Joint Institute for Nuclear Research

SCIENCE BRINGING NATIONS TOGETHER

FLNP

International Student Practice. Stage 3.

Frank Laboratory of Neutron Physics

Neutron radiography and tomography method: practical applications

ISEI BSU

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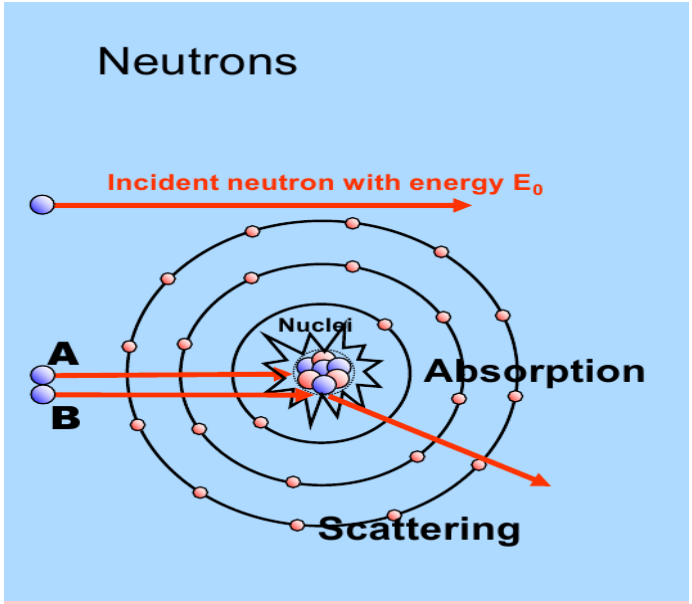
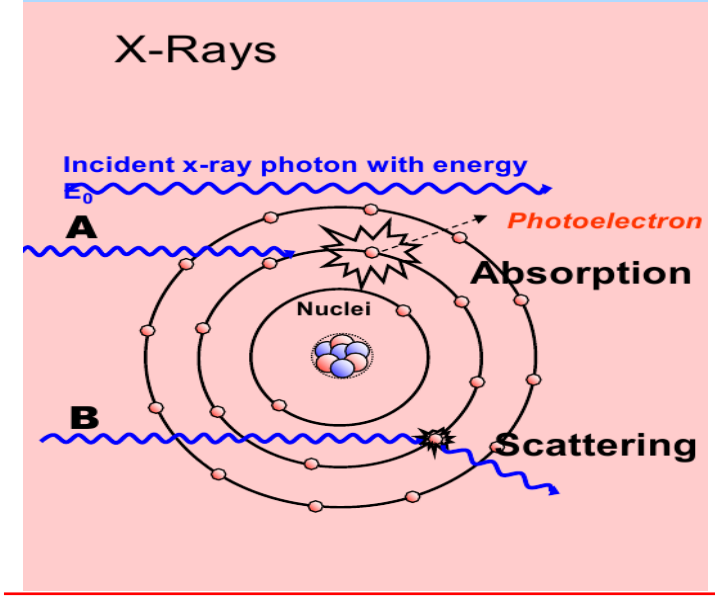
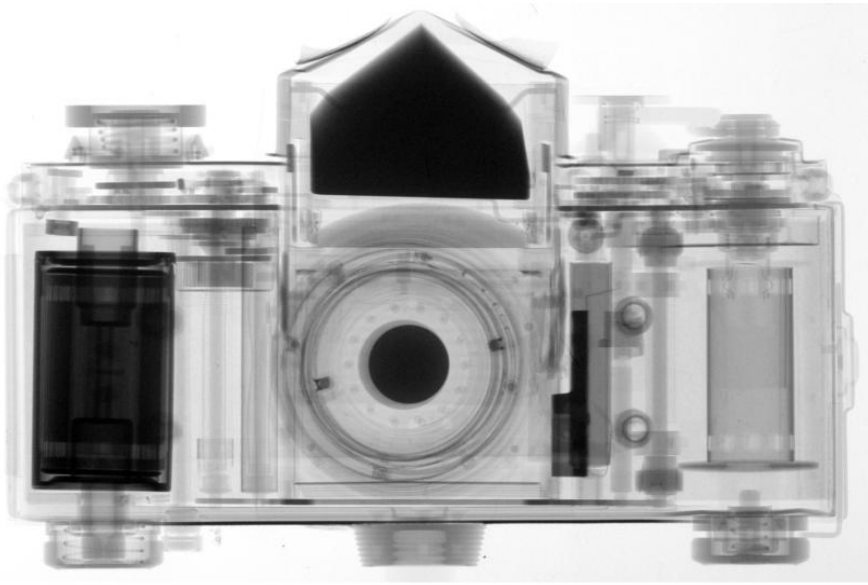
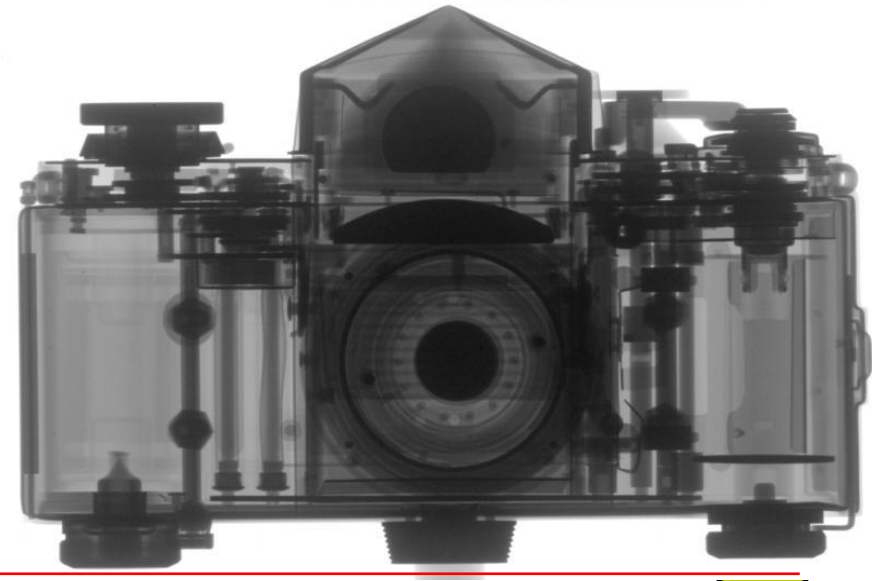
Neutrons vs X-Ray interaction



