

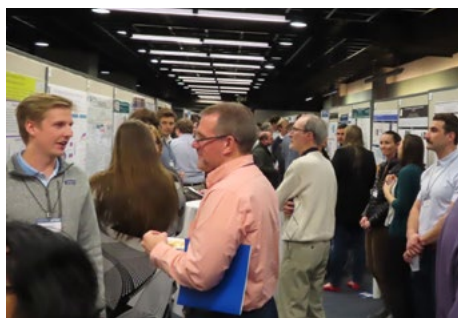


# ACADEMIC PROGRAMS QUARTERLY

Volume 1 | Number 1 | March 2024

Welcome to the inaugural issue of *Academic Programs Quarterly*. Defense Programs has undergone a significant reorganization, and Academic Programs now reports to the Technology and Partnerships Office (TPO). We are pleased to welcome Academic Programs to our office and are devoted to the continued success of these programs that are so vital to the future of the NNSA by identifying, training, supporting, and recruiting top talent into our ranks. With the organizational change, we have rebranded the quarterly newsletter from *Stewardship Science Today* to *Academic Programs Quarterly*, as the newsletter now will focus entirely on accomplishments and news in Academic Programs.

The positive news continues. TPO has just welcomed a new staff member, Dr. Stephanie Miller, who has joined us in the role of Academic Programs' Coordinator as well as the Federal Program Manager (FPM) for the Stewardship Science Academic Alliances (SSAA) and the Joint Program in High Energy Density Laboratory Plasmas (JPHELDLP). In addition to her FPM role for SSAA and JPHELDLP, Dr. Miller will



The 2024 SSAP Symposium was held February 21-22, 2024 in Arlington, Virginia. A favorite feature of the annual symposium is the Poster Session during which students discuss their research. Read about it below.

oversee the coordination of all of the Academic Programs. She joins Terri Stone, Program Analyst for SSAA and JPHELDLP; David Etim, FPM for the Computational Science Graduate Fellowship program and the Predictive Sciences Academic Alliance Program; and Betsy Snell, FPM for the Minority Serving Institution Partnership Program (MSIPP) and the Tribal Education Partnership Program. It is an exceptional team!

This issue features a celebration and workshop in honor of the 20th year of continued operations at the High Pressure Collaborative Access Team (HPCAT). HPCAT is a flagship facility

for materials under extreme conditions research and provides facility access time to students working on research in this area. Academic Programs was able to provide travel and attendance funding for 15 students to participate in this workshop. Also featured is an update on the recent activities in the MSIPP. MSIPP is in its 10th year and continues to expand its programs to provide experiential learning opportunities to talented students in underrepresented groups. The success of the program continues to be phenomenal and is helping to advance diversity in the NNSA workforce, a principle that is key to future innovation and success of the enterprise. A new initiative of MSIPP is the Community and Junior College Trade Occupation Program designed to assist in developing a diverse workforce in trade and skilled labor positions, which is a critical need for the NNSA.

The TPO is delighted to have Academic Programs join our ranks. We look forward to continued successes together.

Jahleel A. Hudson  
Director (Acting)  
Technology and Partnerships Office

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## CALENDAR

- 4/15-19 35th Hardened Electronics and Radiation Technology (HEART) Conference, Huntsville, AL
- 4/16-18 2024 Omega Laser Group (OLUG) Workshop, UR/LLE
- 5/5-10 Conference on Lasers and Electro-Optics (CLEO 2024), Charlotte, NC
- 5/18-24 15th International Particle Accelerator Conference (IPAC24), Nashville, TN

## 2024 Stewardship Science Academic Programs Symposium and Outstanding Poster Awards

This year's Department of Energy/National Nuclear Security Administration (DOE/NNSA) Stewardship Science Academic Programs (SSAP) Symposium was held on February 21-22, 2024 at the Hyatt Regency Crystal City in Arlington, Virginia. The Symposium enjoyed a robust turnout with 340 attendees.

