



COLLOQUIA ON PORTABLE X-RAY FLUORESCENCE
The International p-XRF Network

Prof. Ioannis Liritzis (Dean Class IV) and Dr Michaela Schauer (UNIVIE) cordially invite you to participate in the 1st talk of the colloquium series 2025 (online via ZOOM):

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pXRF for geochemical rock classification in archaeometry: a Pacific case study

ABSTRACT

In this presentation I will discuss the ability of pXRF for geologically classifying stone artefact materials. This is crucial because it is the first step in provenance allocation and geochemical grouping that inform archaeological models used for understanding exchange systems within prehistoric social networks. Geochemical analyses have revolutionised exchange studies by making it possible to match stone artefacts back to quarry sources, sometimes hundreds or thousands of kilometres away. Most archaeological basalt characterisation and provenance studies have relied on destructive sampling techniques to obtain the major trace elements Na₂O, K₂O and SiO₂ (wt%) to identify volcanic rock types on the Total Alkali Silica (TAS) diagram. To overcome this limitation, this paper presents an alternative method, the Pearce W-F diagram, that determines volcanic rock type and alkalinity using elements TiO₂, Zr, Y and Nb that are accurately detected by non-destructive portable X-ray fluorescence (pXRF). This new method is proven to be effective in a comparison with recent XRF archaeological basalt studies in the Pacific. The power to classify volcanic rock types non-destructively with pXRF significantly increases the number of artefacts and museum objects available for inclusion in archaeological exchange studies.