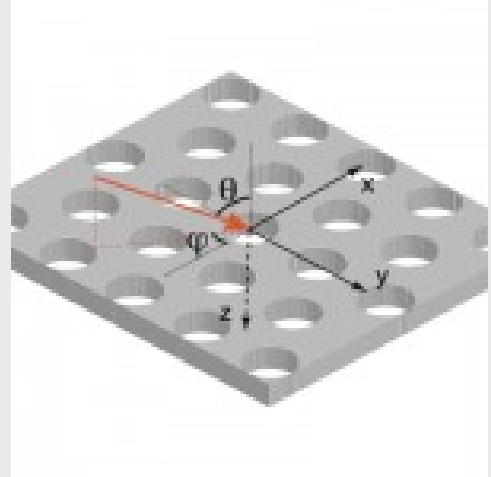


## Theoretical Description of Wave Propagation in Magneto-Plasmonic Nanostructures

Funding Agency: Spanish Ministry of Science and Innovation (contract FIS2011-28851-C02-01).

Duration: January 2012 – December 2014.

Principal Investigator: [Juan Carlos Cuevas](#).



Description:

**T**he main objective of this project is to investigate theoretically the optical properties of metallic nanostructures with both plasmonic and magneto-optical (MO) activity. The major technical goal is the generalization of the scattering matrix approach to describe the magneto-optical effects in nanostructured magneto-plasmonic systems. This method will then be applied to address three basic challenges in the field of magneto-optics:

The interplay between the extraordinary optical transmission and the MO effects in metallic films with MO activity and perforated with periodical arrays of sub-wavelength holes.

The design and optimization of novel surface plasmon resonance biosensors based on the transverse magneto-optical Kerr effect in magnet-plasmonic nanostructures.

Analysis of the magneto-optical properties of hybrid systems formed by two-dimensional photonic crystals fabricated by means of self-assembly of colloidal particles which are deposited on multilayer metallic structures with MO activity.