Title: The Principles of Electron Microscopy and Its Applications to Magnetic Thin Films

Speaker:
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Abstract:
Scanning electron microscopy (SEM) and transmission electron microscopy (TEM) are the most widely employed characterization tools for resolving nanoscaled features in surface and thin film analysis [1]. In this talk, Prof. Lin, the TEM supervisor in the Center of Nanoscience and Nanotechnology, National Chung Hsing University, Taiwan [2], will first introduce the principles of SEM and TEM. Then he will elaborate on the operational modes (imaging and analytical) of the 200 kV TEM (JEOL JEM-2010). Bright-field/dark-field imaging, diffraction, X-ray spectroscopy (known as X-ray energy dispersive analysis, line scan, and mapping), and lattice imaging will be discussed. Secondly, Prof. Lin will present examples of TEM micrographs in his research field of future data storage materials (FePt [3] and exchange-biased thin films [4,5]) to further explain how TEMs can be used to characterize magnetic thin films at nanoscale.

Biography of the speaker:
Ko-Wei Lin received his B.S. and M.S. from Feng Chia University and National Taiwan University in Taiwan in 1992 and 1994 respectively, and a Ph.D. degree from the State University of New York at Stony Brook (supervised by Prof. Richard Gambino) in 2002. He was a postdoctoral fellow in Professor Takao Suzuki's group at the Information Storage Materials Laboratory, Toyota Technological Institute, Japan in Nagoya from 2002 to 2003. Then Dr. Lin joined the Department of Materials Science and Engineering, National Chung Hsing University, Taichung, Taiwan as an Assistant Professor. He is an Associate Professor since 2006. Dr. Lin was a visiting professor in University of Innsbruck, Austria and University of Western Australia in the summers of 2006 and 2009 respectively. His research interests include the exchange-bias effects in ferromagnetic/antiferromagnetic thin films and multilayers, and the future data storage materials such as CoPt and FePt films by using the dual ion-beam sputter deposition technique.

Organizer: Dr. P.W.T. Pong