

Curriculum Vitae

Personal information

Surname / First name **Nottola Alessandro**

Address

Telephone Mobile:

e-mail

Nationality Italian

Date of birth

Gender Male

Desired employment / Occupational field

Senior E-beam Lithography Engineer

Work experience

Dates From February 2015 to present

Occupation or position held

Electron-beam Lithography (EBL) manager / Senior process engineer

Main activities and responsibilities

- Management of an Electron-beam Lithography (EBL) system (VISTEC VB-6HR), coordination of the re-installation of the used tool and of the maintenance activity. Successful reconditioning and debugging of the system after 5 years of inactivity.
- Development and optimization of the EBL process for the manufacturing of Photonic Integrated Circuits, mostly SOI (Silicon On Insulator) and Glass on Silicon waveguides and components in 6 inches wafers.
- Supervision of the Optical Lithography process.
- Process integration within the manufacturing chain.
- Development of an e-beam lithographed bi-layer resist scheme, used in a lift-off process for the integration of metal heaters over the SOI waveguide cores.
- Development of alignment procedures for high-accuracy overlay, making use of evaporated Silicon registration marks.
- Development of single-shot EBL exposure techniques for the fabrication of Photonic Crystals.
- Operation of a Scanning Electron Microscope (TESCAN MIRA 3 XMH) for in-line process control.
- Use of the GenISys BEAMER Data Conversion Software.
- Contribution to the definition of PDK rules making use of the Phoenix Software.
- Teaching activity of EBL and UV lithography processes within the Scuola Superiore Sant'Anna University.
- Supervision and training of staff members, especially in the optical lithography process and in the Scanning Electron Microscopy.

Name and address of employer

C.N.I.T – Consorzio Nazionale Interuniversitario per le Telecomunicazioni (National Inter-Universities Consortium for Telecommunications)
Viale G.P. Usberti 181/A – 43124 Parma (PR), ITALY

Type of business or sector

Research on Telecommunications

Dates	From October 2012 to January 2015
Occupation or position held	Researcher / process engineer
Main activities and responsibilities	<ul style="list-style-type: none"> - Development and optimization of front-end processes such as Electron Beam and UV Lithography and lift-off, for the post-growth manufacturing of concentrated thin-film III-V photovoltaic cells and modules, as well as Light Emitting Diodes. The lithography and the lift-off processes in the devices were used for the definition of the metal front grid for the electrical contact. - Setup of back-end processes such as die bonding and wire bonding for the connection of the devices to the heat sink and to the external electrical load. - Photovoltaic cell simulation in order to optimize the metal contact grid design for the operation at higher efficiency and concentration values, making use of a 3D distributed model implemented by means of an electrical circuits simulation software (LTSPICE). - Bench-marking and technical specification preparation for the procurement of a Scanning Electron Microscope with Electron Beam Lithography capabilities. - Operation of a Scanning Electron Microscope (TESCAN MIRA 3 XMH) for process control. - Electrical resistance measurements by means of the TLM method for the characterization of the metal contact quality.
Name and address of employer	RSE S.p.A. – Concentrated Photovoltaics and LED lab Casino Mandelli - Località Le Mose - Strada Torre della Razza - 29122 Piacenza (PI), ITALY
Type of business or sector	Concentrated Thin-Film III-V Photovoltaics and LED R&D and prototyping
Dates	From February 2009 to June 2012
Occupation or position held	Head of Laser Technology / FE process engineer
Main activities and responsibilities	<ul style="list-style-type: none"> - Development and optimization of the Laser Scribing process technology for the manufacturing of thin-film silicon 1.4 m² wide photovoltaic modules. - Contribution to the photovoltaic modules production line start-up. - Management of several Laser Scribing Systems, from a start-up phase through the ramp-up to the full production regime. - Process Engineering of the Glass Cleaning process. - Process Yield Enhancement through Production Data Analysis, SPC and Quality Management. - Use of IR imaging as a diagnostic tool for the whole FE manufacturing quality of PV modules. - Supervision and training of staff members and development of workplace procedures. - Modeling of photovoltaic cells and modules by means of a commercial electrical circuits simulation software (PSPICE).
Name and address of employer	Pramac Swiss SA Via Campagna, 19 – CH-6595 Locarno, SWITZERLAND
Type of business or sector	Thin-Film Silicon Photovoltaic Modules Manufacturing
Dates	From October 2000 to January 2009
Occupation or position held	Electron-beam Lithography (EBL) manager / process development engineer

