

ANDREA CORPOLONGO

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University of Cincinnati
Department of Geosciences
500 Geology-Physics Building
Cincinnati, OH 45221-0013

EDUCATION

| | | |
|------------|---|------|
| PhD | University of Cincinnati, Geoscience Dissertation: <i>Neoarchean Microfossils and Microbialites Inform the Search for Extraterrestrial Life in the Solar System</i> Advisor: Dr. Andrew Czaja | 2024 |
| MA | University of Cincinnati, Philosophy of Science Supervisor: Dr. Melissa Jacquart | 2024 |
| BS | Michigan State University, Plant Biology | 2004 |

PROFESSIONAL EXPERIENCE

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|---|--------------|
| Postdoctoral Fellow University of Cincinnati, Department of Geoscience | 2024-Current |
| Mars 2020 Mission Science Team Student Collaborator Documentarian SHERLOC Instrument team Astrobiology and Geochemistry working group | 2021-2024 |
| Contributing Editor Sciworthy | 2020-Current |
| Invertebrate Paleontology Collections Assistant Cincinnati Museum Center, Geier Collections and Research Center | 2019-20 |

SKILLS

Instrumentation

Highly skilled
Raman microspectroscopy, transmitted light microscopy, confocal laser scanning microscopy

Experienced
SEM/EDX

Data Analysis

Highly skilled
ImageJ image processing program, Loupe: M2020 SHERLOC visualization software

Proficient
Fytik peak fitting software, Excel

Experienced
R programming language

Sample Preparation

Highly skilled

Petrographic thin section preparation, wet mount slide preparation

RESEARCH

PEER-REVIEWED PUBLICATIONS

Jakubek, R., Corpolongo, A., Bhartia, R., Morris, R., Uckert, K., Asher, S., Burton, A., ... Steele, A. (2024). Spectral Background Calibration of SHERLOC Raman and Fluorescence Spectrometer Onboard the Perseverance Rover Enables Identification of a Ubiquitous Martian Spectral Component. *Applied Spectroscopy*.

<https://doi.org/10.1177/00037028241280081>

Siljeström, S., Czaja, A. D., Corpolongo, A., Berger, E. L., Li, A. Y., Cardarelli, E., Abbey, W., Asher, S. A., Beagle, L. W., Benison, K. C., Bhartia, R., Bleefeld, B. L., Burton, A. S., Bykov, S. V., Clark, B., DeFlores, L., Ehlmann, B. L., Fornaro, T., Fox, A., ... Zorzano, M.-P. (2024). Evidence of Sulfate-Rich Fluid Alteration in Jezero Crater Floor, Mars. *Journal of Geophysical Research: Planets*, 129(1), e2023JE007989.

<https://doi.org/10.1029/2023JE007989>

Neveu, M., Quinn, R., Barge, L., Craft., K., German, C., Getty, S., Glein, C., Parra, M., Burton, A., Cary, F., Corpolongo, A., ... Timm., J. (2024). Future of the search for Life: Workshop report. *Astrobiology*, 24(114-129). <https://doi.org/10.1089/ast.2022.0158>

Sharma, S., Roppel, R., Murphy, A., Beagle, L., Steele, A., Razzell Hollis, J., Siljeström, S., McCubbin, F., Asher, S., Abbey, W., Allwood, A., Berger, E., Bleefeld, B., Burton, Bykov, Cardarelli, E., Conrad, P., Corpolongo, A., ... Steadman, K. (2023). Diverse organic-mineral associations in Jezero crater, Mars. *Nature*, 619(724–732).

<https://doi.org/10.1038/s41586-023-06143-z>

Sun, V. Z., Hand, K. P., Stack, K. M., Farley, K. A., Simon, J. I., Newman, C., Sharma, S., Liu, Y., Wiens, R. C., Williams, A. J., Tosca, N., Alwmark, S., Beyssac, O., Brown, A., Calef, F., Cardarelli, E. L., Clavé, E., Cohen, B., Corpolongo, A., ... Wogsland, B. (2023). Overview and Results from the Mars 2020 Perseverance Rover's First Science Campaign on the Jezero Crater Floor. *JGR: Planets*, 128(6), e2022JE007613.

