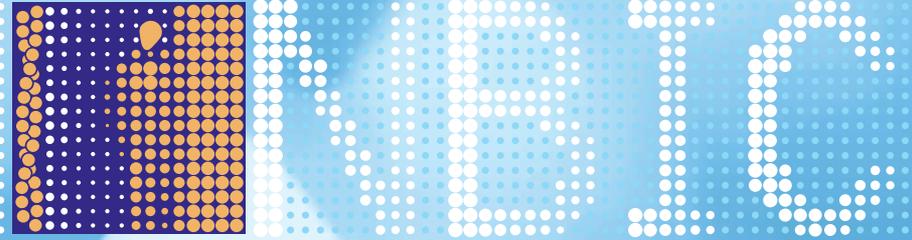


# Nano/Bio Interface Center



Nano/Bio Interface Center at the University of Pennsylvania is a Nanoscale Science and Engineering Center (NSEC) bringing together researchers from the Schools of Engineering and Applied Science; Arts and Sciences; and Medicine. The NBIC exploits Penn's internationally recognized strengths in design of molecular function and quantification of individual molecules. The Center promotes collaboration among investigators in 10 different departments in the basic sciences and engineering. This broadly multidisciplinary approach for innovation allows Penn researchers to best realize the potential, and benefits, of nano-biotechnology.

*NBIC Award for*  
Research Excellence in Nanotechnology

**Catherine J. Murphy**

*2016 Recipient*

UNIVERSITY *of* PENNSYLVANIA



**Catherine J. Murphy** is the Peter C. and Gretchen Miller Markunas Professor of Chemistry at the University of Illinois at Urbana-Champaign (UIUC). She earned two B.S. degrees, one in chemistry and one in biochemistry, from UIUC in 1986. She earned her Ph.D. in 1990 from the University of Wisconsin, and then joined the California Institute of Technology as a postdoctoral fellow from 1990-1993. In 1993 she began her independent career as an assistant professor in the Department of Chemistry and Biochemistry at the University of South Carolina. In 2009, she returned to UIUC as a faculty member. Murphy has won numerous awards for her research (NSF CAREER Award, Sloan Fellowship, Cottrell Scholar, Dreyfus-Teacher Scholar Award, ACS Division of Inorganic Chemistry's Inorganic Nanoscience Award) over the years. She was named a Fellow of the Royal Society of Chemistry in 2014 and was elected to the U.S. National Academy of Sciences in 2015.

**Abstract:** Gold nanocrystals of controlled size and shape have tunable optical properties that enable new science. Upon illumination with resonant light, these gold nanocrystals generate plasmons (coherent oscillations of conduction band electrons). These plasmons, in turn, can produce local electric fields and heat. In this talk I will discuss four short stories about gold nanocrystals and their plasmons. In "Physics" we will discuss how molecules experience the local electric field provided by illuminated plasmonic nanorods. In "Chemistry" we will discuss how the surface chemistry of the nanocrystals can be tuned with both hard and soft shells, and how the particular chemistry at the surface dictates molecular function. In "Biology" I will discuss how these nanocrystals interact with biological fluids and living cells; and in "Ecology" I will discuss how these nanoparticles are distributed in an estuarine ecosystem as a function of surface chemistry.

*The Nano/Bio Interface Center presents its  
Award for Research Excellence in Nanotechnology*

*Join us for a talk by the 2016 recipient*

**Catherine J. Murphy**  
Peter C. and Gretchen Miller Markunas  
Professor of Chemistry  
University of Illinois at Urbana-Champaign

*Gold Nanocrystals:  
Physics, Chemistry, Biology, and Ecology*

Wednesday, October 26, 2016

4:00 PM

Glandt Forum

Krishna P. Singh Center for Nanotechnology  
3205 Walnut Street

*Reception to follow*