אוניברסיטת בן גוריון בנגב **הפקולטה למדעי הנדסה**

טל: 08-6461448 פקס: 08- 6479494 **היחידה להנדסת אלקטרואופטיקה**

סמינר - מרצה אורח

Manipulation of light by strong interactions in nanostructures

Dr. Tal Ellenbogen

Harvard School of Engineering and Applied Sciences, 33 Oxford Street, Cambridge, Massachusetts 02138, USA
e-mail address: tale@seas.harvard.edu

In the next decade we are about to witness great changes in the way we use and manipulate light. Conventional illumination based on incandescent light bulbs and fluorescent lamps will be replaced by semiconductor light emitting devices which are expected to be much more efficient and durable. The goal to increase the portion of energy that comes from renewable sources to larger than 20% by 2020 will lead to the incorporation of light harvesting devices into our homes, cars and appliances. In addition, optical interconnects and computing units are expected to be integrated into computers and other appliances. To be able to face challenges associated with these changes, we will need to find ways to control light better than ever and produce faster, smaller and more efficient light based devices.

One of the most promising approaches for attaining ultra fast control of light in small dimensions is utilizing strong interactions in nanostructures. In my talk I will present some examples of light manipulation by exploiting strong interactions in nanostructures. I will show how strong coupling between photons and excitons in organic semiconductor optical waveguides, changes the dynamics of the coupled system and splits its eigenmodes into mixed photon-exciton modes. I will demonstrate how to probe these modes, modify their properties and show leaky waveguide exciton-polariton emission from these structures. In addition I will show that vertical silicon nanowires can be tuned to couple light at specific frequencies over the visible spectrum and present the development of plasmonic visible color filters based on optical nano-antennas.

הסמינר יתקיים ביום שלישי 4/10/11 בשעה 13:00 בחדר סמינרים בניין 30 קומה ג' חדר 300