<https://doi.org/10.1029/2022JE007613>

Corpolongo, A., Jakubek, R., Abbey, W., Asher, S., Baker, D., Beagle, L., Berger, E., ... Yanchilina, A. (2023). SHERLOC Raman mineral detections of the Mars 2020 Crater Floor Campaign. *JGR Planets*, 128(3). <https://doi.org/10.1029/2022JE007455>

Razzell Hollis, J., Moore, K. R., Sharma, S., Beagle, L., Grotzinger, J. P., Allwood, A., Abbey, W., Bhartia, R., Brown, A. J., Clark, B., Cloutis, E., Corpolongo, A., ... Yanchilina, A. (2022). The power of paired proximity science observations: Co-located data from SHERLOC and PIXL on Mars. *Icarus*, 387, 115179.

<https://doi.org/10.1016/j.icarus.2022.115179>

PREPRINTS AND WHITE PAPERS

Meadows, V., Graham, H., Abrahamsson, V., Adam, Z., Amador-French, E., Arney, G., Barge, L., Barlow, E., Berea, A., Bose, M., Bower, D., Chan, M., Cleaves, J., Corpolongo, A., Currie, M., Domagal-Goldman, S., Dong, C., Eigenbrode, J., Enright, A., ... Young, L.

(2022). Community Report from the Biosignatures Standards of Evidence Workshop. *arXiv*. <https://doi.org/10.48550/arXiv.2210.14293>

Czaja, A., Corpolongo, A., Gangidine, A., Horgan, B., Kah, L., Osterhout, J., Ruff, S., Shkolyar, S., & Zaloumis, J. (2021). Mars as a compelling target in the continuing search for signs of ancient extraterrestrial life. *Bulletin of the AAS*, 53(4). <https://doi.org/10.3847/25c2cfb.514f9ff>

AWARDS, GRANTS, AND FELLOWSHIPS

University of Cincinnati, Department of Geosciences 2024
\$250 Graduate Research Award

University of Cincinnati 2023
Excellence in Undergraduate Research Mentorship

University of Cincinnati, Department of Geosciences 2023
\$1000 Kenneth E. Caster Award for Paleontological Research

Lewis and Clark Fund for Exploration and Field Research in Astrobiology 2022
\$2905 in support of fieldwork in the Green River Formation

NASA Future of the Search for Life (FoSL) Workshop Honorarium 2022
\$500 in recognition of workshop contributions

University of Cincinnati, Department of Geosciences 2021
\$250 Graduate Research Award

NSF, Sedimentary Geology and Paleobiology 2020-24
\$312,000 to fund the project: "Life on an oxidizing planet: Microbial ecosystems of a Neoarchean carbonate platform"*

*The PI on this grant is Dr. Andrew Czaja. Authorship of the proposal was approximately 50% A. Corpolongo and 50% A. Czaja. NSF does not allow graduate students to act as Co-PI on project proposals.

NSF, Graduate Research Fellowship 2020-24
\$138,000 in stipend and scholarship funding

Geological Society of America 2020
Graduate Student Research Award
\$575 in support of stable isotope analysis of Archean microbialites

NASA Astrobiology Institute 2019
Early Career Collaboration Award
\$5000 in support of fieldwork in South Africa

Paleontological Society 2019
Student Research Grant
\$1200 in support of fieldwork in South Africa

Paleontological Society 2019
Richard K. Bambach Award

SELECT PRESENTATIONS

* denotes mentee presenter

Corpolongo, A., Czaja, A., George, A., Jakubek, R. (2024). "Comparing relative peak positions in DUV and visible Raman spectra of biogenic calcite, Mg-calcite, and dolomite to support SHERLOC data interpretation" Poster Presentation. *AbSciCon24*. Providence, Rhode Island.

