

PSC ALL-HANDS MEETING OCTOBER 30, 2019



STEPHEN STREIFFER

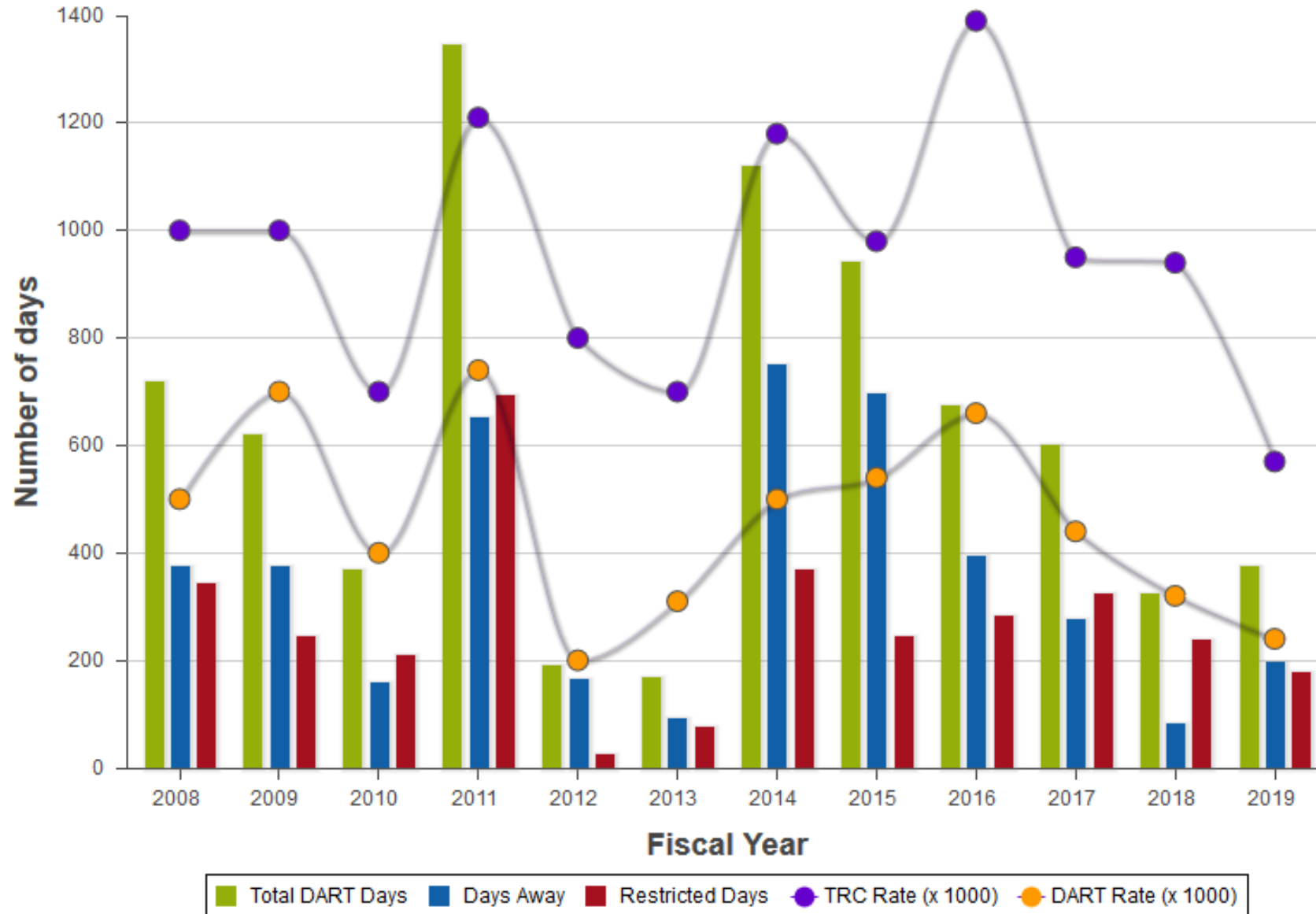
Director, Advanced Photon Source

Associate Laboratory Director, Photon Sciences

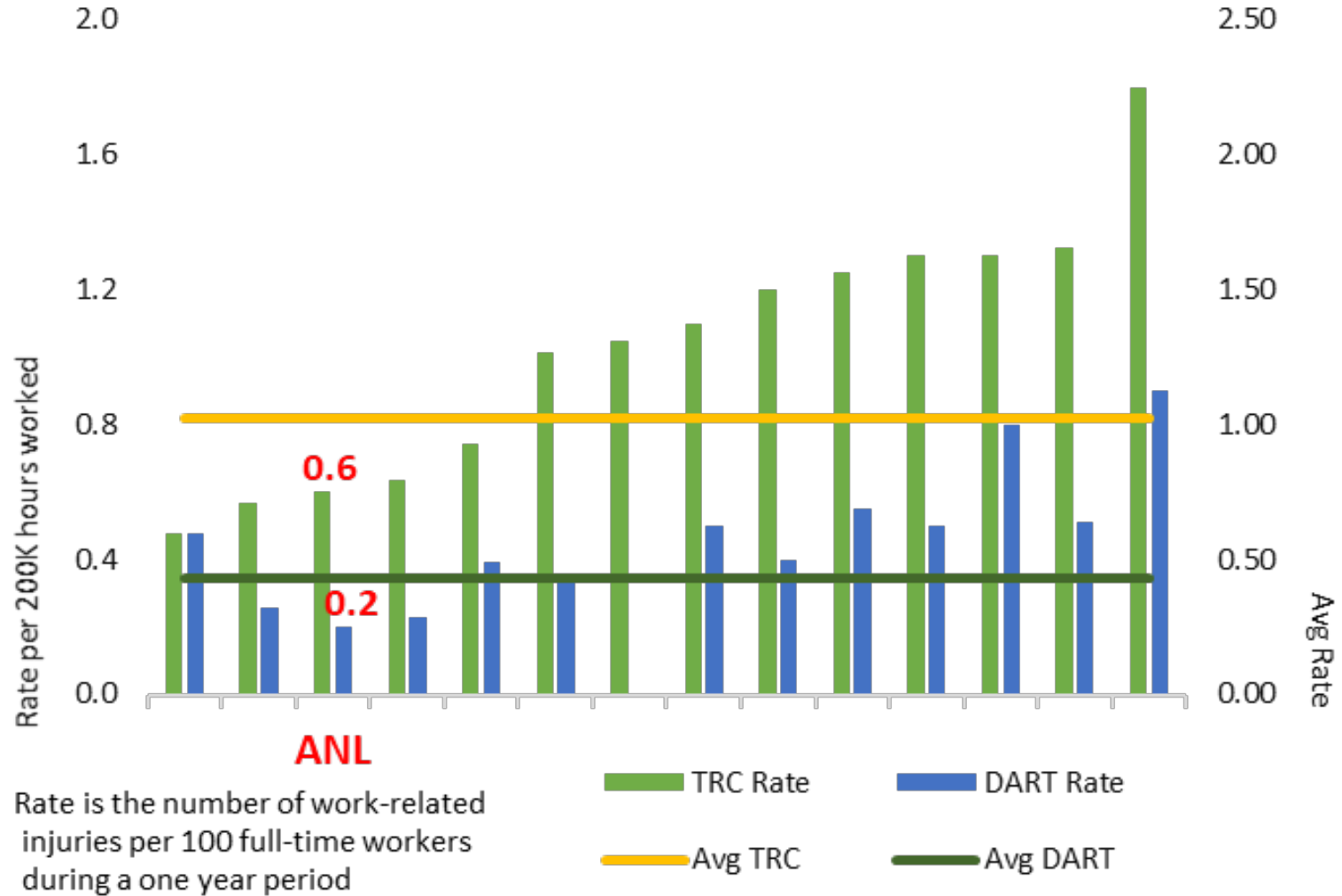
AGENDA

- PSC Update – Stephen Streiffer
 - Safety
 - Budget
 - Highlights
 - In Memoriam
 - Awards
 - Upcoming Events
- Septum Magnet Repair– John Connolly
- APS Upgrade Update – Jim Kerby

INJURY IMPACT: TRC/DART RATE BY YEAR



FY19 INJURY-ILLNESS RATE COMPARISON OF DOE OFFICE OF SCIENCE LABS



Comparison of the 10 Office of Science stewards and DOE Laboratories

UPCOMING TRAINING OPPORTUNITIES

- **WPC 203 - HUMAN FACTORS** - Human errors in the workplace can ruin research projects, jeopardize grant funding, and even threaten life and limb. Learn management strategies used by pilots, surgeons, elite military units, and other high reliability teams.

Date	Time	Building	Room
Wednesday, November 6	8:30-12:30	446	AUD
Monday, January 6	1:00-5:00	202	B169
Tuesday, January 7	1:00-5:00	241	D172
Monday, March 9	8:30-12:30	446	AUD
Tuesday, March 10	8:30-12:30	202	B169

- **WPC 204.1 - How to Build Trust With After Action Reviews** - One way High Reliability Organizations maintain exceptional Human Performance is that they excel at building trust, and sharing unwritten expertise. Learn a unique 4-question debriefing process that has been proven effective for 30+ years.... The After Action Review.

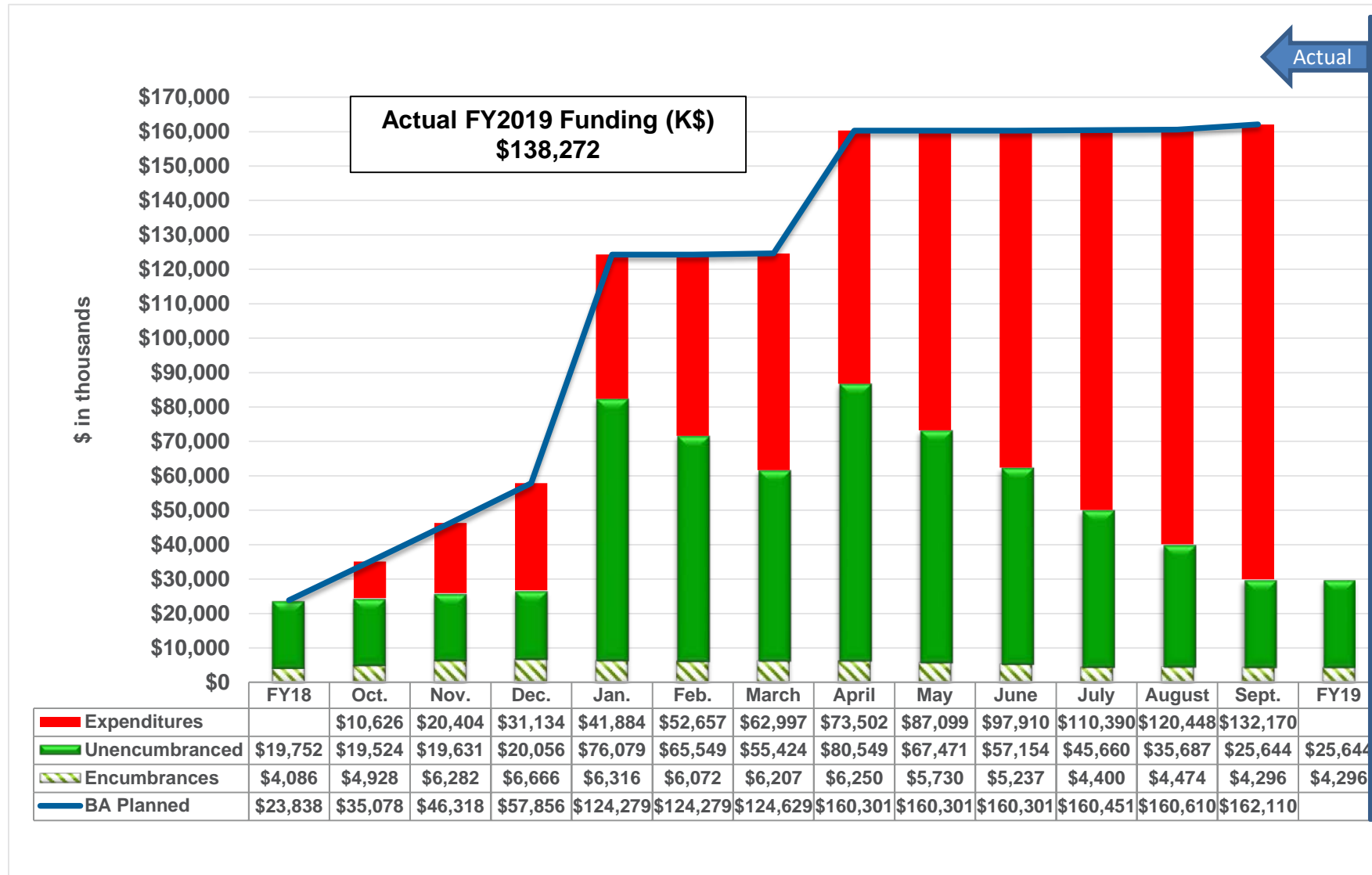
Date	Time	Building	Room
*Tuesday, November 5	1:30-2:30	202	B169
Wednesday, November 6	2:00-3:00	446	AUD
Tuesday, January 7	8:30-9:30	241	D172

- **WPC 204.2 - What Really Happens When We Punish People for Errors** - The theory is that “holding people accountable” for errors reduces errors, but the practical truth is quite the opposite. Punishing people for errors actually chills communication, erodes trust and generates more errors over time.