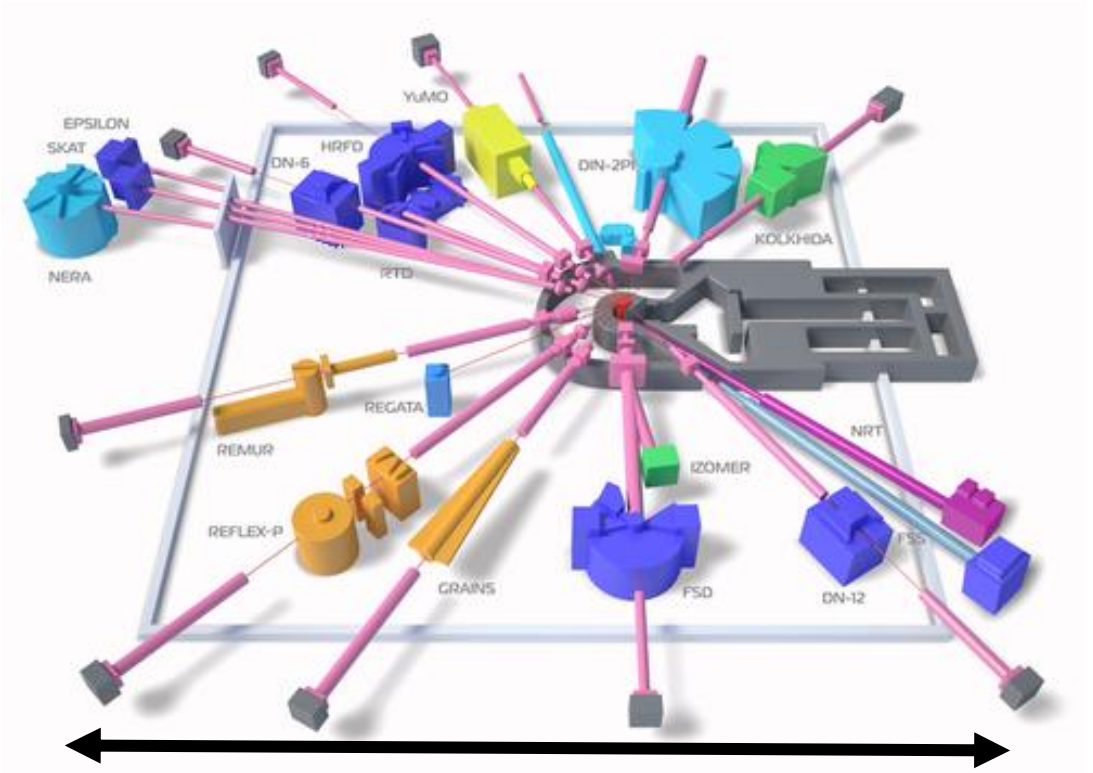






X-Ray and neutron facility

~2 meters

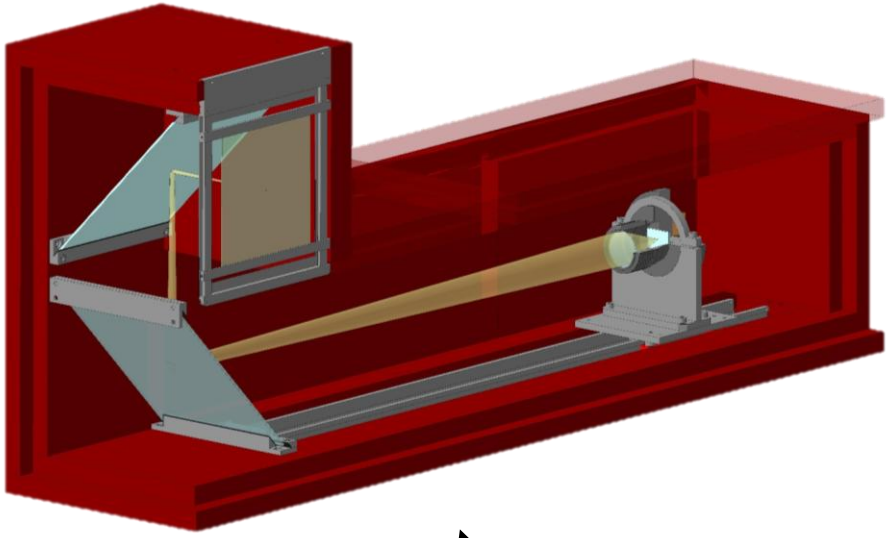


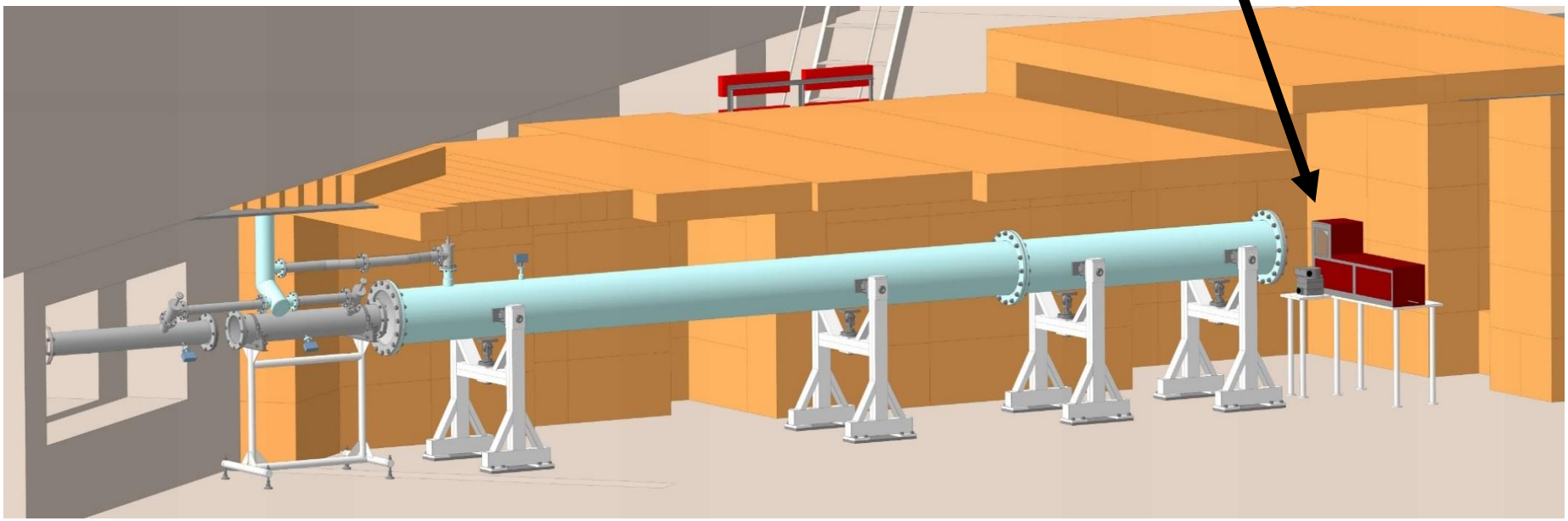
