THE DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING SPEAKER SERIES

PRESENTS

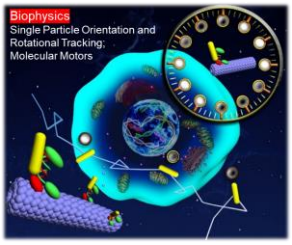
Optical Imaging of Nanoscale Chemical and Biological Processes

Ning Fang
Associate Professor
Department of Chemistry, Georgia State University,
Atlanta, GA, USA 30303

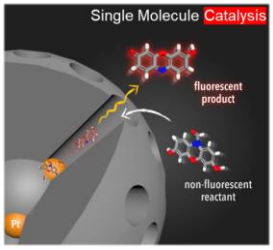
Monday, 10/7, 9:55am
Agnes Arnold Hall, AH-106

LECTURE ABSTRACT

The research in the Fang Laboratory aims to open new frontiers in chemical and biological discovery through the development and use of novel optical imaging platforms, which provide sub-diffraction-limited spatial resolution, high angular resolution (for anisotropic imaging probes), excellent detectability, and/or nanometer localization precision for single molecules and nanoparticles. The talk will include two parts:



Rotational Tracking: The Single Particle Orientation and Rotational Tracking (SPORT) techniques have been developed in the Fang Laboratory to acquire accurate measurements of anisotropic plasmonic gold nanorods in complex cellular environments. Rich information in five dimensions, including the x, y, z coordinates and the two orientation angles (azimuthal angle φ and polar angle θ , as defined in the figure) of the probe's transition dipole, can be obtained from SPORT experiments. The SPORT technique is capable of extracting important information (including rotational rates, modes, and directions) on the characteristic rotational dynamics involved in cellular processes and transport of functionalized nanoparticles, as may be relevant to drug delivery and viral entry.



Single Molecule Catalysis: Real time imaging of single catalyst active sites in situ enables mechanistic studies on fundamental reaction steps under actual turnover operando conditions; these studies have enormous potential impact in establishing intimate structure-property relationships from which to build better (faster, cleaner, cheaper) catalysts. Our research aims to design catalytic platforms for single molecule imaging and reveal molecular dynamics (including diffusion, adsorption, and chemical conversion, as well as their coupling) on the nanocatalyst surfaces or in the nanoporous structures at the single-molecule level.

SPEAKER BIOSKETCH

Ning Fang received his B.S. from Xiamen University, China in 1998 and his Ph.D. from the University of British Columbia, Canada in the group of Prof. David D.Y. Chen in 2006 and was a Postdoctoral Associate at Iowa State University and Ames Laboratory, US Department of Energy with Prof. Edward S. Yeung from 2006 to 2008. From 2008 to 2015, he was an Assistant Professor of Chemistry at Iowa State University and a Faculty Scientist at U.S. Department of Energy, Ames Laboratory. In July 2015, he moved his laboratory to the Department of Chemistry at Georgia State University and became an Associate Professor.

Please contact Dr. Xiaonan Shan (xshan@central.uh.edu) to request further information.