Clark, J. V., Conrad, P., Corpolongo, A., Cardarelli, E., Jakubek, R. S., Buckner, D., Steele, A., & Fries, M. (2024). Deep-UV Raman and Fluorescence of Perchlorates and Chlorates: Implications for the Detection of Oxychlorines by the SHERLOC Instrument in Jezero Crater, Mars. *LPSC 2024*. The Woodlands, Texas.

Jakubek, R. S., Corpolongo, A., Bhartia, R., Uckert, K., Asher, S. A., Burton, A. S., Fries, M. D., Hug, W. F., Lee, C., Scheller, E. L., Sharma, S., & Steele, A. (2024). Raman Spectral Background of SHERLOC. *LPSC 2024*. The Woodlands, Texas.

Corpolongo, A., Czaja, A., Jakubek, R., George, A., Kohl, J. (2023). "Morphological and geochemical analyses of Neoarchean microbialites inform the search for life on Mars" Oral Presentation. *ISSOL 2023*. Quito, Ecuador.

Corpolongo, A. (2023). "Do Astrobiologists Need a Definition of Life?" Poster Presentation. *ISSOL 2023*. Quito, Ecuador.

Corpolongo, A., Potochnik, A. (2023). "Astrobiologists Don't Need a Definition of Life" Oral Presentation. *ISHPSSB 2023*. Toronto, Canada.

George, A.* , Corpolongo, A., Czaja, A., (2023) "Archean Paleontology as an Analog for Possible Martian Life" Poster. *University of Cincinnati Undergraduate Scholarly Showcase 2023*. Cincinnati, OH.

Corpolongo, A., Jakubek, R., Abbey, W., Asher, S., Baker, D., Beegle, L., Berger, E., ...Yanchilina, A. "SHERLOC Raman Mineral Detections of the Mars 2020 Crater Floor Campaign" Virtual Poster Presentation. *AGU Fall Meeting 2022*.

Kohl, J.* , Czaja, A., Corpolongo, A. (2022). "Sources of silica and carbon in organic-rich cherts from the Neoarchean Gamohaan Formation, South Africa" Poster Presentation. *GSA Connects 2022*. Denver, CO.

Corpolongo, A., Czaja, A.D. (2022). "Evaluating Neoarchean microbial communities through three-dimensional visualization of microbialite structures" Oral Presentation. *Astrobiology Science Conference (AbSciCon 2022)*. Atlanta, GA.

Sharma, S., Beegle, L., Bhartia, R., Shkolyar, S., Berger, E., Corpolongo, A., Czaja, A., Murphy, A., Cloutis, E., Siljeström, S., Steele, A., Yanchilina, A. (2022) "On the hunt for detectable biosignatures in Jezero Crater: What to look for and where" Oral Presentation. *Astrobiology Science Conference (AbSciCon 2022)*. Atlanta, GA.

Corpolongo, A. (2022). "NASA's Perseverance Rover is searching for signs of ancient life on Mars" Virtual Oral Presentation. *2022 Joint North-Central & Southeastern GSA Section Meeting*. Cincinnati, OH.

Corpolongo, A. (2022). "Deep ultraviolet Raman spectroscopy of Neoarchean microbialites as analogs to possible Mars 2020 samples" Oral Presentation. *2022 Joint North-Central & Southeastern GSA Section Meeting*. Cincinnati, OH.

Czaja, A., Sharma, S., Allwood, A., Benison, K., Corpolongo, A., Gómez, F., Mayhew, L., Septon, M., Siljeström, S., Williams., A. (2022). "Sampling potential biosignatures with

the Mars 2020 Perseverance Rover" Oral Presentation. *2022 Joint North-Central & Southeastern GSA Section Meeting*. Cincinnati, OH.

Kohl, J.* , Corpolongo, A. (2022). "Using 3D Projections to Understand Precambrian Microbialite Morphology" Poster Presentation. *2022 Joint North-Central & Southeastern GSA Section Meeting*. Cincinnati, OH.

