



## *Growth optimization and field emission properties of highly $sp^2$ carbon films*

by Miss Koh Ting Ting, Angel

**Date:** 29<sup>th</sup> October 2009 (Thursday)

**Time:** 12:00pm to 12:30pm

**Venue:** EA-02-11 (Executive Seminar Room)

### Abstract

In recent years, much carbon related materials research has been focused on single layer or extremely thin graphitic films or otherwise known as graphene or few layer graphene respectively. The many unique properties of graphene include extremely high conductivity and mobility ( $>15,000 \text{ cm}^2\text{V}^{-1}\text{s}^{-1}$ ). It is also known to exhibit room temperature ballistic transport, making it a very exciting material to study for electronic related applications. However, various problems are met in the synthesis of graphene especially in growing large area graphene and in growing exactly a single layer of graphite sheet. In our quest to produce few layer graphene films, highly  $sp^2$  carbon films were first deposited by a KrF 248 nm wavelength pulsed laser with external heating applied to the substrate via resistance heating. The effects of varied temperature from 100-700°C on the  $sp^2$  content of the films were studied using Raman spectroscopy and X-ray photoelectron spectroscopy (XPS). In addition, the effect of laser energy on the grown films will also be discussed as part of the optimization process. Finally, the field emission properties of the synthesized films were also tested, with the film deposited at 700°C being the best emitter. The barrier height ratios of the films were also calculated

### Miss Koh Ting Ting, Angel Speaker

Miss Koh Ting Ting Angel obtained her bachelor's degree in Materials Science from the National University of Singapore (NUS) in 2008. She is currently pursuing her PhD degree under the supervision of Assistant Professor Daniel Chua, in the Department of Materials Science and Engineering, NUS. Her research interests include the synthesis of graphitic films and the study of their electron emission and transport properties.

Dr Xue Jun Min Host

*All are Welcome!*