

Habilitation à diriger des recherches

Vendredi 4 décembre

9h00

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

Fabrice RAINERI

"III-V semiconductors on Silicon hybrid Nanophotonics"

Lien : <https://u-paris.zoom.us/j/82693318586?pwd=bnZQU3RjcUp6cHlQzzYV2hwTFRNdz09>

Jury members :

Prof. Angela Vasanelli (Univ. de Paris), Rapporteur, Présidente du jury
Prof. Jesper Mork (DTU, Danemark), Rapporteur
Prof. Susumu Noda (Kyoto Univ., Japon), Rapporteur
Dr. Frederic Druon (LCF, IOGS, CNRS)
Dr. Guillaume Huyet (INPHYNI, CNRS)
Dr. Rama Raj (C2N, CNRS)

Abstract :

My research activity is focused on the exploration of light-matter interaction in III-V semiconductor/Silicon hybrid photonic crystal (PhC) structures and its exploitation for the achievement of smaller, smarter, faster energy-efficient optoelectronic components which will revolutionize our world, governed by information and communication technology!

Indeed, these hybrid structures combine the best of Silicon and III-V semiconductor photonics, merging the fantastic capacity of Silicon and especially Silicon on insulator (SOI) to provide an excellent way to achieve highly compact low loss passive optical circuitries, with the optical gain and non-linearity of III-V semiconductor compounds.

My aim is to build a new panel of optoelectronic devices, ultimate in terms of power consumption as well as in speed. My goal too is to trace new paths in nonlinear and quantum optics through the use of unprecedented optical configurations enabled by the hybrid approach.

More in detail, I lead my work along 3 research directions namely, nanolasers, nonlinear nanophotonic devices and parametric nonlinear nanophotonics.

During my Habilitation defense, I will review my most important achievements in these domains and give a glimpse of my most recent and future work.



Dr Fabrice Raineri has been an associate professor (*maître de conférences*) at Centre de Nanosciences et de Nanotechnologies (Laboratoire de Photonique et de Nanostructures) since 2005, while teaching at Université de Paris (Université Paris Diderot). His PhD work (2001-04) at LPN was on nonlinear Photonic crystals. He spent one year as a Postdoc at ICFO (Barcelona, 2005) to work on CW Optical Parametric Oscillators. His current research interests are focused on the investigation of optical nonlinear interactions within semiconductor micro/nanostructures and their exploitation for the achievement of optical functionalities useful for data processing. Recently, he led his work towards integrated nanophotonics with a specific effort on hybrid III-V semiconductors on Silicon structures. He has participated and worked on numerous national and European projects. In 2017, he was awarded with an ERC Consolidator grant. He has published more than 65 articles in peer reviewed journals and contributed to many conferences (> 30 invited talk, conference co-chair of CLEO focus at ECOC2014, technical program committee CLEO Europe 2015, CLEO PR2013,...).

