SCHUYLER BORGES

they/them | PhD candidate | Northern Arizona University

Updated: Feb. 25, 2024

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EDUCATION

2018 – present	**Ph.D., Astronomy & Planetary Science**, Northern Arizona University Advisor: Dr. Lillian Ostrach, Chair: Dr. Joshua Emery
2021	**M.S.**, **Astronomy & Planetary Science**, Northern Arizona University Advisors: Dr. Mark Salvatore and Dr. Tyler Robinson
2018	**B.A., Geology**, Lawrence University Thesis: *Orientation of Calcium Sulfate Veins and Their Implication for Fluid Circulation Events at Gale Cater, Mars* Advisors: Dr. Marion Nachon and Dr. Marcia Bjørnerud

ACADEMIC APPOINTMENTS

2020 – present	National Science Foundation Graduate Research Fellow
2018, 2023 – present	Graduate Teaching Assistant, Northern Arizona University
2018 – 2023	Graduate Research Assistant, Northern Arizona University

PEER-REVIEWED PUBLICATIONS: PUBLISHED OR ACCEPTED (1 first author, 7 co-author)

1. Power, S. N., Salvatore, M. R., Sokol, E. R., Stanish, L. F., **Borges, S. R.**, Adams, B. J., Barrett, J. E. (2024). Remotely characterizing detection of photosynthetic biocrust in snowpack-fed microhabitats of Taylor Valley, Antarctica. *Science of Remote Sensing*, *9*. https://doi.org/10.1016/j.srs.2024.100120.
2. **Borges, S. R.**, Jones, G. G., Robinson, T. D. (2024). Detectability of Surface Biosignatures for Directly-Imaged Rocky Exoplanets. *Astrobiology*, *24*(3). https://doi.org/10.1089/ast.2023.0099.
3. Schaible, M. J., Szeinbaum, N., Bozdag, G. O., Chou, L., Grefenstette, N., Colón-Santos, S, Rodriguez, L. E., Styczinski, M. J., Thweatt, J. L., Todd, Z. R., Vázquez-Salazar, A., Adams, A., Araújo, M. N., Altair, T., **Borges, S. R.**, Burton, D., Campillo-Balderas, J. A., Cangi, E. M., Caro, T., Catalano, E., Chen, K., Conlin, P. L., Cooper, Z. S., Fisher, T. M., Mestre Fos, S., Garcia, A., Glaser, D. M., Harman, C. E., Hermis, N. Y., Hooks, M., Johnson-Finn, K., Lehmer, O., Hernández-Morales, R., Hughson, K. H.G., Jácome, R., Jia, T. Z., Marlow, J. J., McKaig, J., Mierzejewski, V., Muñoz-Velasco, I., Nural, C., Oliver, G. C., Penev, P. I., Govinda Raj, C., Roche, T. P., Sabuda, M. C., Schaible, G. A., Sevgen, S., Sinhadc, P., Steller, L. H., Stelmach, K., Tarnas, J., Tavares, F., Trubl, G., Vidaurri, M., Vincent, L., Weber, J. M., Weng, M. M., Wilpiszeki, R. L., Young, A. V. (*Accepted*). Chapter 1: The Astrobiology Primer 3.0. *Astrobiology*.
4. Chou, L., Grefenstette, N., **Borges, S. R.**, Caro, T., Catalano, E., Harman, C., McKaig, J., Govinda Raj, C., Trubl, G., Young, A. V. (*Accepted*). Chapter 8: Searching for Life Beyond Earth. *Astrobiology*.
5. Trubl, G., Stedman, K. M., Bywaters, K. F., Matula, E. E., Sommers, P., Roux, S., Merino, N., Yin, J., Kaelber, J. T., Avila-Herrera, A., Johnson, P. A., Johnson, J. C., **Borges, S. R.**, Weber, P. K., Pett-Ridge, J., Boston, P. J. (2023). Astrovirology: How viruses enhance our understanding of life in the Universe. *International Journal of Astrobiology*, 1-25. doi:10.1017/S1473550423000058
6. Salvatore, M. R., Barrett, J. E., **Borges, S. R.**, Power, S. N., Stanish, L. F., Sokol, E. R., & Gooseff, M. (2021). Counting Carbon: Quantifying Biomass in the McMurdo Dry Valleys through Orbital & Field Observations. *International Journal of Remote Sensing, 42(22)*, 8597-8623. https://doi.org/10.1080/01431161.2021.1981559
7. Nachon, M., **Borges, S. R.**, Ewing, R. C., Rivera-Hernández, F., Stein, N., & Van Beek, J. K. (2020). Coupling Mars ground and orbital views: generate viewsheds of Mastcam images from the Curiosity rover, using ArcGIS® and public datasets. *Earth and Space Science*. https://doi.org/10.1029/2020ea001247

