



DEPARTMENT OF PHYSICS AND ASTRONOMY

COLLOQUIUM **IN-PERSON ONLY EVENT**



Bring Smartphone-Based Labs to Undergraduate Physics Classes

Yiping Zhao

Distinguished Research Professor
Department of Physics and Astronomy,
University of Georgia

Over the past two decades, I have pursued a central question in my teaching: how can we make physics education more engaging, accessible, and relevant to today's students? This journey led to the integration of smartphone technology into undergraduate labs, beginning in 2015 with Modern Optics class and evolving into the Smartphone-based Introductory Physics Labs (SmartIPL) project during the COVID-19 pandemic. These labs are not merely a contingency for remote instruction; they represent a fundamental shift in how we approach experimental science education—empowering students to conduct meaningful, hands-on investigations using devices they already own. From analyzing motion and rotation to exploring diffraction, interference, and polarization, students design and execute real experiments with their smartphones, guided by short manuals, worksheets, and instructional videos. In this talk, I will discuss the motivations behind this pedagogical approach, highlight key outcomes from student-led projects, and reflect on the successes of SmartIPL in remote learning environments. I will also explore how this model fosters broader access to STEM education and encourages creativity, collaboration, and critical thinking—both within the classroom and beyond.



¹Yiping Zhao and Yoong Sheng Phang, "[Use of Smartphones in Optical Experimentation](#)," SPIE Press (September 2022).

² YouTube Channel: UGA Modern Optics: Smartphone Projects (https://www.youtube.com/channel/UCDNH_mEXvy-Rp98ri96EuLw)

³ YouTube Channel: UGA SmartPhone Intro Physics Lab <https://www.youtube.com/@ugasmartphoneintrophysics1041>

Thursday, August 28, at 3:55 PM

IN-PERSON EVENT ROOM 202

Local Contact: Dr. Tho Nguyen, ngtho@uga.edu