

# Miquela Ingalls

Pennsylvania State University | Department of Geosciences

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## RESEARCH INTERESTS

Low-T stable isotope geochemistry; Chemical sedimentology & diagenesis; Geobiology; Ancient environments

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## EDUCATION

**The University of Chicago** 2017

Ph.D. in the Geophysical Sciences

Dissertation: *Subduction and uplift of continental crust in the India-Asia collision zone: Clumped-isotope paleothermometry and paleoaltimetry of the Lhasa block, southern Tibet*

**Chicago Center for Teaching Certificate Program** 2016

**University of North Carolina at Chapel Hill** 2011

B.S. Cum Laude with Honors in Geology

Thesis: *A study of the temporal evolution of the El Capitan granite using high-precision U/Pb zircon geochronology*

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## PROFESSIONAL APPOINTMENTS

**Assistant Professor**, Department of Geosciences, Pennsylvania State University 2020-present

Wilson Faculty Fellow in the College of EMS 2023-present

Graduate Faculty appointments in Biogeochemistry and Astrobiology

**Barr Foundation Postdoctoral Fellow**, California Institute of Technology 2018-2020

**Postdoctoral Research Associate**, University of Colorado, Boulder 2017-2018

**Visiting Faculty**, Miami University Geological Field Station (Idaho & Wyoming). June-July 2016

**Physical Scientist**, U.S. Geological Survey, Northern Rocky Mountain Research Center 2011

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## PUBLICATIONS

### Articles in the Pipeline (‡ student advisee)

**Ingalls, M.**, †Leapaldt, H.C., and Lloyd, M., Microbial autotrophy recorded by carbonate dual clumped isotope disequilibrium, *in revision for PNAS*.

†Leapaldt, H.C., Olsen-Valdez, J., Frantz, C.F., Snell, K.E., Trower, E.J., and **Ingalls, M.**, Primary to post-depositional controls on the stable and clumped isotope record of shoreline sediments at Fayetteville Green Lake, *in revision for Geobiology*.

‡Meyers, K., †Martin, M., Kump, L., and **Ingalls, M.** Phase identification of phosphorus uptake onto carbonate minerals in coastal wastewater injection zones, in prep. for *Water Resources Research* for 2023 submission.

‡Wyman, A., **Ingalls, M.**, †He, R., and Conroy, J., Kiritimati Lagoon temperature reconstruction from clumped isotopes, in prep. for *JGR: Earth Surface* for 2023 submission.

**Ingalls, M.**, Frantz, C.F., Olsen-Valdez, J., Snell, K.E., and Trower, E.J., Early diagenetic carbon cycling in shallow sediments of Great Salt Lake due to intra-annual microbial community succession, in prep. for *JGR Biogeosciences*.

Bojanowski, M.J., **Ingalls, M.**, Kremer, B., Marciniak-Maliszewska, B., Matyszczyk, M., and Srodon, J., Lacustrine Mg-rich carbonates deposited in a cold, non-glaciated desert on Baltica during the Sturtian panglaciation, in prep. for *Nature Geoscience*.

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Shijun, J., Cui, Y., Wang, Y., De Palma, M., Naafs, D., Jingxin, J., Hu, X., Wu, H. Chu, R., Gu, Y., Wang, J., Huang, Y., **Ingalls, M.**, Bralower, T., Zachos, J., and Ridgwell, A., Millennial-timescale volcanic CO<sub>2</sub> release prior to the PETM, *in review*.

### Refereed Journal Articles (‡ student advisee)

#### 2023

‡Scheller, E.L., **Ingalls, M.**, Eiler, J., Grotzinger, J.P., and Ryb, U., The mechanisms and stable-isotope effects of transforming hydrated carbonate into calcite pseudomorphs, *GCA*, doi: 10.1016/j.gca.2023.04.025.

#### 2022

**Ingalls, M.**, Grotzinger, J.P., Present, T., Rasmussen, B., and Fischer, W.W., Carbonate-associated phosphate indicates elevated phosphate availability in Archean shallow marine environments, *Geophysical Research Letters*, <https://doi.org/10.1029/2022GL098100>.

