Curriculum Vitae

Yihang Fang

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EDUCATION

Ph.D. **Geoscience, University of Wisconsin-Madison**, Department of Geoscience 2022

Committee: Huifang Xu (Chair), John W. Valley, Eric E. Roden, Shanan Peters, Dane Morgan, Gabriela Farfan
Dissertation: Abiotic sedimentary dolomite formation: from nano- to macro-scale

M.S. **Geoscience, University of Wisconsin-Madison**, Department of Geoscience 2016

B.S. **Geology and Geophysics, and Mathematics with certificate in Physics, University of Wisconsin-Madison,** 2014

RESEARCH EXPERIENCE

2022	**Postdoctoral Researcher** Washington University in St. Louis, Department of Earth and Planetary Science working with Dr. Jeffrey Catalano
2021	**Big Ten Academic Alliance Predoctoral Fellow** Smithsonian National Museum of Natural History, Department of Mineral Sciences working with Dr. Gabriela Farfan
2019 -	**Lab manager for the S.W. Bailey Powder X-ray Diffraction Laboratory** Department of Geoscience, University of Wisconsin-Madison
2018 -	**Graduate Research Assistant** Department of Geoscience, University of Wisconsin-Madison
2016 - 2017	**Graduate Research Assistant** Department of Earth Science & HIPG, University of Hawaii at Manoa
2016 - 2016	**Graduate Research Assistant** Department of Geoscience, University of Wisconsin-Madison
2011 - 2014	**Undergraduate Research Assistant in Mineralogy and Structure Geology** Department of Geoscience, University of Wisconsin-Madison

PUBLICATIONS

11. **Fang, Y.**, and Xu, H.. Coupled dolomite and silica precipitation from continental weathering during deglaciation (*Accepted by Precambrian Research*).
10. **Fang, Y.**, Zhang, F., Farfan, G.A., and Xu, H., 2022. Low temperature synthesis of disordered dolomite and high magnesium calcite in ethanol-water solutions: the solvation effect. *ACS Omega*.

9. Napieralski, S., **Fang, Y.,** Marcon, V., Brantley, S.L., Xu, H., and Roden, E.E.. 2021. Microbial chemolithotrophic oxidation of pyrite in a subsurface shale weathering environment: geologic considerations and potential mechanisms. *Geobiology*.
8. **Fang, Y.**, and Xu, H., 2022. Dissolved silica-driven sedimentary dolomite precipitation. *American Mineralogist*.
7. Li, H., Sun, C., **Fang, Y.**, Xu, H., Jesovnik, A., Schultz, R., Gilbert, P., and Currie, C.R., 2020. Dolomite armor on ants. *Nature communication*, v. 11.
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*, v. 560.
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*, v. 8.
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*, v. 184.
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*, v. 89, p. 537-551.
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*, v. 88, p. 679-695.
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*, v.8, 17.

PUBLICATIONS IN REVIEW

Fang, Y., Hobbs, F., Yang, Y., and Xu, H.. Dissolved silica driven dolomite precipitation in the Great Salt Lake, Utah and its implication for dolomite formation in hypersaline/saline environments (*In reviewfor Sedimentology*)

PUBLICATIONS IN PREPARATION

Xu, H., **Fang, Y.**, Levitt, N.P., Xiao, S.. Molar-tooth carbonate: An indicator for the rise of sulfate in Proterozoic seawater. (*In preparation for Geochemical Perspectives Letters*)

Fang, Y., Xu, H., and Farfan, G.A.. Role of chitin and amphipathic amino acids in Ca-Mg carbonate precipitation on leaf-cutter ants and other biomineralization organisms (*In preparation for Crystal Growth and design*)

Fang, Y., and Xu, H.. Abiotic primary dolomite precipitation and effect of silica during diagenesis: A case study on Byron Formation, Early Silurian, Northeastern Wisconsin (*In preparation for Geology*)

Fang, Y., Brown, N., Stubbs, J., Eng, P. and Xu, H.. Qualitative growth rate and mechanism of disordered dolomite driven by dissolved silica by crystal truncation rods (CTR) (*In preparation for Geochimica et Cosmochimica Acta*)

AWARDS, GRANTS, AND FELLOWSHIPS

2022 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

INVITED TALKS

2022 **Fang, Y.**, and Xu, H.. Silica effect on dolomite crystal sizes during formation and burial. 21st International Sedimentological Congress (Beijing 2022; Virtual).