Corpolongo, A., Czaja, A.D. (2021). "Neoarchean microorganisms took advantage of a sub-wavebase O₂ gradient approximately 100-200 million years prior to the GOE" Virtual Oral Presentation. *GSA Connects 2021*.

Corpolongo, A. (2021). "Possible Neoarchean Microaerophilic Iron Oxidizing Microorganisms" Oral Presentation. *University of Cincinnati*. Cincinnati, OH.

Corpolongo, A., Czaja, A.D. (2020). "2.5 Ga sub-tidal microfossils of the Campbellrand-Malmani carbonate platform, Kaapvaal Craton, South Africa" Virtual Oral Presentation. *GSA 2020 Connects Online*.

Corpolongo, A., Czaja, A.D. (2020). "Sub-tidal microfossils of the 2.5 Ga Campbellrand-Malmani carbonate platform, Kaapvaal Craton, South Africa" Virtual Oral Presentation. *Virtual AbGradE 2020*.

Corpolongo, A. (2020). "Sub-wavebase microbialites of the Neoarchean Campbellrand-Malmani carbonate platform" Oral Presentation. *University of Cincinnati*. Cincinnati, OH.

Corpolongo, A., Czaja, A.D., Beukes, N.J. (2019). "Microfossils across the Neoarchean Campbellrand-Malmani Carbonate Platform, Kaapvaal Craton, South Africa" Virtual Poster Presentation. *AGU Fall Meeting 2019*.

Corpolongo, A., Czaja, A.D., Beukes, N.J. (2019). "Microfossils from a Range of Depositional Environments across the Neoarchean Campbellrand-Malmani Carbonate Platform, Kaapvaal Craton, South Africa" Oral Presentation. *The Great Lakes Student Paleoconference*. Ann Arbor, MI.

Corpolongo, A., Czaja, A.D., Beukes, N.J. (2019). "Organic-Walled Microfossils from Basinal to Supratidal Microbialite Facies across the Neoarchean Campbellrand-Malmani Carbonate Platform, Kaapvaal Craton, South Africa" Poster Presentation. *GSA 2019*. Phoenix, AZ.

Corpolongo, A., Czaja, A.D. (2019). "Extra-Large and Morphologically Unique Microfossils of the 2.52 Ga Gamohaan Formation, South Africa" Poster Presentation. *Astrobiology Science Conference (AbSciCon)*. Bellevue, WA.

Corpolongo, A. (2019). "Active Learning: Going Beyond Textbook + Lecture = Class" Oral Presentation. *Get Up and Go*, University of Cincinnati. Cincinnati, OH.

Corpolongo, A. (2019). "What Triggered the GOE? Neoarchean Microfossils of the Gamohaan and Frisco Formations" Oral Presentation. *University of Cincinnati*. Cincinnati, OH.

FIELD WORK

Neoarchean Gamohaan Formation, Campbellrand-Malmani Carbonate Platform, South Africa, July 2024

Paleoarchean Moodies Group, Barberton Greenstone Belt, South Africa, July 2022

Neoarchean Gamohaan Formation, Campbellrand-Malmani Carbonate Platform, South Africa, July 2022

Eocene Lake Gosiute, Green River Formation, Colorado/Wyoming, June 2022

Neoarchean Campbellrand-Malmani Carbonate Platform, South Africa, August 2019

PROFESSIONAL DEVELOPMENT

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| Astrobiology Mission Ideation Factory II NASA Ames Research Center | November 2024 |
| SHERLOC Team Meeting Carnegie Science Institute | September 2023 |
| Astrobiology Mission Ideation Factory I NASA Goddard Space Center | August 2023 |
| Gunflint Formation Field Trip Participant University of Cincinnati Department of Geosciences | August 2022 |
| Unlearning Racism in the Geosciences (URGE) Pod participant | 2021 |
| Science Writing for the People Online Course Sciworthy | May 2020 |
| Sharing Science Workshop and Practicum Cincinnati Museum Center | February 2020 |
| 2019 IAGD Accessible Field Trip Petrified Forest National Park | September 2019 |
| Mentor Training University of Cincinnati Grad/Undergrad Research Connections | September 2019 |
| Origins of Life Online Course Santa Fe Institute | Summer 2019 |
| Ion Microprobe Student Workshop University of California Los Angeles SIMS facility | February 2019 |

