



Soutenance de thèse

Vendredi 26 mars

9H30

Centre de Nanosciences et de Nanotechnologies
10 boulevard Thomas Gobert
91120 Palaiseau
Amphithéâtre

Sevag ABADIAN

“ Non-reciprocal waveguides based on magnetoplasmonic effects”

Lien public :

<https://eu.bbcollab.com/quest/daaf7e27ea9c41afab06ee984b7b2922>

Jury members :

Mme Beatrice DAGENS - Thesis director Université Paris-Saclay (C2N), France.
M. Vladimir BELOTELOV - Reporter : Lomonosov Moscow State University, Russia.
M. François ROYER - Reporter : Université Jean Monnet Saint-Étienne (LabHC), France.
Mme Giovanna CALO - Examiner : Politecnico di Bari (DEE), Italy.
M. Mathias VANWOLLEGHEM - Examiner : Université Lille 1 (IEMN), France.
M. Eric CASSAN - Examiner : Université Paris-Saclay (C2N), France.
M. Giovanni MAGNO - Examiner : Politecnico di Bari (DEE), Italy.
M. Alexandre Shen - Invited : III-V Lab, France.

Abstract :

Integrated optical isolators are nonreciprocal components which are crucial for complex Photonic Integrated Circuits, in order to protect laser sources from reflected signals. Our aim is to develop isolator structures in waveguiding configuration which are based on the intertwined effects of magneto-optics and plasmonics. Such a system exploits on one hand magneto-optical (MO) effects to provide nonreciprocal functionality and on the other hand, propagating surface plasmons to enhance these nonlinear effects and contribute to the miniaturization of the device. Two different magnetoplasmonic isolator geometries are studied thoroughly in this thesis. The first is a resonant device consisting of a MO waveguide side coupled to a nanostructured gold grating. The second is non-resonant and is based on the asymmetric plasmonic mode of a MO slot waveguide. In both cases, high values of isolation ratio and figure of merit are predicted with a respectable bandwidth of operation.