2021 **Fang.Y..** Biomineralization mechanism for Ca-Mg carbonates on leaf-cutting ants, National Museum of Natural History, Smithsonian Institute.

2021 **Fang.Y..** A new abiotic sedimentary dolomite precipitation mechanism and its implications. Department of Geosciences, Virginia Tech.

2020 **Fang, Y.**, Li, H. and Xu, H.. High magnesium calcite and disordered dolomite growth on leaf-cutting ants: Challenges and implications. Microscopy & MicroAnalysis.

CONFERENCE ATTENDED

2022 Brown, N., Xu, H., **Fang, Y.**, Yang, Y.. Formation mechanism of modern dolomite and Ca-bearing magnesite in Lake Beeac, Australia. Geological Society of Merica Annual Meeting (Denver, CO). *Oral Presentation*

Fang, Y., Hobbs, F., and Xu, H.. Abiotic driven primary dolomite precipitation in the Great Salt Lake, Utah, USA. 21st International Sedimentological Congress (Beijing 2022; Virtual). *Oral Presentation*

Fang, Y., Hobbs, F., and Xu, H.. Dissolved silica driven dolomite precipitation in the Great Salt Lake,Utah. Goldschmidt Conference (Honolulu, Hawaii). *Oral Presentation*

Fang, Y., and Xu, H.. Constraining Marinoan cap carbonate formation using a geochemical model coupling dolomite formation with dissolved silica. Carbonate Forum 2022. *Oral Presentation*

2021 **Fang, Y.**, and Xu, H.. 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*

Brown, N., **Fang, Y.**, and Xu, H.. Direct precipitation of Oneota dolomite of the Upper Sauk Megasequence. Geological Society of America Annual Meeting (Portland, OR). *Oral Presentation*

Fang, Y., Hobbs, F.W.C., and Xu, H.. 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*

Fang, Y., and Xu, H.. 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*

Fang, Y., and Xu, H.. Dissolved silica catalyzed disordered dolomite precipitation: An abiotic key to the dolomite problem. Carbonate Forum 2021, (Virtual). *Oral Presentation*

2020 **Fang, Y.**, and Xu, H.. Diatom diminishes dolomite: Precipitation of disordered dolomite catalyzed by dissolved silica. Geological Society of America Annual Meeting, (Virtual). *Oral Presentation*

2020 **Fang, Y.**, and Xu, H.. Quantification of protodolomite using a combination of XRD, EDS, Z-contrast imaging and simulation. Microscopy & MicroAnalysis (Virtual). *Oral Presentation*

2020 **Fang, Y.**, and Xu, H.. Precipitation of disordered dolomite catalyzed by dissolved silica. Goldschmidt Conference, (Virtual). *Oral Presentation*

2015 **Fang, Y.**, and Xu, H.. Modern dolomite from Manito Lake, Great Plains, and its implication. Astrobiology Graduate Conference (Madison, WI). *Oral Presentation*

2015 **Fang, Y.**, and Xu, H.. 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*

2013 **Fang, Y.**, and Xu, H.. Sedimentary carbonate rocks with dolomite/calcite micro-laminae: potential indicator for seasonal change. Geological Society of America Annual Meeting (Denver, CO). *Poster Presentation*

