



The Abdus Salam  
International Centre for Theoretical Physics



## Neutron probing for compositional and structural characterization of materials and biological samples

11 – 15 May 2009

(TU Delft - Reactor Institute Delft, The Netherlands)

The Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy, in co-operation with the Reactor Institute Delft (RID), Delft, The Netherlands and the International Atomic Energy Agency (the IAEA), Vienna, Austria is organizing an advanced workshop on Neutron probing for compositional and structural characterization of materials and biological samples, to be held at RID, Delft, from 11 to 15 May 2009.

The neutron-based nuclear techniques, especially those using research reactors, can be effectively used in material research and biological applications. Neutrons are ideally suited to investigate the microscopic or atomic origin of various specimens, ranging from metals to bio-molecules, from engines to fuel cells and nuclear energy applications. Different material properties under different conditions can effectively be studied, for example, study of complex crystal structures, hybrid materials, phase separation and transitions as well as quantification of strain, crystallite size, and structural defects. Further extension of facilities for radiography/tomography devices can significantly enhance the experimental possibilities in basic and applied research sector, as well as industrial applications. Practical applications include elemental analysis of large volume samples, filling level measurements, corrosion testing for nuclear industry, aerospace systems and defect analysis in composite materials, as well as molecular processes in biology and chemistry. The Workshop will review the physical and technical aspects involved together with established uses allowing participants to gain exposure to various methods like neutron activation analysis, neutron diffraction, small angle neutron scattering, neutron radiography, neutron inelastic scattering, single crystal and powder diffraction. The overall aim is to train and enhance the knowledge-base of scientists in this field.

### PROGRAMME:

The Workshop will consist of presentations, tutorials and practical sessions. Select participants will also be invited to make short (10-15 minute) presentations of their own research activity. The participants will study the neutron probe principles and related aspects of their applications in the compositional and structural characterization of materials and biological samples. This event aims to assist competent practitioners to better understand and appreciate the full potential of the neutron based probing techniques to improve their ability to be involved in similar types of research or industrial applications. Attendance in this course enables participants to become acquainted with their international peers and establish links and networks for mutual support. This Workshop will thus facilitate the transfer of knowledge to scientists from developing countries and can later be utilized to further develop material research in these countries.

### PARTICIPATION:

Scientists, engineers and early-stage researchers from all countries that are members of the United Nations, UNESCO or IAEA may attend the activity. Candidates should hold a university degree or post graduate degree/diploma in nuclear physics, chemistry, biology or related subjects. The target group of applicants with demonstrated interest in using neutron-based techniques and those seeking continuous professional development in the field, will be considered for participation. As the School will be conducted in English, participants must have an adequate working knowledge of this language. As a rule, travel and subsistence expenses of the participants are borne by their home institutions. Only 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, moreover applications will be evaluated by the scientific committee. Every effort should be made by candidates to secure support for their fare (or at least half-fare). Such Support is available only to those attending the entire activity. There is no registration fee to be paid.

The **Application Form** is obtainable from the ICTP WWW server: <http://agenda.ictp.it/smr.php?2094> (which will be constantly up-dated) or from the General Secretariat (Ms. Rozanna Bojdo, [r.bojdo@iaea.org](mailto:r.bojdo@iaea.org), Tel.: +43 1 2600-21754, Fax: +43 1 26007-21705). This form should be completed, signed and returned before **31 January 2009** to:

#### Neutron probing for compositional and structural characterization of materials and biological samples (smr2094)

A.Zeman, NAPC / Physics Section, International Atomic Energy Agency  
Wagramer strasse 5, P.O. Box 100, 1400 Vienna, Austria

or

**E-mail:** to [smr2094@ictp.it](mailto:smr2094@ictp.it) (please send file attachments in one of the following formats: pdf (preferably), rtf zipped, or doc.)

(Recent photograph & signature of the candidate are compulsory)

Tel.: +43 1 2600-21754, Fax: +43 1 26007-21705

E-mail: [smr2094@ictp.it](mailto:smr2094@ictp.it) ICTP Home Page: <http://www.ictp.it/>

in co-operation with

Reactor Institute Delft

and

International Atomic Energy Agency

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### NEUTRON PROBING METHODS:

Advanced nuclear neutron-based probing techniques

New material structures investigated by neutron techniques: thin layer, nano-composites and hydrogen storage

Utilisation of reactor-based neutron probes in biology and chemistry

Highlights of neutron technologies in material and life science

Advanced applications of neutron beams

Host lab-experiments

**DEADLINE**  
**for requesting participation**

**31 January 2009**