

Photon Sciences Update



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Associate Laboratory Director for Photon Sciences
UEC Town Meeting
July 29, 2014



U.S. DEPARTMENT OF
ENERGY

Office of
Science

Status of NSLS-II Project

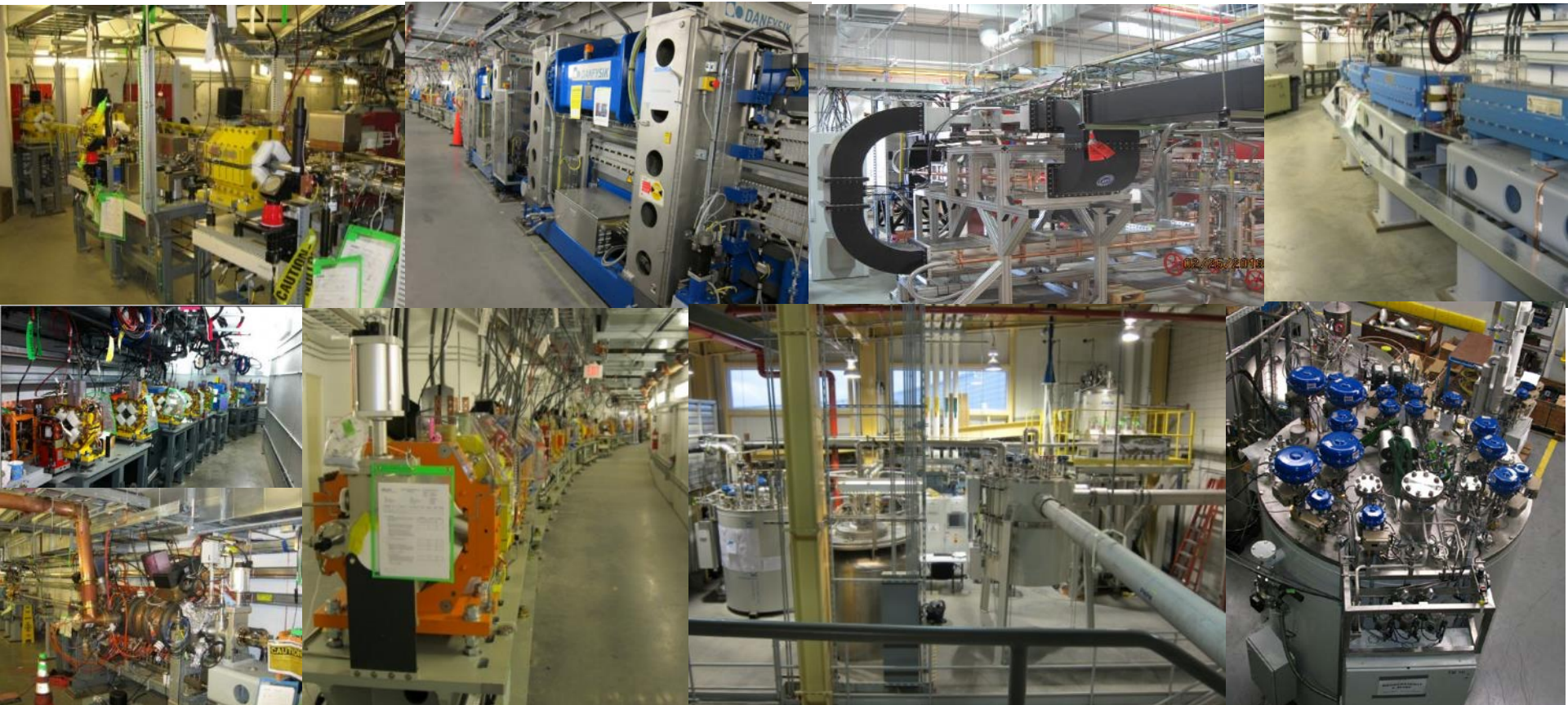
- Excellent progress
- Project is 97% complete as of end of May 2014

	<u>Current baseline</u>	<u>% complete</u>
Conventional Facilities	\$310M	100%
Accelerator Systems	\$293M	98%
Experimental Facilities	\$87M	90%
Pre-Ops	\$60M	88%
Project Management	\$68M	99%
R&D	\$61M	100%

- On schedule and on budget
 - Excellent technical, cost & schedule performance to date
 - Substantial scope (~ \$62M) added to maximize science
 - Sound cost baseline with adequate remaining contingency



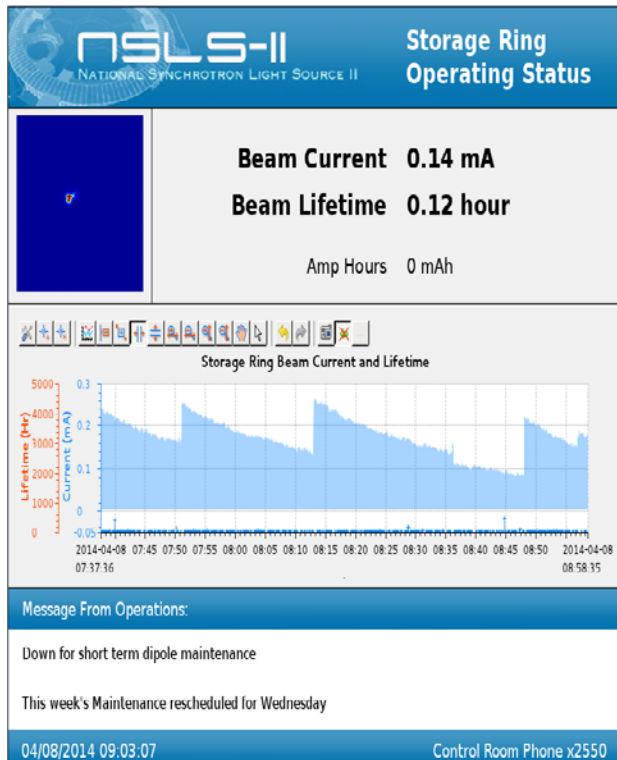
Accelerator Systems



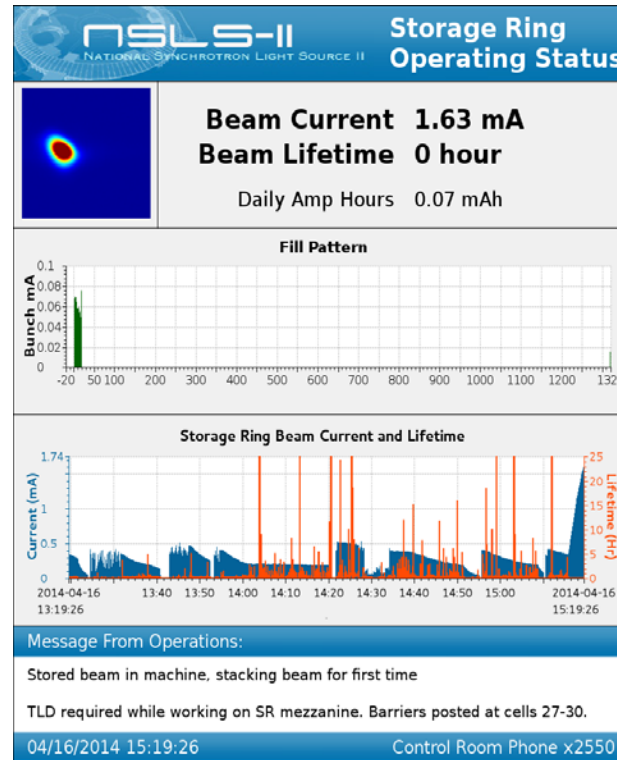
- Linac, Booster, and Storage Ring complex are all complete and commissioned
- Front Ends and Insertion Devices still to be completed
- 2nd SC RF cavity (a spare) still to be delivered and accepted

