



Welcome to the review! We hope this week is productive and useful. We're excited for the opportunity for the potential for new collaborations and ideas to emerge as a result of the research discussed.

Some items for your awareness:

- Refreshments are available here at the BRICC. Payment is handled via a \$5.00 Cash Drop Box and is on the Honor System. Please make sure to contribute if you partake. Envelopes will be available if you want to pay for the 4 day in advance.
- The BRICC closes at 17:00. The agenda has us ending by 16:50 each day. Please make an effort to clear out quickly so that the BRICC staff can finish their day on time.
- The lunch break is scheduled early most days to try to avoid the noon rush at area restaurants. Please make every effort to be back from lunch a couple of minutes early so that we can start the first post-lunch talk on time.
- Please make sure to come load your presentation on the presentation PC (even if you choose to present from your own device) so that we have a full set of presentation slides. If you are a morning presenter, make sure to upload by the afternoon break the day before (at the latest). If you are an afternoon presenter, make sure your presentation is loaded by the beginning of the lunch break.

Enjoy the review!

Ivett and Matthew

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	Any 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 crossflow	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/NO ₂	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		