

Curriculum Vitae - Madeline J. Lewis

Department of Earth, Atmospheric, and Planetary Sciences
 Purdue University, West Lafayette, IN 47907

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PROFESSIONAL APPOINTMENTS

Postdoctoral Research Associate- Purdue University (August 2021-present)
 Instructor- Indiana University Geologic Field Station (June-August 2021)

EDUCATION

Ph.D. in Geochemistry, California Institute of Technology (June 2021)
 Thesis: Magmatic Differentiation in Arc and Mid-Ocean Ridge Settings
 Principal Advisors: P.D. Asimow and C.E. Bucholz

M.S. in Geology, California Institute of Technology (June 2017)
 Advisors: P.D. Asimow and C.E. Bucholz

B.S. in Geological Sciences, Indiana University- Bloomington (May 2015)
 Magna cum laude, Hutton Honors College
 Undergraduate Honors Thesis: Petrology of Ngorongoro Volcanic Highlands, Tanzania
 Advisor: J.G. Brophy

PROFESSIONAL EXPERIENCE

Graduate Research Assistant in Geology and Geochemistry (Sept 2015- June 2021)
 California Institute of Technology, CA

Graduate ICPMS Lab Technician (Jan 2020- June 2021)
 Environmental Analysis Center, California Institute of Technology

Intern: US Geological Survey (May 2015-Sept 2015)
 US Geological Survey, Menlo Park, CA

Science, Research, and Technology Scholars Researcher (Aug 2012- May 2015)
 Indiana University- Bloomington, IN

TEACHING EXPERIENCE

Instructor- Indiana University
 EAS-X429 SU2021, Field Geology in the Rocky Mountains (Field Camp)

Associate Instructor- Indiana University
 EAS-X428 and EAS-X498c SU2020, Field Geology in the Rocky Mountains

Teaching Assistant- Caltech
 Ge120a SP2020, Introduction to Field Geology
 Ge120b SU2019, Field Camp
 Ge114 FA2018, Mineralogy
 Ge136a,b,c FA2016,WI2017, SP2017, Regional Geology of the Southwestern US

GRANT FUNDING

StraboSpot fieldwork support

Awarded: \$1500 (2021)

GSA: Awards for Geochronology Student Research 2

Project: Timing of Mafic Intrusions Relative to Granitic Pluton Emplacement in the Sierra Nevada Batholith

Awarded: \$8,987 (2019-2020)

NASA Indiana Space Grants Consortium: Undergraduate Research Grant

Project: Petrology of Ngorongoro Volcanic Highlands, Tanzania

Awarded: \$1,500 (2014-2015)

FELLOWSHIPS AND AWARDS

Ian Campbell Award for outstanding performance in field geology courses, Caltech (2017)
 National Science Foundation Graduate Research Fellowship Honorable Mention (2016)
 California Institute of Technology Graduate Research Fellowship (2015-2016)
 Magna Cum Laude, Indiana University (2015)
 Phi Beta Kappa, Indiana University (2015)
 Faculty Scholarship, Indiana University Department of Geological Sciences (2015)
 ConocoPhillips Brunton Compass Award: Top Student at Indiana University Field Camp (2014)
 Judson Mead Geologic Field Station Anadarko Scholarship (2014)
 Indiana University Alumni Council Undergraduate Geology Scholarship (2014-2015)
 Mineralogical Society of America Undergraduate Prize (2014)
 Professional Development Award, Indiana University Department of Geological Sciences (2014)
 N. Gary Lane Beginning Geologist Award, Indiana University (2013)
 William L. Frye Scholarship, San Fernando, CA Elks Lodge #1539 (2012-2016)
 Hutton Honors College Member at Indiana University (2012-2015)
 Richard and Virginia Stoner Scholarship (2012-2015)
 Indiana University Distinction Scholarship (2012-2015)
 William L. Frye Scholarship San Fernando, CA Elks Lodge #1539 (2012-2016)

PUBLICATIONS

*note that publications listed *in prep* are fully drafted and undergoing revisions. Many of these experienced significant analytical delays due to pandemic-related lab closures.

- Lewis, MJ**, Bucholz, CE, Jagoutz OE (2021) "Evidence for polybaric fractional crystallization in a continental arc: Hidden Lakes mafic complex, Sierra Nevada batholith, California. 176:90 <https://doi.org/10.1007/s00410-021-01844-y>
- Lewis, MJ**, Ryan-Davis, JR, Bucholz, CE (*in review, Geology*). "Mafic intrusions record mantle inputs and crustal thickening during flare-ups in the Sierra Nevada batholith."
- Lewis, MJ**, McCart, S, Asimow, PD, Lund, DC (*in prep* for Geochemistry, Geophysics, Geosystems*). "Multiple sills tapped by explosive eruptions from the East-Pacific Rise: Ties to sea level variation."

