

SINAM NANO SEMINAR

Center for Scalable and Integrated
Nano Manufacturing (SINAM) &
UC Berkeley Mechanical Engineering Dept.
present



Using Optical Anisotropy to Manipulate Light Beyond the Diffraction Limit

Dr. Viktor Podolskiy - Oregon State University

Wednesday, February 22, 2006

4:00 - 5:00 pm

3110 Etcheverry Hall

(Refreshments provided)

Abstract

In this talk we consider the light propagation in waveguides with strongly anisotropic cores. In contrast to “conventional” waveguides, where the light can propagate only when the waveguide size is larger than some critical value (approximately half of a wavelength) anisotropic systems may support propagating modes even when their dimensions are much smaller than the free space wavelength. We show that by controlling the material anisotropy and waveguide geometry one can manipulate the effective index of refraction of waveguide modes. Both positive and negative refractive indices can be achieved. We also demonstrate sub-diffraction energy compression, and transmission, and planar imaging in anisotropic waveguides. Finally, we present several designs of strongly anisotropic composites for optical, IR, and THz frequencies.

About Dr. Podolskiy

Dr. Podolskiy’s areas of research interests include electrodynamics of complex-materials, negative refraction, nano-photonics, plasmonics, and optical quantum chaos. Prior to Oregon State, VP has been a research associate at Princeton working on optics of micro-resonators with mixed regular-chaotic ray dynamics. VP has obtained his Ph.D. on electromagnetism properties of percolation films, nanowires and nanoholes in 2002.

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