**Ingalls, M.**, Fetrow, A.C., Snell, K.E., Frantz, C.M., and Trower, E.J., Lake level controls the recurrence of giant stromatolite facies, *Sedimentology*, doi: 10.1111/sed.12967.

#### 2021

‡Scheller, E.L., Grotzinger, J.P., and **Ingalls, M.**, Guttulatic calcite: A carbonate microtexture that reveals frigid formation conditions, *Geology*, <https://doi.org/10.1130/G49312.1>.

‡Scheller, E.L., et al., including **Ingalls, M.**, Formation of magnesium carbonates on Earth and implications for Mars, *JGR: Planets*, 126(7): e2021JE006828. Doi: 10.1029/2021je006828.

Bernasconi, S.M., et al., including **Ingalls, M.**, InterCarb: A community effort to improve inter-laboratory standardization of the carbonate clumped isotope thermometer using carbonate standards, *Geochemistry, Geophysics, Geosystems*, 22: e2020GC009588. <https://doi.org/10.1029/2020GC009588>.

**Ingalls, M.**, Snell, K.E., Tools for comprehensive assessment of solid-state and water-mediated alteration of carbonates used to reconstruct ancient elevation and environments, invited contribution to *Reaching New Heights: Recent Progress in Paleotopography* special issue of *Frontiers in Earth Sciences*, doi: 10.3389/feart.2021.623982.

#### 2020

**Ingalls, M.**, Blättler, C., Higgins, J., Magyar, J.S., Eiler, J., and Fischer, W.W., P/Ca in carbonates as a proxy for alkalinity and phosphate levels, *Geophysical Research Letters*, 47(21): e2020GL088804. doi: 10.1029/2020GL088804.

Smith, B.P., **Ingalls, M.**, Trower, E.J., Lingappa, U.F., Present, T.M., Magyar, J.S., and Fischer, W.W., Physical and chemical controls on flat-pebble deposits: an analog from the Great Salt Lake, Utah, *JGR: Earth Surface*, 125(11), doi: 10.1029/2020JF005733.

**Ingalls, M.**, Rowley, D.B., Currie, B.S., and Colman, A.S., Reconsidering the uplift history and peneplanation of the northern Lhasa terrane, Tibet, *American Journal of Science*, 320: 479-532, doi: 10.2475/06.2020.01.

**Ingalls, M.**, Frantz, C.M., Snell, K.E., and Trower, E.J., Carbonate facies-specific stable isotope data record climate, hydrology, and microbial communities in Great Salt Lake, UT, *Geobiology*, 18: 566-593, doi: 10.1111/gbi.12386.

#### 2019

Li, S., Currie, B.S., Rowley, D.B., **Ingalls, M.**, Qiu, L., and Wu, Z., Diagenesis of shallowly buried Miocene lacustrine carbonates from the Hoh Xil Basin, northern Tibetan Plateau: Implications for stable-isotope based elevation estimates, *Sedimentary Geology*, 388: 20-36, doi:10.1016/j.sedgeo.2019.05.001.

**Ingalls, M.** Reconstructing carbonate alteration histories in orogenic sedimentary basins: Xigaze forearc, southern Tibet, *Geochimica et Cosmochimica Acta*, 251: 284-300, doi:10.1016/j.gca.2019.02.005.

#### 2017

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Rowley, D.B., and **Ingalls, M.**, Reply to 'Unfeasible subduction?', *Nature Geoscience*, 10: 879-880, doi:10.1038/s41561-017-0016-1.

**Ingalls, M.**, Rowley, D.B., Currie, B.S., Olack, G., Li, S., Tremblay, M., Schmidt, J., Shuster, D., Zeitler, P., Lin, D., and Colman, A.S., Paleocene to Pliocene low-latitude high elevation of southern Tibet: Implications for tectonic models of India-Asia collision, Cenozoic climate, and geochemical weathering, *GSA Bulletin*, doi:10.1130/B31723.1.

