Archaeologists at Elettra: From the field to the beamline

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At Elettra Synchrotron, cutting-edge technologies are employed for a wide variety of applications, including archaeology and palaeoanthropology. Archaeologists utilize a diverse toolkit to examine human remains, as different analytical techniques can inform various aspects of the human past, including human anatomy and its evolution (1,2), individual life stories (3), the processes of preservation and fossilization (4), and burial circumstances (5). In this talk, we will discuss several case studies and approaches to the study of archaeological human remains, walking through various Elettra cases that demonstrate how different techniques enable us to understand the life stories of the past and make the invisible visible. The presentation will primarily focus on tomography approaches, examining hard tissue histology using lab-based and Synchrotron radiation phase-contrast micro-CT. We will also discuss and illustrate the benefits of multimodal approaches to the study of ancient human remains, emphasizing how synchrotron approaches complement offline and lab-based techniques. Furthermore, we will address some of the crossovers between medical sciences and archaeological studies of human remains, exploring how the past can meet the present, and how multidisciplinary, multi-modal approaches have the potential to shape and change our understanding of human evolution. In addition to the technological aspects, well also touch upon the importance and challenges of sample preparation, organization, and planning as crucial components of the experimental plan.

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