

24 OCTOBER 2018

# PSC ALL-HANDS MEETING



**STEPHEN STREIFFER**

**DIRECTOR, ADVANCED PHOTON SOURCE**

**ASSOCIATE LABORATORY DIRECTOR, PHOTON SCIENCES**

# AGENDA

- APS Update
  - PSC Update
  - Safety
  - News and Updates
- Infrastructure Improvements at APS – John Connolly
- APS Upgrade Update – Bob Hettel
- The Direction of the Leadership Institute – Isaias Zamarripa, Jr.,  
HRS Diversity & Inclusion Consultant

# SAFETY



- Let this be a stark reminder of slippery conditions just around the corner

# PLAZA REMODEL IS ON TRACK



Landscaping coming in Spring

Cannot salt during its first winter, so alternate snow/ice plans being developed

- 2018 PSC Safety Stats: 4 First Aid cases, 0 TRC cases, 0 DART cases
  - Thanks for your effort and attention!
  - Keep reporting!
  
- AWARE: New WP&C application now live
  - All existing WPC documents have been transferred to new system
  - Simplifies input, reduces Hazard Tree (by almost ½) and reduces output to a useable format
  
- 911 Hotline: Now taking all Emergency and Non-Emergency Calls
  - Calls triaged by 911 operator to provide appropriate response to concerns
  
- QEW Training: All QEWs must be retrained by December 21, 2018
  - “QEW Plug and Cord” to be implemented in the near future, helps DEEIs
  - Safety standard for for High Voltage (>750v) Non-Utility electrical work being resolved
  
- DCS Readiness Review held October 5 for restart of user program after laser incident
  - DCS is ready to resume operations under their new Conduct of Operations Model

# NEWS AND UPDATES

# NEW STRATEGIC PLAN

## Advanced Photon Source

An Office of Science National User Facility

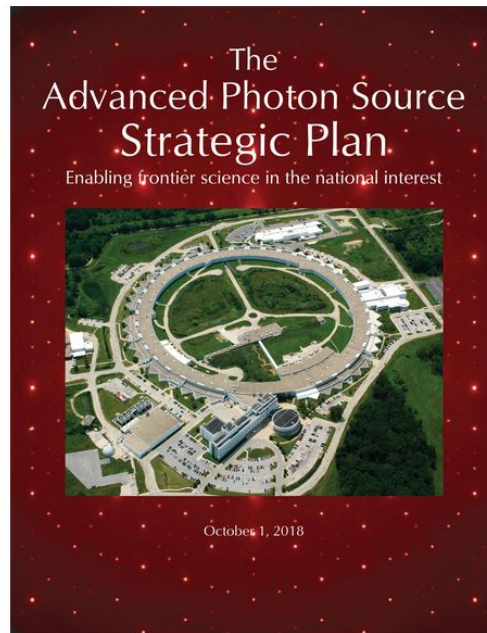


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## The Advanced Photon Source Strategic Plan – October 1, 2018

The [Advanced Photon Source Strategic Plan – October 1, 2018 \(pdf\)](#) is now available for viewing. The Strategic Plan charts the path for the improvements and R&D that will maintain the APS position as the world-leading hard x-ray synchrotron source while simultaneously preparing for the proposed upgrade.



