

Emily H. G. Cooperdock

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RESEARCH INTERESTS

Fluid-rock interaction; age and development of oceanic crust; trace element cycling; timing of serpentinization in tectonic processes; alteration mineral formation; U and Th partitioning during metamorphism, method development for (U-Th)/He analysis; Fe-oxide (U-Th)/He dating; X-Ray Computed Tomography application to geologic samples

EDUCATION

- Aug. 2017 Ph.D. **The University of Texas at Austin**, Department of Geological Sciences
Novel (U-Th)/He thermochronometric constraints on serpentinized ultramafic rocks,
(Dr. Daniel Stockli, advisor)
- May 2011 B.A. **Columbia University**, Department of Earth and Environmental Sciences
Depositional environment and detrital zircon dating of the Jardine Metasedimentary Sequence from the South Snowy Mountains in Yellowstone National Park
(Drs. David Mogk, Darrell Henry, Nicholas Christie-Blick, co-advisors)

PROFESSIONAL EXPERIENCE

- July 2019 Assistant Professor, University of Southern California, Los Angeles, CA
- 2017- present Postdoctoral Scholar, Woods Hole Oceanographic Institution, Woods Hole, MA
- 2012-2017 Graduate Research Assistant, The University of Texas at Austin, Austin, TX
- 2010-2011 Undergraduate Research Assistant, Columbia University, New York, NY

ACADEMIC AWARDS & FELLOWSHIPS

- 2017 Woods Hole Oceanographic Institution: Doherty Postdoctoral Scholarship (18 months)
- 2014 National Science Foundation: Graduate Research Fellowship (\$32,000/year for three years)
- 2014 The University of Texas at Austin: F. Earl Ingerson Graduate Research Assistance Fellowship in Geochemistry (\$4000/year for three years)
- 2014 The University of Texas at Austin: Graduate Dean's Prestigious Fellowship Supplement (\$1000/year for three years)
- 2014 The University of Texas at Austin: Chevron Minority Summer Fellowship (\$9000)
- 2013 Geological Society of America: Diversity Award
- 2013 Geological Society of America Mineralogy, Geochemistry, Petrology and Volcanology Division: Student Research Award (\$1000)
- 2012 The University of Texas at Austin: Jackson School Graduate Fellowship (\$36,000)
- 2010 University of Kansas (Field Camp): Golden Hammer Award

RESEARCH GRANTS

- 2017 Oman Drilling Project, Phase-Two Participation Proposal: "Constraining the low-temperature thermal history of the lower oceanic crust using multi-mineral (U-Th)/He chronometry" (*pending*)
- 2015 Jackson School of Geosciences Grant Matching Program: "Trace Element Systematics of Serpentinites" (\$1,000)
- 2015 Mineralogical Society of America's Mineralogy/Petrology Student Research Grant (\$5000)
- 2014 Jackson School of Geosciences Summer Analytical Fees Grant (\$1000)
- 2013 Geologic Society of America Students-in-Aid Research Grant: "Magnetite (U-Th)/He and (U-Th)/Ne geochronology: constraining serpentinization along magma-poor continental margins" (\$2,300)
- 2013 Jackson School of Geosciences Grant Matching Program: "Magnetite (U-Th)/He and (U-Th)/Ne geochronology: constraining serpentinization along magma-poor continental margins" (\$1,000)

PUBLICATIONS

1. Schwarzenbach, E., Caddick, M., Petroff, M., Gill, B., **Cooperdock, E. H. G.**, and J. D. Barnes, "Sulphur and carbon cycling in the subduction zone mélange" (*in review, Nature Scientific Reports*)
2. Bernard, Rachel E. and **Emily H.G. Cooperdock** (2018), No progress on diversity in 40 years. *Nature Geoscience* 11, 292–295 (2018) doi:10.1038/s41561-018-0116-6.
3. **Cooperdock, E. H. G.**, and D. F. Stockli (2018). "Dating exhumed peridotite with spinel (U-Th)/He chronometry." *Earth Planetary Science Letters* 489: 219-227.
4. **Cooperdock, E. H. G.**, *Raia, N. H., Barnes, J. D., Stockli, D. F. and Schwarzenbach, E. M. (2018) "Tectonic origin of serpentinites on Syros, Greece: Geochemical signatures of seafloor serpentinization preserved in a HP/LT subduction complex." *Lithos* 296: 352-364.
**Undergraduate student mentee*
5. **Cooperdock, E. H. G.**, and D. F. Stockli (2016) "Unraveling alteration histories in serpentinites and associated ultramafic rocks with magnetite (U-Th)/He geochronology." *Geology* 44(11): 967-970. doi: 10.1130/G38587.1