Storage Ring Commissioning

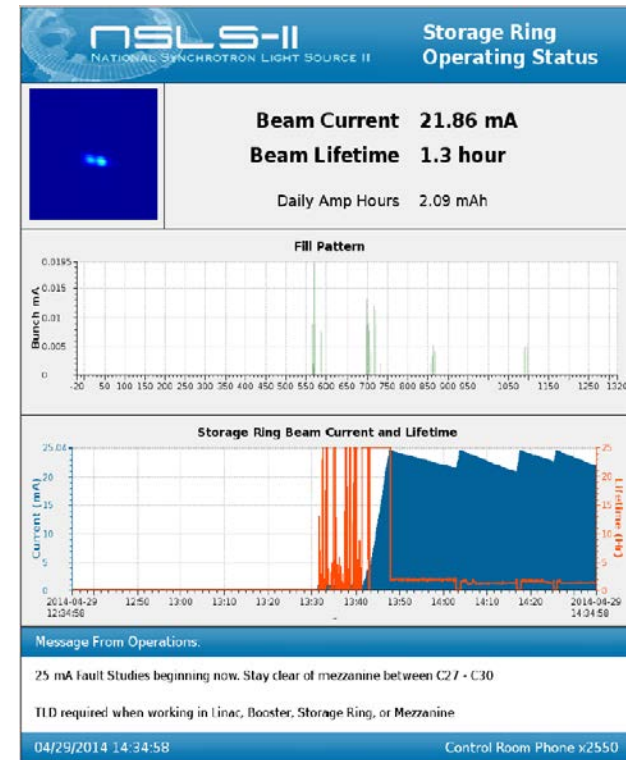
- Started on March 26 w/ normal conducting RF Cavity



First Stored Beam - April 4



First Accumulated Beam - April 12



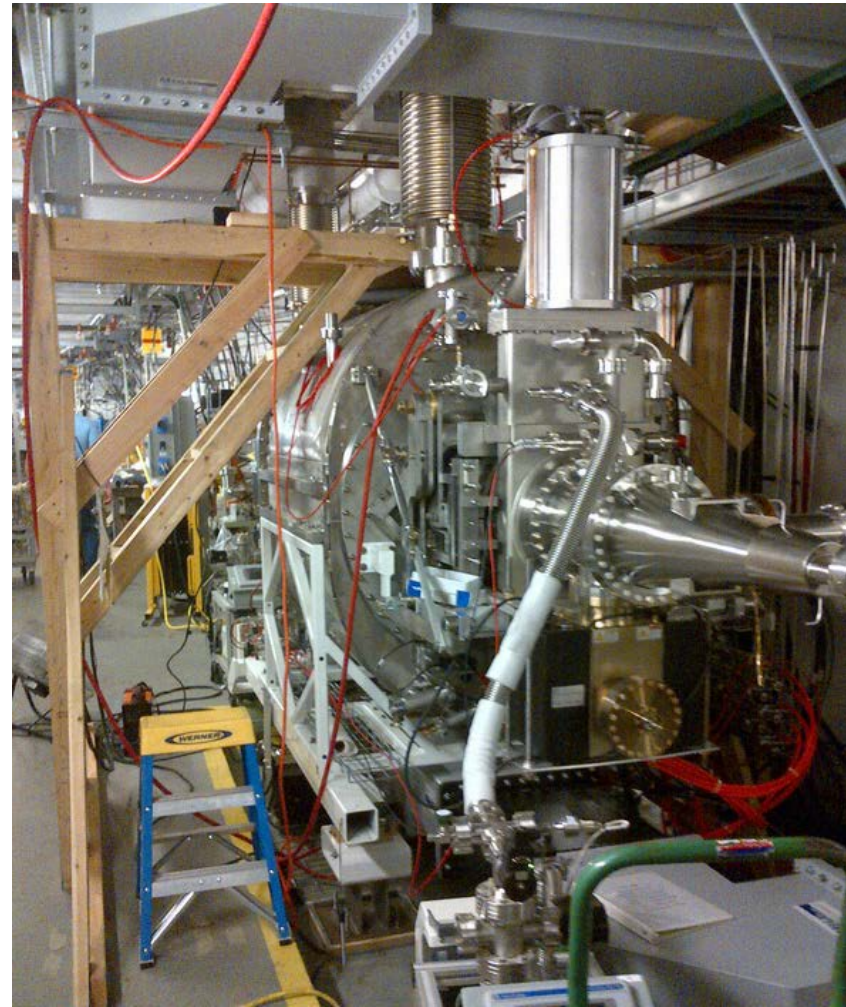
25 mA Stored Beam - April 29

- Storing 25 mA at 3 GeV is a Key Performance Parameter for NSLS-II
- Demonstrates that all components of the accelerator are functioning as designed
- Achieved nine weeks ahead of schedule

Superconducting RF Cavity

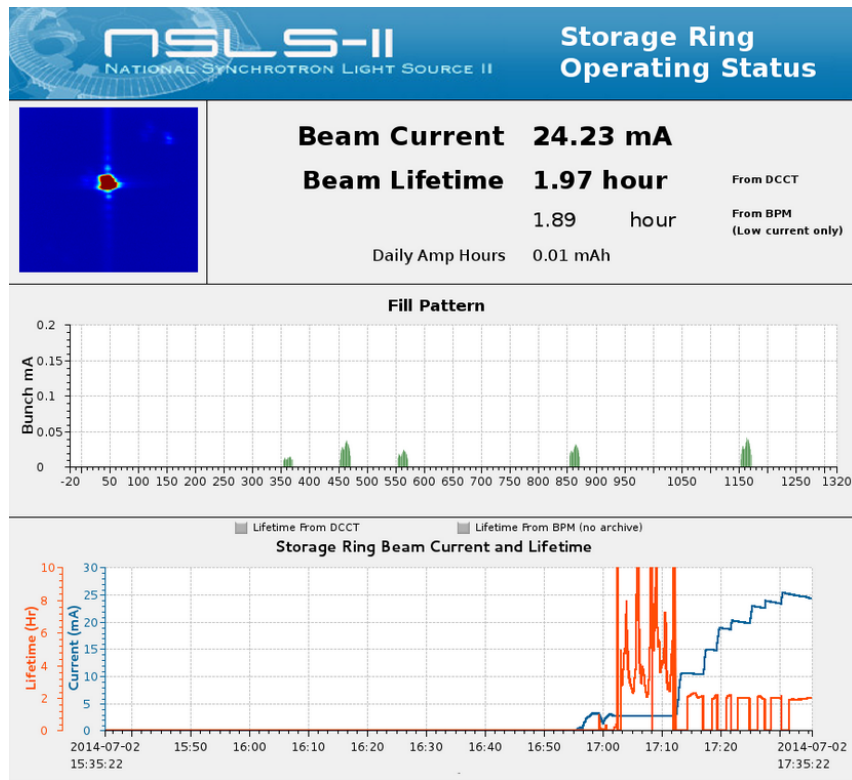


SC RF Cavity 1 in RF Blockhouse for testing (May)

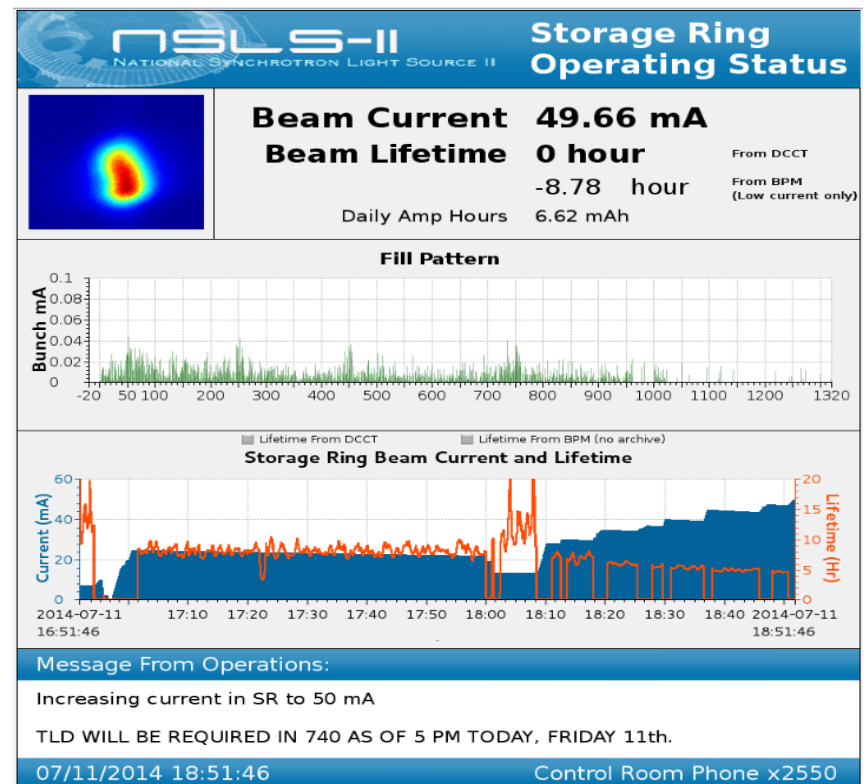


SC RF Cavity 1 during installation in ring (June)