TEACHING

RECENT TEACHING AND MENTORING EXPERIENCE

| | |
|---|--------------|
| Undergraduate Research Mentor University of Cincinnati | 2020-Current |
| Seminar Co-leader “Colonialism and Geoscience” University of Cincinnati Department of Geosciences | Spring 2021 |
| Teaching Assistant “Earthquakes and Society” University of Cincinnati Department of Geosciences | Spring 2020 |
| Teaching Assistant “Astrobiology: Life in the Universe” University of Cincinnati Department of Geoscience | Fall 2019 |
| Teaching Assistant “Geochemistry” | Fall 2019 |

University of Cincinnati Department of Geosciences

Teaching Assistant “Environmental Studies II”
University of Cincinnati Department of Geoscience

Spring 2019

Teaching Assistant “Environmental Volcanology”
University of Cincinnati Department of Geosciences

Fall 2018

SERVICE

SERVICE TO THE PROFESSION

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| AbSciCon 2024 Session Chair Biosignature detection techniques for returned samples | 2024 |
| Peer Reviewer For the journals Geobiology, JGR: Planets, Vibrational Spectroscopy, and Chemical Geology | 2024 |
| Geology Outreach Group University of Cincinnati Department of Geosciences | 2020-Current |
| Social Media Team Member Network for Life Detection, NASA Research Coordination Network | 2021-23 |
| NASA Workshop Participant/Report Contributor Future of the Search for Life (FoSL) workshop | 2022 |
| AbSciCon 2022 Session Chair Recent Advances, Development, and New Challenges in Understanding Early Life | 2022 |
| Joint North-Central & Southeastern GSA Section Meeting Session Leader Directions in Geoscience and Careers: Virtual Student Outreach Event | 2022 |
| Joint North-Central & Southeastern GSA Section Meeting Session Leader Geoscience in Plain Language | 2022 |
| Expert Reviewer Life Detection Knowledge Base | 2022 |
| North-Central/Southeastern GSA Section Meeting Planning Committee Outreach Subcommittee | 2021-22 |
| NASA Workshop Participant/Report Co-author Biosignatures Standards of Evidence Workshop | 2021 |
| DE&I Committee Student Representative University of Cincinnati Department of Geosciences | 2020 |
| Get Up and Go Teaching Workshop Co-organizer University of Cincinnati Graduate Association for Teaching Enhancement | August 2019 |
| Teach Me to Teach Workshop Co-organizer University of Cincinnati Graduate Association for Teaching Enhancement | April 2019 |

PUBLIC ENGAGEMENT AND OUTREACH

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| Library Outreach Presentation Fossils in the Walls | March 2024 |
| Library Outreach Presentation Fossils in the Walls | April 2023 |
| Cincinnati Fossil Hunt Leader Girl Scouts of the USA | May 2022 |
| Trammel Fossil Park Open House Co-leader Sharonville Parks and Recreation | April 2022 |
| Cincinnati Fossil Hunt Co-Leader Pleasant Ridge Montessori | May 2021 |
| Physical Geology Virtual Workshop Co-Leader Scouts BSA | March 2021 |
| Elementary School Virtual Outreach Presentation Fossils in the Walls | February 2021 |
| Elementary School Virtual Outreach Presentation What is Precambrian Paleontology? | February 2021 |
| Educational Activity Kit Co-creator <u>Discover Fossils of Ohio</u> | May 2020 |
| Elementary School Virtual Outreach Presentation What is Precambrian Paleontology? | April 2020 |
| Virtual Science Expo Judge 2020 Virtual Southwest Ohio Science and Engineering Expo | April 2020 |
| UC Undergraduate Scholarly Showcase Judge | April 2019 |
| Science Expo Judge 2019 Southwest Ohio Science and Engineering Expo | April 2019 |
| Physical Geology Workshop Co-Leader Scouts BSA | March 2019 |
| Elementary School Virtual Outreach Presentation What is Precambrian Paleontology? | April 2019 |

