PHYSICS COLLOQUIUM:

Building a Robust Quantum Ecosystem in the Lab and the Classroom

Hilary Hurst

Assistant Professor, Department of Physics & Astronomy
San José State University

Date:
9/23/2022

Time:
10:30 AM - 11:50 AM

Location:
KOLLIG 217

About The Speaker:

Dr. Hilary Hurst is an Assistant Professor in the Department of Physics & Astronomy at San José State University. She is a quantum educator and theoretical physicist, with broad interests in condensed matter theory, many-body atomic physics, and open quantum systems. Her research primarily focuses on the theory of quantum noise and quantum measurement and feedback control for many-body quantum systems. In addition to research, Dr. Hurst is passionate about making quantum physics education more accessible and preparing students to work in the growing quantum technology industry. Dr. Hurst is originally from Greeley, Colorado and received her BS in Engineering Physics from the Colorado School of Mines. She went on to earn a Masters in Applied Mathematics & Theoretical Physics at the University of Cambridge (UK), and received her PhD in theoretical condensed matter physics from the Joint Quantum Institute at the University of Maryland. Following her doctoral work, she was a National Research Council Postdoctoral Fellow at NIST in the Quantum Measurement Division. Dr. Hurst joined the faculty of San José State University in Fall 2020.

Abstract:

Despite many advances in our understanding of how to create and manipulate quantum systems, challenges in both research and education remain for commercialization of quantum technologies. On the research side, the fragility of quantum states continues to present difficulties. Superposition and entanglement are essential quantum properties which can be easily destroyed, rendering quantum devices useless. Isolating quantum systems from external disturbances has therefore been the primary mode of preserving quantum coherence, but it is difficult to scale to large quantum systems.

For more information, contact : David Strubbe
dstrubbe@ucmerced.edu

PHYSICS COLLOQUIUM:

Building a Robust Quantum Ecosystem in the Lab and the Classroom

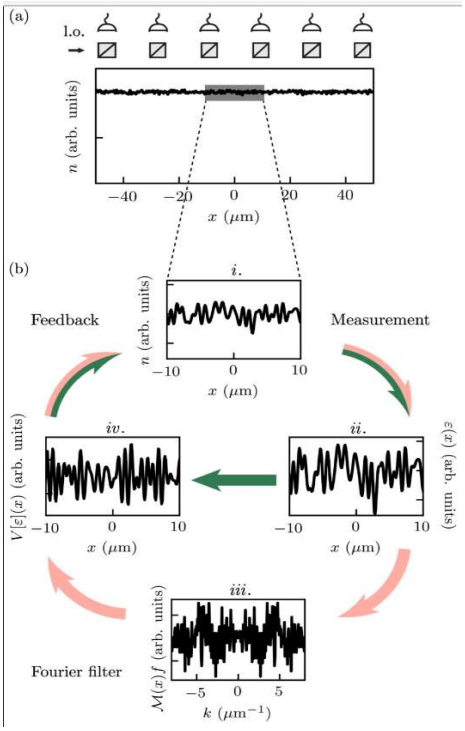
Date:
9/23/2022

Time:
10:30 AM - 11:50 AM

Location:
KOLLIG 217

Abstract (cont.):

New modes of harnessing system-environment coupling can enable robust, entangled quantum phases in open systems, providing a route toward scalable quantum technologies for quantum sensing, computing, and networking. Likewise, quantum education has been isolated to upper-level undergraduate physics majors and those seeking advanced MS or PhD degrees in physics. This educational model is also di fficult to scale up and does not address the increasingly interdisciplinary nature of quantum technologies or workforce needs. In this talk I will provide an overview of work in my group toward robust quantum systems and a robust quantum educational landscape. In particular, I will review our recent theoretical results in using weak measurement and feedback to engineer new phases in ultracold atomic systems. I will also provide an overview of interdisciplinary coursework being developed at San José State University to re-imagine how we teach quantum mechanics and expand access to training in quantum information science and engineering.



For more information, contact : David Strubbe
dstrubbe@ucmerced.edu