

Stanford

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Bio

BIO

I am a graduate student in the Department of Physics at Stanford University. As part of the research group of Dr. Kent Irwin, I focus on the application of superconducting detectors to X-ray spectroscopy.

Working at the Stanford Synchrotron Radiation Lightsource (SSRL), I operate a 240 pixel transition-edge sensor (TES) array in support of a diverse user program at beamline 10-1. TES devices have emerged in the soft X-ray regime as moderate-resolution, high-throughput spectrometers that are particularly suited to measure dilute and damage-sensitive samples. My role as an instrumentation scientist has focused on fast data processing, instrument calibration, and ease-of-use for users.

My research into spectroscopy focuses on using partial-fluorescence-yield X-ray absorption spectroscopy to probe electronic structure in transition-metal complexes. Transition metals play a critical role in proteins such as hemoglobin and photosystem-II, catalysts, and batteries. In all of these systems, metals have a powerful ability to change oxidation states, store energy, and shuttle electrons around. X-ray spectroscopy allows us to directly probe the properties of transition metals that make them so useful for chemistry and biology.