The Abdus Salam International Centre for Theoretical Physics

Advanced School on Synchrotron and Free Electron Laser Sources and their Multidisciplinary Applications

Organizer(s): Directors: N. Binggeli (ICTP), M. Kiskinova (Sincrotrone Trieste) and A. Markowicz (IAEA)
Trieste - Italy, 07 - 25 April 2008

Venue: Adriatico Guest House Giambiagi Lecture Hall

Final programme

Monday, 7 April 2008 (Room:Adriatico Guest House Giambiagi Lecture Hall)

08:30 - 09:30	(Room: Adriatico Guest House (Lower Level 1)) --- REGISTRATION ---
09:30 - 10:30	--- Limit of 1 hour for administrative procedures (Finance office, VISA office, Bank, etc) ---
10:30 - 10:45	**Prof. K.R. Sreenivasan** / *Director, Abdus Salam ICTP* **OPENING by the Director, Abdus Salam ICTP**
10:45 - 11:30	**G. Margaritondo** / *EPFL (Switzerland)* **Fundamentals of Synchrotron Radiation**
11:30 - 11:45	--- Coffee break ---
11:45 - 12:30	**G. Margaritondo** / *EPFL (Switzerland)* **SR-Accelerators**
12:30 - 14:00	--- Lunch break ---
14:00 - 14:45	**E. Karantzoulis** / *Sincrotrone Trieste* **SR-Storage Ring**
14:45 - 15:00	--- Break ---

15:00 - 15:45	**E. Karantzoulis** / *Sincrotrone Trieste* **SR-Beam Optics**
15:45 - 16:00	--- Coffee break ---
16:00 - 17:00	**F. Mulhauser** / *IAEA (Austria)* **SESAME project**

Tuesday, 8 April 2008 (Room:Adriatico Guest House Giambiagi Lecture Hall)

09:00 - 10:15	**D. Attwood** / *Univ. of California, Berkeley & LBNL (USA)* **Spatial and Temporal Coherence, Coherent Undulator Radiation**
10:15 - 10:45	--- Coffee break ---
10:45 - 11:30	**E. Allaria** / *Sincrotrone Trieste* **FEL 1**
11:30 - 11:45	--- Break ---
11:45 - 12:30	**E. Allaria** / *Sincrotrone Trieste* **FEL 2**
12:30 - 14:00	--- Lunch break ---
14:00 - 14:45	**S. Milton** / *Sincrotrone Trieste* **FEL-machine physics**
14:45 - 15:45	**M. Danailov** / *Sincrotrone Trieste* **Utrashort VUV and soft x-ray pulses**
15:45 - 16:15	--- Coffee break ---
16:15 - 18:15	**S. Di Mitri** / *Sincrotrone Trieste* **PC-Session: exercises, software (with 15 min break)**

Wednesday, 9 April 2008 (Room:Adriatico Guest House Giambiagi Lecture Hall)

09:00 - 09:45	**D. Attwood** / *Univ. of California, Berkeley & LBNL (USA)* **X-ray Interaction with Matter: Absorption, Scattering, Refraction**
09:45 - 10:00	--- Break ---
10:00 - 10:45	**D. Attwood** / *Univ. of California, Berkeley & LBNL (USA)* **X-ray transport and tailoring optics: mirrors and gratings**
10:45 - 11:00	--- Coffee break ---
11:00 - 11:45	**A. Bianco** / *Sincrotrone Trieste* **Introduction to optical beamline design for soft x-rays**
11:45 - 12:30	**A. Bianco** / *Sincrotrone Trieste* **Introduction to optical beamline design for hard x-rays**

12:30 - 14:00 --- Lunch break ---

14:00 - 15:00 **D. Attwood** / *Univ. of California, Berkeley & LBNL (USA)*
Multilayers and microscopy optics

15:00 - 15:30 --- Coffee break ---

15:30 - 18:30 **A. Bianco and M. Zangrando** / *Sincrotrone Trieste*
Lecture & exercises: Optical Path Function, ray tracing

18:45 - 18:45 (Room: Adriatico Guest House Cafeteria)
SMALL RECEPTION --- Weather permitting on the Terrace - otherwise, indoor.

