



EUROPEAN ACADEMY
of Sciences and Arts

COLLOQUIUM of the Global p-XRF Network with European Academy of Sciences & Arts



Colloquia on portable X-Ray Fluorescence December 17th 2025, 06:00-08:00 pm CET

Prof. Ellery Frahm

"Building a foundation for pXRF of ceramics: Developing the BRICC sets"

Abstract:

This talk discusses the development of well-characterized historical brick and geological specimens to aid the calibration of portable XRF (pXRF) instruments for archaeological ceramics. Known as the BRICC (Bricks and Rocks for Instruments' Ceramic Calibration) sets, each of these ten sets consists of 20 specimens: 12 bricks and 8 geological specimens to use for calibration. A certified reference material – a shale standard measured by 85 labs – is included to assess accuracy, and a high-purity silica blank is included to check for spectral interferences or other calibration issues. The BRICC sets provide a transparent alternative to pXRF calibration approaches that are proprietary, were devised for materials other than ceramics, or rely on expensive and often unavailable certified standards. Ultimately, these sets are intended and designed to (1) exceed experts' practices regarding accuracy, reproducibility, and scientific transparency and (2) facilitate the integration of more diverse perspectives into elemental studies of archaeological ceramics.

Dr. Kyle Freund

"Assessing the Impact of Firing on the Elemental Composition of Clays using X-Ray Fluorescence Spectrometry"

Abstract:

The use of energy-dispersive X-ray fluorescence (ED-XRF) spectrometry for the analysis of ceramic artifacts has typically centered on identifying distinct geochemical groups within an assemblage and/or matching ceramic artifacts to specific clay sources or alluvial systems. For those focused on clay provenance, there are methodological issues surrounding the effects of firing on the composition of raw clays that are not being systematically addressed in various archaeological contexts. For this study, raw clays were collected from 17 localities in the Pioneer Basin of eastern Idaho and analyzed with XRF both before and after firing to test whether there were significant differences in the elemental composition of these materials. The results of this study have implications for future provenance studies that compare ceramic artifacts to raw or fired clays.

Led by the network and endorsed by the European Academy of Sciences & Arts/STEMAC Expert Group, we are organizing a series of online colloquia to explore the use of pXRF in archaeology and cultural heritage. The colloquia aim to provide a platform for knowledge exchange, featuring expert presentations from both the natural sciences and the humanities. Each session will include 30-minute talks by specialists from archaeology and natural sciences, followed by a 30-minute discussion. Topics include:

- Resources and guidance for the XRF community
- Case studies and exemplary applications
- Opportunities for knowledge exchange

Recordings of the colloquia will be available, and participants can submit case study reviews for publication in PEASA (www.peasa.eu).

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