



NASA EARTH + SPACE SCIENCE FELLOW

# CAITLIN CASAR

## CONTACT

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## TECHNICAL SKILLS

Scanning Electron Microscopy

Fluorescence Microscopy

Microbial Culturing

DNA Extraction

Bioinformatics

PCR

XRD

Adobe Illustrator, Photoshop, InDesign, Premiere Pro, After Effects

Python, R, SQL, Git

2015 ArcGIS Certification

2011 NAUI Master Scuba Diver Certification

## TEACHING EXPERIENCE

2018 Teaching Assistant

Communication for Geoscientists

2012-2015 Teaching Assistant

Global Environmental Change

Earth, Energy, and the Environment

Physical Systems in Earth and Space Science

## RESEARCH INTERESTS

I characterize microbial life in extreme environments on Earth as an analog for life on other planets using field and lab-based cultivation experiments, bioinformatics, thermodynamic modelling, machine learning, and electron microscopy.

## EDUCATION

2016-Current Ph.D. Candidate, Earth and Planetary Sciences, Northwestern University

2015 M.S. Earth and Environmental Science, University of Illinois at Chicago

2012 B.S. Magna Cum Laude, Geology, East Carolina University

## AWARDS AND FELLOWSHIPS

2019 Love Data Week Poster Contest Honorable Mention

2018 NASA Earth and Space Science Fellowship

2018 Illinois Space Grant Fellowship

2017 Northwestern Conference Travel Grant

2017 AbSciCon Travel Grant

2017 CoSURF Travel Grant

2014 UIC Departmental Citizenship Award

2014 UIC Provost Award

2013 Knourek Scholarship

2011 NAGT Fellowship

## PUBLICATIONS

Casar, C. P., Kruger B., Flynn, T., Masterson, A. L., Momper, L., Osburn, M. R. (in prep). Mineral-hosted biofilm communities in the continental deep subsurface, Deep Mine Microbial Observatory, SD, USA. *Geobiology*.

Osburn, M. R., Kruger, B., Masterson, A. L., Casar, C. P., Amend, J. P. (2019). Establishment of the Deep Mine Microbial Observatory (DeMMO), South Dakota, USA, a Geochemically Stable Portal Into the Deep Subsurface. *Frontiers in Earth Science*, 196.

Meyer-Dombard, D. R., Casar, C. P., Simon, A. G., Cardace, D., Schrenk, M. O., & Arcilla, C. A. (2018). Biofilm formation and potential for iron cycling in serpentinization-influenced groundwater of the Zambales and Coast Range ophiolites. *Extremophiles*, 1-25.

## FIELD EXPERIENCE

- 2016-2019 Deployment of field experiments and collection of fluids, biofilms, and fluid geochemical data from the Deep Mine Microbial Observatory, South Dakota for characterization of deep subsurface geomicrobiology
- 2016 Northwestern Earth and Planetary Science field course on sedimentology and stratigraphy of the Western Interior Seaway
- 2014 Collection of fluid geochemical data from the Coast Range Ophiolite Microbial Observatory, California
- 2013 Collection of serpentinizing spring fluids and sediments and spring fluid geochemical data from the Zambales Ophiolite, Philippines for characterization of spring geobiology
- 2013 Collection of hot spring fluid samples and geochemical data from Yellowstone National Park as part of an effort to study nitrogen and carbon fixation in hot spring systems
- 2012 Collection of sediment cores from the Pamlico Sound, NC for X-Ray diffraction and grain size analysis with depth as part of an investigation of coastal system response to sea level rise, climate dynamics, and geomorphic change
- 2011 Two week research cruise on the NOAA R.V. Nancy Foster collecting water column samples along canyon transects for particulate organic matter analysis from Cape Hatteras to the Gulf of Maine as part of a deep water canyon ecology research effort
- 2010 Geologic mapping of northern New Mexico and Southern Colorado as part of the six week ECU Geology summer field camp course

