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EDUCATION

CALIFORNIA INSTITUTE OF TECHNOLOGY   **Pasadena, CA**
- *PhD in Geological and Planetary Sciences*   Graduated: 2022
  - Advisors: Prof. Bethany Ehlmann and Prof. John Grotzinger
  - GPA: 4.0/4.0
- *M.Sc. in Geological and Planetary Sciences*   Graduated: 2020
  - GPA: 4.0/4.0

UNIVERISITY OF COPENHAGEN   **Copenhagen, Denmark**
- *B.Sc. in Geology-Geoscience*   Graduated: 2017
  - GPA: 3.95/4.0 (international) 11.9/12 (Danish)
  - California Institute of Technology exchange program (GPA: 4.2/4.0)   Fall 2015

TECHNICAL SKILLS

Programming:	**Machine Learning (ML) via sklearn, keras, tensorflow, XGBoost. Python. IDL. Matlab. Pandas. Dash. GDAL. SciPy. Bash/shell-scripting, HTML, Git. Google Earth Engine. Docker.**
Software:	ArcGIS / ESRI. QGIS. ENVI. SOCET-SET. Microsoft Office. Abode Illustrator.
Laboratory:	Mass spectrometers. X-ray Fluorescence spectrometers. Electron Microprobe. Scanning Electron Microscope. Energy-dispersive Spectrometer. Raman Spectrometers. Infrared and Imaging Spectrometers. X-ray Diffractometers, Microscopes, and vacuum lines.
Field work:	Geological mapping. Drone imaging. Geophysical field work (spectroscopy, radar, seismics)
Languages:	English (Fluent), Danish (Fluent), Chinese/Mandarin (Intermediate/verbal only), French (Intermediate/verbal and reading)

PHD PROJECTS

Machine Learning, Data Science, Entrepreneurship | Developed algorithms and software for Earth geospatial data
- **Scientific advisor to VC-backed hyperspectral infrared imaging satellite commercial start-up company, EARTH**
- Developer of free access **classification machine learning algorithms for geospatial data** in Caltech Schmidt Academy collaboration.
- Collaborator on the free access **python-based WISER software toolkit** for processing image cubes.

NASA JPL | Group leader of multiple NASA science teams
- Perseverance Rover Strategic Processes Plan: **Project Manager** for the team of **50 scientists & engineers**.
- Perseverance Rover Landing Site Mapping Effort: **Team Lead** for team of **9 scientists/engineers**.
- Perseverance Rover operations**: Payload/Uplink Science Lead** for operations instruments (weekly managing of 5 people).
- Other NASA mission work**:** Major contributor to landing site characterization, Mastcam-Z Science Team, Mars 2020 Science Team, CRISM Science Team, and SAM Science Team

Mars spectroscopic remote sensing | Used satellite and Mars rover imagery to characterize composition of Mars' surface
- Performed various **GIS-, statistical-, and machine learning analyses** for analyzing and visualizing complex multispectral and hyperspectral image cubes of visible, infrared, and thermal wavelengths from Mars – **terrabytes of data**
- Developed **statistical signal processing data pipeline** for deep-UV Raman and infrared spectroscopic analysis from Mastcam-Z and SHERLOC instruments on the Perseverance rover to characterize composition of Martian surface materials.

Numerical Modelling | Modeled complex chemical and physical systems
- Constructed atmospheric model for the evolution of the Martian hydrosphere through time
- Solved systems of differential equations that describe complex chemical reactions

Laboratory Projects | Worked on lab analysis of rocks and minerals (see Technical Skills) – focus on carbonates
- Expert in isotopic analysis using mass spectrometers as well as Infrared, Raman, and X-ray spectroscopy

PREVIOUS EMPLOYMENT

Massachusetts Institute of Technology   **Cambridge, MA**
Heising-Simons 51 Pegasi B Postdoctoral Fellow   *2022 – Present*
- **Geospatial imagery, LiDAR, and infrared spectral** characterization of Mars surface using Mars Reconnaissance orbiter. **Raman and Fluorescence spectroscopy** of organic compounds and materials on Mars using the Perseverance rover.
- **Geospatial and spectroscopy data software tools and software infrastructure development**.
- Project management, mentoring student, scientific publications, scientific presentations.