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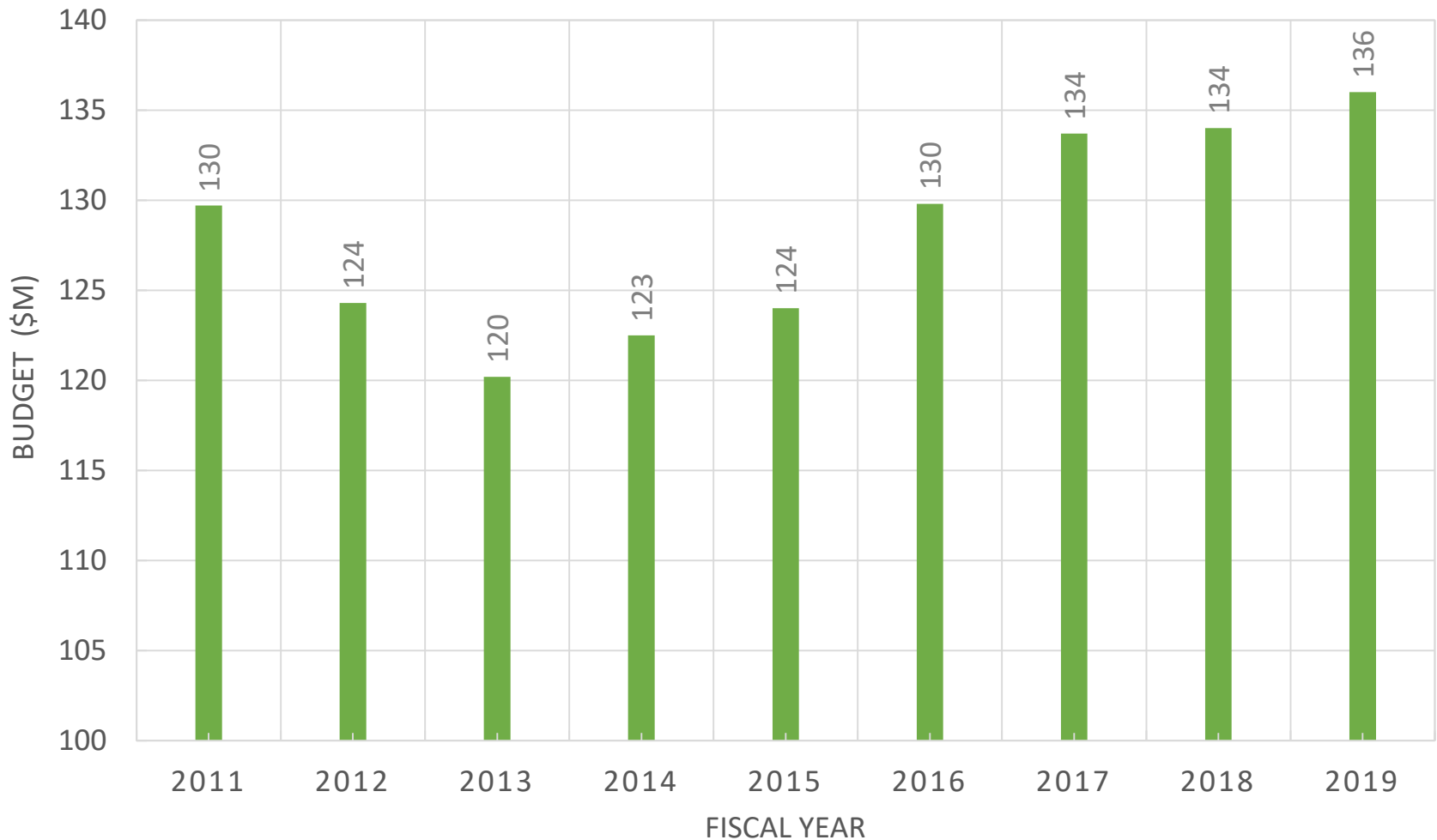
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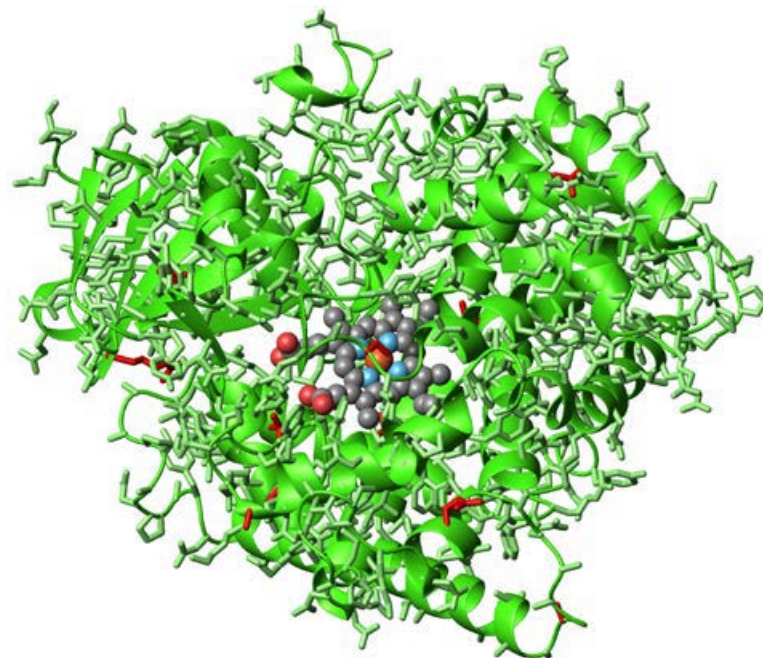
# APS OPS FUNDING