PUBLISHED CONFERENCE ABSTRACTS (née Hernandez Goldstein):

1. **Cooperdock, E. H. G.** and Stockli D. F., "Dating exhumed peridotite with spinel (U-Th)/He chronometry" (2018) 16th International Conference on Thermochronology
2. **Cooperdock, E. H. G.** and Stockli D. F., "Dating exhumed peridotite with spinel (U-Th)/He chronometry" (2018) Goldschmidt Conference
3. Schwarzenbach, E. M., Caddick, M. J., Petroff, M. Gill, B. C., **Cooperdock, E.H.G.** and J. D. Barnes

(2018) “Sources and speciation of Sulphur and carbon in the subduction zone mélange” EGU Galileo Conference

4. **Cooperdock, E. H. G.**, and Stockli, D. F. (2016) “Unraveling the alteration history of serpentinites and associated ultramafic rocks from the Kampos HPLT subduction complex, Syros, Greece” AGU Fall Meeting
5. *Raia, N., **Cooperdock, E. H. G.**, Barnes, J. D., Stockli, D. F., and Schwarzenbach, E. (2016) “Tectonic origin of serpentinites on Syros, Greece: Geochemical signatures of seafloor serpentinitization preserved in the HP/LT subduction complex” AGU Fall Meeting
**Undergraduate student mentee*
6. Cai, Y., Kelemen, P. B., Goldstein, S. L., Yogodzinski, G. M., Hemming, S. R., Rioux, M. E., and **Cooperdock, E. H. G.** (2016) “Ages and geochemical comparison of coeval plutons and volcanics from the central and eastern Aleutian arc” AGU Fall Meeting
7. **Cooperdock, E. H. G.**, and Stockli, D. F., (2016) “Unraveling the alteration history of serpentinites and associated ultramafic rocks from the Kampos HPLT subduction complex, Syros, Greece” 4th International Serpentine Days Conference
8. **Cooperdock, E.**, Carter, M., and Lehnert, K. (2015) “The Internet of Samples in the Earth Sciences: Graduate students invested in the future of physical samples” Geological Society of America, Abstracts with Programs, Vol. 47, No. 7, p.819
9. **Hernandez Goldstein, E.**, Stockli, D., Ketcham, R. & Seman, S., (2014) “Improved Methodology for Magnetite (U-Th)/He Dating of Serpentinites” 14th International Conference on Thermochronology
10. **Hernandez Goldstein, E.**, Stockli, D, Ketcham, R., & Seman, S., (2014) “U-Th/He Dating of Magnetites in Serpentinites” Goldschmidt Abstracts, 2014 974
11. **Hernandez Goldstein, E.**, Stockli, D. and Ketcham, R., (2013) “Vetting Unconventional Minerals for Thermochronology” Geological Society of America, Abstracts with Programs, Vol. 45, No. 7.
12. **Hernandez Goldstein, E.**, Stockli, D. and Ketcham, R., (2013) “Magnetite (U-Th)/He Geochronology: Advancements in Sample Preparation and Application to Date Serpentinites” Geological Society of America, Abstracts with Programs, Vol. 45, No. 3.
13. **Goldstein, E. H.**, Sauer, K., Harwood, J., Mogk, D, Henry, D., Mueller, P., and Foster, D., (2011) “Evolution of the Precambrian rocks of Yellowstone National Park: Metasedimentary Rocks” Geological Society of America, Abstracts with Programs, Vol. 43, No. 4, p. 61.
14. Corbin, N., Walden, J., Bigoldi T., Thompson, J., Stockli, D., **Hernandez Goldstein, E.**, Biel, S., Fry, T., Wiese, S., and Weiland, C., (2010) “Late Miocene to Pliocene left-lateral reactivation of Middle Miocene right-lateral faults in the Mina deflection- a detailed stratigraphic, structural, fault-kinematic, and geochronological investigation in the Coaldale Junction area, Walker Lane, NV” Geological Society of America, Abstracts with Programs, Vol. 42, No. 5, p. 133.

