

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

<b>15:30</b>	Experimental Investigation of Unsteady and Asymmetric Flows of Pitching Asymmetric Bodies at Incidence	<b>Benjamin Dickinson</b> - AFRL Munitions Directorate (RW) <b>Rajan Kumar</b> - Florida State University
<b>15:50</b>	Learning to Fly: Using Distributed Pressure Sensing and Network Strategies for Control in Gusty Environments	<b>David Rival</b> - Queen's University, Canada <b>Melissa Green</b> - Syracuse University
<b>16:10</b>	<b>Wrap-up &amp; Breakout Discussions</b>	
<b>17:00</b>	<b>Adjourn</b>	

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

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

<b>Agenda Day 3   Wednesday, July 22</b>		
<b>Time</b>	<b>Topic</b>	<b>Speaker</b>
<b>10:00</b>	<b>Zoom Room opens, test communications, breakouts</b>	
<b>10:30</b>	<b>Intro &amp; Welcome</b>	<b>Dr. Gregg Abate</b>
<b>Turbulent Flows</b>		
<b>10:40</b>	Disentangling turbulent structure with nonlinear dynamics and machine learning	<b>Michael Graham</b> - University of Wisconsin
<b>11:10</b>	Hibernating turbulence in boundary-layer flows (EOARD)	<b>Richard Whalley</b> - Newcastle University, UK
<b>11:40</b>	Multi-stream near-wall turbulence dynamics	<b>Mark Glauser</b> - Syracuse University <b>Datta Gaitonde</b> - Ohio State University
<b>12:10</b>	<b>BREAK</b>	
<b>12:30</b>	(YIP) Tunable porous and patterned surfaces for turbulence control	<b>Mitul Lumar</b> - University of Southern California
<b>13:00</b>	Mean flow of turbulent boundary layers over permeable rough surfaces (EOARD)	<b>Bharath Ganapathisubramani</b> - University of Southampton, UK
<b>13:20</b>	Wall turbulence response to large-scale surface heterogeneity: physics-based wall models derived from coordinated experiments and simulations	<b>William Anderson</b> - University of Texas at Dallas <b>Kenneth Christensen</b> - Notre Dame University <b>Carlos Pantano</b> - University of Southern California

<b>13:50</b>	(YIP) Exploiting non-linear interactions within wall turbulence for flow control	<b>Ebenezer Gnanamanickam</b> - Embry-Riddle Aeronautical University
<b>14:10</b>	<b>BREAK</b>	
<b>14:30</b>	Fundamental interaction mechanisms of roughness-induced flows with surface textures	<b>David Goldstein</b> - University of Texas at Austin <b>Ed White</b> - Texas A&M University <b>Saikishan (Sai)</b> <b>Suryanarayanan</b> - University of Texas at Austin
<b>15:00</b>	(YIP) Resolvent-based estimation for control of turbulent aerodynamic flows	<b>Aaron Towne</b> - University of Michigan
<b>Unsteady Aeromechanic Interactions</b>		
<b>15:20</b>	Uncovering flow physics for high-speed cavity flow control	<b>Lawrence Ukeiley</b> - University of Florida <b>Sam Taira</b> - University of California Los Angeles <b>Lou Cattafesta</b> - Florida State University
<b>15:50</b>	Dynamic response of the shear layer to cavity door operation at supersonic speeds	<b>Rajan Kumar</b> - Florida Agricultural And Mechanical University <b>Farrukh Alvi</b> - Florida State University <b>Kenneth Granlund</b> - North Carolina State University <b>Datta Gaitonde</b> - Ohio State University
<b>16:10</b>	<b>Wrap-up &amp; Breakout Discussions</b>	
<b>17:00</b>	<b>Adjourn</b>	

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

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