

Joint ICTP-IAEA Workshop on Fusion Plasma Modelling Using Atomic and Molecular Data

23 - 27 January 2012

(Miramare, Trieste, Italy)

The Abdus Salam International Centre for Theoretical Physics (ICTP, Trieste, Italy), in cooperation with the International Atomic Energy Agency (IAEA, Vienna, Austria) will organize a *Workshop on Fusion Plasma Modelling Using Atomic and Molecular Data* to be held at the ICTP, Trieste, Italy from 23 to 27 January 2012.

Fusion energy research relies heavily on plasma modelling to predict the behaviour of the plasma and to interpret spectroscopic and other diagnostics of the plasma during operation. Plasma-wall interaction and the associated sputtering and desorption of wall material into the plasma are extremely important in determining the plasma composition, the erosion of surface material and changes in surface composition and material properties, and ultimately the feasibility of fusion power production. Modelling of plasma-wall interaction requires a combination of plasma and neutral gas transport codes and atomic, molecular, and plasma-material interaction data. Modelling of impurity behaviour in the core plasma and understanding core plasma diagnostics requires use of atomic cross section data and spectroscopic data. It is important for fusion scientists to learn about sources of these data, how they are created and how they are used.

PURPOSE: The purpose of the Workshop is to train potential new researchers in fusion energy in the basics of plasma modelling with use of atomic, molecular and plasma-material interaction data. Lecturers will describe experimental and (mainly) computational methods by which such data are obtained, for example "collisional-radiative" modelling to obtain atomic data and molecular dynamics and Monte Carlo simulations to obtain data on plasma-material interaction, and they will describe how these data are used in modelling and diagnostics of fusion plasma experiments.

TOPICS:

**Plasma-material interaction data for pure and mixed materials;
Electron impact and radiative processes for atoms and ions;
Formation and dissociation of molecules;
Charge transfer processes.**

Prominent researchers in each area will guide the Workshop participants through these categories of data and their use in fusion plasma modelling. Specific widely used data collections will be described and exercises will be undertaken to apply these data to plasmas with parameters typical of current fusion devices.

PARTICIPATION: The Workshop represents a possibility for scientists and researchers of UN, UNESCO and IAEA Member States to enhance their knowledge and skills on fusion plasma modelling using atomic and molecular data. Although the main purpose of the Centre is to help researchers from developing countries through a programme of training activities within a framework of international co-operation, scientists from developed countries are also welcome to apply. As the activity will be conducted in English, participants should have an adequate working knowledge of this language.

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.

HOW TO APPLY FOR PARTICIPATION:

The application form can be accessed at the activity website
<http://agenda.ictp.it/smr.php?2327>

Once in the website, comprehensive instructions will guide you step-by-step, on how to fill out and submit the application form.

WORKSHOP SECRETARIAT:

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Trieste, August 2011

In cooperation with the:

*International Atomic
Energy Agency
(Vienna, Austria)*

DIRECTOR:

B. J. BRAAMS
(IAEA, Vienna, Austria)

LOCAL ORGANIZER:

J. NIEMELA
(ICTP, Trieste, Italy)

*Deadline for
requesting participation*

1 NOVEMBER 2011

*(Late applications may be
considered as space permits
directly to smr2327@ictp.it)*