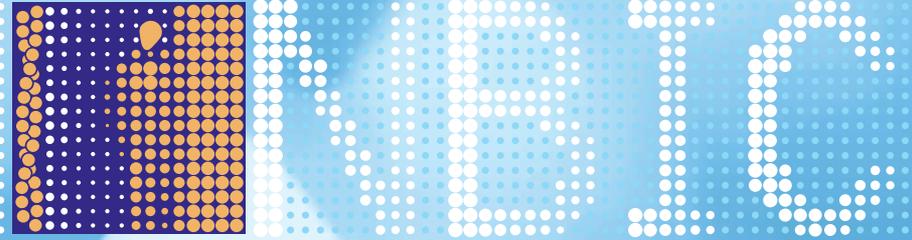


Nano/Bio Interface Center



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

Charles Marcus

2014 Recipient

UNIVERSITY *of* PENNSYLVANIA



Charles Marcus is the Villum Kann Rasmussen Professor and Director of the Center for Quantum Devices at the Niels Bohr Institute, University of Copenhagen, Denmark. Marcus was born in Pittsburgh PA, grew up in Sonoma CA, and was an undergraduate at Stanford University (1980-84). He received his Ph.D. from Harvard University where

he continued as an IBM postdoctoral fellow. He taught at Stanford (1992–2000) and Harvard (2000–2012), and served as director of the Harvard Center for Nanoscale Systems (2004–2009). Marcus's research focuses on quantum coherence in electron devices and solid-state implementations of quantum information processing systems. Recent work includes experiments on spin control in semiconductor quantum dot systems, control of electronic states in nanowires, carbon nanotubes and graphene, development of hyperpolarized nanoparticles for medical imaging, interferometry in the fractional quantum Hall effect, and detection of Majorana fermions in semiconductor/superconductor hybrid structures. Marcus is author of over 170 papers with more than 18,000 citations. He is a Fellow of the American Physical Society and the AAAS, and recipient of the Newcomb-Cleveland Prize from the AAAS.

Abstract: Possessing astounding capability to make nearly whatever we wish from materials of our choice from the atomic scale upward, we (humans, that is) are poised to take on an engineering challenge of an entirely different level of complexity: to build machines that live in the quantum mechanical realm, where states of the machine do not exist prior to measurement and measurement at one point can project outcomes of measurements at other points. Can we make such a machine, what is it good for, what does it teach us about how our universe works? This talk will describe fledgling experimental approaches to building quantum coherent electrical circuits, the elementary building blocks of a future quantum processor. Approaches will be compared, and future challenges identified.

The Nano/Bio Interface Center presents its

Award for Research Excellence in Nanotechnology

Join us for a talk by the 2014 recipient

Charles Marcus

Villum Kann Rasmussen Professor

Center for Quantum Devices

Niels Bohr Institute, University of Copenhagen

Control Without Measurement:

The Profound Challenge of Quantum Information

Wednesday, October 22, 2014

4:00 PM

Glandt Forum

Krishna P. Singh Center for Nanotechnology

3205 Walnut Street

Reception to follow