

Yihang Fang

EDUCATION

- Ph.D.** **Geoscience, University of Wisconsin-Madison, 2022**
Advisor: Prof. Huifang Xu
Dissertation: Abiotic sedimentary dolomite formation: from nano- to macro-scale
- M.S.** **Geoscience, University of Wisconsin-Madison, 2016**
Advisor: Prof. Huifang Xu
- B.S.** **Geology and Geophysics, and Mathematics with a certificate in Physics, University of Wisconsin-Madison, 2014**

RESEARCH EXPERIENCE

- 2025 - Present** **Assistant Professor**
Earth and Environmental Science, Division of Natural and Environmental Sciences
University of Missouri-Kansas City
- 2025** **Postdoctoral Research Associate**
Arizona State University, School of Molecular Sciences
Working with Dr. Hongwu Xu
- 2024 - 2025** **Postdoctoral Research Associate**
Los Alamos National Laboratory, Earth and Environmental Sciences
Working with Dr. Hongwu Xu and Dr. Hakim Boukhalfa
- 2022 - 2024** **Postdoctoral Research Associate**
Washington University in St. Louis, Department of Earth and Planetary Sciences
Working with Prof. Jeffrey G. Catalano
- 2021** **Big Ten Academic Alliance Predoctoral Fellow**
Smithsonian National Museum of Natural History, Department of Mineral Sciences
Working with Dr. Gabriela A. Farfan
- 2019 - 2022** **Lab manager for the S.W. Bailey Powder X-ray Diffraction Laboratory**
Department of Geoscience, University of Wisconsin-Madison
Department of Geoscience, University of Wisconsin-Madison

PEER-REVIEWED PUBLICATIONS

17. Ledingham, G.J., Custis, A.T., **Fang, Y.**, and Catalano, J.G. Short-term inhibition and long-term enhancement of irreversible trace metal binding to goethite in multi-metal systems. *Environmental Science & Technology*, **59**, 12302-12313. <https://doi.org/10.1021/acs.est.5c03866>
16. **Fang, Y.**, Lee, S.S., Ledingham, G.J., Stubbs, J., Eng, P., Catalano, J.G., **2025**. Complex Adsorption behavior of neodymium and ytterbium on structurally-distinct alumina surfaces. *Environmental Science & Technology*, **59**, 3972-3981. <https://doi.org/10.1021/acs.est.4c10140>

