



The Abdus Salam
International Centre for Theoretical Physics



Joint ICTP-IAEA COURSE ON SCIENCE AND TECHNOLOGY OF SUPERCRITICAL WATER COOLED REACTORS

27 June - 1 July 2011
Miramare - Trieste, Italy

The "Abdus Salam" International Centre for Theoretical Physics (ICTP), Trieste, Italy, in co-operation with the International Atomic Energy Agency (IAEA), Vienna, Austria, is organizing a Course on the Science and Technology of Supercritical Water Cooled Reactors (SCWR), to be held at ICTP, Trieste, from 27 June – 1 July 2011.

There is high interest internationally in both developing and industrialized countries in innovative supercritical water-cooled reactors, primarily because such concepts will achieve high thermal efficiencies (44-45%) and promise improved economic competitiveness utilizing and building on recent developments for highly efficient fossil fueled power plants. The Supercritical Water Cooled Reactor (SCWR) is a Generation IV reactor concept that uses supercritical water as the working fluid. Therefore, SCWR systems are essentially water cooled reactors operating at high-temperature and high-pressure, above the thermodynamic critical point of water. Since this concept is based on the well known water cooled reactors currently in operation all over the world, it provides a good stepping stone for developing countries looking to deploy advanced nuclear power plant designs.

The course will provide a comprehensive and up-to-date review of the science and engineering of supercritical water cooled reactor concepts, including thermodynamics, thermohydraulics and heat transfer, neutronics and core design, materials requirements, system design and safety aspects, and a detailed description of the various supercritical water cooled reactor concepts currently under development. The course will also explore the opportunities and challenges associated with this reactor concept, and will unveil opportunities for research and development in this area.

In particular, the following topics will be addressed:

- Thermodynamics of systems at supercritical pressure
- Thermohydraulics and heat transfer in supercritical water cooled reactors
- Neutronics and core design for supercritical water cooled reactors
- Selection of materials for use in supercritical water cooled reactors
- System design and safety aspects for supercritical water cooled reactors
- Overview of the various SCWR concepts currently under development in the world.
- Opportunities and challenges associated with the development and deployment of SCWRs
- Overview of on-going research and development activities in the area of supercritical water cooled reactors
- Experimental databases for the study of these phenomena
- Overview of advanced computational tools to study and simulate these phenomenologies

PARTICIPATION

Scientists and students from all countries, which are members of the United Nations, UNESCO or IAEA, may attend the Course subject to approval by the Course Directors. The course is intended for nuclear engineering faculty and students (at the university level), graduate engineers/physicists working in the nuclear field, post-graduate students, engineering designers, nuclear researchers and nuclear regulators. A basic knowledge in nuclear physics, thermohydraulics, fluid mechanics and heat transfer is required. Logistics limit the number of participants to 25. As the Course will be conducted in English, participants should have an adequate working knowledge of that language. Although the main purpose of the Centre is to help research workers from developing countries, through a programme of training activities within a framework of international cooperation, a limited number of students and post-doctoral scientists from developed countries are also welcome to attend.

As a rule, travel and subsistence expenses of the participants should be borne by the home institution. Every effort should be made by candidates to secure support for their fare (or at least half-fare). However, limited funds are available for some participants, who are nationals of, and working in, a developing country, and who are not more than 45 years old. Such support is available only for those who attend the entire activity. There is no registration fee.

REQUESTS FOR PARTICIPATION

The application form can be accessed at the activity website:

<http://agenda.ictp.it/smr.php?2291>

Once in the website, comprehensive instructions will guide you step-by-step, on how to fill out and submit the application form. The deadline for submitting applications is 25 February 2011

SECRETARIAT

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Course web page: <http://agenda.ictp.it/smr.php?2291>

ICTP Home Page: <http://www.ictp.it/>

Trieste, October 2010



Directors:

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Local Organizer:

Claudio TUNIZ
(ICTP, Trieste, Italy)

DEADLINE
for submitting
applications
25 February 2011