



MATERIALS SCIENCE & ENGINEERING DISTINGUISHED SEMINAR SERIES



Dr. Brian Gleeson

Harry S. Tack Chaired Professor of
Materials Science and Engineering

Mechanical Engineering and
Materials Science

University of Pittsburgh

Friday

September 2, 2022

11:00AM — 12:00PM

Research 1 Room 101

[Zoom](#)

Contact: Dr. Tengfei Jiang

Materials Science & Engineering

Phone: 407-823-2284

Email: Tengfei.Jiang@ucf.edu

Presented in partnership with
The College of Graduate Studies

Deposit-Induced Hot Corrosion of Aero-Turbine Components and Materials Design Strategies to Reduce its Impact

Hot corrosion is an accelerated degradation process that is generally considered to involve deposition of corrosive species (*e.g.*, sulfates) from the surrounding environment to the surface of hot components, followed by destruction of the protective oxide scale. Gas turbine engine components, particularly high-pressure turbine blades and rotors, exposed to harsh environments are apt to encounter two modes of hot corrosion: high temperature hot corrosion (Type I) in the temperature range 850-1000°C and low temperature hot corrosion (Type II) in the range 600-800°C. This presentation will overview recent research conducted at the University of Pittsburgh to advance understanding of sulfate-based deposit-induced hot corrosion. It will be shown that (1) an effective laboratory-scale testing procedure has been developed that better simulates the form and extent of degradation found in service, and (2) that new insights on alloy/coating composition-structure relations for enhanced corrosion resistance have been established.

Biography: Brian Gleeson is currently the Harry S. Tack Chaired Professor of Materials Science in the Department of Mechanical Engineering and Materials Science at the University of Pittsburgh. He is also the Chairman of this department. Prior to taking the Chairman position in May, 2014, he served as Director of the University of Pittsburgh's Center for Energy (2008-2014). Dr. Gleeson received his degrees in materials science & engineering (MSE) from the University of Western Ontario, Canada (BE in 1984; ME in 1986) and the University of California at Los Angeles (Ph.D., 1989). He was a postdoctoral fellow and then a faculty member in the MSE Department at the University of New South Wales, Australia, from 1990-1997. He moved to Iowa State University (ISU) in 1998, where, in 2006, he was appointed the Renken Professor of MSE. From 2001-2006 he also served as Director of the Materials & Engineering Physics Program at the USDOE Ames Laboratory, which is managed by ISU. In the fall of 2007 he moved to the University of Pittsburgh. His research interests include the high-temperature degradation behavior of metallic alloys and coatings; phase equilibria and transformations; deposition and characterization of metallic coatings; and diffusion and thermodynamic treatments of both gas/solid and solid/solid interactions. He is Editor-in-Chief of the international journal *Oxidation of Metals*.