Seeking graduate students to work on a funded project in Tectonics/Thermochronology of the northern Rockies

We are actively recruiting graduate students to work on a collaborative tectonics/ thermochronology project led by researchers at Idaho State University (ISU), Montana State University (MSU), and Columbia University. This project will support several new MS students at Idaho State University and one new PhD student at Montana State University, as well as undergraduates at ISU, MSU, and Columbia.

Research project description:
Unconformities, which are abundant in the rock record, are traditionally viewed as unfillable gaps in Earth's history. However, the thermal imprint of sedimentary cover on the basement rocks that underlie many unconformities provides a rich archive of the otherwise inaccessible parts of a continent's tectonic history. This record is now accessible due to recent advances in low-temperature thermochronology. The primary objective of this study is to contribute to these advances by targeting a critical gap in knowledge about Laurentian tectonics, the breakup of supercontinent Rodinia, while establishing an approach to deep-time thermochronology that can document Precambrian tectonic activity in regions that also experienced significant Phanerozoic mountain building. This study will sample along a 700-kilometer-long segment of western Laurentia's rifted margin, targeting basement rocks directly below the Great Unconformity and using multiple chronometers [(U-Th)/He, fission track, and Ar/Ar] to produce holistic tectonothermal histories to fill a billion-year gap in the rock record. This study will demonstrate how deep time thermochronology can provide a new perspective on the geometry and tectonic evolution of western Laurentia's rifted margin, where much or all of the sedimentary record of Neoproterozoic tectonism is missing. This capability will be tested by (1) establishing a clear link between extant Neoproterozoic sedimentary rocks and Neoproterozoic tectonothermal events in the Uinta Mountains, (2) documenting the Proterozoic thermal histories of basement blocks with no overlying Neoproterozoic strata in the Teton Range and southwestern Montana, and (3) quantifying intra-mountain range variability of Proterozoic thermal histories to evaluate the sampling spatial resolution necessary for extracting meaningful tectonic information from the deep-time thermochronologic record.

More project information can be found here (https://www.nsf.gov/awardsearch/showAward?AWD_ID=2140480).

Timeline and funding information: We plan to recruit prospective graduate students this fall for a January application deadline, with the goal to have new students starting field-based research in summer 2023 and beginning their coursework in fall of 2023. Student funding will be through a combination of teaching and research assistantships; the grant also includes summer research funding.

Prospective students interested in the MS program at ISU should contact Drs. Kendra Murray (kendramurray@isu.edu) and Dave Pearson (davepearson@isu.edu) and those interested in the PhD program at MSU should contact Dr. Devon Orme (devon.orme@montana.edu). We hope to meet prospective students this fall, including at GSA in October.