Newsletter 14 | /August 2025



Co-ACCESS Semi-Annual

Consortium for Operando and Advanced Catalyst Characterization via Electronic Spectroscopy and Structure

Summer Edition

Co-ACCESS Office Hours:
Reminder, if you have any questions about XAS data processing or modeling or experimental design, stop in during our monthly office hours. If you would like to be added to the mailing list, please reach out to Jorge at jperezag@slac.stanford.edu.

10-2 Update – First Experiments:

Beamline 10-2 X-ray commissioning is underway! In early February staff at SSRL including the Co-ACCESS team of Adam Hoffman, Jorge Perez-Aguilar, and Enrico Tusini successfully delivered X-rays into the experimental hutch. This milestone moved the 10-2 project from the construction phase to the commissioning phase. Over the next year we will characterize the beam and run shake-down experiments to demonstrate its functionality before declaring the beamline open to users.

As we closed out the 2025 run cycle, we hosted members of the Prof. David Flaherty Group from Georgia Tech, who helped us successfully demonstrate the continuous scanning functionality of the beamline while collecting crucial data for a few of their projects! Over the next year we intend to collaborate with "friendly" users to aid us in troubleshooting key aspects of the operation of the beamline

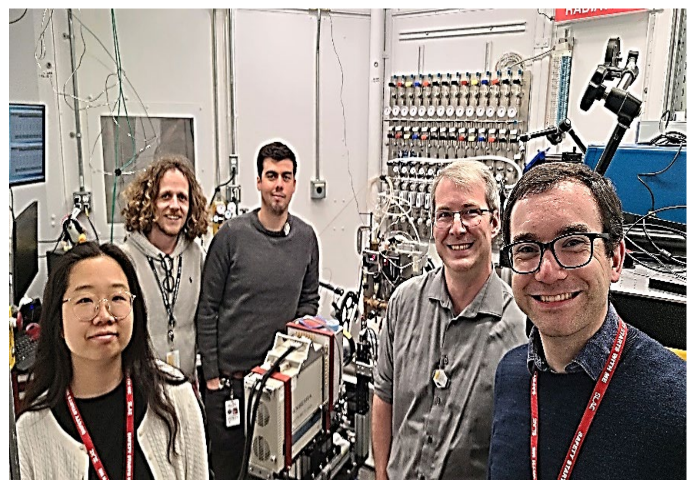
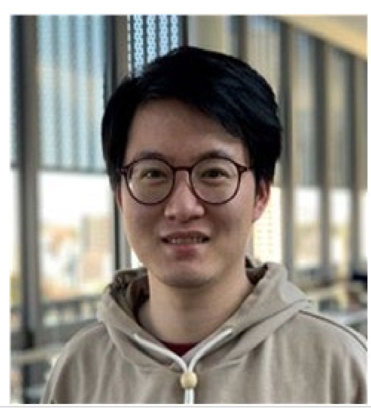


Photo of Prof. David Flaherty Group from Georgia Tech at BL 10-2 together with Enrico, Jorge and Adam

Summer Visitors

Co-ACCESS recently hosted Prof. Jingyi Chen (Department of Chemistry & Biochemistry, University of Arkansas) for a month during her sabbatical. Dr. Chen's research focuses on rational design and synthesis of functional nanomaterials for energy conversion and human health-related applications. She educated Co-ACCESS in aspects of electrocatalysis and used the time to expand her knowledge of SAXS and XAS analysis.

We will also host graduate student Yanze Huang (a PhD student with Prof. Kyoko Nozaki at University of Tokyo) as part of the GX University Collaborative Study Abroad Program. He will be with us for one month and his visit will focus on aspects of *operando* catalyst characterization.



New Staff Member

Enrico Tusini, a postdoctoral associate at Co-ACCESS, graduated from the Karlsruhe Institute of Technology in April 2024. His thesis focused on operando XAS characterization of bimetallic catalysts for hydrogen production. After working at the CAT beamline at the KIT Light Source for a brief postdoctoral appointment, he joined the Co-ACCESS team in early 2025.

