



Archaeometry Laboratory

University of Missouri

CALL FOR GRADUATE INTERNSHIP PROGRAM APPLICATIONS

The Archaeometry Laboratory at the University of Missouri Research Reactor is pleased to advertise its Graduate Internship program in the areas of **compositional analysis or isotopic analysis of archaeological materials** starting in the Summer or Fall, 2025. Types of material and area of geographic focus is open. Program participants will receive training and perform analyses on their own materials for their thesis projects under the supervision of Archaeometry Lab mentors. As part of their training, interns are expected to participate in lab activities including sample preparation and analysis and statistical interpretation of compositional data. The laboratory supports NAA, XRF, Raman spectroscopy, MC-ICP-MS, LA-ICP-MS, and petrography research, and interns will have access to those techniques. More information on the capabilities of the Archaeometry Lab can be found [on our website](#).

There are **four** parts to complete your Internship Application:

Part 1: Provide a 3-5 page statement on your intended program of research. This must include an outline of the research question(s), a description of the samples to be analyzed, the analytical techniques or reference databases that will be used, a statement on why MURR is the ideal location to conduct this research, and a statement on funding support for your project. Be as specific about your research goals as possible. Include a summary table of site names, material types, number of samples, and temporal periods as relevant. Include a statement about your intended dissemination of results (i.e., thesis, publication, conference presentations). You may find helpful information while putting together your application on our website for the miniproposal program: https://archaeometry.missouri.edu/nsf_subsidy.html.

Part 2: Complete the application form. Ensure that all signatures are provided. Submit in .pdf format.

Part 3: Include a current CV in your application package.

Part 4: Include a brief letter confirming support of your application from your Graduate Advisor. The support letter can be delivered by the advisor separately via email.

Please send any questions or your completed application package by email to archaeometrylab@missouri.edu with the subject line: 2025 Graduate Internship Program. Review of applications will begin January 15, 2025. Additional information about the laboratory is available at our website: archaeometry.missouri.edu.

It is strongly encouraged that you seek consultation from the Archaeometry Laboratory as you prepare your application. Lab members can help you determine which techniques would be best applied, what materials, methods, or analyses we can and cannot support, and offer any relevant background information on available databases that might be relevant to your proposed project. Additionally, you can find tips on criteria for evaluation of project feasibility on the website for the related NSF miniproposal program: https://archaeometry.missouri.edu/nsf_subsidy.html.

Applicant Information

Name: _____

Email: _____

Address:

Are you a US citizen, permanent resident, or visa-holder that is legally eligible to work in the US?

Current Doctoral Program and status (University, department, year):

Thesis Supervisor Name and Contact Information:

Research project Timeline: provide tentative dates for your residency. We encourage a 4-6 month period, with a minimum requirement of 3 months.

Project Budget

Through NSF funding, the Archaeometry Lab is able to support hands-on research opportunities such as this program. However, applicants are responsible for securing funds to cover lab consumable costs that will arise. The table below outlines the per-sample costs for each analysis type. These rates are only applicable to applicants who are accepted to the program and only for the duration of the internship residency. We strongly encourage applicants to seek external funding to support their research costs in advance of their internship application (e.g., NSF Doctoral Dissertation Improvement Grant, Wenner Gren Dissertation Fieldwork Grant, support from thesis supervisor, internal grants from host institution, etc.). We encourage applicants to contact us for consultation on your project budget. You must describe your source(s) of funding in your proposal narrative.

Analysis	Cost per Sample	Number of Samples	Total
Neutron Activation Analysis	\$30*		
XRF	\$0		
LA-ICP-MS or Raman Spectroscopy	Request quote		
MC-ICP-MS	Request quote		
Thin Section Petrography	Request quote		

*Our regular subsidized rate of \$50 per sample for NAA (2024 pricing) will be further reduced to \$30 per sample only for the duration of the internship residency.

Signatures

By signing this form you understand the terms and conditions of the MURR Graduate Internship program and agree to the residency requirements as state. You also agree to abide by MURR Archaeometry Laboratory Data Management Policies as described below (found at https://archaeometry.missouri.edu/data_management.html and [10.5281/zenodo.12986929](https://doi.org/10.5281/zenodo.12986929)).

Applicant signature

Applicant Thesis Supervisor signature

MURR Archaeometry Data Management and Sharing Plan

The Archaeometry Laboratory at the University of Missouri Research Reactor maintains data from its research activities and makes these data accessible pursuant to its mission statement, which is to further the knowledge of the human past through the application of scientific techniques to archaeological materials, and to promote awareness, training, and innovation in these techniques. As a laboratory supported by NSF, the Archaeometry Laboratory recognizes an obligation to share and to maintain a formal data management plan in accordance with NSF requirements for dissemination and sharing of results (AAG VI.D.4) and data management plans (GPG II.C.2.j). A long-term goal of the Archaeometry Laboratory is to make its entire dataset available in compliance with the FAIR Guiding Principles for data management. This data management plan is a living document, with current and previous versions made available via open source ([10.5281/zenodo.12986930](https://doi.org/10.5281/zenodo.12986930)).

