

CSX Workshop summary:

The workshop started with a welcoming message from the workshop organizer and a brief introduction about the workshop agenda and expected deliverables. The workshop agenda was divided into a morning session moderated by S. Kevan and an afternoon session moderated by S. Hulbert.

Four talks were presented during the morning session. In the first presentation, J. Hill summarized the NSLS-II access policy and discussed the Beamline Advisory Team (BAT) formation process, both for the project beamlines and for the future Major Instrument Equipment funded (MIE) beamlines. R. Reininger presented a detailed description of the current optical design of the Coherent Soft X-ray (CSX) project beamline and the different possibilities that the beamline offers for experiments requiring high flux or high energy resolution. C. Jacobsen and D. Keavney gave overview scientific talks that described the kinds of soft x-ray experiments being performed today and how they might evolve for NSLS-II. In his talk, C. Jacobsen presented a wide variety of soft x-ray experiments that will be possible to carry out because of the brightness of EPU45 source. D. Keavney presented experimental results from the soft x-ray beamline at sector 4 of the Advance Photon Source (APS), and the plans of the scientific group there to build a new beamline with fast-switching polarization capability to increase the sensitivity to detect small magnetic moments.

The late-morning discussion session began with several questions about the BAT formation process and the beamtime access policy at NSLS-II. Several of the attendees expressed their desire to be members of the CSX BAT. S. Kevan led this discussion, and collected sets of beamline requirements that match different kinds of undulator-based soft x-ray experiments. This exercise generated the table shown below, which is organized mostly by technique. This table covers a wide range of techniques, including imaging, spectroscopy, and scattering.

In the afternoon session, the floor was opened to attendees to provide short contributing talks regarding the type of soft x-ray science, experiments, and techniques that they would like to pursue at NSLS-II. S. Wilkins proposed a Diffraction/Coherent Scattering endstation to be developed now at NSLS and later move to a soft x-ray insertion device beamline at NSLS-II. Y. Idzerda proposed the need to group techniques and endstations with a common theme, such as magnetism. In his talk, D. Arena provided a valuable introduction to ultra-fast experiments and their importance for better understanding magnetic phenomena. L. Piper showed the huge potential of soft x-ray resonant inelastic scattering, as an excellent complement to other spectroscopy techniques and as well as to hard x-ray IXS. S. Hulbert presented a project of D. Fischer et al. to build an XPS-based microscope for NSLS-II. S. Hulbert, as leader of the NSLS beamline transition working group, presented the current status of their efforts in determining the best, most efficient task of transferring beamlines from NSLS to NSLS-II. He then led a smaller group of workshop participants in sketching possible CSX beamline configurations, attempting to provide well-matched soft x-ray beams to the experiments. The afternoon session ended with an eloquent description by K. Kaznatcheev of the STXM beamline at the Canadian Light Source.

Workshop deliverables:

- a) Attached a table summarizing the undulator base beam requirements for soft x-rays experiments at NSLS-II
- b) Attached a proposed beamline scheme with optics and the configuration of the endstations for the CSX beamline:

Please do not hesitate to contact (hanke@bnl.gov) if you want to provide with new contributions to the CSX proposed beamline or if you have interest to *actively* participate in the CSX BAT. I also want encourage you to contact (hulbert@bnl.gov and/or hanke@bnl.gov) if you have interest in leading/forming/participating and get involved in one of the MIE soft x-ray beamlines.

Final remarks:

The organizer wants to thank all the participants for they active involvement and useful contributions during the workshop to provide the pursued deliverables. Is my understanding that we have collected important information for the soft x-ray community that will be delivered to NSLS and NSLS-II management. Please do not hesitate to provide with any other information you estimate important for the community and for a successful development of the soft x-rays at NSLS-II.

Beamline type	Source	Fast-switching pol.?	hν min (circ)	hν max (circ)	Res. Power	Spot size	Sample env.	Number of endstations
XMCD/XAS/scattering (BAT)	EPU45	Yes			2.5×10^4	$\sim 1 \mu\text{m}$	UHV/cells	2 to 3
STXM/CXDI (BAT)	EPU45	?			$10^3 - 10^4$		Atm/cryo	1 and 1
RIXS	EPU45	No			$> 10^5$	$< 1 \mu\text{m}$	UHV	1
Scattering/diffraction from a small spot (BAT)	EPU45	Yes			$10^3 - 10^4$		UHV	1
PEEM	EPU45	Yes			$10^3 - 10^4$	$\sim 30 \mu\text{m}$	UHV	1
XPS, esp. at "high" pressure	EPU45	?			$10^3 - 10^4$	$\sim 10 \mu\text{m}$	$\sim 10\text{-}100 \text{ torr}$	1
Ruben "high flux"	EPU45	Yes	183 (269)	2200 (1500?)	$10^3 - 10^4$	$\sim 8 \mu\text{m}$		2 to 3
Ruben "high res'n"	EPU45	no ?	183 (269)	2200 (1500?)	$< 10^5$	$\sim 8 \mu\text{m}$		2 to 3