

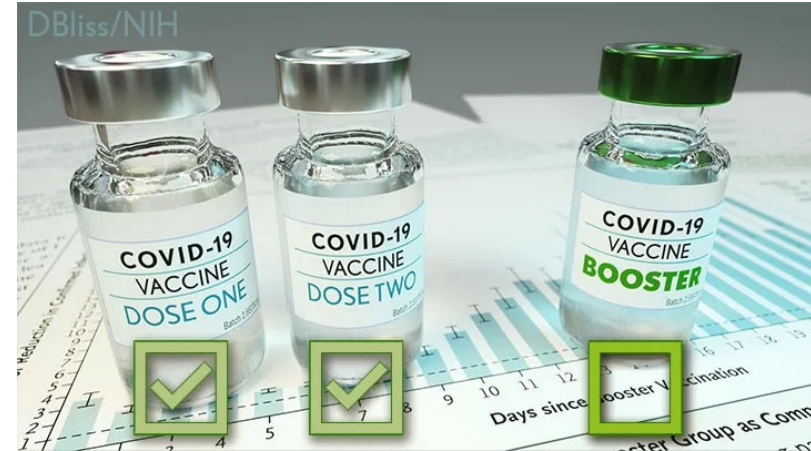
PSC ALL-HANDS MEETING NOVEMBER 11, 2021



STEPHEN STREIFFER
Deputy Laboratory Director for Science & Technology
Interim Associate Laboratory Director, Photon Science

AGENDA

- **Stephen Streiffer** - APS Update
 - Pfizer antiviral pill based on **STUDY** at IMCA-CAT
 - Safety
 - Introducing Laurent Chapon, New ALD/Director
 - Budget
 - Diversity, Equity & Inclusion
 - User Office News
 - DOE “Triennial +1” Review of APS Ops
 - Technical Highlights
 - Personnel Updates
 - Awards and Honors
 - Technical Updates (Operations, AES, ASD, XSD)
- **Tanya Griffin** - Learning and Organization Development
- **Bob Hettel** - APS-U Update
- **Questions from audience / responses from APS leaders**



Are you eligible for a booster shot?

To keep up with the latest APS news & research: www.aps.anl.gov

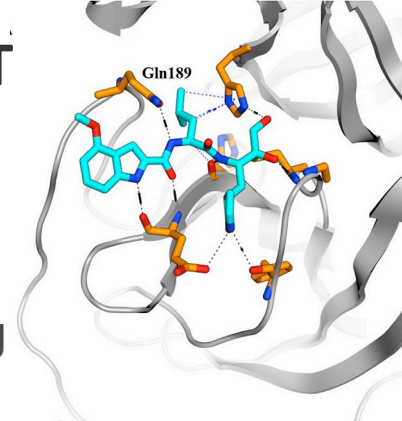
PFIZER ANTIVIRAL PILL BASED ON STUDY AT IMCA-CAT

The New York Times

“Pfizer announced that its pill to treat Covid-19 was found in a key clinical trial to be highly effective at preventing severe illness among at-risk people who received the drug soon after they exhibited symptoms.

