

Seminar Announcement

Center for Optical Research and Education, Utsunomiya University

Date: Monday, 3 February 2014

Place: Collaboration Seminar Room, 4F CORE Building

10:30-11:15

Spectrally-resolved incoherent holography: holographic spectral imaging of incoherently illuminated/self-luminous objects by measurement of optical coherence

Dinesh N. Naik (ITO, Institut für Technische Optik, Universität Stuttgart, Germany)

Spatial and spectral information holds the key for characterizing self-luminous objects and imaging fluorescence. By measuring the spatial and temporal coherence functions using a Mach-Zehnder interferometer capable of providing a radial shear as well as a tunable optical path delay between the interfering optical fields, the recording of 3D spatial and spectral information will be presented.

11:15-12:00

Numerical calculation of the Fresnel transform

Damien Kelly (Fakultät für Maschinenbau, Technische Universität Ilmenau, Germany)

In this presentation we address the problem of calculating Fresnel diffraction integrals using a finite number of uniformly spaced samples. General and simple sampling rules of thumb are derived that allow the user to calculate the distribution for any propagation distance. It is shown how these rules can be extended to fast Fourier transform based algorithms to increase calculation efficiency. A comparison with other theoretical approaches is made.

14:00-14:45

Recent progress in statistical information optics: statistical information processing for optics

Wei Wang (School of Engineering & Physical Sciences; Photonics & Quantum Sciences, Heriot-Watt University, UK)

In this talk, I will review our recent work on the statistical information processing for optics, including coherence diffraction, coherence interference and coherence grating, mutual coherence tensor holography, and Fourier transform polarization spectrometer, which we

recently proposed and experimentally demonstrated. I will emphasize the importance of noting mathematical analogies in optics and physical phenomena, which give insights into the methodology for developing new techniques.

14:45-15:15

Optics for touch screens of tomorrow

Steen G. Hanson (DTU, Photonik, Technical University of Denmark, Denmark)

Two examples on future use in optics within the field of touch screens will be depicted. The first is a simple, yet highly precise, optical system based on spatial filtering velocimetry for cursor control. The second is a simple all-optical touch screen based on propagation in a waveguide, where finger impact is registered by a decrease in the transmitted light.

15:15-16:30

Free discussions