

# APPLICATION FORM

## Frédéric JOLIOT & Otto HAHN SUMMER SCHOOL ON NUCLEAR REACTORS "Physics, fuels and systems"

Title and Family Name  
(Prof-Dr-Mrs-Miss-Mr) \_\_\_\_\_

First Name \_\_\_\_\_

Employer/University \_\_\_\_\_

Professional address \_\_\_\_\_

Country \_\_\_\_\_

Tel. \_\_\_\_\_ Fax \_\_\_\_\_

E-mail: \_\_\_\_\_

Supplementary information for site entry/visits \_\_\_\_\_

Date of birth \_\_\_\_\_ Birthplace \_\_\_\_\_

Nationality \_\_\_\_\_

Home address \_\_\_\_\_

Passport number \_\_\_\_\_

Issued at (city and country) \_\_\_\_\_

Issued on \_\_\_\_\_ Expires on \_\_\_\_\_

Please enclose a short curriculum vitae including an ID photo  
If your application is accepted, you will receive detailed instructions for payment.

Mark this box if you request a fellowship (number is limited). A motivation letter is required. Fellowships are primarily intended for students and applicants from developing countries. For more information, see next page.

Date \_\_\_\_\_ Signature \_\_\_\_\_

Aix-en-Provence France  
August 25 > September 3

# APPLICATION

The application form should be filled out on-line at:  
[www.fjohss.eu](http://www.fjohss.eu)

Should there be problems with the on-line application, fill out and return the attached application form by mail or e-mail to:

**FJOH Summer School**  
DEN/CAD/CDSI, Bldg 155, CEA Cadarache,  
13108 Saint-Paul-Lez-Durance, France  
[fjoh@cea.fr](mailto:fjoh@cea.fr)

**Deadline for application: May 4, 2010**  
**Registration fees: EURO 1700**

Information for payment of the fees will be provided upon review of applications.

Fees cover lectures, class notes, meals and accommodations from August 24 evening to September 3, 2:00 p.m.

**The fees do not cover travel expenses.**

A very limited number of fellowships will be available for qualified candidates. Each fellowship covers the amount of EURO 1000. The fellowship recipients' registration fees will therefore be EURO 700.

The FJOH School considers that the 2010 programme corresponds approximately to 3-4 ECTS credits of post graduate-level course work in Nuclear Engineering.

Selection by the FJOH School Organizers is final.

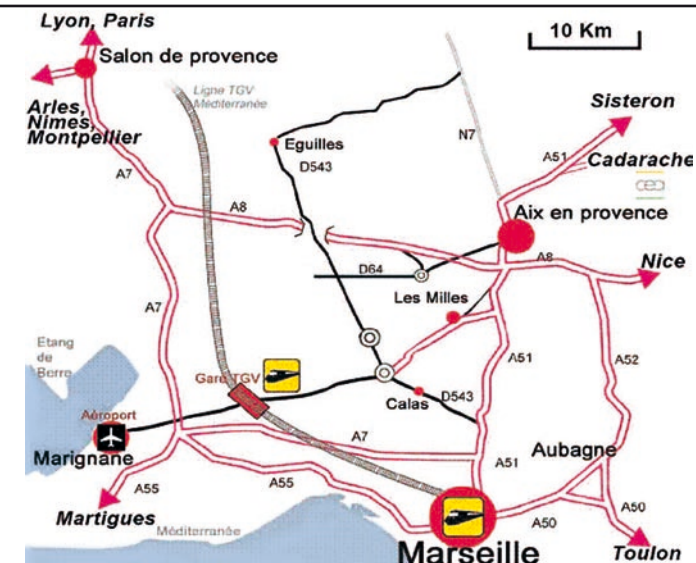
Deadline for application  
May 4, 2010

# INFORMATION

## Venue

The School will be held at the Hotel NOVOTEL Pont-de-l'Arc, located in Aix-en-Provence, 30 km from the Marseille/Provence airport and 40 km from the CEA Cadarache Research Center.

▶ Application deadline **May 4, 2010**



- > Bus transportation (free of charge) will be provided from Marseille airport, and from Aix-en-Provence TGV railway-station, on August 24 p.m.
- > Return transportation will be provided on September 3 at 2.00 p.m.
- > Participation is mandatory till the end of the course.
- > On Sunday August 29, a day trip in Provence will be organized (free of charge).

For questions, please contact  
**FJOH Summer School**  
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13108 Saint-Paul-Lez-Durance, France  
[fjoh@cea.fr](mailto:fjoh@cea.fr)

For more information, please visit our web site  
[www.fjohss.eu](http://www.fjohss.eu)

# Frédéric JOLIOT & Otto HAHN



## SUMMER SCHOOL ON NUCLEAR REACTORS

"Physics, fuels and systems"

# 2010

Jointly organized by the *Commissariat à l'Energie Atomique* (France) and the Karlsruhe Institute of Technology (Germany)

## GOALS AND CHALLENGES FOR THE GEN-II TO GEN-III TRANSITION



Aix-en-Provence France August 25 > September 3



## PROGRAMME OUTLINE

# GOALS AND CHALLENGES FOR THE GEN-II TO GEN-III TRANSITION

### 1. Motivation for the Transition from Gen-II to Gen-III Nuclear Systems..... 1h

Plant specific features, sustainability, economics

### 2. LWR Challenges and how to Address them.....11h

- 2.1 Components lifetime limitations in service conditions
- 2.2 Materials degradation, radiation damage processes, aging mechanisms
- 2.3 Corrosion issues in LWRs
- 2.4 Advanced physics methods for core design and analysis
- 2.5 Contribution of computational fluid dynamics methods

