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Secrets and Mysteries of our Past Revealed by Neutron and X-Ray Radiography/Tomography

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Heritage is our legacy from the past, what we live with today and what we pass on to future generations. Our cultural and natural heritages are both irreplaceable sources of life and inspiration. Places as unique and diverse as also the wilds of East Africa's Serengeti, Cradle of Humankind in South Africa, the Pyramids of Egypt, the Great Barrier Reef in Australia and the Baroque cathedrals of Latin America make up our world's heritage. What makes the concept of World Heritage exceptional is its universal application. World Heritage sites belong to all the peoples of the world, irrespective of the territory on which they are located.

It is a universal need to reveal those important and in most cases hidden features of findings such as artefacts or fossils in a non-invasive manner in order to preserve, sometimes only artefact ever found, in the most a responsible manner for future generations to also study with possible new developed analytic techniques.

Currently, neutron and based analytical techniques play an important role in both applied research and practical applications. Today, various experimental setups of neutron techniques can be used effectively for imaging purposes. Moreover, recent developments of methods, which are used primarily for medical applications, like diagnostics or treatment (e.g., based computer tomography, tomotherapy, image guided radiotherapy, etc.), use advanced imaging principles. However, both neutron and imaging techniques do not offer directly analysis of elemental composition of studied entities. One important application of neutron and radiation based imaging techniques is the non-invasive study on objects from cultural heritage importance, where these probes reveal valuable hidden information in a non-destructive and non-invasive manner.

The aim of this presentation is to highlight the non-destructive analysis of cultural artefacts using the capabilities of neutrons and γ 's as penetrating probes. Several case studies will be discussed about neutron and radiography and tomography investigations of cultural artefacts being practiced at various research institutions worldwide.

Country/Organization invited to participate

South Africa

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