Thursday, 10 April 2008 (Room:Adriatico Guest House Giambiagi Lecture Hall)

09:00 - 09:45 **A. Craievich** / *Univ. de Sao Paulo (Brazil)*
Single crystal crystallography (Basic Aspects)

09:45 - 10:30 **P. Scardi** / *Univ. Trento*
Wide Angle scattering (Basic Aspects)

10:30 - 10:45 --- Coffee break ---

10:45 - 11:45 **P. Scardi** / *Univ. Trento*
Powder x-ray diffraction: applications, including under extreme conditions

11:45 - 12:30 **R. Menk** / *Sincrotrone Trieste*
X-ray Detectors

12:30 - 14:00 --- Lunch Break ---

14:00 - 14:45 **R. Menk** / *Sincrotrone Trieste*
X-ray Detectors

14:45 - 15:30 **M. Polentarutti** / *Sincrotrone Trieste*
Protein Crystallography, methodology and applications

15:30 - 16:00 --- Coffee Break ---

16:00 - 18:30 **J. Plaisier** / *Sincrotrone Trieste*
Tutorials: X-ray scattering set-ups, Powder scattering (Rietveld method)

Friday, 11 April 2008 (Room:Adriatico Guest House Giambiagi Lecture Hall)

09:00 - 09:45 **D. Lamba** / *CNR, Trieste*
Protein Crystallography (Basic Aspects)

09:45 - 10:30 **A. Craievich** / *Univ. de Sao Paulo (Brazil)*
Small angle x-ray scattering (Basic Aspects)

10:30 - 11:00 --- Coffee break ---

11:00 - 11:45	**A. Craievich** / *Univ. de Sao Paulo (Brazil)* **Small angle x-ray scattering (Applications)**
11:45 - 12:30	**S. Bernstorff** / *Sincrotrone Trieste* **Grazing Incidence Small Angle Scattering (GISAXS) in Material Sciences**
12:30 - 14:00	--- Lunch break ---
14:00 - 14:45	**H. Amenitsch** / *Austrian Academy of Sciences* **SAXS under extreme conditions: NanoMaterials and proteins in solutions**
14:45 - 15:30	**A. Craievich** / *Univ. de Sao Paulo (Brazil)* **Small angle x-ray scattering (Application to structure transformations)**
15:30 - 16:00	--- Coffee break ---
16:00 - 18:30	**H. Amenitsch, S. Bernstorff, and M. Rappolt** **Tutorials: Small angle scattering set-ups and data analysis**

Monday, 14 April 2008 (Room:Adriatico Guest House Giambiagi Lecture Hall)

08:30 - 09:30	**F. Bencivenga** / *Sincrotrone Trieste* **Inelastic x-ray scattering**
09:30 - 10:30	**N. Binggeli** / *ICTP* **Magnetic x-ray scattering**
10:30 - 11:00	--- Coffee break ---
11:00 - 12:00	**C. Masciovecchio** / *Sincrotrone Trieste* **Inelastic VUV scattering**
12:00 - 13:30	--- Lunch break ---
13:30 - 14:30	**F. Bencivenga** / *Sincrotrone Trieste* **RIXS and applications**
14:30 - 15:30	--- Break of 1h. for transportation to Elettra ---
15:30 - 18:00	**Visit at Elettra: SAXS, XRD, VUVS divided in 3 groups**

Tuesday, 15 April 2008 (Room:Adriatico Guest House Giambiagi Lecture Hall)

08:30 - 09:30	**F. de Groot** / *Utrecht Univ. (Netherlands)* **XAS and XMCD Spectroscopy (Basic Aspects)**
09:30 - 09:45	--- Break ---
09:45 - 10:45	**F. de Groot** / *Utrecht Univ. (Netherlands)* **XAFS Spectroscopy (Basic Aspects)**
10:45 - 11:00	--- Coffee break ---

11:00 - 12:00 **M. Benfatto** / *INFN, Frascati*
Multiple-scattering approach to XAS (Basic Aspects)

12:00 - 13:30 --- Lunch break ---

13:30 - 14:30 **M. Benfatto** / *INFN, Frascati*
Multiple-scattering approach to XAS

