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# Co-ACCESS

*Semi-Annual*

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

## Winter 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 us at [co-access\\_ssrl@slac.stanford.edu](mailto:co-access_ssrl@slac.stanford.edu).

### 10-2 Commissioning Update:

Beamline 10-2 X-ray commissioning continues! In November 2025, staff at SSRL including Olga Kraynis, Molleigh Preefer, and Jorge Perez-Aguilar, successfully focused beam in the front experimental hutch starting the commissioning of the scattering program that shares the 10-2 source.

### Continuous and Quick Scanning XAS Update:

We have successfully collected transmission and fluorescence XAS spectra using the Si(111) crystals in the energy range of 5-24 keV. This got us thinking about the future...

*Are you interested in exploring time-resolved studies?* Continuous-scanning mode is commissioned allowing XAS spectra collection as fast as 90 seconds. Quick-scanning commissioning is underway, enabling sub-second data collection!

### Ge Detector Update:

In December 2025 we installed and calibrated our new 24-element Ge detector. Over the next year we will be commissioning the detector to demonstrate its functionality before releasing it to users. This again has us thinking about the future...

*Are you interested in studying dilute catalyst samples?* The 24-element Ge detector on 10-2 will allow XAS data to be collected from ultra-dilute samples.

### Science Commissioning Update:

Over the next year we will continue the BL 10-2 science commissioning with “friendly” users to aid us in troubleshooting key aspects of the operation of the beamline. Stay tuned to see if your science is amenable to testing on 10-2.

## Let's Meet Up!

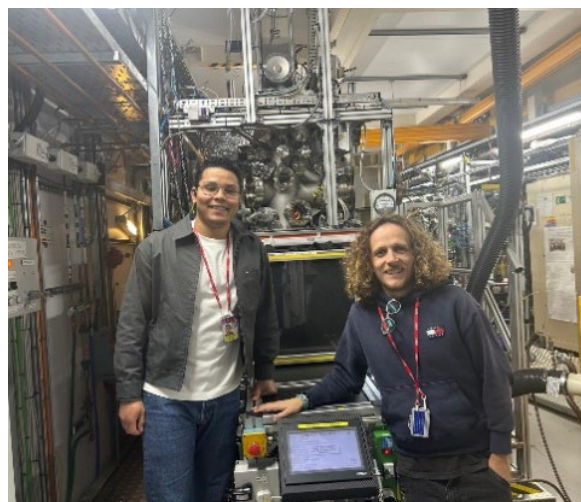
As of now, the Co-ACCESS team will be at the following conferences this year. We look forward to meeting you and discussing how we can help with your *in-situ/operando* characterization.

- ACS Spring – Atlanta, Georgia. Simon, Jiyun, and Adam will be presenting work, and Adam will be co-hosting a symposium on X-ray and Neutron Applications for Catalysis.
- Faraday Discussion on “Bridging the gap from surface science to heterogenous catalysis” – London, UK. Simon will be presenting.
- XAFS19 the 19<sup>th</sup> International XAFS Conference – Chiang Mai, Thailand. Simon will be giving a plenary talk and Fernando will also present his research.
- IUCR – Calgary, Canada. Adam will be co-hosting a micro-symposium on XAS for a net zero transition.
- Operando VIII – Asilomar, California. Co-ACCESS is helping to organize this conference.

## Co-Access on the road: Diamond Synchrotron, UK

At the end of September, Simon and Enrico had the pleasure of performing some ex-situ soft X-ray experiments at the B07 beamline at the Diamond Synchrotron, UK. The project, in collaboration with the group led by Prof. Jeffry Rimer (University of Houston) aimed to uncover the coordination of aluminum in various zeolite-based materials. Moreover, Simon had the pleasure of giving two talks: the first one at the UK Catalysis Hub and the second directed at the Diamond community. Lots of scientific discussions and fun!!