### 2016

**Ingalls, M.**, Rowley, D.B., Currie, B.S., and Colman, A., Large-scale subduction of continental crust implied by India-Asia mass-balance calculation, *Nature Geoscience*, doi:10.1038/ngeo2806.

Currie, B.S., Polissar, P.J., **Ingalls, M.**, Rowley, D.B. and Freeman, K.H., Multiproxy paleoaltimetry of the late Oligocene-Pliocene Oiyug basin, southern Tibet, *American Journal of Science*, 316(5): 401-436.

### 2015

Li, Shanying, Currie, BS, Rowley, DB, and **Ingalls, M.** Cenozoic paleoaltimetry of the SE margin of the Tibetan Plateau: Constraints on the tectonic evolution of the region, *Earth and Planetary Science Letters*, 432: 415-424.

### 2014

Putnam, R., AF Glazner, DS Coleman, ARC Kylander-Clark, T Pavelsky, and **M Ingalls**, Plutonism in three dimensions: field and geochemical relations on the southeast face of El Capitan, Yosemite National Park, California: *Geosphere*, 11(4): 1-25.

### Oral Presentations & Select Conference Activity (\*invited; †early career advisee)

\***Ingalls, M.**, Diagenesis, disequilibrium, and the terrestrial carbonate record. Northwestern University Department of Earth and Planetary Sciences, November 10, 2023.

**Ingalls, M.**, †Leapaldt, H.C., and Lloyd, M.K., A novel record of microbial carbon cycling in carbonate dual clumped isotopes. GSA Annual Meeting, October 16, 2023.

†Meyers, K.L., Kump, L., Webb, S., Richardson, J.A., Martin, M., and **Ingalls, M.**, Phase identification of phosphorus uptake onto carbonate minerals in coastal wastewater injection zones. Goldschmidt, July 2023.

\***Ingalls, M.**, Enhancing geologic carbon capture, Penn State Climate Symposium, May 2023.

\***Ingalls, M.**, Carbonate-associated phosphate as a proxy for alkalinity and phosphate levels in deep time, Iowa State University, Department of Geological and Atmospheric Sciences, April 18, 2023.

†He, R., Lloyd, M.K., Currie, B.S., and **Ingalls, M.** Assessment of the impact of late-stage meteoric diagenesis on siderite geochemistry: Evidence from core-outcrop comparison in Paleocene Fort Union Formation in Wind River Basin, Wyoming. AGU Fall Meeting, December 2023.

†Leapaldt, H.C., and **Ingalls, M.**, Testing carbonate dual-clumped isotope disequilibria as a proxy for microbial metabolism. AGU Fall Meeting, December 2023.

†Meyers, K.L., Kump, L., Martin, M., and **Ingalls, M.**, Experimental investigation of phosphorus uptake onto carbonate minerals in coastal wastewater injection zones, AGU Fall Meeting, December 2023.

\***Ingalls, M.**, Diagenesis, disequilibrium, and the terrestrial carbonate record. Princeton Environmental Geology and Geochemistry Seminar, October 27, 2022.

\***Ingalls, M.**, Frantz, C.M., Snell, K.E., and Trower, E.J., Leveraging the carbonate record from regional hydroclimate to microbial ecology, American Chemical Society Annual Meeting, 20-22 March, 2022, San Diego, California.