Date	Time	Building	Room
Monday, March 9, 2020	3:00-4:00	241	D172
Tuesday, March 10, 2020	1:30-2:30	202	B169
Tuesday, May 12, 2020	1:30-2:30	202	B169
Wednesday, May 13, 2020	3:00-4:00	446	AUD
Tuesday, August 4, 2020	1:30-2:30	202	B169



APS OPERATIONS – FY19 BUDGET



FY20 BUDGET UPDATE

Continuing Resolution through November 21, 2019

- FY19
 - All light sources: \$505M
 - APS Ops: \$138M
 - APS-U: \$130M

- FY20 Budget Outlook

	PBR	House	Senate
Light sources	\$485M	\$520M	\$550M
Ops	\$129M	–	–
APS-U	\$150M	\$170M	\$180M

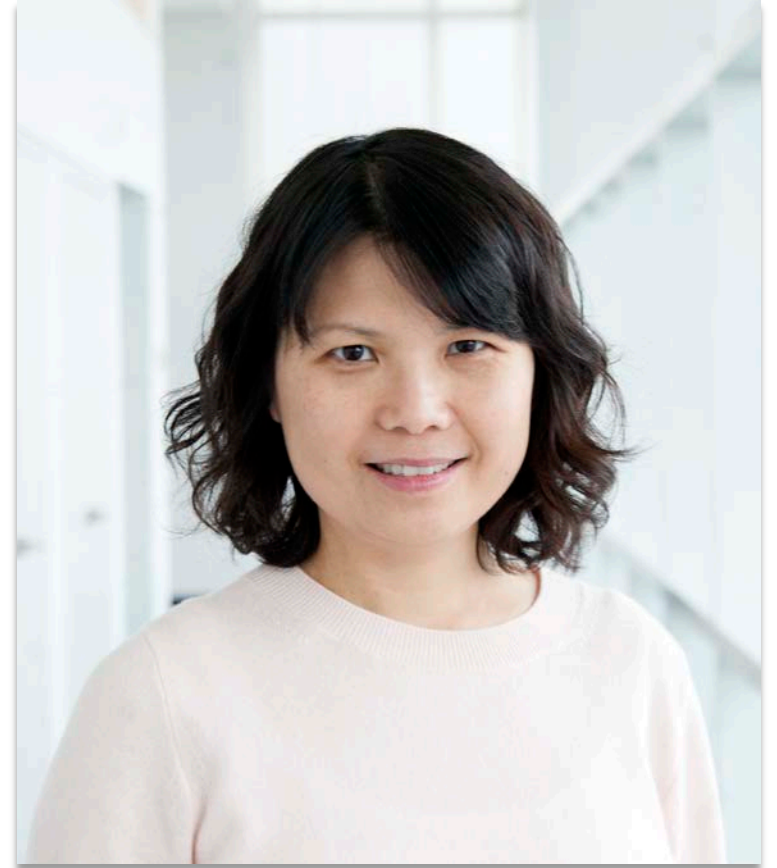


HIGHLIGHTS



PERSONNEL CHANGES

- **Xiaoyi Zhang** was selected as the new Group leader for the XSD Time Resolved Research Group



DESIGN & DRAFTING – APS OPERATIONS AND UPGRADE

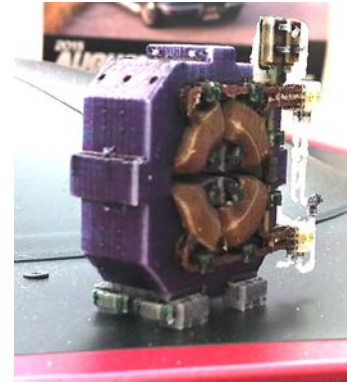
- Additive Manufacturing Facility – Twin Wet Lab Space
 - First laboratory space being cleared for use
 - Water / drain / ventilation to be installed before occupancy
 - Second space later this calendar year
 - Long lead equipment was purchased in preparation for the AMF Space – May PO / Sept Delivery



