



# HPCAT NEWSLETTER – SEPTEMBER/OCTOBER 2024

## APS and HPCAT-Upgrade Status

Over the last month, APS and HPCAT have continued with effort on upgrade and resumption of work. A lot of exciting steps were achieved. Before sharing some highlights, we would like to note some major status updates:

- APS storage ring has been in operation for last few months and currently has at least 100+mA continuously stored (at 120mA currently and pushing to higher) and providing x-ray to experimental stations. For status of storage ring see <https://www.aps.anl.gov/Machine-Status>
- HPCAT has resumed operations in the 16ID-B station, with both General Purpose (GP) and Laser Heating (LH) operational. We hope that you have attended our HPCAT all-hands meeting Oct. 10<sup>th</sup> where we covered details about overall HPCAT status. In case you missed the meeting, please email Freda Humble [fhumble@anl.gov](mailto:fhumble@anl.gov) for copy of relevant slides.

### HPCAT status overall:

Experimental Station	Current Status	Planned full user resumption
16ID-B (GP and LH table)	<ul style="list-style-type: none"> <li>• Scientific commissioning 2024-3 and limited user experiments</li> <li>• Operational and accepting General User (GU) proposals currently for 2025-1 cycle.</li> </ul>	OPEN for General Users (GU) in 2025-1 via open GU proposal call (GU deadline Oct. 25, 2024) <a href="https://ups.servicenowservices.com/ups">https://ups.servicenowservices.com/ups</a>
16BM-B (Paris-Edinburgh Station)	<ul style="list-style-type: none"> <li>• Final installation</li> <li>• Start commissioning Nov. 2024</li> </ul>	Planned resumption with GU in 2025-2
16BM-D (dedicated DAC station with Mono and White beam setup)	<ul style="list-style-type: none"> <li>• Installation in process</li> <li>• Start commissioning Jan. 2025</li> </ul>	Planned resumption with GU in 2025-2
16ID-D (Spectroscopy and Inelastic setup)	<ul style="list-style-type: none"> <li>• New Double Crystal Monochromator and new Double Multilayer Monochromator expected to arrive and be installed in March 2025</li> <li>• ID-D planning to start technical commissioning in March 2025</li> </ul>	Resumption by late 2025-2 and into 2025-3 cycle
16ID-E (Planned setup for x-ray microscopy)	<ul style="list-style-type: none"> <li>• In development and install phase currently. Completion projected by end of 2025 (tentative)</li> </ul>	Projected late-2025/early-2026

We hope to see you at HPCAT soon, and please reach out to HPCAT staff with any questions – beamline contacts are listed under APS directory <https://www.aps.anl.gov/Beamlines/Directory> or HPCAT website <https://hpcat.aps.anl.gov/hpcat-group-members>.

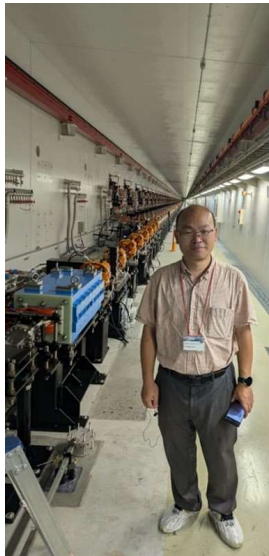
Below are some highlights from recent efforts at HPCAT:

### **Axilon was on site for BDCM1 installation in 16ID-A station, in September-October 2024**

BDCM1 is the last major component for delivery of x-ray to 16ID-B experimental station (which is now operational and accepting GU proposal for 2025-1).



## **News and Highlights**



**HPCAT staff scientist Yuming Xiao attended** the 13th International Conference on Inelastic X-ray Scattering, IXS2024, held in Himeji, Japan September 8-13, 2024. He presented a poster titled “Inelastic X-ray Scattering under High Pressure at HPCAT-U”. The conference organized a SPring-8 and SACLAL tour, shown in below is a photo taken inside SACLAL accelerator tunnel.

