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International Atomic Energy Agency

*Atoms for Peace and Development*

# **Joint IAEA–French Ministry of Culture Advanced Workshop on the Sustainable Management of Ion Beam Analysis Data for Heritage Science within an Artificial Intelligence and Open Science Context**

**Hosted by the**

**Government of France**

**through the**

**French Ministry of Culture**

**C2RMF, Louvre Museum**

**Paris, France**

**16-20 December 2024**

**Ref. No.: EVT2304277**

## **Information Sheet**

# Introduction

Analytical techniques using ion beams produced by particle accelerators (Ion Beam Analysis, IBA) have been applied to investigate Cultural and Natural Heritage for decades. One of the assets of these nuclear analytical techniques is that they allow ‘non-destructive’ analysis, and in several cases without the need of artefact sampling. The obtained analytical results are very versatile and can be useful to answer various questions in heritage science like: a) provenance studies, b) identification of manufacturing or artistic techniques, c) history of the object, d) decision support during the restoration of the object, etc. After the IBA analysis the object is preserved or restored if necessary; and conserved with the aim of being passed on to future generations in the best possible condition.

However, some of the prestigious and precious objects analysed by IBA may not have a chance for a second or additional IBA analyses. For instance, such objects are the stained-glass windows of the Notre-Dame de Paris or the Crouching Scribe in the Louvre, France. According to the present practice the results of the analysis are published in scientific journals and books. There is however an obstacle, as these processed and interpreted results then cannot be easily utilized by others for further evaluation, inter-comparison, or integration into existing datasets.

**Hence, a new initiative is fostered by the main organizers of this meeting, i.e. both the acquired raw and processed data shall be considered as a precious digital knowledge of the heritage object what the IBA analysts should be able to preserve and transmit to the future generations in a good conservation state together with the object itself.**

Moreover, the paradigm of research nowadays is undergoing a significant transformation with the rise of open science and artificial intelligence (AI). Open science promotes transparency, collaboration, and accessibility in research, while AI enhances the capacity to process, analyze and interpret vast amount of data. These recent approaches require the production of FAIR data (Findable, Accessible, Interoperable and Reusable) to ensure that datasets are easily discoverable, accessible to both humans and machines, compatible with various systems and can be reused across different studies. For heritage science, these requirements must be considered over a long term, as the preservation and study of cultural heritage require sustained efforts and resources.

This IAEA advanced workshop, co-organized and hosted by the French Ministry of Culture, will offer an opportunity to discuss and develop strategies for new pathways and synergies for the conservation of the IBA data for their successful transfer to the future generations. Holding the meeting at the Centre for Research and Restoration of the Museums of France ([C2RMF](#)), an institution whose mission is to investigate Art and Archaeology of the artefacts located within the premises of the Louvre Palace, will provide an excellent opportunity to bring together people with various scientific backgrounds including humanities. In addition, the experts in digital information management from the cultural field of the French Ministry of Culture will inform on the best approaches for sustainable data management.

The C2RMF has 35 years of experience in the use of ion beams to study Cultural Heritage with the [AGLAE](#) facility. The installation serves not only the French Ministry of Culture and French museums but also provides transnational access to the international heritage science community through the European Research Infrastructure for Heritage Science, [E-RIHS ERIC](#). Since 2022, the New AGLAE team has been working together with the Digital Service of French Ministry of Culture towards sustainable management of Ion Beam Analysis Data along open science and AI policies and jointly developing the **Euphrosyne digital platform** that enables the New AGLAE users to document and process the data and future generations to access the IBA data.

## **Purpose**

The purpose of the event is to discuss the characterization of heritage objects and materials using ion beam accelerators for collecting, processing and sharing data in line with artificial intelligence and open science policy.

## **Target Audience**

The workshop is intended for 1) both young and experienced nuclear scientists actively involved in Ion Beam Analysis with expertise on analysis of heritage objects and materials, 2) data scientists, 3) data managers, 4) experts from the humanities (e.g. archivists, curators, museum managers etc.) and 5) policy makers working in relevant fields.

