

PHYSICS COLLOQUIUM

March 4; 4pm; Rm 118 Nieuwland

Tracking phase fluctuations in quantum materials using coherent x-rays

Dr. Xiaoqian (Michelle) Chen

Postdoctoral Researcher
Lawrence Berkeley National Laboratory



Quantum materials are condensed matter systems where subtle changes at the quantum level manifest as macroscopic emergent properties, mediated by interactions among electronic and lattice degrees of freedom. Due to this complexity, quantum materials often exhibit dynamical properties. Studying equilibrium and nonequilibrium dynamics in quantum materials is, therefore, a direct route to understanding their ordering mechanics, vital to the design and control of future functional materials. This calls for a microscopic tool that is sensitive to a wide range of dynamical time scales. Synchrotron-based coherent soft x-rays are ideal probes to study the phase history and dynamics of elementary collective phenomena. In this talk, I will use an artificial magnetic lattice and a cuprate superconductor as examples to demonstrate how the coherent property of x-rays serves as a tool of tracking both classical and quantum type of fluctuations.