- FY19 \$136,743 (total)
  - Carve-outs of \$300k for CAMERA, \$300k for ECRP, and \$30k for SBIR detailee



# APS RESEARCH CONTRIBUTES TO 2018 NOBEL PRIZE IN CHEMISTRY

- Dr. Frances Arnold of the California Institute of Technology was one of three awardees of the 2018 Nobel Prize in Chemistry for her work showing how “directed evolution” can be utilized to develop proteins or enzymes that efficiently produce chemicals, biofuels and pharmaceuticals
- As part of this research, the atomic structures of the enzymes were studied at the Advanced Photon Source, a U.S. Department of Energy Office of Science user facility at Argonne National Laboratory



Structure of an evolved biocatalyst for cyclopropanation, determined at the General Medical Sciences and Cancer Institutes facility at the Advanced Photon Source

# FIRST UNIT LCLS-II HGVPU HAS ARRIVED

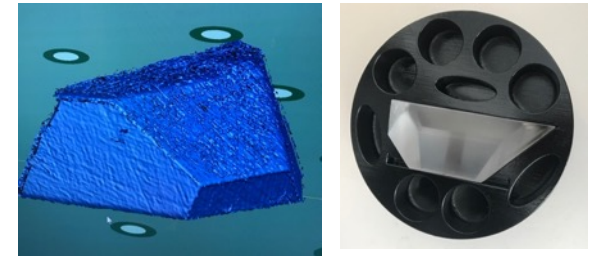
First unit arrived in late Sept. 2018. Effort expected for ~one year.



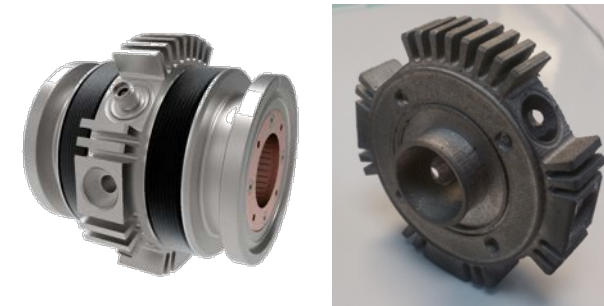
# REVOLUTIONIZING EXPERIMENTAL COMPONENTS USING 3D PRINTING AND 3D SCANNING

## PEMP Goals 2.0, 2.3, 2.4

- Innovative concepts from scientific staff utilizing 3D printing continues to expand.
  - Ideas include utilizing the 3D scanner to scan devices as simple as a barcode scanner handle mount, to a more complex crystal holder for polishing, that exactly matches the crystal.
- FY18 totaled 926 different requests for 3D printing, ranging from unique tool printing, spacers to assist in operational maintenance, sample chambers, to centrifugal pump housings and impellers.
- This has been a very rapid growth considering the service began in earnest in 2017.
- The use of 3D printing allows prototype or production designs to be created that would be cost prohibitive if produced via conventional methods such as machining.
- Most 3D printing requests are completed within 24 hours and provided to the scientific community the following day, exhibiting a dramatic time savings over conventional procurement and manufacturing lead times.
- 3D metal printing is being pursued next, as shown with the APS Upgrade BPM prototype design at right.



