Abstract
National interests are providing motivation for improved understanding of hypersonic viscous flow. In this presentation, we will examine key research challenges associated with transitional and turbulent hypersonic flow. We then discuss two example problems. First, we will describe the role of freestream disturbances on 3-D boundary layer transition by examining cross-flow instability mechanisms on the Air Force HIFIRE 5 flight geometry in both quiet and conventional hypersonic wind tunnels. Second, we will examine the structure and modeling of hypersonic wall boundary layer turbulent flows by quantifying mechanical non-equilibrium effects on the Reynolds stresses, and modeling of the full heat flux vector.

Bio
Dr. Bowersox is the Ford I Professor and Department Head of Aerospace Engineering at Texas A&M University. He was named a Department of Defense Vannevar Bush Faculty Fellow in 2017. He received his PhD in Aerospace Engineering from Virginia Polytechnic Institute & State University in 1992. He founded and directs the Texas A&M University National Aerothermochemistry and Hypersonics Laboratory. He is a fellow of the ASME, associate fellow of the AIAA, member of the ACS, APS, and OSA. He is also an Associate Editor for the AIAA Journal of Propulsion and Power.