

## **SSRL X-ray Absorption Spectroscopy Short Course for Structural Molecular Biology Applications**

The Stanford Synchrotron Radiation Laboratory (SSRL) held a short course on x-ray absorption spectroscopy (XAS) and its applications in structural molecular biology March 13-16. The course was attended by 18 participants from across the United States and Canada, and consisted of two days of lectures, followed by two days of hands-on practical sessions.

The course opened with an introduction to the structural molecular biology program at SSRL and was followed by introductory talks on synchrotron radiation and beam line optics. This was followed by a series of talks which focused basic theory, experimental considerations and applications. The talks were given by lead researchers in the field of x-ray absorption spectroscopy. The final talks focused on more specialized applications, including polarized XAS measurements, XAS imaging, inelastic x-ray scattering, and multiple scattering-based XANES calculations.

The practical sessions included hands-on data collection at SSRL beam lines 7-3 and 9-3, led by SSRL staff members. Participants brought in their own samples for measurements and were able to collect preliminary data sets. This allowed the participants to learn more about optimal sample conditions for XAS measurements, including sample concentrations and the importance of having homogeneous samples. For many of the participants, this information will help make their first beam time more successful. There was also a full day of data analysis for each participant, which included data processing and fitting of EXAFS data (including single and multiple scattering analysis) using EXAFSPAK, PySpline, and FEFF. The participants were given example data sets of increasing difficulty, and in some cases were even able to fit the data they had collected at the beam line on the previous day. Both the lectures and practical sessions were enthusiastically received by the participants. The short course was given by the SSRL Structural Molecular Biology Program's XAS group, which is funded by the U.S. NIH NCRR BTP and DOE BER.