- **Multidisciplinary Analyses of Terrestrial Samples Used to Interpret an Inorganic Origin (Anhydrite:Ce³⁺) for the 304 and 325-nm Doublet Fluorescence Detected by the Mars 2020 SHERLOC Instrument at Jezero Crater** *JOURNAL OF GEOPHYSICAL RESEARCH-PLANETS*

  Haney, N. C., Morris, R. V., Jakubek, R. S., Clark, J. V., Simon, J. I., Buckley, W. P., Downs, R. T., Rampe, E. B., Armytage, R. G., Graff, T. G., Burton, A. S., McCubbin, F. M., Berger, et al

  2026; 131 (3)

- **Carbonated ultramafic igneous rocks in Jezero crater, Mars.** *Science (New York, N.Y.)*

  Williford, K. H., Farley, K. A., Horgan, B. H., Garczynski, B., Treiman, A. H., Gupta, S., Jones, A. J., Siljeström, S., Clavé, E., Mayhew, L., Osterhout, J. T., Ravanis, E., Stack, et al

  2025: eadu8264

- **Photogeologic Map of the Perseverance Rover Field Site in Jezero Crater Constructed by the Mars 2020 Science Team (vol 216, 127, 2020)** *SPACE SCIENCE REVIEWS*

  Stack, K. M., Williams, N. R., Calef, F., Sun, V. Z., Williford, K. H., Farley, K. A., Eide, S., Flannery, D., Hughes, C., Jacob, S. R., Kah, L. C., Meyen, F., Molina, et al

  2025; 221 (6)

- **Spectral Background Calibration of Scanning Habitable Environments with Raman and Luminescence for Organics and Chemicals (SHERLOC) Spectrometer Onboard the Perseverance Rover Enables Identification of a Ubiquitous Martian Spectral Component.** *Applied spectroscopy*

  Jakubek, R. S., Corpolongo, A., Bhartia, R., Morris, R. V., Uckert, K., Asher, S. A., Burton, A. S., Fries, M. D., Hand, K., Hug, W. F., Lee, C., McCubbin, F. M., Scheller, et al

  2025; 79 (6): 904-918

- **Episodic warm climates on early Mars primed by crustal hydration** *NATURE GEOSCIENCE*

  Adams, D., Scheucher, M., Hu, R., Ehlmann, B. L., Thomas, T. B., Wordsworth, R., Scheller, E., Lillis, R., Smith, K., Rauer, H., Yung, Y. L.

  2025; 18 (2)

- **Inorganic interpretation of luminescent materials encountered by the Perseverance rover on Mars.** *Science advances*

  Scheller, E. L., Bosak, T., McCubbin, F. M., Williford, K., Siljestrom, S., Jakubek, R. S., Eckley, S. A., Morris, R. V., Bykov, S. V., Kizovski, T., Asher, S., Berger, E., Bower, et al

  2024; 10 (39): eadm8241

- **Likely Ferromagnetic Minerals Identified by the Perseverance Rover and Implications for Future Paleomagnetic Analyses of Returned Martian Samples** *JOURNAL OF GEOPHYSICAL RESEARCH-PLANETS*
  Mansbach, E. N., Kizovski, T. V., Scheller, E. L., Bosak, T., Mandon, L., Horgan, B., Wiens, R. C., Herd, C. D. K., Sharma, S., Johnson, J. R., Gabriel, T. S. J., Forni, O., Liu, et al
  2024; 129 (9)

- **Astrobiological Potential of Rocks Acquired by the Perseverance Rover at a Sedimentary Fan Front in Jezero Crater, Mars** *AGU ADVANCES*
  Bosak, T., Shuster, D. L., Scheller, E. L., Siljestroem, S., Zawaski, M. J., Mandon, L., Simon, J. I., Weiss, B. P., Stack, K. M., Mansbach, E. N., Treiman, A. H., Benison, K. C., Brown, et al
  2024; 5 (4)

- **Characterizing Hydrated Sulfates and Altered Phases in Jezero Crater Fan and Floor Geologic Units With SHERLOC on Mars 2020** *JOURNAL OF GEOPHYSICAL RESEARCH-PLANETS*
  Phua, Y., Ehlmann, B. L., Siljestroem, S., Czaja, A. D., Beck, P., Connell, S., Wiens, R. C., Jakubek, R. S., Williams, R. M. E., Zorzano, M., Minitti, M. E., Pascuzzo, A. C., Hand, et al
  2024; 129 (7)

- **Evidence of Sulfate-Rich Fluid Alteration in Jezero Crater Floor, Mars** *JOURNAL OF GEOPHYSICAL RESEARCH-PLANETS*
  Siljestrom, S., Czaja, A. D., Corpolongo, A., Berger, E. L., Li, A. Y., Cardarelli, E., Abbey, W., Asher, S. A., Beegle, L. W., Benison, K. C., Bhartia, R., Bleefeld, B. L., Burton, et al
  2024; 129 (1)

- **Science and Science-Enabling Activities of the SHERLOC and WATSON Imaging Systems in Jezero Crater, Mars** *EARTH AND SPACE SCIENCE*
  Wogsland, B. V., Minitti, M. E., Kah, L. C., Yingst, R. A., Abbey, W., Bhartia, R., Beegle, L., Bleefeld, B. L., Cardarelli, E. L., Conrad, P. G., Edgett, K., Hickman-Lewis, K., Hugget, et al
  2023; 10 (11)

