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SÉRIE DE SÉMINAIRES

SEMINAR SERIES



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Title | The interplay of X-ray spectroscopy and microscopy at the synchrotron light source with materials design, functionality, device performance, and dynamics

Abstract | My The advent of advanced synchrotron light source has provided exciting and unprecedented opportunities for materials research and innovation. The ultra bright, energy-tunable, and pulsed synchrotron light from a third-generation light source, such as the Canadian Light Source, is readily available for a wide spectrum of research. In this talk, I will discuss the synchrotron capabilities for resolving scientific issues. Illustrations will be provided from recent results using high energy resolution fluorescence detection (HERFD) X-ray absorption (XAS) and X-ray emission (XES), synchrotron X-ray diffraction (XRD), X-ray excited optical luminescence (XEOL) in the energy and time domain, and X-ray microprobes and phytography. Science includes phase transition under quantum confinement, bimetallic catalysis, in situ/operando Li ion battery, and cultural heritage, among others. The prospects of synchrotron techniques for everyone and emerging fourth generation light source for the Canadian research community will also be discussed.

Keywords: X-ray absorption and emission spectroscopy, X-ray diffraction, X-ray microscopy, nanomaterials phase transition, bimetallic catalysts, battery, cultural heritage materials.

Bio | Dr. [Tsun-Kong Sham](#) is a Distinguished University Professor at the University of Western Ontario. He obtained his BSc from the Chinese University of Hong Kong and PhD from the University of Western Ontario. After a decade on the staff at Brookhaven National Laboratory, he returned to Western in 1988. He was the Director of the Canadian Synchrotron Radiation Facility at the Synchrotron Radiation Center, University of Wisconsin-Madison (1999-2008) and a founding member of the Canadian Light Source where he serves as a beam team leader. He held a Tier I Canada Research Chair (2002-2023). He was appointed Officer of Order of Canada (2016) for his contributions to science and service to the scientific community.



Dr. Sham is a pioneer and a world leader in synchrotron X-ray spectroscopies. Research interests include nanostructure phase transition, bimetallic systems toward high entropy alloys, in situ/operando XAS and XES studies of batteries and catalysis, drug delivery, and X-ray microscopy studies of cultural heritage materials. Dr Sham's recognitions include the 2023 CIC Montreal Medal, the 2017 Allen Pratt award of the Canadian Light Source, Fellow of the Royal Society of Canada (2012) and the CSC John C. Polanyi Prize (2010). He had served as a member of the Board for the CLS (2001-2006) and Chair of the International X-ray Absorption Society (2003-2006). He was the inaugurated director of the Soochow-Western Centre for Synchrotron Radiation (2012-2023). He has been the Chair of the Ontario Synchrotron Consortium since 2005 and is a member of the Board of the Canadian Institute for Synchrotron Radiation (CISR) and Co-Chair of the long-range plan organizing committee, working with CLS and the community toward the next generation synchrotron for Canada.

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