

## Generation 4

Nuclear reactor systems  
for the future

June 19-23, 2017

INSTN/CEA-Saclay, France

*The course is targeting scientists already involved in Gen IV systems activities or planning to work in such areas. The course covers the 6 systems, and cross-cutting aspects (energy conversion, materials, safety, and fuel cycle).*

*The course offers lectures by renowned subject matter experts in the various areas, as well as tutorials (how to “design” a fast neutron reactor using simple calculations).*

### OBJECTIVES

The general objective is to provide participants with an up-to-date, basic knowledge on the six concepts selected for the 4<sup>th</sup> generation of nuclear systems (SFR, LFR, GFR, VHTR, SCWR, MSR).

### PUBLIC

Professionals, researchers and students with an interest in a global view of on the 4<sup>th</sup> generation of nuclear reactors.



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### GENERAL INFORMATION AND REGISTRATION

The course will be held at the National Institute for Nuclear Science and Technology, located at the CEA-Saclay site (20 km south of Paris), in the frame of the European Nuclear Energy Network (ENEN). The number of participant is limited to 20. Course fee includes lectures, documentation, lunches and coffee breaks.

**Language:** English

**Full rate:** €2100      **Student rate:** €1470

### CONTACT

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*INSTN is Collaborating Centre of IAEA*

### PROGRAMME

*The Generation IV International Forum (GIF) and 4<sup>th</sup> generation systems*

- General context, evaluation criteria, the six concepts selected
- Increased performance for energy conversion: innovative cycles
- Materials issues and development of advanced components
- Safety aspects of 4<sup>th</sup> generation reactor concepts

*Sodium-cooled Fast reactors (SFR)*

- Principles, past and existing reactors, and background knowledge
- SFR core design, performance and safety
- The choice of sodium coolant: impact on design and operation
- The ASTRID prototype reactor

*High Temperature and Very High Temperature Reactors (HTR and VHTR)*

- Historical development of HTRs
- HTR core physics

*Gas-cooled Fast Reactors (GFR)*

- GFR core and system design, preliminary safety evaluation
- The ALLEGRO demonstration reactor

*Lead-cooled Fast Reactors (LFR)*

- Status of LFR development

*Supercritical Water Reactors (SCWR)*

- SCWR principles, characteristics and challenges

*Molten Salt Reactors (MSR)*

- Physics of MSR in the thorium fuel cycle

*Fuel cycle of 4<sup>th</sup> generation systems*

- Closed nuclear fuel cycle and transmutation

*Action supported by Generation IV  
International Forum*