

# 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  
Graduate Faculty appointments in the Biogeochemistry and Astrobiology programs

**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)

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., and Zachos, J., Increased climate instability prior to and during the PETM, *submitted*.

Li, S., Wang, P., **Ingalls, M.**, Currie, B.S., Wei, X., and Rowley, D.B., Late Eocene upper crustal extension evidenced by syntectonic carbonates in the SE Tibetan Plateau margin, *submitted*.

‡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, in review at *GCA*.

**Ingalls, M.**, Lloyd, M., and Leapaldt, H.C., Disequilibrium clumped isotope signatures distinguish respiration and fixation of CO<sub>2</sub> in carbonate sediments, *in prep to submit Fall 2022*.

**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 Fall 2022*.

‡Leapaldt, H.C., Olsen-Valdez, J., Frantz, C.F., Snell, K.E., Trower, E.J., and **Ingalls, M.**, The impact of seasonal authigenic carbonate formation via *in situ* microbial metabolisms on the lacustrine carbonate stable isotope record, *in prep to submit Fall 2022*.

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### Refereed Journal Articles (‡ student advisee)

- 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, (2022), *Geophysical Research Letters*, <https://doi.org/10.1029/2022GL098100>.
- Ingalls, M.**, Fetrow, A.C., Snell, K.E., Frantz, C.M., and Trower, E.J., (2022), Lake level controls the recurrence of giant stromatolite facies, *Sedimentology*, doi: 10.1111/sed.12967.
- ‡Scheller, E.L., Grotzinger, J.P., and **Ingalls, M.**, (2021) 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.**, (2021) 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.**, (2021) 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., (2021) 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.
- Ingalls, M.**, Blättler, C., Higgins, J., Magyar, J.S., Eiler, J., and Fischer, W.W. (2020) 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. (2020) 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., (2020) 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., (2020) 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.
- Li, S., Currie, B.S., Rowley, D.B., **Ingalls, M.**, Qiu, L., and Wu, Z. (2019) 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.** (2019) 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.
- Rowley, D.B., and **Ingalls, M.**, (2017) 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., (2017) 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.
- Ingalls, M.**, Rowley, D.B., Currie, B.S., and Colman, A., (2016) 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., (2016) Multiproxy paleoaltimetry of the late Oligocene-Pliocene Oiyug basin, southern Tibet, *American Journal of Science*, 316(5): 401-436.

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Li, Shanying, Currie, BS, Rowley, DB, and **Ingalls, M** (2015) 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.

Putnam, R., AF Glazner, DS Coleman, ARC Kylander-Clark, T Pavelsky, and **M Ingalls** (2014) 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. 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.

\***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.

\*†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.

†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).

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- 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.
- 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.

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**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 = \$979,837

Evolving Earth Foundation [\$3,000]  
2023

May 2022-April

“Siderite clumped isotope systematics during late-stage meteoric diagenesis”

Awarded to Miquela Ingalls and Ran He

Gladys Snyder Junior Faculty Grant [\$5,000]

March 2021-February 2022

“Creation of teaching collections and an accompanying virtual field trip to support the development of a sedimentology and stratigraphy course”

Awarded to Miquela Ingalls

US Environmental Protection Agency – Region 4 [\$322,946]

May 2021-April

2024

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

National Science Foundation – Geobiology and Low-Temperature Geochemistry [\$184,321] July 2020-2022

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)

National Science Foundation – Sedimentary Geology & Paleobiology [\$317,570]

Sept. 2018-Aug. 2022

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)

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

**Pennsylvania State University, Instructor**

GEOSC 497 – Isotopes in Earth History

every Fall and Spring

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GEOSC 497 - Carbonate Seminar: Carbonate chemistry and paleoenvironments	every other Fall
GEOSC 439 - Principles of Stratigraphy	every Spring
GEOSC 1 - Physical Geology	every Fall
GEOSC 518C - Isotopes in Oceans and Climate	every other Fall
<b>University of Colorado, Boulder, Co-instructor</b>	Spring 2018
Stable Isotope Tools	
<ul style="list-style-type: none"><li>Created course material and lectured on principles of carbon, oxygen, and carbonate clumped isotope theory and applications</li></ul>	
<b>Chicago Center for Teaching, Fellow</b>	2016-2017
<ul style="list-style-type: none"><li>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</li><li>Created curricula on inclusive teaching in the physical and biological sciences, active teaching strategies, Constructivism, and backward course design</li></ul>	
<b>Miami University Geological Field Station, Instructor</b>	2016
<ul style="list-style-type: none"><li>Co-instructed a 4-week field course in geological mapping, cross section composition, and field techniques for 27 undergraduate students from across the country</li><li>Developed students' four-dimensional reasoning skills in the field and in the classroom</li></ul>	
<b>The University of Chicago</b>	2012-2017
Teaching Assistant or Head Teaching Assistant for nine courses, including: Evolution of the Solar System and the Earth, <i>Head Teaching Assistant, 1 term</i> Physical Geology, <i>Head Teaching Assistant, 2 terms</i>	
<ul style="list-style-type: none"><li>Guest lectured on plate tectonics, structural geology and crustal deformation</li></ul>	
Global Tectonics & Structural Geology, <i>Teaching Assistant, 4 terms</i>	
<ul style="list-style-type: none"><li>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]</li><li>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)</li><li>90-minute lessons for ~12 upper level undergraduate and graduate students</li><li>Discussion and problem set sessions with 1-5 students</li></ul>	
TA First-year training, <i>Instructor, 1 term</i>	
Field Geology: Death Valley & Owens Valley, CA, <i>Teaching Assistant and Trip Organizer, 1 term</i>	
<ul style="list-style-type: none"><li>Co-designed a geology field course with two UChicago faculty</li></ul>	
Ice Age Earth, <i>Teaching Assistant, 1 term</i>	
<b>Duke Talent Identification Program, Teaching Assistant</b>	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

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**Pennsylvania State University** Dual-title Program in Biogeochemistry  
*Committee Member, Executive Committee* 2022-present

## **To the profession**

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

## **Geological Society of America**

*Chair*, Graduate Student Research Grants Committee 2020-2021

*Committee Member*, Graduate Student Research Grants Committee 2018-2020

*Mentor*, “On to the Future” program 2015-2016

## **Session organizer and convener**

AGU 2021, *Carbonate formation in modern environments*

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**

*Facilitator*, Robotics Special Exhibit 2015-2016

*“Expert”*, ScienceWorks Career Fair 2014, 2015

*Facilitator*, 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

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**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 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



## **Miquela Ingalls**

Geological Society of America, 2009-present

American Geophysical Union, 2013-present

Sigma Xi (2015-2017)

European Association of Geochemistry, 2015-present

American Association of University Women, 2015-2017

Association of Women Geoscientists, 2016-2018