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- \***Ingalls, M.**, P/Ca in carbonate as a proxy for alkalinity and phosphate levels on early Earth, Geological Society of Washington, February 2, 2022.
- \***Ingalls, M.**, P/Ca in carbonate as a proxy for alkalinity and phosphate levels on early Earth, Miami University Department of Geological Sciences, January 31, 2022.
- \*<sup>†</sup>**Scheller, E.L., Ingalls, M., Eiler, J., Grotzinger, J., and Ryb, U.**, How hydrated carbonate pseudomorphs track frigid paleoclimatic conditions: Paragenesis and clumped isotope systematics, AGU Fall Meeting, December 15, 2021.
- <sup>†</sup>**Leapaldt, H.C., Olsen-Valdez, J., Frantz, C.E., Snell, K.E., Trower, E.J., and Ingalls, M.**, Seasonality of Lacustrine Carbonate Early Diagenesis via in situ Microbial Metabolisms in Green Lake, Fayetteville, NY, AGU Fall Meeting, December 15, 2021.
- Ingalls, M., Frantz, C., Snell, K.E., and Trower, E.J.**, Leveraging facies-specific early diagenesis of lacustrine carbonate to improve basin-scale records of hydroclimate and microbial ecology, AGU Fall Meeting, December 16, 2021.
- \***Ingalls, M.**, P/Ca in carbonate as a proxy for alkalinity and phosphate levels on early Earth, University of California at Riverside, November 30, 2021.
- Ingalls, M., Grotzinger, J.P., and Fischer, W.W.**, Carbonate P/Ca as a proxy for phosphate levels in the Archean, Goldschmidt, July 9, 2021.
- \***Ingalls, M., Kump, L.**, Quantifying the impact of shallow wastewater injection on groundwater nutrient fluxes to surface waters in the Florida Keys National Marine Sanctuary: a pilot study, Florida Keys National Marine Sanctuary Water Quality Protection Program Technical Advisory Committee Meeting, April 15, 2021.
- \***Ingalls, M.**, P/Ca in carbonate as a proxy for alkalinity and phosphate levels on early Earth, University of North Carolina at Chapel Hill, February 18, 2021.
- \***Ingalls, M.**, P/Ca in carbonate as a proxy for alkalinity and phosphate levels on early Earth, University of Illinois-Urbana Champaign, February 4, 2021.
- \***Ingalls, M.**, P/Ca in carbonate as a proxy for alkalinity and phosphate levels on early Earth, University of Miami, November 9, 2020.
- \***Ingalls, M.**, P/Ca in carbonate as a proxy for alkalinity and phosphate levels on early Earth, University of Maryland, October 30, 2020.
- \***Ingalls, M.**, P/Ca in carbonate as a proxy for alkalinity and phosphate levels on early Earth, Lehigh University, October 23, 2020.
- Ingalls, M., Fetrow, A., Frantz, C.M., Snell, K.E., and Trower, E.J.**, 2020, What controls giant stromatolite formation and cessation? SEPM International Sedimentary Geosciences Congress, 26-29 April, 2020, Flagstaff, AZ (postponed).
- Ingalls, M., Blättler, C., Higgins, J., Phelan, J., Magyar, J.S., Eiler, J., and Fischer, W.W.**, 2020, Carbonate-bound phosphate and Ca isotopes as measures of cation availability and relative alkalinity, American Geophysical Union Fall Meeting, 9-13 Dec., 2019, San Francisco, CA.
- Ingalls, M., Snell, K.**, 2019, Reconstructing carbonate alteration histories and proxy fidelity in orogenic basins, International Clumped Isotope Workshop, Long Beach, CA, 26 Jan.
- \***Ingalls, M.**, 2019, Reconstructing carbonate alteration histories and proxy fidelity in orogenic basins, Division of Geological and Planetary Sciences, Caltech, 24 Jan.
- \***Ingalls, M.**, 2018, Reconstructing Earth's surface and sub-surface carbonate environments via orogenic sedimentary basins, Department of Earth and Planetary Sciences, UC Davis, 28 Nov.
- \***Ingalls, M., Rowley, D.B., Currie, B.S., and Colman, A.S.**, 2018, Proxy fidelity assessment critical for robust environmental and tectonic reconstructions, oral presentation at 2018 Annual Meeting, Geological Society of America, Indianapolis, IN, 4-7 Nov.

