

# Physics Colloquium

## Michigan Technological University

October 28 (Thursday) 4:00 to 5:00 pm  
Room 139, Fisher Hall

### Syntheses, Characterizations and Applications of Nanostructural Systems

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#### Abstract

Two types of nanostructural systems shall be discussed. One involves nanocomposite systems involving molecules encapsulated in mesoporous materials. For this type of system, functional properties of the nanocomposite material are described, with applications as varied as chemical sensing, new zero-field microwave absorbing magnetic materials, and catalytic behavior evinced by encapsulated semiconductor nanoparticles. The second system discussed is that of single-walled carbon nanotubes, with a focus on unique synthetic approaches, detailed investigations of optical, electron microscopy and optical scanning probe properties, as well as possible applications.

#### Biography

Dr. Daniel L. Akins is a Professor in the Department of Chemistry at the City College of New York (since 1981) and director of the Center for Analysis of Structures and Interfaces, a center that conducts research focused on nanomaterials and their uses. Prof. Akins was an undergraduate at Howard University (Washington, DC) and received his Ph.D. in Physical Chemistry (in 1968) from the University of California-Berkeley. He served as Assistant



Professor and Associate Professor of Chemistry at the University of South Florida, Tampa, Florida, from 1970 to 1977. He then served for 2 years as Program Officer for the Dynamics Program of the National Science Foundation (NSF), followed by 2 year as a Senior Scientist at the Polaroid Corporation in Waltham, Mass. His research focus is on quantum properties of molecular nanostructures and the exploitation of such properties for formulating new nanomaterials with uses in molecular photonic devices (MPDs) and/or chemical sensors. In 2000, Prof. Akins was the recipient of the Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring.