

EVA L. SCHELLER

Email: eschelle@mit.edu ♦ Phone: 626-491-8042

Website: <http://web.gps.caltech.edu/~eschelle/> ♦ GitHub: <https://github.com/evalinghan>

EDUCATION

California Institute of Technology

PhD in Geological and Planetary Sciences 2022

- ♦ Primary advisors: Prof. Bethany Ehlmann and Prof. John Grotzinger

M.Sc. in Geology 2020

Copenhagen University

B.Sc. in Geology-Geoscience 2017

- ♦ Bachelor's thesis project with Prof. Tod E. Waight

California Institute of Technology

Caltech study abroad program of fall term Fall 2015

Sudbury Impact Field School Fall 2019

MISSION EXPERIENCE

Mars 2020 Strategic Process Planning Lead 2020 – Present

Mars 2020 Mastcam-Z Payload Downlink Lead 2021 – Present

Mars 2020 SHERLOC Payload Uplink Lead 2021 – Present

SHERLOC Science Team collaborator 2020 – Present

Mars 2020 Team Mapping Effort Lead 2019

Sample Analysis at Mars Science Team collaborator 2019 - Present

Mars 2020 NE Syrtis Landing Site Working Group collaborator 2017–2018

CRISM Science Team collaborator 2017 – Present

Mastcam-Z Science Team collaborator 2017 – Present

Mars 2020 Science Team collaborator 2017– Present

PROFESSIONAL EXPERIENCE

California Institute of Technology 2017 - Present

NASA Earth and Space Science Fellow

Sustainable Global Summer 2020

Technical research fellow

- Data scientist with focus on gas emissions statistical and computer vision segmentation ML algorithms

Natural History Museum of Denmark, Copenhagen University 2016-2017

Undergraduate researcher at Section of Geobiology and Mineralogy

- Laboratory analysis and management involving, mass spectrometers, XRF, and petrography

Ramboll/Environ 2016-2017

Student intern

- Environmental consultancy for site-solutions clean-up and health risk assessments

Caltech Summer Undergraduate Research Fellowship Summer 2016

Undergraduate researcher

- Laboratory research on X-ray crystallography and applications for Mars rovers

Geological Survey of Denmark and Greenland 2014-2015

Assistant geological mapper

- Field assistant to the quaternary mapping of Denmark

GRANTS, FELLOWSHIPS, AND AWARDS

Heising-Simons Foundation 51 Pegasi b Fellowship	2022
MIT Distinguished Postdoc Program (finalist, but then declined)	2022
John W. Jarve Seed Fund for Science Innovation	2021
<i>(main proposal contributor but not listed as PI/Co-I due to postdoctoral associate status)</i>	
NASA Earth and Space Science Fellowship	2018
Henry Shaws Grant for study abroad	2015
Julie Marie Vinter Hansens Grant for study abroad	2015
Copenhagen University Internationalization Grant for study abroad	2015
Marie og M. B. Richters Grant for study abroad	2015
Hotelejer Anders Månsson og hustrus Grant for study abroad	2015
Danske Bank Award for Nærum high school valedictorian	2013
Volunteer Award for services to the Red Cross	2013

PROFESSIONAL SERVICE AND AFFILIATIONS

Reviewer for NASA	Winter 2022
Reviewer for <i>Nature Geoscience</i>	Winter 2022
Keck Institute of Space Sciences – Revolutionizing Access to the Martian Surface Workshop	Spring 2021
Lunar and Planetary Science Conference Dworknik judge	Winter 2021
Reviewer for <i>Icarus</i>	Summer 2020
Keck Institute of Space Sciences: Graduate student affiliate	2018 – 2022
American Geophysical Union	2020 – Present
Geological Society of America member	2018 – 2019
Geological Society of Denmark member	2014 – 2017

PUBLICATIONS

(* Paper is authored by mission PI, but I contributed part of main discoveries, (***) I acted as advisor on this project

In preparation

Scheller, E. L., Ingalls, M., Eiler, J., Grotzinger, J., and Ryb, U. (in prep). Hydrated carbonate pseudomorphs track frigid paleoclimatic conditions through stable isotope systematics. *Geochemica Cosmochemica Acta*.

In review

Scheller, E. L., Razzell-Hollis, J., et al. (in review). Aqueous alteration processes and implications for organic geochemistry in Jezero crater, Mars. *Science*.

(*)Farley, K. (...) **Scheller, E. L.** et al. (in review). Aqueously-altered igneous and sedimentary rocks on the floor of Jezero crater, Mars. *Science*.

Bell, J. (...) **Scheller, E. L.** et al. (in review). Geological and Meteorological Imaging Results from the Mars 2020 Perseverance Rover in Jezero Crater. *Science Advances*.