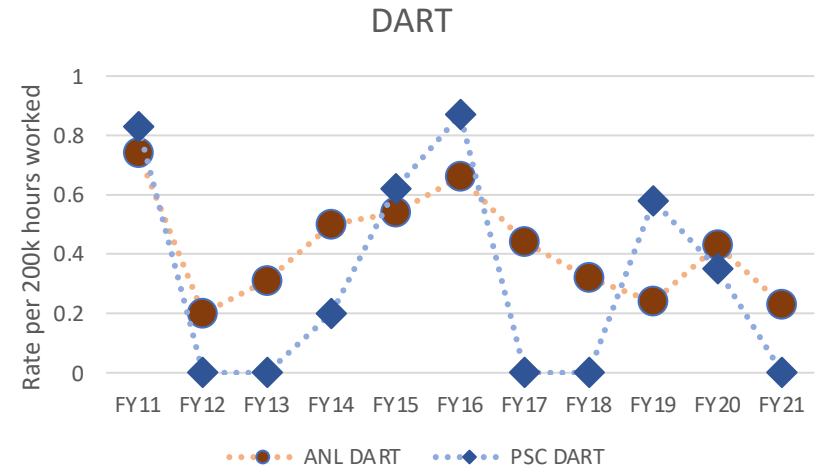
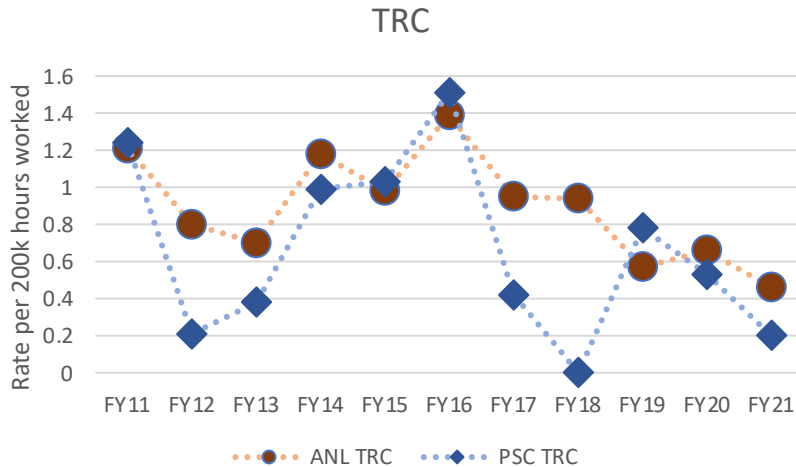
“Pfizer’s pill, which will be sold under the brand name Paxlovid, cut the risk of hospitalization or death by 89% when given within three days of the start of symptoms.”

D.R. Owen et al., “An oral SARS-CoV-2 M^{pro} inhibitor clinical candidate for the treatment of COVID-19,” *Science* 2 November 2021: **“X-ray diffraction data sets were collected at IMCA-CAT 17-ID beamline of the Advanced Photon Source (APS) at Argonne National Lab”**



PHOTON SCIENCES SAFETY PERFORMANCE

Total recordable cases; days away, restricted, or transferred



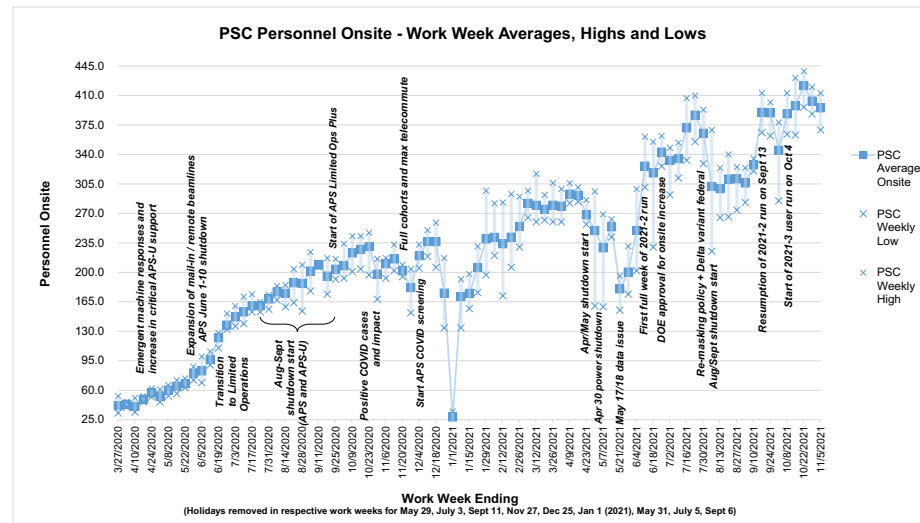
■ FY21 Incidents

- Staff: muscle pain from lifting laser tracker, 3 first aid cases
- Subcontractors: concrete exposure led to irritation, slip and fall, 1 first aid

