

2025 Aerodynamic Sciences Program Review

Dr. Gregg Abate | July 7-9, 2025 | Dayton, OH -hybrid

Wright State University
3640 Colonel Glenn Hwy, Dayton, OH 45435.
The review will be held in the Neuroscience Engineering Collaborative Building (NEC),
in NEC 101 Auditorium

Agenda Day 1 | Monday, July 7, 2025

Time	Topic	Speaker
07:30	Arrival and Zoom setup	
07:50	Intro & Welcome	Gregg Abate, AFOSR
Flowfield Physics		
08:00	(Lab Task) High-Fidelity Simulation of Complex Multi-Disciplinary Interactions in Air Vehicles	Dan Garmann/Caleb Barnes AFRL/RQ
08:30	Dynamics and Control of Cargo Aircraft Wakes with Bays and Doors	Datta Gaitonde, Ohio State University Farrukh Alvi, Florida State University
08:50	Active Flow Control of a Complex 3D Supersonic Multi-Stream Nozzle Flow	Mark Glauser, Syracuse University Datta Gaitonde, Ohio State University Fernando Zigunov, Syracuse University
09:20	Dissecting the Flow Physics of Store-Induced Effects on Wing Aerodynamics and Limit-Cycle Oscillations in Transonic Flows	Rajat Mittal /Jung Hee Seo Johns Hopkins University
09:50	BREAK	
10:00	Compressibility effects on laminar separation bubbles over airfoils	Unnikrishnan Nair, Florida State University
10:20	A combined approach for investigating the effects of large wing sweep and unsteady wing motion on transition and separation: Flight experiments, wind tunnel experiments and simulations	Hermann Fasel (FY23 UFR), University of Arizona Jess Little, Ohio State University
10:40	(HBCU) Physics-Informed Reinforcement Learning-based Multiple-Input Multiple-Output Flow Control	Quiong Liu, New Mexico State University
11:00	(YIP 21) Towards Real-Time, 3D Coherent Structure Estimation for Flow Over Finite Wings	Frank Lagor, University of Virginia
11:30	LUNCH	

12:45	Towards a Generalized Understanding of Steady Jet/Boundary Layer Interaction to Inform Rapid Predictive Capability	Albert Medina/Aaron Altman, AFRL/RQ
13:15	Birth and control of three-dimensional Lagrangian separation: Optimal control	Guus Jacobs, San Diego State University Geoff Spedding, University of Southern California Maziar Hemati, University of Minnesota
13:45	Bispectral Mode Decomposition for discovery and modeling of nonlinear flow physics in open cavity flows	Oliver Schmidt, University of California San Diego
14:15	(YIP 24) Multi-Modal Interactions in Three-Dimensional Unsteady Flows	Yiyang Sun, Syracuse University
14:35	BREAK/OPEN DISCUSSION	
14:45	Flow Physics and Control of 3-D Separation on Finite Span, Tapered and Swept Wings	Miki Amitay, Rensselaer Polytechnic Institute Vasillis Theofilis, Technion, IL Sam Taira, University of California Los Angeles
15:15	Harnessing Fluid-Structure Interaction Complexity for Computing	Phil Buskohl, AFRL/RX Alex Pankonien, AFRL/RQ
15:35	Adaptive Flutter Suppression of a Virtually Controlled Aeroelastic Wing using Active, Aerodynamic - Distributed Bleed	Ari Glezer, Georgia Institute of Technology Mark Costello, Earthly Dynamics LLC
15:55	Fabrication of Fast-Responding, Luminescence-Enhanced micro-Spheres for the Digital Luminescent Particle Tracking Barometry Thermometry and Velocimetry System	Igor Novosselov/Dana Dabiri University of Washington
16:55	Open Discussion	
17:25	Wrap-up, & Adjourn	
17:30		

Agenda Day 2 Tuesday, July 8, 2025		
Time	Topic	Speaker
07:30	Arrival and Zoom setup	
07:50	Intro & Welcome	Gregg Abate, AFOSR
Novel Approaches in Flowfield Physics		
08:00	Data-Driven Control of Unsteady Flows	Sam Taira, University of California Los Angeles Steve Brunton, University of Washington
08:30	A wavelet-based resolvent analysis for highly-unsteady transient flows	Jane Bae, California Institute of Technology Scott Dawson, Illinois Institute of Technology
09:00	Populating the wall layer, one eddy at a time: Resolvent analysis for Wall-Modelled LES	Ugo Piomelli, Queens University, Canada Beverley McKeon, Stanford University
Turbulence Studies & Boundary Layer Interactions		
09:30	(YIP 23) Stochastic modeling and analysis of random surface roughness	Armin Zare, University of Texas Dallas
10:00	BREAK/OPEN DISCUSSION	
Turbulence Studies & Boundary Layer Interactions		
10:10	Passive Control of Non-Canonical Flows with Anisotropic Porous Materials	Lou Cattafesta, Illinois Institute of Technology Rajat Mittal/Charles Meneveau, Johns Hopkins University
10:40	Harnessing phononic materials for unsteady aerodynamic flow control	Andres Goza/Katie Matlack University of Illinois Urbana-Champaign
11:10	Transonic Flow Control over Engineered Elastoacoustic Subsurfaces via Generalized Impedance Boundary Conditions	Mostafa Nouh, State University of New York Buffalo Carlo Scalo, Purdue University
11:30	(DEPSCoR) Cluster-based estimation and control of turbulent aeroelastic flows	Aditya Nair/Floris van Breugel University of Nevada - Reno
11:50	LUNCH	
13:15	(MURI) Fluid-Metamaterial-Interaction to Revolutionize Passive Control of Aerodynamic Flows	Kathryn Matlack (Lead PI)/Andres Goza/Theresa Saxton-Fox/Phillip Ansell University of Illinois at Urbana-