Dr. Yuming Xiao also presented an invited talk at the 9th North American Mössbauer International Symposium held at ORNL Sept 20-21, 2024 titled "Nuclear Resonant Scattering Program at HPCAT after APS-U". This symposium brings together scientist and practitioners of Mossbauer spectroscopy from North America and internationally. Yuming used this opportunity to present new developments which will be available at 16 ID-D after the APS Upgrade and discuss them with current and potential user groups. At ORNL, Yuming joined a tour on Spallation Neutron Source and visited a couple SNS instruments such as ARCS and SNAP.



### **Congratulation to Dr. Matthew Brennan, 2025 GCCM Student and**

**Dissertation Award.** Matthew was chosen for this prestigious honor by the American Physical Society for his exceptional work ethic, high-quality research, and dedicated service to the scientific community. As part of this recognition, Matthew will have the opportunity to present an invited talk at the SCCM 2025. Matthew has been a longtime user of HPCAT, beginning his journey as a graduate student in 2019 under the mentorship of Rebecca

Fischer (Harvard University). He joined LANL partner Blake Sturtevant's group at LANL, where he was awarded a Glenn T. Seaborg Nuclear Science Fellowship in 2022. In 2023, he was selected as a Harold Agnew National Security Postdoctoral Fellow. Currently, Matthew is a staff member of the Static High-Pressure Team within the Shock & Detonation Physics Group at LANL. He remains an active partner-user at the 16-ID-B, 16-BM-D, and 16-BM-B end-stations at HPCAT.

**Beamline Scientist Jesse Smith** attended the Pittsburgh Diffraction Society's 81st Pittsburgh Diffraction Conference, held at Cornell University in Ithaca, New York, where he was invited to give a presentation: *Opportunities in high pressure diffraction enabled by the upgraded Advanced Photon Source*. Highlights of the conference included sessions devoted to AI methods at light sources and high pressure in the physical sciences, a panel discussion on the future of user facilities for diffraction, and a thorough tour of the upgraded Cornell High Energy Synchrotron Source (CHESS) facility. HPCAT was well represented with both staff and users giving invited talks, and with frequent references to research carried out at HPCAT. The 82nd Pittsburgh Diffraction Conference will be held in 2025 at the SLAC National Accelerator Facility.

## Job postings and various opportunities

- **The Shock & Detonation Physics Group (M-9) at Los Alamos National Laboratory (LANL) has openings for multiple Postdoctoral Research Associates.** M-9 group utilizes dynamic drivers (explosives, single- and two-stage gas guns, lasers) and static high pressures (diamond anvil cells, Paris-Edinburgh presses) to study fundamental physics and chemistry of relevance to the behavior of materials at extreme pressures and temperatures. Group also perform experiments at synchrotron and free electron laser user facilities such as the Dynamic Compression Sector at the Advance Photon Source, the Linac Coherent Light Source at SLAC, Sandia's Z-machine, DESY, and the European XFEL. Our research informs multiscale models for equations of state used in the DOE's science-based stockpile stewardship assessment. More info at <https://lanl.jobs/> Search REQ #: IRC133535.
- **Department of Earth and Planetary Sciences (EPS) and the Institute of Meteoritics (IOM) at the University of New Mexico** invites applications for an Open Rank tenure track faculty position (full, associate, assistant) in the field of Earth and Planetary Materials to begin in August 2025. For best consideration, apply by 12/16/2024. The position will remain open until filled. <https://unm.csod.com/ux/ats/careersite/18/home/requisition/31368?c=unm>
- **The Department of Geology and Geophysics at the University of Utah** invites applications for an open-rank faculty position (Assistant/Associate/Full Professor) in the area geomechanics, with emphasis on rock and fracture mechanics, fracture networks, and/or fracture characterization and modeling. We seek applicants whose research complements and grows departmental strengths in areas such as Tectonic Processes, Earth Resources and Energy Transitions, Petrology and Volcanology, Experimental Mineral Physics, Seismology and Geodesy, Geological Engineering, Earth Surface Processes, and Geologic Hazards. Research approaches might include field data generation or exploration of field analogs, numerical modeling, computational methods such as machine learning and AI, and/or laboratory experiments. Review of applications will begin Oct. 14, 2024. <https://utah.peopleadmin.com/postings/168605>
- **Post-doctoral position at Iowa State University** is available in [Dr. Valery Levitas' group](#) starting Fall of 2024 to perform experimental research on coupled plastic flow, phase transformations, and microstructure evolution under high-pressure and torsion of a sample in static and dynamic rotational diamond anvil cells. Experience with *in situ* high-pressure experimentation and/or x-ray characterization of stresses and structural changes in materials at the micron scale is desired. Close collaboration with theoretical/computational collaborators and Argonne National Laboratory of DoE is expected. Please email your application to Prof. Valery Levitas [vlevitas@iastate.edu](mailto:vlevitas@iastate.edu).