8. Salvatore, M. R., **Borges, S. R.**, Barrett, J. E., Sokol, E. R., Stanish, L. F., Power, S. N., & Morin, P. (2020). Remote characterization of photosynthetic communities in the Fryxell basin of Taylor Valley, Antarctica. *Antarctic Science, 16*, 1–16. https://doi.org/10.1017/s0954102020000176

PEER-REVIEWED PUBLICATIONS: IN REVIEW OR SUBMITTED (1 first author, † co-first author)

1. **Borges, S. R.**†, Schaible, G. A.†, Sagasti, A. J., Teece, B. L., Barlow, E. V., Soares, G. G., Gangidine, A. (*Submitted*). Towards process-driven research in geobiology: Stepping away from the binary biogenicity vs. abiogenicity approach. *Geobiology*.

PUBLISHED DATASETS (2 first author)

1. Borges, S.R., Stanish, L.F., Power, S.N., Salvatore, M.R., Barrett, J.E., Sokol, E.R., and Davis, M.R. 2023. *Spectral and biological characteristics of microbial mats and mosses across Fryxell Basin, Taylor Valley, Antarctica (2018-2019)*. Environmental Data Initiative. DOI: 10.6073/pasta/4b06d939260f89de7119fc9662fd5ece
2. Borges, S.R., Salvatore, M.R., Stanish, L.F., Power, S.N., Sokol, E.R., Barrett, J.E., and Tai Udovicic, C.J. 2023. *Distribution models of microbial mats and mosses across Fryxell Basin, Taylor Valley, Antarctica (2018-2019)*. Environmental Data Initiative. DOI: 10.6073/pasta/de796f76bc4aa7cbff001733805adf72

WHITE PAPERS (2 co-author)

1. Trubl, G., Sommers, P., Boston, P. J., Stedman, K., **Borges, S. R.**, Matula, E. E., Zaharescu, D. G., Anto Johnson, P., Johnson, J. C., Buongiorno, J., Nabity, J., Brum, J. R. (2021). Viruses as Modulators of Cellular Metabolism: Implications for Human Health and Life-Support Systems in Space. A National Academies of Sciences, Engineering, and Medicine White Paper for the *Decadal Survey on Biological and Physical Sciences Research in Space 2023-2032.* http://surveygizmoresponseuploads.s3.amazonaws.com/fileuploads/623127/6378869/188-8805b4c0f36f4cd747d8170a08dea29d_Trubl_Gareth.pdf
2. Strauss, B. E., **Borges S. R.**, Faridani, T., Grier, J. A., Kiihne, A., Maier, E. R., Olsen, C., O'Neill, T., Rivera-Valentín, E. G., Sneed, E. L., Waller, D., Zamloot, V. (2020). Nonbinary Systems: Looking Towards the Future of Gender Equity in Planetary Science. A State of the Profession White Paper for the *Planetary Science and Astrobiology Decadal Survey 2023-2032*. https://arxiv.org/pdf/2009.08247.pdf

CONFERENCE ABSTRACTS AND PRESENTATIONS (12 oral, 5 poster, * mentee)

March 2023 Talk. **Borges, S. R.**, Allen, R., Juarez Rivera, M., Sumner, D., Ostrach, L., Newly Discovered Antarctic Laminated Carbonate Rock Coatings as an Additional Analog to Potential Biosignatures on Mars, Arizona Imaging and Microanalysis Society (AIMS) 2023 conference

