



## MATERIALS SCIENCE & ENGINEERING DISTINGUISHED SEMINAR SERIES



Dr. Steve May

Head of Materials Science and  
Engineering Department

Drexel University

Friday

November 5, 2021

11:00AM — 12:00PM

Zoom

[Meeting Room](#)

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### Anion-based Approaches to Engineering Functionality in Perovskite Oxide Heterostructures

Scientific interest in  $ABO_3$  perovskite oxides remains intense due to the wide range of physical behavior present in these materials. The ability to control the position, occupation, and composition of the anion site has recently emerged as a new route to tune properties in epitaxial perovskites. This talk will focus on my group's efforts aimed at developing anion-based approaches to tailor electronic, optical and magnetic properties in oxide thin films. First, I will discuss how epitaxial heterostructures can be used to alter the positions of oxygen atoms to stabilize non-bulk-like bond angles and lengths, which enables the modification or confinement of electronic and magnetic behavior in oxide films and superlattices. In the second half of the talk, I will describe efforts focused on controlling the occupation and composition of the anion site, including reversible oxidation/reduction in perovskite ferrite films, fluorination reactions to synthesize oxyfluoride films, and combining lithographic and topotactic approaches to realize patterned materials with new functionality.

**Biography:** Steve May is the Department Head and Professor of Materials Science and Engineering at Drexel University, having joined the department in 2009. He received a B.S. in Engineering Science and Mechanics from Penn State University and a Ph.D. in Materials Science and Engineering from Northwestern University. Following his doctorate, he was a postdoctoral researcher at Argonne National Laboratory from 2007-2009 in the Materials Science Division. He has received the NSF CAREER award, an ARO Young Investigator Award, the Ross Coffin Purdy Award from the American Ceramic Society, and the Bradley Stoughton Award for Young Teachers from ASM International. His research focuses on the synthesis and characterization of thin films and heterostructures of materials with novel electronic or magnetic function, including perovskite oxides, topological semimetals, and MXenes.