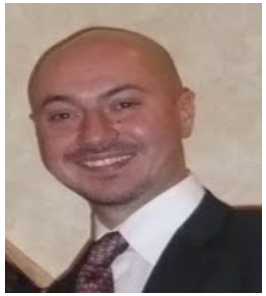
Advanced Integrated Photonics
(Materials and Devices for Applications in Nonlinear Optics)



Marcello Ferrera
Post Doctoral Research
St .Andrews University in Scotland

Marcello Ferrera attained his master degree in micro--electronic engineering in 2005 at University of Palermo (Italy) defending His thesis entitled: "Growth of ferroelectric thin films of barium strontium titanate by pulsed laser deposition and their morphological characterization". This work was developed during a one year internship sponsored by (and performed at) INRS---EMT labs in Canada. During this period, he mastered fundamental techniques for the fabrication and the characterization of semiconductor thin films. In 2006, he was awarded the INRS---EMT scholarship for international students which allowed him to undertake his doctoral studies in the Ultrafast Optical Processing Group (UOP), under the supervision of Prof. Morandotti. In 2007, he won the international doctoral fellowship provided by the government of Quebec in the figure of “Le Fonds québécois de la recherche sur la nature et les technologies”. This fund sponsored his doctoral research in nonlinear integrated photonics focused on the nonlinear characterization of a new material platform named Hydex®. By exploiting a set of integrated photonic structures, fabricated by this novel doped silica glass, he obtained remarkable results dealing with the low---power nonlinear frequency conversion, multiple---wavelength and broadband light generation, and ultra-Fast optical processing. In 2010, he obtained his Ph.D. defending a thesis entitled: ”Towards the integration of nonlinear photonic devices”. The same year, he was among the recipients of the NSERC post---doctoral fellowship, which is currently supportng his post---doctoral research at the University of St. Andrews, in Scotland. Here, in the group of Prof. Thomas F. Krauss (Microphotonic group), he is developing silicon—nitride--based photonic integrated structures for application in nonlinear optics.

Marcello Ferrera’s presentation is a brief summary of his past and present research activities plus a description of His future scientific ambitions. He will start with a very brief introduction about his initial studies focused on the fabrication and the nonlinear characterization of electro--optic and magneto---optic semiconductor thin films. Subsequently, he will talk about his research Line on Hydex®-based integrated photonics devices, giving more relevance on his results on ultra--low power nonlinear frequency conversion, optical hyper--parametric oscillation, and ultra-fast all-optical integration in integrated photonic cavities. Finally, he will present his current research line on silicon nitride photonics, underlining its intrinsic advantages and fabrication challenges.

January 18, 2013 12:30 - Birck Nanotechnology Center Rm. 1001

PURDUE ENGINEERING

Hosted by Prof. Vlad Shalaev

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