He primarily supports the commissioning and implementation of new science at BL 10-2 and assists users with their *in-situ/operando* X-ray absorption spectroscopy experiments. He also supports the Co-ACCESS team's efforts to develop new expertise in catalysis and spectroscopy.

End of Run Statistics:
During the Run 2025 cycle Co-ACCESS supported 41 beamtimes, passing 360 supported beam times since the start of the program. With increased user demand across the facility, we saw a decrease in overall CO-ACCESS beam times; however, we were able to welcome 5 new user groups for their first experiments with us!

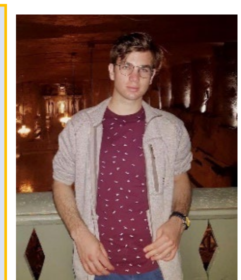
NAM Course:
Simon R Bare and Adam Hoffman, co-hosted a workshop at the 29th North American Catalysis Society Meeting with Eli Stavitski (NSLS-II, Brookhaven National Laboratory), and Debora Meira (APS, Argonne National Laboratory), introducing catalysis researchers to in-situ/operando catalyst characterization capabilities at DOE synchrotron facilities.

Summer Interns

Lucie Johnson is a rising junior studying materials chemistry at Brown University. At Brown, her research focuses on the development and characterization of novel stereo- and sequence- controlled biodegradable block copolymers. This summer, Lucie is a SULI intern working with the CO-ACCESS and Accelerate teams to track catalyst restructuring using diffuse reflectance infrared Fourier transform spectroscopy (DRIFTS).

She is performing time-resolved operando FTIR measurements on a Pt/Al_2O_3 system during the CO oxidation reaction to guide the development of experiments on the new quick-scanning XAS beamline at SSRL. With Accelerate, she is using IR with CO as a probe molecule to examine the effects of different mixing methods on a Rh/TiO_2 system's structure.

Mikolaj Sidzinski recently graduated with a bachelor's degree from UCLA, where he worked on silicon composites as high-capacity lithium-ion battery anode materials. This summer at SLAC, Miko is helping to build a reference database for X-ray absorption spectroscopy (XAS) by preparing standards relevant to heterogeneous catalysis. Through the acquisition and processing of their spectra, he hopes to aid in future interpretation of XAS data by users and SLAC staff alike. In the fall, Miko will continue his education at UC Berkeley as he pursues a PhD in chemical engineering.



Key Recent Publications

"Selective chemical looping combustion of acetylene in ethylene-rich streams", M. Jacob, H. Nguyen, R. Raj, J. Garcia-Barriocanal, J. Hong, J.E. Perez-Aguilar, A.S. Hoffman, K.A. Mkhoyan, S.R. Bare, M. Neurock, A. Bhan, *Science* (2025), **387** 744-749. DOI:10.1126/science.ads3181.

"Nickel promotes selective ethylene epoxidation on silver", A. Jalil, E. E. Happel, L. Cramer, A. Hunt, A.S. Hoffman, I. Waluyo, M.M. Montemore, P. Christopher E.C.H. Sykes, *Science* (2025), **387**, 869-873. DOI:10.1126/science.adt1213.

"Synthesis of Amorphous and Various Phase-Pure Nanoparticles of Nickel Phosphide with Uniform Sizes via a Trioctylphosphine-Mediated Pathway", D. Thompson, A.S. Hoffman, Z. Mansley, S. York, Sarah; F. Wang, Y. Zhu, S.R. Bare, J. Chen, *Inorg. Chem*. (2024), **63**, 40, 18981–18991. DOI:10.1021/acs.inorgchem.4c03334.

"Structural Evolution and Stability of Rh/TiO_2 Catalysts under Reverse Water Gas Shift Conditions: Influence of Initial Rh Structure", E. Schroeder, S. Hong, Seunghwa, X. Chen, A.S. Hoffman, Z. Chen, A. Khan, G. Barber, S. Bac, R. Rioux, J. Yang, C. Tassone, S.R. Bare, P. Christopher, *ACS Catalysis* (2025), **15**, 12133-12147; DOI: 10.1021/acscatal.5c02205.