- Lewis, MJ**, Asimow, PD, Maurice, A, Fischer, WW, (*in prep* for Precambrian Research*).
 “Primary hosting of REEs in apatite the Wadi Karim BIF: Implications for REE chemistry in BIFs.”
- Lund, DC, Seeley, EI, Asimow, PD, **Lewis, MJ**, McCart, S, & Mudahy, A (2018) “Anomalous Pacific-Antarctic Ridge volcanism precedes glacial Termination 2.” *Geochemistry, Geophysics, Geosystems*. 19.8: 2478-2491.

MEETING ABSTRACTS

(*indicates oral presentation)

- ***Lewis, M. J.**, Asimow, P. D., Lund, D. C., & McCart S. (2020). Multiple sills tapped by a series of explosive eruptions from the East Pacific Rise. *AGU Fall Meeting, 2020*, V004-06.
- Lewis, M. J.**, Bucholz, C. E., & Ryan-Davis, J.R. (2020). Geochronology and Petrology of Upper Crustal Mafic Plutons Support a Mantle Connection to Arc Magmatic Productivity: Eastern Sierra Nevada Batholith, CA. *GSA Annual Meeting - 2020*.
- Lewis, M. J.** & Bucholz, C. E. (2019). Mafic Intrusions in the Sierra Nevada Batholith: Evidence for Polybaric Crystallization in a Continental Arc. *GranitesII Summer School on Magmatic Differentiation*. Roscoff, France.
- ***Lewis, M. J.**, Bucholz, C. E., & Jagoutz, O. E. (2018). Polybaric crystallization of hydrous basalts in a continental arc: evidence from Hidden Lakes mafic complex, Sierra Nevada batholith, California. *AGU Fall Meeting, 2018*, V34C-08.
- Lewis, M. J.**, Asimow, P. D., Maurice, A. E., & Fischer, W. W. (2018). REE budget in a Neoproterozoic iron formation dominated by accessory apatite: Wadi Karim BIF, Eastern Desert, Egypt. In *GSA Annual Meeting in Indianapolis, Indiana, USA-2018*. GSA.
- ***Lewis, M. J.**, Bucholz, C. E., Jagoutz, O. E., & Eddy, M. P. (2017). Petrology and Geochemistry of an Upper Crustal Mafic Complex-Hidden Lakes, Sierra Nevada Batholith, California. *AGU Fall Meeting, 2017*, V24D-02.
- Asimow, P. D., **Lewis, M. J.**, Lund, D. C., Seeley, E., McCart, S., & Mudahy, A. (2017). Glacial modulation of mid-ocean ridge magmatism and anomalous Pacific Antarctic Ridge volcanism during Termination II. *AGU Fall Meeting, 2017*, PP13E-03.
- ***Lewis, M. J.**, Asimow, P. D., & Lund, D. C. (2017). Petrology of Explosive Eruptions from the Pacific-Antarctic Ridge and Ties to Sea Level Variation, *IAVCEI Scientific Assembly, 2017*.
- Lewis, M. J.**, Asimow, P. D., & Lund, D. C. (2017). Petrologic Controls on Explosive Eruptions from the Pacific-Antarctic Ridge. *AGU Chapman Conference on Submarine Volcanism, 2017*.
- Lewis, M. J.**, Asimow, P. D., & Lund, D. C. (2016). Controls on Explosive Eruptions along the Pacific-Antarctic Ridge. *AGU Fall Meeting, 2016*, OS31D-2055.
- ***Lewis, M. J.**, & Kirby, S.H. (2015). Regional Sampling of Mantle Peridotites in Serpentinite Blocks Collected from Serpentinite Bodies in the San Francisco Bay Area, California: Petrological Trends. *AGU Fall Meeting, 2015*, T13H-05.

INVITED PRESENTATIONS

University of Southern California- Lithospheric Dynamics Seminar (2019)

Title: Upper Crustal Mafic Intrusions in the Sierra Nevada Batholith: Evidence for Polybaric Crystallization in a Paleo-Continental Arc

OUTREACH, VOLUNTEER, AND SERVICE

Mentor- Women in Science Program (2021-present)

Provide mentoring, advice, and support for women navigating undergraduate and graduate education in STEM fields at Purdue University

Session Convener- GSA Cordilleran Section Meeting (2021)

Session: Petrology, Geochemistry, and Structure of Cordilleran Batholiths through Space and Time

Participant in Certificate of Practice in University Teaching program (2019-present)

Through Center for Teaching, Learning and Outreach at Caltech

Equity and Title IX Advocacy Certification (2019- present)

Served as a confidential resource for Title IX concerns, prevention, and intervention.

