



**Cultural Heritage Advanced Research Infrastructures: Synergy  
for a Multidisciplinary Approach to Conservation/Restoration**

**Population of  
Partner description**



**Website content for: Partners description**

Organization name (participant institute/lab):

MAGYAR TUDOMÁNYOS AKADÉMIA ATOMMAGKUTATÓ INTÉZETE, Laboratory of Ion Beam Applications (ATOMKI-HAS)

Short description (max. 10 rows)

The Institute of Nuclear Research of the Hungarian Academy of Sciences is one of the leading establishments in atomic and subatomic physics in Hungary. Beside the basic research the institute is devoted to application of atomic and nuclear physics in the fields of archaeology, environmental research, earth sciences, materials & surface science and biomedicine. ATOMKI-HAS contributes to higher education as well. It has been associated with the University of Debrecen since 2000.



Role and task in CHARISMA and relevant experience (max 1 page):

The CHARISMA project is implemented by the Laboratory of Ion Beam Applications ([http://iba.atomki.hu/index\\_en.html](http://iba.atomki.hu/index_en.html)). Ion beam analytical investigations can be carried out both at the macro-PIXE beamline and the Scanning Nuclear Microprobe facility (SNM). As in the field of



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cultural heritage the art and archaeological samples are usually not uniform in composition, therefore, SNM analysis are often required. The available beamsizes down to 1  $\mu\text{m}$  allows micro analytical investigations & mapping with high lateral resolution.

The macro-PIXE setup serves for the determination of bulk composition of the samples from Mg to U with the Particle Induced X-ray Emission (PIXE) technique. This technique is also applied on the nuclear microprobe; it is equipped with a high energy and a low energy Si(Li) X-ray detectors allowing the simultaneous detection of chemical elements as well as creation of elemental maps from Carbon to Uranium. Complementary analytical data for light elements are provided by Particle Induced Gamma-ray Emission (PIGE) analysis on both lines.

Further to the PIXE analyses Rutherford-backscattering Spectrometry (RBS), Elastic Recoil Detection Spectrometry, Nuclear Reaction Analysis and Scanning Transmission Ion Microscopy (STIM) are available with a focussed microbeam at the Scanning Nuclear Microprobe. These make available the determination of the absolute thickness of a sample, its distribution, surface topography and 2D tomography.

In the CHARISMA project ATOMIKI-HAS is one of the facilities of the Hungarian platform providing transnational access under the FIXLAB programme. It is also involved in the outreach program activities in particular the establishment of best practices and protocols toward common standards, and the promotion of the scientific excellence.

Website address: [http://www.atomki.hu/index\\_en.html](http://www.atomki.hu/index_en.html)

How to get to ATOMIKI: <http://www.atomki.hu/basicinf.html>

Team leader contacts:

*Name: Dr. Zita SZIKSZAI, Dr. Zsófia KERTÉSZ*


*Address: H-4026 Debrecen Bem tér 18/c*

*Phone: (+36)52509211*

*Fax: (+36)52416181*

*e-mail: [charisma@atomki.hu](mailto:charisma@atomki.hu)*

Enclose logo (*min 200x200 pixel*):

Facility logo (if any):  you can download from: <http://www.atomki.hu/logo/index.html>

Enclose any additional document in .pdf (brochure, large description...) to be downloaded from CHARISMA website