



FACILITATING IMAGING & BIOPHOTONICS - Physicists and Biologists Working Together

10 – 12 October 2011

Bio21 Institute, 30 Flemington Road, The University of Melbourne, Melbourne, Australia

Workshop sponsored by Berthold Australia & API

Monday October 10		Electron, Synchrotron and XFEL imaging	Affiliation	Title
8:45	Arrive			
9:00	Introduction	Harry Quiney	University of Melbourne, Australia	Welcome and overview of CXS
<i>Electron Imaging with a Biological Focus</i>		Chair: Rob Scholten	University of Melbourne, Australia	
9:20		Tatiana Latychevskaia	University of Zurich, Switzerland	Coherent diffraction imaging of individual biological molecules using low-energy electrons
10:00		Geoffrey Kong	Walter+Eliza Hall Institute of Medical Research, Australia	Studying ligand binding to the Type 1 insulin-like growth factor receptor by cryo-transmission electron microscopy
10:20		Corey Putkunz	University of Melbourne, Australia	Towards ultrafast molecular electron diffraction imaging
10:40	Morning Tea			
<i>XFEL dreamtime</i>		Chair: Keith Nugent	University of Melbourne, Australia	
11:10		Abbas Ourmazd	University of Wisconsin-Milwaukee, USA	Structure and dynamics from random snapshots
11:50		Harry Quiney	University of Melbourne, Australia	Determination of biomolecular structures using femtosecond X-ray free-electron laser sources
12:10		Yukio Takahashi	Osaka University, Japan	High-resolution coherent diffraction imaging using focused hard x-ray beam at SPring-8
12:30	Lunch	Bio21 Tours	Lunch sponsored by The Australian Synchrotron	
<i>X-ray Techniques for Proteins</i>		Chair: Ruben Dilanian	University of Melbourne, Australia	
13:50		Bonnie Wallace	Birkbeck College, UK	The AcrB protein: comparisons of electron diffraction, imaging, and crystallographic studies of a multi-form membrane protein
14:30		Terry Mulhern	University of Melbourne, Australia	Synchrotron SAXS studies of biomolecules: pushing the envelope
14:50		Victor Streltsov	CSIRO, Australia	Imaging of amyloid- β oligomerization and metal binding in Alzheimer's disease
15:10	Afternoon Tea			
<i>XFEL reality</i>		Chair: Edgar Vredenburg	Eindhoven University of Technology, Netherlands	
15:40		John Spence	Arizona State University, USA	Time-resolved nanocrystallography with X-ray lasers
16:20		Garth Williams	Stanford University, USA	Provisioning for sub-nanometer-scale, ultra-fast biological studies
16:40		Brian Abbey	University of Melbourne, Australia	Opportunities and challenges for coherent diffractive imaging at the Free Electron Laser
17:00		Rick Millane	University of Canterbury, New Zealand	Phase retrieval in nanocrystallography
17:20	Drinks	Poster Session Trade Display	Sponsored by The Ian Potter Foundation	
19:30	Dinner		Sponsored by Dectris	

