Department of Mechanical Engineering
機械工程學系

THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

Seminar

Date: 21 April 2009 (Tuesday)
Time: 10:00 am -11:00 am
Venue: EF 305, The Hong Kong Polytechnic University

Transmission Electron Microscopy: State-of-the-Art

Dr. Eric Van
Business Developer
FEI Company

Abstract:

The introduction of spherical aberration correctors has enabled new application developments in TEM (Transmission Electron Microscopy) and STEM (Scanning Transmission Electron Microscopy). The image resolution in both TEM and STEM is now significantly below 0.1nm or 1Ångstrom and the sensitivity for imaging ultra light elements is now also at the atomic level. Furthermore, features such as high voltage flexibility and the ability to observe samples in gaseous environments enable dynamic studies and time-resolved experiments. A further improvement to the (S)TEM is electron energy filtering by the use of a monochromator. This reduces the energy spread of the incident beam, allowing more detailed spectral analysis with an energy resolution of 0.1-0.2eV. Last but not least 3D tomography has become a well established technique dramatically improving failure analysis of man-made devices.

The capability of generating directly interpretable images with atomic resolution also at lower accelerating voltages during in-situ experiments promises to revolutionize materials science. It crosses an important threshold in allowing researchers to investigate material properties in terms of individual atomic and molecular mechanisms rather than as the bulk properties of an aggregate population.

The high-visibility TEAM project in the USA will also be discussed.

Biosketch:

Dr. Eric Van Cappellen received his PhD from University of Antwerp (UIA); Belgium, in 1986. His TEM initiation was done on a Philips EM300 in the summer of 1979. With almost 30 years of TEM experience, he has published over 50 publications in the fields of transmission and analytical electron microscopy. He has worked in TEM related R&D and industry positions in Belgium, Germany, Netherlands, USA, and now in Hong Kong. Currently, he is the Business Developer for FEI's Nano Research market.

* Refreshment will be served after the seminar.