		Champaign Jane Bae, California Institute of Technology Jordan Raney, University of Pennsylvania Harold Park, Boston University
13:45	The Response of Wall Turbulence to Large-Scale, Space-Time Perturbations	Ebenezer Gnanamanickam, Embry–Riddle Aeronautical University
14:05	(DEPSCoR) Understanding Vortex-Turbulent Boundary Layer Interactions to Mitigate Separation Using Textured Surfaces	Gokul Pathikonda, Arizona State University Vrishank Raghav, Auburn University
14:25	Tailored Flow Control: Exploiting Triangular Porous Texturing Elements and Architected Materials for Enhanced Air Vehicle Performance	Isaac Choutapalli, Univ. of Texas Rio Grande Valley
14:45	Phononic Subsurfaces for Laminar Flow Control	Abby Juhl, AFRL/RX
15:05	BREAK/OPEN DISCUSSION	
15:15	Passive Flow Control with Bio-inspired Anisotropic Permeable Propulsive Substrate	Wen Wu, University of Mississippi
15:35	Experimental Investigation of Multifunctional Metamaterials for Drag Reduction	Burak Tuna, Florida State University
15:55	(HBCU) Numerical Investigation of Freestream Turbulence Effect on Endwall Flow in Low-Pressure Turbine Passage	Andreas Gross, New Mexico State University
16:25	Methods to control flow separation inception in internal flow passages with strong pressure gradients	Christopher Marks, AFRL/RQ
16:45	Characterization of Unsteady Flow Physics in the Trailing Edge Region of a Transonic Turbine Cascade	James Rutledge, Air Force Institute of Technology
17:05	Open Discussion	
17:25	Wrap-up, & Adjourn	
17:30		

Agenda Day 3 | Wednesday, July 9, 2025

Time	Topic	Speaker
07:30	Arrival and Zoom setup	
07:50	Intro & Welcome	Gregg Abate, AFOSR
Turbulence Studies & Boundary Layer Interactions		
08:00	Data-enhanced Hybrid Modeling for Turbulent Aerodynamics	Paul Durbin/ Anupam Sharma, Iowa State University
08:30	(YIP 22) Efficient Stabilization of the Adjoint for Turbulent Separated Flows	James Coder, Penn State University
09:00	(YIP 23) Extrapolative, progressive machine learning for turbulence modeling	Xiang Yang, Penn State University
09:20	(YIP 24) New Integral Approaches for Analyzing and Predicting Turbulent Boundary Layers	Perry Johnson, University of California Irvine
09:40	Dynamic Response of the Shear Layer to Cavity Door Operation at Supersonic	Rajan Kumar, Florida A&M University Farrukh Alvi, Florida State University Kenneth Granlund, North Carolina State University Datta Gaitonde, Ohio State University
10:00	BREAK/OPEN DISCUSSION	
Unsteady Aeromechanic Interactions		
10:10	Dynamic Response of the Shear Layer to Cavity Door Operation at Supersonic	Rajan Kumar, Florida A&M University Farrukh Alvi, Florida State University Kenneth Granlund, North Carolina State University Datta Gaitonde, Ohio State University
10:40	An experimental dynamical systems approach to aeroelastic instabilities of swept wings	Kenny Breuer, Brown University
11:10	Separation Control using Resonant Metamaterials	Yulia Peet, Arizona State University Kenny Breuer, Brown University
11:30	(DEPSCoR) Mitigation of vortex-foil interactions through passive shape control	Jennifer Franck, University of Wisconsin Kenny Breuer, Brown University
11:50	Flow Physics and Optimized Suppression of High-Speed Cavity Flow	Larry Ukeiley, University of Florida

		Lou Cattafesta, Illinois Institute of Technology Sam Taira, University of California Los Angeles
12:20	LUNCH	
13:20	Distinguishing Among Transverse Jet Instabilities with Data-Based Reduced Order Models	Ann Karagozian, University of California Los Angeles
13:40	Coherent structure assessment in high-speed crossflow jets	Guillermo Araya, University of Texas San Antonio
14:10	Three-Dimensional Gust Control with Morphing Wings	Samik Bhattacharya, University of Central Florida
14:40	A Passive Strategy for Improving Aero-Optics Through a Supersonic Shear Layer	Ed DeMauro, Rutgers Matthew Kemnetz, Air Force Institute of Technology
15:10	High-Angle-of-Attack Translating and Pitching Wings Interacting with Finite Obstacles	Matt Ringuette, State University of New York Buffalo
15:40	Evaluation of Event Cameras for 2D3C Velocimetry	Sidaard Gunasekaran, University of Dayton
06:00	Break/Open Discussion & Wrap-up	
16:15	AFRL Only Caucus	
17:00	Adjourn	