GATE training on medical imaging (PET, SPECT, CT), dosimetry and radiation therapy - Beginner level

OBJECTIVES
- Learn the usage of the GATE platform for medical physics
- Understand the features of the platform dedicated to the development of detection systems (PET, SPECT, CT and X-rays) and detector response, the management of medical images, the development of clinical and preclinical beams in radiation therapy and dose calculation for different radiation therapy treatments (internal or external)
- Be able to use new tools for data analysis using Python

AUDIENCE
Students, faculty, researchers and engineers involved in medical physics

PRE-REQUIREMENT
Basics in particle physics and medical physics

TRAINING PROGRAMME

Day 1
- Introduction to the platform environment
- Description of a macro file and input files
- Visualization
- How to build the geometry of a camera, examples for PET, SPECT and CT systems
- How to manage medical data (simulation inputs)
- How to configure digitizer and detector response

Day 2
- How to handle the geometry of clinical beams in radiation therapy (examples using photons and ions)
- How to configure the physics lists
- How to configure cuts / thresholds
- How to handle output data (actors)

Day 3
- Tools for data analysis using Python
- Tools for distributed computing on clusters

Lectures (5 hours) and hands on (15 hours)

EQUIPMENT
Participants should attend the training with their laptops with the GATE virtual platform installed (vGATE 8.2)