PRESENTATIONS (conferences, *oral, † poster):

- 2018 †16th International Conference on Thermochronology, Quendlinburg, Germany
“*Spinel (U-Th)/He thermochronology: Dating mantle exhumation by tectonic and volcanic processes*”
- 2018 *Goldschmidt Annual Conference, Boston, MA
“*Spinel (U-Th)/He chronometry: A novel approach to date mantle exhumation*”
“*The impact of Science Y'all: A grassroots student blog*”
- 2017 *Tomography for Scientific Advancement Meeting (ToScA) North America, Austin, TX
“*Improved mineral grain screening and measurement using X-Ray Computed Tomography: Applications to (U-Th)/He chronology*”
- 2016 *4th International Serpentine Days Conference, Sete, France
“*Unraveling alteration histories of serpentinites and associated ultramafic rocks with magnetite (U-Th)/He geochronology*”
- 2014 *Goldschmidt Annual Conference, Sacramento, CA
“*(U-Th)/He Dating of Magnetites in Serpentinites*”
- 2014 †14th International Conference on Thermochronology, Chamonix, France
“*Improved Methodology for Magnetite (U-Th)/He Dating of Serpentinites*”
- 2013 †Geological Society of America Annual Meeting, Denver, CO
“*Vetting Unconventional Minerals for Thermochronology*”
- 2013 † Geological Society of America South-Central Annual Meeting, Austin, TX
“*Magnetite (U-Th)/He Geochronology: Advancements in Sample Preparation and Application to Date Serpentinites*”

PRESENTATIONS (institutions, *oral, † poster):

- 2018 **INVITED*: Brown University, Department of Earth, Environmental and Planetary Sciences, Lunch Bunch Seminar
- 2017 *The University of Texas at Austin, Department of Geological Sciences, Petrology, Geochemistry, Structure and Tectonics Seminar
- 2017 *University of Houston, Geochemistry Seminar
- 2017 *Rice University, Geochemistry Seminar
- 2017 *University of Texas at Dallas, GeoClub Meeting and UTD Friday Seminar
- 2017 **INVITED*: Columbia University, Lamont Doherty Earth Observatory, Geochemistry Seminar
- 2017 **INVITED*: Woods Hole Oceanographic Institution, Marine Chemistry & Geochemistry Seminar
- 2017 † Jackson School Research Symposium, The University of Texas at Austin
- 2015 *Exxon-Mobil, Research and Development team, Houston, TX
- 2014 *The University of Texas at Austin, Department of Geological Sciences, Petrology, Geochemistry, Structure and Tectonics Seminar
- 2014 *Columbia University, Lamont Doherty Earth Observatory, Hot Topics Seminar
- 2014 *The University of Texas at Austin, Department of Geological Sciences, Petrology, Geochemistry, Structure and Tectonics Seminar
- 2014 † Jackson School Research Symposium, The University of Texas at Austin

- 2013 *Exxon-Mobil, Research & Development team, Houston, TX
- 2013 † Jackson School Research Symposium, The University of Texas at Austin
- 2011 *Columbia University, Department of Earth and Environmental Sciences, Noon Balloon Seminar

TEACHING & GEOSCIENCE EDUCATION EXPERIENCE

- 2016 Teaching Assistant, Earth Materials, The University of Texas at Austin
Prepared and led hands-on laboratories every week for twelve undergraduate students, guest lectured for class of 70 students, created demonstration videos to accompany lectures (Instructor rating by students: 4.7/5.0)
- 2016 Mentor to Undergraduate Honors Student, The University of Texas at Austin
Mentor to Natalie Raia for her honors thesis project, conceptualized the project, advised research activities, writing, and presentations. The final product included a poster at AGU 2016 and a publication submitted to Lithos.
- 2015 Mentor, Students Raising Students Program, The University of Texas at Austin
Mentor to Allison Berti, undergraduate geophysics major, provided career advice
- 2014 GK-12 Associate, The University of Texas at Austin
Presented to high school classrooms, lead department tours for K-12 students
- 2014 Co-coordinator for UTChron Undergraduate Summer Minority Intern Program
Organized and mentored undergraduates Claudia Roig (University of Puerto Rico), Doris Rivera-Santiago (University of Puerto Rico) and Kendall Salinas (University of Texas) in (U-Th)/He related research projects at University of Texas at Austin.
- 2014 Teaching Assistant, Honors Undergraduate Field Trip to the Colorado Plateau, The University of Texas at Austin
Handled logistics and driving for 5-day field trip, aided in outcrop interpretation
- 2013 Participant, On the Cutting-Edge Workshop: Preparing for an Academic Career in Geosciences, Boulder, CO
- 2010 NSF Research Experience for Undergraduates: Precambrian Rocks of Yellowstone National Park
The results of the REU were published in by Mogk et al. (2012) in Yellowstone Science
- 2010 Teaching Assistant, Solid Earth Systems, Columbia University (2 semesters)
Assisted during lab activities and field trips, graded all labs, tutored students

