IQSE AMO QO Seminar Series

Tuesday, February 21st, 11:30 am ZOOM & IQSE seminar room (MPHY 578)

Pizza will be served for IQSE members at 11:00 am. The talk will start around 11:30 am

Dr. Hui Cao

(Yale University)

Customizing laser speckle statistics

EVENT DETAILS: Laser speckles commonly demonstrate Rayleigh intensity statistics and only possess short-range correlations. Recently we develop a method of customizing the intensity statistics of speckle patterns and introducing long-range spatial correlations among the speckle grains. The tailored speckle patterns exhibit radically different topologies and varying degrees of spatial order. The various families of speckles are created by encoding high-order correlations into the phase front of a monochromatic laser beam with a spatial light modulator. This work provides a versatile framework for creating complex light fields and controlling their statistical properties for varied applications in microscopy, imaging, and optical manipulation. As an example, we design and create special speckle patterns for parallelized nonlinear pattern-illumination microscopy based on fluorescence photoswitching. In a proof-of-principle experimental demonstration, we obtain a spatial resolution three times higher than the diffraction limit of the illumination optics in our setup. Furthermore, the tailored speckles vastly outperform standard speckles.

ZOOM information:

https://tamu.zoom.us/j/98156251523?pwd=QVdSdGxtL1UyY0g1L083SU5QR0QrUT09

Meeting ID: 981 5625 1523
Passcode: 297578

One tap mobile
+13462487799,,98156251523# US (Houston)
+16694449171,,98156251523# US