Published

Razzell-Hollis, J. (...) **Scheller, E. L.** et al., (2022). A Deep-Ultraviolet Raman and Fluorescence Spectral Library of 62 Minerals for the SHERLOC instrument onboard Mars 2020. *Planetary and Space Science* 209, doi: 10.1016/j.pss.2021.105356.

Scheller, E. L., Grotzinger, J., Ingalls, M. (2021). Guttulatic calcite: A carbonate microtexture that reveals frigid formation temperatures. *Geology*. doi: 10.1130/G49312.1

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., and Smith, B. P., (2021). Formation of magnesium carbonates on Earth and implications for Mars. *JGR: Planets* 126, e2021JE006828

(***)Gao, A. F. (...), **Scheller, E. L.** et al. (2021). Generalized Unsupervised Clustering of Hyperspectral Images of Geological Targets in the Near Infrared. *IEEE Perception Beyond the Visible Spectrum workshop series (PBV)*.

- Scheller, E. L.**, Ehlmann, B. L., Hu, R., Adams, D., Yung, Y. (2021). Long-term drying of Mars by sequestration of ocean-scale volumes of water in the crust. *Science* 372, 56-62.
- (*)Stack, K. M. (...) **Scheller, E. L.** et al. (2020). Photogeologic Map of the Perseverance Rover Field Site in Jezero Crater Constructed by the Mars 2020 Science Team. *Space Science Reviews* 216, 127.
- Scheller, E. L.** and Ehlmann, B. L. (2020). Composition, Stratigraphy, and Geological History of the Noachian Basement Surrounding the Isidis Impact Basin. *JGR: Planets* 125, e2019JE006190.
- Scheller, E. L.**, Dickson, A. J., Canfield, D. E., Korte, C., Kristiansen K. K., Dahl, T. W. (2018). Ocean redox conditions between the snowballs – Geochemical constraints from Arena Formation, East Greenland. *Precambrian* 319, 173-186.

INVITED TALKS

Seminar, University of Pennsylvania	2022
Seminar, Brown University	2022
Conference talk, AGU Fall Meeting (carbonates in modern environments)	2021
Seminar, University of Chicago	2021
Seminar, University of Southern California	2021
Lecture, Astronomical Society of Denmark	2021
Seminar, Lunar and Planetary Science Institute	2021
Seminar, NASA Goddard Institute for Space Studies	2021
Seminar, UC Santa Cruz	2021

FIRST AUTHOR TALKS

Scheller, E. L. et al. First-Results from the Perseverance SHERLOC Investigation: Aqueous Alteration Processes and Implications for Organic Geochemistry in Jezero Crater, Mars, <i>LPSC 53</i> , Abstract# 1652	2022
Scheller, E. L. et al., Crustal Hydration of Ocean-scale Water Volumes Controlled Martian Climate and Habitability, <i>AGU Annual Meeting</i> , Abstract# 684085.	2020
Scheller, E. L. et al., Crustal Hydration of Ocean-scale Water Volumes Controlled Martian Climate and Habitability, <i>DPS Annual Meeting</i> , Abstract# 308.05.	2020
Scheller, E. L. et al., Clumped Isotope Thermometry of Hydrated Carbonate Transformation <i>Goldschmidt (cancelled due to COVID-19)</i> , Abstract# 20200016640.	2020
Scheller, E. L. et al., The History of Water on Mars as constrained Through Hydrogen Isotopes, <i>Caltech Planetary Science Seminar</i> .	2020
Scheller, E. L. et al., The History of Water on Mars as Constrained Through Hydrogen Isotopes <i>LPSC 51 (cancelled due to COVID-19)</i> , Abstract# 2326.	2020
Scheller, E. L. et al., Clumped Isotope Thermometry of Hydrated Carbonate Transformation <i>Caltech Geoclub</i> .	2019
Scheller, E. L. and Ehlmann, B. L., Composition and Impact Deformation of Noachian Basement West of Isidis, <i>Mastcam-Z Team Meeting</i> .	2019
Scheller, E. L. and Ehlmann, Isidis Megabreccia Composition, Size, and Formation History, <i>LPSC 50</i> , 2019, Abstract #2033.	2019
Scheller, E. L. and Ehlmann, B. L. Composition and Impact Deformation of Noachian Basement Surrounding the Isidis Basin, Mars, <i>GSA Annual Meeting</i> , Abstract #322778.	2018
Scheller, E. L. et al., Composition, Impact Deformation, and Geological History of Noachian Basement in the Surrounding of the Isidis Impact Basin, <i>Mars 2020 4th Landing Site Workshop</i> .	2018
Scheller, E. L. and Ehlmann, B. L. , Composition and Impact Deformation of Noachian Basement West of Isidis, <i>LPSC 49</i> , Abstract #1385.	2018
Scheller, E. L. et al. Ocean Redox Conditions between the Snowballs – Geochemical Constraints from Arena Formation, East Greenland. <i>Goldschmidt</i> , Abstract #2018002204.	2018