## **Working Language**

The official language of the technical meeting is English (no interpretation will be provided).

## **Expected Outputs**

- Review of present practice of FAIRisation / FAIRification or documentation of IBA datasets for heritage science;
- Propose and assess methodologies on various data models (conceptual, relational and semantic data models for instance);
- Harmonization of procedures and knowledge sharing on methodology and best practice for data conservation for heritage science;
- Provide perspectives how the ion beam community can organize and collectively think together for a unified terminology of data collection and treatment;
- Develop key pathways for future strategies and directions for sustainable management of Ion Beam Analysis Data according to the IBA and Heritage communities needs and requirements.

## Topics

The workshop aims at tackling the following key topics:

- **Data Preservation:** Developing methodologies for the long-term preservation of data obtained through Ion Beam Analysis.
- **Data Standardization:** Establishing standardized protocols for data collection, storage, and sharing to ensure interoperability and accessibility.
- **Collaboration and Networking:** Facilitating collaboration between cultural heritage institutions, research laboratories, and international organizations to promote the sharing of knowledge and resources.
- **Training and Capacity Building:** Providing training opportunities for professionals in the field to enhance their skills in data science and conservation for heritage science.

## Meeting structure

The event will be structured around lectures by experts devoted to the topics mentioned above, working group discussions, a poster session and demonstrations for ion beam analysis, data collection, data treatment and data sharing on the New-AGLAE facility. A dedicated session to exchange ideas, share experiences, and express recommendations will be organized at the end of the meeting.

## Participation and Registration

All persons wishing to participate in the event have to be designated by an IAEA Member State or should be members of organizations that have been invited to attend.

In order to be designated by an IAEA Member State, participants are requested to send the **Participation Form (Form A)** to their competent national authority (e.g. Ministry of Foreign Affairs, Permanent Mission to the IAEA or National Atomic Energy Authority) for onward transmission to the IAEA by **21 October 2024**. Participants who are members of an organization invited to attend are requested to send the **Participation Form (Form A)** through their organization to the IAEA by the above deadline.

Selected participants will be informed in due course on the procedures to be followed with regard to administrative and financial matters.

Participants are hereby informed that the personal data they submit will be processed in line with the [Agency's Personal Data and Privacy Policy](#) and is collected solely for the purpose(s) of reviewing and assessing the application and to complete logistical arrangements where required. The IAEA may also use the contact details of Applicants to inform them of the IAEA's scientific and technical publications, or the latest employment opportunities and current open vacancies at the IAEA. These secondary purposes are consistent with the IAEA's mandate.

## Papers and Presentations

The IAEA encourages participants to give presentations on the work of their respective institutions that falls under the topics listed above.

All participants are requested to provide an **abstract** on their contribution to the meeting strongly related to the topic of the event to be presented as an oral or poster presentation together with **Form B** by **21 October 2024** as part of their nomination. The abstract should be in A4 page format, should extend to no more than 1 page (including figures and tables) and should not exceed 500 words.

The abstract will be reviewed as part of the selection process, and nominations without abstract will not be considered. Authors will be notified by email by **15 November 2024** of the acceptance of their proposed presentations.

## Expenditures and Grants

No registration fee is charged to participants.

The IAEA is generally not in a position to bear the travel and other costs of participants in the event. The IAEA has, however, limited funds at its disposal to help meet the cost of attendance of certain participants. Upon specific request, such assistance may be offered to normally one participant per country, provided that, in the IAEA's view, the participant will make an important contribution to the event.

The application for financial support should be made using the **Grant Application Form (Form C)** which has to be stamped, signed and submitted by the competent national authority to the IAEA together with the **Participation Form (Form A), Abstract, and Abstract Submission Form (Form B)** by **21 October 2024**.

## Visas

Participants who require a visa to enter France should submit the necessary application as soon as possible to the nearest diplomatic or consular representative of France.

