SEMINAR NOTICE

Department of Physics and Engineering Physics
University of Saskatchewan

SPEAKER: Dr. Dean Chapman,
Dept of Anatomy and Cell Biology

TOPIC*:* *X-Ray Diffraction Optics for Synchrotron Imaging and Other Applications*

DATE: Tuesday September 9th, 2025

TIME: 3:30-4:30 p.m.

The BioMedical Imaging and Therapy (BMIT) facility is comprised of two beamlines at the Canadian Light Source – one sourced by a superconducting wiggler (BMIT-ID) and a second with a bend magnet source (BMIT-BM). The bend magnet beamline, BMIT-BM, allows both filtered white beam access as well as monochromatic beam prepared by a double crystal monochromator. Access to the filtered white beam provides an opportunity to develop various x-ray optics using x-ray diffraction akin to an "x-ray wind tunnel". The diffracting elements are typically bent silicon wafers in the Laue or transmission geometry. Some of those optical developments will be presented along with principles of operation and applications including contrast element imaging, element speciation imaging, wide energy range imaging, vertical beam expansion and horizontal beam compression. The "beam expander", a two bent crystal device similar to a Galilean optical expander, can provide expansions up to a factor of 10 while mostly preserving the spatial coherence that enables in-line phase contrast imaging. Additionally, the contrast element imaging led to the discovery that the synchrotron vertical electron source properties (position, angle, size and divergence) could be determined at a single location in a beamline.