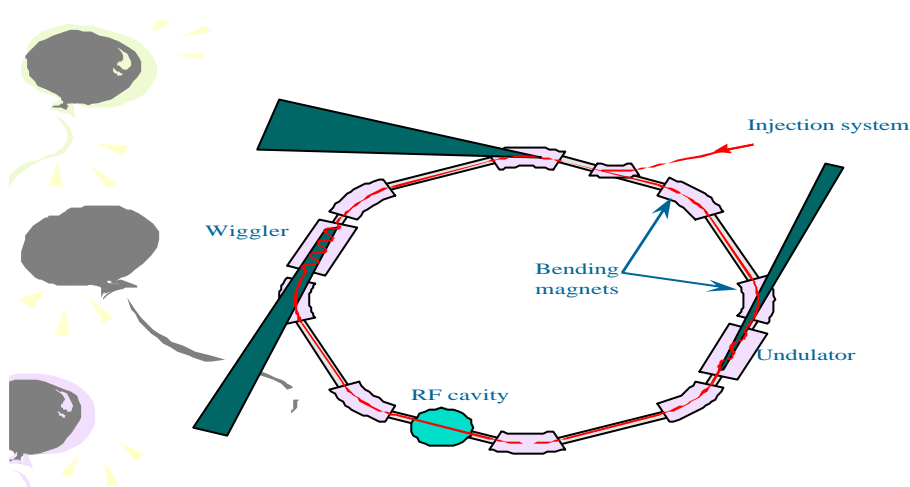


Workshop/ Conference

Application of Synchrotron Light in Life Sciences and
Nanotechnology



Organized by:

The Center for International Scientific Study and Collaboration (CISSC)
I. R. IRAN's SESAME Committee
And
Institute of Advanced Technology

February 22-24, 2010
Venue:
Institute of Advanced Technology
Iranian Research Organization for Science and Technology
Tehran, IRAN

Introduction

Synchrotron light is the electromagnetic radiation emitted when electrons, moving at velocities close to the speed of light, are forced to change direction under the action of a magnetic field. Synchrotrons make light, photons, over a wide energy range from infra-red, visible light to UV and to hard x-rays.

The generation of Synchrotron Radiation by relativistic charged particles following curved trajectories in magnetic fields is well documented and the study and construction of dedicated sources, generating this radiation for experimental use, have been pursued for over the last three decades. It's role in the investigation of the atomic, molecular and macroscopic structure of a wide range of materials was documented.

The unique properties of SR described above indicate that it has great potential for much application such as the analysis of materials and their structures and are relevant to many disciplines:

-**Surface Science:** Studying work functions, boundary features, thin films, etc;

-**Materials Science:** Both steady state and dynamic phenomena, in substances ranging through metals, ceramics, polymers, semiconductors, etc;

-**Chemistry:** particularly the study of catalytic and other complex processes not easily addressed by "wet" chemistry

-**Earth Sciences:** including the study of trace element concentration etc;

-**Life and Medical Sciences:** Particularly the quantitative identification of the atomic assembly of large bio-molecules (proteins, enzymes, virus, etc.) and the determination of the micro structure of biological tissues (muscle, ligament, and tendon) in dynamic situations.

The interface between physics and biology is one of the fastest growing and most successful areas of science. Although novel techniques are increasingly expanding the range of information that can be obtained on biological samples, many life scientists are still unaware of the potentialities offered by synchrotron radiation methods and their ability to provide data at the molecular, chemical, and cellular or tissue level.

The aim of the workshop is to bridge the gap between beam line and Life and Nano scientists, and to stimulate the interest of new potential users towards emerging Synchrotron Radiation methods, including:

- X-ray Diffraction and Small Angle Scattering
- X-ray Imaging and Microscopy
- Infrared Spectroscopy
- X-ray Absorption and Micro-Fluorescence

Speakers will provide a basic introduction on the physical principles and the kind of information that can be obtained by each method, keeping in mind the non expert audience. Case studies will also be discussed to illustrate the possibilities offered by these techniques in terms of SR applications in Nanotechnology, Industrial and Biological results, from molecular biology to medicine.

The number of participants is limited to 300. To participate, the enclosed application form should be sent to the secretary by December 31, 2009.

Application forms shall be sent through the website at www.iransesame.ir Accepted participants will be informed by e-mail by January 15 2010, and shall have paid their registration fee by January 31 2010 to the following account. The fee includes lecture attendance, a copy of lecture notes, transportation and meals.

Full name of bank: Bank Melli Iran

Branch of bank: Tehran University, Code 87

Name bearer of Account: Private Income of The Center for International Scientific Study and Collaboration (CISSC)

Account Number: 90278

For additional information, please contact the secretary at the:

Website: www.iransesame.ir

E-mail: info@iransesame.ir

OR

g_alahyarizadeh@iransesame.ir

Synchrotron Radiation (SR) Properties and Techniques
February 22, 2010

Registration	8-30 to 9.3 0
Opening Address	9.30 to 10.00
Production and Properties of Synchrotron Radiation I	10.00 to 10.45
Coffee Break	10.45 to 11.00
Production and Properties of Synchrotron Radiation II	11.00 to 11.45
Description of the Facilities Around the World & SESAME	11.45 to 12.30
Lunch	12.30 to 14.00
X-ray Scattering Techniques	14.00 to 14.45
X-ray Absorption Techniques	14.45 to 15.30
Coffee Break	15.30 to 16.00
Photo-Electron Spectroscopy	16.00 to 16.45
SR Imaging Techniques	16.45 to 17.30

SR Applications in Life Sciences and Medicine
February 23, 2010

SR Techniques in the Context of the Life Sciences	8.30-9.30
Macromolecular Structure and Function	9.30-10.15
Coffee Break	10.15-10.30
Structural Biology and Protein Crystallography	10.30-11.45
Chemical Imaging and Spectroscopy Application in Life Sciences	11.45-12.30
Lunch	12.30-14.00
X-ray Tomography of Biological Cells and Tissues	14.00-14.45
Medical Imaging and Therapy	14.45-15.30
Coffee Break	15.30-16.00
Metals and Neurodegenerative Disease	16.00-16.45
Photon Activation Therapy of Cancer	16.45-17.30

SR Applications in Nanotechnology and Industries

February 23, 2010

Synchrotron Based Characterization of Advanced Materials I	9.00-10.00
Synchrotron Based Characterization of Advanced Materials II	10.00 to 10.45
Break	10.45 to 11.00
X-ray Diffraction (Single Crystal, Powder, Anomalous Scattering)	11.00 to 11.45
Micro and Nano-Diffraction of Polymers & Biopolymer	11.45 to 12.30
Lunch	12.30 to 14.00
SR Characterization of the Formation of Nano materials	14.00 to 14.45
In-situ Characterization of Heterogeneous Catalysts	14.45 to 15.30
Break	15.30 to 16.00
Micro-Machining & Nano-Lithography	16.00 to 17.00

**SR Applications in Life Sciences,
Medicine and Nanotechnology
February 24, 2010**

SR Techniques in the Context of the Life Sciences: General Discussion	8.30-10.00
Coffee Break	10.00-10.30
SR Technique in the Context of Nano-technology: General Discussion	10.30-12.00
Poster Award and Closing Address	12.00-12.30
Lunch	12.30-14.00