

# EURADOS Training Course on the Application of Monte Carlo Methods for Dosimetry of Ionizing Radiation

March 12-16, 2018 – KIT Karlsruhe, Germany

The Monte Carlo method is a numerical simulation technique that is widely used to simulate transport of ionizing radiation. A Training Course on computational dosimetry applications of MC simulations for PhD students and young investigators working in the field of dosimetry of ionizing radiation is organized by the European Radiation Dosimetry Group (EURADOS) and the Karlsruhe Institute of Technology (KIT). International renown experts will provide lectures and guide practical exercises. Attendance is thus limited to a maximum of 30 participants. The course is supported by the European Joint Programme for the Integration of Radiation Protection Research (CONCERT) and consists of

- one **basis module (3 days)** presenting fundamentals required for computational dosimetry applications, namely voxel phantom development and implementation for radiation physics calculations, and
- two **applications modules (2 days)** on
  - (1) individual monitoring and
  - (2) in-vivo counting.

The two application modules will be held in parallel, all participants may participate in the basis module and one of the application modules. The application module must be selected upon registration. Topics covered are:

## **Basis Module: Voxel Phantom Development and Implementation for Radiation Physics Calculations:**

- General information on voxel phantoms
- Steps needed to go from image data to a voxel phantom
- Combination of voxel phantoms with Monte Carlo codes
- Application of voxel phantoms to MC simulations

## **Applications Module 1: Individual Monitoring:**

- General information on dose quantities and units
- Application of simulations in individual monitoring for calibration, personal dosimetry and area monitoring

## **Applications Module 2: In-Vivo Counting:**

- General information on in-vivo counting methods
- Step-by-Step Exercise: Calibration of a Lung Counter
- This exercise will use the MCNP family of codes, participants will need at least basic knowledge of MCNP.

## **Further information and registration forms**

are available at the course web-page under:

<http://www.sum.kit.edu/CONCERT-Training.php>



### **At a Glance:**

**Topic:** MC-Methods in Computational Dosimetry

**Who:** Up to 30 PhD-Students and Young Investigators, 2 ECTS can be certified upon successful participation

**Date:** March 12-16, 2018

**Venue:** Karlsruhe Institute of Technology  
Campus South, Kaiserstraße 12  
76131 Karlsruhe (Germany)

**Fees:** Basis Module: 400 €,  
Application Modules: 200 €  
Full Course: 500 €  
Discount for Students and EURADOS  
sponsors – Full Course: 450 €  
(All fees are exclusive VAT)

**Web:** [www.sum.kit.edu/CONCERT-Training.php](http://www.sum.kit.edu/CONCERT-Training.php)

### Additional Information:

Participants need to bring their own laptops and have working knowledge about Monte Carlo simulations of radiation transport. The application modules are stand-alone modules that can be booked independently, however it is recommended to book a package including the basis module.

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# EURADOS Training Course on the Application of Monte Carlo Methods for Dosimetry of Ionizing Radiation

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## Training Course

The course will consist of a three day basis module presenting fundamentals required for computational dosimetry applications, namely voxel phantom development and implementation for radiation physics calculations. Two parallel two day application modules will cover applications for individual monitoring and the calibration of in-vivo counters. Besides lectures covering the most important aspects the course will provide a hands on training with many practical exercises. Participants should bring their own laptops for working during the practicals. A working knowledge on Monte Carlo Simulations is required. The application module on in-vivo counters will use codes of the MCNP family. For this module a licensed copy of MCNP(X) should be installed at the laptop. Further Information can be found at the course webpage under:

<http://sum.kit.edu/CONCERT-Training.php>

## Schedule of the Training Course

	Monday	Tuesday	Wednesday	Thursday	Friday
8:30 - 10:00	Basis	Basis	Basis	Applications I/II	Applications I/II
10:00 - 10:30	Coffee Break				
10:30 - 12:00	Basis	Basis	Basis	Applications I/II	Applications I/II
12:00 - 13:00	Lunch				
13:00 - 14:30	Basis	Basis	Basis	Applications I/II	Applications I/II
14:30 - 16:00	Basis	Basis	Basis	Applications I/II	Applications I/II
16:00 - 16:30	Coffee Break				
16:30 - 18:00	Basis	Basis	Applications I/II	Applications I/II	Applications I/II

## Karlsruhe Institute of Technology – <http://www.kit.edu>

On October 01, 2009, the Karlsruhe Institute of Technology (KIT) was founded by a merger of Forschungszentrum Karlsruhe (FZK) and Universität Karlsruhe. KIT bundles the missions of both precursory institutions: A university of the state of Baden-Wuerttemberg with teaching and research tasks and a large-scale research institution of the Helmholtz Association conducting program-oriented provident research on behalf of the Federal Republic of Germany. Within these missions, KIT is operating along the three strategic fields of action of research, teaching, and innovation.

## EURADOS – <http://www.eurados.org>

We are a network of more than 50 European institutions (Voting Members) and 200 scientists (Associate Members). As a non-profit organization we promote research and development and European cooperation in the field of the dosimetry of ionizing radiation. We maintain a network which includes experts, reference and research laboratories, and dosimetry services. Our activities encompasses the coordination of working groups which promote technical development and its implementation in routine work. WGs also contribute to compatibility within Europe and conformance with international practices. EURADOS organizes scientific meetings, training activities, intercomparisons and bench mark studies.

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## Purpose

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## Topics

The course will consist of a three day basis module presenting fundamentals required for computational dosimetry applications, namely voxel phantom development and implementation for radiation physics calculations. Two parallel two day application modules will cover applications for individual monitoring and the calibration of in-vivo counters. Besides lectures covering the most important aspects the course will provide a hands on training with many practical exercises.

## Venue

Karlsruhe Institute of Technology (KIT)  
Campus South  
Kaiserstr. 12  
76131 Karlsruhe (Germany)



For information on travel and accomodation see the webpage of the course

## Prerequisites

The attendance to the course is limited to a maximum of 30 participants. For working during the practicals participants should bring their own laptops. A working knowlede on Monte Carlo Simulations is required. The application module on in-vivo counters will use codes of the MCNP family. For this module a basic knowledge on a code of the MCNP family is needed and a licensed copy of MCNP(X) should be installed at the laptop.

## Registration

Deadline for registration is **February 16, 2018**. A Registration Form is provided at the course webpage: <http://www.sum.kit.edu/CONCERT-Training.php>

KIT and EURADOS will confirm your participation via E-Mail. Upon confirmation you will receive the invoice for the participation fee. Deadline for payment is March 1<sup>st</sup> 2018.

## Registration fees

### Regular Fee:

Basis Module 400 €, Application Module: 200 €  
Full Course (Basis + 1 Application Module): 500€

### Reduced Fee: 450 € - Full Course

Applies for participants from the EURADOS Sponsoring Institutions (see <http://www.eurados.org/en/Sponsors>)

### Students Fee: 450€ - Full Course

Applies for students which are registered at a university.  
(A proof of matriculation needs to be presented at registration)

All fees are exclusive VAT. 7% VAT will be added for invoices to participants from Germany and from EU member states who cannot provide us with their VAT-ID number.

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