14:30 - 15:30 **M. Benfatto** / *INFN, Frascati*
Tutorials & exercises: XAFS

15:30 - 16:00 --- Coffee break ---

16:00 - 18:00 **F. de Groot** / *Utrecht Univ. (Netherlands)*
Lectures & exercises: XAS and XMCD-Experiments and Data Analysis

Wednesday, 16 April 2008 (Room:Adriatico Guest House Giambiagi Lecture Hall)

08:30 - 10:00 **Charles S. Fadley** / *Univ. of California, Davis & LBNL (USA)*
Surfaces, Interfaces and Photoemission Spectroscopy

10:00 - 10:30 --- Coffee break ---

10:30 - 12:00 **Charles S. Fadley** / *Univ. of California, Davis & LBNL (USA)*
Surfaces, Interfaces and Photoemission Spectroscopy

12:00 - 13:30 --- Lunch break ---

13:30 - 15:00 **Charles S. Fadley** / *Univ. of California, Davis & LBNL (USA)*
Surfaces, Interfaces and Photoemission Spectroscopy

15:00 - 15:30 --- Coffee break ---

15:30 - 16:30 **A. Goldoni** / *Sincrotrone Trieste*
Valence Bands, Dispersion and Fermi Surface Mapping

16:30 - 17:00 --- Break ---

17:00 - 18:00 **A. Goldoni & C. S. Fadley** / *Sincrotrone Trieste & LBNL, USA*
Tutorials and exercises

Thursday, 17 April 2008 (Room:Adriatico Guest House Giambiagi Lecture Hall)

08:30 - 09:15 **A. Goldoni** / *Sincrotrone Trieste*
ARPES, many body effects

09:15 - 10:00 **A. Goldoni** / *Sincrotrone Trieste*
Applications to Complex Materials

10:00 - 10:30 --- Coffee break ---

10:30 - 12:00 **Charles S. Fadley** / *Univ. of California, Davis & LBNL (USA)*
Core Level Spectra and Photoelectron Diffraction

12:00 - 13:30 --- Lunch break ---

13:30 - 15:00 **Charles S. Fadley** / *Univ. of California, Davis & LBNL (USA)*
Diffraction and Holography (X-ray Fluorescence Holography)

15:00 - 15:30 --- Coffee break ---

15:30 - 18:00 **Charles S. Fadley, A. Goldoni**
Tutorials and exercises

Friday, 18 April 2008 (Room:Adriatico Guest House Giambiagi Lecture Hall)

08:30 - 10:00 **Charles S. Fadley** / *Univ. of California, Davis & LBNL (USA)*
Core Level Shifts, splitting and dichroism

10:00 - 10:30 --- Coffee break ---

10:30 - 12:00 **Charles S. Fadley** / *Univ. of California, Davis & LBNL (USA)*
Application of Diffraction and Holography

12:00 - 13:30 --- Lunch break ---

13:30 - 14:30 **A. Goldoni** / *Sincrotrone Trieste*
Spin resolved and low energy ARPES

14:30 - 15:30 --- Break of 1h. for transportation to Elettra ---

15:30 - 18:30 **Visit of EXAFS, XAS, PE beamlines at Elettra**

Monday, 21 April 2008 (Room:Adriatico Guest House Giambiagi Lecture Hall)

08:30 - 09:15 **M. Kiskinova** / *Sincrotrone Trieste*
Introduction to x-ray microscopy and spectromicroscopy

09:15 - 10:00 **L. Gregoratti** / *Sincrotrone Trieste*
Scanning photoelectron microscopy: instrumentation and methodology

10:00 - 10:30 --- Coffee break ---

10:30 - 11:15 **L. Gregoratti** / *Sincrotrone Trieste*
Scanning photoemission microscopy:applications and examples

11:15 - 12:00 **E. Bauer** / *Arizona State Univ. (USA)*
Imaging using electron optics, basic concepts for LEEM, PEEM and XPEEM

12:00 - 13:30 --- Lunch break ---

13:30 - 14:15 **E. Bauer** / *Arizona State Univ. (USA)*
PEEM and XPEEM, need for abberation corrections