Storing Beam with SC RF Cavity



25 mA Stored Beam – July 2



50 mA Stored Beam – July 11
 Target Current for Initial Operations

Insertion Device Installation Status



All 3 Damping Wigglers installed
(one for XPD)



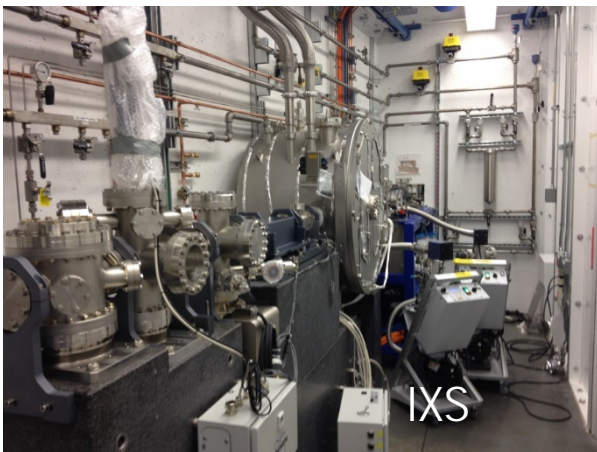
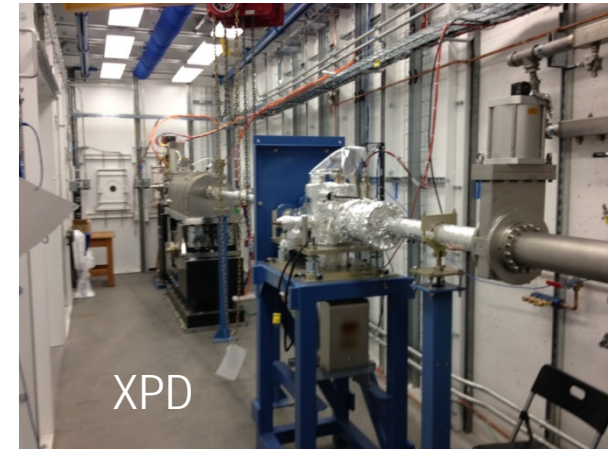
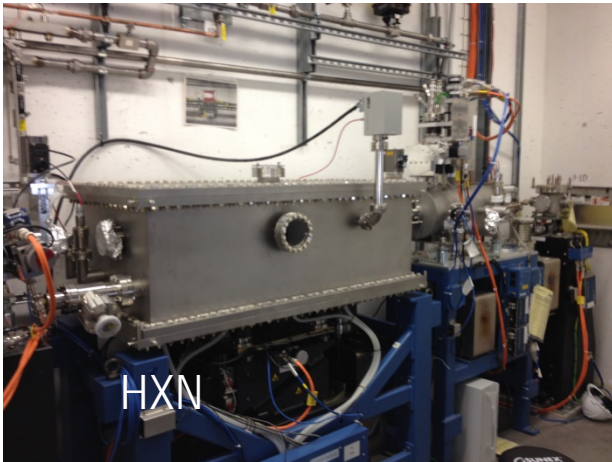
SRX IVU during installation



HXN IVU during installation

2 EPU's (CSX) and 2 IVU's (CHX, IXS) to be installed in August

NSLS-II Project Beamline Status



- Hutches and utilities complete
- Some beamline and endstation components still to be installed

- PPS & EPS installation and verification to be completed by end of August (very tight schedule)
- Readiness review process rescheduled to allow completion



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Recent and Upcoming Events and Milestones

Start Storage Ring Commissioning	28 Mar 2014
DOE Mini-Review of NSLS-II Project	18 Apr 2014
SR Commissioning Completed (w/normal RF cavity)	29 Apr 2014
Operations Instrumentation Readiness Review	2-6 Jun 2014
Preliminary Beamline IRR	30 Jun-2 Jul 2014
Operations Accelerator Readiness Review	7-11 Jul 2014
SR Commissioning completed (w/SC RF cavity)	11 Jul 2014
Phase I Beamline IRR (All 6 Ports outside of ratchet wall)	28 Aug 2014
FE, ID, and PPS Installation Completed	5 Sep 2014
Phase II Beamline IRR (FE's, ID's and PPS all 6 ports)	12 Sep 2014
Authorization from BHSO to begin Operations	26 Sep 2014
All KPPs achieved – Early Project Completion	30 Sep 2014
CD-4 PROJECT COMPLETION	26 JUN 2015



NSLS-II Project Completion

- Project complete by Sep 30, 2014
- Formal completion (CD-4 approval) possible before end of 2014
- Project closeout activities will extend into 2015

Key Performance Parameter	Status
Deliver 340,000 GSF conventional construction	Delivered 627,834 GSF
Achieve 3.0 GeV and 25 mA with normal conducting RF cavity	Achieved on Apr 29, 2014
Achieve 3.0 GeV and 25 mA with SC RF cavity	Achieved on Jul 11, 2014
6 beamlines installed and ready for commissioning w/ x-ray beam	Will deliver 7 by Sep 30, 2014

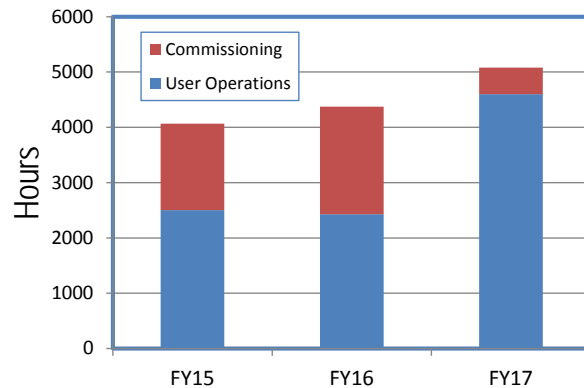
- Completed 9 months ahead of schedule
- Delivered \$62M in additional scope to maximize science
- Outstanding safety record
 - TRC rate 0.69, DART rate 0.25 with > 4M hours worked
- Ready for impactful first light experiments starting Jan, 2015

Early Storage Ring Operations

	FY15	FY16	FY17
Insertion Device, Front-end and Beamline	1563	1947	480
Accelerator Studies [h] (49-60/fortnight)	850	946	1046
Maintenance [h] (12h/week)	425	473	523
Shut downs [h]	2160	2160	1440
High current commissioning [h]	565	320	202

Scheduled User Beamtime [h]	2943	2698	4842
Operations reliability (overall)	0.85	0.9	0.95
Actual User Time w/Beam [h]	2502	2428	4600

Maximum Beam Current [mA]	300	400	500
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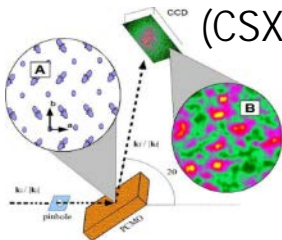
- Challenge: Significant time will be required in FY15 & FY16 to install and commission insertion devices, front ends, and beamlines
- Mitigation: Optimize installation schedule and coordinate with beamline operations

NSLS-II FY15 Operations Schedule (preliminary)

Oct 1 – Dec 23, 2014	11-week ops for ID, FE, & beamline commissioning
Dec 23 – Jan 19, 2015	4-week Shutdown for maintenance
Jan 19 – Apr 27, 2015	14-week ops for science commissioning
Apr 27 – May 28, 2015	4-week Shutdown for maintenance and ID & FE installations
May 28 – Aug 17, 2015	12-week ops for user ops/science commissioning
Aug 17 – Sep 28, 2015	6-week Shutdown for maintenance and ID & FE installations

