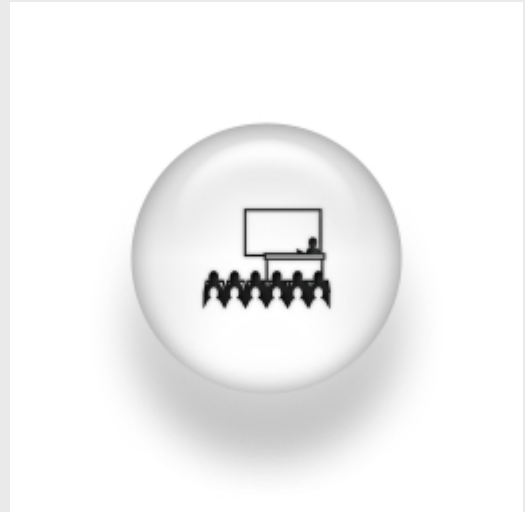


Spoof Plasmons: Dominos, Endoscopes and Invisibility Cloaks

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ABSTRACT:

In this talk we will review two different routes for controlling the flow of surface plasmons (SPs) at metal surfaces. First, we will show how the concept of spoof SPs [1] (introduction of a periodic modulation on a metal surface at a length scale much smaller than the wavelength) can be used to tailor the propagation characteristics of SPs in the optical and telecom regimes [2] and even to create new types of SPs as, for example, domino plasmons [3]. Second, we will demonstrate how Transformation Optics can be applied to the propagation of SPs [4], yielding to recipes for the refractive index map that can lead to several SP-functionalities and to cloaking devices for SPs. In addition, we will show how the idea of spoof SPs can be extended to develop holey-structured metamaterials able to perform very deep subwavelength imaging [5].

[1] Mimicking surface plasmons with structured surfaces, J.B. Pendry, L. Martin-Moreno and F.J. Garcia-Vidal, *Science* 305, 847 (2004).

[2] Geometrically induced modification of surface plasmons in the optical and telecom regimes, M.L. Nesterov, D. Martin-Cano, A.I. Fernandez-Dominguez, E. Moreno, L. Martin-Moreno and F.J. Garcia-Vidal, *Opt. Lett.* 35, 423 (2010).

[3] Domino plasmons for subwavelength terahertz circuitry, D. Martin-Cano, M.L. Nesterov, A.I. Fernandez-Dominguez, F.J. Garcia-Vidal, L. Martin-Moreno and E. Moreno, *Opt. Express* 18, 754 (2010).

[4] Transformation Optics for Plasmonics, P.A. Huidobro, M.L. Nesterov, L. Martin-Moreno and F.J. Garcia-Vidal, *Nano Letters* 10, 1985 (2010).

[5] A holey-structured metamaterial for deep acoustic deep subwavelength imaging, J. Zhu, J. Christensen, J. Jung, L. Martin-Moreno, X. Yin, L. Fok, X. Zhang and F.J. Garcia-Vidal, *Nature Physics* (AOP, November 7th 2010)