



HPCAT NEWSLETTER – FEBRUARY 2024

Dear HPCAT community, we hope everyone is having a good start to 2024 calendar year. As you know, APS and HPCAT are currently still in upgrade shutdown, but working diligently toward user resumption. Overall, there is a lot going on and we are introducing this newsletter to help keep our community in the loop on various activities and upcoming events.

This newsletter is meant to provide some quick status update snapshots and we invite you to also share with us and the community any highlights and other relevant information you may have – if you have information that you like to have included in a future newsletter, please reach out to Freda Humble at fhumble@anl.gov.

We hope that you find the newsletter useful and please feel free to reach out to me or Freda if you have suggestion on how to improve the newsletter.

Wishing you all the best and looking forward to seeing you at HPCAT soon,
Nenad Velisavljevic
HPCAT Director

News and Highlights

Congratulations to Tyler Eastmond, HPCAT postdoc

Tyler was recognized with an "Outstanding Poster Presentation Award" at Argonne's Postdoctoral Research and Career Symposium <https://hpcat.aps.anl.gov/news/2023-12/tyler-eastmond-receives-outstanding-poster-presentation-award-argonnes-postdoctoral>

HPCAT working to support user community during shutdown

Due to the ongoing APS/HPCAT-upgrade shutdown, there is limited access allowed onsite. However, HPCAT continues to provide access as feasible to help and continue supporting some of the user community's research.

Most recently, **Zulu hosted our long-time user Stan Tozer from FSU** who made use of HPCAT's offline capabilities and sample laboratory for preparing samples that will be used for performing magnetic measurements on super-hydrides at FHML in Dresden and MagLab in Tallahassee.

Dmitry and Curtis hosted University of Connecticut student, Philip Tsurkan (part of CREDDS NNSA-SSAA center) to provide training and guidance in DAC preparation, loading, and laser cutting of DAC-sized samples for ongoing experiments at HPCAT.

Additional users are being scheduled currently for other work efforts until the full work resumption post upgrade. This includes a newly commissioned off-line PEC capability in the 401 laboratories.

HPCAT staff and user community have been active in organizing and participating at various conferences and workshops

Rostislav (Ross) Hrubciak gave an invited talk at the Acoustics Conference in December 2023 – Sydney, Australia

Rostislav Hrubciak was invited to present a talk for a special session titled "Acoustical Measurements and Sensors for Challenging Environments". This session included: Measurements and sensor development in diverse industrial and non-industrial settings under difficult and challenging conditions, such as high pressure, high temperature, corrosives, radiation, and more. His presentation title was "Ultrasound Pulse-Echo measurements in a large-volume press at the High-Pressure Collaborative Access Team (HPCAT)", which provided an opportunity to reach a potential new user base and advance our large-volume press program.

Guoyin Shen and Innocent Ezenwa attended AGU in San Francisco

Innocent presented a poster “High Pressure Melting Curve of Fe-Si: Implication for the Melting Temperature Profile and Adiabatic Heat Flux in Mercury’s Core”, as well as Serving as Co-convener and Session Chair for *Session: MR011. Iron, iron alloys, and iron-bearing phases in planetary interiors.*

Guoyin presented a talk on “A miniature multi-anvil device using diamond as anvils”.

Dmitry Popov attended the International Conference on Plasticity, Damage, and Fracture 2024 (ICPDF24) in Panama and presented an invited talk on “Experimental Capabilities to Investigate Transformations of Materials Under Extreme Pressure-Temperature Conditions at HPCAT”.

Dmitry, along with Valery Levitas (ISU) and HPCAT Director Nenad, were co-organizers of the “Material Transformations and Plasticity” symposium session.

Continuing to improve user access - Congratulations to Freda Humble

Freda was recently recognized by ANL management and ANL visits and assignments office for her ongoing effort to help users and improve the user registration and updating information systems. Keeping updated user information is vital in keeping communication with user community, providing updates, and reducing access times.

HPCAT and APS staff, along with LLNL principal investigators and HPCAT partners, were recognized with DOE NNSA Defense Program Award of Excellence

In a ceremony and presentation by Dr. Marvin Adams, NNSA’s Deputy Administrator for Defense Programs, the team was recognized for “significant contributions to the delivery of high-fidelity measurements of a programmatically relevant material in an important pressure/temperature regime”.



Congratulations to LLNL team

(Zsolt Jenei PI, Hyunchoe Cynn, Sony M. Jacob, Earl F. O'Bannon, Daniel T. Sneed) and HPCAT and APS team members: Jesse Smith, Eric Rod, Elizabeth Schmidt, and Wendy VanWingeren)

HPCAT continues outreach and workshop efforts in preparation for post upgrade work resumption

APS is preparing for the next APS users meeting (all onsite at APS-ANL) May 6-10, 2024

<https://www.aps.anl.gov/Users-Information/User-Community/Users-Meetings>

To continue pushing cutting edge research with new APS-U beam, APS user meeting issued a call for workshop proposals on advanced x-ray techniques. They received more than 40 proposals, which is well above the average.