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- Ingalls, M.,** Trower, E., Frantz, C., and Snell, K., 2018, Spatial stable isotope variability in modern lacustrine carbonate: How do local processes translate to the sedimentary record?, oral presentation at the Lake Bonneville Workshop, Salt Lake City, UT, 3-5 Oct. Published Proceedings Volume: [https://ugspub.nr.utah.gov/publications/misc\\_pubs/mp-170/mp-170-1.pdf](https://ugspub.nr.utah.gov/publications/misc_pubs/mp-170/mp-170-1.pdf)
- Ingalls, M.,** Trower, E., Frantz, C., and Snell, K., 2018, Spatial stable isotope variability in modern lacustrine carbonate: How do local processes translate to the sedimentary record?, oral presentation at the Goldschmidt Conference, Boston, MA, 12-17 Aug.
- \*Ingalls, M.,** 2018, Reconstructing Earth history through carbonate clumped isotopes: Ancient orogens to modern lakes, UC Berkeley Isotope Geochemistry Seminar Series.
- Ingalls, M.,** Rowley, D.B., Colman, A.S., Currie, B.S., and Snell, K., 2017, Cryptic carbonate alteration in sedimentary basins: Saving the signal, oral presentation at the American Geophysical Union Fall Meeting, New Orleans, LA, 11-15 Dec.
- \*Ingalls, M.,** 2017, Reconstructing Earth history through carbonate clumped isotopes: Ancient orogens to modern lakes, California Institute of Technology, 8 November.
- \*Ingalls, M.,** 2017, Examining carbonate proxy fidelity: From Tibet to California, University of Colorado at Boulder, 12 October.
- \*Ingalls, M.,** 2017, Reconstructing Earth history through carbonate clumped isotopes: Ancient orogens to modern lakes, Penn State University, Department of Geosciences, 5 October.
- \*Ingalls, M.,** 2017, Low-latitude high elevation throughout the Lhasa Block, University of Kentucky Department of Earth and Environmental Sciences, 21 April.
- \*Ingalls, M.,** 2017, Subduction, uplift, and cryptic carbonate alteration of the Lhasa Block, southern Tibet, Western Washington University Department of Geology, 1 March.
- \*Ingalls, M.,** 2016, A tale of two plates: the elevation history of the Tibetan Plateau & mass balance of the Indo-Asian collision, N.C. State University Department of Marine, Earth, and Atmospheric Sciences, 30 March.
- Ingalls, M.,** Rowley, D.B., Colman, A.S., Olack, G., Currie, B., and Li, S., 2016, Low-latitude high elevation of the leading edge of southern Eurasian throughout the Cenozoic, oral presentation at 2016 American Geophysical Union Fall Meeting, San Francisco, CA, 12-16 Dec.
- Ingalls, M.,** Colman, A.S., and Rowley, D.B., 2016, Can we use clumped isotopes in tectonically complex regions?, oral presentation at 2016 Annual Meeting, GSA, Denver, CO, 24-28 Sept.
- Ingalls, M.,** Rowley, D.B., and Colman, A.S., 2015, Paleocene-early Eocene high elevation of the Linzizong Arc implies large-scale subduction of continental crust during India-Asia collision, oral presentation at 2015 Annual Meeting, GSA, Baltimore, MD, 1-4 Nov.
- Ingalls, M.,** Rowley, DB, Olack, G, and Colman, AS, 2015, Paleocene-Eocene Lhasaplano paleoaltimetry: Implications for mass balance in the India-Asia collision, presented at 2015 Goldschmidt Conference, Prague, CZ, 16-21 Aug.
- Ingalls, M.,** 2011, A study of the temporal evolution of the El Capitan granite using high-precision U/Pb zircon geochronology, Anadarko Research Symposium: Chapel Hill, NC (thesis defense).

