

Olivia Grace Thurston

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Education

Doctor of Philosophy in Geology **2016-2021**

University of Illinois at Urbana-Champaign, Urbana, Illinois

Thesis Title: "Effects of radiation damage level, zonation, and annealing on the (U/Th)-He zircon dating system"

Research Areas: Thermochronology, Radiation damage, Annealing Kinetics

Bachelor of Science in Geology, Magna Cum Laude **2012-2016**

Union College, Schenectady, New York

Thesis Title: "Uranium distribution and High-Damage Zircons in the Lucerne Pluton, Maine: Implications for uranium and radon groundwater contamination"

Research Areas: Thermochronology, Radon, Radiation Damage

Research Experience

University of Illinois at Urbana-Champaign

Graduate Research Assistant **2016-2017; 2019-2020**

- Collect data and prepare samples for Raman Spectroscopy and (U/Th)-He zircon analysis
- Assist in laboratory maintenance
- Analyze Raman zircon data for radiation damage levels and zonation
- Produce radiation damage maps of zircon pre- and post-annealing
- Constructed forward and inverse thermal history models for (U/Th)-He zircon data
- Develop programs in Python to convert Raman data into Full Width Half Maximum maps

Union College

Undergraduate Senior Thesis **2015-2016**

- Collected and processed Gamma spectroscopy data using the RS230 to find areas of high radioactivity
- Analyzed and identified mineral species of fault rock using the SEM
- Determined age and thermal history of zircon crystals from the Lucerne using ICP-MS
- Collected and processed Raman Shift data on zircon to quantify uranium concentrations and potential uranium source minerals
- Developed a proxy for uranium concentration and radiation damage of zircon using Raman Shift

Undergraduate Research Assistant **2014-2015**

- Collected Raman Shift Spectra data on zircon crystals to quantify damage to crystalline structure using the Raman Laser
- Identified minerals in cross section using the Raman Laser and associated peaks

Teaching Experience

University of Illinois at Urbana-Champaign

Head Teaching Assistant

Fall 2018; Spring 2019

- Lead a primer lecture for laboratory component of GEOL 208: History of The Earth System
- Reconstructed and design laboratory exercises
- Assisted in identification of common rocks and minerals
- Taught formation environments of common rocks and minerals
- Helped lead a three-day field trip and teach field work skills

Teaching Assistant

Fall 2017

- Lead a short primer lecture for the laboratory component of GEOL 143: History of Life
- Administered the laboratory exercise
- Assisted in identification of fossils and their importance for the development of life on Earth

Wasatch-Unita Field Camp

Teaching Assistant

Summer 2019; 2020

- Taught basic field skills (orienting, safe camping, rock identification), field mapping using paper maps and Brunton compasses, and remote mapping using GoogleEarth and ArcGIS

Indiana University Field Camp

Instructor

Summer 2021

- Taught basic field skills (orienting, safe camping, rock identification), field mapping using paper maps and Brunton compasses

Service and Mentorship

Head of Undergraduate Mentorship

2019-2021

- Designed and host graduate school application seminars
- Paired undergraduates with graduate student mentors
- Assisted undergraduates in finding research opportunities on campus
- Mentored undergraduates on how best to plan academic and professional careers

SESE Review Committee Member

2018;2019

- Organize a school (School of Earth, Society, and Environment) wide research symposium

Franklin Middle School STEAM Café Presenter

December 2019

- Engage middle school students in the geosciences using art based methods

Presentations and Publications

Thurston, O.G., Guenther, W.R., Karlstrom, K.E., Ricketts, J.W., Heizler, M.T., and Timmons, J.M., IN REVIEW. Zircon (U-Th)/He thermochronology of Grand Canyon resolves 1250 Ma unroofing at the Great Unconformity and <20 Ma canyon carving. *Geology*, IN REVIEW.

Thurston, O.G., Guenther, W.R., Garver, J.I., IN REVIEW. Radiation damage annealing in zircon crystals with heterogenous distributions of U and Th. *Chemical Geology*, IN REVIEW.

Thurston, O.G., Guenther, W.R., Garver, J.I., 2021. Annealing zircon with zoned radiation damage distribution and implications for (U-Th)/He thermochronology. Thermo 2020, (U-Th)/He: Theory, Nuts & Bolts, and Best New Practices - Part 1: Oral Presentations.

- Thurston, O.G., Guenther, W.R., Garver, J.I., 2018. Mapping and quantification of total annealing of zircon alpha-decay radiation damage: Revisions to annealing kinetics for zircon-He thermal histories. Geological Society of America, Work on the Zircon, Highlight the Apatite: Wielding the Power of Accessory Minerals and Honoring the Contributions of Bruce Watson, 2018 Roebling Medalist, Poster Session.
- Thurston, O.G., Guenther, W.R., and Garver, J.I., 2017. Alpha-recoil damage annealing effects on zircon crystallinity and He diffusivity: Improving damage-diffusivity models. American Geophysical Union, Applications of Thermochemistry to Understand Crustal Systems, Poster Session.
- Thurston, O.G., Manon, M.R.F., Garver, J.I., 2016. Uranium in small-scale faults that cut the Upper Devonian Lucerne Pluton, Maine. Northeastern Section of the Geological Society of America, Radioactivity in the Environment, Technical Session.
- Thurston, Olivia G., and Garver, John I., 2015. Radioactivity of the Lucerne Pluton, Maine: Evidence for Post-Intrusive Uranium Redistribution. Geological Society of America, Undergraduate Research Talks: The Next Step in Student Research Projects, Technical Session.
- Worthington, M.P., Thurston, O.G., Manon, M.R.F., Garver, J.I., 2015. Radon Potential and Uranium Redistribution in the Lucerne and Gouldsboro Granites, Maine. Northeastern Section of the Geological Society of America, Recent Advances in Earth Sciences 1, Poster Session.