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
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

Geomicrobiology of extreme environments including high pH serpentinizing systems, hydrothermal systems, and deep subsurface systems and their relevance to astrobiology

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

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

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 serpentinzing system: Zambales Ophiolite, Philippines. Astrobiology Science Conference, Chicago, IL, 2015.

PROFESSIONAL ACTIVITIES

2019 President of NU Academics for Careers in Data Science

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
Univeristy 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