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### FUNDING, FELLOWSHIPS, & AWARDS

Funding to date = \$1,630,086

National Science Foundation [\$500,249]

August 2023-July 2026

“A dual clumped isotope approach to characterize disequilibrium in terrestrial carbonates”

Awarded to Miquela Ingalls

NASA FINESST [\$150,000]

August 2023-July 2026

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“Identifying the fingerprint of microbial autotrophy on magnesium carbonate” Awarded to Miquela Ingalls (PI) and Hanna Leapaldt (FI)	May 2022-April 2023
Evolving Earth Foundation [\$3,000] “Siderite clumped isotope systematics during late-stage meteoric diagenesis” Awarded to Miquela Ingalls and Ran He	May 2022-April 2023
Gladys Snyder Junior Faculty Grant [\$5,000] “Creation of teaching collections and an accompanying virtual field trip to support the development of a sedimentology and stratigraphy course” Awarded to Miquela Ingalls	March 2021-February 2022
US Environmental Protection Agency – Region 4 [\$322,946] Grant number 02D02621, “Quantifying the impact of shallow wastewater injection on groundwater nutrient fluxes to surface waters in the Florida Keys National Marine Sanctuary” Awarded to Miquela Ingalls	May 2021-April 2024
National Science Foundation – Geobiology and Low-Temperature Geochemistry [\$184,321] EAR 1826805 “A predictive framework for micro-scale carbonate diagenesis: Towards more accurate reconstructions of global climate and environmental change” Awarded to Miquela Ingalls and Kathryn Snell (CU-Boulder)	July 2020-2022
National Science Foundation –Sedimentary Geology & Paleobiology [\$317,570] EAR 1826850 “Collaborative Research: Assessing the Sensitivity of High-altitude Environments to Global Increased Temperature as Recorded by Lacustrine Microbialite Carbonates” Awarded to Kathryn Snell, Elizabeth Trower, and Miquela Ingalls (subaward)	Sept. 2018-Aug. 2022
Penn State nominee for the Packard Foundation Fellowship for Science & Engineering	2022
Barr Foundation Postdoctoral Fellowship, Caltech [\$132,000]	2018-2020
Agouron International Geobiology Course geobiology research support [\$1500]	2017
Association for Women Geoscientists Sand Award [\$500]	2017
Agouron International Geobiology Course postdoctoral support [\$4000]	2017
Sigma Xi Grants-in-Aid of Research [\$1000]	2017
Geological Society of America Graduate Student Research Grants [\$3800]	2015, 2017
Chicago Center for Teaching Fellowship [\$3600]	2016-2017
Physical Sciences Division Undergraduate Teaching Award, nominated by students	2016
National Science Foundation Graduate Research Fellowship, Honorable Mention	2012
USGS-National Association of Geoscience Teachers Cooperative Field Training Fellowship	2011
Carolina Undergraduate Research Fellowship [\$3600]	2010-2011
James Johnston Scholar of the College; UNC-Chapel Hill [full academic scholarship]	2007-2011

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## TEACHING

<b>International Geobiology Course, Instructor</b>	2023-present
<b>Pennsylvania State University, Instructor</b>	
GEO SC 497 – Isotopes in Earth History	every Fall and Spring
GEO SC 497 - Carbonate Seminar: Carbonate chemistry and paleoenvironments	every other Fall
GEO SC 439 - Principles of Stratigraphy	every Spring
GEO SC 1 - Physical Geology	every Fall
GEO SC 518C – Isotopes in Oceans and Climate	every other Fall
<b>University of Colorado, Boulder, Co-instructor</b>	Spring 2018
Stable Isotope Tools	

## Miquela Ingalls

- Created course material and lectured on principles of carbon, oxygen, and carbonate clumped isotope theory and applications

**Chicago Center for Teaching, Fellow** 2016-2017

- Teaching assistant for graduate course on College Teaching and Course Design; mentored 7 graduate students in designing college courses and provided feedback on practice teaching sessions and statements of Teaching Philosophy
- Created curricula on inclusive teaching in the physical and biological sciences, active teaching strategies, Constructivism, and backward course design

**Miami University Geological Field Station, Instructor** 2016

- Co-instructed a 4-week field course in geological mapping, cross section composition, and field techniques for 27 undergraduate students from across the country
- Developed students' four-dimensional reasoning skills in the field and in the classroom