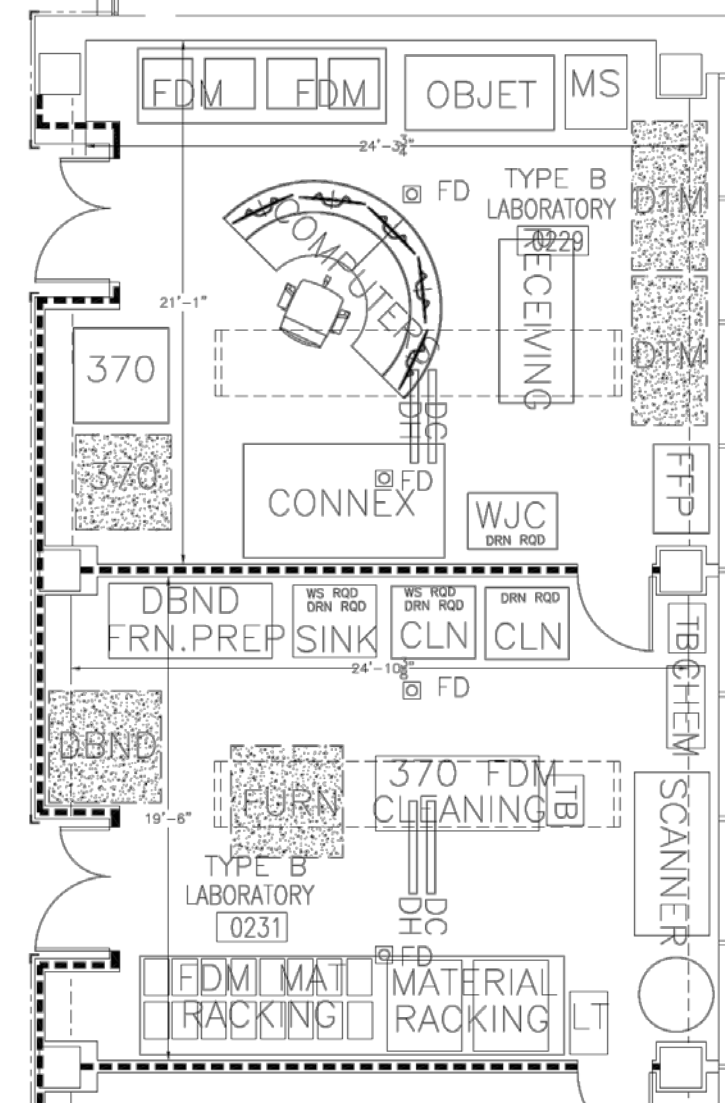
First Lab being Cleared for Occupancy



Form 3 / Wazer Water Jet



daVinci Color Printer



Additive Manufacturing Facility Layout

MECHANICAL ENGINEERING & DESIGN

- MEDSI2020 conference will be hosted by APS July 13-17, 2020, in Chicago, conference planning is on track
 - Conference website launched in September www.anl.gov/MEDSI2020
 - Industrial exhibition/sponsorship brochure emailed to potential exhibitors in September; industrial exhibition booth registration will begin Oct. 1
 - Conference poster/flier emailed to potential attendees in September
 - Abstract of keynote talks and keynote speakers' bios were posted on website in September



EPICS TURNS 30

- The Experimental Physics and Industrial Control System, developed jointly by the APS and Los Alamos National Lab, reached a milestone this year.

EPICS
EXPERIMENTAL PHYSICS AND INDUSTRIAL CONTROL SYSTEM

SOME OF THE EPICS COLLABORATING LABS



EPICS
EXPERIMENTAL PHYSICS AND INDUSTRIAL CONTROL SYSTEM

1994 LOS ALAMOS

Is EPICS so old that we only had black and white photographs in the early days?

CORRELATING DYNAMIC STRAIN AND PHOTOLUMINESCENCE OF SOLID-STATE DEFECTS IN SEMICONDUCTORS

Scientific Achievement

Dynamic strain was found to correlate with enhanced photoluminescence from optically active point defects used for solid-state qubits in 4H-SiC.

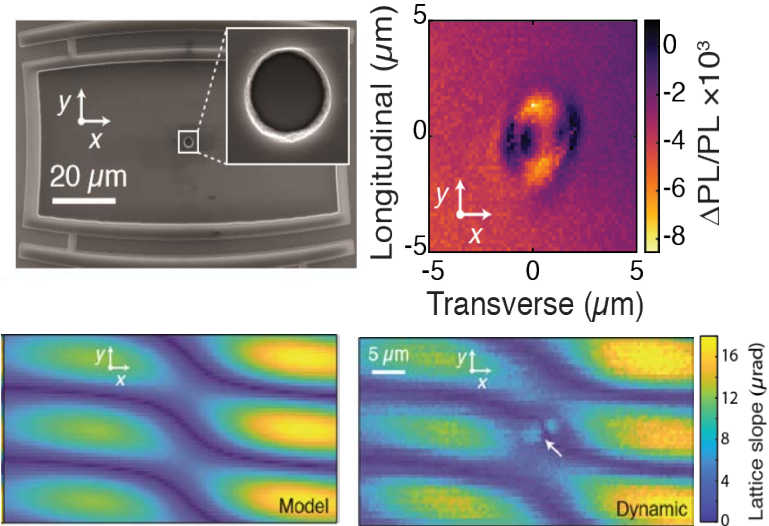
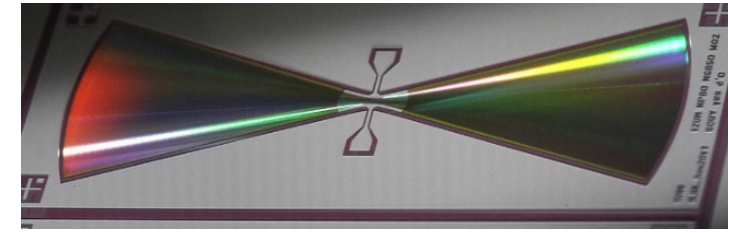
Significance and Impact