- Two abnormal events (mis-wired white-beam shutter; burn-through of closed gate valve) during Ops commissioning at Sector 28 have led to strengthening of controls and processes for bringing up new beamlines

COVID-19 PROTOCOLS

- Nearly 400 PSC staff (about 60% of total) are working on-site with masks, onsite testing, and proximity badges for tracing
- Limited on-site users allowed after beamline staff review and approval of APS director
 - Generally capped at 2 on-site users per experiment but have made exceptions where a larger team is required and can be safely accommodated
- Argonne vaccine requirement goals accomplished
 - Approximately 5% of PSC staff received exemptions



BRINGING NEW LEADERSHIP TO THE ADVANCED PHOTON SOURCE



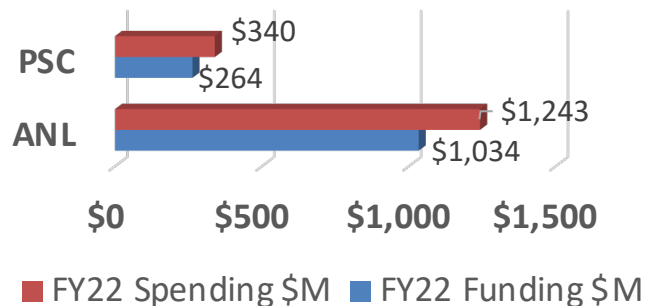
Laurent Chapon appointed Associate Laboratory Director
for Photon Sciences and APS Director

Currently Physical Sciences Director at Diamond Light Source

Anticipated start in January 2022

PSC FY22 BUDGET

Funding and Spending



APS Operating Budgets*

FY 18	\$134 M
FY 19	\$138 M
FY 20	\$140 M
FY 21	\$137 M
FY 22**	\$141 M

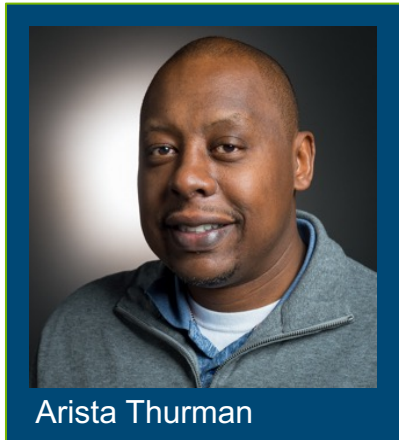
* After SBIR tax and holdbacks

** PBR is +2.9% for APS

- PSC is in good shape going into FY22
- PSC plans to spend 27% of Lab spending
- PSC has carryover funds so that is how we can spend more than we are receiving in funding
- \$150 M of spend is planned for APS Operations
- \$155 M of spend is planned for APS Upgrade
- \$35 M of spend is planned for other Department of Energy projects, Strategic Partnership Projects, and Laboratory Directed Research and Development (LDRD) projects
- PSC has approximately 670 employees including students

BECKY SIKES: NEW DEI COUNCIL CO-CHAIR

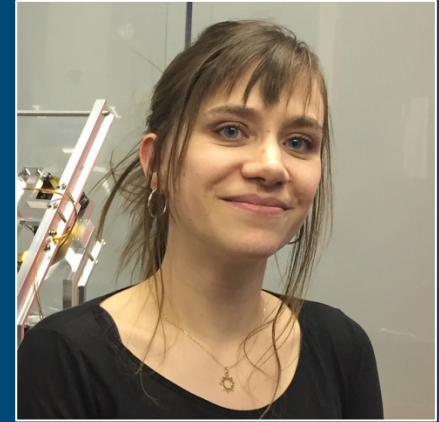
- **Becky Sikes** joins **Fanny Rodolakis** as co-chairs of the PSC Diversity, Equity & Inclusion Council
- Many thanks to **Arista Thurman** for his service as co-chair



