

2016 Flow Control and Interactions and ARO Fluid Dynamics Annual Contractors Review

Drs. Ivett Leyva and Matthew Munson | July 19-22, 2016 | Arlington, VA

Basic Research Innovation and Collaboration Center (BRICC)
4075 Wilson Blvd., Suite 350 | Liberty Room
Arlington, VA 22203

Agenda Day 1 | Tuesday, July 19, 2016

Time	Topic	Speaker/Institution	Agency
07:30	Registration		
08:00	Welcome and Overview	Matthew Munson Ivett Leyva	ARO AFOSR
08:15	A High-order CPR Method on Overset Adaptive Cartesian and Prismatic Meshes	Z.J. Wang University of Kansas	ARO
08:45	High-fidelity Simulation of Complex Multi-disciplinary Interactions in Air Vehicles	Miguel Visbal U.S. AFRL	AFOSR
09:15	Hyperbolic Reconstructed-discontinuous-Galerkin Method for Accurate Unsteady Simulations on Unstructured Grids	Hiroaki Nishikawa National Institute of Aerospace	ARO
09:45	BREAK (0:15)		
10:00	Lagrangian Coherent Structures in Bluff Body Flows	Matthew Rockwood Syracuse University	AFOSR
10:30	Lagrangian Coherent Structures Framework for Flow Control	Gustaaf Jacobs San Diego State University	AFOSR
10:50	Interaction of Vortical Structures with Wings	Donald Rockwell Lehigh University	AFOSR
11:20	LUNCH (1:20)		
12:40	Unsteady Separated Flows	Michael OL U.S. AFRL	AFOSR
13:10	Three-dimensional Vortex Dynamics of Separated Flows	James Buchholz University of Iowa	AFOSR
13:40	Wing Motion, Flow Separation and Separation Control	Hermann Fasel University of Arizona	AFOSR
14:10	BREAK (0:15)		
14:25	Canonical Shear Flow Interactions with Unsteady Airfoils	Manoochehr Koochesfahani Michigan State University	AFOSR
14:55	Production, Analysis, and Control of Unsteady Vortical Wake-airfoil Interactions	Jesse Little University of Arizona	ARO

15:25	Control of Afterbody Vortices and Wake	Ismet Gursul University of Bath	AFOSR
15:55	BREAK (0:10)		
16:05	Flow Physics of Stall- and Separation Cells and their Control	Michael Amitay Rensselaer Polytechnic Institute	AFOSR
16:50	End of Day 1		

Agenda Day 2 Wednesday, July 20, 2016			
Time	Topic	Speaker/Institution	Agency
07:30	Registration		
08:00	AFOSR Flow Interactions & Control Program Update	Ivett Leyva	AFOSR
08:15	The Onset of Dynamic Stall and Flowfield Unsteadiness	Phillip Ansell University of Illinois at Urbana-Champaign	AFOSR
08:45	Theoretical and Computational Modeling of Two-Dimensional and Three-dimensional Dynamic Stall	Ashok Gopalarathnam North Carolina State University	ARO
09:15	A Local Analysis of the Fluid Dynamics and Flow Physics of Dynamic Stall	Andreas Gross New Mexico State University	ARO
09:45	BREAK (0:15)		
10:00	Nonlinear Aeroelastic Analysis of Two- and Three-Dimensional Dynamic Stall	Marilyn Smith Georgia Institute of Technology	ARO
10:30	Synchronized Flow Control of Dynamic Stall under Coupled Pitch and Freestream	Jeffrey Bons Ohio State University	ARO
10:50	Control of Static and Dynamic Stall by Plasma Actuators with Combined Energy / Momentum Action	Andrey Starikovskiy Princeton University	ARO
11:20	LUNCH (1:20)		
12:40	Minimum Power Requirements and Optimal Rotor Design for using Higher Harmonic Blade Root Control	Kenneth Hall Duke University	ARO

13:10	Structure and Modes of Supersonic Base Flows	Craig Dutton University of Illinois at Urbana Champaign	ARO
13:40	Investigation of Shock Interactions with Distorted Boundary Layers for Precision Munitions Applications	Venkataswaran Narayanaswamy North Carolina State University	ARO
14:10	BREAK (0:15)		
14:25	Aerodynamic Control of Coupled Body-wake Flow Instabilities on a Free-moving Platform	Ari Glezer Georgia Institute of Technology	ARO
14:55	Asymmetric Vortex Control on Slender Bodies at High Angles of Incidence	Rajan Kumar Florida A&M University	ARO
15:25	Flow Physics and Nonlinear Dynamics of Separated Flows	Lou Cattafesta Florida State University	AFOSR
15:55	BREAK (0:10)		
16:05	Response of Separated Flows over Airfoils	Jeff Eldredge University of California – Los Angeles	AFOSR
16:50	End of Day 2		

