

Saskatoon Synchrotron Summer School V - June 13th – 18th, 2010

Synchrotron Techniques for the Life Sciences

DRAFT SYLLABUS

In addition to an introduction to synchrotrons, this year we are pleased to offer concurrent streams. Participants choose a multifaceted approach to synchrotron research in life sciences or a dedicated macromolecular crystallography stream.

The crystallography stream will cover all aspects of the structure solution process in macromolecular crystallography, beginning with synchrotron data collection and processing, through phasing and refinement, and ending with structure validation. It is intended for those with biochemical and biological backgrounds.

The multi-technique stream will provide case study examples followed by experience in data collection and analysis for a number of synchrotron experiments. It is appropriate for any inexperienced synchrotron user interested in including synchrotron-based diffraction enhanced imaging, x-ray fluorescence mapping, and mid-infrared mapping techniques.

S ₄ V 2010 Draft Syllabus								
Sunday June 13th	Monday June 14th		Tuesday June 15th		Wednesday June 16th		Thursday June 17th	Friday June 18th
	Life Science School Case Studies	Crystallography School	Life Science School choose one of the concurrent practical session listed below	Crystallography School	Life Science School choose one of the concurrent practical session listed below	Crystallography School	AUM/S ₄ V Workshops - choose one of the following	Annual Users Meeting
	MidIR Case Study presented by Luca Quaroni	Crystallization & cryoprotection techniques	1. Medical Imaging - Diffraction Enhanced Imaging	Phase methods - MAD, SAD & MR using: SHELX, PHASER, & PHENIX . Presentations followed by hands on work with computer access	1. Medical Imaging - Diffraction Enhanced Imaging	Phase extension, model building, refinement, validation and electron density map interpretation: SHELX; PHENIX; COOT; REFMAC, RAPPER & validation tools. Presentations followed by hands on work with computer access	Diffraction Measurements on Micro and Nano scales using Synchrotrons	Facility Overview
	CLS followup	Introduction to protein crystallography (diffraction & data collection)					New Applications for Macro and Micro Tomographic Measurements using Synchrotrons	
	Microprobe Case Study presented by Ingrid Pickering	MAD data collection strategies for crystals with weak anomalous signal and weak diffraction	2. Microprobe - X-ray Florescence Mapping		2. Microprobe - X-ray Florescence Mapping		Split session: a. New Developments in Imaging Software for Synchrotrons; b. Keynote research results from three CLS scientists	Keynote Scientific Speaker
Registration & safety training	CLS follow up						Crystallography workshop	
Welcome	BMIT Case study presented by Dean Chapman	Data Processing: XDS, MOSFLM, HKL2000 - hands on at the beamline	3. Mid Infrared Mapping		3. Mid Infrared Mapping		Practicalities in biological sample prep - 1/2 day	New Results from the CLS
Synchrotron 101	CLS follow up					THRUST 1/2 DAY	Young Researchers	
Beamline Basics	Secrets of accessing Beamtime - Robert Blyth					BMIT opportunities	poster session	
Tour & social	Riverboat Cruise		Free evening		Formal Dinner		Free Evening	Banquet