*Crystal Polishing Scanning (left) and Printed Crystal Holder (right)*



*APS-U BPM Design Rendering (left) and 17-4PH Stainless Steel 3D Printed Test Part (right) Before Surface Finishing*

# 3D X-RAY IMAGES MAY SHED NEW LIGHT ON BRIDGE COLLAPSES

- Metals in all engineering structures may be impacted by hydrogen embrittlement – leading to rapid fracture and need for costly overdesign.
- Using new imaging tools at APS beamline 1-ID, scientists identified 10 grain boundaries that are most resistant to embrittlement.
- This information can be used to design stronger metals through grain boundary engineering – with wide ranging economic benefits.



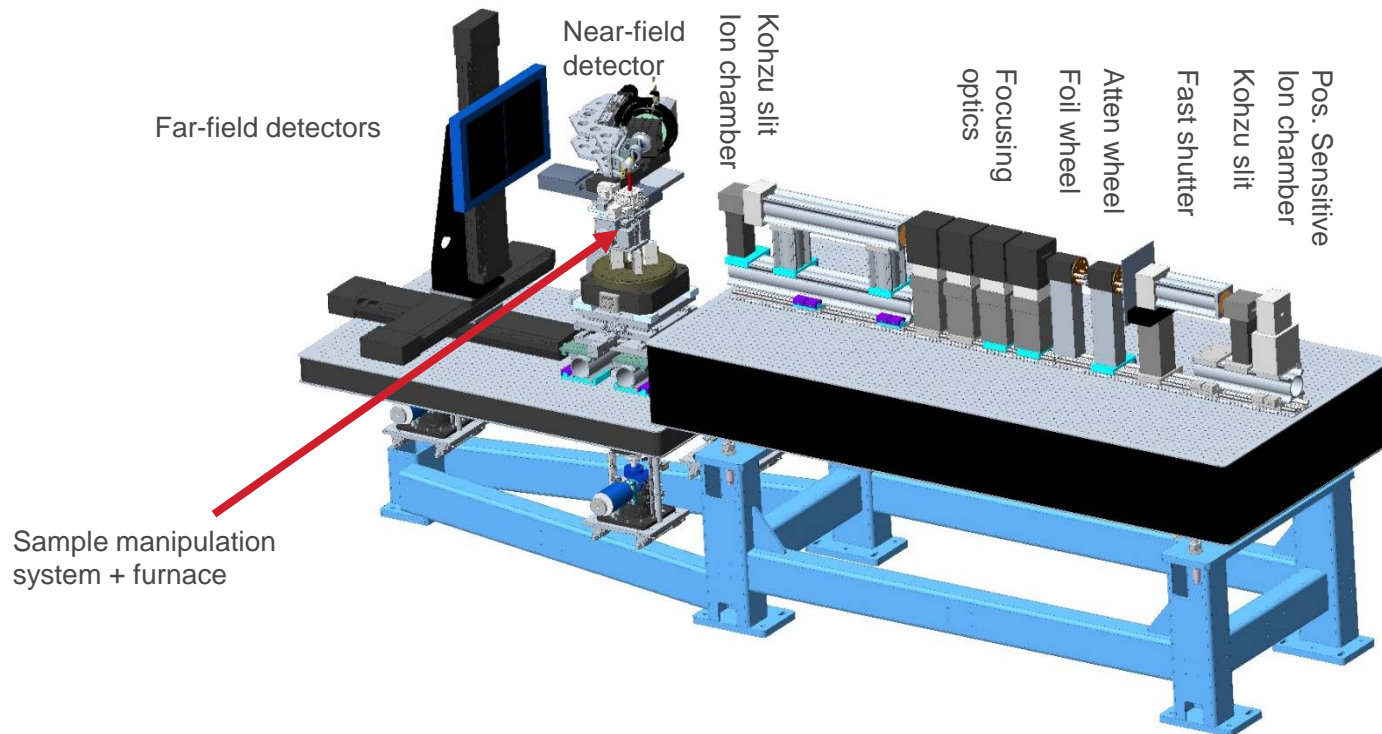
*Advanced 3D imaging using diffraction and density contrast provides clues to predicting fracture in metals. Cracks in a nickel alloy embrittled by hydrogen were caught “red handed” as they propagated along grain boundaries.*