Agenda Day 3 Thursday, July 21, 2016			
Time	Topic	Speaker/Institution	Agency
07:30	Registration		
08:00	ARO Fluid Dynamics Program Update	Matthew Munson	ARO
08:15	Fluid-structure Interactions	Charles Williamson Cornell University	AFOSR
08:45	Vortical Gusts Impinging upon Elastic Wings	Justin Jaworski Lehigh University	AFOSR
09:15	Detailed Measurements of the Aeroelastic Response of a Rigid Coaxial Rotor in Hover	Jayant Sirohi University of Texas at Austin	ARO

09:45	BREAK (0:15)		
10:00	Fluid-structure Interaction Simulation of Gas Turbine Engines using Isogeometric Analysis	Yuri Bazilevs University of California – San Diego	ARO
10:30	Dissecting the Flow Physics of Aeroelastic Wing Flutter	Rajat Mittal Johns Hopkins University	AFOSR
10:50	Flow Control for Flexible Structures	Jurgen Seidel U.S. Air Force Academy	AFOSR
11:20	LUNCH (1:20)		
12:40	Sedimentation, Orientation and Dispersal of Ramified Particles in a Turbulent Environment	Donald Koch Cornell University	ARO
13:10	Nonlinear Dynamics and Control of Near-wall Turbulence	Michael Graham University of Wisconsin	AFOSR
13:40	Dynamics of Turbulent Taylor-Couette Flow via Exact Navier-Stokes Solutions	Roman Grigoriev Georgia Institute of Technology	ARO
14:10	BREAK (0:15)		
14:25	Exploiting the Non-linear Interactions within Wall Turbulence for Flow Control	Ebenezer Gnanamanickam Embry-Riddle Aeronautical University	AFOSR
14:55	Network-based Feedback Control of Fluid Flows	Kunihiko Taira Florida State University	AFOSR
15:05	A Fundamental Study of Electrokinetic Instabilities to Manipulate and Self-assemble Nano- and Microparticles	Minami Yoda Georgia Institute of Technology	ARO
15:25	Unsteady Forcing in Large-disturbance Environments	Anya Jones University of Maryland	AFOSR
15:55	BREAK (0:10)		
16:05	Fractional PDEs for Conservation Laws and Beyond: Theory, Numerics and Applications	George Karniadakis Brown University	ARO
16:50	End of Day 3		

Agenda Day 4 | Friday, July 22, 2016

Time	Topic	Speaker/Institution	Agency
07:30	Registration		
08:00	Independence Principle and Subsonic Wings	Israel Wygnanski University of Arizona	AFOSR
08:30	Characterization and Control of Pressure Loss	Rolf Sondergaard U.S. AFRL	AFOSR
09:00	Numerical Investigation of Flow control of Turbine Endwall Flows	Andreas Gross New Mexico State University	AFOSR
09:30	Turbulent Flow Modification with Thermoacoustic Waves for Separation Control	Kunihiko Taira Florida State University	ARO
10:00	BREAK (0:15)		
10:20	Joint Study of Control of Jets in Cross Flow	Krishnan Mahesh University of Minnesota	AFOSR
10:50	RailPac: a Rail Electrode Based Plasma Actuator for High-authority Aerodynamic Flow Control	Laxminarayan Raja University of Texas at Austin	ARO
11:20	A Passive Bio-inspired Micro-adaptive Separation Control Mechanism Derived from Shark Skin	Amy Lang University of Alabama	ARO
11:50	LUNCH (1:20)		
13:20	Vortex Dynamics and Boundary Layer Characteristics	Isaac Choutapalli University of Texas – Rio Grande Valley	AFOSR
13:50	Calibration and Certification of Molecular Tracking for near Wall High Speed Stress Measurement in Unseeded Air/NO₂	Ben Goldberg Princeton University	ARO/ AFOSR
14:20	A Variational Method for the Extraction of Intermittently Unstable Time-dependent Modes Directly from System Observables	Themistoklis Sapsis Massachusetts Institute of Technology	ARO
14:50	Program Review Wrap-up	Matthew Munson Ivett Levya	ARO AFOSR
15:30	End of Day 4 - Adjourn		