

Geoscience is interdisciplinary at its very core, and I am too; whether those disciplines are teaching and research or geochemistry and thermochronology, these exist in blissful coordination within me. Throughout my undergraduate education at [Uni A] and [Uni B], I have dedicated my time to becoming a more effective science communicator both as an undergraduate teaching assistant and as a researcher. I have been a TA for six upper and lower level classes with between 15 to 130 students. In each of these classes, I created the opportunity to have one-on-one interactions with students during my well-attended office hours. While I was a TA for Prof. A's class, I created and delivered a lecture, and gave practical in-class activities to 150 students on geochemistry. Teaching, tutoring, and preparing detailed lecture materials has given new depth and life to my desire to engage in scientific research and to disseminate new discoveries to the next generation of students.

As an undergraduate at [Uni B], I joined Dr. T's geomicrobiology lab as the resident petrologist in 2018. Using a Raman spectrometer and petrographic microscope I identified garnet in serpentinite cores from the [location] ophiolite. The presence of andradite garnet was a surprising discovery because it should not have been present in such large quantities. Analyzing and imaging the garnet and its surroundings led to my first research presentation at the AGU annual meeting in 2018, where I examined garnet's role in creating a habitable environment for microbial life in the ophiolite's extreme subsurface conditions. I am continuing this research into the garnet-microbe relationship by reacting environmentally viable concentrations of mineral and fluid precursors to crystalize garnet and hopefully release H₂, a potent microbial food source.

I started in Dr. F's thermochronology lab after graduating from [Uni B] and becoming a professional research assistant. I am working to develop and implement a solution to estimating uncertainties on He-loss correction in apatite during U-Th decay and alpha-ejection. I classified over 400 apatite grains based on grain size, grain geometry, and surface roughness using an x-ray microscope in collaboration with the Engineering Department at [Uni B]. I was involved in the design of mounts that held 50 apatite grains on the head of a pin so we could achieve the highest resolution x-ray images of apatite ever published. I enjoyed weaving this methods development project into a compelling story, which I told at the 2019 GSA meeting where I was awarded "Best Poster Presentation" by the geochronology division of the GSA. Currently, I am drafting a manuscript for publication in a peer-reviewed journal which details our findings and how they will increase the accuracy of apatite (U-Th)/He calculated ages.

Over the course of my PhD, I am eager to narrow my focus by carving a research niche at the intersection of thermochronology and geochemistry—I know that I can accomplish this by working with Dr. F. I have had the privilege of benefitting from the Department of Geosciences' robust academic philosophy over my years of studying and researching here; my collaborative goals in research, mentorship, and career align closely with this mission. I have worked with Dr. F and Dr. M over the past couple of years in many capacities, both inside and outside the lab. I know I have countless opportunities to grow as a thermochronologist and geochemist in the [lab].

I intend to take part in a project proposed by Dr. F that uses kimberlite pipes across the [location] to understand the Phanerozoic surface history of this area. This will be accomplished by using the cutting-edge low temperature thermochronologic instrumentation and methodology in the TRaIL. In addition, we will use high temperature thermochronology and mantle geochemistry to tackle this problem from all angles. This project has several collaborators at CU and beyond, like Dr. P at the [Uni C]. Dr. P's group is currently studying the geochemistry of mantle xenoliths in these kimberlites to elucidate the origin and geochemical evolution of the cratonic mantle roots. I am eager to develop my understanding of lithospheric evolution by combining thermochronologic and geochemical data to craft a robust story for the surface history of the [location]. The opportunity to conduct research with him would advance my exploration of the junction of thermochronology and geochemistry. With Dr. F as my PI and this project so well suited to my research goals, I know that [Uni B] is the best place for my graduate studies to begin and the best environment for me, my abilities, and my research to flourish.

The faculty and facilities at [Uni B] provide unparalleled opportunities to enhance my technical research skills and many avenues to create and share scientific narratives. My passion for crafting scientific stories is the basis for my dedication to mentorship for underrepresented populations in geosciences, and I hope to mentor undergraduates in the lab. As the 2018 recipient of "Outstanding Woman Geoscientist of the Year" and my work as an accessibility activist, I plan on bringing awareness to barriers in the geosciences and working to overcome them as a TA and RA while I pursue my PhD. Research flourishes with a diversity of people and perspectives; I will continue to work to make this a reality at [Uni B] and beyond by bringing this awareness to my classroom and labs across campus. [Uni B] and the Graduate Teacher Program will provide the preparation necessary for me to pursue an academic career at an institution with a focus on interdisciplinary undergraduate education and research. I hope to integrate accessible pedagogy and research practices into my classroom so I can lower the barriers for underrepresented students to be involved in geology. The Department of Geological Sciences at [Uni B] provides access to state-of-the-art instrumentation, opportunities for collaboration, resources to publish, and a

community dedicated to deliberately increasing diversity in the geosciences—qualities that are integral to my continued growth as a researcher, educator, and mentor.