Arista Thurman



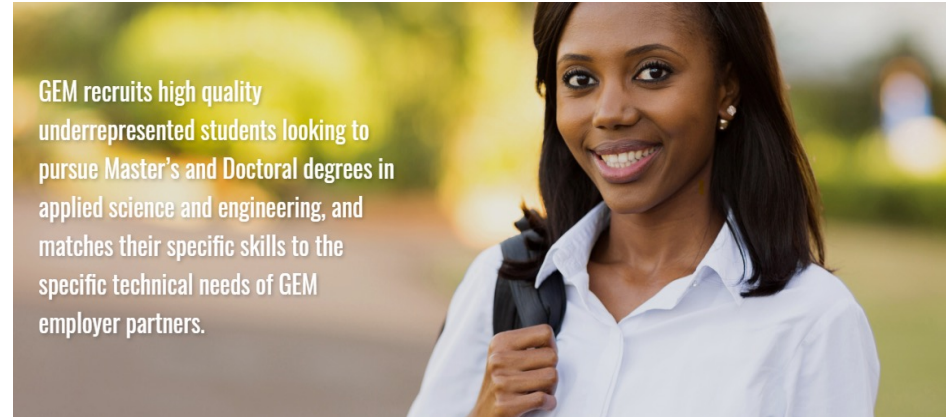
Becky Sikes



Fanny Rodolakis

DIVERSITY, EQUITY AND INCLUSION: OUTREACH & EDUCATIONAL PROGRAMS

- **The National GEM (Graduate Education for Minorities) Consortium** recruits high-quality, underrepresented students looking to pursue Master's and Doctoral degrees in applied science and engineering and matches their specific skills to the specific technical needs of GEM employer members
- Argonne National Laboratory is now an employer member
- 3 of 16 GEM fellows working at Argonne were assigned to APS in summer 2021
- GEM fellows connected with the Argonne African American ERG and the Argonne Hispanic/Latino Club



UPDATE FROM THE USER PROGRAM OFFICE

- Effective today
 - User badges are now being issued based on dates commensurate with an approved ESAF form
 - COVID-19 attestation form required or show proof of a negative COVID-19 test result that is less than 72 hours old
- Coming soon
 - New COVID-19 site access requirements for general users
 - Current site access requirements go to:
<https://www.anl.gov/site-entry-requirements>
- Implementation in 2022
 - New joint APS, NSLS-II, LCLS proposal platform
 - REAL ID requirement enforcement anticipated (did not go into effect on 10/1/2021 due to COVID-19)
- Implementation in 2023
 - Argonne Enterprise Registration System (AERS) and Site Access System

USER STATISTICS

	FY16	FY17	FY18	FY19*	FY20	FY21
Total Users	5521	5742	5704	5426	4323	3686
On-site Users	4306	4461	4423	4396	2924	780
Remote Users	1215	1281	1281	1030	1399	2906
First-time Users	1959	2121	2011	2020	1340	1772
% First-time Users	35%	37%	35%	37%	31%	48%
% Remote Users	22%	22%	22%	19%	32%	79%

- Only one user per remote access ESAF counted

2022 APS/CNM USERS MEETING

Virtual meeting

Proposed schedule:

- May 2-5 (M-Th): Workshops only
- May 9 (M): Combined plenary (morning), APS facility plenary (afternoon), and workshop/other sessions as will fit
- May 10 (Tu): CNM facility plenary (morning), poster session (afternoon), and workshop/other sessions as will fit
- May 11-12 (W-Th): Workshops and other sessions as needed

Workshop Proposals: Due November 30 at 5:00 pm

Award Nominations: Due February 28, 2022
Gopal K. Shenoy Excellence in Beamline Science
Rosalind Franklin Young Investigator Award (now an annual award)

