Sarah Katz

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Dept. of Earth and Environmental Sciences
University of Michigan
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Education

University of Michigan, *Department of Earth and Environmental Sciences,* Ann Arbor, MI
PhD Candidate
Research Focus: modern hydrology, paleoclimate, Peru, Andes, lake systems, triple oxygen isotopes ($\Delta'^{17}O$)
GPA: 4.00/4.00

Colgate University, Hamilton, NY
Bachelor of Arts, May 2016
Major: Geology; Minor: Anthropology
GPA: 3.63/4.00

Honors & Awards

Graduate:

LACS Tinker Field Research Grant (university international research award: $1000)
GSA Graduate Student Research Grant (professional society research award: $1875)
Kerry Kelts Research Award (Limnogeological Division GSA research award: $1000)
Turner Award (competitive departmental award: $1750, $1390)

Undergraduate:

Award for Excellence in Geology (Department award for "achievements and perseverance in research")
Magna Cum Laude (Institutional Honors)
Honors in Geology (Departmental Honors)
Dean's Award for Academic Excellence (8 terms)

Relevant Coursework

Isotope Geochemistry	Data Analysis	Lakes and Environmental Change
Paleoclimatology	Paleontology of Marine Life	GIS
Solid Earth Processes	Hydrology & Surficial Geology	Planetary Science
Structural Geology	Stratigraphy & Sedimentation	Volcanology
Earth Resources	Petrology	Mineralogy
Evolution Planet Earth	Geology Outdoors	Stratigraphy & Basin Analysis
Chemistry I, II	Physics I, II	Fluvial Ecosystems
Hydro. Cycle & Water Res. Man.	Multivariate Stats. for Env. Sci.	Advanced Isotope Geochemistry

Scientific Knowledge

Research Experience

Lake Junín Watershed Hydrology using $\Delta^{17}O$, *UM Isotopologue Paleosciences Laboratory* (July 2018-present)

Development of an isoscape of the Lake Junín watershed in central Peru, specifically $\Delta'^{17}O$ in precipitation and surface waters. Multiply substituted ("clumped") isotopes and $\Delta'^{17}O$ values of lacustrine carbonates will be used to back-calculate the isotopic composition of carbonate formation water and initial precipitation in the watershed.

Peru Eggsoscape, *UM Isotopologue Paleosciences Laboratory* (May 2019-present)
Lead project design and undergraduate mentor for a UROP project examining the spatial variability of $\delta^{18}O$ values in eggshells collected across central and southern Peru. In addition to the spatial component captured by the Peruvian shells, we are conducting weekly monitoring of Ann Arbor eggshells to evaluate temporal trends in shell chemistry.

Gage 1 Speleothem Project*, Union College Stable Isotope Lab* (July 2017-Nov. 2018)
Analysis of a central New York speleothem to determine paleoclimate conditions using stable carbon and oxygen isotopes in carbonates.

Senior Honors Research Student*, Colgate University Stable Isotope Lab* (August 2015-May 2016)
Year-long independent research project culminating in an Honors thesis and oral defense. Primary focus on chemical and mineralogical characterization of Ordovician carbonates and a minor carbonate lens within a complete Barrovian sequence.

Equipment Proficiency
Delta V Advantage IRMS with Conflo IV, Gas Bench II, TC/EA, and Costech EA peripherals, Delta+ Advantage IRMS with Costech EA peripheral, New Wave Micromill, MetrOhm Titrando autotitrator, total carbon and total inorganic carbon UIC Coulometrics carbon dioxide coulometers, laser diffraction particle sizer (Coulter LS 230), magnetic susceptibility dual frequency sensor, SEM (JEOL JSM636OLV), XRD (Philips PW3040), Cubis microbalance, thin section preparation, centrifuge, freeze dryer.

Laboratory Experience

Lab Technician*, Core Lab and Stable Isotope Lab*, Union College, Schenectady, NY (July 2016-June 2018)
Technician for ICDP (International Continental Scientific Drilling Program) paleoclimate project at Lake Junín in the Peruvian Andes. Oversaw preparation and analysis of samples for stable isotope analysis, biogenic silica, magnetic susceptibility, grain size, carbonate metals ratios, total carbon and total inorganic carbon coulometry. IRMS technician: independently prepared and analyzed samples for $\delta^{13}C$ and $\delta^{15}N$ for solids, $\delta^{13}C$ and $\delta^{18}O$ for carbonates, $\delta^{13}C$ and $\delta^{18}O$ for dissolved inorganic carbon (DIC) in waters, δD in waters, and $\delta^{18}O$ for waters and wood samples. Prepared and ran alkalinity samples. Drilled carbonate samples. Supervised and trained undergraduate research students.

Lab Research Assistant*, Stable Isotope Lab*, Department of Geology, Colgate University (Summer 2015)
Prepared carbonate metasediments for $\delta^{18}O$ and $\delta^{13}C$ analysis and assisted in running samples on a glass-trellis vacuum line and stable isotope mass spectrometer.

