

IT IS WHAT IT IS ON THE INSIDE THAT COUNTS:

Extracting qualitative and quantitative data from heritage materials using X-ray computed tomography.

Dr J. Riley Snyder

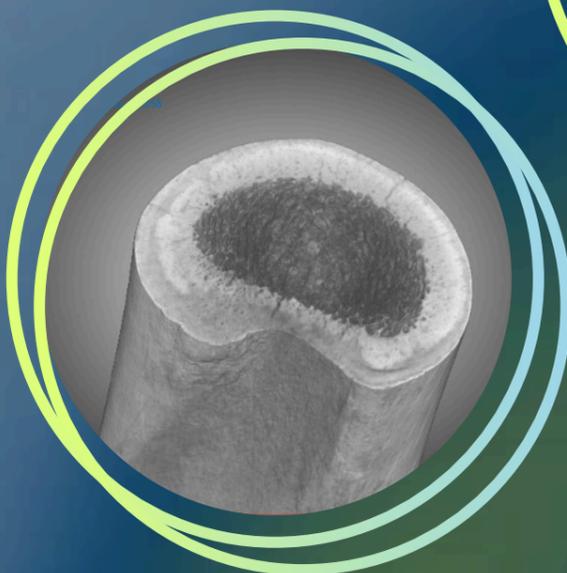
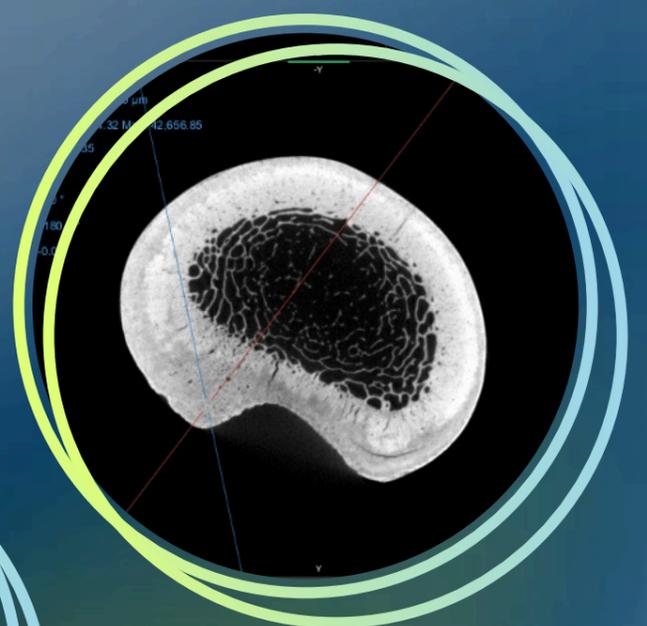
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The
Department of
Archaeology



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It is what it is on the inside that counts: extracting qualitative and quantitative data from heritage materials using X-ray computed tomography

Biography:

Dr J. Riley Snyder is Technical Manager in X-Ray Computed Tomographic Research at the Department of Archaeology, Durham University, where he directs the NeMCAS facility funded through the AHRC's RICHeS initiative. Trained in both archaeology and engineering, his research combines material science, GIS, and computational modelling to investigate the sourcing, production, and organisation of construction materials in the ancient Mediterranean and Caucasus, reconstructing the logistics and labour behind monumental Roman and Byzantine building projects. He holds a PhD in Archaeology from the University of Edinburgh and has held research posts at Newcastle University, the University of Edinburgh, the University of Bologna, and the British Institute at Ankara. He currently co-leads the BIAA-funded project Fortifying Frontiers: A Multi-Scalar Study of Late Antique Defensive Architecture in Ancient Lazica.

Abstract:

X-ray computed tomography (XR-CT) is reshaping heritage science by revealing the internal structures of objects in three dimensions through non-destructive means. This talk presents various case studies highlighting the ways in which XR-CT generates both qualitative visualisations and quantitative data to address questions of manufacture, material performance, degradation, and manufacturing practice. Examples from ceramics, glass, wood, soils and biological materials demonstrate how CT enables measurement of things like porosity, density variation, void networks, and internal sequencing. Crucially, XR-CT is integrated with complementary analyses — including petrography, XRF, SEM, and mechanical testing — linking structural imaging with compositional and performance data.

Together, these methods provide a multi-scalar, interdisciplinary approach to understanding the technologies, histories, and conservation of heritage materials.