The 2024 Symposium featured the cutting-edge research performed by grantees from the Stewardship

Science Academic Alliances and High Energy Density Laboratory Plasmas programs. Special presentations were given by staff from NNSA's Academic Programs: Jahleel A. Hudson, Director (Acting), Technology and Partnerships Office, gave the welcome address followed by program overviews by Betsy Snell, Program Manager for the Minority Serving Institution Partnership Program and David Etim, Program Manager for the Predictive

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*Academic Programs Quarterly* (APQ) highlights the stewardship science and academic programs supported by the Department of Energy/National Nuclear Security Administration (DOE/NNSA). APQ is published quarterly by the Defense Programs Technology and Partnerships Office. Questions and comments regarding this publication should be directed to Terri Stone at [terri.stone@nnsa.doe.gov](mailto:terri.stone@nnsa.doe.gov).

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## High Pressure Collaborative Access Team Anniversary Celebration and Workshop

by Nenad Velisavljevic,  
HPCAT Director

The High-Pressure Collaborative Access Team (HPCAT) facility recently held a celebration in honor of 20 years of continuing operations (Figure 1). HPCAT is an NNSA-funded facility encompassed within the larger synchrotron X-ray Advanced Photon Source (APS) facility at Argonne National Laboratory. The primary focus for HPCAT is to provide cutting-edge X-ray platforms in support of the NNSA laboratories, NNSA Stewardship Science Academic Programs (SSAP), and the broader scientific community for research of matter at extreme pressure-temperature (P-T) conditions. Over the last 20 years, HPCAT has grown into the largest synchrotron-based, high-pressure research facility in the world with over 850 experimental users visiting every year. HPCAT is comprised of five dedicated experimental-stations and various laboratory spaces that support sample preparation. The end-stations offer a suite of experimental X-ray probes that span spectroscopy, diffraction, microscopy, radiography, and tomography and that can accommodate a variety of diamond anvil cells (DAC) and Large Volume Paris-Edinburg (PE) press assemblies for *in situ* measurements at high pressures up to and above 500 GPa and temperature of more than 4,000 K. The experimental platforms enable the determination of strength, volume, structure, and bonding at extreme P-T conditions and constitute key data that are used to validate theoretical models and support various NNSA mission-focused projects.

The 20-year anniversary celebration was a great opportunity to reflect on many accomplishments, which include more than 1,000 journal publications, over 130 PhD student theses supported, and numerous Defense Program Awards of Excellence and other DOE awards. The celebration featured over 130 attendees—including students, postdocs, and academia and national

laboratory scientists—and plenary talks by: Laboratory Director Dr. Kimberly S. Budil, Lawrence Livermore National Laboratory (LLNL); Laboratory Director Dr. Paul Kearns, Argonne National Laboratory (ANL); Dr. Douglas A. Dalton, NNSA Federal Program Manager; Dr. Laurent Chapon, APS Director; and HPCAT management (Figure 2, Figure 3).

The HPCAT anniversary celebration was a great opportunity to reflect on past accomplishments, but, more importantly, it also was a time to look ahead. With APS undergoing a major upgrade (April 2023 through April 2024), and HPCAT likewise working on a proposed ~\$14M upgrade, it is an exciting time with many opportunities ahead. As part of the celebration, a scientific workshop on "Opportunities for Advancement of Studies of Matter at Extreme Conditions with the APS/HPCAT-Upgrade" was organized to discuss major scientific challenges and opportunities in support of the NNSA mission and the broader scientific discoveries of matter under extreme conditions.

The HPCAT facility is committed to continuing to provide vital experimental research platforms for the NNSA laboratories and the SSAP community, and, with support from the SSAP, the workshop included presentations and participation from numerous students. HPCAT plays a significant and critical role in training the next-generation of scientists and serves as a pipeline for developing the workforce at DOE/NNSA and other national facilities.



Figure 1. Group photo taken at the steps of entrance to the APS during the 20-year anniversary celebration and workshop.



Figure 2. HPCAT Director Velisavljevic and ANL Laboratory Director Kearns cutting the cake with LLNL Laboratory Director Budil, NNSA Federal Program Manager Dalton, HPCAT staff, and guests participating.



Figure 3. Part of the student group at the workshop takes time from posters and presentations to pose for a group photo. The SSAP provided partial funding to cover the travel and attendance of 15 students for the event.

We are grateful to LLNL Laboratory Director Budil, ANL Laboratory Director Kearns, and all of the ceremony and workshop participants for taking the time to attend the event. It is great to see continued support from DOE/NNSA for high-pressure research at synchrotron X-ray sources. As HPCAT and APS work toward completing the major upgrade to infrastructure and experimental capabilities, we are looking forward to coming back online and bringing back our user community. It really is an exciting time for high pressure research, and we hope to have many new accomplishments to share at the next anniversary celebration.