- **Diverse organic-mineral associations in Jezero crater, Mars.** *Nature*
  Sharma, S., Roppel, R. D., Murphy, A. E., Beegle, L. W., Bhartia, R., Steele, A., Hollis, J. R., Siljeström, S., McCubbin, F. M., Asher, S. A., Abbey, W. J., Allwood, A. C., Berger, et al
  2023; 619 (7971): 724-732

- **The mechanisms and stable isotope effects of transforming hydrated carbonate into calcite pseudomorphs** *GEOCHIMICA ET COSMOCHIMICA ACTA*
  Scheller, E. L., Ingalls, M., Eiler, J. M., Grotzinger, J. P., Ryb, U.
  2023; 354: 146-164

- **SHERLOC Raman Mineral Class Detections of the Mars 2020 Crater Floor Campaign** *JOURNAL OF GEOPHYSICAL RESEARCH-PLANETS*
  Corpolongo, A., Jakubek, R. S. S., Burton, A. S. S., Brown, A. J. J., Yanchilina, A., Czaja, A. D. D., Steele, A., Wogsland, B. V. V., Lee, C., Flannery, D., Baker, D., Cloutis, E. A. A., Cardarelli, et al
  2023; 128 (3)

- **Aqueous alteration processes in Jezero crater, Mars-implications for organic geochemistry.** *Science (New York, N.Y.)*
  Scheller, E. L., Razzell Hollis, J., Cardarelli, E. L., Steele, A., Beegle, L. W., Bhartia, R., Conrad, P., Uckert, K., Sharma, S., Ehlmann, B. L., Abbey, W. J., Asher, S. A., Benison, et al
  2022; 378 (6624): 1105-1110

- **Geological, multispectral, and meteorological imaging results from the Mars 2020 Perseverance rover in Jezero crater.** *Science advances*
  Bell, J. F., Maki, J. N., Alwmark, S., Ehlmann, B. L., Fagents, S. A., Grotzinger, J. P., Gupta, S., Hayes, A., Herkenhoff, K. E., Horgan, B. H., Johnson, J. R., Kinch, K. B., Lemmon, et al
  2022; 8 (47): eabo4856

- **Aqueously altered igneous rocks sampled on the floor of Jezero crater, Mars.** *Science (New York, N.Y.)*
  Farley, K. A., Stack, K. M., Shuster, D. L., Horgan, B. H., Hurowitz, J. A., Tarnas, J. D., Simon, J. I., Sun, V. Z., Scheller, E. L., Moore, K. R., McLennan, S. M., Vasconcelos, P. M., Wiens, et al
  2022; 377 (6614): eabo2196

- **Guttulatic calcite: A carbonate microtexture that reveals frigid formation conditions** *GEOLOGY*
  Scheller, E. L., Grotzinger, J., Ingalls, M.

2022; 50 (1): 48-53

- **A deep-ultraviolet Raman and Fluorescence spectral library of 62 minerals for the SHERLOC instrument onboard Mars 2020** *PLANETARY AND SPACE SCIENCE*
  Hollis, J., Abbey, W., Beegle, L. W., Bhartia, R., Ehlmann, B. L., Miura, J., Monacelli, B., Moore, K., Nordman, A., Scheller, E., Uckert, K., Wu, Y.
  2021; 209

- **Formation of Magnesium Carbonates on Earth and Implications for Mars.** *Journal of geophysical research. Planets*
  Scheller, E. L., Swindle, C., Grotzinger, J., Barnhart, H., Bhattacharjee, S., Ehlmann, B. L., Farley, K., Fischer, W. W., Greenberger, R., Ingalls, M., Martin, P. E., Osorio-Rodriguez, D., Smith, et al
  2021; 126 (7): e2021JE006828

- **Long-term drying of Mars by sequestration of ocean-scale volumes of water in the crust.** *Science (New York, N.Y.)*
  Scheller, E. L., Ehlmann, B. L., Hu, R., Adams, D. J., Yung, Y. L.
  2021; 372 (6537): 56-62

- **Generalized Unsupervised Clustering of Hyperspectral Images of Geological Targets in the Near Infrared**
  Gao, A. F., Rasmussen, B., Kulits, P., Scheller, E. L., Greenberger, R., Ehlmann, B. L., IEEE Comp Soc
  IEEE COMPUTER SOC.2021: 4289-4298

- **Photogeologic Map of the Perseverance Rover Field Site in Jezero Crater Constructed by the Mars 2020 Science Team.** *Space science reviews*
  Stack, K. M., Williams, N. R., Calef, F., Sun, V. Z., Williford, K. H., Farley, K. A., Eide, S., Flannery, D., Hughes, C., Jacob, S. R., Kah, L. C., Meyen, F., Molina, et al
  2020; 216 (8)

- **Composition, Stratigraphy, and Geological History of the Noachian Basement Surrounding the Isidis Impact Basin.** *Journal of geophysical research. Planets*
  Scheller, E. L., Ehlmann, B. L.
  2020; 125 (7): e2019JE006190

- **Ocean redox conditions between the snowballs - Geochemical constraints from Arena Formation, East Greenland** *PRECAMBRIAN RESEARCH*
  Scheller, E. L., Dickson, A. J., Canfield, D. E., Korte, C., Kristiansen, K. K., Dahl, T. W.
  2018; 319: 173-186