**The University of Chicago** 2012-2017

Teaching Assistant or Head Teaching Assistant for nine courses, including:

Evolution of the Solar System and the Earth, *Head Teaching Assistant, 1 term*

Physical Geology, *Head Teaching Assistant, 2 terms*

- Guest lectured on plate tectonics, structural geology and crustal deformation

Global Tectonics & Structural Geology, *Teaching Assistant, 4 terms*

- Designed and implemented a structural geology lab course consisting of 9 labs and a final mapping project [received a University teaching award for this course]
- Individual Teaching Consultation through the Chicago Center for Teaching; received high praise for my execution of the observed lab period (complete evaluation available upon request)
- 90-minute lessons for ~12 upper level undergraduate and graduate students
- Discussion and problem set sessions with 1-5 students

TA First-year training, *Instructor, 1 term*

Field Geology: Death Valley & Owens Valley, CA, *Teaching Assistant and Trip Organizer, 1 term*

- Co-designed a geology field course with two UChicago faculty

Ice Age Earth, *Teaching Assistant, 1 term*

**Duke Talent Identification Program, Teaching Assistant** 2009

Science on the Appalachian Trail: Geology and Environmental Science

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## SERVICE, DEI & OUTREACH

### *To the University*

**Pennsylvania State University** Dept. of Geosciences

*Committee Member,*

Executive Committee 2022-present

Graduate Program Committee 2020-present

Graduate Admissions Committee 2020-present

*Pod Member,* Unlearning Racism in the Geosciences 2021-present

**Pennsylvania State University** Dual-title Program in Biogeochemistry

*Committee Member, Executive Committee* 2022-present

### *To the profession*

**International Geobiology Course, Instructor** 2023-present

**Frontiers in Earth Sciences – Geochemistry, Associate Editor** 2022-present

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## Geological Society of America

<i>Committee Member</i> , Annual Meeting Program Committee	2023-present
<i>Chair</i> , Graduate Student Research Grants Committee	2020-2021
<i>Committee Member</i> , Graduate Student Research Grants Committee	2018-2020
<i>Mentor</i> , "On to the Future" program	2015-2016

## Session organizer and convener

AGU, *Carbonate formation in modern environments (2021)*, *Carbonate sediments through time (2022-2023)*  
SEPM 2020 (postponed due to COVID-19), *Geochemical and petrographic fingerprints of microbially mediated carbonate precipitation*  
GSA 2018, *Recent advances and future directions in paleoaltimetry and paleoclimate*  
Goldschmidt 2018, *Mineral recorders of Earth and planetary processes*

## Reviewer

*Journals*: Nature Geoscience; Nature Communications; Science Advances; Geology; Geological Society of America Bulletin; Geophysical Research Letters; Earth and Planetary Science Letters; Chemical Geology; Geochimica et Cosmochimica Acta; Paleogeography, Paleoclimatology, Paleoecology; Basin Research; Climates of the Past

*Funding Agencies*: National Science Foundation EAR PF; National Science Foundation EAR SedPaleo, Low-T Geochem & Geobio, Marine Geology & Geophysics; American Chemical Society Petroleum Research Fund; NASA; Geological Society of America (2018-21); NASA FINESST panel 2021

## To society

**Geoscience Education Mentorship and Support (GEMS)** 2021-present  
Mentor to a female Earth scientist in Nigeria preparing to apply to graduate schools in the United States

## Letters to a Pre-Scientist

STEM professional pen pal with a 7<sup>th</sup> grade URM student in South Carolina 2020-2021

## Museum of Science & Industry

<i>Facilitator</i> , Robotics Special Exhibit	2015-2016
<i>"Expert"</i> , ScienceWorks Career Fair	2014, 2015
<i>Facilitator</i> , School Field Trips	2011-2012