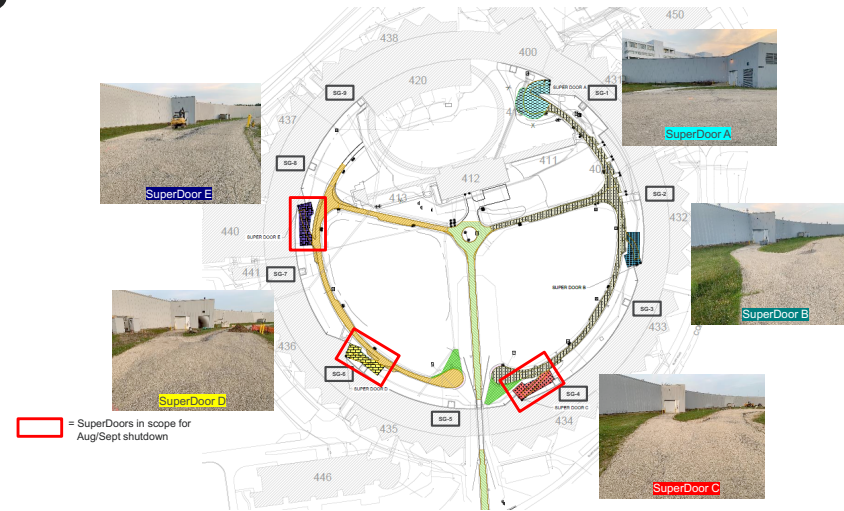
Details: <https://www.aps.anl.gov/Users-Information/User-Community/Users-Meetings>

BES “TRIENNIAL+1” REVIEW OF APS OPERATIONS, SEPTEMBER 7-10, 2021

- The review was originally scheduled for 2020, postponed due to COVID-19
- Submitted 2 volumes of written material (~1450 pp) and 14 pre-recorded talks (overview, division presentations, business ops, user program, science highlights, strategic planning and resources, ESH, DEI, COVID-19 impact, data management and computing, remote access, APS-U, and future directions)
- 15 reviewers, each submits an independent report
- Review itself consisted of virtual Q&A sessions on each talk, and virtual breakout sessions with staff, CAT representative, APSUO steering committee, and SAC
- More than 170 questions received on Sept 3rd at 2:17 pm prior to the review
- Anticipate receiving review reports and BES recommendations in the next 2-4 months
- Thanks to all who participated!

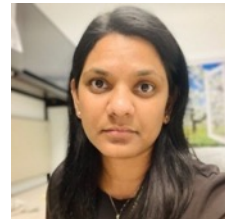
APS POWER SHUTDOWNS

- April 2021 power shutdown (linac to SR including the experiment hall) was conducted without issue, to enable repairs of ruptured fire mains in the APS infield
 - The APS had never undertaken this expanse of a power shutdown since facility went operational
- Argonne has started a roadway improvement project in the APS infield to upgrade SuperDoor basemat concrete for additional floor loading required by future APS-U hardware moves into the storage ring
 - Argonne project team alerted the APS of a discovery that demo and excavation work at SuperDoors C, D & E during the August 2021 shutdown would require de-energization of portions of buried 13.2 kV power lines
 - Power shutdowns were again carried out without issue or incident, in series on Aug 5-7 (SR sectors 13-24, beamline sectors 12-23) and Aug 10-12 (SR sectors 25-36 and beamline sectors 24-35)
 - Future power shutdowns for SuperDoors A and B concrete excavation will be required in April 2022 to complete upgrade scope