Edgar, a Ph.D. student in Professor Rimer's group (on the left), and Enrico (on the right) standing in front of the XPS/NEXAFS B07-ES1 branchline at Diamond.



## Strategic Partnership Project with ExxonMobil Technology and Engineering Company

ExxonMobil has, as part of its R&D program, the need to accelerate discovery processes which entail the need to characterize the working state of catalysts using X-ray methods including x-ray absorption spectroscopy and X-ray scattering. Co-ACCESS will assist ExxonMobil on evaluating X-ray absorption spectroscopy capabilities, specifically tailored for in-situ and operando catalysis characterization at SSRL beam lines. These capabilities will be accessible to both ExxonMobil and the broader Stanford Synchrotron Radiation Lightsource general user community.

## Meet New SCGSR Intern - Libby Brungardt

Libby Brungardt is a 5th year PhD candidate at the University of Wisconsin – Madison, advised by Prof. Siddarth Krishna. She studies the selective catalytic reduction of nitrous oxide (N<sub>2</sub>O-SCR) over Fe-exchanged zeolites, focusing on active site characterization, and generating a structure-function relationship for this system.

Libby is a visitor at Co-ACCESS as a DOE Science Graduate Student Research (SCGSR) award recipient, hosted by Simon Bare and working with the Co-ACCESS team at SLAC. During her internship, Libby is assisting the Co-ACCESS team in operating beamlines 9-3 and 10-2 for facility users while also working on understanding the dynamic active site structure of ionic Fe during both N<sub>2</sub>O-SCR and



## Key Recent Publications

[“Tuning Catalytic Reactivity via Wetting Control Through Oxygen Vacancies: Ru Clusters on Anatase TiO<sub>2</sub> and CeO<sub>2</sub> Supports”](#), L. Chen, C.G. Moore, C.E. Umhey, J.E. Perez-Aguilar, J. Hong, A.S. Hoffman, R.M. Thorpe, J.B. Moreira, L. Kovarik, S.R. Bare, S. Rauegi, J.-S. McEwen, J. Szanyi, *Journal of the American Chemical Society* 2025, **147** (35), 31779-31790. DOI: 10.1021/jacs.5c08781.

[“Reversible Temperature-Induced Shape Transition of Pt Nanoparticles Supported on Al<sub>2</sub>O<sub>3</sub>”](#), R. Pool-Mazun, S.A. Khan, V. Liao, Thomas W. Hansen, Md R. Yousuf, P. Yang, A. Shrotri, A.S. Hoffman, Simon R. Bare, D. Vlachos, A.M. Karim, *Nanoscale Advances* (2025), online. DOI: 10.1039/D5NA00930H.

[“Best Practices for In-Situ and Operando Techniques within Electrocatalytic Systems”](#), A. Prajapati, C. Hahn, I. Weidinger, Y. Shi, Y. Lee, A.N. Alexandrova, D. Thompson, S.R. Bare, S. Chen, S. Yan, N. Kornienko, *Nature Communications*, (2025), 16, 2593. DOI: 10.1038/s41467-025-57563-6.

[“Adapted cell design for the operando X-ray absorption study of a structurally evolving Cu nanoparticle ensemble during the CO<sub>2</sub> electroconversion to multicarbon products”](#), S. Louisia, J. Feijóo, Y. Yang, S. Yu, G. Fonseca, M. Guzman, Y. Shan, Yu, E. Tusini, A.S. Hoffman, S.R. Bare, P. Yang, *Journal of Physical Chemistry C*, (2026), 130, 426-436. DOI: 10.1021/acs.jpcc.5c06449.

We invite any catalysis researcher to contact us prior to submitting a proposal to SSRL, or prior to their upcoming experiment. We can advise you at the appropriate level with the expressed aim of trying to maximize the success of your time at SSRL. We look forward to collaborating with you! [srbare@slac.stanford.edu](mailto:srbare@slac.stanford.edu) <https://www-ssrl.slac.stanford.edu/content/science/chemistry-catalysis>