

IQSE AMO QO Seminar Series

Friday, May 19th, 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. Nikolay I. Zheludev

(University of Southampton, UK; Nanyang Technological
University, Singapore)

The physics and technology of optical superoscillations

EVENT DETAILS: Optical superoscillations are rapid, subwavelength spatial variations of the intensity and phase of light, occurring in complex electromagnetic fields formed by the interference of several coherent waves. The discovery of superoscillations stimulated a revision of the limits of classical electromagnetism — in particular, the studies of phenomena such as unlimitedly small energy hotspots, phase singularities, energy backflow, anomalously high wavevectors and their intriguing similarities to the evanescent plasmonic fields on metals. In recent years, the understanding of superoscillatory light has led to the development of superoscillatory lensing, imaging and metrology technologies. Dielectric, metallic and metamaterial nanostructured superoscillatory lenses have been introduced that are able to create hotspots smaller than allowed by conventional lenses. Far-field, label-free, non-intrusive deeply subwavelength super-resolution imaging and metrology techniques that exploit high light localization and rapid variation of phase in superoscillatory fields have also been developed, including new approaches based on artificial intelligence, that now reach the atomic scale resolution. We review the fundamental properties of superoscillatory optical fields and examine emerging technological applications.

ZOOM information:

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

Meeting ID: 981 5625 1523

Passcode: 297578

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