

Physics Colloquium

Dr. Brandon Mitchell

**Department of Physics and Engineering
West Chester University**

**“Development of Semiconductor-based Intra-center Photonics for
Micro-Display and Quantum Computing Applications”**

The development of a "smart society" will require advancements in display and quantum computation technologies. These advancements will likely come in the form of color-tunable pixels that can be fabricated on the micrometer scale and the fabrication of systems whose quantum states can be isolated and precisely controlled, both of which can be addressed by "trapping" rare earth (RE) ions in a semiconducting host. In this regard, a deeper understanding of the carrier dynamics and energy transfer between the host crystal and the RE ions is essential. Moreover, the ability to control the radiative lifetimes of the RE ions and from which level the RE ion emits will be critical for these applications. In this presentation, the basics of semiconductors technologies, RE ions and the applications that are facilitated by the merging of these two systems will be discussed.

Dr. Mitchell graduated from Lehigh University in 2014 with a Ph.D. in Applied Physics. Dr. Mitchell is currently an Associate Professor in the Department of Physics and Engineering at West Chester University. During his five years at WCU, Dr. Mitchell has supervised 15+ undergraduate research students and published 20+ peer-reviewed manuscripts in the fields of rare-earth-based photonics, perovskite nanocrystals, and physics education. He currently has two NSF-funded projects. One project focuses on increasing the retention of low-income STEM majors at WCU. The other is an international collaborative effort with Osaka University, Lehigh University, and the University of Pennsylvania that focuses on using rare-earth ions doped into semiconductors for micro-display and quantum information technologies.

Thursday September 2 in LL 316 at 4:25

Refreshments available at 4:00

For Zoom participation, please see information below:

Meeting ID: 972 1274 7894

Passcode: 631869