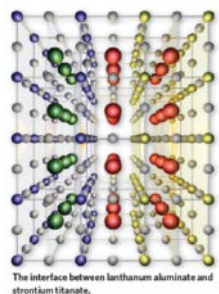
NSLS-II Project Beamlines

Coherent Soft X-ray Scattering (CSX-1)



World-leading coherent flux
XPCS, CDI

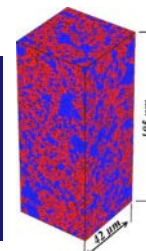
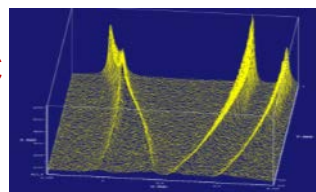
Imaging & dynamics in strongly correlated and magnetic materials



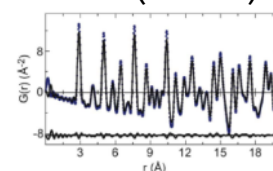
Fast Switching Polarization (CSX-2)

Resonant magnetic scattering, spectroscopy, XMCD

X-ray Powder Diffraction (XPD-1)



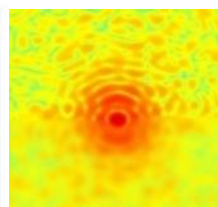
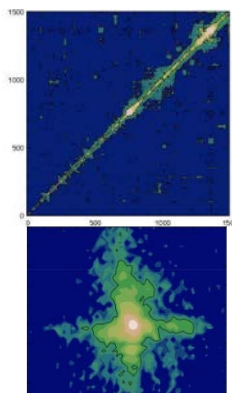
PDF (XPD-2)



Powder diffraction, scattering, PDF 30-80 keV

Time-resolved in-situ in-operando extreme conditions
Understanding complex nanostructured materials

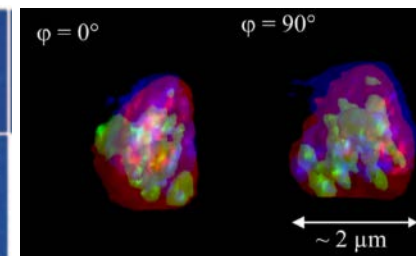
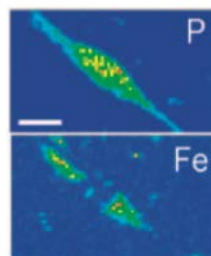
Coherent Hard X-ray Scattering (CHX)



100x greater time resolution in XPCS studies of dynamics

Non-equilibrium and heterogeneous dynamics in soft matter, at buried interfaces, biomaterials, glasses, driven systems

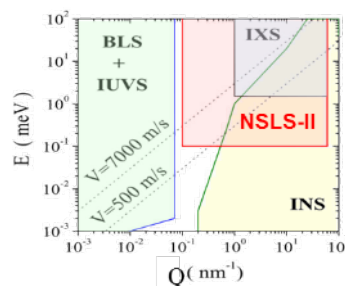
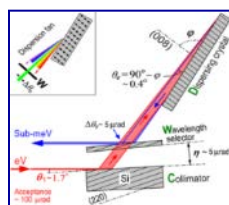
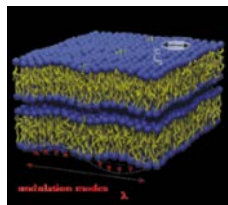
Sub-um Resolution X-ray Spectroscopy (SRX)



World-leading spectroscopy in sub-100 nm spot

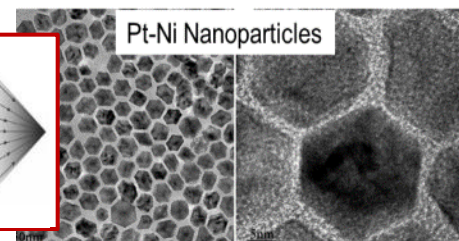
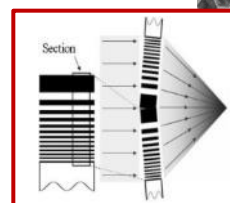
3D chemical imaging and speciation at the nanoscale

Inelastic X-ray Scattering (IXS)

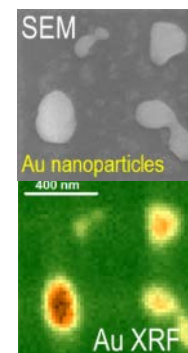


THz dynamics in liquid, glassy, and crystalline materials with nanoscale inhomogeneities

Hard X-ray Nanoprobe (HXN)



100m long beamline
~10 nm baseline
~1 nm ultimate goal



Nanoscale imaging with fluorescence and diffraction

~1 meV baseline
~0.1 meV ultimate goal

First Experiments Workshop

August 12-13, 2013



- Update community about NSLS-II, operations ramp-up, and anticipated beam parameters
- Identify key research projects and first experiments for NSLS-II project beamlines, emphasizing those that need NSLS-II properties
- Facilitate formation of teams and identify key additional members needed to achieve science goals (e.g., theory and analysis, ancillary measurements, specimen preparation, etc)
- Excellent turnout
 - 305 registered attendees (incl IXS session on Oct 1, 2013)
 - >75% of attendees from outside of BNL-PS
 - ~58% of attendees from outside of BNL
- A dozen other user workshops also held in FY13

August 12-13, 2013
Berkner Hall Bldg. 488
Brookhaven National Laboratory
Upton, NY, 11973, USA

NSLS-II First Experiments Workshop



Monday: Morning Plenary Session
Afternoon Breakout Sessions
"Coherence, Dynamics, and Polarization" (CHX, CSX-1, CSX-2)
- Hard material and condensed matter physics science focus
- Soft matter, biology, chemistry science focus
"Combined Multi-length Scale Techniques for 21st Century Science" (HXN, SRX, XPD)
- Soft matter, biology, chemistry science focus
- Hard material and condensed matter physics science focus

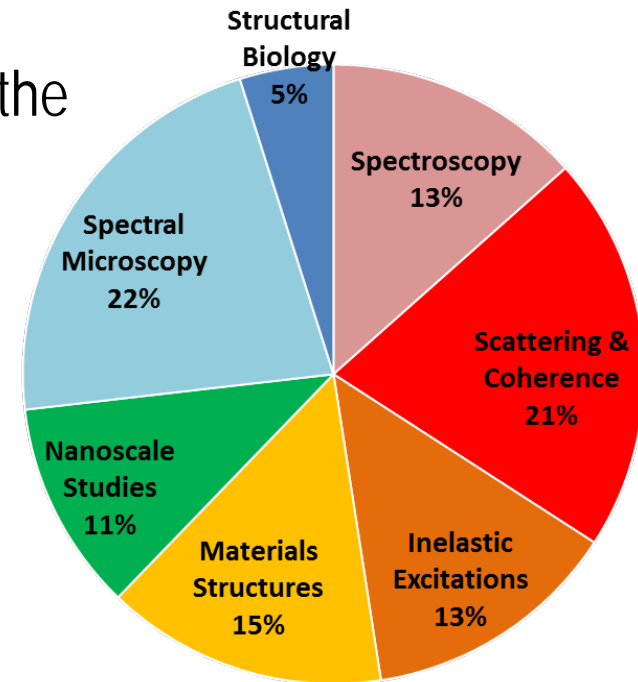
Tuesday: 6 Parallel Sessions
Hard X-ray Nanoprobe (HXN)
Submicron Resolution X-ray Spectroscopy (SRX)
Coherent Hard X-ray Scattering (CHX)
Coherent Soft X-ray Scattering (CSX-1)
Full Polarization Control Soft X-rays (CSX-2)
X-ray Powder Diffraction (XPD)
Inelastic X-ray Scattering (IXS) focus session – Fall 2013

Late Afternoon Plenary Session
<http://workshops.ps.bnl.gov/default.aspx?w=NSLS-II>

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Outcome of the First Round Call for Proposals

