

Seminar at FOTON Laboratory



# Silicon photonics for optical communications and mid-IR spectroscopy

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<http://silicon-photonics.ief.u-psud.fr>

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## Abstract

Silicon photonics has generated a strong interest in recent years, first mainly for optical telecommunications and optical interconnects in integrated circuits. The main rationales of silicon photonics are the reduction of photonic system costs and the increase of the number of functionalities on the same chip combining photonics and electronics. Recent advances in silicon photonics optoelectronic devices will be presented with a focus on optical modulators and photodetectors for the demonstration of high performance optical transceivers.

The extension of silicon photonics towards the mid infrared (mid-IR) spectral range has also recently attracted a lot of attention. The development of photonic devices operating at these wavelengths is crucial for many applications including environmental and chemical sensing, astronomy and medicine. Recent works regarding the development of new photonics platform on silicon will be presented.

**Delphine Marris-Morini** is a Professor at Paris Sud University. Her research interests at the Center for Nanosciences and Nanotechnologies include high speed and efficient silicon photonics devices for telecom applications. Since 2009 she developed in collaboration with Pr. Giovanni Isella's group from Politecnico Di Milano a new route towards efficient on-chip optical links based on the "direct like" bandgap of Ge/SiGe quantum wells structures. She published over 70 journal papers and she is in charge of the group of Micro and Nanophotonic devices on silicon since 2015. Recently she received an ERC starting grant (INSPIRE) on the translation of Ge-rich photonic integrated chips towards the

mid-IR wavelength range for sensing and spectroscopic application. She received the bronze medal from CNRS in 2013.

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