Main activities and responsibilities	<ul style="list-style-type: none"> - Development and optimization of the EBL process technology for the manufacturing of Integrated Photonic Devices on 6 inches wafers, namely Bragg Gratings for tunable lasers and WDM systems (see List of Publications, [RP 8] and [RP 10]), Silicon-On-Insulator waveguides and micro-ring TOADM filters [RP 9], [CP 10] and [CP 11]. Besides, new concepts for the manufacturing of optical components like coupling mirrors have been developed (Patent awarded, [P 1]). - Contribution to the clean room facility start-up. - Management of an Electron-beam Lithography (EBL) system (VISTEC VB-6HR), from a start-up phase to the process integration and the mass production phase. - Use of the Synopsys CATS Data Conversion Software. - Process integration within the manufacturing chain. - EBL process transfer from R&D to Production, focusing especially on Yield Enhancement. - Staff members training and user's guide development for the EBL system. - Attending of the ELBUM (Electron Beam User Meetings), held among the Vistec users' community during the 2002-2009 period.
Name and address of employer	Pirelli Labs, later known as PGT Photonics S.p.A. Viale Sarca, 222 - 20126 Milano (MI), ITALY
Type of business or sector	Integrated Optical Components and Systems, R&D and prototyping
Dates	From April 1999 to October 2000
Occupation or position held	Researcher
Main activities and responsibilities	<ul style="list-style-type: none"> - Microelectronic and photonic devices nanofabrication by Electron-beam Lithography (mainly Diffractive Optical Elements) [RP 5-7] [CP 8-9].
Name and address of employer	IFN-CNR (<i>Institute for Photonics and Nanotechnologies of the National Research Council</i>) (formerly IESS-CNR, <i>Institute for Solid State Electronics</i>) Via Cineto Romano, 42 - 00156 Roma (RM), ITALY
Type of business or sector	Research on microelectronic and photonic devices
Dates	From April 1998 to March 1999
Occupation or position held	Researcher
Main activities and responsibilities	<ul style="list-style-type: none"> - Characterization of a soft X-ray laser-plasma source at the Rutherford Appleton Laboratory [IR 1]. - Contribution to related research projects (spectroscopy and radiobiology studies).
Name and address of employer	<ul style="list-style-type: none"> - Department of Physics, University of Essex, Wivenhoe Park, Colchester, Essex, CO4 3SQ, UK - Radiation and Genome Stability Unit, Medical Research Council, Harwell, Didcot, Oxon, OX11 0RD, UK
Type of business or sector	Research on basic Physics/Radiobiology
Dates	From June 1997 to March 1998
Occupation or position held	Researcher
Main activities and responsibilities	Development of theoretical models of interaction between soft X-rays and mammalian cells [RP 4].
Name and address of employer	Department of Biophysics, ISS (<i>Italian National Health Service</i>) Viale Regina Elena 299 - 00161 Roma (RM), ITALY
Type of business or sector	Research and consulting on public health
Education and training	
Dates	From October 1987 to December 1994
Title of qualification awarded	"Laurea" (MSc) in Physics on 29.05.1997, final mark: 103/110

Principal subjects/occupational skills covered

- Experimental Physics, Classical and Quantum Optics, Solid State Physics
- 1.5 years experimental work for thesis preparation [RP 1-3] [CP 1-7]
- Dissertation subject: "Laser-driven plasma X-rays source" (in Italian)

Name and type of organisation providing education and training

Physics Department, University of Rome "La Sapienza", ITALY

Level in national or international classification

ISCED 5A

Personal skills and competences

Mother tongue(s)

Italian

Other language(s)

English

Self-assessment

European level (*)

English

Understanding				Speaking				Writing	
Listening		Reading		Spoken interaction		Spoken production			
(C1)	Proficient user	(C2)	Proficient user	(B2)	Independent user	(B2)	Independent user	(C1)	Proficient user

(*) Common European Framework of Reference for Languages

Social skills and competences

- Team spirit
- Pro-active attitude
- Highly motivated
- Ability to adapt to multicultural environments and multi-discipline groups

Organisational skills and competences

- Sense of organisation
- Planning capability
- Ability to meet deadlines

Technical skills and competences

- CAD, GDS editing
- EBL Proximity corrections
- Statistical analysis
- Process control

Computer skills and competences

- Main PC applications software
- Main OS platforms (Windows, VMS, Unix)
- Basic programming in Pascal, Basic, Fortran

Driving licence

Category B

Additional information

One year Military Service carried out in 1995

Annexes

List of publications

I authorize the use of my personal data in compliance with the current Italian Data Protection Law (D.Lgs. 196/2003)

