



UNIVERSITÀ
DI PAVIA

Ph.D. Program in Electronics, Computer Science and Electrical Engineering

COURSE

Photonic integrated circuits

Prof. Marc Sorel

University of Glasgow and Scuola Sant'Anna - Pisa

OBJECTIVES: The course will provide an overview on the main photonic integrated technologies, on their limitations and on the challenges to be addressed to sustain the current growth. We will then introduce a number of basic building blocks such as waveguide couplers, resonators, diffraction gratings, semiconductor sources and detectors, and show how these can be combined to form more complex circuits. Examples will include multiplexers for optical communications, optical combs for atomic clocks, mid infrared chips for pollution sensing and spatial mode sorters for advanced imaging. The course will also illustrate future trends such as the heterogeneous integration of hybrid materials for novel functionalities, bendable and foldable photonic chips and 3D integrated photonic circuits.

BIO: Marc Sorel is professor of optoelectronics at the University of Glasgow and Scuola Superiore Sant'Anna. He has been active in research related to integrated photonic devices and optoelectronics for over 25 years, supported by several national funding bodies and industrial collaborations. His present research activities revolve around the development of integrated photonic technologies in silicon, silicon nitride and III-V semiconductors for applications in telecoms, sensing and quantum. He has authored or co-authored more than 250 papers in peer-reviewed journals including in Science, Physical Review Letters, Optica and Nature Communications that have attracted over 10.000 citations.

EVALUATION: Each student will be asked to choose a topic, analyze a paper regarding the chosen field, and then give a short presentation.

ATTENDANCE: The course will take place in the BLUE Seminar Room. Students who are not currently in Pavia can contact the professor

LECTURES: 10 h; CREDITS: 3 CFU

DATES: September 3 (h. 16), 4 (h. 14), 5 (h. 11)

The final lectures will be held remotely and will be organized by Prof. Sorel.

Ph.D. Coordinator

Prof.ssa Ilaria Cristiani

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