



Interregional Training Course on Synchrotron X-ray Data Analysis

Hosted by

The Government of Jordan

through the

**Synchrotron-light for Experimental Science and Applications in the Middle East
(SESAME)**

06 December to 12 December 2026

Ref. No.: RTC-INT0104-EVT2603728

Information Sheet

Purpose

The purpose of this event is to provide participants with the necessary tools to analyse synchrotron data and to develop practical skills in data processing, interpretation, and application to real experimental cases. The training will focus on powder X-ray Diffraction (XRD) and Infrared (IR) spectroscopy datasets.

The programme is designed to provide a comprehensive and practical introduction to the processing, analysis, and interpretation of synchrotron data, combining theoretical background with extensive hands-on activities. The training sessions will be based on real experimental datasets and will address a range of case studies representative of current research challenges in materials science, chemistry, physics, and related disciplines.

Through guided practical exercises, participants will gain direct experience with the complete data analysis workflow, including data pre-processing, quality assessment, fitting and refinement procedures, and finally the extraction of meaningful structural and chemical information. Particular attention will be given to best practices in data analysis and interpretation, as well as to common challenges encountered when handling synchrotron datasets. Participants will work with state-of-the-art software packages widely used by the synchrotron community, enabling them to acquire practical experience with data analysis tools widely accepted and utilized by the scientific community.

Working Language(s)

The working language of the event will be English.

Deadline for Nominations

Nominations received after 19 October 2026 will not be considered.

Project Background

The project INT0104, 'Increasing Transnational Cooperation between Light Sources, and Diversifying the User Base' officially began on 1 January 2024, for a five-year duration, under field of activity 01, Capacity establishment, programme knowledge management and facilitation of cooperation among Member States, contributing towards UN Sustainable Development Goals (SDG) 9 to build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

The overall objective of this project is to support the Member States in building and leveraging a network that increases both the awareness and practical use of synchrotron light technology amongst participating institutes, facilitating an increased sharing of knowledge and technical experiences among participating countries. Key performance indicators include the number of institutes participating, the frequency of knowledge exchanges, and the establishment of joint projects or initiatives. The aim is to significantly enhance the collaboration between end-users, scientists, engineers, and technicians involved in synchrotron facilities. This will not only promote scientific advancement but also indirectly bolster socioeconomic development in participating countries.

The project scope includes expanding the use of synchrotron facilities, sharing best practices and technical knowledge, conducting training programs and workshops, and establishing effective funding mechanisms for equitable user access, outreach and required capacity building.

Expected Output of the Training

Upon completion of the training, participants will have acquired the knowledge and practical skills required to independently process, analyze, and interpret synchrotron datasets obtained from powder X-ray Diffraction (XRD) and Infrared (IR) spectroscopy experiments. They will be familiar with state-of-the-art software tools and established data analysis workflows, enabling them to perform reliable data treatment, fitting, refinement, and interpretation of experimental results.

Participants will also gain a better understanding of the capabilities and limitations of synchrotron techniques, allowing them to design more effective experiments and critically evaluate the quality of their data. The hands-on experience with real experimental datasets will strengthen their ability to address practical analytical challenges and to apply the acquired methodologies to their own research activities.

Overall, the training will contribute to increasing the participants' scientific autonomy, and enhancing their capacity to effectively exploit synchrotron facilities and advanced characterization techniques in future research projects.

Scope and Nature

This training is designed to provide early-career researchers, PhD students, postdoctoral fellows, and other users of synchrotron facilities with practical knowledge and hands-on experience in the analysis of synchrotron data. The course focuses on powder X-ray Diffraction (XRD) and Infrared (IR) spectroscopy, covering the complete data analysis workflow from raw data processing to the extraction and interpretation of structural and chemical information.

The training combines theoretical lectures with extensive practical sessions based on real experimental datasets acquired at synchrotron beamlines. Participants will work with state-of-the-art software packages under the guidance of experienced scientists, learning established methodologies, best practices, and strategies for addressing common analytical challenges. Interactive discussions and case studies will encourage participants to critically evaluate data quality, select appropriate analysis approaches, and interpret results in the context of their own research.

