

Session Proposal

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Session Title:

Unveiling the Unseen: Advanced Imaging Techniques for Prehistoric Material Culture and Contexts

Keywords:

Micro-CT, Synchrotron, X-ray Micro-tomography, Microscopy, 3D Imaging, Prehistory, Archaeology, Plants, Raw Materials, Taphonomy, Technology, Functionality

Recent advances in imaging technologies—particularly micro-computed tomography (micro-CT) and high-resolution microscopy—are transforming the study of prehistoric archaeological materials. These non-destructive methods provide unprecedented access to both surface morphologies and internal structures of artifacts and their surrounding matrices, offering insights often unattainable through conventional imaging approaches.

This session aims to highlight cutting-edge applications of a wide range of imaging modalities and resolutions across diverse prehistoric contexts. Techniques include various forms of advanced microscopy (e.g., confocal microscopy, 3D digital microscopy, scanning electron microscopy [SEM]), laboratory-based microtomography using X-rays, neutrons, and muons, as well as synchrotron radiation-based micro-CT.

We invite contributions that explore the informative potential of these techniques in addressing key archaeological questions related (but not limited) to: sediment analysis (site formation processes and taphonomy), raw material characterization, technology and manufacturing processes (*chaîne opératoire*), use-wear and functional analysis, residue analysis, and the microstructure of plant matter. Submissions may also address topics such as portable art and artifacts of animal origin, enabling the examination of internal composition and manufacturing details of decorated objects to enhance our understanding of their creation and symbolic significance. For more recent industries, the application of microtomography to ceramics and metal tools enables detailed, non-invasive investigation of their internal microstructure, manufacturing techniques, and post-depositional alterations. This includes insights into temper distribution, porosity, and forming and firing methods in ceramics, as well as alloy composition, casting defects, and tool use-wear in metal artifacts. Furthermore, these techniques have demonstrated significant potential in the field of conservation, allowing for the assessment of the preservation state of fragile archaeological materials and informing conservation strategies through non-destructive internal analysis.

We are inviting talks and posters based on advanced imaging techniques applied to prehistoric archaeology.

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