

Workshop for Industry Researchers

Brookhaven National Laboratory

December 14-17, 2020

All times are Eastern Time (ET)

Monday, December 14

Presentations from NSLS-II and CFN and industry researchers

Chairs: Chuck Black, John Hill, Jun Wang (BNL)

10:30 am	Welcome/Charge of the workshop	Chuck Black (BNL)
10:40 am	Synchrotron light sources and basic research at ExxonMobil	Pedro Serna (ExxonMobil)
11:10 am	Innovative chemistry through advanced microscopy techniques	Ke-Bin Low (BASF)
11:30 am	Bio-inspired invisible glass: from nature to commercialization	Calvin Cheng (Edgehog)
11:45 am	Overview of capabilities of NSLS-II and CFN	John Hill (BNL)
12:15 pm	BREAK	
1:00 – 5:00 pm	Open House (concurrent sessions at CFN & NSLS-II) CFN: Nano-IR, sSNOM Overview of the PTIR, s-SNOM and nanoTA methods and capabilities with some examples (1:00 – 1:30 pm) Q&A session (1:30 – 1:40 pm) Video of a PTIR experiment (1:40 – 2:10 pm) Q&A session (2:10 – 2:20 pm) Live demonstrations with samples (2:20 – 4:00 pm) User samples: <ul style="list-style-type: none">• Polykala Technologies - polyimide film• s-SNOM on monolayer and bilayer graphene on silicon wafer	Sam Tenney (BNL) Moderator: Priscilla Antunez (BNL)
1:00 – 3:00 pm	NSLS-II: X-ray scattering (CMS beamline) Beamline introduction (1:00 – 1:30 pm) User samples (1:30 – 3:00 pm): <ul style="list-style-type: none">• Latex particle dispersions in water• Molecular Sieve membranes	Masa Fukuto (BNL) Moderator: Lisa Miller (BNL)
3:00 – 5:00 pm	NSLS-II: X-ray diffraction & PDF (XPD beamline) Introduction to XPD presentation- PPT presentation (3:00 – 3:30 pm) Powder Diffraction from sample loading to Data Analysis- Video presentation (3:30 – 4:00 pm) Q&A Session (4:00 – 4:15 pm)	Sanjit Ghose (BNL) Moderator: Cara Laasch (BNL)

Discussion on Industrial User's Data: Presentation & Q&A (4:15 – 5:00 pm)

Sanjit Ghose / Eric Dooryhee / Jianming Bai (BNL)

Tuesday, December 15

DOE programs relevant to industry researchers Q&A

Chair: Martin Schoonen (BNL)

10:30 am	DOE SBIR/STTR Program	Manny Oliver (SBIR/STTR Program Office, DOE)
10:45 am	DOE TIR Program	Eli Levine (Advanced Manufacturing Office, DOE)
10:55 am	DOE TCF Program	Zack Baize (Office of Technology Transitions, DOE)
11:05 am	BNL Strategic Partnership Program	Ivar Strand (BNL)
11:20 am	Q&A	
12:15 pm	BREAK	

Open House (concurrent sessions at CFN & NSLS-II)

1:00 – 5:00 pm	CFN: Electron Microscopy Introduction (1:00 – 1:30 pm) Demo sample (thin film sample) (1:30 – 2:30 pm) User samples (2:30 – 4:00 pm): <ul style="list-style-type: none">• battery cathode materials	Sooyeon Hwang (BNL) Moderator: Pam Ciufo
1:00 – 5:00 pm	NSLS-II: Soft X-ray Spectroscopy (IOS beamline) Beamline introduction (1:00 – 1:45 pm) User samples (1:45 – 5:00 pm): <ul style="list-style-type: none">• battery cathode materials (XAS)• molecular sieve membranes (AP-XPS)• materials for semiconductor process control (XAS, AP-XPS)	Ira Waluyo (BNL) Moderator: Gretchen Cisco / Mercy Baez (BNL)

Wednesday, December 16

Lessons learned by industry users of BNL facilities -- panel discussion

Chairs: Yan Gao (GE), Karren More (ORNL)