### 3. Safety - The Approach and the Associated R&D..... 9h

- 3.1 Analysis of design basis accidents
- 3.2 Safety and severe accidents - The general R&D Methodology and the particular case of EPR
- 3.3 Beyond design basis accidents and accident management
- 3.4 Probabilistic and deterministic safety analyses

### 4. Economics and Fuel Cycle Strategies - Needs, Constraints, Optimization..... 6h

- 4.1 LWR fuel cycle strategies
- 4.2 Reactor fuel performance and optimization
- 4.3 Plutonium recycling and its implications

### 5. GEN-III Systems - From the Initial Requirements to the Designers' Choices ..... 9h

- 5.1 Pressurized Water Reactors - Part I
- 5.2 Pressurized Water Reactors - Part II
- 5.3 Boiling Water Reactors
- 5.4 Advanced Heavy Water Reactors

### Seminar: Progress in Gen-III Reactor Constructions and in Gen-II Plant Improvements

### Technical Visit of CEA Cadarache Facilities

## LECTURERS

#### Topic 1

Dr. Michael Wenk EnBW, Germany

#### Topic 2

Dr. David Lidbury Serco, United Kingdom  
Mr. Tim Williams Rolls Royce, United Kingdom

Dr. Damien Féron CEA, France  
Dr. Kord Smith Studsvik, Sweden  
Dr. Pierre Coste CEA, France

#### Topic 3

Dr. Frank-Peter Weiss FZD, Germany  
Dr. Jean-Pierre Van Dorsselaere IRSN, France

Dr. Martin Sonnenkalb GRS, Germany  
Dr. Robert Martin AREVA, USA

#### Topic 4

Dr. Marc Delpech CEA, France  
Dr. Guy Chaigne EdF, France  
Dr. Kiyoshi Ono JAEA, Japan

#### Topic 5

Dr. Pierre Berbey EdF, France  
Dr. Volker Noack RWE, Germany  
Dr. Stephan Leyer AREVA, Germany  
Dr. Ken Kozier AECL, Canada

#### Seminar

Dr. Rüdiger Leverenz AREVA, Germany

## COORDINATION

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Contact: fjoh@cea.fr

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## DESCRIPTION

This 16<sup>th</sup> session of the Frédéric Joliot/Otto Hahn (FJOH) Summer School on Nuclear Reactors "Physics, Fuels, and Systems" will be held in Aix-en-Provence, France, from **August 25 to September 3, 2010**. This represents the continuation of the Frédéric Joliot (FJOH) Summer Schools on « Modern Reactor Physics and the Modelling of Complex Systems », which was created by CEA in 1995 to promote knowledge in the field of reactor physics, in a broad sense, and the international exchange of teachers, young scientists and researchers.

Since 1999, the Forschungszentrum Karlsruhe, which has recently merged with the University of Karlsruhe to form the Karlsruhe Institute of Technology (KIT), and the Nuclear Energy Division of CEA jointly organize the FJOH Summer School. The venues of the FJOH School sessions alternate between Karlsruhe and Cadarache. Beginning in 2004, the scope of the School was extended to include scientific issues related to nuclear fuels.

The School's general aim is to address the challenges of reactor design and optimal fuel cycles, and to broaden the understanding of theory and experiments. The 2010 edition is devoted to the transition between current reactors and the next generation of Light Water Reactors. Lectures will address the main scientific and technical challenges of this evolution, relative in particular to plant and component lifetime, safety and economics. The motivation, requirements and designer's choices will be described for the main Gen-III systems currently under development.

Lecturers are invited from internationally leading universities, research and development laboratories, and industry. The lectures are at the post-doctoral level; they are primarily intended for scientists and engineers engaged in the broad field of nuclear sciences, engineering and technologies.

The programme of each School session is defined by the FJOH International Scientific Board.

FJOH-2010 is sponsored by the CEA Nuclear Energy Division, the Karlsruhe Institute of Technology (KIT), the Institute for Education and Training in Nuclear Science and Technology (INSTN), and the Provence-Alpes-Côte-d'Azur Region.

### FJOH Scientific Board members

**Prof. José María Aragonés** (Universidad Politécnica de Madrid)  
**Prof. Michel Beauvy** (CEA, Cadarache)  
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**Dr. Wolfgang Dams** (AREVA NP GmbH, Offenbach)  
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**Prof. Michel Giot** (Univ. Catholique de Louvain-la-Neuve)  
**Prof. Anthony Goddard** (Imperial College, London)  
**Dr. Wacław Gudowski** (Int. Science and Tech. Centre, Moscow)  
**Dr. Didier Haas** (EC, JRC, Brussels)  
**Prof. David Weaver** (The University of Birmingham)

**Dr. Kevin Hesketh** (British Nuclear Fuels Plc., Springfield, Madrid)  
**Prof. Jan Leen Kloosterman** (Delft University)  
**Dr. Joachim Knebel** (Karlsruhe Institute of Technology)  
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**Prof. Alex Mueller** (CNRS, IN2P3, Orsay)  
**Prof. Yoshiaki Oka** (University of Tokyo)  
**Prof. Piero Ravetto** (Politecnico di Torino)  
**Dr. Daniel Rippert** (CEA, INSTN, Cadarache)  
**Prof. Richard Sanchez** (Commissariat à l'Energie Atomique, Saclay)  
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2010