NSLS-II Proposal Review Panel – Review Procedure and Guidelines

Introduction

As stated in the *NSLS-II User Access Policy*, two principles underlie all user access to beam time at NSLS-II. The first is that it is based on proposals that are subjected to peer review that is fair, clear, and expedient, that is sensitive to the needs of users, and that recognizes contributions that improve the overall scientific program. The second is that all proposals receive a finite amount of beam time for a limited duration that is justified by the need for beam time of the proposed work.

The NSLS-II User Access Policy provides three modes of user access to beam time at NSLS-II: General User (GU) access, Partner User (PU) access, and Beamline Discretionary Time (BDT) access. The life cycle for GU and PU access to beam time involves the following steps: proposal submission, proposal review and award of beam time, beam time allocation, beam time scheduling, carrying out the work, and reporting the results. BDT access involves scheduling, carrying out the work, and reporting the results but is reviewed retrospectively. Both GU and PU access require peer review of proposals through a central review process managed by the BNL Photon Science (PS) Directorate that utilizes a Proposal Review Panel (PRP).

Beam time is awarded to PU proposals by PS management via a Partner User Agreement based on recommendations from the PRP and the assessment of PS management. Beam time is awarded to GU proposals largely based on the scores of the PRP, but may also include consideration of outreach to specific research communities, industrial research objectives, etc… In mature operations, 50-90% of the available user beam time on every beamline shall be allocated by a Beam Time Allocation Committee (BAC) to GU proposals every run cycle. Up to 40% of the available beam time may be allocated by the BAC to one or more PU proposals in response to their beam time requests for that run cycle. Up to 10% of the available beam time may be allocated at the discretion of beamline management every run cycle for BDT access, typically by beamline staff. During the Early Science stage (science commissioning), prior to initiating a General User Program, PS management will allocate beam time for all proposals instead of a BAC.

This document provides general guidelines of the NSLS-II beam time proposal review process, and some additional information specific to the start-up phase of NSLS-II beamlines.

NSLS-II Proposal Review Panel (PRP)

The use of the NSLS-II is ultimately the responsibility of the Photon Science Directorate. To help establish the merit of PU and GU proposals for beam time, PS will establish a PRP. All proposals for Early Science, General User, or Partner User beam time will be reviewed by the PRP.

Beam time awarded to Early Science and GU investigators for technically viable proposals will be based primarily on the PRP scoring/recommendations. PU beam time awards will also consider the impact of the proposed PUP on the General User Program.

NSLS-II Proposal Review Panel consists of several (6-12) subpanels, each focusing on a specific research area. Each subpanel is composed of a number of scientific peers, mostly from outside Photon Sciences (PS), with a range of balanced expertise and experience in the specific field of research. One member of each subpanel is appointed by the PS as the Subpanel Chair. The membership for each subpanel may change from run-cycle to run-cycle depending on the number of proposals received in a given field.

Subpanel Members – review proposals assigned by Subpanel Chair before each of the review meetings, provide ratings and comments for each assigned proposal, and participate in the PRP meetings to discuss the reviews at the subpanel sessions.

Subpanel Chairs – assign proposals to individual members, chair the subpanel review session; request joint reviews with other subpanels should such needs arise, consolidate input and ratings from other members into a concise Proposal Review Report, and debrief PS management at the close-out of each PRP meeting about any issues during the review process.

Review Procedures

It is expected that the PRP will meet at BNL 2-3 times a year to review proposals. Each review meeting will start with a joint session where all PRP members will be together and will be provided updates on NSLS-II. Specific general questions from the PRP will be addressed in this joint session. Then each subpanel will break-out separately to deliberate and discuss the proposals in detail. The proposals will be made available on line in advance of the meeting so that the reviewers can be prepared to talk about the proposals assigned to them at the meeting. It is expected that each proposal is evaluated by at least two reviewers assigned by the sub-panel chair.

- The goal is for each subpanel to arrive at a consensus rating and produce a brief report (a few sentences or a couple of paragraphs) for each proposal at the end of the review meeting.
- For Early Science and GU proposals, the total number of days required to accomplish the proposed experiment should be suggested. (Any additional comments regarding optimal beam time schedules/increments are also welcome).
- For PU proposals, a careful assessment of the impact of the contribution made by the PUP to the General User program is needed as well as an assessment of the beam time required to accomplish the goals of the partnership. Since PU beam time reduces the beam time available to General Users, an assessment of the appropriate fraction of PU beam time and duration that should be considered for this PUP program without jeopardizing the overall GU programs is also needed.

