

## **Advanced Photon Source Upgrade Project: Call for Beamline Enhancement Proposals**

This letter is a call is for proposals for beamline enhancements to existing beamlines that will be funded as part of the APS Upgrade project.

### **Introduction & Background**

The Advanced Photon Source (APS) is preparing for a significant upgrade of its accelerator and beamline facilities that will dramatically improve the brightness, coherence, and stability of the storage ring x-ray beams and will provide the scientific community with a world-leading suite of new experimental tools and capabilities. Source performance will improve tremendously at all x-ray energies, but gains at high x-ray energies ( $>20$  keV) will be particularly revolutionary. A suite of new and upgraded beamlines have been selected for inclusion in the project.

For all the remaining beamlines, to first order the APS-U is following a “do no harm” policy to ensure, wherever possible, that post-upgrade APS beamlines have capabilities that are at the very least comparable to their capabilities prior to the upgrade. Improvements that fall into this class include the following:

- a new high-heat-load ID front end (if necessary) and a new ID(s) providing comparable performance to the existing ID(s) on the beamline,
- realignment of BM beamlines to compensate for source point movement in new lattice, and
- new/refurbished optics and other hardware to ensure that the beamline performs as well as before the upgrade.

The above items are considered non-discretionary improvements and are not the subject of this call. Regarding the third bullet, it is believed that current APS ID beamline optics and equipment will generally meet the criteria of providing equivalent performance post APS-U and do not qualify for non-discretionary upgrades. To discuss potential exceptions for inclusion on the non-discretionary list please contact Dean Haeffner (haeffner@anl.gov).

In certain cases, bending optics may fall into the non-discretionary category, depending on BM source choices. APS-U staff will work with BM beamline staff to identify appropriate non-discretionary upgrade items.

The focus of this call is for proposals for “discretionary” enhancements to existing beamlines that will significantly extend experimental capabilities and more fully use the capabilities of the APS-U low emittance beam. These enhancements will be funded as part of the APS Upgrade project.

### **Process**

This is a call for a 1-2 page proposal that describes the scientific case for discretionary enhancement funds, the community it would support, and specifics on requested scope. Examples of discretionary beamline enhancements include (but are not limited to):

- Enhanced sources (SCUs, revolver-type undulators, 3-pole wigglers),
- Upgraded optics (monochromator improvements, new mirrors, better cooling, etc.),
- Vibration isolation for optical components and/or sample environments, and
- End station instrumentation.

Please list individual items/components you are requesting and any functional relationship between items/components (e.g., a superconducting undulator with higher heat load that consequently requires new optics).

Note that detectors will not be considered for enhancement funds in this call.

Upon receipt of the proposal, APS-U staff will evaluate the proposals, clarify any scope issues with proposers, and create estimates for the cost of the requested enhancements. Proposals will then be reviewed and prioritized by an *ad hoc* committee composed of APS/APS-U staff/managers, CAT/PUC representative(s), and member(s) of the APS-U Experimental Systems Advisory Committee. The prioritized list of enhancements will be presented to the APS Scientific Advisory Committee for advice and comment. Top proposals (limited by funding) will be incorporated into the APS-U project and the remainder held for possible contingency funding.

### **Review Criteria**

Enhancement proposals will be evaluated according to the following criteria:

- Scientific impact
  - Does the proposal enable high-impact scientific, technological, or industrial research?
- Degree of benefit to the General User Program
  - What fraction of the time does the beamline allocate for access by General Users?
- Alignment with upgraded APS capabilities and APS strategic plan
  - Do the enhancements take advantage of high energy, coherence, etc.?
- Return on investment

### **Schedule**

The deadline for submission of Enhancement Proposals is Friday February 3, 2017. The selection process will be completed late-Spring/Summer of 2017 so that the proposed enhancements can be included in the project plan before the CD-2 review (tentatively late-Summer/Fall of 2017).

## **Notes**

- Changes can be made, if necessary, after the CD-2 review
- Enhancement fund budget could change (up or down) now that the beamline road mapping has been firmed up and better costs for the proposed full beamlines are determined.

## **APS-U Beamline Enhancement Selection Process Points of Contact**

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