

# Quantum Dots in Long Wavelength Applications

**Speaker: Xifeng Qian**, Elif Demirbus - UMass Lowell, Lowell, MA

E-Mail: [Xifeng\\_qian@uml.edu](mailto:Xifeng_qian@uml.edu)

## Abstract

Since the realization of quantum dots (QDs), it has shown great potential in optoelectronic applications due to its unique properties of 3-D carrier confinements. The rapid progress of QD devices has brought to the demonstration of quantum dot lasers, quantum dot infrared photodetectors (QDIPs), amplifiers and solar cells. This talk will discuss QD applications in long wavelength sources and detectors, such as QDIPs and QD cascade lasers, which are based on carrier intersubband transition mechanism in QDs. Moreover, we will introduce a novel design of mid-infrared lasers using strain-balancing QD and QW hybrid structure.

### **Speaker's bio:**

Xifeng Qian received his PhD in Physics from University of Massachusetts Lowell (UML) in 2009. He was a Post-doc from 2009 to 2012 and then a Visiting Assistant Professor from 2012 to 2014. In 2015, he became an Assistant Professor in the department of Physics and Applied Physics in UML. Dr. Qian's research focuses on nanofabrication, long wavelength optoelectronic devices, and THz technologies.