14:15 - 15:30 **A. Locatelli** / *Sincrotrone Trieste*
Beamline specifics and methodology of LEEM-XPEEM and applications

15:30 - 16:00 --- Coffee break ---

16:00 - 18:00 **A. Barinov** / *Sincrotrone Trieste*
Tutorials: More applications combining methods and exercises

Tuesday, 22 April 2008 (Room:Adriatico Guest House Giambiagi Lecture Hall)

08:30 - 09:15 **B. Kaulich** / *Sincrotrone Trieste*
Full-field imaging transmission x-ray microscopy

09:15 - 10:00 **B. Kaulich** / *Sincrotrone Trieste*
Contrast mechanisms and detectors used in transmission x-ray microscopes

10:00 - 10:30 --- Coffee break ---

10:30 - 11:15 **G. Tromba** / *Sincrotrone Trieste*
X-ray imaging: absorption, phase contrast, and tomography

11:15 - 12:00 **Koen Janssens** / *Univ. of Antwerp (Belgium)*
Application of x-ray imaging and spectroscopy in environmental science

12:00 - 13:30 --- Lunch break ---

13:30 - 14:15 **G. Tromba** / *Sincrotrone Trieste*
Application of x-ray imaging in medicine

14:15 - 15:00 **Koen Janssens** / *Univ. of Antwerp (Belgium)*
Cultural Heritage and x-ray microscopy

15:30 - 16:00 --- Coffee break ---

16:00 - 16:45 **A. Markowicz** / *IAEA, Vienna (Austria)*
Development and applications of X-ray microanalytical techniques based on X-ray tubes and SR sources

16:45 - 17:30 **B. Kaulich** / *Sincrotrone Trieste*
Other applications of x-ray microscopy, spectroscopy, and imaging

Wednesday, 23 April 2008 (Room:Adriatico Guest House Giambiagi Lecture Hall)

08:30 - 09:45 **J. Kirz** / *State Univ. of New York at Stony Brook (USA)*
Coherent diffraction imaging: basics

09:45 - 10:15 --- Coffee break ---

10:15 - 11:00 **J. Kirz** / *State Univ. of New York at Stony Brook (USA)*
Coherence diffraction imaging using synchrotrons

11:00 - 12:00 **H. Chapman** / *DESY (Germany)*
Coherence diffraction imaging with FEL

12:00 - 13:30 --- Lunch Break ---

13:30 - 15:00	**L. Mancini** / *Sincrotrone Trieste* **Tutorials & exercises: imaging- tomography**
15:00 - 15:30	--- Coffee break ---
15:30 - 17:00	**A. Gianoncelli** / *Sincrotrone Trieste* **Tutorials: x-ray microscopy data processing and exercises**

Thursday, 24 April 2008 (Room:Adriatico Guest House Giambiagi Lecture Hall)

08:30 - 10:00	**P. Dumas** / *Soleil (France)* **Infrared spectroscopy and microscopy using SR (Basics)**
10:00 - 10:30	--- Coffee break ---
10:30 - 11:15	**P. Dumas** / *Soleil (France)* **IR spectrometry and microscopy in biology and biochemistry**
11:15 - 12:00	**A. Perucchi** / *Sincrotrone Trieste* **IR spectrometry and microscopy in materials science**
12:00 - 13:30	--- Lunch break ---
13:30 - 14:30	**U. Schade** / *Bessy (Germany)* **Terahertz spectroscopy using SR**
14:30 - 15:30	--- Break of 1h. for transportation to Elettra ---
15:30 - 18:00	**Visit of Microscopes and imaging stations at Elettra**

Friday, 25 April 2008 (Room:Adriatico Guest House Giambiagi Lecture Hall)

08:30 - 10:00	**M. Altarelli** / *DESY (Germany)* **European X-FEL Project**
10:00 - 10:30	--- Coffee break ---
10:30 - 12:00	**F. Parmigiani** / *Univ. Trieste* **Two-colour and photon correlation spectroscopy**
12:00 - 13:30	--- Lunch break ---
13:30 - 14:45	**C. Masciovecchio** / *Sincrotrone Trieste* **Inelastic scattering and FEL**