Field Experience

PhD Thesis Work, University of Michigan, May 2019
Designed, planned, and executed a week of field work in central Peru. This work was a critical component in developing an understanding of spatial variability in $\Delta'^{17}O$ in waters and carbonates from the Lake Junín watershed. In addition, local citizens were recruited to collect precipitation samples at four stations over the course of one year. Continuing exploratory work is expected in May 2020.

Geology Field Camp, Colgate University, June-July 2014
Five week intensive geology field camp with particular emphasis on sedimentology, structural geology, and geologic mapping.

Chile Extended Study, Colgate University, January 2016
Three week student designed and led field trip to the Lakes District in the Andean foothills.

Archaeology Field Course *Teaching Assistant* (Fall 2015) and *Student* (Fall 2013), Colgate University

Taught excavation techniques to students and assisted in cataloguing and cleaning materials recovered at an Oneida site in central New York.

Volcanology Spring Break Trip, Colgate University, March 2014
Week-long study trip to Ecuador with an emphasis on volcanic hazards, detection, and warning systems.

Geology of America's Parks, Colgate University, August 2013
Two-week volcanology and coastal geology field camp in the Cascades and Oregon coast.

Teaching Experience & Development

**Student evaluations of my teaching are available upon request*

Topics in Earth and Env. Sci. (EARTH296) Graduate Student Instructor, University of Michigan, Summer 2020
Worked with a team of Graduate Student Instructors and faculty to convert entry-level field camp courses to an online format due to university closures as part of the COVID-19 pandemic.

Stratigraphy and Basin Analysis (EARTH467) Graduate Student Instructor, University of Michigan, Winter 2020
Led lab sections for an upper-level stratigraphy and basin analysis course taught by Dr. Naomi Levin. The first half of this class met as a regularly scheduled, in-person course while the second half of the term was conducted remotely due to COVID-19 closures. I helped move our lecture sections online and conducted online video meetings for my own lab sections. This involved substantial adjustments to both my teaching style and partial re-design of labs to facilitate remote instruction.

Sediments (EARTH305) Graduate Student Instructor, University of Michigan, Fall 2018 & Fall 2020
Led lab sections, updated course assignments, and led review sessions for an upper-level sedimentology course taught by Dr. Kacey Lohmann.

Center for Research on Learning and Teaching (CRLT) Certificate Program, University of Michigan, In Progress
Developed an advanced understanding of pedagogy through CRLT teaching seminars and teaching evaluations by peer mentors. Seminars: *Backwards Course Design: Planning your course with the end in mind* (Fall 2019); *Evaluating Student Writing* (Winter 2019); *The Science of Learning* (Winter 2019); *Assessing Student Participation: What, How, and Why?* (Fall 2019).

Mentorship Experience

Undergraduate Research Opportunities Program (UROP) Mentor, University of Michigan, Fall 2019-Spring 2020
During the 2019-20 academic year, I served as a Research Mentor for a sophomore undergraduate student working on the Eggsoscape pilot project. I led project design and met with the student for weekly advising meetings. I worked with the student to develop her laboratory and analytical skills, data analysis and management skills, and scientific writing.

Publications, Posters, and Presentations

(§ indicates undergraduate student author)

Michigan Geophysical Union (MGU) Research Symposium, Virtual Conference (April 2021)
Abstract & Talk
Katz, S.A., Passey, B.H., and Levin, N.E., "A simple numerical model to predict the effect of moisture recycling on the triple oxygen isotope ($\Delta'^{17}O$) composition of downwind precipitation." MGU Annual Meeting 2021.

Michigan Geophysical Union (MGU) Research Symposium, Virtual Conference (April 2021)
Abstract & Talk
§ Andrews, K.S., **Katz, S.A**., Aron, P.G., Levin, N.E., "Spatial and temporal trends in stable oxygen isotopes of eggshells and waters" MGU Annual Meeting 2021.

American Geophysical Union (AGU), Virtual Conference (December 2020)
Abstract & Talk
Katz, S.A., Levin, N.E., Rodbell, D.T., Gillikin, D.P., Passey, B.H., "Reconstructing precipitation $\delta^{18}O$ from lacustrine carbonates using $\delta^{18}O$, Δ_{47}, and $\Delta'^{17}O$: a modern case study from Junín, Peru with implications for paleoclimate." AGU Fall Meeting 2020.

Union College, (October 2020)
Invited Talk
Katz, S.A., "Reconstructing precipitation $\delta^{18}O$ from lacustrine carbonates using $\delta^{18}O$, Δ_{47}, and $\Delta'^{17}O$: a modern case study from Junín, Peru with implications for paleoclimate." Invited talk for undergraduate audience.

American Geophysical Union (AGU), San Francisco, CA (December 2019)
Levin, N.E., Beverly, E.J., **Katz, S.A.**, Passey, B.H., Pelletier, E.M., Poulsen, C.J., Quade, J., Rech, J., "Triple oxygen isotopes, aridity and uplift: a case study from the Atacama." AGU Fall Meeting 2019.

