EarthScope Student Geochronology Research and Training Program Laboratory Overview
University of Wyoming High-Precision Isotope Laboratory

Ken Sims, P.I.

Lab Description

The UW High-Precision Isotope Lab is equipped with a state of the art ThermoFischer NeptunePlus MC-ICP-MS. Our equipment allows for measurements of long-lived radiogenic isotope systems Sr, Nd, Hf, and Pb, U-series disequilibria measurements of U, Th, and Ra, and non-traditional stable isotope measurements of Ca, Fe and U. The lab has all the facilities needed for sample preparation and purification of all currently measured isotope systems, including a class-100 clean lab.

Expected Time Frame

Students must arrange time to visit the UW High-Precision Isotope Lab, making sure that personnel are available to train and mentor students during their visit. A minimum of two weeks is necessary to prepare a minimum of 10 silicate samples for isotope analyses, including digestion, purification, and analysis of a single isotope system. Additional time is required for additional isotopic measurements, as each isotope system requires different purification procedures and analytical time on the mass spectrometer.

The basic steps students will learn and perform at the UW High-Precision Isotope Lab include:

- Protocol for sample preparation (i.e., picking clean rock pieces and powdering samples)
- Protocol for sample digestion
- Protocol for analyte purification, depending on the desired isotope systems
- Analytical techniques associated with Multi-Collector ICP-MS technology

Costs for UW analysis

Students should budget for housing costs, food, and other accoutrements during their stay in Laramie, WY. Costs for sample analysis include $1000/day for mass spectrometry, which amounts to approximately 10 samples per day, but can vary depending on the isotope system. In addition, some lab materials (acids, resins, etc.) should also be budgeted for up to $1000 depending on the number of samples processed.

Preparation for Visit

Students simply need to bring any rock samples they wish to analyze. Students wishing to analyze whole rock powders would be advised to prepare those powders in their home facilities, but we also provide equipment for crushing, powdering, and picking.

Relevant Laboratory Staff

The UW High-Precision Isotope Laboratory is directed by Ken Sims (ksims7@uwyo.edu).

Data Processing and Interpretation

Visiting students will be primarily in charge of the processing of their samples and purification of desired analytes. Students will learn all steps involved in data acquisition, from rock to analysis using the mass spectrometer. Students should gain an understanding of the limits of data interpretation through this process.

Expected Lab Availability

Students should contact the lab at least one month in advance prior to visiting the lab to schedule a time when personnel will be available for lab training.

Contacts

Those interesting in using the facilities at UW should contact:
Ken Sims (ksims7@uwyo.edu)