

Coherent X-ray Scattering on Magnetic and Electronic Materials

Monday, 31 May 2021 16:30 (30 minutes)

With the advent of diffraction limited light sources, coherent X-rays will play an important role in understanding and characterizing nanoscale magnetic surfaces and interfaces with unique and novel spin textures. Coherent X-ray scattering give rise to speckle pattern that contain unique finger-print about the sample heterogeneity. In this talk I will show various examples to demonstrate how speckle pattern enable us to undertake studies that provide insight into spatial and temporal correlation of magnetic and electronic features in a quantum material. I will show Photon Correlation Spectroscopy (XPCS) studies performed on a 2D square magnetic lattice performed at a synchrotron, where we observed two distinct regimes of domain wall motion—a low temperature ballistic, and a high temperature diffusive type. I will also show a pulse-pair method employed at the LCLS to perform sub-nanosecond fluctuation studies on a magnetic thin film. Finally, I will also show our recent studies on generating soft X-ray orbital angular momentum beams using magnetic nanostructures that has the potential to unravel new information about quantum properties in materials.

Work is funded by U.S. DOE.

Dr. Sujoy Roy is a beamline scientist at the Cosmic Beamline at the Advance Light Source of the Berkeley National Laboratory, and also serving as manager for the x-ray scattering program.

Presenter: Dr ROY, Sujoy (Advanced Light Source, Berkeley National Laboratory)

Session Classification: Session IIIb