Michigan Geophysical Union (MGU) Research Symposium, Ann Arbor, MI (March 2019)
Abstract & Poster Presentation
Katz, S.A., Levin, N.E., 2019, "Assessing modern Andean hydroclimate using the oxygen and hydrogen isotopic composition of waters in a Peruvian watershed." Michigan Geophysical Union Research Symposium Program.

GSA Annual Meeting, Indianapolis, IN (Nov. 2018)
Abstract & Poster Presentation
Katz, S.A., Gillikin, D.P., Rodbell, D.T., Cheng, H., 2018, "Climatic and hydrologic variability recorded in a mid- to late-Holocene central NY speleothem."

Northeast GSA Section Meeting, Burlington, VT (March 2018)
Abstract submission
Katz, S.A., Gillikin, D.P., Rodbell, D.T., Cheng, H., 2018, "High-resolution Paleo-hydrologic Speleothem Record from Central New York, Schoharie County."

Northeast GSA Section Meeting, Burlington, VT (March 2018)
Abstract submission
§ Lama Sherpa, T., **Katz, S.A.**, Rodbell, D.T., 2018, "A 700,000 YR record of glacial flour flux to Lake Junin, Peru."

Northeast GSA Section Meeting, Burlington, VT (March 2018)
Abstract submission
§Barnes, H., Gillikin, D.P., **Katz, S.A**., Cheng, H., 2018, "An Isotopic Investigation of a Partially Recrystallized Aragonite Stalagmite from Central New York."

Northeast GSA Section Meeting, Burlington, VT (March 2018)
Abstract submission
§Ammirato, J., Gillikin, D.P., Rodbell, D.T., **Katz, S.A**., Cheng, H., 2018, "Replication of a Speleothem Stable Isotope Record of South American Summer Monsoon Variability over the Last 6 ka from the Central Peruvian Andes."

Mohawk Watershed Symposium, Union College, Schenectady, NY (March 2017)
Abstract & Poster Presentation
Verheyden, A., **Katz, S**., & Gillikin, D.P., 2017, "The IAEA Global Network of Isotopes in Precipitation and Rivers (GNIP and GNIR) Stations at Union College," Proceedings of the 2017 Mohawk Watershed Symposium: Union College, Vol. 9: p. 74.

Northeast GSA Section Meeting, Albany, NY (March 2016)
Abstract & Poster Presentation
Katz, S., & Peck, W., 2016, "Mineralogy and Stable Isotopes of Dutchess and Litchfield County Metasedimentary Rocks" Geological Society of America Abstracts with Programs. Vol. 48, No. 2.

New York State Archaeological Association, Chenango Chapter, Norwich, NY (Sept. 2014)
Article & Group Presentation

Christiansen et al., 2014, “Excavations and Interpretations of the Oneida Brunk Site, Fall 2013: Colgate University ANTH 253 Class,” The Bulletin of the Chenango Chapter of the NYSAA. Vol 34, No. 1.

Additional Experience

***Graduate Student Representative**, GeoClub*, University of Michigan (Spring 2019-present)
Representative for the undergraduate and graduate student body at departmental faculty meetings.

***EarthCamp Instructor,** University of Michigan*, (June 2019)
Program instructor for a residential summer camp promoting “hand-on explorations of earth science” for Michigan high-school students. Students from districts with historically low enrollment in earth science degree programs participate in a 3-year summer enrichment program

***Member and Licensing Chair**, Colgate University Geological Society*, Colgate University (Fall 2015-Spring 2016)
Co-organized engaging programs and events for students outside of the academic department.

***Education Outreach Volunteer**, Robert M. Linsley Geology Museum*, Colgate University (Fall 2013-2014)
Collaborated with other volunteers to create geologic and environmental programs and led educational activities and tours for school groups.

***Sustainability Chair and Member**, Delta Delta Delta Sorority*, Colgate University (Fall 2014-Spring 2016)
Oversaw chapter sustainability and member education on renewable practices and policies.

***Upstate Institute Fellow**, Friends of Rogers Environmental Center*, Sherburne, NY (July-Aug. 2014)
Created, oversaw distribution of, and analyzed data from a series of surveys for community visitors to gauge program effectiveness. Suggested modification and updates to school programs offered at the Center.

***Museum Volunteer**, New York State Geological Survey at the New York State Museum*, Albany, NY (January 2014)
Data entry of well-log data used to create a statewide soil and bedrock profile.

Professional Memberships

***Student Member**, Geological Society of America (GSA)*, Years active: 2016-present
GSA divisions: Limnogeology Division; Continental Scientific Drilling Division

Ethics Training

Foundations of Good Research Practices (Fall 2019), *Conflict of Interest* (Fall 2019), *Research Administration* (financial ethics; Fall 2019)

Language Skills

Good command: *French*
Basic communication: *Spanish* (continuing to increase proficiency)

Computer Skills

Proficiency in: *Microsoft Word, Excel,* and *PowerPoint*; *Isodat* software
Some experience: *Python Anaconda; ArcGIS*; *Corelyzer; R*

Certifications

PADI SCUBA certification