May 2022 Talk. **Borges, S. R.**, Sumner, D. Y., Dijkstra, P., Salvatore, M. R., Robinson, T. D., Ostrach, L. R., Juxtaposing Martian Biosignature Analogs from Cold and Hot Environments: Newly Discovered Antarctic Carbonate Structures and Hot Spring Silica Sinters, Astrobiology Science Conference (AbSciCon) 2022

May 2022 Talk. **Borges, S.**, Saleh, O., Chung, A. F., Fox, R. K., Leddin, E., Boll, A. M., THRIVE Lifeline: A Resource for People in STEMM with Marginalized Identities, Astrobiology Science Conference (AbSciCon) 2022

May 2022 Talk. Jones, G. G.*, **Borges, S. R.**, Robinson, T. D., Detectability of Surface Biosignatures for Directly Imaged Exoplanets, Astrobiology Science Conference (AbSciCon) 2022

May 2022 Poster. STROMATOLITE Syndicate, Barlow, E. V., **Borges, S. R.**, Cassady, V. C., Dobson, M. J., Galar, A., Gangidine, A., Hartz, J., Lyon, B., Meyer, A. C. S., Sagasti, A. J., Schaible, G. A., Sevgen, S., Soares, G. G., Sriaporn, C., Steller, L., Teece, B. L., Introducing the STROMATOLITES (Studying Totally Rad Objects in Modern and Ancient Thermal, Oceanic, Lithified, and Interlayered Textures on Earth/Exoplanets Syndicate): an International Collaborative Early Career Research Group in Astrobiology, Astrobiology Science Conference (AbSciCon) 2022

Apr. 2022 Talk. **Borges, S. R.**, Sumner, D. Y., Juarez Rivera, M., Dijkstra, P., Salvatore, M., Ostrach, L., Robinson, T., Juxtaposing Martian Biosignature Analogs from Cold and Hot Environments: Newly

Discovered Antarctic Carbonate Structures and Hot Spring Silica Sinters, McMurdo Long-Term Ecological Research Spring Student Showcase, virtual

Dec. 2021 Poster. Power, S. N., Salvatore, M. R., **Borges, S. R.**, Sokol, E. R., Stanish, L. F., Barrett, J. E., Investigating Detection Limits of Antarctic Microbial Communities Using Remote Sensing Data, American Geophysical Union (AGU) 2021 Fall Meeting

Nov. 2021 Talk. **Borges, S. R.**, Salvatore, M. R., Stanish, L. F., Power, S. N., Sokol, E. R., Barrett, J. E., Ostrach, L. R., High-resolution Satellite Mapping of Microbial Mats in Antarctica's Fryxell Basin, AZ AstroBio Symposium 2021, virtual

Nov. 2021 Talk. Jones, G. G.*, **Borges, S. R.**, Robinson, T. D., Detectability of Surface Biosignatures for Directly Imaged Exoplanets, AZ AstroBio Symposium 2021, virtual

Sept. 2021 Talk. **Borges, S. R.**, Salvatore, M. R., Stanish, L. F., Power, S. N., Sokol, E. R., Barrett, J. E., Ostrach, L. R., High-resolution Satellite Mapping of Microbial Mats in Antarctica's Fryxell Basin, Astrobiology Graduate Conference 2021, virtual

Sept. 2021 Talk. Jones, G. G.*, **Borges, S. R.**, Robinson, T. D., Detectability of Surface Biosignatures for Directly Imaged Exoplanets, Astrobiology Graduate Conference 2021, virtual

Aug. 2021 Talk. **Borges, S. R.**, Detecting Remote and *In Situ* Biosignatures from Fryxell Terrestrial Microbial Mats, Sumner Antarctic Research Symposium, virtual

Jul. 2021 Talk. Salvatore, M. R., Barrett, J. E., **Borges, S. R.**, Power, S. N., Sokol, E. R., Stanish, L. F., Counting Carbon I: Advances in Ecological Remote Sensing in Taylor Valley, Antarctica, Scientific Committee on Antarctic Research (SCAR) 2021 meeting, virtual