Types of Data

Data produced from analyses undertaken by the Archaeometry Laboratory include spectral data files and tabulated chemical data specific to the methods used in the laboratory, as well as technical reports and documents, correspondence, and publications related to specific projects. Additional archaeological and contextual data for each sample are provided by collaborators and by principal investigators in the Archaeometry Laboratory. In addition to these data, the Archaeometry Laboratory also maintains a collection of geological source material, including obsidian samples from sources, pre-assembled sets of source material designed for the calibration of scientific instruments that measure materials commonly studied in the Archaeometry Lab, and custom Raman/IR reference libraries for archaeologically relevant materials.

Sharing and Access of Data

Findability

Data produced by the Archaeometry Laboratory are uploaded to three locations: on its website, in the institutional repository of the University of Missouri System (MOspace), and in the open repository Zenodo. MOspace and Zenodo assign a persistent identifier to these datasets, enabling academic citation with attribution to the Lab and collaborator or principal investigator. Datasets are uploaded by project, and include documentation about appropriate use and citation, the citations of published works and technical reports related to the dataset, and copies of any technical reports interpreting the data. Each uploaded dataset is assigned keywords that correspond to the method used, type of material, and geographic information including site name, state-level administrative division, and country. At the time of submission the Archaeometry Laboratory has published approximately 40% of the data it has produced in at least one of these locations. An active and long-term goal of the Archaeometry Laboratory is to make its entire dataset available. Resources and efforts committed toward realizing that goal include working with the archaeological data publishing service Open Context for the creation of an interactive index and geospatial visualization of available datasets and source materials.

Accessibility

Data produced by the Archaeometry Laboratory are made available under a Creative Commons Attribution Non-Commercial 4.0 International license. Tabulated chemical data are published as RFC 4180 .csv files, and additional data including technical reports are published as RFC 7995 .pdf files. In addition to making data available, the Archaeometry Laboratory has also shared the Gauss Run-Time Module 8.0 software and MURRAP statistical routines and instructions for downloading and using the software in English and Spanish on its website and on Zenodo. Data from projects supported by our NSF-subsidy program are made available after academic publication or two years from the date of collection, whichever comes first. At the end of this two-year period, collaborators who have not yet published their results may request an extension before data are shared. In addition to uploading the data to multiple repositories, collaborators are encouraged to include data as supplementary information accompanying published manuscripts. Any project supported through our NSF-subsidy program involves a mutual agreement that data be shared in accordance with the Lab's data management policy. Collaborators not participating in the NSF-subsidy program have the option to opt into an agreement to share their data in accordance with our data management policy.

Interoperability

Data produced by the Archaeometry Laboratory at MURR has used the same NIST Standard Reference Materials and quality controls throughout its entire history, and any data produced is interoperable with the Laboratory's extensive databases, and interoperability with data from other reactors is usually achievable through intercalibration.

Reusability

Senior staff and faculty of the Archaeometry Laboratory dedicate a portion of their time to advancing in-house methodological procedures. These efforts are driven by the motivation to create and promote new benchmarks for disciplinary standards and to enable scholarly reuse of data. We develop new or optimize existing analytical protocols, implement new reference libraries and source databases, and pursue the acquisition of research materials to build out existing databases where relevant. This includes routine maintenance of existing databases as well as developing, delivering, and sharing teaching resources. This also includes creating, evaluating, and maintaining open-source calibration materials, examples of which include obsidian and clay calibrations for pXRF, and custom Raman/IR reference libraries for archaeologically-relevant materials including pigments, glazes, clays, and lithics.

The Archaeometry Laboratory's physical collections, including obsidian calibration sets and source samples, are managed under the Lab's Object Loan Policy ([10.5281/zenodo.13380664](https://doi.org/10.5281/zenodo.13380664)) pursuant to its mission statement and are made available to researchers upon request. Information about the objects that are available to borrow, including a list of source samples, is available on the Lab's website.

Preservation of Data

The Archaeometry Lab retains all tabulated geochemical data generated at our laboratory, as well as any archaeological and contextual data provided by collaborators. Qualitative and quantitative data derived from elemental, isotopic, and molecular analyses are stored in spreadsheet and/or database formats along with digital archaeological/contextual data for each specimen. In addition to uploading data to multiple repositories, these data are archived on a locally maintained server, with nightly differential backups on a tandem server. All data stored on the server are backed up and stored off-site on a weekly basis. The costs associated with data storage and back-up are covered by general MURR operating funds and are not requested in this proposal.

Ethical Considerations for Culturally Sensitive Information

The Archaeometry Laboratory works with external collaborators to protect culturally sensitive metadata, including geospatial data on site locations. Prior to the initiation of a project, collaborators must attest that they have obtained all necessary permissions to conduct analysis, and that their project adheres to CARE Principles for Indigenous Data governance. The Laboratory works with researchers in situations where destructive analysis is not possible to develop non-destructive alternatives. Sensitive cultural or spatial information not generally intended for public knowledge is redacted from datasets and technical reports prior to their publication. The Laboratory works collaboratively with museums, state agencies, and tribal entities to comply with NAGPRA regulations regarding its physical archive collections.