M2 Internship / Ph.D. thesis available

An integrated electrical plasmon nanosource

(ANR-funded project INTELPLAN)

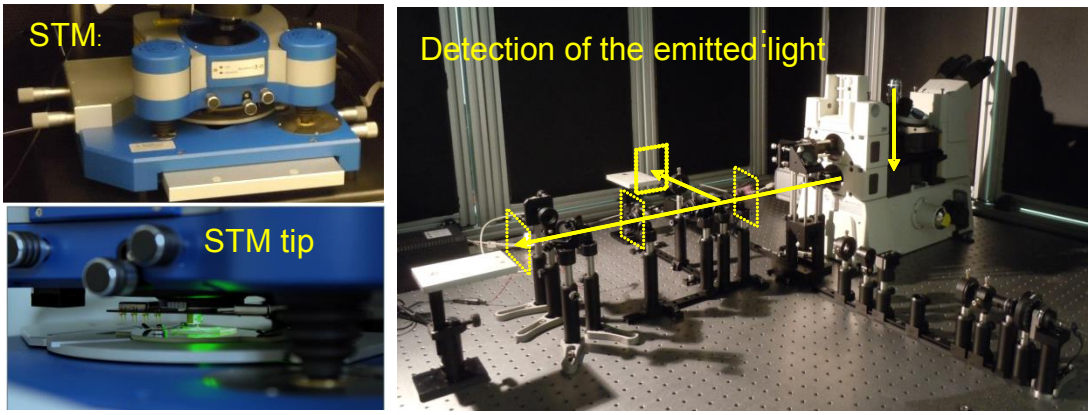
Plasmonic nanostructures are metallic objects which have at least one nanoscale dimension (i.e., nanoparticles, nanowires, thin films, etc.) Such structures can support *surface plasmons*, i.e., collective surface electron oscillations coupled to an electromagnetic wave. Surface plasmons are intensely studied at the moment as they may one day replace electrons in electronics and photons in photonics, leading to small and fast plasmonic devices.

In this internship/thesis, the goal is to build an efficient, electrical, low-energy nanoscale source of surface plasmons that could be integrated into a plasmonic circuit. Such a nanosource could consist of a nano-antenna in which a tunnel junction is embedded.

The internship/thesis student will be involved in the plasmon nanosource design and fabrication, but will be particularly responsible for the testing of the nanosource. This will involve using a scanning tunneling microscope (STM) and atomic force microscope (AFM) coupled to an optical microscope. During this project, the student will acquire experience in optical and scanning probe microscopy (AFM/STM), optical (laser) and electrical (STM) excitation of nanostructures, plasmonics and the optical properties of metals.

The successful candidate will have a physics background or equivalent, an affinity for optics and nanoscience, and a desire to do experiments. Good communication skills in English (or French) are required.

Experimental set-up: STM coupled to an inverted optical microscope



This project may be begun as an M2 internship carrying on to a Ph.D. (prefered option), or begun immediately as a thesis.

To apply please send a detailed CV and recent transcripts to the address below. A short motivation statement is not mandatory but would be appreciated.

This internship/thesis is funded by the ANR project INTELPLAN. The partners of this project are the Nano-Optics group at ISMO, Orsay (http://www.nanosciences.ismo.u-psud.fr/spip.php?article65), the Nanophotonics and Electromagnetism group at LCF, https://www.lcf.institutoptique.fr/lcf/Groupes-de-recherche/Nanophotonique-et-Electromagnetisme) and the NanoStructures at the NanoSecond timescale group at LPS, Orsay (https://www.equipes.lps.u-psud.fr/ns2/index.htm).

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