Yale Institute for Nanoscience and Quantum Engineering

Malone Engineering Center nano.yale.edu

Friday- October 12, 2018

12:00 -1:00 PM

BECTON SEMINAR ROOM

Light lunch will be served

Wen Xiong

Department of Applied Physics, Yale University

"Coherent Control of Light in Multimode Fibers"

Multimode optical fibers have seen increasing applications in telecommunication, imaging, spectroscopy, high-power lasers and amplifiers. However, inherent imperfections and environmental perturbations cause random mode and polarization mixing in the fiber, resulting distortions of optical signals in space, time and polarization. These distortions pose serious issues for communication and imaging applications. In this talk, I will present our works that not only correct the distortions induced by random mode mixing, but also utilize strong mode coupling to enhance the coherent control of light propagation in the multimode fiber. We show that by tailoring the input spatial profile of coherent waves, a strongly broadened and distorted pulse transmitted through a multimode fiber can be compressed, increasing the bandwidth of the system. Besides the temporal shape, we also demonstrate an effective control of the polarization states by shaping the input spatial profile.

Zachary Kobos

Department of Electrical Engineering, Yale University

"Construction of a Portable, Electronic Assay for Biosensing Applications"

Point-of-care testing aims to bring diagnostics directly to the patient-provider interaction, utilizing user-friendly methods that provide rapid results. Portable testing frees the patient-provider schema from infrastructural constraints, elevating healthcare standards in remote and time-critical contexts. Electronic readout is highly desirable for these portable biosensing applications from the perspectives of cost, speed, and ease-of-use. We present a microfluidic device implementing a purely electronic assay to separate and enumerate activated and un-activated T-cells to rapidly detect a systemic infection response. We will discuss the system architecture and design considerations underlying the presented assay as well as the state of efforts to fully miniaturize the device.

Host: Professor Corey O'Hern