10:30 am	Panel discussion	Carter Abney (ExxonMobil) Donald Dimarzio (Northrup Grumman) Eugene Lavelly (BAE)
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11:30 am	BREAK	Stan Petrash (Henkel)
1:00 – 5:00 pm	<p>Open House (concurrent sessions at CFN & NSLS-II)</p> <p>CFN: Ambient Pressure X-ray Photoemission Spectroscopy</p> <p>Instrument Introduction (1:00 – 1:30 pm)</p> <p>User samples (1:30 – 5:00 pm):</p> <ul style="list-style-type: none"> • PPE materials • Gas trapping silicates 	<p>Ashley Head (BNL)</p> <p>Anibal Boscoboinik (BNL)</p> <p>Moderator: Priscilla Antunez (BNL)</p>
1:00 – 3:00 pm	<p>NSLS-II: X-ray spectroscopy (BMM beamline)</p> <p>Beamline introduction (1:00 – 1:45 pm)</p> <p>User samples (1:45 – 5:00 pm):</p> <ul style="list-style-type: none"> • Iron nanoparticles in solution (XAFS) • Aluminosilicate beads doped with nickel (XAFS) 	<p>Bruce Ravel (NIST)</p> <p>Moderator: Lisa Miller (BNL)</p>
3:00 – 5:00 pm	<p>NSLS-II: Submicron resolution x-ray spectroscopy (SRX beamline)</p> <p>Beamline introduction</p> <p>Sample preparation</p> <p>User samples:</p> <ul style="list-style-type: none"> • Battery electrode particles (XRF) <p>Data analysis and post-processing</p>	<p>Andrew Kiss (BNL)</p> <p>Yang Yang (BNL)</p> <p>Moderator: Mercy Baez / Gretchen Cisco (BNL)</p>

Thursday, December 17

Help desk and other DOE user facilities Q&A

Chairs: Priscilla Antunez, Lisa Miller (BNL)

10:30 am	Industry research program, procedures and policy	Jun Wang (BNL)
10:45 am	How to write a good nonproprietary industrial proposal	Priscilla Antunez (CFN) Lisa Miller (NSLS-II)
11:00 am	<p>Overview of other DOE BES user facilities followed by Q&A</p> <p>See ANL supplemental video</p> <p>See APS supplemental video</p> <p>See LBNL supplemental video</p>	<p>Denny Mills, Ilke Arslan (ANL)</p> <p>Andreas Scholl, Branden Brough (LBNL)</p> <p>Paul McIntyre (SLAC)</p> <p>Karren More (ORNL)</p>
12:10 pm	Closing Remarks	Jim Misewich (BNL)
12:15 pm	BREAK	
1:00 – 5:00 pm	<p>Open House (concurrent sessions at CFN & NSLS-II)</p> <p>CFN: Nanofabrication</p> <p>Introduction to nanofabrication at the CFN</p>	<p>Aaron Stein (BNL)</p> <p>Moderator: Priscilla Antunez (BNL)</p>

Single-digit patterning using aberration-corrected STEM

Process demonstration: biomimetic structures using self-assembly techniques

Scanning electron microscopy demonstration

This will be a discussion-based workshop with video examples, demos, and plenty of time to ask questions, discuss processes and potential applications, and ask questions of the CFN staff.

CFN: Aberration-corrected e-beam lithography

Fernando Camino (CFN)

Moderator: Priscilla Antunez (BNL)

Jean Jakoncic (BNL)

1:00 – 5:00 pm

NSLS-II: Macromolecular Crystallography (AMX beamline)

Overview of the MX micro-focus beamlines at the NSLS-II: AMX and FMX (1:00 – 1:30 pm)

Overview of the LIX beamline (1:30 – 1:45 pm)

Overview of the CryoEM Center (1:45 – 2:00 pm)

Live demonstration at the AMX beamline (2:00 – 4:00 pm)

User samples:

- High throughput/high resolution GSAM: GGCSID
- Beta propellers

Lin Yang (BNL)

Liguo Wang (BNL)

Jean Jakoncic (BNL)/

Alexei Soares (BNL)