

UNIVERSITY OF HOUSTON
CULLEN COLLEGE OF ENGINEERING

Center for Integrated Bio and Nano Systems
SPEAKER SERIES

PRESENTS

LOW DOSE ELECTRON MICROSCOPY OF MATERIALS WITH ATOMIC RESOLUTION



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Melcher Hall - Room 180 (Business School)

LECTURE ABSTRACT

Electron microscopy has reached atomic resolution by means of the use of aberration correctors and appropriate manipulation of experimental images. The two main variants i.e., transmission (TEM) and scanning transmission electron microscopy (STEM) are reviewed together with the corresponding basic concepts and expected performance for different applications. The case of exit wave reconstruction is then introduced together with benefits and development in the case of TEM techniques. Several examples of application of this technique will be offered including beam sensitive materials where the need for low dose rates is explained. All images and examples will attempt to demonstrate the benefit of reducing the dose rate and the corresponding beam sample interaction in order to keep the genuine atomic distribution of the observed samples. Discussion of the procedures and experiences with the use of the low dose techniques will include results showing clear contrast differences for different atomic distributions in the imaged columns i.e., atomic resolution.

SPEAKER BIOSKETCH

Hector Benavides' research interests include solar fuels with nanostructured devices, artificial photosynthesis, and atomic resolution electron microscopy of materials and nanomaterials. Currently serving as professor at Instituto Politécnico Nacional, his professional experience also includes the Federal Institute of Technology - Zürich (ETH-Zürich). His accomplishments include several academic distinctions and honors awarded by Alpha Sigma Mu, the Mexican Academy of Sciences, the National Research System of Mexico, and the International Advisory Committee de la International Federation of Societies of Electron Microscopy (IFSEM). He has produced over 180 technical publications.

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