Spécialité de Master « Optique, Matière, Plasmas »

Stage de recherche (4 mois minimum, à partir de début mars 2012)

Proposition de stage pour l'année 2011-2012 (ne pas dépasser 1 page)

Date de la proposition : 20/10/2011

Responsable du stage / *internship supervisor*:

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Nom du Laboratoire / *laboratory name*:

Code d'identification : UMR 8501 Organisme : Laboratoire Charles Fabry
web site: http://www.lcf.institutoptique.fr/Groupes-de-recherche/Nanophotonique-et-Electromagnetisme
Adresse / *address:* Campus Polytechnique – 2 avenue Augustin Fresnel – 91127 PALAISEAU CEDEX
Lieu du stage / *internship place*: Nanophotonics and Electromagnetism group in Palaiseau

Titre du stage / *internship title*: **Slow-light in periodic nanowaveguides**

Résumé / *summary*

There are several mechanisms that can generate slow light, all of which create narrow spectral regions with high dispersion. Schemes are generally grouped into two categories: material dispersion and geometric dispersion. We are interested in investigating geometric dispersion by carefully engineering dielectric materials to obtain photonic crystal waveguides or periodic nanowires. Contrary to the material approaches, the dispersion engineered structures can be fashioned out of fairly standard materials, potentially paving the way toward the implementation of slow light for on-chip optical information processing.

The MSc student will aim at approaching (without being limited to) the following achievements:

- Characterization of nanowaveguides fabricated by our collaborators using a linear spectroscopic transmission setup. The setup will enable the student to get familiar with the manipulation of typical photonic instruments such as a Tunable laser source in the Telecom S- and C-bands and different detectors (InGaAs infrared camera, silicon photodiode etc).

- Designing structures to be fabricated and characterized keeping in mind that the goal is to achieve high-transmission/slow-light operation, using computational software capable of quantitatively predicting the transport of light in those waveguides in the presence of inevitable (small) random fabrication errors.

The core aim is to demonstrate that engineered dielectric structures may be viewed as new artificial materials that support slow light operation and that are fully compatible with on-chip optical processing.

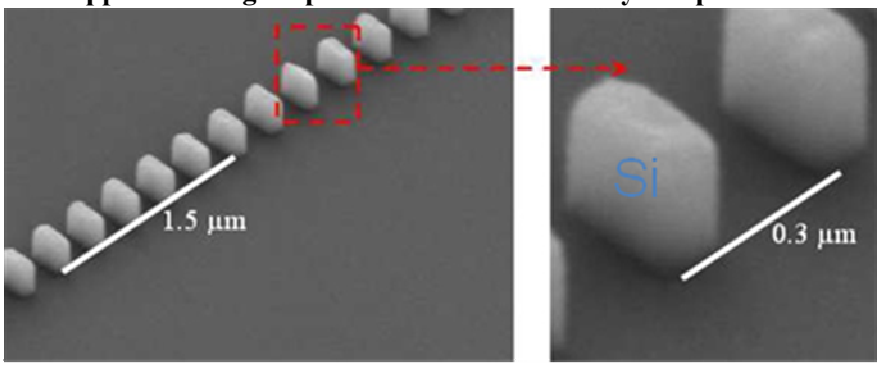

Fig. 1 - Example of silicon periodic waveguides fabricated by our Canadian collaborators

Ce stage pourra-t-il se prolonger en thèse ? *Possibility of a PhD* **? : Yes**

Si oui, financement de thèse envisagé/ *financial support* **Région Aquitaine, Université Bordeaux I**
http://www.institutoptique.fr/recherche/Le-Laboratoire-Photonique-Numerique-et-Nanosciences

Lasers et matière	**x**	Lumière, Matière : Mesures Extrêmes	
Optique de la science à la technologie	**x**	Plasmas : de l'espace au laboratoire	