LSU DEPARTMENT OF MECHANICAL ENGINEERING

The Sidney E. Fuchs Seminar Series

3:30-4:30pm, Friday, February 24, 2012

Frank H. Walk Design Presentation Room

Plasmonic Nanostructures: Artificial Molecules

by

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The recent observation that metallic nanoparticles possess plasmon resonances that depend sensitively on the shape of the nanostructure has led us to a fundamentally new understanding of the plasmon resonances supported by metals of various geometries. This picture- "plasmon hybridization", reveals that the collective electronic resonances in metallic nanostructures are mesoscopic analogs of the wave functions of simple atoms and molecules, interacting in a manner that is analogous to hybridization in molecular orbital theory. The new theoretical insight gained through this approach provides an important conceptual foundation for the development of new plasmonic structures that can serve as chemical and biosensors, substrates for surface enhanced spectroscopies and subwavelength plasmonic waveguides and devices such as routers, multiplexers, modulators, and logic gates.

* Obtained his PhD degree in Theoretical Physics at Chalmers Univ. of Technology in Gothenburg in Sweden in 1985. After postdoctoral positions at IBM Thomas J. Watson Research Center (USA), AT&T Bell Laboratories (USA), and Rutgers Univ., he joined Rice University where he is Professor of Physics & Astronomy and Professor of Electrical & Computer Engineering. He has been Visiting Professor at Univ. of Paris and at the Institute of Physics at the Chinese Academy of Sciences. His research background is in theoretical condensed matter physics and nanophysics. His current research is focused on theoretical and computational modeling of Plasmonics and Nanophotonics phenomena. He is an associate editor of ACS Nano, fellow of APS, AAAS, and SPIE and the recipient of the Charles Duncan Award. He has published more than 200 refereed articles, given more than 250 invited presentations worldwide, and has been cited more than 10000 times with an h-index higher than 50.

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