



Virtual Training Course on Mathematical Modelling for Radiation Processing

Hosted by

The International Atomic Energy Agency
IAEA Headquarters
Vienna, Austria

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Information Sheet

Purpose

The purpose of the event is to provide the practical application on the use of mathematical modelling for design processes in the radiation processing of materials.

Working Language(s)

The working language(s) of the event will be **English**.

Deadline for Nominations

Nominations received after **4 June 2021** will not be considered.

Backgrounds

The radiation processing is based on the physical and chemical changes introduced by the interactions of ionizing radiation with matters. Ionizing radiation produces ionization and excitation by transferring energy to electrons present in atoms of the stopping material. The use of ionizing radiation for industrial applications, like the sterilization of medical devices or cross-linking of polymers, has a long and successful track record and has proven itself to be a key technology. Emerging fields, including environmental applications, the sterilization of complex products, such as medical and pharmaceutical products, cultural heritage artefacts or advanced material treatment, require the design and control of even more complex irradiators and irradiation processes.

As there has been increasing interests from MSs in the use of mathematical modelling, RER1021 supports this training to strengthen the Member States' capacities in mathematical modelling that can help ease the design process, for example, by calculating absorbed dose distributions in a product long before any prototype is built. The mathematical modelling supports process qualification by assessing the impact of process variable uncertainties and can act as an indispensable teaching tool in radiation processing training.

Scope and Nature

This virtual training focuses on the use of mathematical modelling (mostly regarding Monte Carlo methods) in radiation processing. In radiation processing, Monte Carlo transport codes are widely used because they simulate the tracks of individual particles and photons based on detailed physics of the interaction of radiation in matter. Monte Carlo methods have been successfully established in science and have proven their success in critical applications like radiation therapy or space flight.

The training course will feature a series of specialized lectures with advanced technology introductions and practical exercises to facilitate sharing experiences by:

- Mathematical models of radiation processing
- Introduction of Monte Carlo methods
- Applications of Monte Carlo transport code
- Calculation of dose and dose uniformity

Participation

The event is open to **40** participants from Member States.

Participants and their Qualifications and Experience

The participants should be involved in radiation sciences and technologies as researchers, engineers, facility operators, or coordinators of academic programmes from the RER1021 MSs. Participation of young researchers and engineers are highly recommended.

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 (EVT2101729) 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.

Should online application submission not be possible, candidates may download the nomination form for the meeting from the [IAEA website](#).

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 who indicate their need, will receive financial support to contribute to the expenses of their costs for internet connection for the duration of the event in line with IAEA rules and procedures.

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.

The IAEA takes no responsibility for, and the provider of the virtual meeting services has represented and warranted that the Services shall not contain, and that no end user shall receive from the software used to hold the virtual meeting, any virus, worm, trap door, back door, timer, clock, counter or other limiting routine, instruction or design, or other malicious, illicit or similar unrequested code, including surveillance software or routines which may, or is designed to, permit access by any person, or on its own, to erase, or otherwise harm or modify any data or any system, server, facility or other infrastructure of any end user (collectively, a “Disabling Code”).

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