Presenter & Volunteer- Skype a Scientist (2018-present)

Act as a virtual guest science teacher for elementary school classrooms

Chair- Caltech Arts Committee (2017-2019)

Advocate for the arts on campus, organize art and science outreach events

Graduate Student Representative- Institute Arts Committee (2018-present)

Select and approve art installations at Caltech

Volunteer- Science Olympiad (2017-2019)

Roles: proctor and grader at State tournament

Volunteer- Arroyos and Foothills Conservancy (2016)

Geologic mapping to secure land for wildlife corridor

PROFESSIONAL MEMBERSHIPS

American Geophysical Union (2015- present)

Geological Society of America (2016- present)

WORKSHOPS AND TRAINING

GSA Short Course: Petrochronologic Applications of U-Pb Geochronology and Lu-Hf and Trace/ REE Geochemistry by LA-ICPMS (2020)

Goals: Gain experience with petrochronologic analysis methods, data reduction, statistical tools, and data interpretation.

GSA Field Short Course: Pluton Construction Using StraboSpot Field Data System (2019)

Goals: Introduction to, practice with, and suggestions for improvements to the StraboSpot program and associated geologic data repository.

Granites II Summer School: Magmatic Differentiation (2019, Roscoff, France)

Goals: Explanation of magmatic differentiation mechanisms and the generation of granitic magmas across all tectonic settings. Summarizing current theories and determining directions for future research.

UCLA SIMS Workshop: Fundamentals of SIMS Analysis and Roles in Geology (2017, UCLA)

Goals: Chemical explanation of the ion probe and introduction to sample preparation, data acquisition, and applications.

MELTS workshop (2015, Caltech)

Goals: Understanding the thermodynamics and experimental data that forms the basis of alphaMELTS, and practice with application of the software.

FIELD EXPERIENCE

Field Camp, Faculty Instructor and Group Leader (2021)

Tobacco Root Mountains, Montana – Mapping/ Structural Geology

Course: Field Geology in the Rocky Mountains, EAS-X429, Indiana University

Ph.D Fieldwork: Mapping and sampling upper mafic intrusions (2016, 2017, 2018, 2019)

Eastern Sierra Nevada, California – Igneous Petrology, Mapping

Field Assistant: Mapping and sampling of volcanic rocks (2018)

Isla Ángel de la Guarda, Baja California, Mexico – Structural Geology/ Igneous Petrology

Field Assistant: Sampling of peraluminous granites (2017,2018)

Northwestern Ontario, Canada – Igneous/ Metamorphic Petrology (PI: Prof. C. Bucholz)

USGS Internship: Serpentinites of the Franciscan Complex (2015)

San Francisco Bay Area, California – Structural Geology/ Metamorphic Petrology

Field Camp, Student (2014)

Tobacco Root Mountains, Montana – Mapping/ Structural Geology

Course: Field Geology in the Rocky Mountains, G429, Indiana University

REFERENCES

Please contact the following for reference information. **Email is preferred** when possible:

1. Dr. Paul D. Asimow

Professor of Geology and Geochemistry, California Institute of Technology

Relationship to applicant: Thesis Advisor (Explosive Submarine Eruptions and BIF projects)

Email: asimow@caltech.edu

Phone: (626) 395-4566

2. Dr. Claire E. Bucholz

Assistant Professor of Geology, California Institute of Technology

Relationship to applicant: Thesis Advisor (Sierra Nevada arc projects)

Email: cbucholz@caltech.edu

Phone: (626) 395-1315

3. Dr. Michael C. Rygel

Professor of Geology and Department Chair, SUNY Potsdam

Academic Director, Indiana University Geologic Field Station

Relationship to applicant: M.Lewis was an Instructor for the Indiana University field camp, where academics are overseen by Dr. Rygel

Email: rygelmc@potsgdam.edu

Phone: (315) 267-3401

4. Dr. George R. Rossman

Professor of Mineralogy, California Institute of Technology

Oct, 2021

C.V. Madeline J. Lewis

Relationship to applicant: M.Lewis was a TA for Dr. Rossman's Mineralogy course

Email: grr@caltech.edu

Phone: (626) 395-6471