*Image: Dharmesh Patel*

J. Hanson, A. Bagri, J. Lind, P. Kenesei, R. Suter, S. Gradecak and M. Demkowicz, *Nat. Comm.* **9**, 3386 (2018).

# HIGH THROUGHPUT HEDM INSTRUMENT

- \$1.5M NSF grant led by Carnegie Mellon Univ. to develop high throughput HEDM instrument; Working with APS staff on design and procurement of components.
- 6-ID-D experimental station being expanded to accommodate instrument. SOW is out; Expect construction starting May 2019.



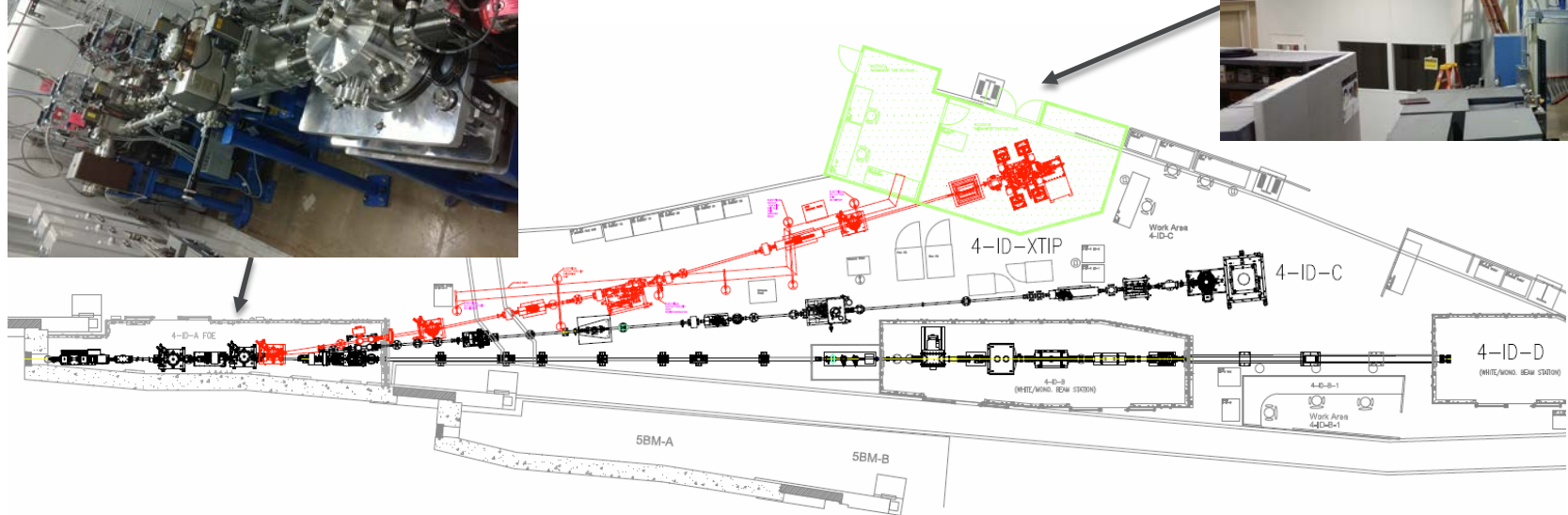
# X-TIP BEAMLINE AT 4-ID (JOINT WITH CNM)

- DOE funded project (\$800k) to provide permanent location for APS/CNM X-STM instrument
- 2018-3: Final optics being installed; First light expected December 2019
- 2019-1: Beamline/Instrument commissioning
- 2019-2: Transition to operations

