



The Abdus Salam
**International Centre
for Theoretical Physics**
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Joint ICTP/CAS/IAEA School and Workshop on

PLASMA-MATERIAL INTERACTION IN FUSION DEVICES

18 - 22 July 2016

(Hefei Institutes of Physical Science, Hefei, P. R. China)

The Abdus Salam International Centre for Theoretical Physics (ICTP), the Chinese Academy of Sciences (CAS) and the International Atomic Energy Agency (IAEA) will jointly organize a *School and Workshop on Plasma-Material Interaction in Fusion Devices* from 18 to 22 July 2016. The event will be hosted by the CAS Institutes of Plasma Physics (ASIPP) and of Solid State Physics (ISSP) and held at the CAS Hefei Institutes of Physical Science in Hefei, China.

Introduction

The study of plasma-material interaction in fusion devices is devoted foremost to the twin topics of erosion and hydrogen (tritium) retention, and it is closely connected to the study of material microstructure and radiation damage. Basic computational methods include first-principles electronic structure calculations, classical molecular dynamics, kinetic Monte Carlo (KMC) and rate equation modeling, quantum transition state theory, and path integral approaches to hydrogen and defect migration, among other methods. The field has a strong interest in predictive simulations and also in simulations to support interpretation of experimental data. Relevant research is carried out in fusion and materials research institutes and in university departments of physics, chemistry and engineering science.

Purpose

The purpose of the School and Workshop is to provide advanced training and a forum for discussion concerning computational studies of plasma-material interaction processes in fusion devices. The meeting will bring together researchers (lecturers, invited speakers and participants by application) from the areas of materials science and plasma-material interaction in connection with nuclear fusion. Participants should return from the meeting with a richer understanding of computational methods for study of plasma-material interaction processes and of the applications of these methods in fusion energy research. The school and workshop is being held in China in order to take advantage of that country's rapidly growing expertise in modelling of fusion materials and plasma-material interaction and to promote interaction between younger Chinese scientists and their international peers.

Topics to be covered

1. Electronic structure methods and tools for study of material microstructure and trapping and transport of H and He in fusion wall materials.
2. Development of classical interaction potentials for molecular dynamics studies.
3. Development of rate coefficients for KMC and other long-time evolution calculations.
4. Simulation methods for interpretation of experimental data, for example data obtained by thermal desorption spectroscopy.
5. Specific computational studies of erosion of plasma-facing materials due to plasma exposure, of radiation damage in plasma-facing materials and of trapping and migration of hydrogen and helium in such materials.

Participation

As the School and Workshop will be conducted in English, participants must have an adequate working knowledge of this language. A limited number of grants are available to cover partially or completely the travel and living expenses of some selected participants. Priority is given to participants who are nationals of, and working in, a developing country, and who are at the early stages of their career. *There is no registration fee.* In order to apply for participation please access the Online Application at the activity website <http://indico.ictp.it/event/7637/>. Comprehensive instructions will guide you step-by-step on how to fill out and submit the application form. Kindly send all file attachments in Word or Acrobat format.

Further information

Please see <https://www-amdis.iaea.org/Workshops/ICTP2016Hefei/> for the latest information about lecturers and schedule.

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DEADLINE

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