

NOTE: Dr. Boltasseva is a prospective ECE faculty member.

SEMINAR

**MONDAY, April 23, 2007
10:30 A.M.
ROOM 1001, BRK Building**

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Plasmonics – Building Nanophotonics with Metals

Abstract

Today, surface plasmon polaritons (SPPs) that represent two-dimensional electromagnetic waves propagating along a dielectric-metal interface are being explored for their potential in subwavelength optics, photonic integrated circuits, data storage, light generation, microscopy and bio-sensing. One of the most attractive features of SPPs is that they can help to concentrate and channel light using subwavelength structures. This could lead to miniaturized photonic circuits with length scales much smaller than those currently achieved. Giving the possibility of using the same metal circuitry for guiding light and transmitting electrical signals, plasmonics paves the way to efficient control of optical signals in integrated optical circuits.

In this talk, different metal-dielectric geometries are considered for efficient excitation and guiding of SPPs. Planar plasmonic waveguides based on nm-thin and μm -wide metal strips embedded in a polymer that support propagation of long-range SPPs are shown to constitute an alternative for integrated optical circuits. For applications where polarization is random or changing, metal nanowire waveguides are considered to be suitable candidates for efficient guiding of arbitrary polarized light. Plasmonic waveguides based on metal v-grooves that were recently shown to have superior features for subwavelength guiding, such as relatively low propagation loss and strong confinement, are also considered. For different waveguide geometries issues like main loss contributions, propagation loss vs. confinement and fabrication challenges are discussed. In this presentation, recent advances in manufacturing of nanostructured metal surfaces for plasmonic structures are also discussed.

Biography

Dr. Alexandra (Sasha) Boltasseva received M. Sc. degree in Physics, with highest honors, from Moscow Institute of Physics and Technology in 2000 and Ph.D. degree in Electrical Engineering from Technical University of Denmark (DTU) in 2004. After industrial experience with companies Micro Managed Photons A/S and Alight Technologies A/S, she joined as a postdoc the Department of Communications, Optics & Materials at DTU, where she is currently an Assistant Professor. Her main research activities are within nanophotonics, plasmonics, metamaterials and advanced nanotechnology.

Reception following the Seminar at 11:30 am in Room BRK 1001.
Prof. Vlad Shalaev (shalaev; 49855) is hosting Dr. Boltasseva.