

HPCAT NEWSLETTER – MARCH 2024

APS and HPCAT-Upgrade and plan for resumption of work

Below are some critical timelines for the ongoing APS-Upgrade and HPCAT-Upgrade and path forward:

- Week of March 25 – DOE holding APS-U and Accelerator Readiness Review (ARR). This is a critical step in APS introducing current in the storage ring (initially starting at ~25mA and gradually increasing to 200mA target current over the next year)
- Early/mid-April – Following DOE ARR, storage ring ops would commence
- By May – APS start delivery of x-ray beam to experimental stations
- May-September
 - Experimental stations will work with APS on radiation surveying and getting approvals for ops
 - Over this period, each station will also work on commissioning
- HPCAT commissioning and restart of user support will be performed in phased approach
 - ID-B (General purpose and laser heating table) to complete final equipment install and commissioning by October. Initial user visits expected to begin by the end of 2024 (APS cycle 2024-3)
 - BM-B (PE press dedicated station) to complete final equipment install and commissioning by December. Initial user visits expected to begin in early 2025 (APS cycle 2025-1)
 - BM-D (dedicated white beam Laue and mono-beam XRD) to complete final equipment install and commissioning by February 2025. Initial user visits expected to begin in 2025 (APS cycle 2025-1/2025-2 timeframe)
 - ID-D (dedicated spectroscopy, inelastic, and SAXS setup) to complete final equipment install and commissioning by February 2025. Initial user visits expected to begin in 2025 (APS cycle 2025-1/2025-2 timeframe)
 - ID-E station is currently being set up as the future dedicated station for sub-micron beam and x-ray microscopy. Install effort is ongoing and contingent on funding. Further details will be provided in coming months

All restart efforts and timelines for HPCAT's phased restart are contingent on APS-U timelines and DOE reviews, as noted above. APS has initiated a call for proposals for upcoming cycles, below is the list of experimental stations accepting GU proposals for 2024-2. For HPCAT, please plan your proposals in line with timelines provided for ID-B, BM-B, BM-D, and ID-D.

APS is accepting **proposals for select APS Beamlines** for 2024-2 cycle (June - August 2024)

Submission Deadline: March 29, 2024 <https://ups.servicenowservices.com/ups>

1-ID-B,C,E	High-energy X-ray Scattering
5-ID-B,C,D	DND-CAT Insertion Device
7-ID-B,C,D	Time Resolved Scattering and Spectroscopy
8-ID-E,I	X-ray Photon Correlation Spectroscopy (XPCS)
9-BM-B,C	X-ray Absorption Spectroscopy Beamline
9-ID-D	Coherent Surface Scattering Imaging (CSSI)
10-ID-B	MR-CAT Insertion Device Beamline
11-ID-B	Total scattering and powder diffraction
11-ID-C	High-energy x-ray scattering (HEXS)
13-BM-D	GSECARS Bending Magnet End Station
20-BM-B	X-ray Absorption Spectroscopy
23-ID-B	GM/CA-XSD Life Sciences
24-ID-E	NE-CAT Life Sciences
25-ID-D,E	SPC / TRR
26-ID-C	CNM Hard X-ray Nanoprobe
27-ID-B	Resonant Inelastic X-ray Scattering
29-ID-C,D	IEX - Intermediate Energy X-ray
30-ID-B,C	HERIX
33-BM-C	Multi-Purpose General Scattering

For overall **APS upgrade status** please see:

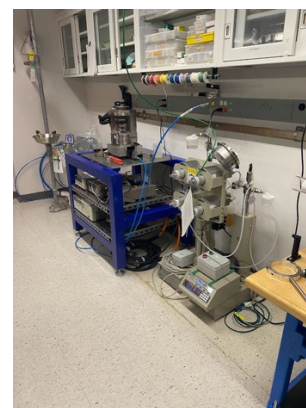
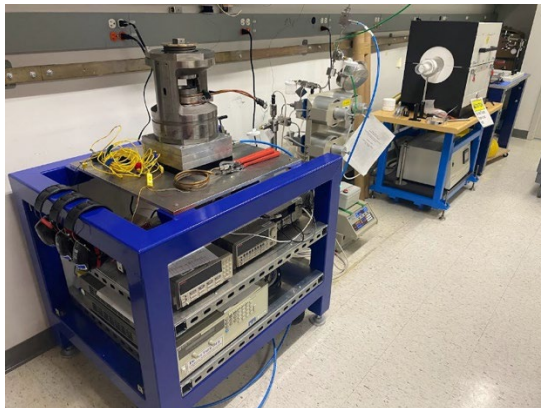
<https://content.govdelivery.com/accounts/USDOEANL/bulletins/386af14>

