ARO/AFOSR Joint Program Review - 2019 - **Day 1**

15 Jul 2019

TIME	TITLE	DESCRIPTION	ADDITIONAL INFO
12:00 20'	**Welcome and Introduction**	Meeting Details, Ground Rules and Introductions Matthew Munson and Gregg Abate U.S Army Research Office and U.S. Air Force Office of Scientific Research	
		Unsteady Aeromechanics	
12:20 25'	**A coordinated experimental and computational study of global and convective gusts on swept wings**	John Farnsworth and Ken Jansen University of Colorado Boulder	Agency: AFOSR
12:45 15'	**Flow physics and distillation of the gust-induced stall of a low aspect ratio wing**	Jeff Eldredge and Dave Williams University of California Los Angeles and Illinois Institute of Technology	Agency: AFOSR
13:00 15'	**Aerodynamic and aeroelastic behavior of wings in the presence of upstream vortical and viscous disturbances**	Ashok Gopalarathnam and Matthew Bryant North Carolina State University	Agency: AFOSR
13:15 25'	**BREAK**		
		Unsteady Aeromechanics	
13:40 25'	**Using cyber-physical systems to study the dynamics of unsteady leading edge vortices with cross-stream flows**	Kenny Breuer and Juergen Seidel Brown University and U.S. Air Force Academy	Agency: AFOSR
14:05 15'	**Unsteady aerodynamics of goal-based propulsion and flight, employing CPFD**	Charles Williamson Cornell University	Agency: AFOSR
14:20 15'	**Geometric control theoretic formulation and analysis of unsteady fluid flows**	Haithem Taha University of California Irvine	Agency: AFOSR
14:35 15'	**Unsteady compressibility effects for modern rotorcraft**	James Gregory and Jeffrey Bons The Ohio State University	Agency: ARO
14:50 20'	**BREAK**		
		Other Aeromechanics	
15:10 25'	**Dissecting the flow physics of aeroelastic wing flutter**	Rajat Mittal and Joe Katz Johns Hopkins University	Agency: AFOSR
15:35 15'	**Wing sweep, structural motion and their effect on separation and separation control**	Hermann Fasel and Jesse Little University of Arizona	Agency: AFOSR
15:50			

TOTAL LENGTH: 03:50

ARO/AFOSR Joint Program Review - 2019 - **Day 2**

SessionLab
http://www.sessionlab.com

TIME	TITLE	DESCRIPTION	ADDITIONAL INFO
08:00 10'	**Introduction**	Beginning of the Day Announcements	
		High-Speed Flows	
08:10 15'	**Joint experimental/computational study of control of jets in crossflow**	Krishnan Mahesh and Ann Karagozian University of Minnesota and University of California Los Angeles	Agency: AFOSR
08:25 15'	**Uncovering flow physics for high-speed cavity flow control**	Larry Ukeiley, Kunihiko (Sam) Taira and Lou Cattafesta University of Florida, University of California Los Angeles and Florida State University	Agency: AFOSR
08:40 15'	**Fundamental turbulence mechanisms in highly-unsteady multi-stream flows**	Mark Glauser and Datta Gaitonde Syracuse University and The Ohio State University	Agency: AFOSR
08:55 25'	**Asymmetric vortex control on slender bodies at high angles of incidence / Forebody vortex interactions with control surfaces of generic axisymmetric configurations**	Rajan Kumar et al. Florida A&M University and Florida State University	Agency: ARO Also supported, in part, by funding from HBCU/MI programs at OSD and USA
09:20 25'	**Investigation of shock interactions with distorted boundary layers for precision munition applications**	Venkat Narayanaswamy North Carolina State University	Agency: ARO
09:45 25'	**BREAK**		
		Structure of Turbulence	
10:10 25'	**Low-complexity stochastic modeling and control of turbulent flows**	Mihailo Jovanvic University of Southern California	Agency: AFOSR
10:35 15'	**The geometry and topology of turbulent blobs**	William Irvine University of Chicago	Agency: ARO
10:50 25'	**Dynamics of turbulent Taylor-Couette flow via exact Navier-Stokes solutions**	Roman Grigoriev and Mike Schatz Georgia Institute of Technology	Agency: ARO
11:15 30'	**Characterization, modeling, and control of turbulence from a network-theoretic perspective / Network-based feedback control of fluid flows**	Kunihiko (Sam) Taira and Steve Brunton University of California Los Angeles and University of Washington	Agency: ARO (Topic 1) Agency: AFOSR (Topic 2)
11:45 15'	**Disentangling turbulent structures with nonlinear dynamics and machine learning**	Mike Graham University of Wisconsin	Agency: AFOSR
12:00 65'	**LUNCH**		
		Transition to Turbulence	
13:05 15'	**Understanding nonlinear coherent structure interactions in boundary-layer transition using adaptive signal analysis**	Phillip Ansell University of Illinois Urbana-Champaign	Agency: ARO YIP
13:20 25'	**Shaping modal dynamics for drag reduction: a study of transition suppression in shear flows**	Maziar Hemati University of Minnesota	Agency: AFOSR

