

NCLT SEMINAR

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Matthew J. Gilbert

Matthew J. Gilbert received his B.S. (Honors), M.S., and PhD. degrees in electrical engineering from Arizona State University in 2000, 2003 and 2005 respectively. He has held postdoctoral fellowships at the University of Texas at Austin and Stanford University. He has also served as the Assistant Director of the South West Academy of Nanoelectronics (SWAN). He is currently an Assistant Professor in the electrical and computer engineering department at the University of Illinois at Urbana-Champaign and a Research Assistant Professor in the Micro and Nanotechnology Laboratory at the University of Illinois at Urbana-Champaign. He has contributed to research on quantum computing, decoherence mechanisms in nanostructures, many-body theory, and quantum transport. He has authored more than 40 refereed publications, 1 patent, 1 book chapter, and has given presentations at over 35 international conferences. His current research centers on spintronics, quantum transport in low-dimensional nanostructures, and strongly correlated condensed matter systems.

Title:

Correlated Charge Motion in Nanoscale Logic Devices for Next Generation Computing

Abstract:

Computers are an essential part of everyday life for many people. As a corollary, people are demanding that next generation computers not only provide them with additional computing power but in an increasingly compact and lightweight package. For many years, the semiconductor industry has made billions of dollars by successfully providing customers with exactly this combination of computer characteristics. However, we are reaching a critical point in the development of next generation computers. The traditional methods that the semiconductor industry has been using are no longer providing the performance increases that are expected. This problem stems mainly from the fact that the logic device technology that drives these advances can no longer operate efficiently with continued shrinking. In this talk, I will discuss the problems facing current semiconductor nanoscale logic devices and present an approach to potential surmount these problems by coercing the charge particles flowing in these tiny devices.