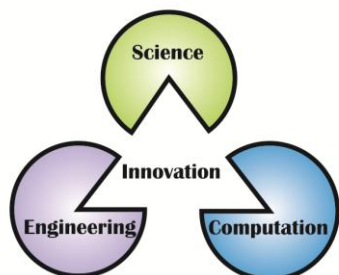


The Brojde Center



The Peter Brojde Center For Innovative Engineering and Computer Science
The Department of Applied Physics
The Rachel and Selim Benin School of Computer Science and Engineering

A Special Brojde Center Lecture:

Prof. Eugenio DelRe

University of Rome La Sapienza, Italy

Scale-free optics: Cancelling and inverting diffraction below the optical wavelength

At the wavelength scale, optical propagation is dominated by diffraction that distorts fine details in the field, setting limits to imaging instruments, such as microscopes and telescopes. For subwavelength perturbations, only evanescent waves are excited so that no image is actually able to leave the emitting plane. Although waveguides and spatial solitons can compensate diffraction for specific waveforms, they can neither be used to transmit an arbitrary image nor can they achieve subwavelength propagation. In recent years we have discovered a new regime in which the laws of optical propagation can be profoundly modified by so-called shape-sensitive nonlinearities, that is, nonlinearities that depend on the shape but not on the actual intensity. In these systems, light can be made to obey a modified Helmholtz equation where diffraction is cancelled and no evanescent waves exist, so that subwavelength perturbations are observed to propagate undistorted for macroscopic distances. We will discuss the underlying physics, the different experimental demonstrations in Nano-disordered photorefractive ferroelectrics, and future developments and applications.

Wednesday, March 29 2017, At 12:00

Bergman Bldg., Seminar Hall

Refreshments will be served at 11:45

For details please contact: galiashn@savion.huji.ac.il