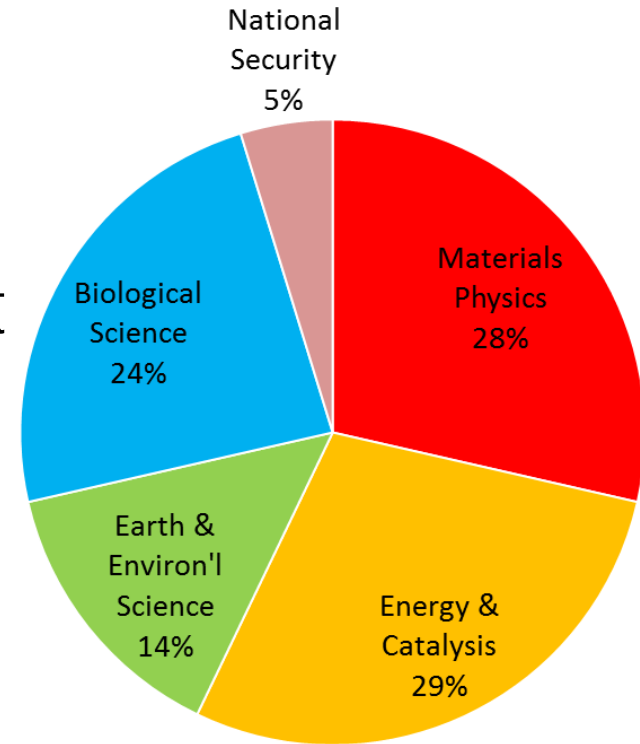
- First Light Experiment Proposals
 - 61 proposals received
 - 324 proposers from 129 institutions from around the world
- Partner User Proposals
 - 21 proposals for partnerships on 14 beamlines received
 - 73 proposers from 22 institutions
- NSLS-II Proposal Review Panel (PRP) was formed, consisting of 24 scientists from the international scientific community, distributed among 7 sub-panels
- PRP meeting was held on Feb 4, 2014, to review all 82 proposals



Distribution of the 82 Proposals in the 7 PRP Sub-panels

Partner User Proposal Review Conclusions

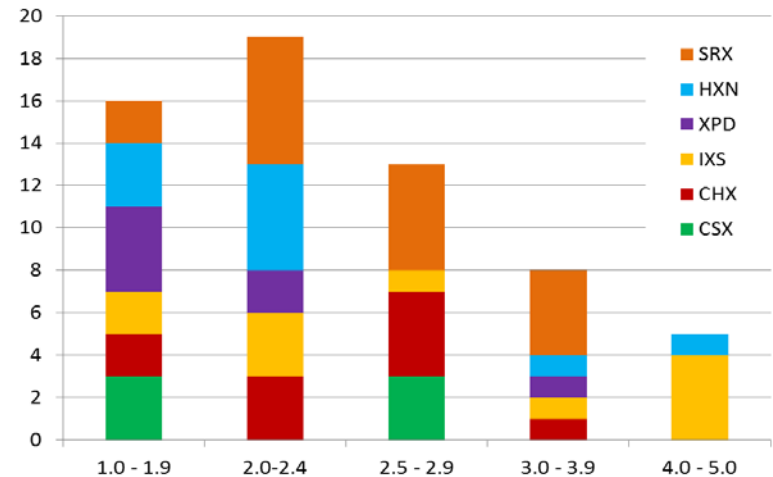
- The Partner User Proposals (PUPs) cover a broad range of scientific disciplines and communities at 14 NSLS-II beamlines that are currently under development
- Among the 21 proposals, 16 have been approved, 2 were withdrawn, and 3 were not approved
- Letters and Partner User Agreements have been sent to the proposal PI's and finalized in most cases
- We look forward to working together with our partners in developing high-impact science programs at NSLS-II



First Experiments Review Conclusions

- All First Experiments Proposals have been reviewed and rated by the NSLS-II PRP
- These proposals will be the first batch of General User Proposals (GUPs), valid for two years from the start of science commissioning period for each beamline
- All proposals will be competing for beam time after the start of official user operations based on their PRP scores
- All proposals are eligible for receiving beam time during the designated science commissioning period for each beamline
 - In addition to the PRP scores, the science commissioning beam time awards will also take into account other factors such as compatibility with day-1 beamline commissioning schedule, likelihood for immediate success, potential for highly visible publications, and track-record of the experimental group
 - Science commissioning beam times are awarded by the PS science management group
- Proposal PI's will be informed of their proposal scores and beam time allocation shortly

1st Exp Proposal Rating Distribution by Beamline



NSLS-II Planned Run Cycles in FY15

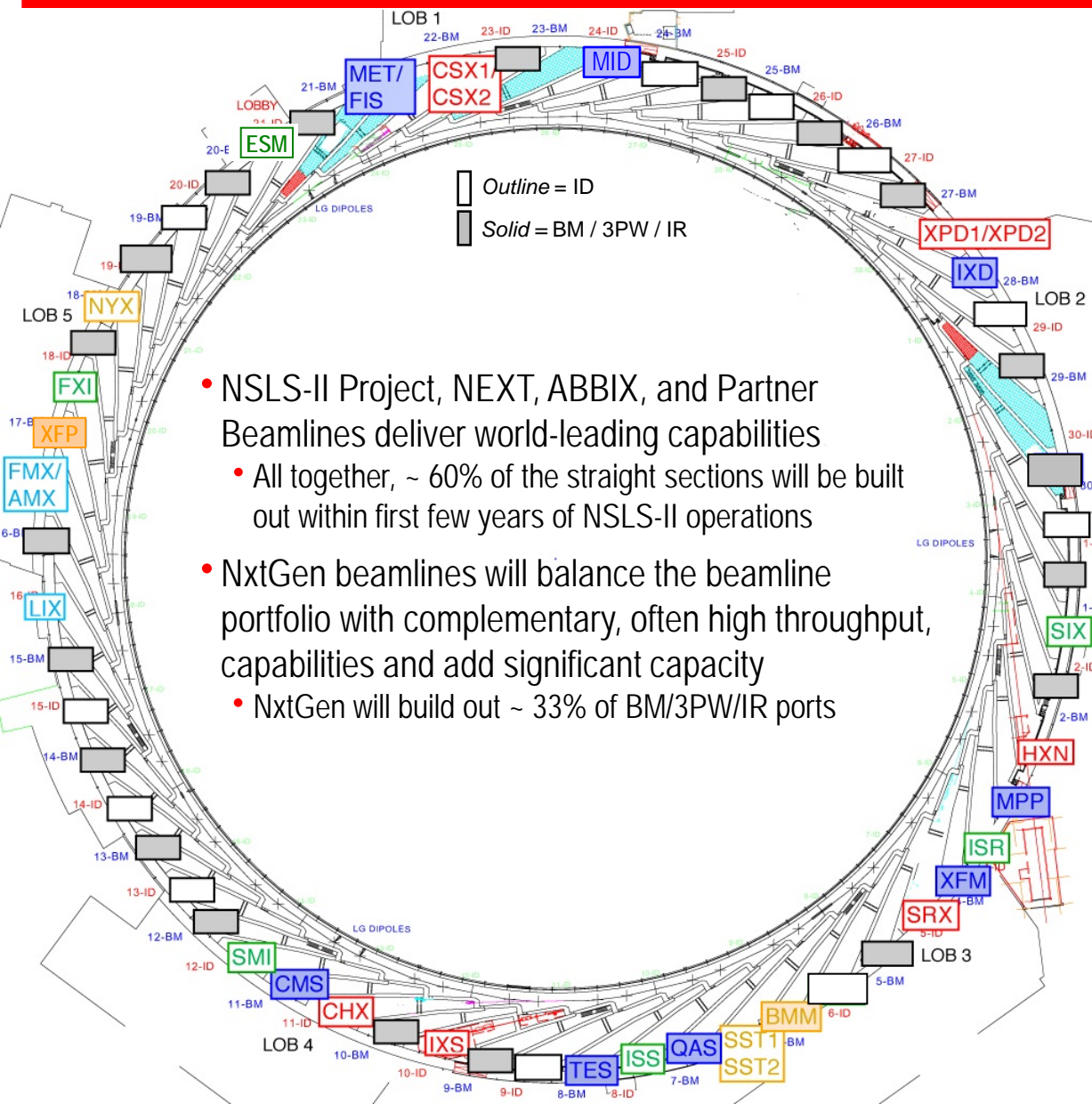
- We will start a regular ops run pattern in FY15, with 3 run cycles/yr and shutdowns in-between for maintenance and additional BL installations
- Along with the run pattern, we will announce GUP/PUP proposal due dates and dates for beamline and PRP reviews as well as allocation notification and scheduling (see table)
- Beamtime allocation for science commissioning experiments will be done one-cycle in advance to allow add'l time to prepare for experiments