## Upcoming events

Oct 10, 2024	HPCAT User Meeting 10am CDT – IF YOU Missed the meeting please email Freda Humble <a href="mailto:fhumble@anl.gov">fhumble@anl.gov</a> for copy of relevant slides.
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Nov. 06 (rescheduled from Oct. 29)	APS PUC/User meeting
Oct 29, 2024	HPCAT EC quarterly meeting
Nov 4-5, 2024	2 <sup>nd</sup> PRESSYNC Workshop, Synchrotron Techniques Under High Pressure, SIRIUS, Brazilian Synchrotron Light Laboratory (LNLS)
Nov 6-7, 2024	34th LNLS Annual Users' Meeting (RAU), Campinas, Brazil
Dec. 9-13, 2024	AGU Fall meeting in Washington DC
Jan 14-15, 2025	FORCE facility WORKSHOP on Recent Advances in High Pressure Research – VIRTUAL
Jan 22, 2025	APS PUC/User meeting
Jan 21-24, 2025	DESY Photon Science and European XFEL Users' Meeting, DESY Campus in Hamburg (Germany).
Jan 29 (tentative)	HPCAT EC meeting
Feb 10-12, 2025	ESRF User meeting
Mar 16–21, 2025	2025 APS March meeting, Anaheim, CA <a href="https://www.aps.org/events/2025/joint-meeting">https://www.aps.org/events/2025/joint-meeting</a>
Mar 23-27, 2025	TMS Annual Meeting in Las Vegas, NV <a href="https://www.tms.org/TMS2025">https://www.tms.org/TMS2025</a> NOTE: There is session organized by HPCAT/APS long time user Richard Sandberg and additional folks from APS “Characterization of Materials through High Resolution Coherent Imaging” <a href="https://www.programmaster.org/PM/PM.nsf/UpcomingSymposia/D6B7CB06ED39D35B85258AB5000D0E8F?OpenDocument&amp;ParentUNID=268FE297891FF1D785258687004BB316">https://www.programmaster.org/PM/PM.nsf/UpcomingSymposia/D6B7CB06ED39D35B85258AB5000D0E8F?OpenDocument&amp;ParentUNID=268FE297891FF1D785258687004BB316</a>
June 10-12, 2025	NNSA-SSAP symposium in Chicago area and Visit to HPCAT on 12 <sup>th</sup>
Jun 22–27, 2025	2025 American Physical Society Science of Compression in Condensed Matter (SCCM) conference in Washington, D.C.
July 6-11, 2025	Goldschmidt conference 2025 in Prague, Czech Republic. Includes high-pressure sessions <a href="https://conf.goldschmidt.info/goldschmidt/2025/meetingapp.cgi/Home/0">https://conf.goldschmidt.info/goldschmidt/2025/meetingapp.cgi/Home/0</a>
August 31 – Sep. 05, 2025	European High Pressure Research Group EHPRG 62nd Meeting, Manchester, UK. <a href="https://www.ehprg.org/meetings.php">https://www.ehprg.org/meetings.php</a>
Sept. 28-Oct. 03, 2025	29th AIRAPT Intl. Conference on High Pressure Science and Technology, Matsuyama, Japan, 2025 <a href="https://smartconf.jp/content/airapt29/">https://smartconf.jp/content/airapt29/</a>