



The Abdus Salam
International Centre for Theoretical Physics

Joint ICTP/IAEA School on

SYNCHROTRON RADIATION APPLICATIONS IN CULTURAL HERITAGE AND ENVIRONMENTAL SCIENCES - MULTIDISCIPLINARY ASPECTS OF IMAGING TECHNIQUES

21-25 November 2011

ICTP, Miramare - Trieste, Italy

The Abdus Salam International Centre for Theoretical Physics (ICTP) and the International Atomic Energy Agency (IAEA, Vienna) will jointly organize the above *School* to be held at the ICTP in Trieste from 21 to 25 November 2011.

Synchrotron and other accelerator-based sources offer additional insight into the records of our cultural past. Over the last years, there has been an increasing demand for access to synchrotron and accelerator-based techniques, and their applications in the fields of archaeological science and cultural heritage. The purpose of this course is to give the participants an introduction to the basic principles of synchrotron radiation, including imaging, microscopy, diffraction, absorption and fluorescence, infrared spectroscopy. The school will also provide cross-disciplinary examples (using neutron and ion-beam) illustrating the abilities of these techniques in a representative range of scientific cases in relation with cultural heritage.

Environmental sciences are dealing with complex heterogeneous dynamical systems, which extend over a few orders of magnitude both in space and time. Understanding environmental systems and environmental evolutions therefore require a multidisciplinary approach with inputs and concepts from various disciplines. The aim of this course is to provide environmental scientists with an overview of some relevant techniques available in synchrotron facilities, through a combination of technical presentations, scientific conferences and practical courses.

A huge development of synchrotron radiation based x-ray imaging techniques (absorption, phase contrast, diffraction, fluorescence, etc.) occurred over the last few years. It is based on the association of the beam features with the new detectors and computers. The techniques are characterized by words such as "three-dimensional", "high spatial resolution", "coherent beams", "in-situ", and "real-time". The purpose of this course is to give the participants an introduction to the basic principles of imaging techniques using synchrotron radiation, together with the elements to understand the contrast within the images.

Lectures will cover both theoretical and experimental aspects and will be complemented by tutorials and hands-on activities in the ICTP multidisciplinary laboratory and at ELETTRA.

The following specific topics will be included:

- Advances in synchrotron analyses for cultural heritage and environmental sciences
- Cross-disciplinary examples (using neutron and ion-beam)
- Environmental and climatic impact on cultural heritage;
- Analyses of ceramics, glass, marble, metals and organic materials, pigments
- Human evolution and paleoanthropology
- Archaeological and urban prospection;

Students and young scientists from all countries that are members of the UN, UNESCO or IAEA can attend the School. 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. A limited number of students and post-doctoral scientists from developed countries are also welcome to attend. In particular this School is intended for strongly motivated graduate students and young post-doctoral scientists. Logistics limit the number of participants to 30-40.

Limited funds are available for some applicants from developing countries, to be selected by the organizers. Such financial support is available only to those who attend the entire school. Every effort should be made by candidates to secure support for their fares (or at least half-fare) from their home country. There is no registration fee for attending the School.

The online application form for this School is available at:
http://cdsagenda5.ictp.trieste.it/full_display.php?smr=0&ida=a10176

School Secretariat (smr2272)
c/o Elizabeth Brancaccio
The Abdus Salam International Centre for Theoretical Physics
Strada Costiera 11
34151 Trieste, Italy

DIRECTORS:

F. Mulhauser
IAEA, Vienna

A. Paolini
UNESCO, Amman

G. Paolucci
Elettra, Trieste

C. Tuniz
ICTP, Trieste

DEADLINE

23 August 2011