## Minority Serving Institution Partnership Program in 2024

by Betsy Snell (Federal Program Manager) and Suraya Bair (Communication and Informational Specialist, NNSA Contractor)

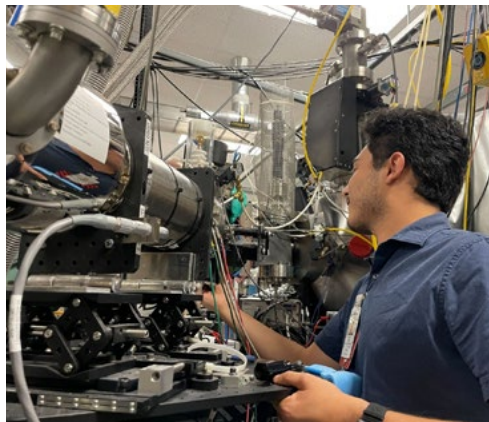
The Minority Serving Institution Partnership Program (MSIPP) creates and supports a career pathway that prepares a diverse student workforce for the Department of Energy/National Nuclear Security Administration (DOE/NNSA) laboratories, plants, and sites that constitute the Nuclear Security Enterprise (NSE). The Partnership Program aligns investments in Minority Serving Institutions of Higher Education (MSIs), building research and educational capacities, targeting collaborations between MSIs and the NSE, and supporting students in science, technology, engineering, and mathematics (STEM) disciplines through internships and experiential learning opportunities.

Since 2014, the MSIPP has funded over \$163 million to build educational and workforce capacities for over 70 MSIs and 11 Tribal Colleges and Universities (TCUs). Today, the MSI Partnership Program has 35 active projects encompassing 54 MSIs, including 20 Historically Black Colleges and Universities (HBCUs), 26 Hispanic Serving Institutions (HSIs), 7 TCUs, and 1 Predominantly Black Institution (PBI). MSIPP also collaborates with 14 NSE facilities nationally, supporting unique opportunities to link classroom training with hands-on experience in cutting-edge research and technologies.

In 2023, the MSIPP introduced the Community and Junior College Trade Occupation Program (CJCTOP) Notice of Funding Opportunity (NOFO) to develop and advance a diverse student workforce training in trade and skilled labor positions. Resulting from this NOFO, five institutions were awarded a total of \$2.5 million in collaboration with an NSE laboratory, plant, or site to build educational capacity and provide learning opportunities. The CJCTOP empowers a diverse group



Students from the Growing STEMS Consortium attend Innovation Challenge at Pantex Laboratory. Students worked in teams with a Pantex mentor to work through energetic-material-related challenges.



Students from the Microelectronics and Materials Engineering Education for Nuclear and Cyber Security (MEMENCY) consortium visit Sandia National Laboratories where they landed microscale probes and inserted them into ion beam machines utilizing game controllers.

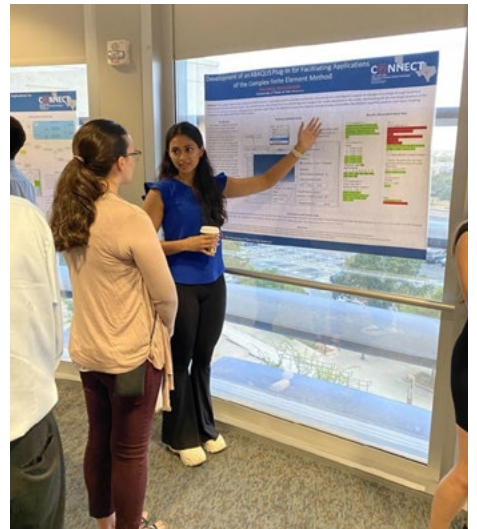
of students with interest or skills in radiation management, construction, nuclear safety, and other skilled trades critical to the success of the NSE and the NNSA.

Over MSIPP's 10-year history, the program has influenced success for a multitude of STEM scholars and professionals and has supported institutions to enhance and expand programs for students and faculty. MSIPP continues to enhance educational capacities to develop and strengthen a diverse student workforce at MSIs and TCUs.

