CURRICULUM VITAE

Prof. Andrea Melloni

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SHORT BIOGRAPHY

Andrea Melloni (1963) is Full Professor at the Politecnico di Milano in Italy, in the Department 'Elettronica, Informazione e Bioingegneria' (Electronics, Information and Bioengineering), where he leads the Photonic Devices Research Group. He graduated from the Politecnico di Milano in 1989, obtained the PhD degree in 1992, was appointed Assistant Professor in 1992, Associate Professor in 2003 and Full Professor in 2015. From 1996 to 2006 he has been involved in the Direction of CoreCom - a consortium organization formed jointly by the Pirelli Company and Politecnico di Milano – where he promoted the high-contrast integrated-optics concept. Since 1997, he teaches the course 'Photonic Devices', as well as other courses at both Bachelor and Master levels. He regularly contributes with courses at national and international PhD schools.

With a background in microwaves, his main research activity since 1997 has been focused on the analysis, modeling, design and characterization of integrated optical devices and circuits in linear and nonlinear regime. He is one of the pioneers of the slow light concept and its exploitation in the linear and nonlinear domains by using coupled cavities (commonly called coupled-resonator optical waveguides or CROWs). In 2008 and 2009 he succeeded in realizing fully tuneable planar-waveguide based, delay-lines on-chip, that were capable of storing (buffering) and processing as much as an entire byte of data - at 10 and 100 Gbit/s rates, thereby setting the state-of-the-art in this field. He is one of the major experts of circuits in silicon photonics in Italy and especially microring resonators and filters. His paper on synthesis of ring-based filters published on JLT in 2002 is, with more than 280 citations, a worldwide reference for resonating filter design.

Since 2007 he collaborated in a number of EU projects and NoE (he is partner of Jeppix) and contributed shaping the new concept of generic platform technology for application-specific PICs and to enable access to photonics foundries in InP, Silicon and SiN technologies with the concept of Building Blocks and Photonics Design Kits. Since 2017 he collaborates in defining the roadmap of Integrated Photonics within Photonics21 and AIM (the American Institute for Manufacturing Integrated Photonics Photonics).

He conceived and promoted the development of ASPIC (Advanced Simulator for Photonic Integrated Circuits, http://www.aspicdesign.com), the first commercial circuit simulator for integrated optical circuits. He founded the Company Filarete srl for the development Aspic in 2008.

He has been and is involved in several European and National research projects - as both

partner and coordinator. He coordinated the EU FET Project BBOI, focusing on the control of both classical and quantum circuits. Responsible of several founded collaborations with national as well as international companies.

He is co-inventor of the first noninvasive on-chip light-monitor CLIPP (patented), a new technique of non-invasive light monitors based on the natural surface state absorption phenomena occurring in semiconductor waveguides.

He is now involved in the control and stabilization of photonic circuits exploiting the CLIPP monitor and several other techniques for managing and harnessing photonic circuits. These activities are at the basis of the dynamic management and control of large and complex photonic integrated circuits for reconfigurable, programmable, locking and adaptive functionalities.

Other research activities include biosensing (with exploitation of magnetic beads, founded by European Defense Agency, Regional and private companies), characterization and testing techniques (from wafer to module testing), numerical methods in photonics (stochastic and machine learning based approaches), development of high index contrast dielectric materials (SiliconOxyCarbide), high speed modulators (private company).

Concerning testing at wafer level in photonics he set up the Joint Research Center "JRC T^3 Photonics" in December 2020 together with Ficontec and Photonics42, two private companies renowned in photonics automated assembly and testing in order to develop Techniques and Tooling for Testing in Photonics for high volumes.

PROFESSIONAL ACCOMPLISHMENTS AND ACHIEVEMENTS

POLIFAB

In 2011, Andrea Melloni proposed the creation of a Facility for Micro and Nano Technologies at Politecnico di Milano. Taking advantage of the dismissed activities in photonics of Pirelli he succeeded, with the support of two colleagues and the Directors of the involved Departments, in acquiring a large number of technological capabilities (thin films, etching and lithography equipment, back-end and metrological instrumentation). The project was approved and founded by the Senato Accademico in June 2012. PoliFab is fully operative since June 2015. PoliFab consists of a clean room of 400 m^2 for both front-end and back-end processes, together with 400 m^2 of laboratories and office accommodation. PoliFab is open to all the groups operating in photonics, electronics, physics, bioengineering, etc. at Politecnico and works in close collaboration with CNR (Centro Nazionale per le Ricerche), IIT (Italian Institute of Technology) - and local industries.
In 2019 he has been appointed Deputy Director of Polifab and he now supervising the expansion to 650m^2 thanks to a Joint Research Center with ST microelectronics.

HONORS and ROLES

- Member of the Executive Committee of the IEEE Photonics Society, Italian Chapter, since March 2012.
- Nominated Fellow of the Optical Society of America in 2014 with motivation:

  "for significant contributions to the understanding and development of high refractive-index contrast, planar-waveguide based, integrated-optical devices and circuits – with applications primarily in advanced optical communications systems."

- Regularly invited to present scientific results in International Conferences and Workshops. Currently he presented more than 40 invited talks in International conferences with an average rate of more than 3 per year in the last 10 years.
- Member of the Board of Stakeholder of the European Technology Platform Photonics21 since 2018.
- Member of the Board of Directors of PoliHUB, the incubator of the Politecnico di Milano since June 2020.
- Member of the Scientific Committee of L-NESS, the Laboratory for Nanostructure Epitaxy and Spintronics on Silicon of Politecnico di Milano, since July 2020.

ACTIVITIES WITHIN JOURNALS AND CONFERENCES

Associate Editor of Optica (OSA, IF 9.26) since September 2019.
General Chair of ECIO 2021, Italy. He will be in charge of the organization of ECIO in 2021 (the European Conference in Integrated Optics).
Guest Editor of the Special Issue "Workshop on Optical Waveguide Theory and Numerical Modelling - OWTNM" of Optical and Quantum Electronics (vol. 38, no. 9/11), Springer, 2006. Member of the Editorial board of International Journal of Optics, Hindawi from 09/2008 to 07/2012, guest editor for special issues of the Journal of Lightwave Technology in 2007 and Topical Editor for JOSA A from 2010 to 2013. Member of the Editorial Board of The Institution of Engineering and Technology - IET Optoelectronic Journal since June 2010. Program and General co-Chair for the OSA's Integrated Photonics Research (IPR) meetings in 2009, 2010, 2015 and 2016. He is and has been involved in the Steering and Technical committee of several national and international conferences as Slow and Fast Light (OSA), ECIO, CLEO S&I, OWTNM, SPIE, ICTON, Photonic West OPTO, Convegno Nazionale "Fotonica", Italy.

SCIENTIFIC PRODUCTION

The impact of the scientific production can be summarized in (SCOPUS, January 2021):
- 3 Chapters in International books
- 127 Publications in international journals
- 236 Conference Papers
- 18 International and National patents
- He has supervised more than 170 theses of Laurea and 12 PhD in Information Engineering.

- Scopus: h-index 40; 5407 citations (February 2020)

See also http://scholar.google.it/citations?user=HsIELTUAAAAJ
http://photonics.deib.polimi.it
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