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## TECHNICAL EXPERIENCE

**Isotope ratio mass spectrometry** Gas Chromatography with continuous flow isotope ratio mass spectrometers (IRMS; Delta V, Thermo Scientific) Elemental Analyzer (EA) and GasBenchII; magnetic sector dual inlet IRMS (MAT253 and MAT253+, Finnigan)

**Thermal ionization mass spectrometry** VG Sector 54 TIMS with eight adjustable faraday cups; Radiogenic isotope geochemistry; U/Pb zircon geochronology of igneous plutons; Sr/Rb analysis of human teeth, fossils, and other biogenic materials; class 1000 and class 100 clean lab facilities; mineral separation

**Analytical techniques** Carbonate digestion on glass vacuum line for analyses of multiply substituted isotopologues of CO<sub>2</sub>; Organic carbon and oxygen in biogenic and sediment samples; inorganic carbon and oxygen in carbonates from fossils, metamorphic rocks, and sediments; field emission scanning electron

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microscopy (Zeiss Supra35 and TESCAN LYRA3 with electron backscatter diffraction, secondary and backscattered electron detector); optical petrography and cold-cathode luminescence petrography (Technosyn cold-cathode luminiscope, Cambridge Imaging) for characterization of carbonate alteration; Secondary ionization mass spectrometry, Cameca IMS-7fGEO

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### PROFESSIONAL ACTIVITY

<b>SERC Workshop for Early Career Geoscience Faculty</b>	2020
<b>International Geobiology Course</b> —Caltech, Agouron	2017
<b>Secondary Ion Mass Spectrometry Workshop</b> —Arizona State University, Tempe, AZ	2017
<b>Geological Society of America Short Courses</b>	
Organic and stable isotope geochemistry in the 21 <sup>st</sup> century	2016
Strabospot for Sedimentary Field Geology	2018
<b>Building Future Faculty Program</b> —NCSU, Raleigh, NC	2016
Highly selective national program for early career academics	
<b>Chicago Center for Teaching</b>	
Independent Teaching Consultation (Structural Geology)	2016
College Teaching, Advanced Pedagogy Course	2015
Teaching@Chicago Conference	2015, 2016
Seminar & Workshop on the Teaching Portfolio	2014
Seminar & Workshop on Course Design	2014
<b>Presenting Data and Information</b> , Edward Tufte—Chicago, IL	2015
<b>International Clumped Isotope Workshop</b> – Harvard University, Cambridge, MA	2012
The Queen Mary, Caltech, Long Beach, CA	2019
<b>Geology Field Trips/Field Seasons</b>	
Great Salt Lake, Fayetteville Green Lake, and Laguna Bacalar lacustrine carbonate sedimentology, aqueous geochemistry and geobiology	2017-present
Modern and Ancient Carbonate Environments: San Salvador, Bahamas	2016
Trip leader: Susan Kidwell and Michael LaBarbera, The University of Chicago	
Paleoaltimetry of the Lhasa Block, Tibet	2014, 2015
Geomorphology, Active Tectonics, and Landscape Evolution in the Mid-Atlantic Region	2015
Trip leader: Frank Pazzaglia, Lehigh University	
Topics in Stratigraphy and Biosedimentology: Salton Trough, California	2015
Trip leader: Susan Kidwell, The University of Chicago	
Geology of Death Valley & Owens Valley, California	2014
Trip leaders: David Rowley, Mark Webster, and <i>Miquela Ingalls</i> , The University of Chicago	
Lehigh University Geology Field Camp, Utah & Colorado	2010
Instructor: Dr. Frank Pazzaglia	
Magma ascent rates, igneous petrology: Sierra Nevadas, CA	2010
Rockfalls in Yosemite Valley, CA	2009
PI: Greg Stock	

### Professional Affiliations

Society for Sedimentary Geology, 2019-present  
Geological Society of America, 2009-present  
American Geophysical Union, 2013-present  
Sigma Xi (2015-2017)

## **Miquela Ingalls**

European Association of Geochemistry, 2015-present  
American Association of University Women, 2015-2017  
Association of Women Geoscientists, 2016-2018