PROFESSIONAL SERVICE/ACTIVITIES

- 2018 Member, Diversity Action Committee, Woods Hole, MA
- 2018 Co-convener, 16th International Conference on Thermochronology
- 2017 Co-convener, Goldschmidt Session “Innovations and Advances in Thermochronology”
- 2016 Co-convener, AGU Session “4 Billion Years of Serpentinization on Earth and Beyond”
- 2016 Co-founder & Editor, *Science, Y’all!* the official student science blog of the Jackson School of Geosciences at The University of Texas at Austin

- 2016 Coordinator, Petrology, Geochemistry, Structure and Tectonics Seminar, The University of Texas at Austin
- 2016 Panel Member, Jackson School of Geosciences 10th Anniversary Celebration and Research Symposium, The University of Texas at Austin
- 2015 Graduate Student Representative, Jackson School Dean's Evaluation Committee, The University of Texas at Austin
- 2015 Planning Committee Member, iSamples EarthCube Research Coordination Workshop, Austin, Texas
- 2014 Secretary, Graduate Student Executive Committee, The University of Texas at Austin
- 2014 Lead Coordinator, Jackson School Poster Symposium, The University of Texas at Austin
- 2013 Vice President, Graduate Student Executive Committee, The University of Texas at Austin
- 2013 Student Volunteer, South-Central Annual Meeting, Geological Society of America
- 2012 Student-Faculty Liaison, Graduate Student Executive Committee, The University of Texas at Austin
- 2012 Participant, Pyrenees Workshop 2012, St. Martin d'Arrossa, France
- 2011 Research Assistant, International Drilling Program Dead Sea Project, Dead Sea, Israel
- 2010 Student Volunteer, Annual Meeting, Geological Society of America
- 2009 Participant, Geoinformatics Workshop, Geological Society of America
- 2009 Research Assistant, MEDCOR Research Cruise, Messina, Sicily

FIELD EXPERIENCE

- 2016 Etang de Lers, France, Participant in 2-day field trip for Serpentine Days conference led by Yves Lagabrielle
- 2016 Newfoundland Bay of Islands Ophiolite; Participant in week-long field trip for UT graduate seminar led by John Dewey and Jack Casey
- 2015 Aleutian Islands, Alaska; Field assistant for GeoPRISMS funded sampling of volcanic rocks on the islands Atka and Unalaska with Columbia University collaborators
- 2015 Western Alps, Switzerland; Ph.D. field work to collect serpentinite samples for geochronology
- 2015 Oman Ophiolite; Ph.D. field work to collect serpentinite samples for geochronology
- 2013 Graubünden, Switzerland; Participant in Exxon Mobile Field School, "Tectonic Sedimentary and Magmatic Evolution of Hyper-Extended Rift Margins" led by Gianreto Manatschal
- 2014 Colorado Plateau, USA; Teaching Assistant for week-long UT honors undergraduate field trip
- 2013 Malenco, Italy and Davos, Switzerland; Ph.D. field work to collect serpentinite samples for geochronology and geochemistry
- 2013 Franciscan Subduction Complex, CA, USA; Participant and driver in the International Lithosphere Program Field Trip led by Mark Cloos
- 2013 Cycladic Islands, Greece; Participant in week-long field trip for UT graduate seminar led by Daniel Stockli, followed by week-long field work with UT Ph.D. student (Spencer Seman) to collect samples for U-Pb and (U-Th)/He analyses
- 2012 Western Pyrenees; Participant in 3-day field trip of the Pyrenees Workshop led by Emmanuel Masini followed by week-long field work with UT M.S. student Nicole Hart to collect samples for U-Pb and (U-Th)/He analyses

- 2012 Dead Sea, Israel; Field assistant, documented stratigraphy, soft sediment collection
- 2011 Dead Sea, Israel; Field assistant for International Continental Drilling Program: Dead Sea Drilling, prepared and described drill cores
- 2010 Yellowstone National Park, WY; Senior thesis field work to collect Archean metasedimentary rocks for geochronology and pseudo-stratigraphic sections
- 2010 Colorado, Nevada and Utah; Participant in the University of Kansas field camp for 6-weeks

RESEARCH SKILLS

Noble Gas Mass Spectrometry (quadrupole and magnetic sector split-flight tube)
X-Ray Computed Tomography (CT) data acquisition and manipulation
Inductively Coupled Plasma Mass Spectrometry (ICP-MS – solution and laser modes)
Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES)
Scanning Electron Microscopy (SEM)
Energy Dispersive Spectroscopy (EDS)
Clean laboratory sample dissolution (flux fusion, parr-bomb, hot plate, sinter)
Sample preparation (whole rock crushing, mineral separation for magnetite, spinel, apatite, zircon)

PROFESSIONAL SOCIETIES

Geological Society of America
Mineralogical Society of America
American Geophysical Union
National Association of Geoscience Teachers