FIRST AUTHOR POSTERS

Scheller, E. L. et al., How hydrated carbonate pseudomorphs track frigid paleoclimatic conditions: Paragenesis and clumped isotope systematics, <i>AGU Annual Meeting</i> , Abstract# 806224	2021
Scheller, E. L. et al., Crustal Hydration of Ocean-scale Water Volumes Controlled Martian Climate and Habitability, <i>LPSC 52</i> .	2021
Scheller, E. L. et al., A Novel Approach To Integrated Time Series Analysis of Anthropogenic Gas Emissions, <i>AGU Annual Meeting</i> , Abstract # 683693.	2020
Scheller, E. L. and Ehlmann, B. L., Stratigraphy and Geological History of the Noachian Basement on the Western Rim of Isidis Basin, <i>LPSC 50</i> , Abstract #1515.	2019
Scheller, E. L. and Waight, T., Mineral Chemistry of the Hohonu Dike Swarm. <i>Nordic Magma Chamber Processes Meeting</i>	2017

SELECTED CO-AUTHOR PRESENTATIONS WITH MAJOR CONTRIBUTIONS

Beegle, L. (...) Scheller, E. L. et al., An overview of SHERLOC Raman and fluorescence spectroscopy results obtained during Perseverance's Green Zone Campaign at Jezero crater, Mars. <i>AGU Annual Meeting</i> , Abstract #924652.	2021
Gao, A. (...) Scheller, E. L. et al., Generalized Unsupervised Clustering of Hyperspectral Images of Geological Targets in the Near Infrared using Autoencoders. <i>AGU Annual Meeting</i> , Abstract #806089.	2021
Pinkston, D. (...) Scheller E. L. et al., WISER - A Customizable, Extendable Visualization and Analysis Tool for Imaging Spectroscopy Data. <i>AGU Annual Meeting</i> , Abstract #953619.	2021
Alwmark, S. (...) Scheller, E. L. et al., Detailed orbital mapping highlights relationships among Jezero Crater Floor units. <i>GSA</i> , Abstract #369062.	2021
Simon, J., Scheller, E. L. et al., Characterizing the Stratigraphy of the Nili Planum Region outside Jezero crater: Implications for Mars 2020 Strategic Planning. <i>LPSC 52</i> .	2021
Pinkston, D., Greenberger, R. N., Thompson, D. R., Scheller, E. L. , Rasmussion, B., Ehlmann, B. L., A WISER Software Toolkit for Imaging Spectroscopy Visualization and Analysis, <i>AGU Annual Meeting</i> .	2020
Kah, L., Scheller, E. L. , et al., Depositional Relationships Between Crater Floor Materials in Jezero Crater, Mars. <i>LPSC 51 (cancelled due to COVID-19)</i> .	2020
Weiss, B. P., Scheller, E. L. et al., Megabreccia at Northeast Syrtis major and its importance for Mars science, <i>LPSC 49</i> .	2018

TEACHING

Caltech Teaching Assistant, Ge151: Planetary Surfaces	2019
Caltech Teaching Assistant, Ge157c: Remote Sensing for Environmental and Geological Applications	2018
My Academy professional tutor for college, high school, and middle school <i>Taught maths, chemistry, physics, English, Danish, and natural geography</i>	2014-2017
Nærum High School professional chemistry A levels tutor	2012 - 2013

OUTREACH AND VOLUNTEER WORK

Expert interviews at newspapers (Times Magazine, MIT Review, National Geographic, BBC, ABC, etc.), TV news stations (BBC World & Danish National News), podcasts (Strange New Worlds, We Martians), and youtube videos (NASA – ask a scientist series, JPL, geopop)	2021 – Present
LPSC: LPSC Live outreach panelist	2022
Caltech: Convocation speaker	2021
Scholastic: Science advisor to the Real World Math: Space Exploration book by Scholastic	2020 – Present
Caltech Graduate Student Council member (international student council and the athletics committee)	2019 – Present
Caltech: Volunteer online tutor	2020 – Present
Caltech: International orientation leader	Fall 2020
Future Engineers: Judge for the Mars 2020 naming contest	2019

Letters to a Pre-scientist: Mentor of middle schoolers from low-income families
Danish Youth Science Association: Organizer of lecture series in science topics
Danish Red Cross: Founder and manager of the youth section of Red Cross Lyngby

2018
2015-2016
2011-2014