OUTREACH PUBLICATIONS

Corpolongo, A. (2024, September 9) *How will the melting Greenland Ice Sheet affect ocean currents?* Sciworthy. <https://sciworthy.com/could-the-melting-greenland-ice-sheet-change-ocean-currents/>

Corpolongo, A. (2021, December 6). *How can we search for life as we don't know it?* Sciworthy. <https://sciworthy.com/how-can-we-search-for-life-as-we-dont-know-it/>

Corpolongo, A. (2021, October 21). *Mars could host a deep underground biosphere*. Sciworthy. <https://sciworthy.com/mars-could-host-a-deep-underground-biosphere/>

Corpolongo, A. (2021, August 11). *3.42 billion-year-old fossilized microbes in an ancient hydrothermal vent*. Sciworthy. <https://sciworthy.com/3-42-billion-year-old-fossilized-microbes-in-an-ancient-hydrothermal-vent/>

Corpolongo, A. (2021, June 22). *How long ago did we learn to move?* Sciworthy. <https://sciworthy.com/how-long-ago-did-we-learn-to-move/>

Corpolongo, A. (2020, September 1). *Deep-sea mining impacts on diverse ocean ecosystems*. Sciworthy. <https://sciworthy.com/deep-sea-mining-threatens-the-foundation-of-diverse-ocean-ecosystems/>

Corpolongo, A. (2020, July 28). *Ancient microbes reveal Earth's response to the asteroid that killed the dinosaurs*. Sciworthy. <https://sciworthy.com/ancient-microbes-revealearths-response-to-the-asteroid-that-killed-the-dinosaurs/>

Corpolongo, A. (2020, June 5). *A new way to look for signs of ancient life on Earth and Mars*. Sciworthy. <https://sciworthy.com/a-new-way-to-look-for-signs-of-ancient-life-on-earth-and-mars/>

MEDIA COVERAGE

Miller, M. (2024, February 22). *The search for signs of life on Mars continues*. Earth.com. <https://www.uc.edu/news/articles/2024/02/search-for-life-on-mars-continues-on-third-anniversary-of-rover-mission.html>

Gangidine, A. (Host). (2023, January 19). The Perseverance Mars Rover and Ancient Life (No. 10) [Audio Podcast Episode]. In *Cranbrook Paleo Podcast*. Cranbrook Institute of Science. <https://science.cranbrook.edu/explore/paleo-podcast>

Bangert, B. (2022, September 20). *UC geologists uncover the stories rocks tell, exploring ancient formations along Lake Superior*. UC News. <https://www.uc.edu/news/articles/2022/08/on-field-trip-uc-students-faculty-alumni-have-the-stones-and-skills-to-uncover-stories-rocks-can-tell.html>

Czaja, A., Corpolongo, A., (2022, August 1). *University of Cincinnati professor, students take part in NASA's Mars research*. Spectrum News 1. <https://spectrumnews1.com/oh/columbus/news/2022/08/01/university-of-cincinnati-mars-research#>

Miller, M. (2022, July 11). *The Search for Life on Mars*. UC News. <https://www.uc.edu/news/articles/2022/06/uc-geology-students-help-nasa-search-for-evidence-of-ancient-life-on-mars.html>

Emery, E. (2022, June 23). *The search for life on Mars: how the University of Cincinnati is involved*. Fox 19 Now. <https://www.fox19.com/2022/06/23/search-life-mars-how-university-cincinnati-is-involved/>

PROFESSIONAL SOCIETIES

International Association for Geoscience Diversity
Geological Society of America
Paleontological Society
Philosophy of Science Association