Sustainable Global   **San Francisco, CA**
Data Science Technical research fellow   *Summer 2020*
- Main developer of **Sentinel-5 and OCO-2/OCO-3 gas emissions statistical algorithms as well as Sentinel-2 imagery computer vision classification and segmentation machine learning algorithms for time series analysis.**
- **Developed Geodash app for data visualization** and writing blog posts/reports of analysis results.

Natural History Museum of Denmark, Copenhagen University   **Copenhagen, Denmark**
Undergraduate researcher at Section of Geobiology and Mineralogy   2016-2017
- Laboratory analysis involving sample preparation, mass spectrometers, XRF, and petrography
- Laboratory management, maintenance, website design, and ad hoc

Ramboll/Environ   **Copenhagen, Denmark**
Environmental Solutions Intern   2016-2017
- **Diffusion modelling** and designing solutions for ventilation systems for building projects.
- Working on report on health risks concerning per- and polyfluoroalkyl substances for the Danish Ministry of Health.

Caltech Summer Undergraduate Research Fellowship   **Pasadena, CA**
Undergraduate researcher   Summer 2016
- Conducting laboratory research on the sensitivity of X-ray powder diffraction to compositional variation in olivine for applications to the CheMin instrument on the Curiosity rover.
- Report writing and presentations.

Geological Survey of Denmark and Greenland   **Copenhagen, Denmark**
Assistant Geological Mapper   2014-2015
- Field assistant to the quaternary mapping of Denmark which included in-field mapping, sample collection, and **GIS analysis**.

AWARDS AND FELLOWSHIPS

Heising-Simons 51 Pegasi b Fellowship, John W. Jarve Seed Fund for Science Innovation, NASA Earth and Space Science Fellowship, Henry Shaws Grant, Julie Marie Vinter Hansens Grant, Copenhagen University Internationalization Grant, Marie og M. B. Richters Fund, Hotelejer Anders Månsson og hustrus Grant, Danske Bank Grant, Red Cross Volunteer Award.

OUTREACH AND ORGANIZATIONS

- **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, geopop)**
- **Scholastic:** Science Advisor on math book for K-12. Judge for the Mars 2020 naming contest.
- **Caltech:** Student council member. International orientation leader.
- **Keck Institute of Space Sciences:** Selected Graduate Student Affiliate.
- **Letters to a Pre-scientist:** Mentor of middle schoolers from low-income families.
- **Youth Science Association:** Organizer of lecture series in science topics for high schoolers.
- **Red Cross:** Founder and manager of the youth section of Red Cross Lyngby, Denmark.

SELECTED FIRST-AUTHOR PUBLICATIONS

Full publication and abstract list, including Machine Learning contributions to IEEE, found here: http://web.gps.caltech.edu/~eschelle/#Publications

Scheller, E. L., Miquela Ingalls, John Eiler, John Grotzinger, Ury Ryb (2023). A new isotopic paleoclimate proxy: Clumped isotope geochemistry of carbonate dehydration diagenesis and ikaite pseudomorphs. Geochemica Cosmochemica Acta, 354, 146-164.

Scheller, E. L., et al. (2023). Aqueous alteration processes and implications for organic geochemistry in Jezero crater, Mars. Science, 378.

Scheller, E. L., John Grotzinger, Miquela Ingalls (2021). Guttulatic calcite: A carbonate microtexture that reveals frigid formation temperatures. Geology, 50, 48-53.

Scheller, E. L., et al. (2021). Formation of magnesium carbonates on Earth and implications for Mars. JGR: Planets, 126, e2021JE006828.

Scheller, E. L., Bethany L. Ehlmann, Renyu Hu, Danica Adams, Yuk Yung (2021). Crustal Hydration of Ocean scale Water Volumes Controlled Martian Climate and Habitability. Science, 372, 56-62.

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., et al. (2018). Ocean redox conditions between the snowballs – Geochemical constraints from Arena Formation, East Greenland. Precambrian 319, 173-186.