	Science Commission	User Operation
Run 14-3: Oct-Dec 2014		
Run Cycle Start	Oct 1, 2014	
Run 15-1: Jan-Apr 2015		
GUP/PUP due	Nov 1, 2013	
Beamline Review	Jan 20, 2014	
PRP Review	Feb 11, 2014	
Allocation	Jul 31, 2014	
Scheduling	Dec 1, 2014	
Run Cycle Start	Jan 19, 2015	
Run 15-2: May-Aug 2015		
GUP/PUP due	Oct 6, 2014	Feb 2, 2015
Beamline Review	Oct 20, 2014	Feb 16, 2015
PRP Review	Nov 3, 2014	Mar 2, 2015
Allocation	Dec 8, 2014	Mar 16, 2015
Scheduling	May 11, 2015	May 11, 2015
Run Cycle Start	May 25, 2015	
Run 15-3: Sep-Dec 2015		
GUP/PUP due	Feb 2, 2015	Jun 1, 2015
Beamline Review	Feb 16, 2015	Jun 15, 2015
PRP Review	Mar 2, 2015	Jun 29, 2015
Allocation	Mar 30, 2015	Jul 20, 2015
Scheduling	Aug 17, 2015	Aug 17, 2015
Run Cycle Start	Sep 28, 2015	



NSLS-II Beamline Portfolio

30 Beamlines Under Development



8 NSLS-II Project Beamlines

Inelastic X-ray Scattering (IXS)
Hard X-ray Nanoprobe (HXN)
Coherent Hard X-ray Scattering (CHX)
Coherent Soft X-ray Scat & Pol (CSX1, CSX2)
Sub-micron Res X-ray Spec (SRX)
X-ray Powder Diffraction (XPD1, XPD2)

6 NEXT Beamlines (DOE MIE)

Photoemission-Microscopy Facility (ESM)
Full-field X-ray Imaging (FXI)
In-Situ & Resonant X-Ray Studies (ISR)
Inner Shell Spectroscopy (ISS)
Soft Inelastic X-ray Scattering (SIX)
Soft Matter Interfaces (SMI)

3 ABBIX Beamlines (NIH)

Frontier Macromolecular Cryst (FMX)
Flexible Access Macromolecular Cryst (AMX)
X-ray Scattering for Biology (LIX)

5 Partner Beamlines

Spectroscopy Soft and Tender (SST1, SST2)
Beamline for Mater. Measurements (BMM)
Microdiffraction Beamline (NYX)
X-ray Footprinting (XFP)

8 NxtGen Beamlines

Complex Materials Scattering (CMS)
Magneto, Ellipso, High Pressure IR (MET/FIS)
Metrology & Instrum Development (MID)
In-situ X-ray Diffraction Studies (IXD)
Materials Physics & Processing (MPP)
Quick X-ray Absorption and Scattering (QAS)
Tender X-ray Absorption Spectroscopy (TES)
X-ray Fluorescence Microscopy (XFM)

Other Beamline Projects Status

- NEXT Beamlines
 - CD-3 Review took place Mar 20-21, 2014
 - Identified some issues with project schedule performance
 - Made changes in project work organization and personnel work assignments, and increased project oversight
 - DOE approved CD-3 on July 7
 - Follow-up status review to be held Aug 12-13
- ABBIX Beamlines
 - Overall 38% complete
 - Hutches complete, utilities underway
 - Photon Delivery System procurements continuing
 - Good cost performance enabled \$4.7M in scope additions to ensure completion of all three beamlines
 - 5 year P41 Operations proposal submitted in Sep, 2013 to NIH/BER; Site review held Mar 12; preliminary feedback is NIH/BER will cofund at close to the requested amount
- NxtGen Beamlines
 - Focussed on refining baseline in anticipation of review in late summer



Considerations for Development of Additional Beamlines

- We are having discussions with our Science Advisory Committee on various considerations to prioritize and select additional beamlines for future development
- The SAC has been very engaged in these discussions and made the following recommendations for us to consider:
 - Capabilities Gap Analysis Based on Community Needs
 - Anticipated Capacity Needs (for both standard & cutting-edge NSLS-II beamlines)
 - Capitalize on World-leading Properties of NSLS-II
 - BNL Strategic Science Directions
- We have worked with the SAC to further develop our strategic plans in response to these recommendations

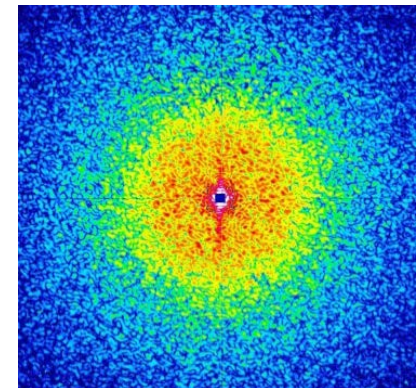
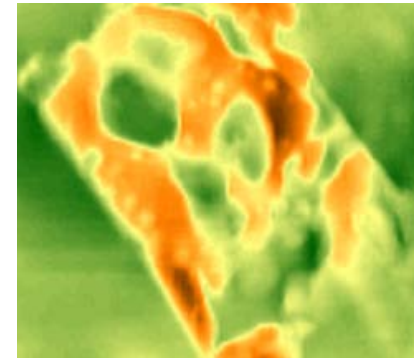
Capability Gaps in Current NSLS-II BL Portfolio

- The 30 beamlines currently under development at NSLS-II will bring a broad range of leading capabilities to the scientific community
- Each scientific community typically requires a complete suite of capabilities to pursue their research
- Looking at the complete picture, we see that our current beamline portfolio has the following capability gaps:
 - High-resolution hard x-ray inelastic scattering for probing electronic excitations in hard condensed matter
 - Materials structural analysis under dedicated in-operando and extreme conditions that require large-scale dedicated experimental setup
 - Soft x-ray spectroscopic microscopy in both scanning and full-field modes for soft matter, environmental, and biological applications
 - Spatially resolved diffraction for grain-mapping in materials engineering
 - Pump-probe fast-timing with high-rep-rate and femto-second pulses



Anticipated Capacity Needs for Cutting-Edge Capabilities Already Being Developed at NSLS-II

- First Experiments Proposals requesting science commissioning beamtime at the NSLS-II Project Beamlines provides a quick early glimpse of user demands and community interests for specific types of cutting-edge capabilities
- It appears that coherent scattering and high-resolution spectroscopic imaging are the two areas where unique capabilities have attracted high demands (already heavily oversubscribed based on the requested and the estimated available beam days during science commissioning)
- This observation is consistent with the evolving trends at other 3rd-generation SR facilities, such as at APS and ESRF



Multi-Purpose High-End Beamlines to Meet the Diverse Community Needs

- The initial suite of NSLS-II project beamlines will provide cutting-edge world-leading capabilities and, being at the cutting-edge, multiple modalities have been developed that will serve diverse scientific communities
- All capability modalities at a given NSLS-II beamline (e.g. nano-XRF imaging and nano-XRD imaging) are developed to ensure world class performance, and this has attracted considerable demand from the community as evidenced in First Experiments Proposal requests
- It is expected that such high user demands for cutting-edge capabilities will continue to grow from multiple scientific communities that often require specialized sample environments (e.g. in-situ battery cells vs cryo-preservation for biology), making efficient operations of such beamlines challenging
- The next phase of beamline development at NSLS-II will need to address this user demand issue, by considering building out additional 'high-end' beamlines with similar cutting-edge capabilities but tailored towards specialized sample environments for different communities

