

2021 Unsteady Aerodynamics and Turbulent Flow Program Review

Dr. Gregg Abate | July 12-15, 2021 | Virtually

Agenda Day 1 | Monday, July 12, 2021

Time	Topic	Speaker
10:15	Zoom Room opens, test communications, breakouts	
10:30	Intro & Welcome	Gregg Abate, AFOSR
Turbulent Flows		
10:40	(YIP) Tunable Porous and Patterned Surfaces for Turbulence Control	Mitul Luhar University of Southern California
11:05	Resonant Metamaterials for Laminar Flow Control	Abby Juhl/Caleb Barnes/Albert Medina AFRL (RX & RQ)
11:30	Passive Control of Non-Canonical Flows with Anisotropic Porous Materials (New Start)	Lou Cattafesta/Rajat Mittal - Florida State Charles Meneveau Johns Hopkins University
11:45	Harnessing Phononic Materials for Unsteady Aerodynamic Flow Control (New Start)	Andres Goza/Kathryn Matlack UIUC
12:00	Breakout Discussions	
12:25	Anisotropic Permeable Substrates for Turbulent Drag Reduction	Ricardo Garcia-Mayoral Cambridge, UK (EOARD)
12:50	Designer Porous Materials for Flow Control: Effective Property Characterization	Mitul Luhar - USC Shervin Bagheri - KTH, Sweden
13:15	Surface Irregularity Effects on Laminar-Turbulent Transition - Understanding the Surface Quality Requirements for Laminar Flow on Wings	Marcello Augusto Faraco de Medeiros Universidade de Sao Paulo (USP) (SOARD)
13:40	Absolute Instability of Interacting Planar Mixing Layers and Wakes	Leonardo Alves Universidade Federal Fluminense (UFF), Brazil (SOARD)
14:05	Breakout Discussions	
14:30	Multi-stream Near-wall Turbulence Dynamics	Mark Glauser Syracuse University Datta Gaitonde Ohio State University
14:55	Disentangling Turbulent Structure with Nonlinear Dynamics and Machine Learning	Michael Graham University of Wisconsin
15:10	Breakout Discussions	
15:35	Wall Turbulence Response to Large-scale Surface Heterogeneity: Physics-based Wall Models derived from Coordinated Experiments and Simulations	William Anderson - University of Texas at Dallas Kenneth Christensen - Notre Dame University Carlos Pantano - University of Southern California
16:00	(YIP) Resolvent-based Estimation for Control of Turbulent Aerodynamic Flows	Aaron Towne University of Michigan
16:25	Fundamental Interaction Mechanisms of Roughness-induced Flows with Surface Textures	David Goldstein - University of Texas at Austin Ed White - Texas A&M University Saikishan (Sai) Suryanarayanan University of Texas at Austin
16:50	Breakout Discussions	
17:15	Wrap-up & Adjourn	

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Agenda Day 2 | Tuesday, July 13, 2021

Time	Topic	Speaker
10:35	Zoom Room opens, test communications, breakouts	
10:50	Intro & Welcome	Gregg Abate, AFOSR
Unsteady Aeromechanic Interactions		
11:00	Dynamic Response of the Shear Layer to Cavity Door Operation at Supersonic Speeds	Rajan Kumar - Florida Agricultural And Mechanical University Farrukh Alvi - Florida State University Kenneth Granlund - North Carolina State University Datta Gaitonde - Ohio State University
11:25	Aerodynamic & Aeroelastic Behavior of Wings in Disturbances	Ashok Gopalarathnam/Matthew Bryant North Carolina State University
11:50	Flow Physics and Distillation of the Gust-induced Stall of a Wing	Jeffrey Eldredge - University Of California Los Angeles Dave Williams - Illinois Institute of Technology Tim Colonius - California Institute of Technology
12:15	Breakout Discussions	
12:40	Using Cyber-physical Systems to Study Unsteady Leading Edge Vortices in Flows	Kenneth Breuer - Brown University
13:05	Onset and Prediction of Orbital Motions of Streamwise Vortices	Justin Jaworski - Lehigh University
13:30	Unsteady Aerodynamics of Goal-based Propulsion and Flight Employing Cyber-physical Fluid Dynamics (CPFD)	Charles Williamson - Cornell University
13:55	Wing Sweep, Structural Motion and their Effect on Separation and Transition	Hermann Fasel/Jesse Little University of Arizona
14:20	Breakout Discussions	
Novel Approaches in Flow Control		
14:45	Separation Dynamics: The View from the Wall	Tamer Zaki - Johns Hopkins University
15:10	(YIP) Interpretable Nonlinear Models of Unsteady Flow Physics	Steven Brunton - University Of Washington
15:35	Active Flow Control via Low Aspect Ratio Rotating Cylinders	Alberto Medina - AFRL, Aerospace Systems Directorate (RQ)
16:00	Breakout Discussions	
16:25	Wrap-up & Adjourn	