15. Hobbs, F., **Fang, Y.**, Brown, N., Yang, Y., and Xu, H., **2024**. Co-precipitation of Primary Dolomite and Mg-rich clays in Deep Springs Lake. *Sedimentology*, **71**, 1363-1383.
<https://doi.org/10.1111/sed.13176>
14. Ledingham, G.J., **Fang, Y.**, and Catalano, J.G, **2024**. Irreversible trace metal binding to goethite controlled by ion size. *Environmental Science & Technology*, **58**, 2007-2016.
<https://doi.org/10.1021/acs.est.3c06516>
13. **Fang, Y.**, Lee, S., Xu, H., and Farfan, G.A., **2023**. Organic controls over biomineral Ca-Mg carbonate compositions and morphologies. *Crystal Growth and Design*, **23**, 4872-4882.
<https://doi.org/10.1021/acs.cgd.3c00102>
12. **Fang, Y.**, Hobbs, F., Yang, Y., and Xu, H., **2023**. Dissolved silica-driven dolomite precipitation in the Great Salt Lake, Utah and its implication for dolomite formation in hypersaline/saline environments. *Sedimentology*, **70**, 1328-1347. <https://doi.org/10.1111/sed.13081>
11. **Fang, Y.**, and Xu, H., **2022**. Coupled dolomite and silica precipitation from continental weathering during deglaciation. *Precambrian Research*, **380**, 106824.
<https://doi.org/10.1016/j.precamres.2022.106824>
10. **Fang, Y.**, and Xu, H., **2022**. Dissolved silica-driven sedimentary dolomite precipitation. *American Mineralogist*, **107**, 443-452. <https://doi.org/10.2138/am-2021-7474>
9. Napieralski, S., **Fang, Y.**, Marcon, V., Brantley, S.L., Xu, H., and Roden, E.E., **2022**. Microbial chemolithotrophic oxidation of pyrite in a subsurface shale weathering environment: Geologic considerations and potential mechanisms. *Geobiology*, **20**, 271-291.
<https://doi.org/10.1111/gbi.12474>
8. **Fang, Y.**, Zhang, F., Farfan, G.A., and Xu, H., **2021**. Low temperature synthesis of disordered dolomite and high magnesium calcite in ethanol-water solutions: The solvation effect. *ACS Omega*, **7**, 281-292. <https://doi.org/10.1021/acsomega.1c04624>
7. Li, H., Sun, C., **Fang, Y.**, Xu, H., Jesovnik, A., Schultz, R., Gilbert, P., and Currie, C.R., **2020**. Biomineral armor in leaf-cutter ants. *Nature Communication*, **11**, 5792.
<https://www.nature.com/articles/s41467-020-19566-3>
6. Schwid, M.F., Xiao, S., Hiatt, E.E., **Fang, Y.**, and Nolan, M.R., **2020**. Iron phosphate in the Ediacaran Doushantuo Formation of South China: A previously undocumented marine phosphate sink. *Palaeogeography, Palaeoclimatology, Palaeoecology*, **560**, 109993.
<https://doi.org/10.1016/j.palaeo.2020.109993>
5. Dunham, E.C., Fones, E.M., **Fang, Y.**, Lindsay, M.R., Steuer, C., Fox, N.R., Wilis, M., Walsh, A., Colman, D., Baxter, B.K., Lageson, D., Mogk, D., Rupke, A., Xu, H., and Boyd, E., **2020**. An ecological perspective on dolomite formation in Great Salt Lake, Utah. *Frontiers in Earth Sciences*, **8**, 24. <https://doi.org/10.3389/feart.2020.00024>
4. Yu, W., Xu, H., Tan, D., **Fang, Y.**, Roden, E.E., and Wan, Q., **2020**. Adsorption of iodate on nanosized tubular halloysite. *Applied Clay Science*, **184**, 105407. <https://doi.org/10.1016/j.clay.2019.105407>
3. **Fang, Y.**, and Xu, H., **2019**. A new approach to quantify ordering state of protodolomite using XRD, TEM and Z-contrast imaging. *Journal of Sedimentary Research*, **89**, 537-551.
<https://doi.org/10.2110/jsr.2019.29>
2. **Fang, Y.**, and Xu, H., **2018**. Study of an Ordovician carbonate with alternating dolomite-calcite laminations and its implication for catalytic effects of microbes on sedimentary dolomite formation. *Journal of Sedimentary Research*, **88**, 679-695. <https://doi.org/10.2110/jsr.2018.35>

1. Xu, H., Zhou, M., **Fang, Y.**, and Teng, H.H., **2018**. Effect of mica and hematite (001) surfaces on the precipitation of calcite. *Minerals*, **8**, 17. <https://doi.org/10.3390/min8010017>

AWARDS, GRANTS, AND FELLOWSHIPS

- 2024** Geological Society of America Marine and Coastal Geological Division Field Trip Award
- 2023** C.F. Schiesser Outstanding Student Research Paper Award
- 2022** Minerals 2022 Best Ph.D. Thesis Award
C.F. Schiesser Outstanding Student Research Paper Award
- 2021** Geological Society of America Lipman Student Research Grant
Thomas E. Berg Award for Excellence in Teaching
Best Talk for IAS Carbonate Forum 2021
- 2020** Big Ten Academic Alliance Smithsonian Institution Predoctoral Fellowship, National Museum of Natural History
C.F. Schiesser Outstanding Student Research Paper Award
Thomas E. Berg Award for Excellence in Teaching
- 2019** Graduate Summer Research Fund, Department of Geoscience, University of Wisconsin-Madison
Student Research Grants Competition – Conference Presentation, Wisconsin Scholarship Hub, University of Wisconsin-Madison
IAS Travel Grant for 34th IAS Meeting of Sedimentology, Rome, International Association of Sedimentologist
The S.W. Bailey Distinguished Graduate Fellowship, Department of Geoscience, University of Wisconsin-Madison
C.F. Schiesser Outstanding Student Research Paper Award
- 2018** Graduate Summer Research Fund, Department of Geoscience, University of Wisconsin-Madison
The S.W. Bailey Scholarship, Department of Geoscience, University of Wisconsin-Madison
- 2015** Graduate Summer Research Fund, Department of Geoscience, University of Wisconsin-Madison
Travel grant for GSA annual meeting Baltimore, MD, Department of Geoscience, University of Wisconsin-Madison
- 2014** Winchell Scholarship, Department of Geoscience, University of Wisconsin-Madison
- 2013** Travel grant for GSA annual meeting Denver, CO, Department of Geoscience, University of Wisconsin-Madison

