

STudent REseArch Mobility Programme (STREAM) Project proposal



Host University:
Université Paris-Sud

Field (drop-down list):
Natural sciences, mathematics and statistics



Specified field, subject:
Physics

Research project title:
An integrated electrical plasmon nanosource

Possible starting month(s):

Sep	Oct	Nov	Dec	Jan	Fev	Mar	Apr	May	Jun	Jul	Aug
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Possible duration in months:

1	2	3	4	5	6	7	8	9	10	11	12
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Alternatively, exact starting and end date: from date to date



Suitable for students in: Bachelor level Master level

Prerequisites:
Physics background; a desire to do experiments; good communication skills in English (or French).



Restrictions:

Description (maximum 2,000 characters):

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, 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 student will be involved in the plasmon nanosource design and fabrication, but will be particularly responsible for the testing of the



Comprendre le monde,
construire l'avenir



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.

Faculty and/or Department:

UFR de Sciences, Département de Physique
<http://www.sciences.u-psud.fr>

Contact person, including position:

Séverine Fogel, Head of International Relations

Contact email:

severine.fogel@u-psud.fr

Deadline for nomination to reach host university:

2 months before the starting date

Notification of admission given by the end of:

Within 3 weeks

Additional information:

Starting date and length of internship may be flexible.