September 2018: FOE optics installed



Environmental enclosure at 4-ID



# THE REVAMPED APS WEB SITE COURTESY OF KELLY CUNNINGHAM - WEBMASTER

## APS Website Working Group

- Keith Brister PUC
- Malcolm Capel PUC
- Joe Kline APSUO
- Alexander Goncharov APSUO
- Kevin D'Amico PSC
- Denny Mills PSC
- Becky Sikes PSC
- Jude Kitching XSD
- Joe Strzalka XSD
- Brian Toby XSD
- Julie Cross AES
- Andrew Johnson AES
- Brian Rusthoven AES

## COMMENTS

### (plus some housekeeping suggestions):

- I like the look of the new page. In general, I think the new page looks clean and brighter than before.
- I like the APS/User News scrolling box a lot compared to the old.
- In general the main APS site looks fine with respect to layout, organization, etc. The intranet site looks fine also.
- Plus: Broken links, etc. – general housekeeping

**CHANGES:** Site is wider; new active text windows for Upgrade, user info, news, video; dissolve not scroll

**Not done yet – will evaluate for user interface/user experience**



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https://www-dev.aps.anl.gov

Entries in the APS Publ... Remedy Mid Tier 6.3 - ... Soft Tissue Reconstruct... Tumblr

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## Advanced Photon Source

An Office of Science National User Facility



Hidden Magnetism Appears under Hidden Symmetry

Researchers using the U.S. Department of Energy's Advanced Photon Source studied a two-dimensional magnetic system that may lead to devices with increased security and efficiency using a small amount of energy.

[Read more...](#)




APS Upgrade



The APS Upgrade project will increase the brightness of the APS high-energy (hard) x-ray beams. This will equip researchers for the groundbreaking discoveries and transformational innovations that create new products and industries and generate jobs. [MORE](#)

APS User Info



Comprehensive information for prospective, new, and existing APS users, including how to get started as a user, safety and training, experiment proposals, travel, news and calendars, and access to the APS User Portal. Watch this space for announcements and updates. [MORE](#)


APS Facility Documents




Science Highlights



Safety



Conferences, Workshops, Meetings, Events

Jun 14 to Nov 16  
APS Upgrade (APS-U) Forum Meeting  
10:00 a.m. 401/A1100

Nov 05 to Nov 06  
Beamline Reviews: November 5-6, 2018

Nov 07 to Nov 08  
APS Scientific Advisory Committee (SAC) Meeting

May 19 to May 24  
International Particle Accelerator Conference (IPAC19)  
Melbourne, Australia

[View All](#)

Seminars, Training, Schools, Etc.

Oct 10 to Oct 19  
NST Colloquium: Synthesis and Photophysical Properties of Strongly Confined Cesium Lead Halide Perovskite Quantum Dots  
10:00 a.m. 440/A105-A106

Oct 15 to Oct 26  
The ASAXS Method and Its Application To Analyze the Structure and Composition of Nanomaterials  
1:00 p.m. 433/C010

Oct 18 to Oct 27  
Thermal Design and Model of SCU Crystals  
1:00 p.m. 401/A1100

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APS/User News




**Yang Ren of XSD Named Co-Winner of the American Iron and Steel Institute "2018 Institute Medal"**

Yang Ren, a physicist with the X-ray Science Division at the U.S. Department of Energy's Argonne National Laboratory, joins eight colleagues and co-authors as winners of the American Iron and Steel Institute "2018 Institute Medal" for their paper "Deformation Mode and Strain Path..."

[View All](#)

APS Video



Access the our YouTube channel for videos about research carried out at the APS.

1.5x larger than current site

“Live” text boxes

Other goodies

# WE HAVE THE CONFERENCES!

- SAS 2018 – Conference Chairs Randy Winans, Jan Ilavsky, and Pete Jemian, with support by Jude Kitching and Linda Shoudis



Winans, Jemian, and Ilavsky with the proposal team for SAS 2024 in Taiwan

## COMING SOON...

- MEDSI 2020 hosted by APS/Argonne
- LINAC 2022 to be co-hosted by APS/Argonne and Fermilab

# AWARDS & HONORS

- **Ralph Bechtold (AES)** received the 2018 UChicago Argonne, LLC Board of Governors award for Outstanding Service.
- **Oliver Schmidt (APS-U) and Mike Merritt (ASD)**, received a **Director's Award** for recovery of the XLEAP wiggler.
- **Sharon Gunter (PSC), Arista Thurman (AES), Harold Gaines (BIO), and Eva Stringer (CNM)**, received a **Director's Award** for their leadership of the Argonne African American Employee Resource Group.