TEACHING EXPERIENCES

- Teaching Assistant:** *Geoscience 360 - Mineralogy* (Fall 2021, Fall 2020, Fall 2019, Fall 2017)
Department of Geoscience, University of Wisconsin-Madison
- Teaching Assistant:** *Math 320 – Differential Equation and Linear Algebra* (Spring 2019)
Department of Mathematics, University of Wisconsin-Madison
- Grader:** *Material Science and Engineering 530 – Thermodynamics* (Spring 2019)
Material Science and Engineering, University of Wisconsin-Madison
- Teaching Assistant:** *Geoscience 204 – Geologic Evolution of the Earth* (Spring 2018, Spring 2015)
Department of Geoscience, University of Wisconsin-Madison

INVITED TALKS

1. **Fang, Y.** (2025). Mineral-water interface and the surface of the Earth. Department of Geology. Kansas State University.
2. **Fang, Y.** (2025). Minerals and the Evolution of the Earth. Department of Earth Sciences. South Alabama University.
3. **Fang, Y.** (2024). The unforeseen mineral interactions. Department of Atmospheric, Oceanic and Earth Sciences. George Mason University.
4. **Fang, Y.**, and Xu, H.. (2024). From promotion to inhibition: effects of silica on carbonate mineral growth. Geological Society of America Annual Meeting (Anaheim, CA).
5. **Fang, Y.**, Ledingham, G.J., Stagg, O., Stubbs, J.E., Eng, P.J., and Catalano, J.G.. (2024). Effects of solution chemistry on rare earth element adsorptions at alumina-water interface. American Chemical Society Spring 2024 Meeting (New Orleans, LA).
6. **Fang, Y.** (2023). Linking minerals and aqueous geochemistry: implications for elemental cycling. National Museum of Natural History, Smithsonian Institution.
7. **Fang, Y.** (2023). Coupling of carbon and silicon cycles through carbonate and silicate interaction. Department of Geosciences, Mississippi State University.
8. **Fang, Y.**, and Xu, H.. (2022). Silica effect on dolomite crystal sizes during formation and burial. 21st International Sedimentological Congress.
9. **Fang, Y.** (2021). Biomineralization mechanism for Ca-Mg carbonates on leaf-cutting ants, National Museum of Natural History, Smithsonian Institution.
10. **Fang, Y.** (2021). A new abiotic sedimentary dolomite precipitation mechanism and its implications. Department of Geosciences, Virginia Tech.
11. **Fang, Y.**, Li, H. and Xu, H.. (2020). High magnesium calcite and disordered dolomite growth on leaf-cutting ants: Challenges and implications. Microscopy & MicroAnalysis Virtual Meeting.

