

# 2022 Unsteady Aerodynamics and Turbulent Flows

Dr. Gregg Abate | June 21-23, 2022 & July 11-14, 2022 | Virtual

## Agenda Day 1 | Wednesday, June 22, 2022

Time	Topic	Speaker
10:45	<b>Zoom Room opens, test communications, breakouts</b>	
11:00	Intro & Welcome	Gregg Abate
11:10	Dynamics and Control of Cargo Aircraft Wakes with Bays and Doors	Datta Gaitonde, Ohio State University Farukh Alvi, Florida State University
11:40	Fundamental Turbulence Mechanisms in Highly-Unsteady Multi-Stream Flows: A Comprehensive Joint Experimental, Theoretical and Computational Study	Mark Glauser, Syracuse University Datta Gaitonde, Ohio State University
12:10	High-Fidelity Simulation of Complex Multi-Disciplinary Interactions in Air Vehicles	Miguel Visbal/Caleb Barnes/Dan Garmann, Air Force Research Laboratory - Aerospace Systems Directorate (RQ)
12:40	<b>Break/Open Discussion</b>	
1:00	Learning to Fly - Using Distributed Pressure Sensing and Network Strategies	David Rival, Queens University, CA Melissa Green, University of Minnesota
1:30	(YIP 19) Reducing Transient Energy Growth in Shear Flows using Sensor-Based Output Feedback Control	Maziar Hemati, University of Minnesota
2:00	(YIP 22) Efficient Stabilization of the Adjoint for Turbulent Separated Flows	James Coder, University of Tennessee - Knoxville
2:30	<b>Break/Open Discussion</b>	
2:50	A Wavelet-Based Resolvent Analysis for Highly-Unsteady Transient Flows	Jane Bae, California Institute of Technology Scott Dawson, Illinois Institute of Technology
3:20	Harnessing Phononic Materials for Unsteady Aerodynamic Flow Control	Andres Goza/Katie Matlack, University of Illinois Urbana-Champaign
3:50	Transformative Prognostic Wall-Turbulence Models For Realistic Spatial Heterogeneities: Theory, Experiments and Direct- And Large-Eddy Simulation	William Anderson, University of Texas at Dallas Kenneth Christensen, Illinois Institute of Technology Carlos Pantano, University of Southern California

<b>4:20</b>	Open Discussion, Wrap-up, & Adjourn	
<b>5:00</b>	<b>MEETING ADJOURN</b>	

<b>Agenda Day 2   Thursday, June 23, 2022</b>		
<b>Time</b>	<b>Topic</b>	<b>Speaker</b>
<b>10:45</b>	<b>Zoom Room opens, test communications, breakouts</b>	
<b>11:00</b>	Intro & Welcome	Gregg Abate
<b>11:10</b>	Experimental Investigation of Unsteady and Asymmetric Flows of Pitching Asymmetry	Ben Dickinson, Air Force Research Laboratory - Munitions Directorate (RW) Rajan Kumar, Florida Agricultural & Mechanical University
<b>11:40</b>	(HBCU) Numerical Investigation of Freestream Turbulence Effect on Endwall Flow in Low-Pressure Turbine Passage	Andreas Gross, New Mexico State University
<b>12:10</b>	Rapid (on-Demand) Control of Shock-Dominated Flows by Filamentary Plasma	Sergey Leonov, University of Notre Dame
<b>12:40</b>	<b>Break/Open Discussion</b>	
<b>1:00</b>	An Experimental Dynamical Systems Approach to Aeroelastic Instabilities of Swept Wings	Kenny Breuer, Brown University
<b>1:30</b>	Onset and Prediction of Orbital Motions of Streamwise Vortices	Justin Jaworski, Lehigh University
<b>2:00</b>	Vortex Interactions on Multi-Swept Wing Configurations	Mehdi Ghoreyshi, United States Air Force Academy
<b>2:30</b>	Open Discussion, Wrap-up, & Adjourn	
<b>2:50</b>	<b>MEETING ADJOURN</b>	

# 2022 Unsteady Aerodynamics and Turbulent Flows

Dr. Gregg Abate | June 21-23, 2022 & July 11-14, 2022 | Virtual

## Agenda Day 1 | Tuesday, July 12, 2022

Time	Topic	Speaker
10:45	<b>Zoom Room opens, test communications, breakouts</b>	
11:00	Intro & Welcome	Gregg Abate
11:10	(PECASE FY16) Flow Control for Force Regularization in Large-Disturbance Environments	Anya Jones, University of Maryland
11:40	(YIP 21) Towards Real-Time, 3D Coherent Structure Estimation for Flow Over Finite Wings	Frank Lagor, University of Buffalo
12:10	Boundary-Layer Control, Investigated Using Phenomenological Low-Order Models of Unsteady Flow (EOARD)	Kiran Ramesh, University of Glasgow, UK
12:40	<b>Break/Open Discussion</b>	
12:55	Separation Inception in High-Work Turbine Passages	Christopher Marks (RQ), Air Force Research Laboratory - Aerospace Systems Directorate (RQ)
1:25	Embedded Flow Control for High Work / Low Reynolds Turbines - BFCNTUR	Guillermo Paniagua, Purdue University
1:55	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
2:25	<b>Break/Open Discussion</b>	
2:40	Flow Physics and Control of 3-D Separation on Finite Span, Tapered and Swept Wings	Miki Amitay, Rensselaer Polytechnic Institute Vasillis Theofilis, University of Liverpool, UK Sam Taira, University of California Los Angeles
3:10	Low-Complexity Stochastic Modeling and Control of Turbulent Flows	Mihailo Jovanovic, University of Southern California
3:40	Joint Experimental/Computational Study of Control of Jets in Crossflow	Krishnan Mahesh, University Of Minnesota Ann Karagozian, University of California Los Angeles
4:10	Distangling Turbulent Structure with Nonlinear	Mike Graham, University of

