

I'm a doctoral graduate with six years of international PhD and postdoctoral planetary/earth science research experience. My cross-disciplinary projects utilized computer modeling to interpret Martian climate history from patterned layers in the planet's polar ices, and to investigate Earth's permafrost carbon cycle. I have additional experience in varied science support and teaching roles. I have a continuing interest in projects focused on data analysis, modeling, teaching, software engineering/operations, or field/lab technical work.

## Employment

### Department of Earth Sciences, Vrije Universiteit Amsterdam

09/2021 – 09/2024

*Postdoctoral Researcher, Supervisors: Prof. dr. Jorien Vonk & Prof. dr. Sander Houweling*

Investigating the role of microbe dynamics in driving methane emission (or uptake) surface fluxes in the subarctic, using a self-developed, process-based model (*Python*). Field and lab work to measure surface gas fluxes and various biogeochemical soil properties. Python teaching assistant.

### Planetary Data System Atmospheres Node, New Mexico State University

06/2020 – 07/2021

*Research Engineer, Associate, Supervisor: Dr. Nancy Chanover*

Migration of spacecraft instrument data file labels from PDS3 (ASCII) to PDS4 (XML) (*Python*).

### Department of Astronomy, New Mexico State University

08/2014 – 05/2020

*Graduate Research Assistant, Advisor/Supervisor: Dr. Jim Murphy*

Interpreting Martian polar ice stratigraphy as a planetary climate record, using the 'NASA Ames Mars GCM' (*FORTRAN*) and a self-developed long-term polar ice & dust deposition model (*IDL*) to predict layer production in response to climate variations. Astronomy teaching assistant.

### Laboratory for Atmospheric and Space Physics

05/2013 – 07/2014

*Undergraduate Research Assistant, Supervisor: Dr. Nick Schneider*

Identifying optimal time windows for MAVEN spacecraft observations of Martian aurorae, using self-developed routines (*IDL*) and the 'NASA SPICE' data toolkit to visualize instrument observation geometries with respect to global magnetic field topology.

## Education

### New Mexico State University, Las Cruces, NM, USA

*Doctor of Philosophy (PhD) and Master of Science (MS), Astronomy*

Conferred: 05/2020

### University of Colorado Boulder, Boulder, CO, USA

*Bachelor of Arts (BA), Astronomy, with distinction (minor: mathematics)*

Conferred: 05/2014

## Skills

- Python, IDL, FORTRAN, MATLAB
- Numerical modeling, data analysis & visualization
- Planetary/Earth science research & teaching
- Linux, MS Windows, MS Office

## Publications

*In-Preparation:* **Emmett, J.**, G. Hensgens, J. Vonk, S. Houweling, J. Weedon, and W. Lenstra. Documentation of a microbial model of methane production in subarctic active layer soils. 2024.

**Emmett, J.**, J. Murphy, and M. Kahre. Obliquity Dependence of the Formation of the Martian Polar Layered Deposits. 2020. *Planetary and Space Science*.

Smith, I., + 37 co-authors including **J. Emmett\***. The Holy Grail: A Roadmap for Unlocking the Climate Record Stored within Mars' Polar Layered Deposits. 2020. *Planetary and Space Science*.

Becerra, P. + 18 co-authors including **J. Emmett\***. Past, Present and Future of Mars Ice Research: Conclusions and Outlook of the 7<sup>th</sup> International Conference on Mars Polar Science and Exploration. 2021. *The Planetary Science Journal*.

## Grants and Honors

2019/2020 NMSU Barry Neil Rappaport Endowed Memorial Scholarship (\$1000) 05/2020

NASA Earth and Space Science Fellowship (NESSF) #NNX16AP37H (\$119,000) 09/2016 – 08/2019

New Mexico Space Grant Consortium Fellowship #NNX15A51H (\$5000) 08/2019 – 12/2019

## Professional Service

Secondary Reviewer and Executive Secretary: NASA ROSES Solar System Working Program 03/2021

## Reference Contacts

### Prof. dr. Jorien Vonk

Vrije Universiteit Amsterdam, Dpt. of Earth Sciences, Amsterdam, Netherlands. Professor.  
Relationship: Primary postdoctoral supervisor  
j.e.vonk@vu.nl | +31 20 59 87366

### Dr. Jim Murphy

New Mexico State University, Dpt. of Astronomy, Las Cruces, NM, USA. Emeritus Professor, Retired Associate Dean for Research Arts/Sciences  
Relationship: PhD Advisor/Supervisor  
murphy@nmsu.edu

### Dr. Melinda Kahre

NASA/Ames Research Center, Mountain View, CA, USA. Director, Mars Climate Modeling Center  
Relationship: External PhD research collaborator  
melinda.a.kahre@nasa.gov | +1 (650) 604-3863

### Dr. Nicholas Schneider

University of Colorado at Boulder, Dpt. Of Astrophysical and Planetary Sciences  
Laboratory for Atmospheric and Space Physics  
Boulder, CO, USA.  
Professor. MAVEN IUVS Instrument Lead.  
Relationship: LASP supervisor  
nick.schneider@lasp.colorado.edu  
+1 (303) 492-7672

### Dr. Nancy Chanover

New Mexico State University, Dpt. of Astronomy, Las Cruces, NM, USA. Professor, PI of NASA PDS Atmospheres Node | Relationship: PDS supervisor  
nchanove@nmsu.edu | +1 (575) 646-2567