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Agenda Day 3 | Wednesday, July 14, 2021

Time	Topic	Speaker
10:35	Zoom Room opens, test communications, breakouts	
10:50	Intro & Welcome	Gregg Abate, AFOSR
11:00	Data-Driven Control of Unsteady Flows (New Start)	Sam Taira – UCLA Steve Brunton - University of Washington
Flow Physics for Control		
11:15	Flow Physics and Control of 3-D Separation on 3-D Swept Wings (Wrap-up) Flow Physics and Control of 3-D Separation on Finite Span, Tapered and Swept Wings (New Start)	Miki Amitay - Rensselaer Polytechnic Institute Vassilios Theofilis - University of Liverpool, UK Sam Taira - University of California Los Angeles
11:55	Dissecting the Flow Physics of Aeroelastic Wing Flutter	Rajat Mittal/ Joe Katz Johns Hopkins University
12:20	Breakout Discussions	
12:45	Physics-based Control of Transverse Jets	Krishnan Mahesh - University Of Minnesota Ann Karagozian - University of California Los Angeles
13:10	(YIP) Reducing Transient Energy Growth in Shear Flows using Sensor-based Output Feedback Control	Maziar Hemati University Of Minnesota
13:35	Low-complexity Stochastic Modeling and Control of Turbulent Flows	Mihailo Jovanovic University Of Southern California
14:00	Breakout Discussions	
14:25	High-fidelity Simulation of Complex Multi-disciplinary Interactions in Air Vehicle	Miguel Visbal/Dan Garmann Caleb Barnes AFRL, Aerospace Systems Directorate (RQ)
Novel Approaches in Flow Control		
14:50	Experimental Investigation of Unsteady and Asymmetric Flows of Pitching Asymmetric Bodies at Incidence	Benjamin Dickinson - AFRL Munitions Directorate (RW) Rajan Kumar- Florida State University
15:15	Breakout Discussions	
15:40	Wrap-up & Adjourn	

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Agenda Day 4 | Thursday, July 15, 2021

Time	Topic	Speaker
10:15	Zoom Room opens, test communications, breakouts	
10:30	Intro & Welcome	Gregg Abate, AFOSR
Unsteady Aeromechanic Interactions		
10:40	Geometric Control Theoretic Formulation and Analysis of Unsteady Fluid Flow	Haithem Taha University Of California Irvine
11:05	A Coordinated Experimental and Computational Study of Gusts on Wings	John Farnsworth/Ken Jansen University Of Colorado Boulder
11:30	Aerodynamically-adaptive Aero-structures using Flow-interactive Control by Distributed Bleed Actuation	Ari Glezer - Georgia Institute of Technology Massimo Ruzzene - University of Colorado Boulder
11:55	Breakout Discussions	
Flow Physics for Control		
12:20	Learning to Fly: Using Distributed Pressure Sensing and Network Strategies for Control in Gusty Environments	David Rival - Queen's University, Canada Melissa Green - Syracuse University
12:45	Numerical Investigation of two- and three-dimensional Wake effects in High-lift low-pressure Turbine Flows	Andreas Gross New Mexico State University
13:10	The Effect of Unsteadiness on Three Dimensional Endwall Flows in a Turbine Passage	Chris Marks AFRL, Aerospace Systems Directorate (RQ)
13:35	Breakout Discussions	
14:00	Embedded Flow Control for High Work / Low Reynolds Turbines - BFCNTUR	Guillermo Paniagua Purdue University
14:25	Rapid (on-demand) Control of Shock-dominated Flows by Filamentary Plasma	Sergey Leonov University Of Notre Dame
14:50	PECASE - Flow Control for Force Regularization in Large-disturbance Environments	Anya Jones University of Maryland
15:15	Breakout Discussions	
15:40	(YIP) Towards Real-Time, 3D Coherent Structure Estimation for Flow Over Finite Wings (New Start)	Frank Lagor SUNY Buffalo
Novel Approaches in Flow Control		
15:55	Birth and Control of Three-dimensional Lagrangian Separation: Optimal control (New Start)	Guus Jacobs – SDSU Geoff Spedding – USC Maziar Hemati - University of Minnesota
16:10	Vortex Interactions on Multi-swept Wing Configurations (New Start)	Mehdi Ghoreyshi/Juergen Seidel USFAA
16:25	Breakout Discussions	
16:50	Wrap-up & Adjourn	