

Lecture Series on Nanophotonics

By Professor Uriel Levy

Visiting Professor from the Hebrew University of Jerusalem.

Time: Fridays 11-12; Place: DTU Nanotech, Building 344, room 114

This lecture series is aimed at students, post-docs and faculty with an interest in nanophotonics. It will consist of five colloquium lectures about 45-50 minutes each.

30.09.2016: Lecture 1 – From vector beams, to beating the diffraction limit

In this lecture I will present the concept of vector beams with focus on the example of radially polarized light. Several approaches for the generation of radially polarized light will be discussed. It will be shown how to calculate vector beam propagation under tight focusing conditions, and the conditions for achieving sharper focal spot will be discussed, together with near field characterization of radially polarized light exciting plasmonic lenses.

07.10.2016: Lecture 2 – Metasurfaces: past, present and future

Metasurfaces are man-made nano surfaces with properties that are not available in nature. They can be used to control amplitude, phase, polarization and spectral response of light. In this lecture I will discuss some of the early works in the field, as well as the current overwhelming activity, with focus on my own contributions. I will also try to speculate regarding the future of the field.

14.10.2016: Lecture 3 – Silicon photonics devices

Silicon photonics is now an established field of research, with many of the innovations finding their way to commercial applications. In this lecture I will provide a short overview, followed by presenting our work in the field, with focus on modulation and metrology applications

21.10.2016 : Lecture 4 – Plasmonic devices

The field of plasmonics is rapidly growing, and is now going into the phase where applications are needed. In this lecture I will discuss our work on plasmonic enhanced photo detection in the near IR. I will also present our approach for plasmonic memory devices, as well as present some recent results regarding the Aluminum plasmonic waveguide for applications in short wavelength regime.

28.10.2016: Lecture 5 – Chip scale atomic vapors

Hot vapors are commonly used for variety of applications, from metrology to frequency standards, and atomic clocks. Following the ongoing efforts for the miniaturization of atomic vapor systems, we have recently introduced the platform of the atomic cladding waveguide. In this lecture I will describe the recent progress towards the construction of chip scale devices for enhanced light vapor interactions including the interactions of Rb vapor with nanophotonic structures such as waveguide, dielectric resonators and plasmonic structures.

Short Bio of Professor Uriel Levy:

Uriel Levy is a professor at the Department of Applied Physics, School of Engineering and Computer Science and the director of the center for nanoscience and nanotechnology at the Hebrew University of Jerusalem, Israel (HUJI). Prior to joining HUJI in 2006 he was a post graduate researcher at the University of California, San Diego. His major research interest is nanophotonics, with focus on silicon photonics, plasmonics, and light matter interactions for applications in communication, imaging, lithography, sensing, memory, and alternative energy. He is a fellow of the optical society of America and a recent recipient of an ERC grant related to light vapor interactions on a chip.

Hosts: Anders Kristensen (DTU Nanotech) and N. Asger Mortensen (DTU Photonics Engineering)