

The Mechanical Engineering Department cordially invites you to our:
DEPARTMENT SEMINAR

Topic:	Recent Development in the Study on Unsteady Aerodynamics of Flapping Wing in NUS
Speaker:	Dr Lua Kim Boon Senior Research Fellow Department of Mechanical Engineering, NUS
Date:	Monday, 29 October 2012
Time:	2.15pm – 3.30pm
Venue:	EA-06-07 (map of NUS can be found at http://www.nus.edu.sg/campusmap/)

Abstract

The passion in developing flapping wing micro aviation vehicles (MAVs) has drawn considerable research interest in the unsteady aerodynamics of flapping wing. Due to their small physical dimension, MAVs are flying in the Reynolds number region which is much lower than those of conventional flying vehicles. The insects flapping flight may be best suited for MAVs, mainly due to the extra-ordinary flying capability that insect has demonstrated in the low Reynolds number regime.

In this presentation, recent experimental studies on the aerodynamics of flapping wing at National University of Singapore (NUS) will be introduced. Selected experiments conducted with our three-dimensional (3-D) flapping wing facility as well as two-dimensional (2-D) flapping wing facilities will be presented. The 3-D hovering experiments were conducted to measure the force and to visualize the flow of a rigid hawkmoth-like wing undergoing flapping motions. In addition, the effects of wing flexibility were investigated with hawkmoth-like wing of different flexibility performing the same flapping motions. The 2-D experiments include 2-D tandem wings as well as 2-D hovering experiments. The tandem wing experiments were aimed to investigate the effects of forewing and hindwing interaction on the thrust generation of 2-D tandem wings in forward flight condition at a Reynolds number of 5,000. The 2-D hovering experiments studied the force and flow characteristics of hovering wing, wing wake interaction as well as the effects of the relative timing of pitching motion.

About the Speaker

Dr Lua Kim Boon is currently a Senior Research Fellow in the Department of Mechanical Engineering, NUS working on the MAV project. He obtained his BS degree from the National Taiwan University in 1994, and Ph.D. degree in fluid mechanics from NUS in 2001. Dr Lua's research interests include unsteady aerodynamics, fluid structure interaction of unsteady flapping wings, high angle of attack aerodynamics and PIV.

**** Admission is free. All are welcome to attend. ****