Rostislav (Ross) Hrubciak, along with colleague Gilberto Fabbris, Phillip Ryan, and Yongseong Choi from sector 4, is organizing “APS WK#5: *Integrating Nanofabrication with Next Generation X-ray Techniques to Probe and Control Novel Phenomena*”. The workshop will be focused on highlighting recent developments in nanofabrication that are providing a remarkable advance in creating complex tailored sample environments, ranging from customized diamond anvils generating ultra-high pressures at elevated temperatures, while concomitantly probing transport properties, to strain cells integrated with delicate nanoscale electrical devices. The workshop will explore the state-of-the-art and challenges in combining micro- and nano- fabricated sample environments with cutting-edge x-ray techniques and capabilities facilitated by the next generation light sources. Emphasis will be placed on available opportunities at APS-U and CNM. **Changyong Park** and colleagues have been selected to organize “APS WK#10: *Advanced X-ray Capabilities for High-pressure Research*”. The workshop will bring together experts from the

community and tackle some of the challenges and opportunities with the new APS x-ray beam, with focus on coherence, x-ray brightness, and time-resolved measurements.

We are excited that HPCAT is part of two of eight proposals selected – congratulations to organizing staff!

HPCAT-Upgrade

HPCAT upgrade is in progress and more information will be provided in future monthly newsletter issue.

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

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

APS is accepting **proposals for APS Feature Beamlines** - due March 1, 2024

<https://ups.servicenowservices.com/ups>

Job postings and various opportunities

- Sandia National Laboratories - Summer Undergraduate Internships (posted Feb 2024)
 - [Intern - SEERI Dynamic Material Properties - R&D Graduate Summer](#)
 - [Intern - Science of Extreme Environments Research & Innovation \(SEERI\) - R&D Undergraduate Summer](#)
- Advanced Photon Source awards call
 - [Gopal K. Shenoy Excellence in Beamline Science Award](#)
 - [Rosalind Franklin Young Investigator Award](#)
 - NOMINATIONS DUE February 14, 2024
 - Email nomination materials to: **Nathan Rogers** (nrogers@anl.gov)
- The National Nuclear Security Administration (NNSA) has published the Minority Serving Institution Partnership Program Notice of Funding Opportunity (NOFO) **DE-FOA-0003285** - due date for applications is **June 15, 2024, by 11:59 PM EST**

Upcoming events

NOW through March 1 st	CALL FOR PROPOSALS ON APS FEATURE BEAMLINES for the 2024-3 cycle https://ups.servicenowservices.com/ups The following feature beamlines are available for proposal submission: <ul style="list-style-type: none"> • POLAR: 4-ID Polarization Modulation Spectroscopy • XPCS: 8-ID X-ray Photon Correlation Spectroscopy • CSSI: 9-ID Coherent Surface Scattering Imaging • HEXM: 20-ID High-energy X-ray Microscope • ISN: 19-ID In-situ Nanoprobe
Feb. 19	Monthly High Pressure Interest Group Meeting 1pm CST Speaker: Przemyslaw Dera, (University of Hawaii at Manoa) Title: Novel quantum crystallography methods for modeling of pressure- and temperature effects in minerals with cation disorder
Feb. 21-24	NNSA-SSAP Symposium in DC
Mar 3-7	TMS Annual Conference in Orlando, FL
March 3-8	American Physical Society March meeting, Minneapolis, Minnesota https://march.aps.org/
March 13	Application deadline for The National School on Neutron and X-ray Scattering (NXS) will be held July 28 - August 9, 2024. https://www.anl.gov/education/national-school-on-neutron-and-xray-scattering?utm_content=&utm_medium=email&utm_name=&utm_source=govdelivery&utm_term=
Submission window – Jan. 17 – Mar. 27	Gordon conference awards: J.C. Jamieson, A. Van Valkenburg Awards: Traditionally, the attendees of this conference have honored an early-career scientist (Alvin Van Valkenburg Award) and an outstanding graduate student (J.C. Jamieson Award) working in high pressure research. Please send a supporting letter and CV to the Chair for nominations . The recipients of these awards will be given travel support and invited talks to present their work. https://www.airapt.org/?q=node/48 https://www.agu.org/honors/jamieson

April 24	APS PUC/User meeting
May 1 (tentative)	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
Deadline: June 3, 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 3, 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.
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 7 (tentative)	HPCAT EC quarterly
Oct 23	APS PUC/User meeting
Oct 30 (tentative)	HPCAT EC quarterly