Advanced Course on Accelerator Techniques for Materials Analysis

10-12 July, 2017

Organized by

National Centre for Physics, Islamabad

Course Theme

The course is addressed to students, researchers and engineers wishing to push the limits of their investigations a step further by applying a new exciting material analysis techniques in their respective area of R & D work. Potential participants will be the students, researchers and engineers from R & D institutes, universities, and industries dealing with materials science, thin films, multi-layer thin films, thin film devices, nanomaterials, environmental science, chemistry, archaeology, food industry, tobacco industry, mining industry, paint and coating industry, pharmaceutical industry, oil industry, herbal medicine industry, surgical tool industry etc.

In addition, the course will include "hands-on" sessions for the participants at the ion beam accelerator facility, where the participants will attend practical demonstrations of sample preparation, sample loading, vacuum generation/measurement and data acquisition of RBS, PIXE, ERDA, NRA, RBS/C, PIGE techniques.

Course Description

Expert will deliver the series of lectures in the field of materials analysis using PIXE, RBS, Ion channeling, PIGE, NRA, ERDA techniques for:

Thin film/coating analysis

- Non-destructive multi-element compositional analysis of thin films.
- Measures ppm levels of elements ranging from Be to U.-Measures impurity distribution in thin films, single crystals and semiconductor devices. Sensitivity: 10ppm
- Thickness measurement of thin films, multilayer samples, surface layers,
- Thickness measurement of Coatings, adhesive study of coating with substrates, diffusion of multilayer coating and the composition of the thin film/coating interfaces.
- Nondestructive depth profiling.

Hydrogen depth profiling of materials

- Detection of hydrogen in thin films/coating, steel or other materials which cannot be easily detected from other techniques.

Light elemental analysis

- Non-destructive, analysis of low Z elements (such as Li, B, F, Na, Mg, Al, Si, etc.) using PIGE technique
- NRA technique to measure low levels of B, C, N, and O elements.

Simultaneous analysis of 72 inorganic elements

- Non-destructive, simultaneous analysis for the 72 inorganic elements from Sodium through Uranium on the Periodic Table for solid, and thin film/coating (i.e. aerosol filter) samples etc with simple PIXE technique which is 100 times more sensitive than EDX and 10 times than XRF and Sensitivity is 0.1ppm.
- Non-destructive, simultaneous elemental analysis of raw materials to final product of food, agriculture, clinical, pharmaceutical, product safety, chemical/petrochemical, geochemical/mining industry etc.
- Testing for the presence of the toxic element in various products
- Testing for product impurities
- Geology and archaeology samples analysis such as rocks, coins and artifacts etc.

How to apply

Online Registration Form can be accessed at: http://www.ncp.edu.pk/. Application Form should be submitted on or before June 20, 2017. All applicants are required to provide information about their CNIC in the Application Form.

For further information, please contact:

Activity Secretariat

Collaborations & Academic Activities Directorate (CAAD)

caad@ncp.edu.pk

National Centre for Physics, QAU Campus, Shahdra Valley Road, Islamabad, Pakistan

Tel: 051-2077363, Fax: 051-2077342 & 2077395

Director

Ishaq Ahmad

Speakers

Ishaq Ahmad

G. Husnain

M. Usman

Waheed Akram

Turab Ali

Javaid Hussain

Course Coordinator

Dr. Waheed Akram

Email: waheed_akram@yahoo.com

Tel: 051-9006219

Organizing Committee

Inamur Rehman

Abdul Hamid

Javaid Hussain

Maryam Mazhar Butt

Ayesha Zahid

Registration

For Students: Rs. 1500

For Faculty/Strat. Org. Members: Rs. 2000

For General / Industrial Participants: Rs. 3000

Note: The registration fee includes course materials, accommodation at campus, tea, Lunch and certificate of participation.

APPLICATION DEADLINE

20 June 2017