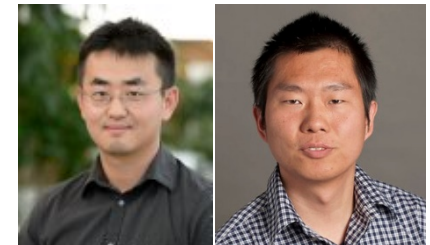
# AWARDS & HONORS

- **Brian Toby and Robert Von Dreele** (XSD) Brian is the APS Chief Computational Scientist and CSX Group Leader; Robert is a Senior Physicist in the CSX Group. Both were selected as the recipients of the **American Crystallographic Association 2019 Trueblood Award** in recognition of their “seminal contribution to the crystallographic community, in the creation and support of widely-used open-source software (GSAS-II, GSAS, and EXPGUI), in development of new instrumentation, new diffraction techniques, and in training.



# AWARDS & HONORS

- **David Keavney** (XSD) has been awarded an **AAAS Science and Technology Policy Fellowship** at the U.S. Department of State, Bureau of Energy Resources for 2018-2019.
- **Yang Ren** (XSD) joins eight colleagues and co-authors as co-winners of the **American Iron and Steel Institute “2018 Institute Medal”** for their paper, “Deformation Mode and Strain Path Dependence of Martensite Phase Transformation in a Medium Manganese TRIP Steel.”
- **Daikang Yan** (Northwestern University) received the **2017 IEEE CSC Graduate Study Fellowship Award** in Applied Superconductivity.
- **Qingteng Zhang** (left) and **Cang Zhao**, both XSD postdocs, received an award for **Outstanding Postdoctoral Performance in the Area of Basic Research** from Argonne National Laboratory.



# AWARDS & HONORS

- **Raymond Ziegler** (XSD/TRR)
  - **Pacesetter Award** for extraordinary effort in reducing legacy chemicals in the 432 E030 and D030 chemical laboratories and in dramatically reducing legacy equipment and significant clutter in the 7-ID-C experiment station.
  
- **David J. Bromberek, Terry L. Smith, Michael Douell** (ASD/RF), **William G. Jansma** (AES/SA), **Michael Johnson, Wayne Michalek, John E. Dench, Jr., Guy Harris, John L. Burke, John Hoyt, Mark Martens, Kevin Knoerzer, Ralph R. Bechtold, and Robert Wright** (AES-MOM)
  - **Pacesetter Award** for their successful repair of the APS linac, retrofitting and replacing a damaged structure and thus allowing the linac to reach energies necessary for the APS Upgrade.

# AWARDS & HONORS

- **Brenda Davis** (AES-DD)
  - **Pacesetter Award** for extraordinary effort in creating a more efficient, measurable means of handling the increased workload of prototyping requests. She handles all bases of the project from printing, cleaning, and end preparation to notifying the user of job completion. She has increased the efficiency of the 3D printing process by managing this branch of the Design and Drafting Group using the skills she has developed over a long career.
- **Kevin D'Amico, Christine McGhee** (PSC), **Karen Mellen** (CPA), **Michelle Leisten, Thomas Padilla, and Michael Sullivan** (HRS)
  - **Pacesetter Award** for extraordinary effort in exceeding the demands and deadlines of the HP-CAT transition from the Carnegie Institution for Science to Argonne. This required diagonal coordination between external and internal organizations in order to achieve success.

# AWARDS & HONORS

## 25+ YEARS SERVICE AWARDS

Congratulations to the following individuals for **25 years of dedicated service to Argonne National Laboratory** (third quarter 2018):

**Scott Peterson**

**Jerry Rice**

**Robert Wilson**