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Amphitheater of C2N

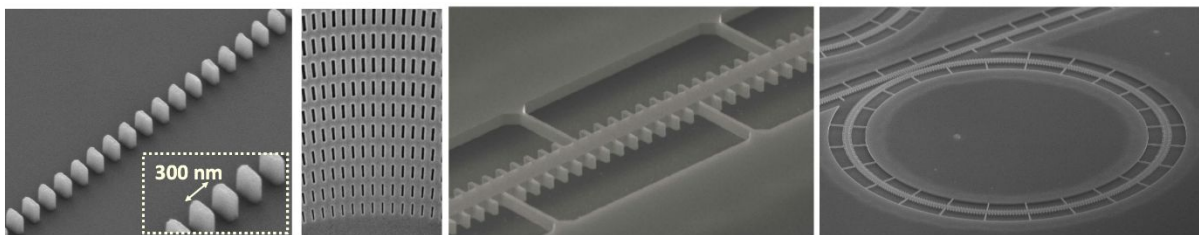
Nanostructured silicon photonics for applications in the Near- and Mid-infrared

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Driven by the impressive technology development in the recent years, silicon photonics is expanding its frontiers towards new applications beyond Datacom. These include, among others, chemical and biological sensing, radio-over-fiber and quantum cryptography. Aiming to fulfil the requirements of these new applications Si photonics is now exploring alternative wavelengths, design strategies and novel physical phenomena. In this context, nanostructured photonic metamaterials have opened new prospects for controlling and manipulating light in planar waveguide circuits. By periodically patterning silicon with a pitch sufficiently small to suppress diffraction effects, subwavelength engineered structures open new degrees of freedom to control light propagation in silicon photonic circuits with unprecedented flexibility and accuracy. Since the early demonstrations of a silicon wire waveguide with subwavelength grating (SWG) metamaterial core, metamaterial SWG waveguides have attracted a strong research interest in academia and industry, enabling the demonstration of various devices with record performance, including fiber-chip couplers, ultra-wideband power splitters and mode converters, to name a few.

In this presentation we will discuss the principles and emerging applications of subwavelength metamaterial silicon waveguides and will present an overview of our recent advances and perspectives in this exciting field.



Illustrative examples of nanostructured silicon photonic structures



Carlos Alonso-Ramos obtained his PhD in Telecommunications in June 2014 at the Universidad de Málaga on the development of high-performance integrated photonic circuits for chip interconnects and next generation coherent transceivers. Currently he is working on the hybrid integration of carbon nanotubes on Si for the realization of active devices and the development of sub-wavelength engineered devices for applications in the near- and mid-IR. He joined C2N in the fall 2017 as a CNRS researcher in the group MINAPHOT of the Department of Photonics.

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