

# DEPARTMENT OF MECHANICAL ENGINEERING

## WILLIAM MAXWELL REED SEMINAR SERIES

### **“Experimental Investigations into the Material Response of Heatshields, High-Temperature Coatings, and Meteors.”**

**Brody K. Bessire, Ph.D.**  
**NASA Ames Research Center**

**Abstract:** Phenolic Impregnated Carbon Ablator (PICA) gained heritage during the Stardust mission and is the baseline thermal protection system (TPS) material for missions to Mars. However, PICA is friable, so a thin layer of siloxane resin (NuSil) is applied to the surface of the heatshield to suppress the spread of particulate matter during cleanroom activities. Until recently, the thermochemical response of NuSil had not been accounted for in material response models. Therefore, a test campaign was executed at the Hypersonic Materials Environmental Test System (HyMETS) facility to investigate the material response of NuSil and provide crucial insight for model development. Finally, salient results from an experiment supported by the Asteroid Threat Assessment Project (ATAP) will be discussed, which probed the material response of the Tamdakht meteorite and notable analogs.

**Speaker Bio:** Dr. Bessire is a senior research scientist in the thermal protection system materials branch at the NASA Ames Research Center. His research focuses on developing analytical techniques designed to inform and validate the development of material response models.

**Date:** Friday, January 29, 2022  
**Place:** Whitehall Classroom Building 110

**Time:** 3:00 PM EST  
**Contact:** Dr. Alexandre Martin 257-4462

Attendance open to all interested persons