

# DEPARTMENT OF MECHANICAL & AEROSPACE ENGINEERING

## WILLIAM MAXWELL REED SEMINAR SERIES

### **“Understanding and mitigating high temperature oxidation for gas-turbine, nuclear, and hypersonic applications”**

**Ken Kane, Ph.D.**  
**Johns Hopkins University**  
**Applied Physics Laboratory**

#### **Abstract:**

When exposed to high temperature environments containing oxidants like O<sub>2</sub> and H<sub>2</sub>O, metals and ceramics can form solid, liquid, and/or gaseous oxidation products. These solid-gas interactions can have catastrophic consequences if not thoroughly understood and mitigated. Since high temperature oxidation is governed by time, temperature, and pressure and these three factors vary dramatically across target applications, there is no one-size-fits all solution. There are commonly employed strategies but the truth is that oxidation is rarely mitigated entirely; virtually all solutions present new problems to understand. This talk will consist of an introduction to high temperature oxidation and the application of corrosion science to various applications.

#### **Speaker Bio:**

Dr. Kane is an extreme environments subject matter expert at the Johns Hopkins University Applied Physics Laboratory where his research is focused on understanding the interactions of solids and gases for hypersonic and chemical incineration applications. Before being at the Applied Physics Laboratory, Dr. Kane was a principal investigator at Oak Ridge National Laboratory, where his research was focused on thermal and environment barrier coatings for next-generation gas turbines, accident tolerant fuel cladding for fission reactors, and ultrahigh temperature ceramics. Dr. Kane received his B.S. in Physics from West Chester University, and then his PhD in Nanoscience from Virginia Commonwealth University, where his research was focused on atmospheric plasma spray parameter development for thermal and environmental barrier coatings for aerospace gas-turbines.

**Date:** Friday, December 1, 2023  
**Place:** Whitehall Classroom Building 110  
**ZOOM ID:** 7344744383

**Time:** 3:00 PM EST  
**Contact:** Dr. Jonathan Wenk

Attendance open to all interested persons