Curriculum Vitae Monica Bollani

BOLLANI MONICA: (21/12/1973, Venice- ITALY)
ADDRESS:
Telephone:

monica.bollani@polimi.it
http://lness.como.polimi.it/monicabollani.php

Born in 1973, Monica Bollani is a permanent researcher at the Institute of Photonics and Nanotechnology of the National Research Council (IFN-CNR) at the Milan branch, in the LNESS (Laboratory for Nanostructure Epitaxy and Spintronics on Silicon). She graduated in **chemistry**, in 1997 at the Università degli Studi di Milano, defending an experimental thesis on Self-Assembled Organic Monolayer systems on silicon surfaces. She obtained a **European Doctor of Research** in November 2000 in **Physics of Materials** from the University of Aix-Marseille III (France) with a "very honorable" mention on microscopic and spectroscopic analysis of self-assembled sensors on silicon for applications in opto-nanoelectronics.

Work experience:

Between December 2000 and April 2002, she was employed as a **fixed-term researcher** by the Milano Research Council within the MURST project entitled "Technology and equipment for the monitoring and the safety of internal environments". She left this position during 2002 for a 4-year research **post-doc**: the subject of this research was the growth of epitaxial SiGe heterostructures by low-energy plasma-enhanced chemical vapour deposition (LEPECVD). This activity was carried out at the ETH in Zurich until 2003 under the guidance of Prof. Hans von Känel and then in LNESS (Como, Italy). During this period, she also contributed to the decommissioning and re-assembly of a growth tool from a laboratory at ETH in Zurich to the L-NESS premises in Como, resulting in a lower number of publications but in an increased knowledge of the growth methodologies, techniques and hardware-related topics.
In 2002 and 2004 she won twice in **a row an integrative grant** from the prestigious Angelo della Riccia Foundation for research carried out at the electron microscopy center in Zurich (ETH University) for high-resolution transmission electron microscopy (HRTEM) on Si-based samples. In December 2004 she was the winner of a concourse for a **fixed-term research** post at the National Institute of Materials Physics (INFM), to be carried out at the L-NESS laboratory where she continued the research related to the semiconductor growth.
Between the years 2004 and 2007, Dr. Bollani has given birth to three children, while continuing her research activities, even though at a reduced extent.
Starting May 2006, she has enlarged her responsibilities by joining the optical and electron-beam lithography group, mainly dedicated to nanostructurization of low-dimensional systems (field-effect transistors and diodes) and to the patterning on Si and Ge substrates for the growth of regular arrays of three-dimensional islands or nanometer-scale mesa structures. She additionally leads the research activities relating to wet chemical etching of semiconductor systems. In February 2009 she was promoted to a CNR **permanent researcher** position, at the Milano branch of the Institute of Photonics and Nanotechnology (IFN). The main working site is yet again the L-NESS and the research activity has continued to be connected to the micro and nanofabrication of semiconductor materials for photonic and sensors applications.
She has assisted several students (as **supervisor**) in physics (from Università degli Studi di Milano), materials science (from Università degli Studi Milano Bicocca) and physical engineering (from Politecnico di Milano) in their master thesis and/or PhD projects and post doc activities.
Starting from February 2014- 2018 she is also **professor at the Politecnico** of Milano, teaching electrostatic and magnetostatic courses for engineering students.
In February 2015 and in February 2019 she was **president** of the Committee for the XXVII cycle of the **physics**

PhD school at the Milano Politecnico.

Scientific experience abroad:

She worked for one month (February 2010) in the **Johannes Kepler Universität** Linz (Austria) to develop the use of electron beam lithography for the pattern realization with very high resolutions on silicon oxides substrates. She worked for one month (February 2014) in the **Molecular Foundry (LBL laboratory)** in Berkeley (California) to develop a new nanofabrication approach to realize Ge plasmonic tips. In the February 2016 and October 2016, she hosted at CNR's **LPN laboratory** (Marcoussis-Paris, France) to carry out nanofabrication activities within the SPICE project. She worked for two months (26 June-24 August 2019) at the **Molecular Foundry** in the frame of proposal ##5387 "High-index dichalcogenide nanoantennas".

Research sectors:

Optical and electronic lithography fabrication :Deposition, exposure and development of both positive and negative photoresist for semiconductor applications; **Nano-imprinting lithography**: transfer of solid master on transparent and flexible substrates for photonics applications; **Epitaxial growth techniques:** Exploitation and optimization of LEPECVD- epitaxial growth technique aimed to obtain high quality layers, at least comparable with the MBE grown layers but with much higher growth speed (in agreement with the industrial requirements).

