The Abdus Salam
International Centre for Theoretical Physics

United Nations Educational, Scientific and Cultural Organization

IAEA International Atomic Energy Agency

Joint ICTP-IAEA Workshop on Atomic and Molecular Data for Fusion

20 - 30 April 2009

(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 Atomic and Molecular Data for Fusion*** to be held at the ICTP, Trieste from ***20 to 30 April 2009.***

The success of nuclear fusion relies heavily on atomic and molecular data to predict the behaviour of the plasma as well as the interaction of the plasma with the wall materials. Such data are also essential for spectroscopic diagnosis of the plasma during operation of fusion devices. Furthermore, plasma-wall interaction data are extremely important in determining the overall amount of tritium load in machines such as ITER. As the overall power generated in these machines increases, the extraction of that power without causing disruption of the mechanical integrity of the machines relies predominately on atomic and molecular physics. The diverter region of fusion reactors is of critical importance in the extraction of energy from the plasma as well as in the recycling of the tritium fuel. The plasma in this region cools to temperatures at which the formation of stable molecules has a significant effect on the plasma as well as on the uptake of tritium fuel. Plasma interaction with wall materials leads to mixing of surface materials which alters the interaction of the plasma with the wall. A wealth of new data is available on these topics and fusion scientists need to learn to use these data in the design, modelling and diagnostics of fusion plasma reactors.

PURPOSE: The purpose of the Workshop is to train potential new researchers in fusion energy in the basics of atomic, molecular and plasma-material interaction data. The Workshop participants will be guided through the use of such data in fusion-relevant plasma situations and will be introduced to a variety of sources of data. Workshop exercises will make use of specific modelling codes using data from sources available through Internet links.

TOPICS:

- **Plasma-material interaction data for pure materials**
- **Co-deposition of materials and the Interaction of the mixed materials with the plasma**
- **Electron collision processes in atoms and molecules and their ions**
- **Molecular formation and dissociation**
- **Charge transfer processes**

Workshop participants will be guided through these categories of data by prominent researchers in each area. Specific exercises will be undertaken to apply these data to plasmas with parameters typical of current fusion devices in order to estimate device behaviour under expected operational conditions

PARTICIPATION: The Workshop represents a possibility for scientists and researchers of UN, UNESCO and IAEA Member States, to refresh and up-date their knowledge and skills on atomic and molecular data for fusion. 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?2028

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

ACTIVITY SECRETARIAT:

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E-mail: smr2028@ictp.it ICTP Home Page: http://www.ictp.it/

Trieste, September 2008

In cooperation with the:

International Atomic Energy Agency
(Vienna, Austria)

DIRECTOR:

R.E.H. CLARK
(IAEA, Vienna, Austria)

LOCAL ORGANIZERS:

J. NIEMELA
and
C. TUNIZ
(ICTP, Trieste, Italy)

Deadline for requesting participation

1 DECEMBER 2008