Jul. 2021 Talk. **Borges, S. R.**, Salvatore, M. R., Stanish, L. F., Power, S. N., Sokol, E. R., Barrett, J. E., Ostrach, L. R., Counting Carbon II: Spectral Endmember Diversity and Small-Scale Distributions, Scientific Committee on Antarctic Research (SCAR) 2021 meeting, virtual

Jul. 2021 Talk. Power, S. N., **Borges, S. R.**, Sokol, E. R., Stanish, L. F., Salvatore, M. R., Barrett, J. E., Counting Carbon III: Investigating Detection Limits of Microbial Communities Using Remote Sensing Data, Scientific Committee on Antarctic Research (SCAR) 2021 meeting, virtual

Mar. 2021 Poster. Strauss, B. E., Rasmussen, K. C., Maier, E. R., **Borges, S. R.**, Durbin, M., Erena, A., Faridani, T., Grier, J. A., O'Neill, T., Olsen, C., Riesbeck, L., Rivera-Valentín, E. G., Sneed, E. L., Wallach, A., Waller, D., Zamloot, V., Nonbinary Systems: Gender-Inclusive Study Methods in Planetary Science, Lunar and Planetary Science Conference (LPSC) 52, virtual

Sept. 2020 Talk. **Borges, S. R.**, Robinson, T. D., Simulating the Detection of Microbial Life on Earth-like Exoplanets, Research Rotation Presentation, NAU, virtual

Dec. 2020 Poster. Strauss, B. E., Rasmussen, K. C., Maier, E. R., **Borges, S. R.**, Durbin, M., Erena, A., Faridani, T., Grier, J. A., O'Neill, T., Olsen, C., Riesbeck, L., Rivera-Valentín, E. G., Sneed, E. L., Wallach, A., Waller, D., Zamloot, V., Non-binary Systems: Looking Toward the Future of Gender Equity in Planetary Science and Related Fields, American Geophysical Union (AGU) 2020 Fall Meeting, virtual

Nov. 2019 Poster. **Borges, S. R.,** Salvatore, M. R., Rutledge, A., Astrobiologic Implications of Fryxell Rock Coatings, 9th Annual oSTEM Conference: Visibility Fuels Opportunity, Detroit, MI

Sept. 2019 Talk. **Borges, S. R.,** Salvatore, M. R., Stanish, L. F., Power, S. N., Sokol, E. R., Barrett, J. E., Spectral Archive and Remote Characterization of Terrestrial Microbial Mats in the Fryxell Basin of Taylor Valley, Antarctica, Geological Society of America (GSA) 2019 Annual Meeting, #8-2

Sept. 2019 Talk. **Borges, S. R.,** Salvatore, M. R., Stanish, L. F., Power, S. N., Sokol, E. R., Barrett, J. E., Spectral Archive and Remote Characterization of Terrestrial Microbial Mats in the Fryxell Basin of Taylor Valley, Antarctica, 2019 Fall Flagstaff Astronomy Symposium

Aug. 2019 Poster. **Borges, S. R.,** Salvatore, M. R., Rutledge, A., Astrobiologic Implications of Fryxell Rock Coatings, McMurdo Dry Valleys Long Term Ecological Research (MCM-LTER) Project Annual Meeting in Denver, CO

Mar. 2019 Talk. Salvatore, M. R., **Borges, S. R.,** Remote Characterization of Microbial Communities in Antarctica and Astrobiological Implications, 2019 Spring Flagstaff Astronomy Symposium

Oct. 2018 Poster. **Borges, S. R.,** Nachon, M., Orientation of Calcium Sulfate Veins and Their Implication for Fluid Circulation Events at Gale Crater, Mars, Northern Arizona STEM Poster Session hosted by the Northern Arizona Planetary Science Alliance (NAPSA)

Jun. 2018 Poster. **Borges S. R.**, Nachon, M., Orientation of Calcium Sulfate Veins and Their Implication for Fluid Circulation Events at Gale Crater, Mars, Lawrence University Senior Thesis

