Dr. Emma Cating-Subramanian

JILA

Multi-modal spectromicroscopy and its application to strongly correlated systems

The complexity of strongly-correlated materials provides tremendous opportunity for design, manipulation, and coherent control of material properties. From topologically non-trivial magnetic states to charge density waves (CDW) and hidden phases, learning to control these properties starts with understanding them. To do that we turn to multi-modal spectroscopic and microscopic techniques. To explore and manipulate the coupling of the electrons with specific phonon modes in CDW materials we combine angle resolved photoemission spectroscopy (ARPES) and visible transient reflectivity, and by combining magnetically-sensitive x-ray spectroscopies and cutting-edge lenseless imaging techniques we can image topologically non-trivial magnetic textures in 3D. Correlative imaging and spectroscopies are more powerful than individual techniques, and allow us a more comprehensive look at these intricate systems.

Short Bio

Dr. Emma Cating-Subramanian got her bachelors degree in Chemistry from Carnegie Mellon University in 2010. She then graduated with a Ph.D. in physical chemistry from the University of North Carolina Chapel Hill where she studied the impact of nano-to-micro scale morphology on photoexcited electron/hole dynamics in semiconductors. She is currently a postdoctoral researcher at JILA at CU Boulder where she uses visible-to-soft x-ray light to study magnetic, electronic, and phonon properties of strongly correlated and nanostructured materials.