CONFERENCE PRESENTATIONS

1. Farfan, A.G., **Fang, Y.**, Thompson, D., and Kojima, A. (2024). Assessing the reliability of biocarbonate paleoproxies from a mineralogical perspective. American Geophysical Union Fall Meeting (Washington DC). *Oral Presentation*
2. **Fang, Y.**, Lee, S.S., Ledingham, G.J., Stagg, O., Stubbs, J., Eng, P.J., Catalano, J.G.. (2024). Controls of rare earth elements fractionation during competitive adsorption on corundum surface. Goldschmidt Conference (Chicago, IL). *Oral Presentation*.
3. Catalano, J.G., Ledingham, G.J., **Fang, Y.** (2024). Dynamic trace metal redistribution by goethite via redox and non-redox processes. Goldschmidt Conference (Chicago, IL). *Oral Presentation*.
4. Catalano, J.G., **Fang, Y.**, Ledingham, G.J., Stagg, O., Stubbs, J.E., and Eng, P.J.. (2024). Surface-specific selectivity patterns during rare earth element adsorption: implications for fractionation patterns in regolith-hosted deposits. 2024 Hydrothermal Geochemistry and Critical Minerals Meetings (Socorro, NM). *Oral Presentation*.
5. Martin, A.S., **Fang, Y.**, Kaczmarek, S.E.. (2024). A comparison of TEM microstructures: Observed features in natural and synthetic dolomites. SEPM International Sedimentary Geoscience Congress (Flagstaff, AZ). *Poster presentation*.
6. Catalano, J.G., **Fang, Y.**, Ledingham, G.J., Stagg, O., Ramanzanova, E., Giammar, D.E., Stubbs, J., Eng, P.J.. (2024). Surface-specific selectivity during lanthanide adsorption at aluminum oxide-water interfaces. American Chemical Society Spring 2024 Meeting (New Orleans, LA). *Oral Presentation*.

7. **Fang, Y.**, Lee, S., Xu, H., Farfan, G.A.. (2023). Catalytic and surface effects of organic compounds on Ca-Mg carbonate formation. American Geophysical Union Fall Meeting (San Francisco, CA). *Oral Presentation*
8. **Fang, Y.**, Ledingham, G.J., Stagg, O., Stubbs, J.E., Eng, P.J., Catalano, J.G.. (2023). Factors controlling competitive adsorption of rare earth elements on aluminum oxide surface. American Geophysical Union Fall Meeting (San Francisco, CA). *Poster Presentation*
9. **Fang, Y.**, Lee, S., Xu, H., Farfan, G.A.. (2023). Ca-Mg carbonate biomineral controlled by organic compound and surface effects. Geological Society of America Annual Meeting (Pittsburg, PA). *Oral Presentation*
10. **Fang, Y.**, Ledingham, G.J., Stagg, O., Stubbs, J.E., Eng, P.J., Catalano, J.G.. (2023). Competitive adsorption of rare earth elements on alumina-water surface. Geological Society of America Annual Meeting (Pittsburg, PA). *Poster Presentation*
11. Ledingham, G.J., Custis, A.T., **Fang, Y.**, J., Catalano, J.G.. (2023). Competitive effects on adsorbed nickel accessibility at the goethite surface. Geological Society of America Annual Meeting (Pittsburg, PA). *Oral Presentation*
12. Catalano, J.G., **Fang, Y.**, Ledingham, G.J., Stagg, O., Ramazanov, E., Giammar, D.E., Stubbs, J., Eng, P.J., Bylaska, E.J.. (2023). Competition and selectivity during rare earth element adsorption at aluminum oxide-water interfaces. Goldschmidt Conference (Lyon, France). *Oral Presentation*
13. **Fang, Y.**, Lee, S., Xu, H., Farfan, G.A.. (2023). Amino acid and chitin controlled Ca-Mg carbonate precipitation. Goldschmidt Conference (Lyon, France). *Poster Presentation*
14. Wilcott, C.K., Juang, C., **Fang, Y.** (2022). Asian Americans and Pacific Islanders in Geosciences (AAPiG) Town Hall: Accomplishments and Future Vision. American Geophysical Union Fall Meeting (Chicago, IL). *Oral Presentation*
15. **Fang, Y.**, Farfan, G.A., and Xu, H.. (2022). Understanding dolomite problem through low temperature synthesis of disordered dolomite by catalysis and solvation effect. American Geophysical Union Fall Meeting (Chicago, IL). *Oral Presentation*
16. Brown, N., Xu, H., **Fang, Y.**, Yang, Y.. (2022). Formation mechanism of modern dolomite and Ca-bearing magnesite in Lake Beac, Australia. Geological Society of America Annual Meeting (Denver, CO). *Oral Presentation*
17. **Fang, Y.**, Hobbs, F., and Xu, H.. (2022). Abiotic driven primary dolomite precipitation in the Great Salt Lake, Utah, USA. 21st International Sedimentological Congress (Beijing 2022; Virtual). *Oral Presentation*
18. **Fang, Y.**, Hobbs, F., and Xu, H.. (2022). Dissolved silica driven dolomite precipitation in the Great Salt Lake, Utah. Goldschmidt Conference (Honolulu, Hawaii). *Oral Presentation*
19. **Fang, Y.**, and Xu, H.. (2022). Constraining Marinoan cap carbonate formation using a geochemical model coupling dolomite formation with dissolved silica. Carbonate Forum 2022. *Oral Presentation*
20. **Fang, Y.**, and Xu, H.. (2021). Dissolved silica driven rapid precipitation of cap carbonate during deglaciation of the Marinoan Snowball Earth. Geological Society of America Annual Meeting (Portland, OR). *Oral Presentation*
21. Brown, N., **Fang, Y.**, and Xu, H.. (2021). Direct precipitation of Oneota dolomite of the Upper Sauk Megasequence. Geological Society of America Annual Meeting (Portland, OR). *Oral Presentation*
22. **Fang, Y.**, Hobbs, F.W.C., and Xu, H.. (2021). Roles of dissolved silica in promoting abiotic precipitation of dolomite in the Great Salt Lake, Utah. American Geophysical Union Fall Meeting (New Orleans, LA, attended virtually). *Poster Presentation*
23. **Fang, Y.**, and Xu, H.. (2021). Dissolved silica catalyzed primary dolomite precipitation and adsorbed silica restricting dolomite size growth during recrystallization in Lower Silurian dolomite. American Geophysical Union Fall Meeting (New Orleans, LA, attended virtually). *Oral Presentation*

