

BioNIUM Seminar Series

THURSDAY
27 February 2025



TIME
2:00 PM



LOCATION
Zoom



Plasmonic nanoparticles for enhanced, live-cell, single-molecule imaging and localized biotoxicity

Gold nanoparticles strongly interact with light when excited at their plasmon resonance. This increased interaction with light allows the nanoparticles to enhance the absorption and emission of nearby fluorophores. However, this enhanced light interaction can also be used to generate heat and reactive oxygen species that can cause cellular damage. Here, I will discuss my research efforts to enhance the single-molecule imaging of fluorescent protein labeled *Vibrio cholerae* cells. Additionally, I will discuss my recent work on uncovering the mechanism of gold nanoparticle photoluminescence and its implications for reactive oxygen species generation for targeted biotoxicity.

Dr. Stephen Lee, PhD

Assistant Professor of Chemistry

Stephen A. Lee is an Assistant Professor of Chemistry at the University of Miami. His research group studies the interaction and control of individual quantum emitters coupled to plasmonic cavities for quantum sensing and quantum communication purposes using frequency and time-resolve emission microscopy. Stephen obtained his bachelor's degree in chemistry at Sam Houston State University in 2014 with an undergraduate thesis under Professor David E. Thompson. Stephen then completed his PhD in Chemistry in 2019 in Professor Julie S. Biteen's group at the University of Michigan, where he earned Dow and PPG Summer Research Fellowships and the Rackham Graduate Dissertation Fellowship. He then moved to Rice University as a Post-Doctoral Researcher in Professor Stephan Link's group from 2019–2023 and finally to the University of Illinois at Urbana-Champaign in Professor Christy F. Landes's group in 2023–2024.