



Mechanical and Aeronautical Engineering Department
University of California Davis
Davis, California 95616-5294
<http://mae.ucdavis.edu/research/spaceEd/>

2008-2009 Monthly Seminar Series on Space Research

16 October, 20 November, 15 January, 19 February, 16 April, 21 May
3rd Thursday 4:00-5:00 pm

AIR LAUNCHING SPACE VEHICLES

Professor Nesrin Sarigul-Klijn, Ph.D.
University of California at Davis, (UCD)

Date: 20 Nov. 2008 Thursday Time: 4:10-5:00 pm (*Refreshments will be provided at 4:00 pm*) Location: 1062 Bainer

ABSTRACT

Hosted by: Professor Fidelis Eke

This presentation give the results of a comparative study conducted on the advantages and disadvantages of various methods for air launching space vehicles and the details of flight tests from two new air launch methods. Many different air launch scenarios are modeled and simulated using trajectory optimizations in this comparison study. The results identified the most beneficial launch vehicle parameters to be in following order; launch velocity, launch flight path angle, and launch altitude. The two new air-launch methods detailed are the Gravity Air-launch (GAL) and trapeze-lanyard airdrop (t/LAD). These methods are designed for safely launching personnel and cargo into low Earth orbit (LEO). Unlike the standard heavy equipment airdrop method, GAL imparts much of the launch carrier aircraft's altitude and airspeed onto the rocket, which in turn improves payload mass to orbit. t/LAD launch is designed to improve safety and reliability of launching personnel into LEO. A t/LAD launch eliminates the need for wings or fins on the launch vehicle; greatly reduces ascent dynamic pressure, sideway accelerations, bending forces, and rocket engine thrust vector control. Flight test results will be presented.

ABOUT THE SPEAKER

Professor Nesrin Sarigul-Klijn has 22 years of experience in theoretical, computational, and experimental research in Aerospace Vehicle Structures and Control including Dynamics, Acoustics and Aeroelasticity effects, Space Transportation Vehicle Trajectory Optimizations/Air Launching Methods, Finite Element Methods, and Flight Testing of Aerospace Vehicles at sub and full scales. At present she is a Professor of Mechanical and Aeronautical Engineering at UCD. She received her Ph.D. degree from the University of Arizona in 1984. From 1984 until 1989 she was an Assistant Professor of Aeronautical and Astronautical Engineering at The Ohio State University. She also worked at NASA Glenn Research Center in Advanced composites and Propulsion Structures research as a faculty fellow. From July 1989 to July 1996, she was a tenured Associate Professor in the MAE Department at UCD Campus. She was promoted to Full Professor rank in 1996. In 1994, she founded the Scaled Model Aerospace Research and Testing Laboratory and has been serving as its Director. In 1996 she co-founded the Transportation Noise Control Center and has been serving as its Co-Director. In 2001 she established the Space Engineering Research and Graduate Program and has been serving as its Leader. She holds zero percent appointments as a Professor in two departments' graduate groups: the Biomedical Engineering Graduate Group, and the Electrical and Computer Engineering at UCD. In addition to her Engineering academic degrees, she is an instrument rated commercial pilot with flight experience in 34 different types of aircraft and has completed the FAA Wings level IV proficiency award program. She has over 100 technical publications. Professor Sarigul-Klijn has been the director of thesis and dissertation research of 26 MS and 15 PhD (1 MD/PhD) degree students under research funding from NASA, NSF, DARPA(AirLaunch LLC), NASS, Steller Solutions, AFRL(SpaceDev), and California Space Flight. Professor Sarigul-Klijn is an Associate Fellow of the AIAA. She was the technical co-chair of the AIAA Joint Propulsion Conference 2006. She delivered two invited keynote technical lectures in 2008. She is a member of ASME, SAE and IEEE.

For more information about

SpaceED (Space Engineering Research and Graduate Program) or the seminars please contact Professor Nesrin Sarigul-Klijn at (530)-752-0682 or nsarigulklijn@ucdavis.edu

Members of the campus community and visitors from the region are welcome to attend the seminar series.

Sign-in is required at the event. SpaceED seminar will replace MAE297 seminar on 3rd Thursdays.

SpaceED seminars are supported in part by



Space Systems Company