



## *Synthesis of ZnO and Cu-doped ZnO Films by hydrothermal route*

by Miss Li Tong

**Date:** 10<sup>th</sup> September 2009 (Thursday)  
**Time:** 12:00pm to 12:30pm  
**Venue:** EA-02-11 (Executive Seminar Room)

### Abstract

Due to numerous potential applications of high-quality ZnO/transition-metal (TM)-doped ZnO films and the great advantages of hydrothermal synthesis in both cost and environmental impact, a significant effort recently has been made for growth of highly-textured ZnO (TM-doped ZnO) films via hydrothermal method. However, considering the requirement of hydrothermal growth on small lattice mismatch between films and the substrates, most research based on the traditional two-step hydrothermal method now is confined to employ spinel or sapphire as the substrates for ZnO films synthesis. In my study, I employed an improved hydrothermal method, in which we use as-grown ZnO films fabricated by pulsed laser deposition (PLD) which is more flexible in substrates selection as the ZnO seed layers, and then followed by hydrothermal process to grow highly-textured films on different substrates. The structural, optical and electrical properties of the pure ZnO films on different substrates were then studied. Besides, among the TM-doped ZnO films, because Cu-doped ZnO films were considered as promising intrinsic diluted magnetic semiconductors as Cu atoms have no clustering tendency and Cu and its compounds are not ferromagnetic, I chose ZnO: Cu system in my study and mainly investigated the doping concentration, annealing effect and substrate effect related to the Cu-doped ZnO films fabricated by this improved hydrothermal method. Finally, the possible origin of room temperature ferromagnetism in ZnO:Cu system was further discussed. This study lays the foundation for growing high-quality and thick ZnO and TM-doped ZnO films with large area on various substrates, which could be a promising technique for practical applications.

**Miss Li Tong** **Speaker**

Miss Li Tong received bachelor's degree in Materials Science and Engineering from Tong Ji University in 2007. She is currently a second year studying for PhD. in Dept. of Materials Science and Engineering in NUS. She is under the guidance of Associate Professor Ding Jun. Her research project is Synthesis of ZnO & TM-doped ZnO Films by hydrothermal route.

**Dr Xue Jun Min** **Host**

*All are Welcome!*