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

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The use of radiation in modern life is merely known for the X-ray diagnostics in the case of X-rays and nuclear power reactors in the case for neutrons. Few people have the unfortunate experience of using nuclear medicine (radiation) in the treatment of illness. However, the application of radiation as a research tool is merely unknown also in revealing those hidden secrets of the past. Heritage is our legacy from the past, what we live with today and what we should pass on to future generations. Our cultural and natural heritages are both irreplaceable sources of life and inspiration - places such as 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. World Heritage sites belong to all the peoples of the world, irrespective of the territory on which they are located and should be treated in the most responsible manner.

It is a universal need to reveal those secrets and in most cases hidden features of findings such as artifacts or fossils. Non-invasive techniques to preserve the findings during its analysis is one of the best ways to reveal secrets in the most a responsible manner also to be studied by future generations with possible new developed analytic techniques.

Today, neutron and X-ray based analytical techniques play an important role in both applied research and practical applications. Both neutron and X-ray imaging techniques do not offer directly analysis of elemental composition of studied entities. However, its non-invasive nature to study also objects from cultural heritage is of high value, where these probes reveal valuable hidden information non-destructively.

Summary

The aim of this presentation is to highlight the non-destructive analysis of cultural artefacts using the capabilities of neutrons and X-ray's as radiation based penetrating probes. Several case studies will be discussed where neutron and X-ray radiography / tomography investigations of cultural artefacts are being practiced in South Africa and at a few international research institutions.

Apply to be considered for a student award (Yes / No)?

No

Level for award (Hons, MSc, PhD, N/A)?

N/A

Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

No

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