Mar. 2018 Poster. **Borges S. R.**, Nachon, M., Orientation of Calcium Sulfate Veins and Their Implication for Fluid Circulation Events at Gale Crater, Mars, Lunar and Planetary Science Conference (LPSC) 49, The Woodlands, Texas, #2776

Dec. 2017 Talk. Nachon, M., Sumner, D.Y., **Borges, S. R.,** Stack, K., Stein, N., Watkins, J. A., Banham, S., Rivera-Hernández, F., Wiens, R.C., l'Haridon, J., Rapin, W., Kronyak, R., Stratigraphic distribution of veins in the Murray and Stimson formations, Gale crater, Mars: Implications for ancient groundwater circulation, American Geophysical Union (AGU) 2017 Fall Meeting, #P24B-03

Aug. 2017 Talk. **Borges, S. R.**, Nachon, M., Summary of Research Experience: Presentation presented at the University of California, Davis, Davis, CA

AWARDS AND HONORS

2022 NASA Astrobiology Early Career Collaboration Award: $3,248
2020 National Science Foundation Graduate Research Fellowship: ~$150,000
2018 Cum laude, Lawrence University
2018 Lantern Community Service Award, Lawrence University: $500
2017 – 2018 Chandler Senior Experience Grant, Lawrence University: $1,200
2015 – 2018 Franke D. Memorial Scholarship, Lawrence University
2014 PG&E PrideNetwork Scholar: $6,000
2014 Cabrillo Civic Clubs of California Scholarship: $500

PROFESSIONAL ACTIVITIES

2023 Invited Panelist for Womanium Astrobiology Program
2023 Invited Panelist for Labor in Space Panel, Space Science in Context 2023 conference
2022 Ocean World Analog Field Site Assessment Workshop
2021 Executive secretary for NASA funding program
2021 Discussion panel moderator for the Astrobiology Graduate Conference 2021
2021 Co-moderator for a session at the Scientific Committee on Antarctic Research 2021 Meeting
2020 Executive secretary for NASA funding program

SEMINARS AND COLLOQUIUMS

Oct. 2021 Seventh Semester Presentation, *Detecting Remote and In Situ Biosignatures from Fryxell Terrestrial Microbial Mats*, Dept. Astronomy and Planetary Science, Northern Arizona University, virtual

Sept. 2020 Research Rotation Project Presentation, *Simulating the Detection of Microbial Life on Earth-like Exoplanets,* Dept. Astronomy and Planetary Science, Northern Arizona University, virtual

TEACHING AND MENTORING EXPERIENCE

Guest Lecturer

AST 210: Celebrating Diversity in Astronomy (Northern Arizona University, Spring 2022, Spring 2023, & Spring 2024)
AST 183 & AST 184L: Life in the Universe class and laboratory (Northern Arizona University, Fall 2019 & Fall 2020)

Teaching Experience

AST 201L: Indigenous Astronomy (Northern Arizona University, Fall 2023 & Spring 2024)
AST 184L: Life in the Universe (Northern Arizona University, Fall 2018)
PHY 111L: General Physics I (Northern Arizona University, Fall 2018)

Mentoring Experience

Gabrielle G. Jones – Currently Space Systems Engineer at Katalyst Space Technologies
Undergraduate mentee (Northern Arizona University, 2020 – 2022)

PUBLIC AND COMMUNITY SERVICE

Community Engagement: International Activities

2021 – present Early Career Council, Network for Life Detection
- Member and co-lead of journal club discussions

2020 – present The STROMATOLITES (Studying Totally Rad Objects in Modern and Ancient Thermal, Oceanic, Lithified, and Inter-layered Textures on Earth/Exoplanets Syndicate)
- Co-founder and member

2020 – present Astrobiology Primer 3.0
- Co-authored Chapter 1 & 8

2020 – 2022 Crisis Responder, Training Assistant, Mentor, and Organizer for THRIVE Lifeline
- Train, mentor, provide crisis response, and logistically support the trans-owned suicide hotline, THRIVE Lifeline, which is staffed by and for people with marginalized identities in STEMM

