



UNIVERSITY OF CENTRAL FLORIDA

MECHANICAL AND AEROSPACE
ENGINEERING

Announcing MAE Spring 2013 Seminar Series Friday, February 22, 2013, 2:00pm-3:00pm, CL 1, Room 320

This event is hosted by the College of Engineering and Computer Science and the Mechanical and Aerospace Engineering Department at the University of Central Florida

“The Art & Science of Flow Control: Some Examples with a Visual Emphasis”

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Director, Florida Center for Advanced Propulsion
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Abstract - Active Flow Control (AFC) has been the focus of significant research for well over a decade. This is mainly due to the *potentially* substantial benefits it affords in numerous applications. AFC applications range from subsonic to the supersonic regime (and beyond), for both internal and external flows. The applications are wide and varied, such as controlling flow transition and separation over various external components of air vehicles to active management of separation and flow distortion in engine components and over turbine and compressor blades. High-speed AFC applications include control of flow oscillations in cavity flows, supersonic jet screech, impinging jets and jet-noise control, among others. For nearly a decade, the group at the Advanced Aero-Propulsion Laboratory (AAPL) in Tallahassee, Florida, has been exploring ways to better understand and more efficiently control such flows. In this talk we review some recent applications of AFC on canonical supersonic and subsonic flows that also illustrate the typical benefits as well as limitations and challenges of implementing AFC. We will also discuss some actuator designs that have been developed at FCAAP with the aim of providing robust control and have led to significant performance gains. In keeping with the title of this talk, flowfield properties and their response to actuation will be discussed through the use of qualitative and quantitative flow visualization methods, illustrating the merits of using flow visualization to gain significant insight into the flow and its response to AFC.

Bio - Farrukh Alvi is a professor in the Dept. of Mechanical Engineering at the Florida A&M University – Florida State University College of Engineering. He is the Founding Director of the *Florida Center for Advanced Aero-propulsion* (FCAAP), a multi-university, state-wide research, technology and education center he helped establish in 2008. He is also the director of the *Advanced Aero-Propulsion Laboratory* (AAPL) and a Co-Director of the recently established *FAA- Center of Excellence in Commercial Space Transportation*. Over the last decade his research has in large part focused on active flow and noise control, such as the control of supersonic jets, cavity flows and flow separation and in the related area of development and implementation of actuators, especially micro-fluidic actuators, for flow & noise control applications. He holds a number of patents in this area. The development and use of diagnostics, especially non-intrusive optical techniques for fluid flows is also an active area of research. He has published nearly 150 technical papers and articles in his areas of research. He is an Associate Editor of the AIAA Journal, an Associate Fellow of AIAA (American Institute of Aeronautics and Astronautics) and a Fellow of the ASME (American Society of Mechanical Engineers).

Date:
Friday, 02/22/2013

Time:
2:00pm—3:00pm

Location:
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**For more information
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