

Call for NSLS-II First Experiments Proposals

May 17, 2013

1. INTRODUCTION

The National Synchrotron Light Source II (NSLS-II) is a highly optimized 3rd generation synchrotron facility currently under construction at Brookhaven National Laboratory. When fully commissioned and built out, NSLS-II promises to provide unprecedented high brightness and photon flux as well as beam stability over a broad range of photon energies from infrared to hard x-rays, and be able to accommodate at least 58 beamlines for a wide-range of scientific programs from physical sciences to biological and life science research.

NSLS-II is scheduled to start science-commissioning operations in October 2014 with an initial suite of the following seven beamlines:

- Hard X-ray Nanoprobe (HXN),
- Inelastic X-ray Scattering (IXS),
- Coherent Hard X-ray Scattering (CHX),
- Coherent Soft X-ray Scattering and Polarization (CSX-1 and CSX-2),
- Submicron Resolution X-ray Spectroscopy (SRX), and
- X-ray Powder Diffraction (XPD).

These beamlines are designed and constructed to fully exploit the most advanced and world-leading hard and soft x-ray capabilities that NSLS-II can provide, and will enable new scientific research opportunities. More information on this suite of beamlines and their capabilities can be found on the NSLS-II beamlines website at <http://www.bnl.gov/ps/nsls2/beamlines/>.

In order to fully engage the scientific community in these exciting early science opportunities, NSLS-II plans to allocate beam time to research teams selected from the community to conduct user-assisted science commissioning experiments at all seven NSLS-II project beamlines as early as in October 2014. These experiments will be selected based on the experiment proposals initiated by the experiment team, peer-reviewed by a Proposal Review Panel, and approved by NSLS-II management.

2. NSLS-II FIRST EXPERIMENTS WORKSHOP

In order to facilitate discussions on first experiments with the broad scientific user community, an NSLS-II First-Experiments Workshop will be held at Brookhaven National Laboratory, **August 12-13, 2013**. This two-day Workshop will consist of a plenary session and five parallel sessions. The Plenary Session will start with talks on grand-challenge science topics in several key research fields, followed by facility presentations to update the community about the early scientific capabilities at the initial suite of NSLS-II beamlines.

The five parallel sessions are designed to provide forums to facilitate more detailed discussions about potential first experiments at specific beamlines and the formations of the experiment teams. The parallel sessions will take the following research themes for specific NSLS-II beamlines:

- Hard x-ray scanning microscopy and nanoprobe (HXN and SRX)
- Coherent x-ray scattering (CHX and CSX-1)
- Soft x-ray spectroscopy with fast polarization switching (CSX-2)
- In-situ and in-operando X-ray diffraction (XPD)
- Inelastic x-ray scattering at sub-meV resolution (IXS).

Specifically, each parallel session group will be charged to:

- Identify key research projects and the associated first experiments that may be conducted at the initial suite of NSLS-II beamlines, emphasizing those projects that will take advantage of NSLS-II properties
- Facilitate the formation of research teams to generate First Experiment Proposals for submission
- Identify key additional team members in such areas as theory and analysis, ancillary measurements, and specimen preparation, needed to achieve the research goals.

The expected outcome from this Workshop is two-fold: (a) a concise Workshop report outlining how NSLS-II beamlines will help to address outstanding grand challenge problems in science and technology, and (b) a list of potential first experiments along with the corresponding research teams. For more information on the Workshop, please contact Gretchen Cisco, the NSLS-II User Administration Manager, at gcisco@bnl.gov, or [click here](#) to visit the workshop website.

3. CALL FOR FIRST EXPERIMENTS PROPOSALS

With this Call, NSLS-II solicits First Experiment Proposals for user-assisted science-commissioning experiments to be conducted at the initial suite of NSLS-II beamlines as early as in October 2014. It is expected that each of these First Experiment Proposals will be submitted by a strongly collaborative team of researchers covering all aspects of a well-planned synchrotron experiment, including scientific expertise and experimental methodology, novel specimens and sample environment, and data analysis and theory support.

Each First Experiment Proposal should consist of the following information:

A. Basic Information (1-2 pages)

- Experiment Title
- Names and Contact Information of the PI and the Experiment Team
- Beamline where the proposed experiment will be performed

B. Proposed Experiment and Impact (2-6 pages)

- Description of the proposed experiment, including the science case, materials specimen, type of experiment, experiment plan, data reduction and analysis, and expected outcome
- Potential issues and risks, including experiment safety, and mitigation plans

C. Experience and Expertise of the Research Team (1-2 pages)

- Brief description of team's relevant prior experience, and key publications.

All First Experiment Proposals should be submitted by **November 1, 2013**, to nsls2proposals@bnl.gov. Please address all questions to Gretchen Cisco, the NSLS-II User Administration Manager, at gcisco@bnl.gov. The submitted First Experiment proposals will be reviewed by a Proposal Review Panel (PRP) consisting of scientific peers from the community. The reviews will be conducted according to the following evaluation criteria:

- Potential for high scientific, technological, and/or societal impact
- Experiment plan well developed to cover all stages of the experiment, including science relevance, experimental methodology, specimen preparation, data acquisition and analysis, and theory support
- Technical feasibility, with analysis of identified technical risks and associated mitigation and/or development plans
- Quality and expertise of the participating experiment team well matched to the experiment plan, ensuring high likelihood of success for each stage of the experiment.

Based on the outcome of the PRP reviews, a number of First Experiment Proposals will be approved for allocation of beam time as soon as science commissioning starts at a given NSLS-II beamline.

Performing the first science experiments during the science-commissioning period is an important part of the science readiness ‘commissioning’ activity at the beamline, which follows a technical readiness commissioning period. It will be a high priority to provide as much scientific and technical support to these first science experiments as possible, including tailoring the operating modes and schedule for the NSLS-II storage ring to suit their needs to the maximum extent practical. The allocated beam time will be more flexible than usual and will take into account all factors that may affect the success of the early science experiment.

[Click here to download the NSLS-II First Experiments Proposal Form](#)