

## **Safeguarding History with Atoms: Malaysia's Journey in Cultural Heritage Conservation**

**Presenter:**

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Building 21., room: lecture hall downstairs  
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**Abstract:**

The collaboration between Nuclear Malaysia and the Department of Museum Malaysia (DMM), established in 2003 and renewed in 2019, focuses on applying nuclear techniques for artifact preservation and characterization. Building on existing initiatives, several new programs have been planned, including artifact analysis and characterization, environmental monitoring, training workshops, joint exhibitions, and collaborative publications. Training and outreach efforts have proven effective in raising public awareness and promoting the use of nuclear technologies, prompting interest from various state museums that have begun requesting support for training and artifact characterization. Commonly employed techniques include X-ray Diffraction (XRD), X-ray Fluorescence (XRF), Scanning Electron Microscopy with Energy Dispersive X-ray Spectroscopy (SEM/EDX), neutron and X-ray imaging, and other non-destructive testing (NDT) methods. Ground Penetrating Radar (GPR) is also used to survey subsurface materials and structures. Artifacts studied through these methods range from pottery recovered from shipwrecks and metal weaponry to historical documents and aged textiles. Looking ahead, future activities will incorporate advanced techniques such as gamma irradiation for the characterization and preservation of old manuscripts and wooden artifacts. Malaysia has already begun applying gamma irradiation on a small scale for the disinfection of rare books, with encouraging results. With continued support from the International Atomic Energy Agency (IAEA), efforts will focus on enhancing capabilities in nuclear-based characterization, disinfection, and material consolidation. To extend these initiatives beyond museum collections, collaboration has also been initiated with the Department of National Heritage, enabling the application of nuclear techniques at archaeological sites and reinforcing Malaysia's commitment to safeguarding its cultural heritage.