Projects:

- Between 2003- 2018, she has collaborated in several national research projects (PRIN) and within some Cariplo Foundation projects ("NanoDEV", "NanoGap", "NanoPAT" and "MANDIS"), relating to the nano-fabrication and nano-manipulation of dislocations for heteroepitaxial integration on silicon. She has participated in the Italian project "Technologies and materials for the efficient use of solar energy" between the CNR and Lombardy county (Decr. Reg. n. 3667 - 2013-2015). She was partner of the Italian SIR project Mid Infrared Nano-optics: approaching plasmonics with Doped Semiconductors (MINDS),(Cod:RBSI14IT0D, 2015-2019) and partner in the Italian project "I-ZEB Verso Edifici Intelligenti a Energia Zero per la crescita della città intelligente" between the CNR and Lombardy county (Decr. Reg. n. 19366/RCC-decreto n° 7784 (2016-2018). She has participated in the European project "NanoPHOTO: NANOcrystalline silicon film for PHOTOvoltaic and optoelectroic applications", active from June 1, 2005 to May 30, 2008 (Sixth Framework programme priority 3 –NPM, project n° 013944), and she is involved in European project "GEMINI, germanium mid-infrared plasmonic for sensing" grant agreement n°613055 (2015-2017).
- She **was responsible** for the CNR unit in the Italian Cariplo Foundation project DefConIV ("Nanostructures for the deformation control of group-IV epilayers and membranes", 2013- 2015);
- she **was principal investigator** of the project SPICE between Italy and France, which is a project related to Surface Plasmon Enhanced Inter-subband cells based on III/V semiconductor materials (2014-2015).
- Currently she is **principal investigator** of the European project NARCISO (FET-OPEN, grant n° 828890, "NAtuRal instability of semiConductors thIn SOlid films for sensing and photonic" 2019-2022);
- she is **responsible** of the CNR unit in the European project SONAR (Marie Curie project grant N°734690 "Localized Surface Plasmon Resonance in doped semiconductor nanocrystals" 2017-2020);
- she is **responsible** of the CNR unit in the italian PRIN project NOMEN (NOnlinear photonics with metal-less NAnoantennas and MEtasurfaces) (Feb2020 – June 2023);
- she is **work package responsible** (devices fabrication) for the italian ASI project QUASIX (Sorgente integrata di singoli fotoni in silicio per comunicazioni quantistiche nello spazio) (Nov 2019 May 2022).

Decision-making role in congresses or scientific events

She was part of the **organizing committee** of the 8th ESPS-NIS conference (Como, 14-18 June 2010) and the organizing committee of FisMat2013 conference (Milano, 9-14 September 2013). She was also involved in the

scientific advisory committee for the XTOP 2014 Conference (Grenoble, Sept. 2014, http://xtop2014.org/index.php/committees) and for the plasmonic school, scheduled for July 2016 (http://www.sbai.uniroma1.it/scuole/plasmonics2016/).

Invited talks and keynote speaker:

Over the years, she has participated in more than 40 conferences, most often with an oral work to share. She was to present a work as invited at the NanoSea congress 2014 in Marseille (France), NanoSea congress 2016 in Messina (Italy), Bilateral workshop Italy-Japan in Colico (Italy, May 2017), SeminNano conference in Como (Italy, Sept 2017), NanoSea congress 2018 in Carquerenne (France), NanoInnovation Congress (Rome, Italy 2018) (as keynote speaker), ICPAM 12 congress in Heraklion (Greece, 2018), Materials Congress (Bologna, Italy 2018), SPb-POEM2020 (St. Petersburg, Russia 2020), SCT2021 (7-9 April, Paris, France, as keynote speaker), CONMAT2021 (Valencia, Spain, 18-20 Oct 2021).

Dissemination activity:

Dr. Bollani has also been active in the dissemination area by participating in the "MeetMe Tonight" events (Sept 2012, Sept 2013, Sept 2016, Sept 2019), aimed to a scientific knowledge sharing and more general science introduction to curious people and students (April 2015 ; March 2016). Electromagnetism and physics fundamentals have been the main topics presented.
Starting from 2017, she collaborated at the dissemination for Pint of Science and since 2018 she is responsible of the "Pint of Science" events for Milano city (https://pintofscience.com/).

Dr. Bollani currently holds 82 publications (articles) in international peer-reviewed journals and 2 chapters in books. H index: Google Scholar 20, WOS and Scopus: 18.

Milano, 6 October 2021