

# High energy resolution X-ray spectroscopy at SLAC

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High-energy-resolution X-ray spectroscopy is an ensemble of advanced X-ray characterization tools that can provide unprecedented electronic structure insights of molecules and materials. The availability of high-photon-flux synchrotron radiation beamlines has enabled the routine application of such techniques for the characterization of metallic species and active centers in metalloproteins, heterogeneous and homogeneous catalysts, actinides, and beyond upon static and operando sample environment conditions. Moreover, the recent availability of X-ray Free Electron lasers has extended the applicability of such spectroscopy tools for the study of ultrafast dynamics such as electron transfer processes, transient molecular states, and molecular dissociation.

At SLAC National Accelerator Laboratory, we have built an extended science program based on in-house developed high-energy-resolution X-ray spectroscopic capabilities. In this presentation, we will be highlighting the developments we have been doing at SLAC in order to enable scientific studies of broad research interest. Moreover, representative examples from the ongoing spectroscopy programs of SSRL and LCLS will be discussed.