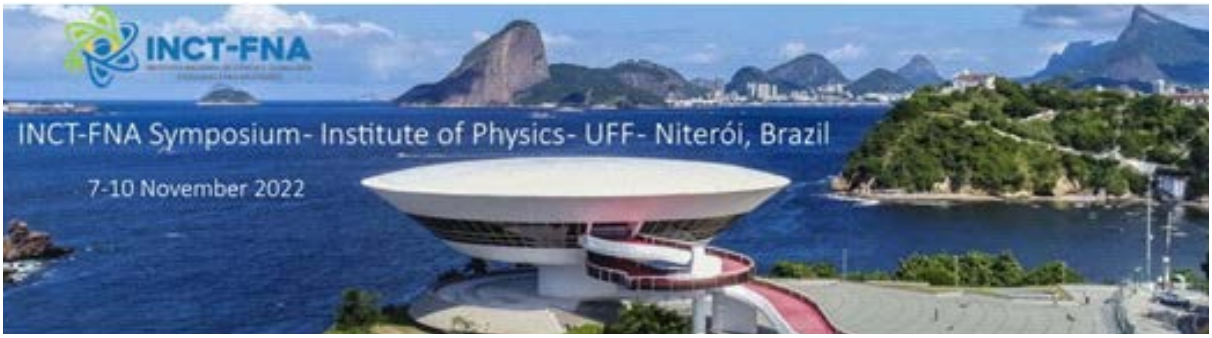

X-Ray Digital Radiography and Computed Tomography applied to cultural heritage studies

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X-ray detection systems with Digital Radiography (DR) and Computed Tomography (CT) are being routinely used to study different cultural heritage materials. The radiography analysis is being performed at the Laboratory of Archaeometry and Applied Sciences to Cultural Heritage Studies (LACAPC - IFUSP) in partnership with the Dosimetry Laboratory of the Physics Institute at the University of São Paulo. This radiography techniques were primarily based on X-ray images with conventional film (Lima, 2010), computed radiography (CR) and nowadays with digital radiography (DR). The latter is being carried out with an innovative equipment, which allows us to analyze different types of materials quickly and in situ. The new linear array detector with high resolution and low dose digital radiography was recently acquired and is being used in the analysis of paintings and ceramics material. This detector associated with a low-power X-ray tube can be used in the museum itself and allows new discovering information's. This new instrument can acquire radiological image with a dose amounting to one hundred times less than standard films used in the past. Computed micro-tomography using synchrotron light associated with X-ray fluorescence (XRF) has immensely advantages and, for example, can better understand the internal structure present in archaeological seed samples (Calo, 2022). In this way, digital radiography and computed tomography are the two new imaging fields of non-destructive analysis and a tool for scientific

investigations. These types of analyzes can also help to better understand construction techniques and the “history of the object under examination” (Casali, 2006). Several case studies carried out on cultural heritage objects, at the laboratories, will be present. Some images obtained reveal new information for archeologists, art historians and cultural heritage experts.

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