200 meters

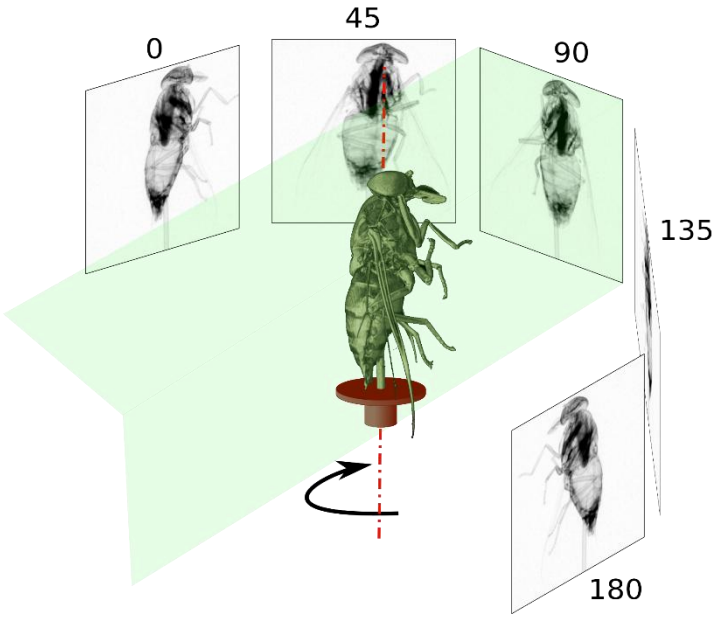
X-ray tomography

Reactor IBR-2 at FLNP

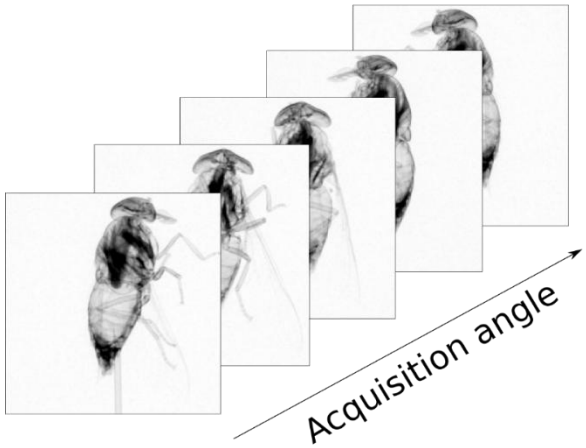
Neutron radiography and tomography station