List of publications

Review papers

- [RP 1] Dominant role of dielectronic satellites in the radiation spectra of a laser plasma near the target surface**
Rosmey *et al.*, JETP LETTERS 1997, Vol. 65, Issue 9, pp. 708-713
- [RP 2] X-ray contact microscopy using an excimer laser plasma source with different target materials and laser pulse durations**
Albertano *et al.*, JOURNAL OF MICROSCOPY-OXFORD 1997, Vol. 187, Issue 2, pp. 96-103
- [RP 3] Soft X-ray plasma source for atmospheric-pressure microscopy, radiobiology and other applications**
Bollanti *et al.*, NUOVO CIMENTO DELLA SOCIETA ITALIANA DI FISICA D-CONDENSED MATTER ATOMIC MOLECULAR AND CHEMICAL PHYSICS FLUIDS PLASMAS BIOPHYSICS 1998, Vol. 20, Issue 11, pp. 1685-1701
- [RP 4] Irradiation of cultured mammalian cells with ultrasoft X-rays: experimental set-up and dose calculation for non-monochromatic beams**
Belli *et al.*, RADIATION PHYSICS AND CHEMISTRY 1999, Vol. 54, Issue 4, pp. 393-402
- [RP 5] 3D microstructures fabricated by partially opaque X-ray lithography masks**
Cabrini *et al.*, MICROELECTRONIC ENGINEERING 2000, Vol. 53, Issue 1-4, pp. 599-602
- [RP 6] Fabrication of semi-continuous profile diffractive optical elements for beam shaping by electron beam lithography**
Nottola *et al.*, MICROELECTRONIC ENGINEERING 2000, Vol. 53, Issue 1-4, pp. 325-328
- [RP 7] Electron-beam lithography patterning of magnetic nickel films**
Gerardino *et al.*, MICROELECTRONIC ENGINEERING 2001, Vol. 57-8, pp. 931-937
- [RP 8] Randomly sampled apodization in Bragg gratings**
Tormen *et al.*, JOURNAL OF LIGHTWAVE TECHNOLOGY 2006, Vol. 24, Issue 4, pp. 1896-1902
- [RP 9] Line edge roughness (LER) reduction strategy for SOI waveguides fabrication**
Sardo *et al.*, MICROELECTRONIC ENGINEERING 2008, Vol. 85, Issue 5-6, pp. 1210-1213
- [RP 10] Fabrication of ultra high aspect ratio Bragg gratings for optical filter**
Sardo *et al.*, MICROELECTRONIC ENGINEERING 2008, Vol. 85, Issue 7, pp. 1511-1513

Conference proceedings

- [CP 1] Atmospheric-pressure soft x-ray source for contact microscopy and radiobiology applications**
Albertano *et al.*, Proc. SPIE 3157, 164 (1997)
- [CP 2] X-ray plasma source pumped by a large volume excimer laser: characteristics and applications**
S. Bollanti *et al.*, Proceedings II Intern Conf. "New laser technologies and applications" Ancient Olimpia, June 1-4, Greece (1997)
- [CP 3] Applications of a soft x-ray plasma source pumped by a long pulse excimer laser**
Flora *et al.*, Proceedings of the international conference "Lasers '98"; December 7-11, 1998; Tucson. 1999. p. 454-461
- [CP 4] Soft x-ray plasma source pumped by an excimer laser: optimization and applications**
Albertano *et al.*, Proc. SPIE 3683, 138 (1998)
- [CP 5] Applications of an x-ray plasma source driven by an excimer laser: in vivo microscopy, microradiography, and radiobiology**
Bollanti *et al.*, Proc. SPIE 3423, 406 (1998)
- [CP 6] Toward a high-average-power and debris-free soft x-ray source for microlithography pumped by a long-pulse excimer laser**
Bollanti *et al.*, Proc. SPIE 3767, 33 (1999)

[CP 7] High efficiency XUV plasma source at 10-30 nm for projection microlithography pumped by a long pulse excimer laser

Bollanti *et al.*, Proc. Conf. MNE '99, "Micro and nano-Engineering", Roma, 21-23 Sept. 1999.

[CP 8] Microfabrication of diffractive optical elements onto the active region of optical fiber termination

Giannini *et al.*, Proc. of International Conference on Microtechnologies: MICRO.tec 2000, Pages: 695-7 vol.2 (2000)

[CP 9] Zone plate for x-ray applications

Di Fabrizio *et al.*, Proc. SPIE 4145, 317 (2001)

[CP 10] Silicon on Insulator Based Integrated Tunable Add & Drop Filter for Metro DWDM Networks

Cabas *et al.*, ICTON '07 Volume 1, pp 236-239, 9th International Conference on Transparent Optical Networks (2007)

[CP 11] Silicon photonics in Pirelli

Romagnoli *et al.*, Proc. SPIE 6996, 699611 (2008)

Internal reports

[IR 1] Spectra in the Range 5 to 50 Å from the X-ray Source

Nottola *et al.*, Rutherford Appleton Laboratory Central Laser Facility Annual Report 1998-1999

Patents

[P 1] Method to fabricate a redirecting mirror in optical waveguide devices

Nottola *et al.*, Publication Number: WO/2006/102917; Publication Date: 05.10.2006