Combining time-resolved optical and x-ray microscopy demonstrated a unique route for quantifying dynamic structure-function relationships in *operando* quantum materials.

Research Details

Fabricated Gaussian-shaped piezoelectric transducers were used to drive focused 350-MHz surface acoustic waves in 4H-SiC.

A stroboscopic x-ray diffraction microscopy method used at CNM/XSD 26-ID was developed to directly image local lattice dynamics, quantifying their effect on defect photoluminescence.



Gaussian focused acoustic waves (top) enhanced photoluminescence from point defects near a fabricated scattering structure in SiC (mid) that was shown to correlate with dynamic lattice curvature measured through stroboscopic x-ray microscopy (bottom) determining optical response to acoustic dynamics.

S.J. Whiteley, F.J. Heremans, G. Wolfowicz, D.D. Awschalom, M.V. Holt, "Correlating dynamic strain and photoluminescence of solid-state defects with stroboscopic x-ray diffraction microscopy", Nat. Commun. **10**, no. 3386 (2019). DOI: 10.1038/s41467-019-11365-9

Contact: mvholt@qanl.gov

FIRST PICTURES OF AN ENZYME THAT DRIVES A NEW CLASS OF ANTIBIOTICS

Scientific Achievement

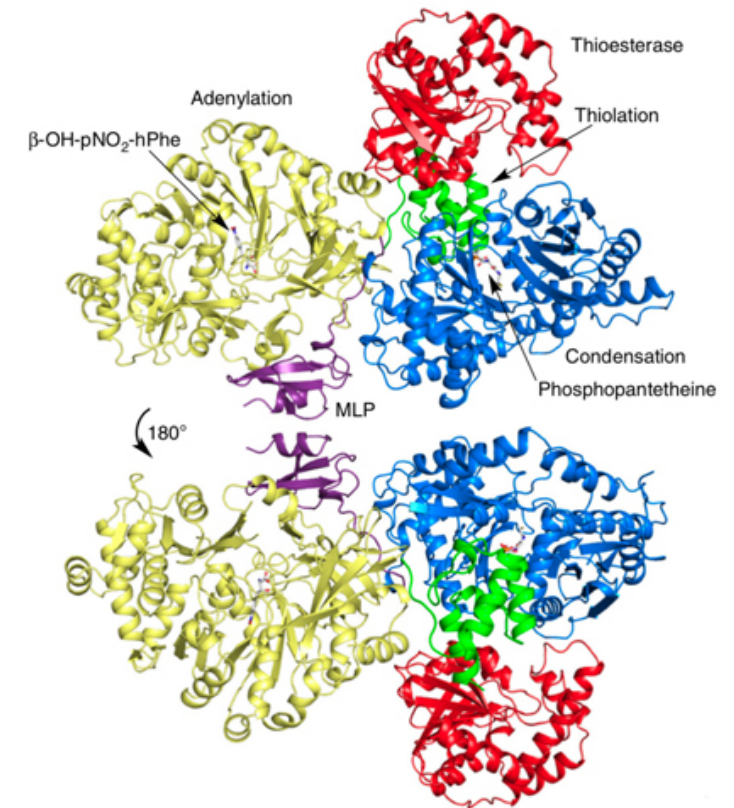
Researchers used an understanding of how antibiotic scaffolds are constructed in nature, and synchrotron x-rays at GM/CA-XSD beamline 23-ID-B and at SSRL to help solve the molecular structure of the enzyme that makes obafluorin — a broad-spectrum antibiotic agent made by a fluorescent strain of soil bacteria.

Significance and Impact

The work provides a road map that shows how individual protein domains in the ObiF1 enzyme are stitched together in 3-D space, making it possible to quickly and easily create analogs of the natural product in the laboratory to optimize its molecular properties and bioactivity.

Research Detail

- Mapped the full-length nonribosomal peptide synthetase that makes the bio-active components of obafluorin.
- Result is a comprehensive, detailed molecular structure at 3- Å resolution.