2019 – 2020 Conference Vice Chair, oSTEM (Out in Science, Technology, Engineering, and Mathematics)
- Facilitate the production of annual oSTEM conferences dedicated to LGBTQIA2S+ people in STEMM

Community Engagement: Local Activities

2024 Arizona Astrobiology (AZ Astrobio) Symposium 2024 conference organizer

2023 Arizona Astrobiology (AZ Astrobio) Symposium 2023 conference organizer

2018 – present Guest lecturer for elementary school students in Bakersfield, CA, teaching them about geology, astronomy, biology, and Antarctic science

2021 Co-leader of NAU Astronomy & Planetary Science Graduate School 101 Summer Workshop

2021 Northern Arizona University Dept. of Astronomy & Planetary Science Unlearning Racism in Geoscience (URGE) pod member

2021 Invited speaker for the Northern Arizona University Astronomy Club

2021 Invited speaker for the Northern Arizona University Society for Women in Space Exploration

2020 – 2021 Social Justice Group Co-Chair, Dept. of Astronomy & Planetary Science Graduate Club, Northern Arizona University

2020 – 2021 Talked with 6th graders from Cranford, NJ about Antarctic science and astrobiology

2020 Assisted teaching elementary students about magnetic fields on Earth and Mars through Flagstaff's "Scientist in the Classroom" program

2019 – 2021 Assist in educational science outreach with the American Indian Mobile Educational Resources (AIMER), which is a NASA/Northern Arizona University Space Grant project

2019 – 2020 Co-developing of a Planetary Science Field Course at Northern Arizona University

2018 Talked with an elementary school robotics team from Virginia through "Skype a Scientist"

2018 Talked with 3rd-5th graders from Howell, MI about mining asteroids for the "Ask a Geologist" Michigan section of the American Institute of Professional Geologists (AIPG)

2017 – 2018 Council on Community Service and Engagement Chair, Student Government, Lawrence University

2017 Assisted in teaching children ages 6-12 about the Curiosity rover, Sacramento Science Center, CA

2016 – 2018 President and Founder**,** RiseUp, Lawrence University

2015 – 2018 Co-President, Lawrence University Geological Society, Lawrence University

Media Appearances and News Articles

Nov. 2022 Space.com, "NASA's Perseverance rover opens a window into Mars' watery past," https://www.space.com/mars-perseverance-rover-story-fire-water

Sept. 2022 The Astro Show, Wyoming Stargazing Special Guest: https://www.youtube.com/watch?v=6MyG9VIT_R8&list=PLTL-DoT_0H9jqitb-PdL5Qd52BmP330-I&index=30

Oct. 2021 Grad Chat by PhD Balance podcast, Navigating Academia as a Queer and Trans Person w/ Schuyler Borges, https://anchor.fm/phd-balance

Feb. 2021 Storytellers of STEMM, #99 - Antarctica Series 16: Schuyler Borges, podcast by Rachel Villani, https://anchor.fm/storytellersofSTEMM

Jan. 2021	Astronomy and Astrophysics Outlist: https://astro-outlist.github.io/
Aug. 2020	Arizona Daily Sun, "Biosignatures in rock: NAU doctoral student researching life on Mars using Antarctic data," https://azdailysun.com/news/local/education/biosignatures-in-rock-nau-doctoral-student-researching-life-on-mars-using-antarctic-data/article_30039944-0f44-56a1-a1fc-d2bc43c7357d.html
Jun. 2020	NAU News, "With prestigious NSF fellowship, NAU grad student tackling the question of life on Mars by way of Antarctica," https://news.nau.edu/grfp-schuyler-borges/#.X5Yll1NKjBI
Apr. 2019	500 Queer Scientists: https://500queerscientists.com/

TECHNICAL SKILLS

Remote Sensing Techniques: gravity, reflected and refracted seismic, resistivity, magnetic, controlled source audio-frequency magnetotellurics (CSAMT), GPR, magnetic and LiDAR mapping, visible/near-infrared (VNIR), short-wave infrared (SWIR), and thermal infrared (TIR) spectroscopy (field and lab), polarization techniques (field), satellite imagery and raster data (e.g., DEMs), Structure from Motion (SfM) photogrammetry