Strategy for Future NSLS-II Beamlines

- Taking all these considerations into account, the strategy for future NSLS-II beamlines will be to complete the portfolio of scientific capabilities by developing additional beamlines that:
 - provide additional cutting-edge capabilities with specialized sample environments and handling tailored towards specific communities
 - ensure NSLS-II's leadership role in developing science programs that meet the growing interest world-wide in high-resolution imaging and coherence
 - meet the unmet needs of the scientific community aligned with one or more BNL strategic priority research areas

Strawman Plan for Future NSLS-II Beamlines

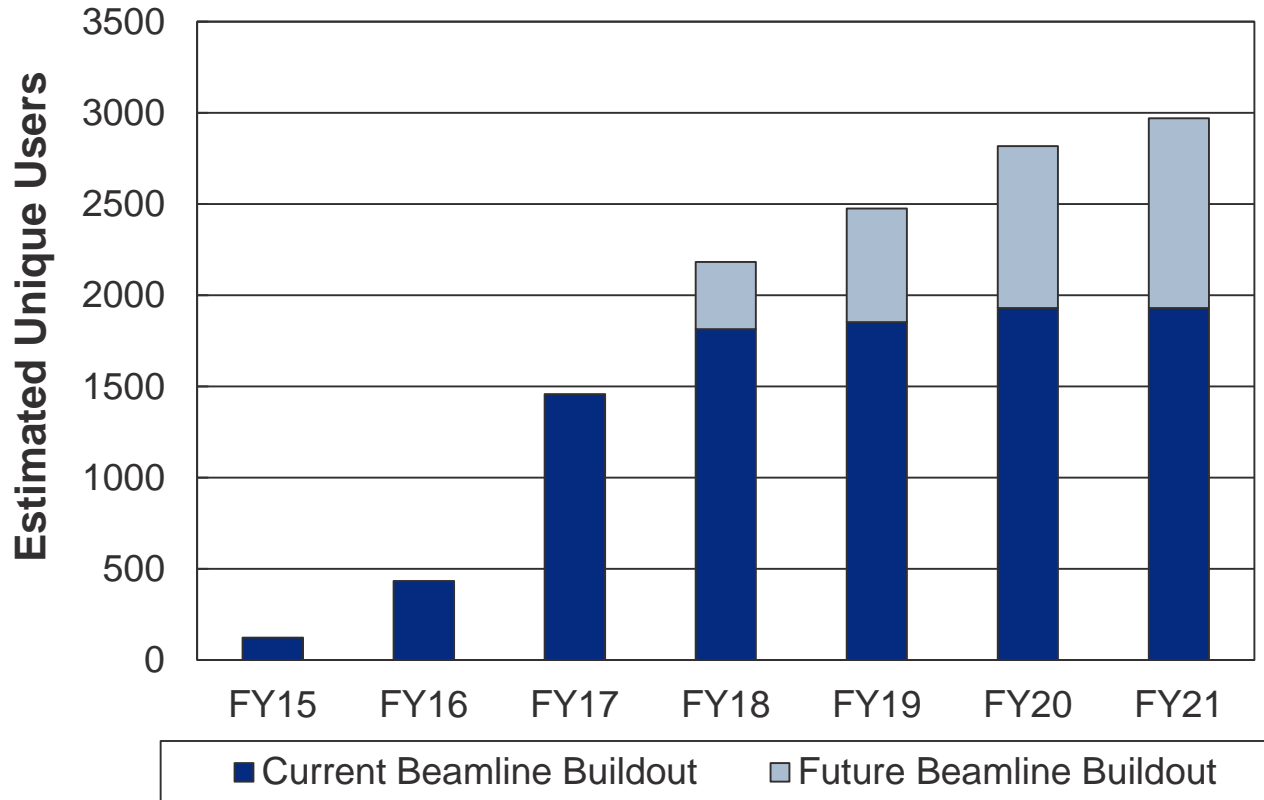
- Planning for future beamlines with PS Science Advisory Committee
 - Gap analysis of capabilities versus community needs
 - Anticipated capacity needs (for both standard & cutting-edge beamlines)
 - Prioritize based on NSLS-II world-leading properties
 - Integrate with BNL strategic science directions
- Strategy and compelling benefits:
 - Specialized sample environments
 - Leadership in high-resolution imaging and coherence
 - Satisfy unmet needs
- Strawman plan provides 20 additional beamlines beyond the current 30 under development (total of 50 beamlines)

	Potential Funding Source
Nano-Imaging & Coherence	
X-ray Fluorescence Nanoprobe*	DOE-BER
Hard IXS Nanoprobe for Electronic Excitations*	DOE-BES
Scanning Microscopy Facility for Mat Sci*	DOE-BES
Coherent Diffraction Imaging*	DOE-BES
Multiscale X-ray Diffraction*	DOE-BES
Scanning Transmission X-ray Microscope	Add'l NxtGen
Soft X-ray Full-Field Transmission Microscope	DOE-BES
Additional Capabilities & Capacities	
Low-Energy Anomalous X-ray Diffraction MX*	Partner
Infrared Imaging	DOE-BER
Micro-tomography for Materials Science	Add'l NxtGen
Correlated Spectroscopy and MX	DOE-BER
Soft X-ray Scattering and Spectroscopy	Add'l NxtGen
Biological X-ray Absorption Spectroscopy	Add'l NxtGen
Industrial Small Angle X-ray Scattering	Add'l NxtGen
In-situ Combinatorial Structural Biochemistry	NIH
Capabilities with Dedicated Sample Environment	
High Energy X-ray Diffract for Mat Eng / Battery*	DOE/3rd Party
Materials in Radiation Environment*	NNSA/DOE-NE
4-D Studies in Extreme Environment*	NSF
Time resolved Studies in Extreme Conditions*	NSF
Fast Timing Capabilities	
Electron Beam Slicing for Ultrafast Science*	DOE-BES

*Insertion Device Beamline

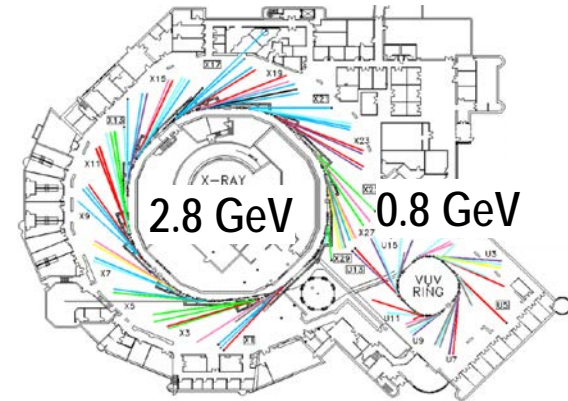
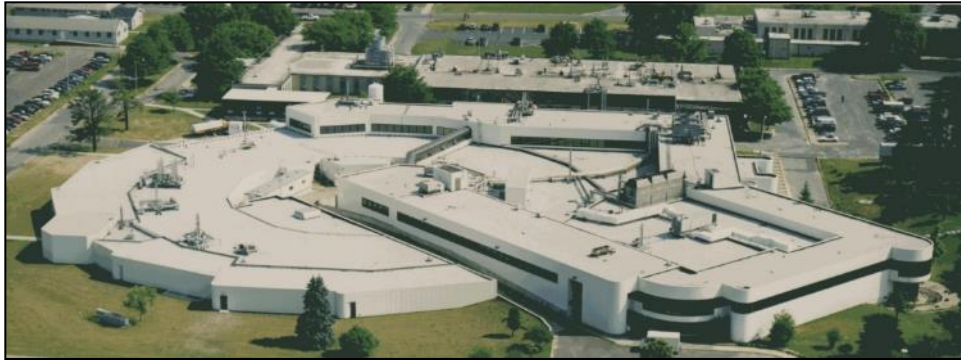


NSLS-II Beamline & User Ramp-up

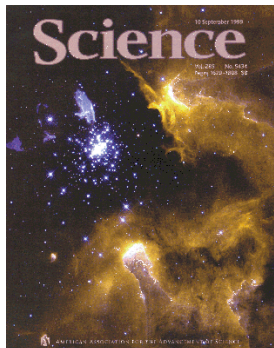
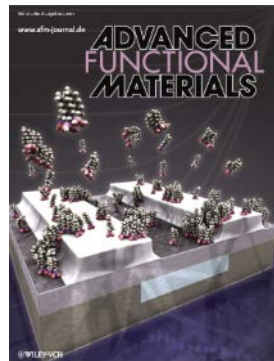


