Introducing Synchrotrons into the Classroom

Beamtime Proposals

• Teachers and students formulate a hypothesis and set of experiments using conventional and synchrotron-based methods.
• A beamtime proposal will be written and submitted online.
• An NSLS Proposal Review Panel (PRP) reviews and scores the proposals. The PRP consists of a mix of synchrotron scientists and science educators, and ratings are based on scientific merit and the educational nature of the project.
•The highest rated proposals are allocated beamtime.
• If teachers wish to continue the experiments, a continuation proposal can be submitted.

Implementation

3-Day Teacher Training Course

Teachers & Students formulate a hypothesis and experiment

July 2010

Teachers & Students submit proposal

Score too low for this cycle: Classroom Visit

Peer Review

Highest rated scheduled for beamtime

Proposals receive 1-4 rating

NSLS Beamtime Cycles

• The NSLS operates 3 cycles a year and users submit proposals months in advance of these cycles:

- Cycle: January-April — Deadline: Sept. 30
- Cycle: May-August — Deadline: January 31
- Cycle: September-December — Deadline: May 31

• Scheduling for these cycles is usually completed at least a month before the cycle begins.

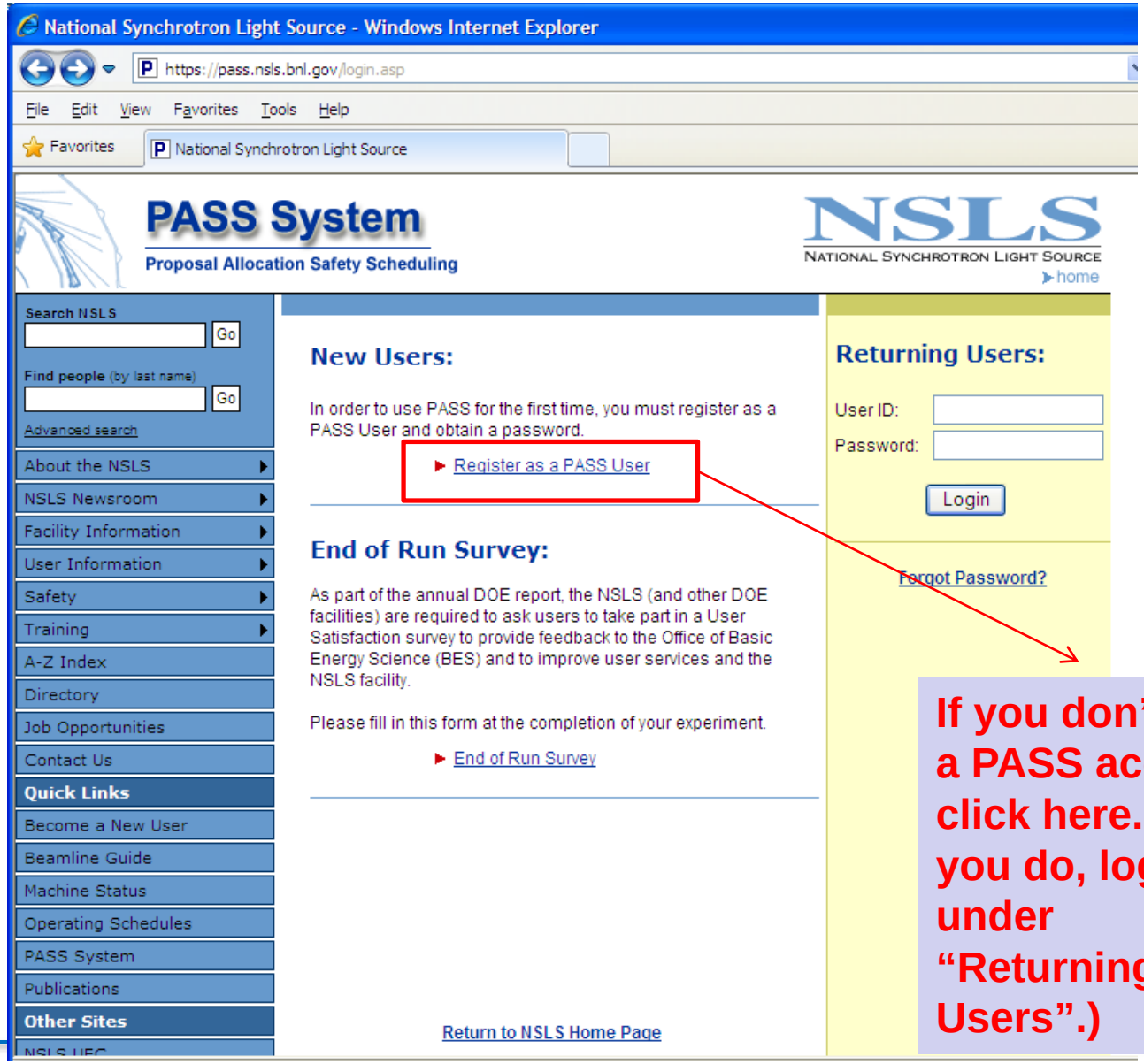
• InSynC recognizes issues with respect to school scheduling, so we allow for “current-cycle” or “rapid-access” requests, but for this to work we must block out elected dates in advance.