Laboratory Techniques: fluorometer & chlorophyll extractions, ash-free dry mass measurements, VNIR, SWIR, and TIR spectroscopy, X-ray diffraction (XRD), X-ray fluorescence (XRF), scanning electron microscopy (SEM), energy dispersive x-ray spectroscopy (EDS), backscattering electron (BSE) imaging, light microscopy, thin section petrography, sample preparation

Programming Languages & Computer Software: Software: ArcGIS, ENVI, Stereonet, gravity and seismic modeling software, RESIST, Agisoft, Microsoft Office, Outlook, and Google suites, ImageJ, and Adobe Illustrator; Programming & Modeling: Python, R, Davinci, linear spectral unmixing model, Spectral Mapping Atmospheric Radiative Transfer (SMART) model, and telescope high-contrast imaging noise model

Field Methods: geological and biological sample collection, preparation, observations, and documentation, foundational geological field measurements, instrumentation, navigation (e.g., GPS, Trimble), and techniques (e.g., stream profiles, topographic surveys, stratigraphic columns), geophysical surveying measurements, instrumentation, and techniques (e.g., seismic, GPR), spectral ground truthing for reflectance spectroscopy, remote sensing field measurements, instrumentation, and techniques (e.g., field spectrometer), logistical duties affiliated with camp maintenance, environmental preparedness, and hazard mitigation.

FIELDWORK EXPERIENCE

2019	Field technician for a Planetary Science and Technology from Analog Research (PSTAR) proposal on geophysical surveying techniques of the San Francisco Volcanic Field with applications to the Moon Techniques and research utilized: GPR, magnetic and LiDAR mapping
2019	Planetary Analogs Field Course: Active and Ancient Fluvial Systems, Northern Arizona University Techniques and research utilized: investigated the detection of life using polarization as a remote sensing technique
2018 – 2019	PhD research, Lake Fryxell, McMurdo Dry Valleys, Antarctica Techniques and research utilized: remote sensing techniques, biological sample collection, preparation, and analysis
2018	Introduction to Applied Geophysics, Northern Arizona University Techniques and research utilized*:* assisted the USGS with conducting a CSAMT survey in the Western Grand Canyon area to determine sources of water for the Hualapai Nation & conducted GPR survey of sinkholes at Lake Mary near Flagstaff, AZ
2018	Planetary Analogs Field Course: the San Francisco Volcanic Field, Northern Arizona University
2017	Geology of the Driftless Area Seminar Field Course, Lawrence University Techniques and research utilized: stream profiles, topographic surveys, and general understanding of the history of the Baraboo formation
2016	Associated Colleges of the Midwest (ACM) environmental science and geology study abroad program with the Osservatorio Geologico di Coldigioco in Apiro, Italy

Techniques and research utilized: mapping of the Apennines, stratigraphic column of the Dolomites, soil sampling, determination of ancient paleocurrents and orientation of folds in bedding, cyclostratigraphic analysis of the Scaglia Rossa Cretaceous unit of limestone across the K-Pg boundary at Monte Conero, Italy, analyzed geomorphology of terraces and stream channels in Tuscany, general geologic history of Italy and Croatia

UNDERGRADUATE INTERNSHIPS AND RESEARCH EXPERIENCE

2015, 2017 Volunteer Researcher, University of California, Davis, Davis, CA
Duties: Created a tool in ArcGIS that locates calcium sulfate veins in Mastcam images taken from the Curiosity rover on an orbital HiRISE image of Gale crater. Also investigated calcium sulfate vein orientation to determine possible formation mechanisms and timing of veins. Participated in lab group meetings focused on microbial mat communities in Lake Vanda and Lake Joyce, Antarctica. Advisors: Dr. Marion Nachon and Dr. Dawn Sumner

2015 Pacific Gas and Electric Company Bright Minds Scholarship Intern, San Ramon, CA
Duties: Located transmission lines traveling over rivers and found equipment numbers of assets that were replaced and/or repaired and used the programs SAP, Clarity, Google Earth, Excel, and EDRS to record information. Supervisor: Erick Corona