24. **Fang, Y.**, and Xu, H.. (2021). Dissolved silica catalyzed disordered dolomite precipitation: An abiotic key to the dolomite problem. Carbonate Forum 2021, (Virtual). *Oral Presentation*
25. **Fang, Y.**, and Xu, H.. (2020). Diatom diminishes dolomite: Precipitation of disordered dolomite catalyzed by dissolved silica. Geological Society of America Annual Meeting, (Virtual). *Oral Presentation*
26. **Fang, Y.**, and Xu, H.. (2020). Quantification of protodolomite using a combination of XRD, EDS, Z-contrast imaging and simulation. Microscopy & MicroAnalysis (Virtual). *Oral Presentation*
27. **Fang, Y.**, and Xu, H.. (2020). Precipitation of disordered dolomite catalyzed by dissolved silica. Goldschmidt Conference, (Virtual). *Oral Presentation*
28. **Fang, Y.**, and Xu, H.. (2015). Modern dolomite from Manito Lake, Great Plains, and its implication. Astrobiology Graduate Conference (Madison, WI). *Oral Presentation*
29. **Fang, Y.**, and Xu, H.. (2015). Study on an oscillatory micro-laminated dolomite/limestone rock and its implication on sedimentary dolomite formation. Geological Society of America Annual Meeting (Baltimore, ML). *Oral Presentation*
30. **Fang, Y.**, and Xu, H.. (2013). Sedimentary carbonate rocks with dolomite/calcite micro-laminae: potential indicator for seasonal change. Geological Society of America Annual Meeting (Denver, CO). *Poster Presentation*

OTHER PROFESSIONAL ACTIVITIES

Session Co-Chair, (2024) Goldschmidt conference. session 9e Biomineralization and Geobiology: The intersection between life and minerals

Session Co-Chair, (2022) Goldschmidt conference. session 7o Biomineralization: mechanisms, functions and geochemical importance

PEER REVIEW ACTIVITIES

- *American Mineralogist*
- *Applied Sciences*
- *Crystal Growth & Design*
- *Earth and Planetary Science Letters*
- *Environmental Science & Technology*
- *Journal of Marine Science and Engineering*
- *Marine and Petroleum Geology*
- *Scientific Reports*
- *The Journal of Physical Chemistry C*

COMMUNITY AND DEI INVOLVEMENT

- **Mineralogy/Petrology Research Grant Committee (2025)** of Mineralogical Society of America (MSA)
- **Early Career Committee (2024-present)** of Mineralogical Society of America (MSA)
- **Executive Director (2024-present)** of Asian American and Pacific Islands in Geosciences (AAPIG)