Tuesday October 11		X-ray and Super-Resolution Microscopy	Affiliation	Title
8:45	Arrive			
<i>X-ray Imaging</i>		Chair: Mark Le Gros / Mike Ryan	National Centre for X-ray tomography, USA / La Trobe University, Australia	
9:00		Carolyn Larabell	University of California, San Francisco, USA	Quantitative, 3D analysis of cells in the near-native state using soft x-ray tomography
9:40		Eric Hanssen	University of Melbourne, Australia	Soft x-ray microscopy analysis of cell volume and hemoglobin content in erythrocytes infected with asexual and sexual Plasmodium falciparum
10:00		Martin de Jonge	Australian Synchrotron, Australia	Exquisite sensitivity at high resolution: mapping trace metals in model systems with x-ray fluorescence microscopy
10:20		Benedicta Arhatari	La Trobe University, Australia	X-ray micro-tomography for biological structures
10:40	Morning Tea			
<i>Inside Cells</i>		Chair: Leann Tilley / Sarah Russell	University of Melbourne, Australia / Peter MacCallum Cancer Centre, Australia	
11:10		Peter Kner	University of Georgia, USA	Live structured illumination microscopy
11:50		Christian Soeller	University of Auckland, New Zealand	Fluorescence super-resolution microscopy of calcium signaling domains in cardiac muscle cells
12:10		Lloyd Hollenberg	University of Melbourne, Australia	Quantum measurement and orientation tracking of fluorescent nanodiamonds in living cells
12:30		Lynne Turnbull	University of Technology Sydney, Australia	Fast, live structured illumination microscopy
12:50	Lunch	Sponsored by ASBMB		
<i>Optical Imaging at Molecular Scale</i>		Chair: Trevor Smith / Xiaosong Gan	University of Melbourne, Australia / Swinburne University of Technology, Australia	
14:10		Markus Sauer	Julius-Maximilians-University Würzburg, Germany	Super-resolution imaging with dSTORM
14:50		Kat Gaus	University of New South Wales, Australia	Using super-resolution localisation microscopy to quantify protein clustering in cell membranes
15:10		Kirstin Elgass	La Trobe University, Australia	Super-resolution and energy transfer: conflict, competition or completion?
15:30		Jeff Davis	Swinburne University of Technology, Australia	Resolving energy transfer mechanisms in photosynthetic light-harvesting complexes using 3D spectroscopy
15:50	Afternoon Tea			
<i>Imaging Cells and Tissues</i>		Chair: Mark Prescott	Monash University, Australia	
16:20		Peter Carlton	Kyoto University, Japan	Three-dimensional structured illumination imaging of chromosome structure in pluripotent and meiotic cells
17:00		David Sampson	University of Western Australia, Australia	Human cancer imaging with optical coherence tomography microscope-in-a-needle technology
17:20	Final Comments	Leann Tilley & Trevor Smith	University of Melbourne, Australia	
17:30	Drinks	Poster Session Trade Display	Sponsored by Coherent Scientific & Scitech	

Wednesday October 12		Electron Diffraction and Imaging	Affiliation	Title
8:45	Arrive			
<i>X-rays, Electrons and Atoms</i>		Chair: David Paganin	Monash University, Australia	
9:00		Jom Luiten	Eindhoven University of Technology, The Netherlands	Coherent electron beams for ultrafast structural dynamics
9:40		Peter Colman	Walter+Eliza Hall Institute of Medical Research, Australia	Crystallographers bringing themselves undone
10:00		Simon Ringer	University of Sydney, Australia	Exploring the architecture of solid solutions with atom probe microscopy: a pathway towards remarkable new materials properties
10:20		Paul Curmi	University of New South Wales, Australia	The evolution of cryptophyte light harvesting proteins: the emergence of quantum coherence
10:40	Morning Tea			
<i>Ultrafast and Electron imaging</i>		Chair: Jo Etheridge	Monash University, Australia	
11:10		Les Allen	University of Melbourne, Australia	The quest for quantitative electron microscopy at atomic resolution
11:30		Dave Kielpinski	Griffith University, Australia	Precision attosecond physics: quantum-coherent electron imaging and a window on XFELs
11:50		Mauro Maiorca	La Trobe & Melbourne Universities, Australia	Improving electron tomography reconstruction using non-linear anisotropic diffusion filtering
12:10		Jabez McClelland	National Institute of Standards and Technology, USA	Imaging with ultracold ion beams and high angular momentum electron beams
12:50	Closing remarks	Keith Nugent	University of Melbourne, Australia	
13:00	Lunch Graduate students meet with Scientific Advisory Board		Sponsored by La Trobe Institute for Molecular Science	
14:15	Synchrotron visit		by Dr David Cookson and Kent Wootton	
Parallel lab tours				