



# AIAA

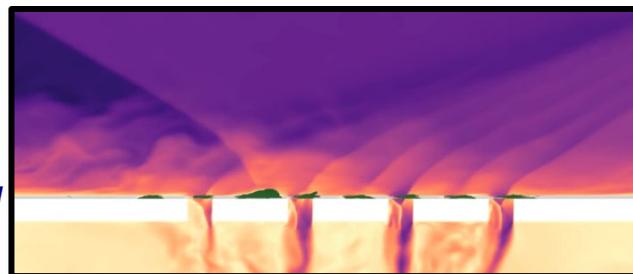
*American Institute of  
Aeronautics and Astronautics  
Dayton-Cincinnati Section*

## Lunch 'n' Learn

May 12<sup>th</sup>, 2023

### *Uncertainty and Unsteadiness of Supersonic Boundary-Layer Bleed Control*

*Guest Speaker: Mr. Matthew Schwartz,  
The Ohio Aerospace Institute*



**Abstract:** Shock wave/boundary-layer interactions (SBLI) plague many high-speed systems. One promising control strategy is the utilization of passive or active suction to remove low-momentum fluid near vehicle surfaces. This technique is known as boundary-layer bleed, which is commonly employed in high-speed inlets. While the effectiveness of bleed-based control has been proven, bleed introduces its own inefficiencies into the system since it reduces the effective mass capture of the inlet. An optimal bleed system seeks to minimize bleed flow while still achieving sufficient SBLI control. Optimization studies of bleed are expensive to study; therefore, simplified models are commonly employed. The impact of these physically simplified models are not understood. Additionally, bleed models cannot characterize the dynamics of this complex flow field. This computational study alleviates this research gap by exploring the uncertainties associated with these simplified models and studying the impact of bleed rate on SBLI-induced unsteadiness.

**Biography:** Mr. Matthew Schwartz is a Research Aerospace Engineer working with The Ohio Aerospace Institute. He joined as an AFRL contractor in March of 2022. He is currently finishing his Ph.D. as a part time student at The Ohio State University. This presentation overviews his dissertation work, which was funded by NASA through the 2019 NASA Fellowship Activity. Mr. Schwartz hopefully will receive his Ph.D. from the Department of Mechanical and Aerospace Engineering at OSU this summer. Matthew has been a Student Member of AIAA since 2018, and he is looking to increase his community involvement in his expected free time after graduating.

**Time:** 11:45 am

**Location:**

*China Garden Buffet  
112 Woodman Dr.  
Dayton, OH 45431*

**Lunch:**

*You will be able to  
purchase the buffet*