SYNCHRONTRON PROPOSALS

2022	80646	Role of adsorbed Si(OH)4 on dolomite surface in catalyzing dolomite growth at room temperature. Beamline: 13-ID-C,D. PI: Dr. Huifang Xu
	80399	Interfacial Processes at Iron Oxide Surfaces Controlling Platinum Group Element Migration in Weathering Environment. Beamline: 13-ID-C,D. PI: Dr. Jeffrey Catalano
	80219	Development of Sub-millimeter Goethite Crystals for Application in Surface X-ray Scattering Studies of Geochemical Processes. Beamline: 13-BM-C. PI: Dr. Jeffrey Catalano
	79103	Role of adsorbed Si(OH)4 on dolomite surface in catalyzing dolomite growth at room temperature. Beamline: 13-ID-C,D. PI: Dr. Huifang Xu
2021	76035	Role of adsorbed Si(OH)4 on dolomite surface in catalyzing dolomite growth at room temperature. Beamline: 13-BM-C. PI: Dr. Huifang Xu
	74738	Determination of modulated structure of minnesotaite. Beamline: 11-BM-B. PI: Dr. Huifang Xu
	74207	Role of adsorbed Si(OH)4 on dolomite surface in catalyzing dolomite growth at room temperature. Beamline: APS 13-BM-C. PI: Dr. Huifang Xu
	73468	Surface adsorbed $Si(OH)_4$ inhibits recrystallization of carbonate minerals. Beamline: APS 11-BM-B. PI: Dr. Huifang Xu
2020	73274	Investigation of crystal structures of magadiite and modulated structure of vaterite. Beamline: APS 11-BM-B. PI: Dr. Huifang Xu
	73055	Role of adsorbed $Si(OH)_4$ on dolomite surface in catalyzing dolomite growth at room temperature. Beamline: APS 13-MB-C. PI: Dr. Huifang Xu
2017	53998	Thermal equation of state of Fe_3Si and FeSi by single crystal X-ray diffraction. Beamline: APS 13-BM-C. PI: Dr. Xiaojing Lai

PEER REVIEW EXPERIENCES

2022	**Minerals (3 manuscripts)** **Earth and Planetary Science Letters (1 manuscript)**

CONFERENCE SESSION ORGANIZED

2022	**Goldschmidt conference 2022 session 7o Biomineralization: mechanisms, functions and geochemical importance**

TEACHING EXPERIENCES

Fall 2021	**Teaching Assistant:** *Geoscience 360- Mineralogy* Department of Geoscience, University of Wisconsin-Madison
Fall 2020	**Teaching Assistant:** *Geoscience 360- Mineralogy* Department of Geoscience, University of Wisconsin-Madison

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

WORKSHOPS/SHORT COURSES ATTENDED

2021	ORNL workshop: Single Crystal Data Analysis
	Synchrotrons and Geochemistry: A Workshop for Novices and Experts
	IAS Short Course: Carbonate Diagenesis
	Nanoscience Earth and Environmental Science Research Community Virtual Workshop
	Virtual Tutorial on Crystal Truncation Rod Diffraction for Atomic-Scale Surface Structure Measurement
2020	GSA Short Course: An Introduction to Stratigraphic Data Analysis in R (SDAR)
	X-ray Powder Diffraction and Pair Distribution Function Data Analysis Course

PROFESSIONAL MEMBERSHIPS

- Geological Society of America
- Society of Sedimentary Geology
- International Association of Sedimentology
- American Geophysical Union
- Mineralogical Society of America

COMMUNITY INVOLVEMENT AND MENTORING

- Steering Committee Member of Asian American and Pacific Islanders in Geoscience (AAPIiG) **(This is an national organizing to support AAPI in Geoscience: https://www.aapigeosci.org/)**
- Part of the Geoscience Graduate Student Association (GGSA) Recruitment Committee to organizing prospective new student recruitment week and leading laboratory and campus tour
- Part of the Graduate School Panel, organized by the Association for Women Geoscientists (AWG) and GeoPath, to answer question from undergraduate students on pursuing graduate school.

- Participate in the discussion in the department with GeoPath and the Diversity & Inclusion committee regarding minority and/or international students
- Mentor two undergraduate student for their undergraduate research

RESEARCH SKILLS

Crystallography: *In situ* powder x-ray diffraction; single crystal x-ray diffraction; electron backscattered diffraction; selected area electron diffraction. Crystal truncation rod (CTR).

Chemistry and morphology: Scanning electron microscopy with backscattered electron, energy dispersive spectrometry and electron microprobe; Transmission electron microscopy and scanning transmission electron microscopy with energy dispersive spectrometry and high-angle annular dark-field imaging; Synchrotron-based X-ray diffraction; UV-visible light absorbance spectroscopy; Laser-induced fluorescence. Extended X-ray absorption fine structure (EXAFS).

Programming/computing: MATLAB, Igor Pro, PHREEQC, Visual Basic, Visual MINTEQ, MICROQL, TOPAS, APEX, GSAS II, CrystalMaker, Jade, VESTA,

Languages: English (fluent), Cantonese (native), Mandarin (native), Japanese (intermediate)**.**