The NNSA is accepting applications for a MSIPP Notice of Funding Opportunity posted on grants.gov and fedconnect.net. The NOFO invites new or renewal grant applications



Students from the Advanced Sensors Technologies for Applications in Electrical Engineering-Research and Innovation Excellence (ASTERIX) consortium visit Y-12 National Security Complex in Oak Ridge, Tennessee.



Students from the Consortium on Nuclear Security Technologies (CONNECT) showcase poster presentations on research projects.

from consortia partnerships consisting of MSIs and TCUs. More information on MSIPP and applying for the current opportunity can be found [here](#).

## 2024 SSAP Symposium and Outstanding Poster Awards

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Science Academic Alliance Program. Other special presentations included Kris Moran, Krell Institute, discussing NNSA's highly successful fellowship programs, i.e., Stewardship Science Graduate Fellowship, Laboratory Residency Graduate Fellowship, and Computational Science Graduate Fellowship, and Keith LeChien, a NNSA contractor, discussing ZNetUS. Also of note were presentations by NNSA laboratory and site staff focused on opportunities available at their locations. This was followed by a meet and greet at which attendees could meet with staff from the labs/sites, Krell Institute, user facilities, ZNetUS, LaserNetUS, and the Defense Threat Reduction Agency postdoctorate program.

The focus of the keynote address delivered by David Hoagland, Executive Principal Assistant Deputy Administrator for Defense Programs, NNSA, was the importance of academic programs to the Nuclear Security Enterprise. This was followed by a graduate student poster session with 132 posters. Read about the 2024 SSAP Symposium Outstanding Poster awards in the sidebar on this page. The Symposium featured a presentation about protecting DOE research presented by DOE counterintelligence personnel Paul Maric and Wendy Spittal.

It was another exciting SSAP Symposium. Thank you to all the speakers and volunteers for helping make it a success. We look forward to seeing you next year!

## OUTSTANDING POSTER AWARD WINNERS

### 2024 Stewardship Science Academic Programs Symposium

As in past years, we received several exceptional research posters. We congratulate all of the graduate students who submitted posters and presented them at this year's Poster Session. This year, 10 of the 132 graduate student posters had that something extra that makes them stand out from the others, and they are the 2024 Stewardship Science Academic Programs (SSAP) Symposium Outstanding Posters. We extend our thanks to all who participated in the judging and send kudos and congratulations to the winners. Please read on to meet this year's winners.

#### Anirudh Hari

Stanford University  
*Phase Transformations in Additively Manufactured Eutectic High Entropy Alloys under Laser-Driven Shock Compression and Release*

#### Genevieve Kidman

University of Nevada, Las Vegas  
*Stress Percolation in Polycrystalline Materials Through Elastic Strain Mapping*

#### Heather Moon

Washington State University  
*Shock Compression of Silver Single Crystals*

#### Samuel Patzkowsky

Washington University in St. Louis  
*In-situ Production of  $^{130}\text{Xe}$  in Ancient Rocks and Constraints on the Evolution of Noble Gas Isotopes in Earth's Mantle*

#### Jonathan Phillips

Washington University in St. Louis  
*Invariant-Mass Spectroscopy of Neon Isotopes*

#### Michael Pokornik

University of California, San Diego  
*Using Deep Learning to Analyze Thomson Scattering Diagnostic Data in Laboratory Astrophysics Experiments*

#### Trevor Smith

University of Michigan  
*Power Feed Plasma Formation Studies on the 1-MA Mykonos Facility*

#### Michael Springstead

University of Michigan  
*Laboratory-Generated Photoionization Fronts Relevant to Cosmology*

#### Afreen Syeda

University of Rochester  
*Shock-Particle Interaction Experiments to Measure Viscosity in Epoxy*

#### Justin Warren

Ohio University  
*Active Target Measurement of the  $^{35}\text{Cl}(n, p)$  and  $^{35}\text{Cl}(n, \alpha)$  Cross Sections*



Jahleel A. Hudson (left), Director (Acting), NNSA Technology and Partnerships Office, presented the 2024 Stewardship Science Academic Alliances Symposium Outstanding Poster Awards to this year's winners. On the far right is the new Academic Programs Coordinator and Federal Program Manager for SSAA and JPHEDLP, Stephanie Miller.

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