



## Sebastien Boutet

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### Bio

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#### BIO

I am currently a Senior Staff Scientist at the Linac Coherent Light Source (LCLS), part of SLAC National Accelerator Laboratory. I also serve the role of LCLS Director of Experimental Operations since 2020.

I joined SLAC in 2007 working on the Coherent X-ray Imaging (CXI) instrument as part of the LCLS Ultrafast Science Instrument (LUSI) project. This project delivered one of the first operating LCLS instruments in 2011, available to the user community for cutting edge ultrafast x-ray science. After a few years of working with LCLS staff and a broad user community on many experiments, I also worked on the design and deployment of a new LCLS x-ray instrument, the Macromolecular Femtosecond Crystallography (MFX) instrument. From there, I became the Department Head for the LCLS Hard X-ray Department, charged with the operations of the XPP, XCS, MFX and CXI instruments. I worked in this role until 2020 when I become LCLS Director of Experimental Operations.

During my undergraduate studies in Physics at McGill University, I spent a summer at TRIUMF at the University of British Columbia working on heavy ion cooling trap simulations. After graduating with Honours in 1999, I joined Ian Robinson x-ray diffraction group at the University of Illinois at Urbana-Champaign, where I learned how to perform synchrotron experiments at multiple light source including NSLS, ESRF and the APS. My primary focus during PhD work was on applying known and novel techniques of surface diffraction and coherent diffractive imaging to the study of protein crystals. After some work on large protein crystals surface diffraction at NSLS, most of my efforts shifted to a new beamline at the APS. I participated in the installation and commissioning of this beamline, sector 34ID-C, although I was far from the primary contributor. This nevertheless introduced me to the intricacies of building x-ray beamlines. I then used this beamline for a few years to study the shapes and internal defects of crystals of proteins using newly developed coherent diffractive imaging techniques applied to small crystals. While some successes were achieved, it became clear that limitations exist at synchrotrons due to sample motion and radiation damage. Luckily, as I completed my PhD work in 2005, new light sources were in construction that would remove these limitations. FLASH in Hamburg and LCLS were soon to come online. I spent a few years at the APS trying to observe shape transforms from protein crystals, with great difficulty, something that LCLS now routinely accomplishes without much effort due to the instantaneous nature of the LCLS measurements.

After completion of my PhD work, I joined SLAC as a Research Associate, with a joint appointment with Uppsala University and Janos Hajdu but spending all my time at Lawrence Livermore National Laboratory working with the group of Henry Chapman. We spent a couple of years using FLASH to demonstrate the feasibility of using ultrashort FEL pulses for "diffraction-before-destruction" imaging and developing new tools and techniques for FEL research.