## Venue and accommodation

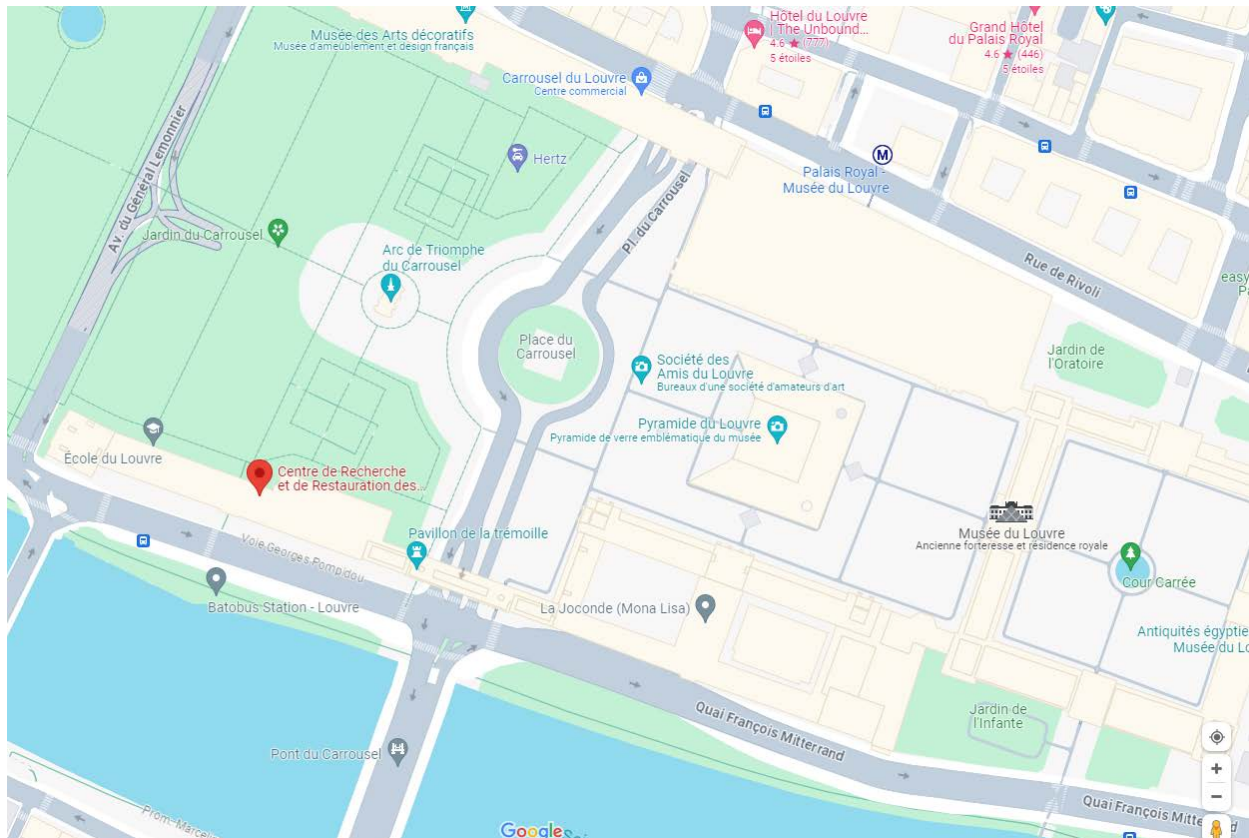
The event is an in-person meeting only.

The workshop will be held at the **Palissy Auditorium of the C2RMF, Louvre Museum, Paris**.

Please find information on how to get to the Louvre Museum here:

<https://www.louvre.fr/en/visit/map-entrances-directions>

Please see the detailed access map to the C2RMF below:



The entrance is indicated “Centre de Recherche et de Restauration” in red on the map.

## Workshop Webpage

Participants are encouraged to visit the workshop [web page](#) regularly to check for new or updated information regarding the meeting:

# Organization

## Meeting Co-Chairs

### IAEA Scientific Secretary

#### **Ms Aliz Simon**

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## Local Organizers

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14 quai F. Mitterrand  
75001 Paris, France  
Email: [brice.moignard@culture.gouv.fr](mailto:brice.moignard@culture.gouv.fr)

Subsequent correspondence on scientific matters should be sent to the Scientific Secretary/meeting Co-Chairs and correspondence on other matters related to the event to the Administrative Secretary.