• Next InSynC dedaline is July 15, 2011 for beamtime that will be scheduled between September 1 – December 31, 2011.

• All deadlines will always be posted in the InSynC website.

Go to: http://pass.nsls.bnl.gov

Follow the guidelines for proposal submission posted on the InSynC website.



Complete the Template available on the InSynC Website

TITLE

ABSTRACT (enter into "Research" field in PASS form)
Provide a meaningful abstract of the proposed research and educational impact below.
(limit 1300 characters including spaces)

RESEARCH DESCRIPTION (enter into "Current Cycle Request" field in PASS form) *(limit 4000 characters including spaces for sections A-D)*

A. Scientific Importance of these experiments

B. Educational Impact of these experiments

C. Research Description
Provide sufficient details about your experiments including:

- *specific aims and hypotheses*
- *sample preparation, data collection, and data analysis*
- *explain why synchrotron radiation is necessary (e.g. technique, sample size, concentration)*
- *describe any associated supporting (non-synchrotron) experiments*

D. List up to three publications you feel will assist in reviewing this proposal

E. List any collaborators on these experiments and their institutional affiliations

An abstract. What's the scientific question that will be addressed? What experiments will be done to answer the question? What synchrotron techniques will be used? What's the educational impact?

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Explain the scientific question you're trying to answer. This is a high level explanation of the problem.

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Explain how the experiment will provide an educational benefit. Don't necessarily focus on just the synchrotron aspects.

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This is where all the specifics of the experiment should go?

- **What detailed information are you aiming to get in the beamtime you're asking for?**
- **How will you prepare samples, do you have a reasonable approach to collecting and interpreting the data?**
- **Convince the panel that a synchrotron is needed to do this…why can't you use a less expensive or complex method?**

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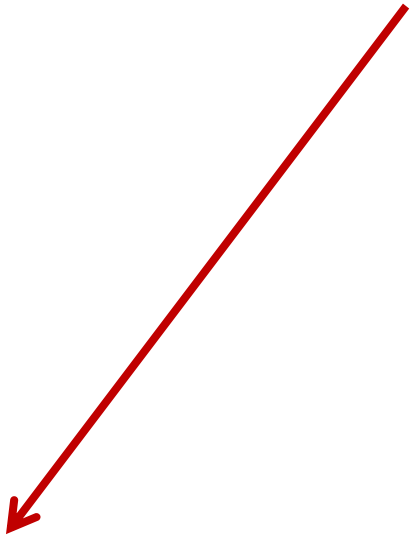
Adequately reference your proposed work and make sure you list all collaborators.



Review Panel

Prof. Scott Calvin, Ph.D.
Dept. of Physics, Sarah Lawrence College
Yonkers, NY

Tracy Walker
Educational Outreach Coordinator
Canadian Light Source
Saskatchewan, Canada

Jonathan De Booy
Education and Outreach Officer
Australian Synchrotron,
Clayton, Australia

Review Rubric

Rating: Scores listed below range from 1 (high quality) to 5 (low quality). Each category is equally weighted. Please use the Reviewer Form (below) for each proposal.

	Scientific Merit: Innovation/Originality	Experimental Plan	Educational Impact
1 Outstanding	Highly innovative; clear, testable hypothesis; potential to publish	Project is well thought out, organized, and methodology is easy to follow; likely to succeed; makes unique use of proposed beamline; good use of supporting laboratory or field experiments	Several broader educational impacts clearly explained; uses novel inquiry based learning across disciplines/subjects; 1 or more classes of students impacted
2 Excellent	Original, high-quality research; although unlikely to be published can be presented as a student research project	Well-conceived project; could be accomplished with other techniques but synchrotron will more efficient; good use of supporting laboratory or field experiments	Broader educational impacts explained; uses inquiry based learning; potential for cross discipline/subject impact; classroom-level research group is impacted
3 Good	Research in established area; builds on referenced scientific precedence; some uncertainty whether hypothesis can be tested	Some gaps exist or are not clearly outlined in plan but is potentially feasible experiment; good use of supporting laboratory and field experiments	Some educational impacts are explained; inquiry based learning implied but not defined; addresses a single subject area; a small research group is impacted
4 Fair	Hypothesis not well defined or testable but important scientific concepts can be observed	Some gaps exist or are not clearly outlined in plan; feasibility unclear; no supporting laboratory or field experiments	Broader educational impacts not clear, inquiry-based learning not utilized; little potential to impact interdisciplinary/cross-curricular subject areas; 1 student impacted
5 Needs Improvement	No testable hypothesis presented	need for synchrotron beamline not clearly explained/justified; not likely a feasible synchrotron experiment	Broader educational impacts not clear, inquiry-based learning not utilized; subject areas addressed do not match to likely student curriculum; student impact unclear