News and Highlights

Offline user experiments at HPCAT

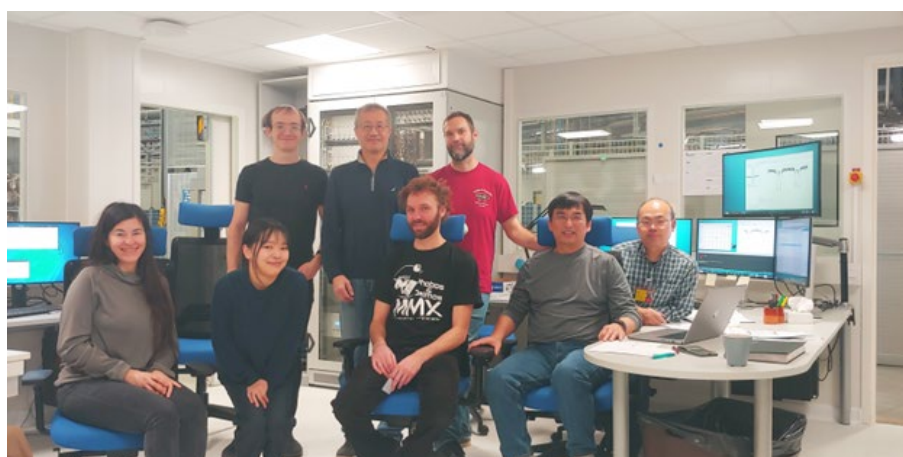
- During the ongoing upgrade shutdown HPCAT is available for limited offline user support. Some of the available offline capabilities include:
 - Sample lab
 - Paris-Edinburgh (PE) press experiments
 - Raman measurements
- Please reach out to Zulu zulu@anl.gov and Freda fhumble@anl.gov for additional information and requests for onsite visits during the shutdown
- Recently, Dr. Paul Baker, from Professor Yogesh Vohra's UAB research group, performed experiments using the newly commissioned offline Paris-Edinburgh (PE) press setup. PE was used to synthesize novel boron carbides as well as high entropy alloys by compressing and heating the appropriate precursor materials to 12,000 psi and 2000 °C. Offline PE setup and experiments, which required a substantial effort by HPCAT and UAB team, is critical in maintaining our user community scientific research efforts and progress during the upgrade shutdown.

Offline PE set up in the HPCAT 401 lab at APS



HPCAT staff and APS colleagues visit the recently upgraded ESRF

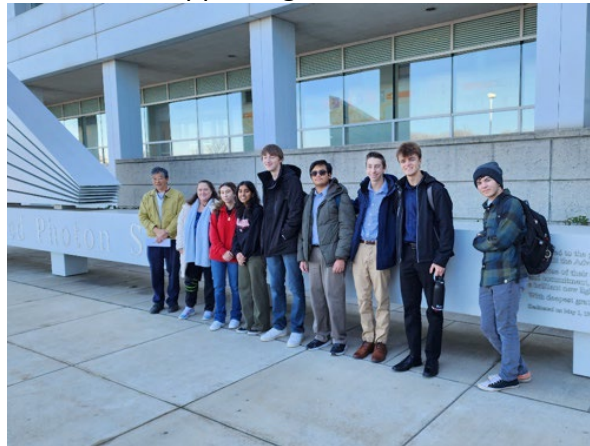
Yuming Xiao recently visited and performed nuclear resonant scattering measurements at ID14, the newly commissioned beamline at ESRF. Yuming, along with APS colleagues Jiyong Zhao and Michael Hu from IXN group of XSD-ANL and Barbara Lavina from SEES of UChicago, used the opportunity to measure spin state of varied ^{57}Fe contained materials under ambient and high-pressure conditions, while also engaging with ESRF colleagues and exchanging valuable insight into the operation of the newly upgraded ESRF.



