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## Seminar on

# ORIGAMI STRUCTURES FOR ENGINEERING APPLICATIONS

### Seminar Topic:

In recent decades, origami folding, an art form of paper folding has been of increasing interest to both mathematicians and engineers. Mathematicians are more interested in the geometrical aspects of origami objects such as foldability of origami patterns, especially foldability of developable surfaces. Engineers, on the other hand, are finding that traditional geometry and folding used for artistic paper models can be readily parameterised and applied to the development of new structures and devices. Since most of the sheet materials used in engineering applications are relatively rigid in comparison with paper, particular attention has been drawn on to rigid origami, a subset of origami that permit continuous motion between folded states along the pre-determined folding creases without the need for twisting or stretching of the facets. This allows the patterns to be readily manufactured from modern materials such as plastic, metal, or carbon-fibre sheets, producing patterns that are sufficiently strong and durable to be of use in large-scale applications.

In the seminar, Prof Zhong You would introduce a number of new structural concepts that have been developed by his research group. The primary focus of his research is on modelling origami and the development of thin-walled energy absorbing structures using origami, including crash boxes and sandwich plates and shells containing origami core structures, also known as foldcores. This type of structures can be used in cars, helicopters and trains to absorb kinetic energy in case of a collision. It has been discovered that by pre-folding the surface of a thin-walled materials with particular sets of origami patterns, it is possible to alter the post-buckling failure mode, and this deformation mode could be tailored to coincide with very high energy absorption capability.

### About the Speaker:

**Prof Zhong You** holds a Ph.D. in Structures (Cambridge) is a Professor of Engineering Science in the Department of Engineering Science, University of Oxford, U.K. since 1998. Prof Zhong has been one of the very small numbers of engineers who initiated systematic research into origami applications in engineering. He has been inundated by invitations to contribute reviews on his work by leading international journals such as Materials Today and Smart Materials and Structures.

**Date:** Wednesday, 19<sup>th</sup> November, 2014

**Time:** 10:00am to noon

**Venue:** School of Mechanical and Aerospace Engineering,

Meeting Room D , Block N3.2, Level 2, room 59,

Nanyang Technological University ([Map](#))



To register for this seminar, please click on the link below, or scan the barcode to register online.

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