

# Neutron Imaging and Neutron Methods in Archaeology and Cultural Heritage Research



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## **NINMACH 2013, 1st International Conference on Neutron Imaging and Neutron Methods in Archaeology and Cultural Heritage Research**

Sept. 9-12, 2013

Held under the Auspices of the International Atomic Energy Agency (IAEA) at Technische Universität München, Garching, Germany



In the recent years, modern scientific methods have led to a wealth of information in Archaeology and Cultural Heritage Research concerning the composition of artefacts both on a molecular level and on the mechanical built of objects than cannot be dismantled without destroying them. X-ray methods from radiography to fluorescence have become widespread, but the potential of neutron methods has barely been tapped. Neutrons easily penetrate thick layers of metals, even lead, while revealing organic material like wood, leather or bones in sealed metal or stone containers.

Two- and three-dimensional imaging provides visual information, while neutron activation analysis delivers elemental composition information, and neutron scattering reveals alloys and textures. With modern detectors, Neutron Imaging can even be performed at low-power research reactors; the application for cultural heritage research gives rise to new uses to elder small research reactors throughout the world, which is explicitly supported by IAEA.

NINMACH addresses archaeologists and conservators from museums and universities and aims to illustrate the potential of neutron methods in cultural heritage research. Talks and posters will be presented by physicists and archaeologists who have already

employed neutron methods successfully; attendance is explicitly recommended for scientists who are completely new to neutron methods and want to learn about the possibilities at neutron sources throughout the world.

The conference will be held from Sept. 9 to 12, 2013, at the Garching campus of Technische Universität München, Germany.

**Call for Papers is open until 31 May 2013.**

For further info, call for papers submission, pre-registration, please visit the [official conference website](#).

**NINMACH 2013**  
9-12 September 2013 TUM Campus Garching

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IAEA will provide limited travel support to applicants from countries with emerging economies.

Scope: Subjects (methods):

- Neutron Imaging: Radiography and Tomography
- Autoradiography
- Activation Analysis
- Prompt Gamma Activation Analysis
- Neutron Resonance Capture Analysis
- Large Object Imaging with Fast Neutrons
- Advanced Imaging Methods: Bragg Edge Scanning, Phase Gratings, Texture
- Scattering Methods

Archaeological subjects:

- Numismatics (Greco-Roman coins and others)
- Textile Archaeology
- Organic residues on archaeological metal objects
- Non-destructive characterization of metal structures
- Autoradiography of paintings
- Statuettes and Figurines
- Ceramics
- Wood conservation, impregnation with liquid consolidants
- Fossils

Neutron sources:

- FRM II - Forschungsneutronenquelle Heinz Maier-Leibnitz (FRM II), Technische Universität München, Germany
- PSI - Paul-Scherrer-Institut, Villigen, Switzerland
- HZB - Helmholtz Zentrum Berlin (Formerly Hahn-Meitner-Institut), Berlin, Germany
- ISIS Rutherford Appleton Laboratory, Harwell, United Kingdom
- ANSTO - Australian Nuclear Science and Technology Organisation, Sydney, Australia
- MCNRC - McClellan Nuclear Radiation Center - University of California, Davis, USA
- NIST - National Institute of Standards and Technology, Gaithersburg, USA
- KFKI - Budapest, HU

International Advisory Committee:

- Prof. Rupert Gebhart, Bayrische Staatssammlung
- Dr. Marie Wörle, Schweizerisches Nationalmuseum
- Dr. Kilian Anheuser, Musee d'Ethnographie de Genève
- Prof. Yoshiaki Kiyonagi, Hokkaido University, JP
- Dr. Eberhard Lehmann, PSI, CH
- Dr. Nikolay Kardjilov, HZB, DE
- Dr. Thomas Bücherl, TUM, DE
- Dr. Burkhard Schillinger, TUM, DE
- Dr. Michael Schulz, TUM, DE
- Dr. Petra Kudejova, TUM, DE
- Frikkie deBeer, NECSA, SA
- Dr. Winfried Kockelmann, ISIS, GB
- Dr. Ulf Garbe, ANSTO, AU
- Dr. Alexander Gabov, Queens University, CA

Local Organising Committee:

- Dr. Burkhard Schillinger
- Dr. Michael Schulz
- Dr. Petra Kudejova
- Elisabeth Jörg-Müller
- Vladimira Vodopivec
- Prof. Dr. Rupert Gebhart