AEROSPACE ENGINEERING

Friday Apr 10, 2015 2:00 P.M.

Engineering Bldg Room 328



San Diego State University

Aerospace Engineering College of Engineering

> 5500 Campanile Drive Mail Code 1308 San Diego, CA 92182

> Phone: 619 594 6067 Fax: 619 594 0933

Webpage: http://aerospace.sdsu.edu





Design, Development, and Flight Test of a Multi-utility Aeroelastic Demonstrator Aircraft - the X-56A

Jeff Beranek Skunk Works (Lockheed Martin)

Efforts to develop the next generation of aircraft with ever increasing levels of performance; higher, further, faster, cheaper; face great technical challenges. One of these technical challenges is to reduce structural weight of the aircraft. Another is to look to aircraft configurations that have been unrealizable to date. Both of these paths can lead to a Rigid Flex Coupling (RFC) phenomenon that can result in anything from poor flying qualities to the loss of an aircraft due to flutter. This presentation discusses the motivations for increased air vehicle performance, development of a small demonstration aircraft, then development and flight test of the X-56A vehicle. The principle thrust of the presentation is flutter and flutter suppression of a high aspect ratio, low tail volume vehicle along with the challenges and fun that occurs in the vehicle development process.



Speaker Biography:

Mr. Beranek has 34 years of experience in flutter and aeroservoelasticity – all of it in the Skunk Works. He graduated from Iowa State University in 1981 with a B.S. in Aerospace Engineering. He has worked on 30+ air vehicles; most notable are the YF-12A, SR-71, U-2, F-117A, F-22, DarkStar, JASSM, X-35, and X-56A. His experience has been as flutter lead on many programs, structures lead on several programs, principal investigator on four Lockheed Martin research programs, and Chief Engineer of the X-56A program. Mr. Beranek has developed a number of the flutter and aeroservoelastic methodologies that are used in the Skunk Works and Lockheed Martin today.

Host: Dr. Luciano Demasi