

2020 Unsteady Aerodynamics & Turbulent Flow Program Review

Dr. Gregg Abate | July 20-23, 2020 | Virtually

Agenda Day 1 | Monday, July 20

Time	Topic	Speaker
10:00	Zoom Room opens, test communications, breakouts	
11:00	Intro & Welcome	Dr. Gregg Abate
Flow Physics for Control		
11:10	Flow Physics and Control Of 3-D Separation On 3-D Swept Wings	Miki Amitay - Rensselaer Polytechnic Institute Vassilios Theofilis - University of Liverpool, UK Sam Taira - University of California Los Angeles
11:40	Dissecting the Flow Physics of Aeroelastic Wing Flutter	Rajat Mittal/Joe Katz - Johns Hopkins University
12:00	Flow Physics and Nonlinear Dynamics of Turbulent Separation Bubbles	Louis Cattafesta - Florida State University Rajat Mittal/Charles Meneveau - Johns Hopkins University Clancy Rowley - Princeton University
12:30	BREAK	
13:00	Dynamics of Unsteady Flow Past Bluff Bodies with Lofted Bases	Datta Gaitonde - Ohio State University Farrukh Alvi/Rajan Kumar - Florida State University
13:30	Physics-Based Control of Transverse Jets	Krishnan Mahesh - University Of Minnesota Ann Karagozian - University of California Los Angeles
14:00	(YIP) Reducing Transient Energy Growth in Shear Flows using Sensor-Based Output Feedback Control	Maziar Hemati - University Of Minnesota
14:20	BREAK	
14:50	Low-Complexity Stochastic Modeling and Control of Turbulent Flows	Mihailo Jovanovic - University Of Southern California
15:10	High-Fidelity Simulation of Complex Multi-Disciplinary Interactions in Air Vehicle	Miguel Visbal/Dan Garmann/Caleb Barnes - AFRL, Aerospace Systems Directorate (RQ)

15:30	Experimental Investigation of Unsteady and Asymmetric Flows of Pitching Asymmetric Bodies at Incidence	Benjamin Dickinson - AFRL Munitions Directorate (RW) Rajan Kumar - Florida State University
15:50	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
16:10	Wrap-up & Breakout Discussions	
17:00	Adjourn	

Agenda Day 2 Tuesday, July 21		
Time	Topic	Speaker
10:00	Zoom Room opens, test communications, breakouts	
11:00	Intro & Welcome	Dr. Gregg Abate
11:10	Numerical investigation of two- and three-dimensional wake effects in high-lift low-pressure turbine flows	Andreas Gross- New Mexico State University
11:40	The effect of unsteadiness on three dimensional endwall flows in a turbine passage	Chris Marks- AFRL, Aerospace Systems Directorate (RQ)
12:10	Embedded flow control for high work / low Reynolds turbines - BFCNTUR	Guillermo Paniagua- Purdue University
12:30	Rapid (on-demand) control of shock-dominated flows by filamentary plasma	Sergey Leonov- University Of Notre Dame
12:50	BREAK	
Novel Approaches in Flow Control		
13:10	The benefits of reconfigurable avian airframes (EOARD)	Richard Bompfrey- Royal Veterinary College, London, UK
13:40	L1-based sparsification of reduced order models of high Reynolds number turbulent flows (EOARD)	Andrea Da Ronch- University of Southampton, UK
14:10	Separation dynamics: the view from the wall	Tamer Zaki- Johns Hopkins University
14:30	BREAK	

14:50	Network-based feedback control of fluid flows	Sam Taira - University of California Los Angeles Steve Brunton - University of Washington
15:20	(YIP) interpretable nonlinear models of unsteady flow physics	Steven Brunton - University Of Washington
15:50	Active flow control via low aspect ratio rotating cylinders	Alberto Medina - AFRL, Aerospace Systems Directorate (RQ)
16:20	Wrap-up & Breakout Discussions	
17:10	Adjourn	

Agenda Day 3 Wednesday, July 22		
Time	Topic	Speaker
10:00	Zoom Room opens, test communications, breakouts	
10:30	Intro & Welcome	Dr. Gregg Abate
Turbulent Flows		
10:40	Disentangling turbulent structure with nonlinear dynamics and machine learning	Michael Graham - University of Wisconsin
11:10	Hibernating turbulence in boundary-layer flows (EOARD)	Richard Whalley - Newcastle University, UK
11:40	Multi-stream near-wall turbulence dynamics	Mark Glauser - Syracuse University Datta Gaitonde - Ohio State University
12:10	BREAK	
12:30	(YIP) Tunable porous and patterned surfaces for turbulence control	Mitul Lohar - University of Southern California
13:00	Mean flow of turbulent boundary layers over permeable rough surfaces (EOARD)	Bharath Ganapathisubramani - University of Southampton, UK
13:20	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

13:50	(YIP) Exploiting non-linear interactions within wall turbulence for flow control	Ebenezer Gnanamanickam - Embry-Riddle Aeronautical University
14:10	BREAK	
14:30	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
15:00	(YIP) Resolvent-based estimation for control of turbulent aerodynamic flows	Aaron Towne - University of Michigan
Unsteady Aeromechanic Interactions		
15:20	Uncovering flow physics for high-speed cavity flow control	Lawrence Ukeiley - University of Florida Sam Taira - University of California Los Angeles Lou Cattafesta - Florida State University
15:50	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
16:10	Wrap-up & Breakout Discussions	
17:00	Adjourn	

Agenda Day 4 Thursday, July 23		
Time	Topic	Speaker
10:00	Zoom Room opens, test communications, breakouts	
10:30	Intro & Welcome	Dr. Gregg Abate
10:40	Geometric control theoretic formulation and analysis of unsteady fluid flow	Haithem Taha - University Of California Irvine

11:10	Aerodynamic & aeroelastic behavior of wings in disturbances	Ashok Gopalarathnam/Matthew Bryant- North Carolina State University
11:40	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
12:10	BREAK	
12:30	A coordinated experimental and computational study of gusts on wings	John Farnsworth/Ken Jansen- University Of Colorado Boulder
12:50	Using cyber-physical systems to study unsteady leading edge vortices in flows	Kenneth Breuer- Brown University Juergen Seidel/Casey Fagley- United States Air Force Academy
13:30	Aerodynamically-adaptive aero-structures using flow-interactive control by distributed bleed actuation	Ari Glezer- Georgia Institute of Technology Massimo Ruzzene- University of Colorado Boulder
13:50	BREAK	
14:10	Onset and prediction of orbital motions of streamwise vortices	Justin Jaworski- Lehigh University
14:40	Unsteady aerodynamics of goal-based propulsion and flight employing cyber-physical fluid dynamics (CPFD)	Charles Williamson- Cornell University
15:10	Wing sweep, structural motion and their effect on separation and transition	Hermann Fasel/Jesse Little- University of Arizona
Flow Physics for Control		
15:40	PECASE - Flow control for force regularization in large-disturbance environments	Anya Jones- University of Maryland
16:10	Wrap-up & Breakout Discussions	
17:00	Adjourn	