TIME	TITLE	DESCRIPTION	ADDITIONAL INFO
13:45 15'	**Passive flow control of bypass transition by roughness shielding**	David Goldstein and Ed White University of Texas Austin and Texas A&M University	Agency: AFOSR
14:00 15'	**Investigation of laminar-turbulent transition for transonic boundary layers using advanced computational tools**	Hermann Fasel University of Arizona	Agency: ARO Also supported, in part, by funding from HBCU/MI programs at USA
14:15 15'	**Operator methods for analysis and control of dynamics, networks, and dynamic networks**	Clancy Rowley and Amit Singer Princeton University	Agency: ARO
14:30 20'	**BREAK**		
		Diagnostics and Capabilities	
14:50 25'	**A high-order CPR method on overset adaptive Cartesian and prismatic meshes for rotorcraft flow simulations**	ZJ Wang University of Kansas	Agency: ARO Also supported by U.S. Army CCDC - Aviation and Missile Center
15:15 15'	**Development of fast-responding, luminescence-enhanced microbeads for the digital luminescent particle image barometry thermometry and velocimetry system**	Dana Dabiri and Guozhong Cao University of Washington	Agency: ARO
15:30 15'	**Characterization of turbulent unsteady separation using photonic micro-skin friction and wall pressure sensors**	Tindaro Ioppolo New York Institute of Technology	Agency: ARO
		Turbine Flows	
15:45 15'	**The effect of unsteadiness on three dimensional endwall flows in a turbine passage**	Chris Marks U.S. Air Force Research Laboratory	Agency: AFOSR
16:00 15'	**Numerical investigation of two- and three-dimensional wake effects in high-lift low-pressure turbine flows**	Andreas Gross New Mexico State University	Agency: AFOSR Also supported, in part, by funding from HBCU/MI programs at USAF
16:15			

TOTAL LENGTH: 08:15

TIME	TITLE	DESCRIPTION	ADDITIONAL INFO
08:00 10'	**Introduction**		
		Boundary Layer Separation	
08:10 15'	**Flow physics and nonlinear dynamics of natural and perturbed turbulent separation bubbles**	Lou Cattafesta, Rajat Mittal, Charles Meneveau and Clancy Rowley Florida State University, Johns Hopkins University and Princeton University	Agency: AFOSR
08:25 30'	**Flow physics and control of (AFOSR) 3-D separation on 3-D swept wings and of (ARO) reverse flow over finite span swept blades under static and dynamic pitch conditions**	Miki Amitay, Vassilios Theofilis, and Kunihiko (Sam) Taira Rensselaer Polytechnic Institute, University of Liverpool and University of California Los Angeles	Agency: AFOSR (Topic 1) Agency: ARO (Topic 2)
08:55 25'	**Control of Lagrangian coherent structures at stagnation and separation locations on airfoils**	Geoff Spedding and Gus Jacobs University of Southern California and San Diego State University	Agency: AFOSR
09:20 25'	**A passive bio-inspired micro-adaptive separation control mechanism derived from shark skin**	Amy Lang University of Alabama Tuscaloosa	Agency: ARO
09:45 15'	**Study of flow separation on a rotating wing using volumetric velocimetry in the rotating frame of reference**	Vrishank Raghav and Brian Thurow Auburn University	Agency: ARO
10:00 25'	**BREAK**		
		Wall Turbulence	
10:25 25'	**Nonlinearity in the resolvent analysis: recovery of the mean velocity profile and energy transfer paths in wall turbulence**	Beverley McKeon California Institute of Technology	Agency: AFOSR
10:50 25'	**Exploiting the non-linear interactions within wall turbulence for flow control**	Ebenezer Gnanamanickam Embry-Riddle Aeronautical University	Agency: AFOSR YIP
11:15 15'	**Tunable porous and patterned surfaces for turbulence control**	Mitul Luhar University of Southern California	Agency: AFOSR YIP
11:30 15'	**Transformative prognostic wall-turbulence models for realistic spatial heterogeneities**	William Anderson University of Texas Dallas	Agency: AFSOR
11:45 15'	**Hibernating turbulence in boundary layer flows**	Richard Whalley University of Newcastle	Agency: EOARD
12:00 65'	**LUNCH**		
		Particle Laden Flows	