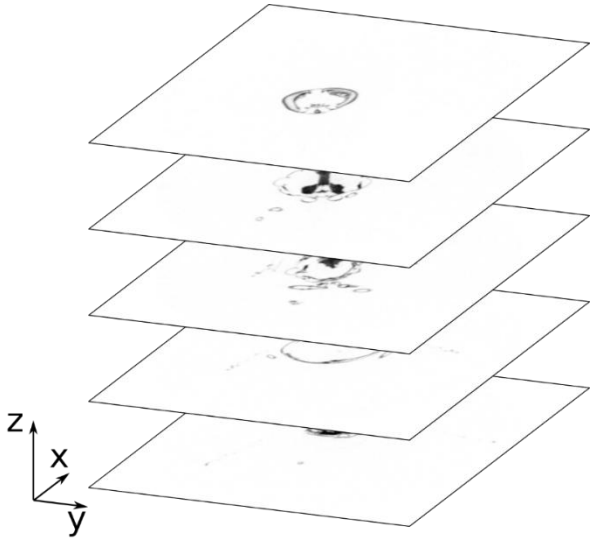






Neutron radiography and tomography

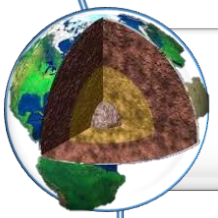




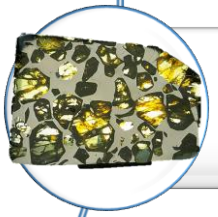
Projection data → Reconstruction → Slice images

Neutron Radiography and Tomography facility
Applications in Science and Industry

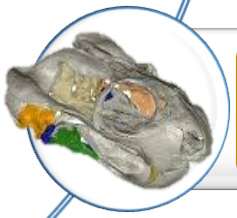
Material Science



Geophysics



Astrophysics



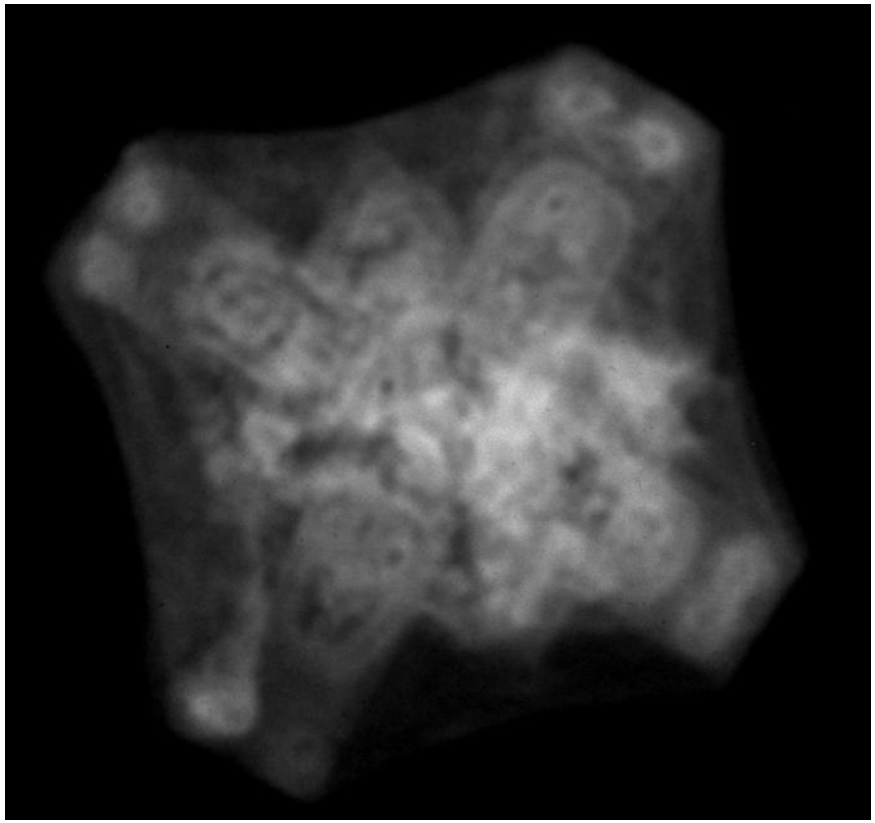
Cultural Heritage

Neutron radiography and tomography capabilities:

The study of parts of the bracelet from the burial ground Alayka-7 (excavation K.N. Skvorcov)