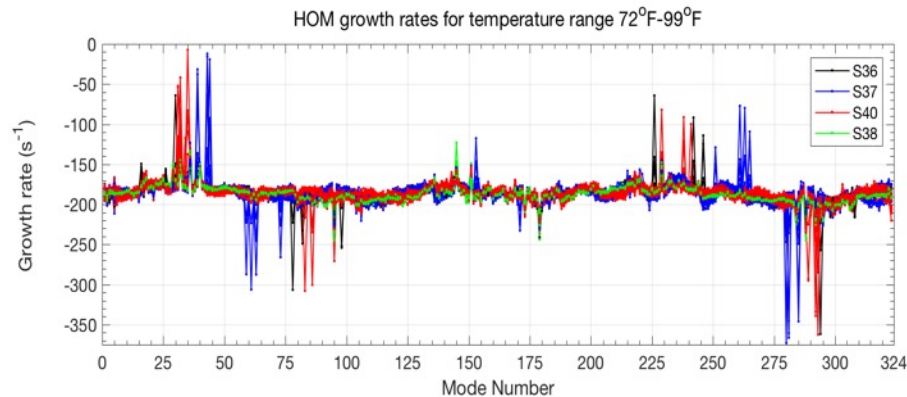


MAPPING THE RF CAVITY MODES FOR STABLE APS-U OPERATION

A new technique has been developed that allows complete characterization of cavity higher-order modes; critical for APS-U



- The existing APS rf system is being kept for APS-U (minus 4 cavities)
- The current rf cavities have mostly undamped higher order modes (HOMs) that will cause instabilities for APS-U if not tuned correctly
- We have used the new APS-U longitudinal feedback system as a diagnostic tool to map all the cavity HOMs for proper tuning for APS-U; led by Sirisha Kallakuri



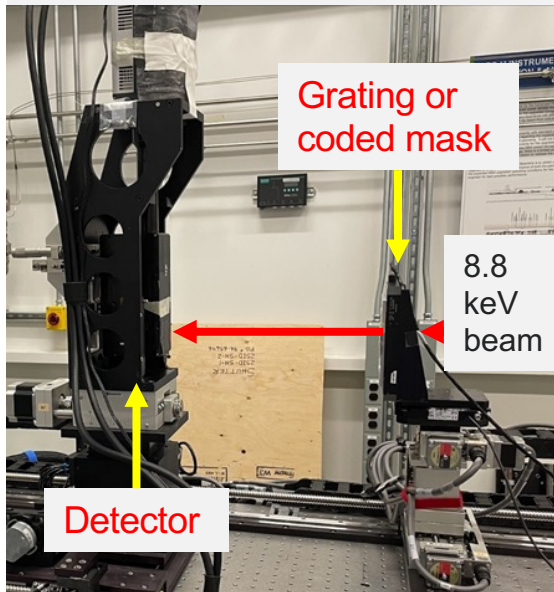
The measured growth/damping rate of each mode for 324 bunches

Each mode is individually excited and its response measured, allowing HOM identification

This will allow optimal tuning of HOMs for operation and ensure multi-bunch stability

