



Lee Bassett is an Assistant Professor of Electrical & Systems Engineering and responsible for the Quantum Engineering Lab (<http://nanoquant.seas.upenn.edu/>) at the University of Pennsylvania. Following undergraduate studies at the Pennsylvania State University (BS Physics, 2004), Lee travelled to the United Kingdom as a Marshall Scholar and NSF Graduate Research Fellow to complete the MSt (Part III) in Mathematics (2005) and PhD in physics (2009) at the University of Cambridge, the latter for his work on low temperature quantum electronics in III/V semiconductor devices. From 2009-2013 he was a Hewlett Packard Postdoctoral Fellow at the University of California, Santa Barbara. He received the NSF CAREER award in 2016 and the Ford Motor Company Award for Faculty Advising in 2018.



Physics Colloquium

The power of imperfection:

Embracing the quantum limit in semiconductor devices

Lee Bassett, Ph.D.

*Department of Electrical & Systems Engineering
University of Pennsylvania*

Counterintuitively, the same atom-scale defects that are the bane of integrated electronic devices might be the key to a grand challenge of 21st century science: harnessing the enormous complexity and sensitivity of quantum-coherent systems for practical applications. Certain semiconductor defects exhibit quantum-mechanical features comparable to isolated atoms or molecules, but in room temperature devices amenable to nanofabrication and integration. I will introduce this expanding research field and describe several recent efforts to identify, create, and control quantum states using defects in solid-state devices. Quantum engineering research connects disparate areas in nanophotonics, information processing, materials science, physics, and electrical engineering, and has wide-ranging applications in quantum computing, secure communication, and high-performance sensors.

Thursday, Sep. 20, 2018 at 4:10PM in Lewis Lab. 316