Abstract
At the confluence of engineering and science, the field of materials engineering provides exciting opportunities for interdisciplinary research. In this seminar I will present three quintessential examples of materials engineering research from my group.

Tailoring of ceramic thermal barrier coatings for gas-turbine engines, used in transportation and energy sectors, to withstand extreme environments including high temperatures and molten deposits of desert sand or volcanic ash or coal fly ash.

Multifunctional ceramic/carbon nanotubes composites with unprecedented microstructures for potentially extreme combinations of electrical properties and mechanical properties such as damage tolerance, strength, toughness, and creep resistance.

High-throughput, large-scale fabrication of devices of the extreme two-dimensional crystal that is graphene using site-specific stamping and chemical vapor deposition.

Although these examples are diverse, a common thread runs through them — rational tailoring of materials for desired properties and performance — which is arguably the essence of materials engineering research.

Biographical Sketch
Nitin Padture is the College of Engineering Distinguished Professor in the Department of Materials Science & Engineering and the founding Director of the Center for Emergent Materials (NSF MRSEC), at the Ohio State University. Padture received his Ph.D. from Lehigh University, and he worked as a postdoc at NIST, before joining the University of Connecticut faculty in 1995. Padture moved to OSU in 2005. Padture has published over 120 journal papers which have been cited over 4,200 times, co-invented 4 patents, and delivered over 130 invited/keynote talks. A Fellow of the American Ceramic Society, he has received that society's Roland Snow, Robert Coble, and Richard Fulrath awards. Padture is also a recipient of the ONR Young Investigator Award. He was elected Fellow of the American Association for the Advancement of Science in 2008.