Front and back side view of the holo-ObiF1 module. (Image: Courtesy Nature Communications)

D.F. Kreitler, E.M. Gemmell, J.E. Schaffer, T.A. Wenczewicz, A.M. Gulick, "The structural basis of N-acyl- α -amino- β -lactone formation catalyzed by a nonribosomal peptide synthetase," *Nat. Commun.* **10**, 3432 (31 July 2019). DOI: 10.1038/s41467-019-113

Contact: wenczewicz@wustl.edu, amgulick@buffalo.edu

Work performed at Argonne National Laboratory and SLAC National Accelerator Laboratory



In Memoriam



DR. MARK BENO, APS SUPPORTER, ADVOCATE, AND MENTOR

- The APS community mourns the loss of Dr. Mark Beno, who passed away suddenly at the age of 68 on August 24, 2019.
- Mark was a Senior Chemist at Argonne National Laboratory and held a number of leadership roles within the XSD, including twice serving as interim Division Director.
- Mark produced more than 190 publications and earned three awards from the DOE Division of Materials Sciences, for Outstanding Scientific Accomplishment. While at the APS, he led or participated in the design of many beamlines, and made significant contributions in the areas of x-ray optics and synchrotron radiation techniques.
- Mark is survived by his wife Mary (Mitzi); his son Donald; his mother and father, Genevieve and Donald; his brother Henry; and sister Donna.



DR. ROBERT KUSTOM, DISTINGUISHED ARGONNE SCIENTIST

- It is with heavy heart we note the passing of Dr. Robert Kustom, founding member and past Acting Director of the Accelerator Systems Division and an integral part of accelerator achievements at Argonne.
- Bob's career at Argonne spanned over 60 years as an employee and as an Argonne Associate, during which he served in numerous leadership capacities and earned a world-wide reputation for his groundbreaking work in accelerator radio-frequency systems.
- His outstanding technical expertise and sound judgement were sought by accelerator facilities around the world, and his role as a mentor to new engineers and physicists helped launch many careers. He will be sorely missed.
- Bob is survived by his wife Dolores; and children Brittan, Todd, and Jill.





IMPACT ARGONNE AWARDS & CORE VALUES SHOUT-OUT

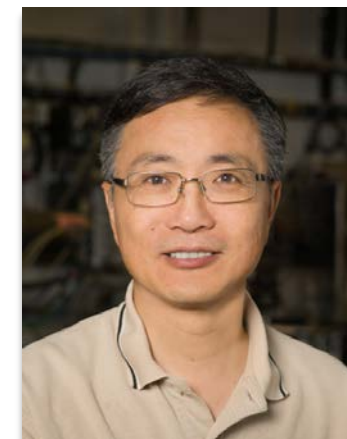
- The **Argonne Pacesetter Award** is now the **Impact Argonne Award**
 - Recognize and reward notable achievements of individuals and teams across the Laboratory with a plaque and financial award

- Recognize colleagues who demonstrates one of the Core Values of Impact, Safety, Respect, Integrity, and Teamwork by giving them a **Core Values Shout-Out**.
 - Complete and submit the Core Values Shout-Out form ANL-1238; the recipient will receive a copy of the form and a corresponding button, which can be worn on a lanyard or displayed in their office.



AWARDS & HONORS

- **Mark Rivers** (The University of Chicago/Center for Advanced Radiation Sources) received the Lifetime Achievement Award from the International Conference on Accelerator and Large Experimental Physics Control Systems 2019 (ICALEPCS) in recognition of his vision, leadership, technical excellence, and a willingness to think beyond a single laboratory or even a country, and influencing the international practice of control-system development.
- **Andrew Johnson** (ASD) was presented with the Leadership in Mentoring award from the ICALEPCS for his “contribution to training, mentoring, and inspiring countless control system engineers working within the international Experimental Physics and Industrial Control System Collaboration.”
- **Guoyin Shen**, beamline scientist with HPCAT-XSD, was elected as a Fellow by the Council of the Mineralogical Society of America (MSA). This honor is bestowed upon members who have contributed significantly to the advancement of mineralogy, crystallography, geochemistry, petrology, or allied sciences and whose scientific contribution utilized mineralogical studies or data.