TIME	TITLE	DESCRIPTION	ADDITIONAL INFO
13:05 25'	**A fundamental study of electrokinetic instabilities to manipulate and self-assemble nano- and microparticles / Structured-illumination microscale particle image velocimetry**	Minami Yoda and Shaurya Prakash Georgia Institute of Technology and The Ohio State University	Agency: ARO
13:30 15'	**Understanding the instability of particle-laden liquids over soft porous media**	Parisa Mirbod University of Illinois Chicago	Agency: ARO
13:45 25'	**BREAK**		
		Flow Control	
14:10 25'	**Aerodynamic control of coupled body-wake flow instabilities on a free-moving platform**	Ari Glezer Georgia Institute of Technology	Agency: ARO
14:35 15'	**Active flow control via low aspect ratio rotating cylinders**	Albert Medina Air Force Research Laboratory	Agency: AFOSR
14:50 25'	**Aerodynamically-adaptive wings using distributed bleed flow control**	Ari Glezer Georgia Institute of Technology	Agency: AFOSR
15:15			

TOTAL LENGTH: 07:15

TIME	TITLE	DESCRIPTION	ADDITIONAL INFO
08:00 10'	**Introduction**		
08:10 15'	**Advanced molecular tagging velocimetry in cryogenic helium**	Wei Guo and Lou Cattafesta Florida State University	Agency: ARO
	Computational Fluid Dynamics		
08:25 25'	**High-fidelity simulation of complex multi-disciplinary interactions in air vehicles**	Miguel Visbal and Dan Garmann U.S. Air Force Research Laboratory	Agency: AFOSR
08:50 25'	**Hyperbolic reconstructed-discontinuous-Galerkin method for accurate unsteady viscous simulations on unstructured grids**	Hiroaki Nishikawa National Institute of Aerospace	Agency: ARO
09:15 15'	**Coherent-vorticity-preserving (CvP) Large-Eddy Simulations (LES) of very-high-Reynolds-number vortex dynamics**	Carlo Scalo Purdue University	Agency: ARO YIP. Also supported by DARPA Young Faculty Award program.
09:30 25'	**BREAK**		
	Unsteady Flows		
09:55 25'	**Mechanisms of force and moment generation by the flow over oscillating rectangular cylinders**	Ahmed Naguib and Manoochehr Koochesfahani Michigan State University	Agency: ARO Also supported by U.S. Army CCDC - Soldier Center
10:20 15'	**Onset and prediction of orbital motions of streamwise vortices**	Justin Jaworski Lehigh University	Agency: AFOSR
10:35 15'	**Dynamics of unsteady flow past bluff bodies with lofted bases**	Datta Gaitonde, Farrukh Alvi and Rajan Kumar The Ohio State University and Florida State University	Agency: AFOSR
10:50 15'	**Meeting Wrap-Up**	Matthew Munson and Gregg Abate U.S. Army Research Office and U.S. Air Force Office of Scientific Research	
11:05			

TOTAL LENGTH: 03:05