- Assumes future buildout of an additional 20 beamlines beyond the current 30 under development (total of 50 beamlines including all but 2-3 ID beamlines)
- Fully instrumented facility will have ~ 70 beamlines and support > 4000 users/yr
- Unique users estimated as 50% of total users (based on NSLS experience)

NSLS in Its Final Year of Operation as an Outstanding Scientific User Facility

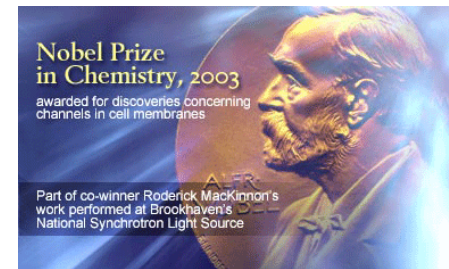


59 Beamlines



- **NSLS Tradition and Strengths:**
 - Broad range of science programs
 - Diverse capabilities over broad spectral range
 - Highly engaged and productive user community
- **Highly Productive & High Impact**

	FY13	Since 1982
• Users	2,367	~ 57,000
• Publications	881	17,182
• Protein Databank Deposits	~ 600	7,122
• 2 Nobel Prizes (2003, 2009)		
- **Operating Schedule**
 - Plan to provide maximum operating hours for remainder of FY14
 - No extended maintenance shutdowns planned for the summer, to reduce start-up overhead and cold-start issues
- **Will cease operations on Sep 30, 2014**



NSLS Commemoration Events Being Planned

- Two events being planned to commemorate over 32 years of great scientific achievements at NSLS and to mark its official closing



- NSLS Last Light Celebration: *September 30, 2014 (tentative)*

- Celebrating the occasion of the last light at NSLS with interested staff and users
- Picnic style dinner sponsored jointly by PS and PS UEC
- Remarks by staff and users

- NSLS Science Symposium: *Date TBD*

- Celebrating 32 years of outstanding scientific productivity and impact as well as community development
- Commemorating pioneering science and technology accomplishments
- Recognizing the critical role that NSLS played in developing the photon sciences community

NSLS User Coordination with Other Facilities

- We have been actively coordinating with the other SR facilities (APS, ALS, SSRL, CHESS) and plan to commit staffing and resources to help users during the transition
- Arrangements are being made in areas where users have been productive at NSLS and/or will be strategically important to the science programs at NSLS-II:
 - X-ray Spectroscopy: SSRL BL2-2 (~80% available beamtime)
 - Spectroscopy collaboration: Case Western (NSLS X3A), SCC, and PS
 - Protein Crystallography: ALS - distributed among several PX beamlines), SSRL - BL14-1 (50%)+ access to ID beamline(s), and APS - 23-BM (50 %) + access to 23-ID
 - Energy Dispersive XRD: APS 6-BM (~58%)
 - EDX collaboration (COMPRES for 6-BM-B, Materials/Battery Group for 6-BM-A)
 - Infrared Program: ALS 1.4 & 5.4 (~15%)
 - Approved Program Proposal has been approved by ALS; Beam time effective Oct 2014
 - Detector R&D Program: ALS BL 3.2.2 (50%)
 - Transmission X-ray Microscopy: SSRL BL 6-2 and APS 32-ID
 - Discussions ongoing with SSRL and APS to gain access for the expanding nano-CT community
 - Radiation Detector Program (BNL-NNS): ALS 3.2.2 (50%) and APS MR-CAT (15%)
 - CHESS intends to accommodate some former NSLS users on XRD and MX beamlines

NSLS User Transition Plans Being Implemented

Major User Group/Consortium	Current		Near Term		Long Term	
	NSLS Beamline	Status	Beamline	Status	NSLS-II Beamline	Status
Center for Functional Nanomaterials (CFN)	X9	CU	CHX	GU	SMI, CMS	PUAs signed
	X1A1	CU	CSX-2	PUP approved	CSX-2	PUP approved
	U5UA	CU	Lab-based		ESM	PUP next round
Synchrotron Catalysis Consortium (SCC)	X18A, X18B	CU	SRX, SSRL 2-2	MOU in progress	ISS, QAS	PUA-QAS signed
	X19A	CU	SSRL 2-2	MOU in progress	TES	PUA signed
GeoSoilEnviro CARS (GSE-CARS)	X26A/X27A	PRT/CU	SRX, APS Sect-13		SRX, XFM, TES	PUA-XFM signed
Protein Crystallo. Res Resource (PXRR)	X25, X29, X12B/C, X26C	Facility	SSRL 14-1, APS 23BM/ID, ALS PX Group	MOU-SSRL signed; MOU-APS/ALS in progress	FMX, AMX, SM3	GU
NY Structural Biology Center (NYSBC)	X4A, X4C	PRT			NYX	PUA under discuss.
East Coast Structural Biology Consortium	X6A	Facility			FMX, AMX	GU
Case Center for Synchrotron Bioscience (CSB)	X29	CU	SSRL 14-1	MOU signed	FMX, AMX	PUA signed
	X3A, X3B	PRT	SSRL 2-2	MOU in progress	ISS	PUA signed
	X28C	PRT			XFP	PUP next round
Consortium Mat Prop Res in Earth Sci. (COMPRES)	X17C	CU	XPD-1	PUA signed	XPD-1, New BL	PUA signed
	X17B2/B3	CU	APS 6BM	MOU in progress	New SCW BL	BDP approved
	U2A	CU	Lab-based		FIS/MET	PUP next round
Energy Dispersive XRD for Materials & Battery Research (EDX)	X17B1	CU	APS 6BM	MOU in progress	New SCW BL	BDP approved
National Institute of Science & Technology (NIST)	X23A2	PRT	SSRL 2-2	MOU in progress	BMM	PUP next round
	U7A, X24A	PRT			SST-1, SST-2	PUP next round
Center Emergent Superconductivity (CES)	U13UB	PRT	Lab-based		ESM	PUP next round
	X1A2	PRT	CSX-1	PUA signed	CSX-1	PUA signed
Radiation Detectors Research (BNL-NNS)	X27B	PRT	ALS 3.2.2 APS 10BM	ALS AP approved; APS MR-Cat joined	MID	PUA signed
Rapid Acquisition PDF (BNL-CMP)	X17A	CU	XPD-1	PUP approved	XPD-2	PUP approved
Chemistry XRD Consort. (BNL-Chem)	X7B	PRT	XPD-1	PUP approved	XPD-1, IXD	PUP approved
Liquid Surface Science (LSS)	X22B	PRT			SMI	PUP approved
Microelectronics R&D - IBM	X20A, X20C	PRT	CLS		MPP	PUP next round
Infrared Imaging (IRI)	U2B, U10B	Facility	ALS 1.4 & 5.4	ALS AP approved	IRI	GU
Transmission X-ray Microscopy (TXM)	X8C	Facility	SSRL 6.2, APS 23ID	Under discussion	FXI	GU

12th International SRI Conference (SRI 2015)



Synchrotron Radiation Instrumentation Conference 2015

The National Synchrotron Light Source II at Brookhaven National Laboratory will host the 12th International Conference on Synchrotron Radiation Instrumentation in New York City in July of 2015.

Please **mark this event** on your calendar and check this page or follow us on [Twitter @SRI2015NYC](#) for up-to-date information on speakers, session topics, and events related to SRI 2015.

<http://www.bnl.gov/sri2015>

Conference Date

July 5-10, 2015

Conference Location

NY Marriott Marquis (Times Square)
1535 Broadway
New York, NY 10036 USA

[Maps & Transportation](#)



U.S. DEPARTMENT OF
ENERGY

Office of
Science

NSLS-II: A Bright Future

- NSLS-II Project continues to make excellent progress
 - On track for early completion, on budget, substantial added scope
- 30 beamlines under development
- Commissioning proceeding well & early operations plans well developed
- Planning for first experiments underway
- Strategic planning underway to drive development of future NSLS-II beamlines
- Looking forward to fast ramp up to an exciting science program

