

**Tuesday May 5th, 09:30-10:30**

## **Advances in Active Flow Control, Control Allocation, and L1 Robust Control**



**Speaker:** Michael Niestroy, Ph.D., Lockheed Martin, Senior Fellow for Control Sciences

**Short Bio:** Dr. Niestroy is a member of Lockheed Martin's Advanced Development Programs (ADP) team, also known as Skunk Works. He has been at Lockheed Martin (LM) for 28 years with his focus mainly on control-related research and development. Mike has participated in three NATO-sponsored R&D programs that included formation flight for fuel efficiency, active flow control, and control allocation. He has participated in over thirty R&D projects, funded both internally by LM and externally by many US government agencies and participation with small businesses and universities. Dr. Niestroy was also an adjunct professor of electrical engineering at The University of Texas at Arlington for over eleven years, teaching control-related graduate classes.

**Abstract:** This talk focuses on three control-related research and development efforts involving Lockheed Martin Skunk Works. The first two are part of NATO-sponsored Applied Vehicle Technology (AVT) efforts; one long-standing effort on maturing active flow control for aircraft and the second on flight testing of control allocation methods on a small remotely piloted vehicle. The third part of the presentation highlights our efforts in developing a bolt-on L1 robust control methodology. For this last topic, some of the underlying concepts are presented first, followed by flight test results of those algorithms on the X-62A VISTA at the US Edwards Air Force Base facility. Results are shown in graph form with a short HUD video. The presentation wraps with some going-forward thoughts on the technologies discussed.