4 centimeters

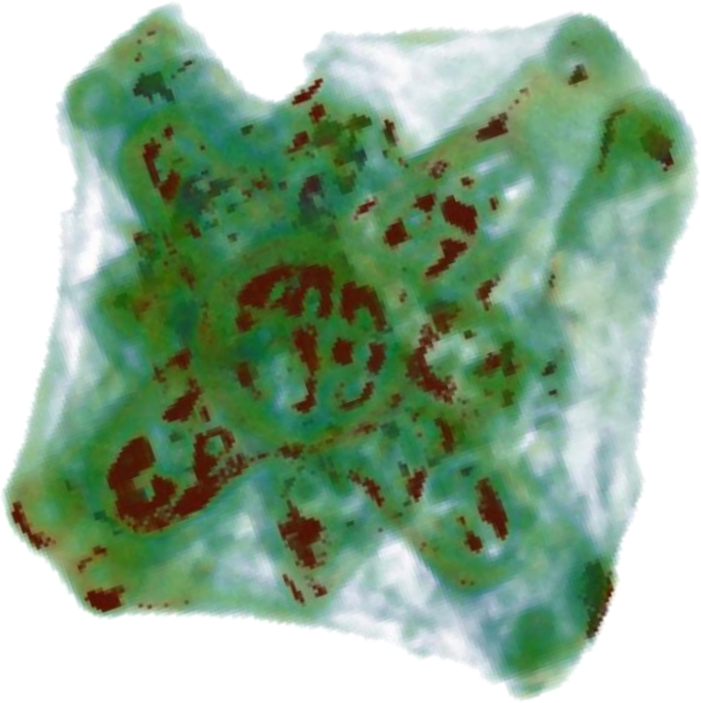
Sample object



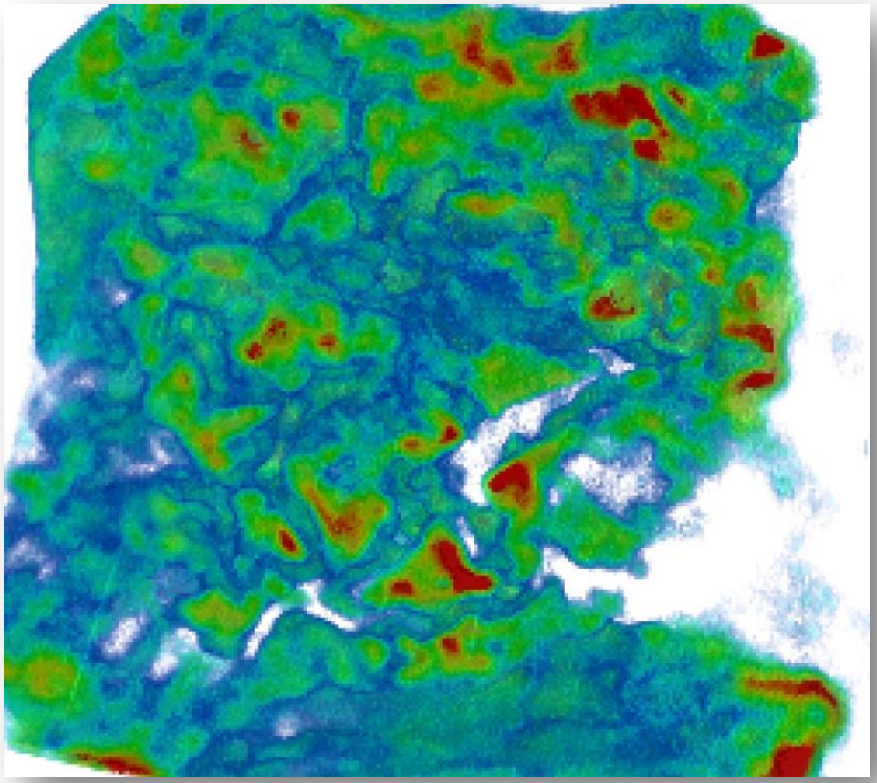
Normalized image

Neutron radiography and tomography capabilities:

The study of parts of the bracelet from the burial ground Alayka-7 (excavation K.N. Skvorcov)



3D model



Summary

- Non-destructive investigation of Cultural Heritages is important for understanding the culture of ancient civilizations
- Neutron Radiography and Tomography is state-of-the-art, non-destructive tool in the area of CH, and plays an important role in the modern archeology
- Develops in many of the major neutron centers in the world, including at the NRT facility of pulsed reactor IBR-2

Thank you for attention.