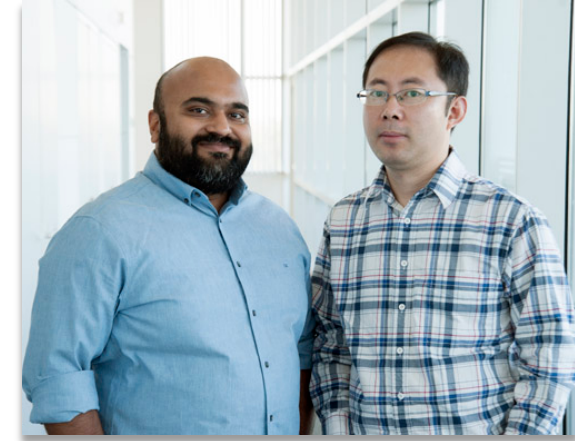
AWARDS & HONORS

- **Marion White** (AES) was named a 2019 American Physical Society Fellow for her tireless efforts to increase the participation of women and minorities in physics, especially through one-on-one mentoring and educating minorities from elementary school through college about opportunities in the field.
- **Ercan Alp** (XSD) received the International Board of Applications of Mössbauer Effect 2019 Science Award in recognition of his outstanding contributions to the development of synchrotron radiation techniques and their scientific applications based on the Mössbauer effect.
- **Ercan** also received the Argonne Distinguished Fellow Award for 2019.
- **Kamilia Wiaderek** (XSD) received the 2019 Charles Hatchett Award for originality and technical excellence and the best paper on the science and technology of niobium-based materials. She was named along with four others on their paper published in *Nature*: “Niobium Tungsten Oxides for High-rate Lithium-ion Energy Storage.”



AWARDS & HONORS

- **Cunming Liu and Niranjan Parab**, XSD postdocs, were among seven recipients of 2019 Argonne Postdoctoral Performance Awards. Liu was nominated in the basic research category for uncovering fundamental mechanistic details on the electronic and structural response of photoexcited perovskite materials. Parab's nomination in applied research stemmed from pioneering work in the field of additive manufacturing.
- **Alex Lumpkin** (Argonne Associate/APS-U) received the 2019 FEL Prize for his seminal, time-resolved measurements of dynamics in free-electron laser (FEL) oscillators and the elucidation of microbunching in relativistic electron beams and self-amplified spontaneous emission FELs.



AWARDS & HONORS

- **Daniel Haskel** (XSD) received the UChicago Argonne Board of Governors Distinguished Performance Award, recognizing his work on developing and leading instrumentation, user programs, and research for studies of quantum matter under extreme pressure conditions.

- **Kwang Je Kim** (ASD) was named an Argonne Emeritus Scientist, granted only to the most distinguished contributors in a scientific discipline.



AWARDS & HONORS

- **Darius Jarosz, Sinisa Veseli** (XSD), **Guobao Shen** (ASD), **Rob Connatser, Thomas Barsz**, and **Diane Wilkinson** (PSC/APSU) received Pacesetter Awards for their extraordinary effort and teamwork in defining and developing the eTraveler and Component Database tools that will better facilitate Argonne's management of components delivered under the APS Upgrade Project.
- **Alex Deriy, Michael Bartlein**, and **David Gagliano** (all XSD) received Pacesetter Awards for displaying remarkable team work and strong work ethic during construction of XTIP, the worldwide first beamline for the emerging SX-STM technique that is now available to general users. This was only possible because of the extraordinary technical skills provided on a challenging, short timeline.
- **Alex Quental, Tianpin Wu** (both XSD), and **Claybourne White** (PSC) received Pacesetter Awards for displaying leadership in the clean-up and organization of cages that housed various gas cylinders, both flammable and nonflammable, that had been forgotten. They took time to sort through, eliminate items, fix labels, and rearrange the cages making the area far better organized and safer to access.

AWARDS & HONORS

25+ YEARS SERVICE AWARDS

Congratulations to the following individuals for 25+ years of dedicated service to Argonne National Laboratory (third quarter 2019):

25 years

Guy Jennings

John Grimmer

30 years

Robert Kalt

Ned Arnold

Charles Keyser

35 years

Elizabeth Moog

Ercan Alp

2019 APS/CNM USERS MEETING

May 6, 2019—May 10, 2019

Advanced Photon Source | Center for
Nanoscale Materials
Argonne National Laboratory

THE INTERNATIONAL YEAR OF THE PERIODIC TABLE OF CHEMICAL ELEMENTS



OTHER UPCOMING EVENTS

▪ 2019

- Nov 04 to Nov 05: Beamline Reviews
- Nov 06 to Nov 07: APS Scientific Advisory Committee (SAC) Meeting

▪ 2020

- Jul 13 to Jul 17: 11th International Conference on Mechanical Engineering Design of Synchrotron Radiation Equipment and Instrumentation (MEDSI2020) Chicago
- Sep 21 to Sep 22: Industrial Processes and the Role of APS Upgrade, Argonne National Laboratory
- Sep 23 to Sep 24: Materials under Extreme Conditions at the APS Upgrade, Argonne National Laboratory
- October 19, 2019: ICALEPCS, New York, NY