

THE MATERIALS SCIENCE AND ENGINEERING DEPARTMENT  
SPRING COLLOQUIUM SERIES PRESENTS:

## Morris E. Fine Lecture: Elizabeth Dickey

Professor and Department Head of Materials Science and Engineering

Carnegie Mellon University



### *Defect Disorder and Dynamics in Electronic Ceramics*

The rational design and control of defects in electronic ceramics is critical to property control and optimization. Point defects, in particular, influence properties such as conductivity, electric polarization and, as most recently discovered, the ability to switch polarization to engender ferroelectricity in wurtzite-structure materials. In polycrystalline materials, the interactions of point defects with higher dimensional defects, such as grain boundaries and interfaces, also influences the macroscopic material response. Once in device applications, point defect interactions with external fields influence material performance and, in some cases, instigate material degradation and failure. This lecture will review developments in our understanding of defect disorder and defect dynamics in electronic ceramics. It will highlight the role of transmission electron microscopy techniques for assessing local to meso-scale disorder in complex electronic ceramics and for studying their response to electric fields.

**Elizabeth Dickey** is the Teddy & Wilton Hawkins Distinguished Professor and Department Head of Materials Science & Engineering at Carnegie Mellon University. She received her B.S. in Materials Engineering from the University of Kentucky and her Ph.D. from Northwestern University. Her research group 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 200 peer-reviewed journal publications, which have been cited over twenty-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 and the Sosman 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.

**Tuesday, April 9 • 4 pm CT • Tech L211**

Reception to follow in the Willens Wing Atrium

*In person only; no Zoom*

*Host: Professor Vinayak David*

Questions? Contact [allison.macknick@northwestern.edu](mailto:allison.macknick@northwestern.edu)