Old Dominion University
Department of Physics

Colloquium

Tuesday, October 4, 2022

"Quantum: from quarks to computing"

Dr. David Dean
Deputy Director for Science
Jefferson Lab

Abstract:

During this colloquium I will describe two quantum extremes. At one end of the spectrum, I will describe the research of Jefferson Lab where we explore the nature of QCD and matter at its most fundamental level of quarks and gluons. Understanding the amazing world inside a nucleon requires tremendous technical capabilities embodied in large accelerator facilities and advanced detector technology. Such capabilities have recently focused attention on astrophysical phenomena: for example, a precise measurement of the thickness of the neutron skin in Pb has implications in the astrophysics associated with neutron-star mergers. This interplay is but one demonstration of how the world of the small, even at the nuclear level, affects the most violent of collisions in the universe.

Before my move to JLab eight months ago, I was the Director of the Quantum Science Center (QSC) at ORNL. The QSC performs R&D in quantum computing. Every week researchers make great strides in demonstrating a new breakthrough in Quantum Information Science (QIS). These breakthroughs will lead accelerated innovation in both QIS and related disciplines. Furthermore, QIS innovation will generate new technologies to accurately predict, detect, and model the complex world around us in areas such as energy generation and efficiency, national security, new materials discovery, and fundamental physics. In this case, quantum mechanics governs a new paradigm for how one computes, and offers tremendous promise in the future.

About David Dean:
https://www.jlab.org/news/releases/david-j-dean-appointed-jefferson-lab-deputy-director-science

Please Note Room Change

Presentation: OCNPS SCALE-UP 142 @ 3:00 pm
Refreshments: OCNPS First Floor Atrium @ 2:30 pm
All interested persons are cordially invited to attend.