

# Monash e-Research Centre



**Monday 7 November 2011**  
**Monash-Technion MURPA Seminar**

## **Buckling and Postbuckling Behaviour of Laminated Composite Stringer Stiffened Curved Panels**

**Presented by Assoc Prof Haim Abramovich**  
**(Aerospace Engineering, Technion-Israel Institute of Technology)**

**Time: 5 - 6pm**

**Location: Room 135, Bldg 26, Clayton Campus**

**Visit:** <https://messagelab.monash.edu.au/MURPA/TechnionMURPA>

**Abstract:** ( **Biography** - <http://ae-www.technion.ac.il/staff/pages/1> )

The first part of the presentation will deal with buckling and postbuckling behaviour of laminated composite stringer stiffened curved panels under axial compression and will include the description of some of the experiments performed by the Technion within the POSICOSS project (improved postbuckling simulation for design of fiber composite stiffened fuselage structures) aiming at design of low cost, low weight airborne structures that was initiated and supported by the Fifth European Initiative Program. Based on the experimental studies carried out within the framework of the POSICOSS project and reported in the literature and on the present study design guidelines will then be formulated and presented.

The second part of the presentation will address the issue of repeated buckling and postbuckling behaviour of laminated stringer-stiffened composite panels with and without damage. Experiments on eight curved blade stringer-stiffened composite panels that were tested under axial compression to obtain the "first" buckling and postbuckling behaviour till collapse, will be presented. Except for one panel, used as a reference panel, all of the panels had stringers without drop off layers. Four panels contained either artificial damage or both artificial and impact-induced damage. Cyclic/repeated buckling was applied well in a relatively "deep" postbuckling region. It was demonstrated that neither repeated buckling, within the number of cycles applied in the present program, nor artificial damage and impact-induced damage, which were introduced into the panels, resulted in stiffness degradation of the panels. It was shown that stiffeners with no drop off plies aimed amongst others at providing a mechanism for initiating stiffener debonding, no skin-stringer separation was encountered till collapse of the panels. It was found that composite stringer-stiffened panels can be safely and repeatedly loaded in their deep postbuckling range with no degradation in their stiffness.

*\*The new Technion and Monash University collaboration is supported by the Victorian Technion Society and Monash and involves seminars by experts at the Technion-Israel Institute of Technology and Monash on a range of topics of mutual interest, with the goal of fostering closer research ties. Leveraging on existing equipment and expertise at Monash, the Victorian Technion Society has funded the installation of similar equipment in Israel, enabling High Definition Video linked interactive seminars between the two universities. It is also planned to extend the successful Monash Undergraduate Research Projects Abroad (MURPA) scheme, allowing up to two Monash undergraduate students to engage in a summer research internship at the Technion-Israel Institute of Technology in the near future. URL: <http://www.monash.edu.au/eresearch/events/index.html>*