A close-out session is planned with all PRP sub-panel Chairs where the Chairs will debrief PS management about issues related to the review process and make suggestions for future improvements. A draft review report should be prepared at the time of the PRP meeting by each subpanel, and the final review report is expected 1-2 weeks after the meeting.

Anticipated Beam Availability in the NSLS-II Start-up Phase

In mature operation, the NSLS-II will be available for approximately 5000 hours per year. However, in the first few years, front-end and ID commissioning activities will require that the scheduled accelerator operations be reduced. It is anticipated that approx. 2500 hours (104 days) will be available for experiments in FY15 and FY16. In FY17, up to 4800 hours (200 days) may be available.

Phased Commissioning Approach: Each beamline is designed for more than one capability or technique – including high-flux or high resolution modes, different scanning modes, various experimental protocols, or sample environments. Because there is an interest in initiating high-impact user science as early as possible, each beamline has evaluated the capabilities that should produce early high-impact results. These capabilities will be commissioned first, and once a scientific capability or technique is commissioned, the User Science program utilizing that technique will commence during storage ring operations. Secondary technique capabilities will be commissioned by alternating between the established user science programs and new commissioning activities in the subsequent running periods. This phased commissioning approach provides an optimal balance between a rapid start of user science programs and a comprehensive, complete technical commissioning of all beamline capabilities.

The beam time available for allocation to users does not include time that PS management requires for commissioning, maintaining, and upgrading the beamlines, and so is typically less than the accelerator operations hours.

This overall approach may need to be revised after gaining experience during the early operations of the NSLS-II.

Proposal Review Criteria

All beam time proposals are to be evaluated and rated by the NSLS-II PRP according to the review criteria in the following categories as outlined in the *NSLS-II User Access Policy*:

- Scientific and/or technical impact, innovation, and originality
- Scientific, technical and/or industrial importance
- Education and/or outreach importance
- Capability of proposers and quality of past performance based on track record
- Experiment/Work plan and technical feasibility.

In the reviews, the PRP is expected to take into consideration supporting evidence provided in the proposal (e.g., publications, patents, or corporate impact statements as evidence of past performance), to impartially evaluate the likely success of the beam time, and to evaluate these categories in a balanced way (e.g., recognizing the merit of adventurous, exploratory experiments as well as those with a clear expected result, or recognizing the value of encouraging the development and contribution of new users as well as supporting proven performers from existing communities). Each proposal is rated by the PRP on the scale of 1 to 5, with 1 being the highest rating. In general, the following descriptions serve as guidelines to the ratings.

Score=1: The highest rated proposals will be highly innovative with revolutionary or transformative societal impact or scientific importance. The proposed research will significantly advance knowledge in a specific scientific discipline or address critical open questions in a particular field. The potential for publication in a leading scientific journal is very high, and the capabilities characteristics of the NSLS-II are critical for the success of the proposed work. Generally, these proposals have very well developed experiment plans that address all phases of a successful experiment – including pre-measurement preparations, data collection methods, data analysis, additional ancillary measurements or theoretical calculations, etc…

Score=2: These excellent proposals represent high quality, cutting edge research that has significant societal or scientific impact. The proposed research has potential for making an important contribution to a specific field or scientific discipline. The work is likely to be published in a leading scientific journal, and the capabilities characteristics of the NSLS-II are important to the success of the proposed work. These proposals typically have well developed experiment plans that address the important phases of a successful experiment.

Score=3: These proposals represent good, near-cutting edge research that has direct societal or scientific importance. The research goals have potential for making notable contributions to a specific field or scientific discipline. The work is likely to be published in a respected scientific journal, and the capabilities characteristics of the NSLS-II would benefit the proposed work. The experiment plan is sufficiently well developed to assure a successful result.

Score=4: These proposals represent interesting research that may or may not have direct societal or scientific importance. The research goals might influence a specific field or scientific discipline. The work might be published in a scientific journal, but the capabilities characteristics of the NSLS-II might not be required to accomplish the research goals. The experiment plan is sufficiently developed to assure a successful result.

Score=5: These proposals represent research that does not appear to have direct social or scientific importance. The work might not be publishable in a scientific journal, and synchrotron radiation might not be required to accomplish the research goals. The experiment plan might be missing key elements to assure a successful result.