	Dynamics and Machine Learning	Wisconsin
<b>4:40</b>	Open Discussion, Wrap-up, & Adjourn	
<b>4:55</b>	<b>MEETING ADJOURN</b>	

<b>Agenda Day 2   Wednesday, July 13, 2022</b>		
<b>Time</b>	<b>Topic</b>	<b>Speaker</b>
<b>10:45</b>	<b>Zoom Room opens, test communications, breakouts</b>	
<b>11:00</b>	Intro & Welcome	Gregg Abate
<b>11:10</b>	Aerodynamically-Adaptive Wings using Distributed Bleed Flow Control	Ari Glezer, Georgia Institute of Technology Massimo Ruzzine, University of Colorado - Boulder
<b>11:40</b>	Populating the Wall Layer, One Eddy at a Time: Resolvent Analysis for Wall-Modelled LES	Ugo Piomelli, Queens University, CA Beverley McKeon, California Institute of Technology
<b>12:10</b>	(YIP 20) Resolvent-Based Estimation for Control of Turbulent Aerodynamic Flows	Aaron Towne, University of Michigan
<b>12:40</b>	<b>Break/Open Discussion</b>	
<b>12:55</b>	Resonant Metamaterials for Laminar Flow Control	Abby Juhl, Air Force Research Laboratory - Materials & Manufacturing Directorate (RX) Caleb Barnes, Air Force Research Laboratory - Aerospace Systems Directorate (RQ) Albert Medina, Air Force Research Laboratory - Aerospace Systems Directorate (RQ)
<b>1:25</b>	Passive Control of Non-Canonical Flows with Anisotropic Porous Materials	Lou Cattafesta, Florida State University Rajat Mittal/Charles Meneveau Johns Hopkins University
<b>1:55</b>	Designer Porous Materials for Flow Control: Effective Property Characterization	Mitul Luhar, USC Shervin Bagheir, KTH, Sweden
<b>2:25</b>	<b>Break/Open Discussion</b>	

<b>2:40</b>	Data-Driven Control of Unsteady Flows	Sam Taira, University of California Los Angeles Steve Brunton, University of Washington
<b>3:10</b>	Passive Flow Control of Bypass Transition by Roughness Shielding	David Goldstein, University of Texas at Austin Ed White, Texas A&M University Saikishan (Sai) Suryanarayanan University of Texas at Austin
<b>3:40</b>	Dynamic Response of the Shear Layer to Cavity Door Operation at Supersonic	Rajan Kumar, Florida Agricultural & Mechanical University Farrukh Alvi, Florida State University Kenneth Granlund, North Carolina State University Datta Gaitonde, Ohio State University
<b>4:10</b>	Flow Physics and Optimized Suppression of High-Speed Cavity Flow	Larry Ukeiley, University of Florida Lou Cattafesta, Florida State University Sam Taira, University of California Los Angeles
<b>4:40</b>	Open Discussion, Wrap-up, & Adjourn	
<b>4:55</b>	<b>MEETING ADJOURN</b>	

<b>Agenda Day 3   Wednesday, July 14, 2022</b>		
<b>Time</b>	<b>Topic</b>	<b>Speaker</b>
<b>10:45</b>	<b>Zoom Room opens, test communications, breakouts</b>	
<b>11:00</b>	Intro & Welcome	Gregg Abate
<b>11:10</b>	Development of ultra-miniature wall-shear-stress sensors for low- and high-speed flow applications (AOARD)	Duvvuri Subrahmanyam, Indian Institute of Science
<b>11:40</b>	A Passive Strategy for Improving Aero-Optics Through a Supersonic Shear Layer	Ed DeMauro, Rutgers University Matthew Kemnetz, Air Force Research Laboratory - Directed Energy Directorate (RD)

<b>12:10</b>	Computational Interpretation of Limited and Noisy Measurements using CFD and Machine Learning	Tamer Zaki, Johns Hopkins University
<b>12:40</b>	<b>Break/Open Discussion</b>	
<b>12:55</b>	A Coordinated Experimental and Computational Study of Global and Convective Gusts on Swept Wings	John Farnsworth/Ken Jansen University of Colorado - Boulder
<b>1:25</b>	Wing Sweep, Structural Motion and Their Effect on Separation and Separation Control – Simulations, Wind Tunnel and Flight Experiments	Hermann Fasel/Jesse Little University of Arizona
<b>1:55</b>	<b>Break/Open Discussion</b>	
<b>2:10</b>	Geometric Control Theoretic Formulation and Analysis of Unsteady Fluid Flows	Haithem Taha, University of California Irvine
<b>2:40</b>	Unsteady Aerodynamics of Goal-Based Propulsion and Flight, Employing CPFD	Charles Williamson, Cornell University
<b>3:10</b>	Advancing the Flow Physics behind the Drag of Riblets (AOARD)	Daniel Chung/Nicholas Hutchins University of Melbourne
<b>3:40</b>	Open Discussion, Wrap-up, & Adjourn	
<b>3:55</b>	<b>MEETING ADJOURN</b>	