28-ID-B (IDEA) BEAMLINE OPTIMIZATION FOR OPTICS CHARACTERIZATION AND BEAMLINE DIAGNOSTIC

Beamline setup for coherence and wavefront measurements



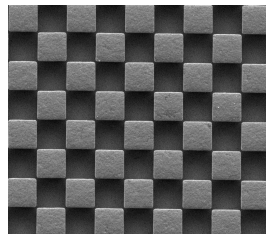
Grating or coded mask

8.8 keV beam

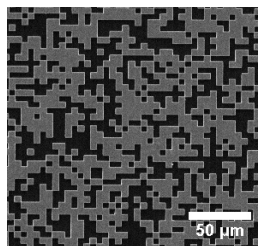
Detector

Portable grating interferometer

L. Assoufid, et al., Rev. Sci. Instrum. **87**, 052004 (2016).

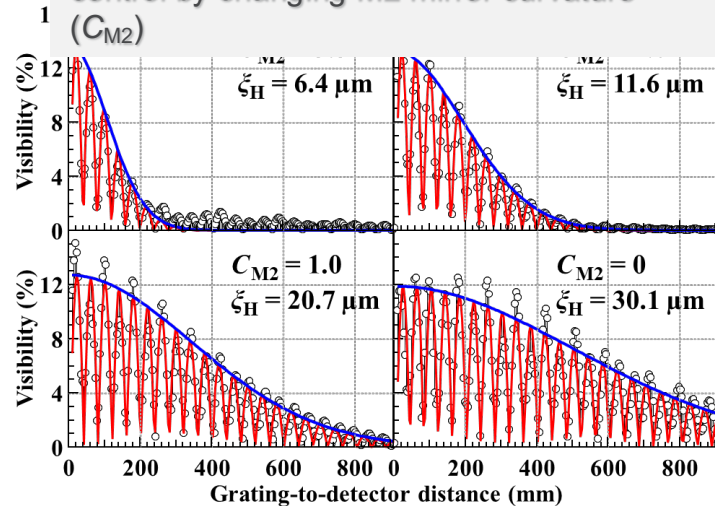


Checkerboard grating for coherence measurement
[S. Marathe, et al., Opt. Express **22**, 14041 (2014).]

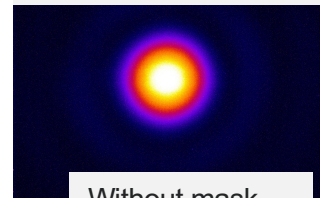


Coded mask for optics characterization and wavefront measurement
[Z. Qiao, et al., Appl. Phys. Lett. **119**, 011105 (2021).]

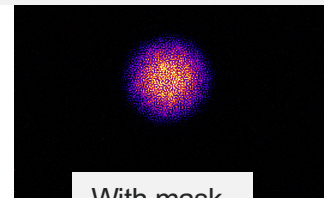
Beamline horizontal coherence length (ξ_H) control by changing M2 mirror curvature (C_{M2})



Coded-mask-based wavefront sensor calibration with pinhole diffraction (Airy disc)



Without mask



With mask

PERSONNEL



Shelley Kelly

- **Shelly Kelly** has been named group leader of the XSD Spectroscopy Group following the retirement of **Steve Heald**



Steve Heald

AES DIVISION DIRECTOR SEARCH UPDATE: ON TRACK

Feb 2021: Announcement of AES division director role opening for competitive search

Mar 9, 2021: Invitations sent to PSC Search Committee members and chair

Mar 26, 2021: AES division director posting goes live

Apr 2, 2021: Kickoff of PSC Search Committee for AES Division Director

Apr-Aug 2021: Applicant intake, down-selected to 15 qualified candidates from industry, other national laboratories, and internal to Argonne, for search committee consideration; diverse slate of 5 candidates selected by the committee and completed panel interviews

Aug 10, 2021: PSC Search Committee final report issued to current AES division director

Sept 21, 2021: Final candidates selected for second-round interviews with AES division director, AES deputy division director, panel of AES group leaders and staff, panel of ASD, XSD, APS-U and Argonne service directorate senior management

Oct 26, 2021: Completion of all second-round interviews and interviewer feedback sessions with AES division director

Next Steps: Finalist nominated by Nov 12 to Streiffer and Chapon for review

Please continue to respect candidate requests for strict confidentiality within/beyond Argonne

Any questions? Please reach out to John Connolly, Mike Sullivan, Jim Kerby, or any search committee member

AWARDS AND HONORS

- **Si Chen** (XSD Microscopy Group) is 1 of 6 Argonne researchers to receive an FY 2021 DOE Early Career Research Program award
- **Laura Greene**, NHMFL Chief Scientist and member of the APS Scientific Advisory Committee, was named to the President's Council of Advisors on Science and Technology
- **Jan Ilavsky** (XSD Chemical & Materials Science Group) was named a Fellow of the American Crystallographic Association
- **Randy Winans** (XSD Chemical & Materials Science Group) was named the winner of the American Chemical Society R. A. Glenn Award
- **Jiyong Zhao** (XSD Inelastic X-ray & Nuclear Resonant Scattering Group) received the 2021 "Gopal K. Shenoy Award for Excellence in Beamline Science at the Advanced Photon Source" from the APSUO