Outreach and user opportunities

- As part of the upcoming APS users meeting (all onsite at APS-ANL May 6-10, 2024), HPCAT staff are coordinating a number of important workshops focusing on continuing to push cutting edge research with the new APS-U beam. Final workshop list and agenda have been posted <https://www.aps.anl.gov/Users-Information/User-Community/Users-Meetings>

- Innocent Ezenwa will present an invited talk on Friday, May 24th [Events - FORCE: Facility for Open Research in a Compressed Environment \(asu.edu\)](#)
- HPCAT beamline scientist, Paul Chow, has been working with local area students, as part of the Exemplary Student Research Program (ESRP) administered by Argonne’s Educational Outreach department. The program is a great opportunity for students to learn about various STEM programs and interact with leading scientists at ANL. HPCAT has been an active participant over the years in hosting students and supporting various ANL outreach programs in STEM.



Job postings and various opportunities

- The [2025 APS Compression of Condensed Matter \(GCCM\) Student and Dissertation Research Award](#) will be presented to recognize outstanding work by a researcher within *two years of PhD completion*. The honor includes a \$2000 stipend. The recipient will be recognized at the March Meeting or SCCM conference and will give an invited presentation on their work. The nomination deadline is **June 3, 2024**
- Sandia National Laboratory is preparing for the *15th Z Fundamental Science with Pulsed Power: Research Opportunities and User Meeting* (tentatively scheduled for Wednesday-Friday, August 7-9, 2024). The Workshop is an opportunity for the external Z user community to discuss new collaborative research ideas, hear about the Z accelerator facility status and future plans, and discuss research directions and ideas for new work on Z. For additional information and to be included on email-distribution list reach out to Marcus Knudson, SNL staff scientist, mdknuds@sandia.gov
- The National Nuclear Security Administration (NNSA) has published the Minority Serving Institution Partnership Program Notice of Funding Opportunity (NOFO) **DE-FOA-0003285** on grants.gov and fedconnect.net. - due date for applications is **June 15, 2024, by 11:59 PM EST**

Upcoming events

Submission Deadline: Mar 29	APS is accepting proposals for select APS Beamlines for 2024-2 cycle (June - August 2024) https://ups.servicenowservices.com/ups
April 15	Monthly High Pressure Interest Group Meeting 1pm CDT Speaker: Jung-Fu “Afu” Lin , (University of Texas at Austin) Title: TBA
April 24	APS PUC/User meeting
May 1	HPCAT EC quarterly
May 6-10	APS User meeting, at APS-ANL https://www.aps.anl.gov/Users-Information/User-Community/Users-Meetings
May 20-24	14th International Conference on High Energy Density Laboratory Astrophysics HEDLA-2024, Tallahassee, Florida
May 24	Innocent Ezenwa to present at ASU’s Force Seminar series
Deadline: June 1, 2024	Call for Neil Ashcroft Early Career Award for Studies of Matter at Extreme High Pressure Conditions from American Physical Society Topical Group on Compression of Condensed Matter (APS-GCCM) https://engage.aps.org/gccm/honors/prizes-awards
Deadline: June 1, 2024	Call for George E. Duvall Shock Compression Science Award (via SCCM) https://www.aps.org/programs/honors/prizes/shock.cfm To recognize contributions to understanding condensed matter and non-linear physics through shock compression.

Deadline: June 3, 2024	Send nominations for 2025 APS Compression of Condensed Matter (GCCM) Student and Dissertation Research Award to sduwal@sandia.gov
June 23 – 28	Asia Oceania Geosciences Society (AOGS) 2024, In South Korea Pyeongchang, Gangwon-do, Korea. https://www.asiaoceania.org/aogs2024/public.asp?page=home.asp
July 13-14	Gordon Research Seminar - Research at High Pressure (GRS) Opportunities for High-Pressure Science Beyond Equilibrium Conditions https://www.grc.org/research-at-high-pressure-grs-conference/2024/
July 14-19	GRC Research at High Pressure (Gordon Research Conference - Exploring Matter Beyond Equilibrium) https://www.grc.org/research-at-high-pressure-conference/2024/
July 28 – Aug 9	The National School on Neutron and X-ray Scattering (NXS) will be held July 28 - August 9, 2024
July 31	APS PUC/User meeting
Aug 1	HPCAT EC quarterly
Aug 18-23	Goldschmidt2024 Conference in Chicago, IL https://conf.goldschmidt.info/goldschmidt/2024/goldschmidt/2024/meetingapp.cgi
Oct 23	APS PUC/User meeting
Oct 30	HPCAT EC quarterly