

SPRING 2023

MSE 690 SEMINAR SERIES

FRIDAY, MARCH 10TH | 3:30 REFRESHMENTS | 3:45PM SEMINAR

ARMS 1010



ELIZABETH DICKEY

Teddy & Wilton Hawkins
Distinguished Professor
and Department Head of
Materials Science &
Engineering

Carnegie Mellon University

“Local to Meso-scale Order in Ferroelectrics Characterized by Aberration -Corrected Scanning Transmission Electron Microscopy”

Abstract: The ability to design the composition and microstructure of electronic ceramics for emerging technological applications requires sophisticated characterization techniques that can provide quantitative information about local structure and chemistry. Such structure quantification is particularly important to the fundamental understanding of properties in many important non-linear dielectrics, where chemical heterogeneities associated with dopants or intrinsic lattice defects give rise to local inhomogeneities in charge, strain and polarization. Such local deviations from the global average structure and symmetry are often linked to enhancements in macroscopic dielectric and electromechanical properties. This seminar discusses the use of aberration-corrected scanning transmission electron microscopy (STEM) to quantify short- and medium-range lattice disorder in electronic oxides, including ferroelectrics and relaxor ferroelectrics. The ability to quantify local structure on a sublattice basis and in real space provides unique insight into the polarization of these materials.

Biography: Elizabeth Dickey is the Teddy & Wilton Hawkins Distinguished Professor and Department Head of Materials Science & Engineering at Carnegie Mellon University. Her research aims to develop processing-structure-property relationships for materials in which the macroscopic physical properties are governed by point defects, grain boundaries or internal interfaces. She has over 170 peer-reviewed journal publications, which have been cited over fifteen-thousand times. Early in her career she received the Presidential Early Career Award for Scientists and Engineers (PECASE) for her work on metal-ceramic interfaces. She was awarded the Fulrath Award by the American Ceramic Society in recognition of her research on characterization of functional ceramics and composites. Professor Dickey is a fellow of the American Ceramic Society, the Microscopy Society of America and AAAS. She currently serves as Past-President of the American Ceramic Society.



School of Materials Engineering