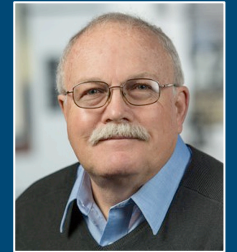
Si Chen



Laura Greene



Jan Ilavsky



Randy Winans



Jiyong Zhao

AWARDS AND HONORS

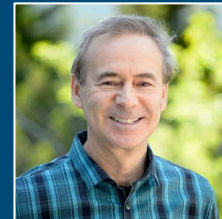
- **Glenn Decker** has been presented with an Outstanding Safety Leadership Award by the UChicago Argonne, LLC Board of Governors
- **Arista Thurman** has been presented with an Excellence in Diversity and Inclusion Award by the UChicago Argonne, LLC Board of Governors
- **Alexander (Sasha) Zholents** has been presented with the Argonne National Laboratory Distinguished Performance Award by the UChicago Argonne, LLC Board of Governors



Glenn Decker



Arista Thurman



Sasha Zholents

IMPACT ARGONNE AWARD RECIPIENTS

Program Development

- Dave Wallis, David Leibfritz, Troy Lutes, Zachary Basile, Mark Engbretson
- Arun Bommannavar

Innovation

- Donald Walko, Sunil Bean, Raymond Ziegler, Don Jensen Jr., Haidan Wen, Mike Fisher, Dohn Arms
- Ralph Bechtold, Nick Bechtold, Aric Donnelly, Michael Johnson, Robert Furst, Gentillo Curescu, Tyler Malas, Charles Doose, Scott Izzo, Spiro Skiadopoulos, Roberto Lopez, William Jansma, Animesh Jain, Jamal Pegues, Evan Carter
- Kevin Knoerzer, George Gonzalez, Tim Clute, Frank Westferro, Patrick Farquhar, Juan Anda, Richard Voogd, William Jansma, Ken Kishbaugh, Mark Erdmann, Nemanja Arsic, Yidan (Julie) Wu, Grace Avellar, Joe Aguilar, Alex Orestis

Significant Cost Reduction

- Sungsik Lee

IMPACT ARGONNE AWARD RECIPIENTS

Extraordinary Effort

- **Anita Garcia**
- **Fang (Jennifer) Zhang**
- **Mike McDowell**
- **John Quintana, Jesse Smith, Maddury Somayazulu, Nenad Velisavljevic**
- **Susan White De Pace, Connie Vanni**
- **Ibrahim Kesgin**
- **Elizabeth Schmidt, Kimberly Toerpe**
- **Max Wayman, Jun Qian, Curt Preissner, Steven Kearney**
- **Jeremy Carvelli**
- **Jun-Sang Park, Peter Kenesei, Andrew Chuang, Ali Mashayekhi**
- **Wendy VanWingeren, Elizabeth Schmidt**
- **Charles Doose, Gentillo Curescu, Tyler Malas, Spiro Skiadoupoulos, Roberto Lopez**
- **Joseph Xu, Isaac Vasserman, John TerHAAR, Yinghu Piao, Maofei Qian, Jie Liu, Sasha Zholents, Luis Diaz, Martin Smith, Joseph Gagliano, Eric McCarthy, Semyon Sorsher, Emil Trakhtenberg, Laura Boon**

25+ YEARS SERVICE AWARDS

30 years

Jeffrey Toeller
Michael Bosek
Michael Douell

25 years

Jeffrey Dooling
Dmitriy Ronzhin
William Yoder
Zhonghou Cai
Nicholas Sereno
Thomas Gog