UTSA The University of Texas at San Antonio™

DATE:
Friday,
November 20, 2020

TIME:
2:00-3:00pm CDT

LOCATION:
via Zoom (Click HERE to Join)

CAMEE

NASA MIRO CAMEE

CENTER FOR ADVANCED MEASUREMENTS IN EXTREME ENVIRONMENTS

PRESENTS:

Dr. John Schmisseur, Professor in the Department of Mechanical, Aerospace, and Biomedical Engineering, H. H. Arnold Chair in Computational Fluid Dynamics, and B. H. Goethert Professor at the University of Tennessee Space Institute. Dr. Schmisseur is also a member of CAMEE's External Advisory Committee.

Title: ***High-Speed Imaging of Unsteady Shock Interactions & a General Perspective on Hypersonics***

Abstract:

High-speed flight within the atmosphere has inspired scientists and engineers for decades with its potential to bolster national defense, reduce the cost of access to space, and perhaps bring the world more closely together far in the future. Within the myriad of technical challenges that impede progress towards the realization of high-speed systems, the interaction of shock waves with the boundary layer generated on a hypersonic vehicle is one of the primary sources of technical risk. Shock-wave/boundary-layer interactions are ubiquitous on high-speed vehicles and have thus been a focus of active research for many years. Even the most basic configurations generate such interactions which, uncontrolled, can lead to high thermal and acoustic loads, and potentially vehicle failure. Interactions in laminar and turbulent boundary layers have been studied extensively over the past several decades, with many review articles published, however, investigations of interactions in transitional boundary layers have been sparse in the existing literature. Understanding the dynamic behavior and potential approaches to mitigation of such interactions is critically important for the development of emerging high-speed systems.

Recent research at the University of Tennessee Space Institute has focused on the use of high frame rate optical diagnostic techniques for the characterization of the evolving interaction structure and dynamics as the incoming boundary layer varies from laminar to transitional and turbulent states. During this seminar, Dr. John Schmisseur will discuss the development of experimental facilities and high-speed imaging systems used in the study of shock/boundary layer interactions occurring in transitional boundary layers and provide an overview of the current understanding of transitional interactions.

More details of Dr. Schmisseur's Research: **https://www.utsi.edu/dr-john-schmisseur/**

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The material contained in this document is based upon work supported by a National Aeronautics and Space Administration (NASA) grant or cooperative agreement. Any opinions, findings, conclusions or recommendations expressed in this material are those of the author and do not necessarily reflect the views of NASA.

SPACE INSTITUTE

Dr. John D. Schmisseur

Professor of Aerospace Engineering

H.H. Arnold Chair and B.H. Goethert Professor

Dr. John D. Schmisseur joined the faculty of the University of Tennessee Knoxville Department of Mechanical, Aerospace, and Biomedical Engineering on August 1, 2014. He teaches and leads research at the University of Tennessee Space Institute.

Prior to joining the faculty, John was the Chief of the Energy, Power & Propulsion Sciences Division and Program Manager for Aerothermodynamics within the Air Force Office of Scientific Research (AFOSR). During his tenure at AFOSR, John initiated and led a national strategic research plan which has guided the research efforts of multiple federal agencies and championed the transition of basic research capabilities that have advanced flagship national hypersonics technology programs and transformed test and evaluation capabilities. He envisioned the HIFiRE program which unified the efforts of AFRL, NASA and the Australian DSTO to advance fundamental hypersonic science and technology via flight research. He is active within the professional community including having served as Chair of the AIAA Fluid Dynamics Technical Committee and a NATO Science and Technology Organisation working group. Dr. Schmisseur earned his B.S. (90) and M.S. (92) in Aerospace Engineering from the University of Texas at Austin and his Ph.D. (97) in Aeronautics and Astronautics from Purdue University. He is a Fellow of the American Institute of Aeronautics and Astronautics (2012) and the Air Force Research Laboratory (2013) and is the 2008 recipient of the Air Force Science and Engineering Award in Research Management.