The overall aim is to strengthen the scientific and technical skills of synchrotron users, promote the adoption of reliable and reproducible data analysis methodologies, and enhance the effective exploitation of large-scale research infrastructures. By fostering competence in advanced data analysis, the training will support participants in independently analyzing synchrotron datasets and in maximizing the scientific impact of their future experiments.

Participation

The interregional training course is open to up to participant per country. Nominations are open to Member States participating in the TC Project INT0104.

Participants' Qualifications and Experience

Participants should have a basic understanding of synchrotron-based experimental techniques. Candidates should also have a well-defined scientific project for which powder X-ray Diffraction (XRD) or Infrared (IR) spectroscopy is needed.

Application Procedure

Candidates wishing to apply for this event should follow the steps below:

1. Access the InTouch+ home page (<https://intouchplus.iaea.org>) using the candidate's existing Nucleus username and password. If the candidate is not a registered Nucleus user, she/he must create a Nucleus account (<https://websso.iaea.org/IM/UserRegistrationPage.aspx>) before proceeding with the event application process below.
2. On the InTouch + platform, the candidate must:
 - a. Finalize or update her/his personal details, provide sufficient information to establish the required qualifications regarding education, language skills and work experience ('Profile' tab) and upload relevant supporting documents.
 - b. Search for the relevant technical cooperation event (EVT2206107) under the 'My Eligible Events' tab, answer the mandatory questions and lastly submit the application to the required authority.

NOTE: Completed applications need to be approved by the relevant national authority, i.e. the National Liaison Office, and submitted to the IAEA through the established official channels by the provided designation deadline.

For additional support on how to apply for an event, please refer to the [InTouch+ Help page](#). Any issues or queries related to InTouch+ can be addressed to InTouchPlus.Contact-Point@iaea.org.

NOTE: A medical certificate signed by a registered medical practitioner dated not more than four months prior to starting date of the event must be submitted by candidates when applying for a) events with a duration exceeding one month, and/or b) all candidates over the age of 65 regardless of the event duration.

Administrative and Financial Arrangements

Nominating authorities will be informed in due course of the names of the candidates who have been selected and will at that time be informed of the procedure to be followed with regard to administrative and financial matters.

Selected participants will receive an allowance from the IAEA sufficient to cover their costs of lodging, daily subsistence and miscellaneous expenses. They will also receive either a round-trip air ticket based on the most direct and economical route between the airport nearest their residence and the airport nearest the duty station through the IAEA's travel agency American Express, or a travel grant, or they will be reimbursed travel by car/bus/train in accordance with IAEA rules for non-staff travel.

Disclaimer of Liability

The organizers of the event do not accept liability for the payment of any cost or compensation that may arise from damage to or loss of personal property, or from illness, injury, disability or death of a participant while he/she is travelling to and from or attending the course, and it is clearly understood that each Government, in approving his/her participation, undertakes responsibility for such coverage. Governments would be well advised to take out insurance against these risks.

Note for female participants

Any woman engaged by the IAEA for work or training should notify the IAEA on becoming aware that she is pregnant.

The Board of Governors of the IAEA approved new International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources. The Standards deal specifically with the occupational exposure conditions of female workers by requiring, inter alia, that a female worker should, on becoming aware that she is pregnant, notify her employer in order that her working conditions may be modified, if necessary. This notification shall not be considered a reason to exclude her from work; however, her working conditions, with respect to occupational exposure shall be adapted with a view to ensuring that her embryo or foetus be afforded the same broad level of protection as required for members of the public.

IAEA Contacts

Ashley Bantelman,
Programme Management Officer
Division for Asia and the Pacific
Department of Technical Cooperation
International Atomic Energy Agency
Vienna International Centre
PO Box 100
1400 VIENNA
AUSTRIA
Tel.: +43 1 2600 22613
Fax: +43 1 26007
Email: a.bantelman@iaea.org

Ms Foteini Kanatsouli,
Administrative Contact
Division for Asia and the Pacific
Department of Technical Cooperation
International Atomic Energy Agency
Vienna International Centre
PO Box 100
1400 VIENNA
AUSTRIA
Tel.: +43 1 2600 21484
Fax: +43 1 26007
Email: f.kanatsouli@iaea.org