## Participation Form

### Joint IAEA–French Ministry of Culture Advanced Workshop on the Sustainable Management of Ion Beam Analysis Data for Heritage Science within an Artificial Intelligence and Open Science Context

C2RMF, Louvre Museum, Paris, France

16 to 20 December 2024

To be completed by the participant and sent to the competent national authority (e.g. Ministry of Foreign Affairs, Permanent Mission to the IAEA, or National Atomic Energy Authority) of his/her country for subsequent transmission to the International Atomic Energy Agency (IAEA) either by email to: [Official.Mail@iaea.org](mailto:Official.Mail@iaea.org) or by fax to: +43 1 26007 (no hard copies needed). Please also send a copy by email to the Scientific Secretary, Ms Aliz Simon, Division of Physical and Chemical Sciences, Department of Nuclear Sciences and Applications (Email: [Aliz.Simon@iaea.org](mailto:Aliz.Simon@iaea.org)) and to the Administrative Secretary, Ms Ivana Andrejic-Dukic, (Email: [I.Andrejic-Dukic@iaea.org](mailto:I.Andrejic-Dukic@iaea.org)).

Participants who are members of an invited organization can submit this form to their organization for subsequent transmission to the IAEA.

**Deadline for receipt by IAEA through official channels: 21 October 2024**

Family name(s): (same as in passport)	First name(s): (same as in passport)	Mr/Ms
Institution:		
Full address:		
Tel. (Fax):		
Email:		
Nationality:	Representing following Member State/non-Member State/entity or invited organization:	
Do you intend to submit a paper? Yes <input type="checkbox"/> No <input type="checkbox"/>		
Would you prefer to present your paper as a poster? Yes <input type="checkbox"/> No <input type="checkbox"/>		
Title:		

Participants are hereby informed that the personal data they submit will be processed in line with the [Agency's Personal Data and Privacy Policy](#) and is collected solely for the purpose(s) of reviewing and assessing the application and to complete logistical arrangements where required. The IAEA may also use the contact details of Applicants to inform them of the IAEA's scientific and technical publications, or the latest employment opportunities and current open vacancies at the IAEA. These secondary purposes are consistent with the IAEA's mandate.

# Form for Submission of a Paper

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Participants who are members of an invited organization can submit this form to their organization for subsequent transmission to the IAEA.

**Deadline for receipt by IAEA through official channels: 21 October 2024**

Title of the paper:		
If applicable: Abstract ID in IAEA-INDICO:		
Family name(s) and first name(s) of all author(s) (same as in passport(s):	Scientific establishment(s) in which the work has been carried out	City/Country
1.		
2.		
3.		
Family name and first name(s) of author presenting the paper (same as in passport(s):	Mr/Ms:	
Mailing address:		
Tel. (Fax):		
Email:		

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Furthermore, I herewith declare:

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- that the material submitted to the IAEA does not contain any libellous or other unlawful statements and does not contain any materials that violate any personal or proprietary rights of any person or entity.

**Date:**

**Signature of main author:**

# Grant Application Form

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Family name(s): (same as in passport)	First name(s): (same as in passport)	Mr/Ms:
Mailing address:	Tel.:	
	Fax:	
	Email:	
Date of birth (yyyy/mm/dd):	Nationality:	

#### 1. Education (post-secondary):

Name and place of institution	Field of study	Diploma or Degree	Years attended from            to	

#### 2. Recent employment record (starting with your present post):

Name and place of employer/ organization	Title of your position	Type of work	Years attended from            to	

#### 3. Description of work performed over the last three years:

**4. Institute's/Member State's programme in field of event:**

**Date:** \_\_\_\_\_ **Signature of applicant:** \_\_\_\_\_

**Date:** \_\_\_\_\_ **Name, signature and stamp of Ministry of Foreign Affairs, Permanent Mission to the IAEA or National Atomic Energy Authority**

\_\_\_\_\_