

Wednesday August 6th			
Time	Topic	Description	Speaker/Facilitator
8:00 - 8:30	Arrival & sign in at CLS reception	Meet at reception, photos for badges & escort to 2068	Tracy Walker, Educational Outreach Coordinator, CLS; Amy Friesen, Outreach Assistant
8:30 - 9:15	Welcome	CLS' enthusiasm and mandate for Education - registration check in - self introductions - the workshop overview	Dr. Murray McLaughlin, Director of Business Development, CLS
9:15 - 10:15	SR 101	Brief orientation to light production and research possibilities	Tracy Walker, Educational Outreach Coordinator, CLS
10:15 - 10:30	BREAK		
10:30 - 11:15	Tour the Accelerator & LINAC	What an opportunity to see this magnificent facility up close and personal!!	Tasha Summers, Accelerator Physicist, CLS
11:15 - 12:00	Tour the Experimental Hall	Round the experimental hall to view the where the action is!!	Jennifer Heggie, Industry Science Associate, CLS
12:00 - 1:00	LUNCH		
1:00 - 2:00	Light & Matter	The basis of Synchrotron research techniques - what does it all entail?	Dr. Jeff Warner, Industry Scientist, CLS
2:00 - 3:00	Determining structure of matter	Discover how SR techniques contribute to the development of cutting edge materials!	Dr. Alexander Moewes, Canada Research Chair in Materials Science, Professor, Physics and Engineering Physics
3:00 - 3:15	BREAK		
3:15 - 3:30	Educational Overview/Introduction		Tracy Walker, Educational Outreach Coordinator, CLS
3:30 - 4:15	Students on the Beamlines	How did it work from the perspective of the teachers and students that have participated?	Jacqueline Gregoire and students from Centennial Collegiate Science Academy
Free time			
6:00 - 8:00	Dinner Cruise	All Aboard the Saskatoon Princess for a tour of the river, dinner and a view of the city lights	www.shearwatertours.com
Thursday August 7th			
8:30 - 9:30	Green Light for Imaging and Therapy	Learn about some of the possibilities being explored in cancer research!	Dr. Elisabeth Schultke, MD, Assistant Clinical Professor in Surgery, Research Associate with Anatomy and Cell Biology
9:30 - 10:30	Environmental Applications	What is Environmental chemistry and how can the synchrotron impact the research?	Dr. Jeff Warner, Industry Scientist, CLS
10:30 - 10:45	BREAK		
10:45 - 11:45	SyLMAND - Synchrotron Laboratory for Micro and Nano Devices	X-ray lithography and supporting processes	Venkat Subramanian, Staff Scientist, CLS SyLMAND
11:45 - 12:30	LUNCH		
12:30 - 1:30	Stations	Demonstration of classroom activities included in SSCR provided.	Tracy Walker, Educational Outreach Coordinator, CLS
1:30 - 2:30	Biomedical Imaging and Therapy Beamline	Synchrotron facilities have widely varying imaging and some therapy capabilities for biological tissues, animal and some human research.	Dr. L. Dean Chapman, Canada Research Chair in X-Ray Imaging, Professor, Anatomy and Cell Biology
2:30 - 2:45	BREAK		
2:45 - 3:45	Breakout Sessions: choose one of the following	<i>Beamline Optics</i> (Dr. Lucia Zuin, Staff Scientist, VLS-PGM Beamline)	<i>Control Room Basics</i> (Tasha Summers, Accelerator Physicist)
Evening	Enjoy the city at your own pace	We will make reservations to eat together for those who wish to and then enjoy the city!	www.tourismsaskatoon.com
Friday August 8th - Breakout Sessions - choose one of ...			
8:15 - 8:30	Arrival & meet in 2068	Meet your presenters and organize for breakout sessions	Tracy Walker & Amy Friesen- Outreach
8:30 - 10:00	Gaseous Molecules (FarIR)	From crystals to drug design I (CMCF -- note double session)	Surface Studies (SGM)
10:00 - 10:15	BREAK		
10:15 - 11:45	Surface Studies (SGM)	From crystals to drug design II (CMCF -- note double session)	Understanding plant cell walls (SM)
11:45 - 12:45	LUNCH		
12:45 - 2:15	Radiation Safety	Understanding plant cell walls (SM)	Gaseous Molecules (FarIR)
2:15 - 2:30	BREAK		
2:30 - 3:30	Fitting it into the classroom - debrief and good-byes		
Safe Travels!!			
Breakout Session Details:			
<p>Gaseous molecules under infrared light: Dr. Brant Billinghamurst (Staff Scientist for Far IR Beamline) offers the opportunity for teachers to collect and analyse the spectra of a simple molecule in gas form. Review the basics of Fourier transformation. Connect concepts in chemistry and physics through vibration-rotation spectroscopy. This is a new project with potential for Students on the Beamlines</p>			
<p>Surface studies of your sample: Dr. Robert Blyth (Staff Scientist for SGM Beamline) You provide the sample then collect chemical information with soft x-ray photo-emission spectroscopy. Teachers will learn to analyse the data to identify elements present on the surface. The sample must be conductive sample and roughly the size of a dime. Please note what your sample is, where you collected it, and any treatment you made to it (cleaning?).</p>			

From crystals to drug design: Dr. Igor D'Angelo (Sr. Science Associate for CMCF beamline) will show teachers how to prepare protein crystals for X-ray data collection. You will collect data, analyze diffraction patterns and learn how to use that information to determine the atomic structure of a protein. You will build part of a protein molecule at the graphics workstation and will learn how scientists use the high resolution biostructural information gathered at CMCF for research and drug design. Teachers will have the chance to fit a specific natural or inhibitory substrate into the active site of their protein model. ***Please note that this is a double session****

Understanding plant cell walls: Dr. Chithra Karunakaran (Staff Scientist for Spectromicroscopy Beamline) combines data recorded using optical microscope, scanning transmission X-ray microscope on SM, and FT-IR microscope in MidIR beamline to better understand the composition of the cells in the stem of lignin plants. She will walk teachers through sample preparation, data acquisition on SM, and analysis of information provided by the several techniques, contributing to development of efficient biofuel production.

Beamline optics under vacuum from hutch to sample station: Dr. Lucia Zuin (Staff Scientist for VLS-PGM Beamline) will introduce teachers to beamline components to manipulate and focus desired wavelenghts of x-rays onto a sample. With particular challenges presented by the vacuum system associated with working in soft x-rays, teachers will have the opportunity to become familiar with the sample handling system.

Control Room Basics: Tasha Summers, Accelerator Physicist, will introduce teachers to the brain of the machine. You will see what is involved in monitoring the accelerator and facility, how the magnets affect the properties of the electron beam and the process of injecting electrons into the storage ring.

Radiation Safety: is a common thread in everything at a synchrotron facility. Radiological Control Coordinator Grant Cubbon will take you throughout the facility to introduce you to the various detection systems and monitoring conducted to ensure our safety. Teachers will have the opportunity to participate in a radiation survey and system lock downs as preparation to a user run.