## ORAL PRESENTATIONS

- Casar, C., Osburn, M., Flynn, T., Masterson, A., Kruger, B. Mineral-hosted biofilm communities in a deep subsurface Mars-analog system: The Deep Mine Microbial Observatory (DeMMO), SD, USA. Astrobiology Science Conference, Seattle, WA, 2019.
- Casar, C., Osburn, M., Flynn, T., Masterson, A., Kruger, B. Mineral-hosted biofilm communities within the Continental Deep Subsurface. Midwest Geobiology Symposium, Northwestern University, Evanston, IL, 2018.
- Casar, C., Osburn, M., Flynn, T., Masterson, A., Kruger, B. Cultivating the Deep Subsurface Microbiome. CoSURF Conference, South Dakota School of Mines, SD, 2017.
- Casar, C., Osburn, M., Flynn, T., Masterson, A., Kruger, B. Cultivating the Deep Subsurface Microbiome. Astrobiology Science Conference, Mesa, AZ, 2017.

## RESEARCH EXPERIENCE

- Current Geomicrobiology of deep fracture-hosted mineral-associated biofilms in the Deep Mine Microbial Observatory, Lead, South Dakota. (Advisor: Magdalena Osburn, Collaborators: Theodore Flynn, Andrew Masterson, Brittany Kruger)
- 2012-2015 Microbially influenced iron cycling in high pH serpentinizing systems in the Zambales Ophiolite, Philippines and Coast Range Ophiolite, California (Advisor: D'Arcy Meyer-Dombard, Collaborators: Dawn Cardace, Matthew Schrenk, Caloy Arcilla)
- 2012 Cultivating and characterizing deep sea hydrothermal vent archaea (Advisor: Matthew Schrenk)
- 2011 Community composition and connectivity of deep sea coral and cold seep ecosystems in the Gulf of Mexico. (USGS Internship through NAGT Fellowship program)

## SELECTED POSTER PRESENTATIONS

- Casar, C., Karbelkar, A., Vinnichenko, G., Chen, M., Osburn, M., Orphan, V., Fischer, W., Sessions, A., 2018 International Geobiology Course Participants. Transformation of ancient organic carbon in exposed organic-rich black shale of the Monterey Formation, Naples Beach, Ca. American Geophysical Union Fall Meeting, Washington D.C., 2018.
- Casar, C., Osburn, M., Flynn, T., Masterson, A., Kruger, B. Mineral-hosted biofilm communities in the Continental Deep Subsurface. North American International Society of Microbial Electrochemistry and Technology, University of Minnesota, St. Paul, MN, 2018.
- Casar, C., Osburn, M., Flynn, T., Masterson, A., Kruger, B. Cultivating the Deep Subsurface Microbiome. American Geophysical Union Fall Meeting, New Orleans, LA, 2017.
- Casar, C., Meyer-Dombard, D., Cardace, D., Simon, A. Characterizing subsurface microbial Fe-reduction in a Martian analog serpentinizing system: Zambales Ophiolite, Philippines. Astrobiology Science Conference, Chicago, IL, 2015.

## PROFESSIONAL ACTIVITIES

- 2019 President of NU Academics for Careers in Data Science
- 2019 SatRDays Chicago Conference Attendee
- 2019 NU R User Group workshop attendee
- 2019 NU Data Science Nights attendee
- 2018 Interviewee for NU Science Journalism Workshop
- 2018 Interviewee for Bill Nye children's science book
- 2018 Midwest Geobiology Symposium Organizing Committee
- 2018 International Geobiology Field Course
- 2017 NU RSG Workshop for Communicating Science Research
- 2017-2018 President of NU Geoclub
- 2016 ECOGEO Workshop - Intro to Environmental 'Omics  
University of Hawaii at Mānoa, Honolulu Hawai'i
- 2013-2015 President of UIC Terra Society
- 2014 Natural Sciences Teaching Laboratory Revision  
UIC Earth and Environmental Science, Education Dept.'s
- 2009 ECU Geology Field Camp Manager