

## PERSONAL INFORMATION

## Marilena Vivona

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## WORK EXPERIENCE

30th Sep 2019 up to now

**Permanent member of Research Staff at National Research Council (CNR) of Italy - Institute for Microelectronics and Microsystems (IMM) of Catania (Italy)**

**Micro/Nano Electronics domain**

Experimental investigation on advanced Silicon Carbide (SiC) devices for high Power Electronics applications. Electrical, morphological and structural characterizations of MOS capacitors, Ohmic and Schottky contacts.

**Skills**

- Atomic Force Microscopy applying various configurations (AFM, C-AFM).
- I-V and C-V characterizations of MOS capacitors, Schottky and Ohmic contacts. TLM characterization. Oxide reliability testing stressed by thermal ageing.
- Sample preparation for TEM analysis Structural Analysis (XRD, TEM, EDX, SEM): arrangement of the results, measurements supported by technical operator.
- Clean-room (ISO 4) operations for device fabrication: processing of devices (cleaning, laser beam lithography (with technician), thermal oxidation, metal deposition by rf-magnetron sputtering, wet and dry etching, thermal treatments).

3<sup>rd</sup> May 2019 - 30<sup>th</sup> June 2019

**Visiting Researcher at the Opto-Electronics Research Centre (ORC) - University of Southampton (UK)**

1<sup>st</sup> Apr 2016 - 31<sup>st</sup> March 2019

**Research Fellow at the Opto-Electronics Research Centre (ORC) - University of Southampton (UK)**

Bldg 53 - Highfield Campus - University of Southampton - SO17 1BJ Southampton UK

Research Fellow in the Preform Rare-Earth Profiler (PREP) project (P.I.: Prof. M. N. Zervas).

**Optics domain**

Design, Development and Test of an imaging and detection platform for Optical Preform Profiling. Specifically:

- Refractive index profiling by transmitted-ray deflection measurements.
- Active-dopant distribution and concentration evaluation in Rare-Earth-doped optical preforms through computed tomography-like technique. Application of the Inverse Radon and Abel transforms to rebuild the Rare-Earth ion profile in the core of the optical preform.

**Skills**

- Scientific and financial Interaction with optical and electronic components suppliers.
- Set-up of optoelectronic benches for investigations and material validations.
- Transformation Optics.
- Spectroscopy measurements.
- SEM and EDX trained.

9<sup>th</sup> Feb 2015 - 8<sup>th</sup> Mar 2016

**Granted with Post-Doc Fellowship at CNR-IMM**

1<sup>st</sup> Oct 2012 - 31<sup>st</sup> Jan 2015

**Granted with Marie Curie Fellowship (ESR -European NetFiSiC project) at CNR-IMM**

CNR - Istituto per la Microelettronica e Microsistemi (IMM) - Strada VIII n.5, Zona Industriale I95121 Catania - ITALY([marilena.vivona@imm.cnr.it](mailto:marilena.vivona@imm.cnr.it))

**Micro/Nano Electronics domain**

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1<sup>st</sup> Oct 2009 - 30<sup>th</sup> Sept 2012**Engineer of Optical Fibers**

Industrial PhD: Contract " CIFRE " under collaboration between Laboratoire Hubert Curien of Saint-Etienne (France) and ixFiber SAS.

Laboratoire Hubert Curien - 18, Rue B. Lauras F42000 Saint-Etienne – FRANCE

ixFiber SAS (now ixBLue SAS) - Rue Paul Sabatier F22300 Lannion – FRANCE

**Optics and Photonics domain**

Experimental investigation on Er/Yb-doped fibres for high performance optical amplifiers designed for space applications. Spectroscopic characterization in the IR-Vis-UV domain. Study of the microscopic mechanisms responsible for performance degradation and evaluation of the hardening solutions (Ce-codoping and H<sub>2</sub>-loading).

**Skills**

- Handling with optical fibre (stripping, cleaving, splicing and connection of optical fibres)
- Mechanical polishing and measurements of optical preforms.
- Stationary and time-resolved luminescence spectroscopy with various laser sources, continuous or pulsed, from UV to IR.
- Absorption and wavelength-dependent luminescence spectroscopy.
- Confocal microscopy: Raman and Luminescence.
- Active and passive characterizations under gamma-ray irradiation of optical fibres as part of an optical amplifier.

User of the Gamma-ray facility and Semiconductor X-ray irradiator at the *Commissariat à l'énergie atomique et aux énergies alternatives* (CEA) of Arpajon in Paris- FRANCE.

11<sup>th</sup> Oct 2008 - 21<sup>st</sup> Mar 2009**Teaching at High School**

Istituto professionale per l'agricoltura e l'ambiente " D. Dolci " - via C. Goldoni, 9 - 91011 Alcamo (TP) – Italy.

Course of 20h " **Electronics of semiconductors for solar cells** "

**ADDITIONAL SCIENTIFIC  
ACTIVITY**

March 2019 **Training for the use of SEM and combined EDX analysis facility**

7<sup>th</sup> - 18<sup>th</sup> April 2016 **Guidance on the safe use of lasers in education and research**

4<sup>th</sup> - 9<sup>th</sup> October 2015 **Member of the Local Organizing Committee of the ICSCRM 2015 conference**

4<sup>th</sup> October 2015 **Tutorial Day of the ICSCRM 2015 conference**

(4<sup>th</sup> – 9<sup>th</sup> October 2015 - Giardini Naxos, Italy)

SiC materials and technology: from the past towards the future

10<sup>th</sup> - 13<sup>th</sup> November 2014

Visiting Researcher at the Friedrich-Alexander-University (FAU) of Erlangen-Nuremberg (Germany)

Study on the electrical behavior of MOS capacitors by bias-temperature stress measurements.

21<sup>st</sup> September 2014

Tutorial Day of the conference ECSCRM 2014

(21<sup>st</sup> – 25<sup>th</sup> September 2014 - Grenoble, France)

Characterization methods applied to SiC: from material to devices.

25<sup>th</sup> May 2014

Tutorial Day of the workshop ISiCPEAW 2014

(25<sup>th</sup> – 27<sup>th</sup> May 2014 - Stockholm, Sweden)

Power electronics applications of silicon carbide technology.

28<sup>th</sup> April 2014- 11<sup>th</sup> May 2014

Visiting Researcher at the Friedrich-Alexander-University (FAU) of Erlangen-Nuremberg (Germany)

Study on the electrical behavior of MOS capacitors by admittance spectroscopy.

29<sup>th</sup> September 2013

Tutorial Day of the conference ICSCRM 2013

(29<sup>th</sup> September – 4<sup>th</sup> October 2013 - Miyazaki, Japan)

Advanced materials for high power application

5<sup>th</sup> July 2013

Visiting Researcher at the Université Claude Bernard - Lyon (France)

Growth of epitaxial layer in SiC technology.

30<sup>th</sup> Jan 2012-10<sup>th</sup> Feb 2012

17<sup>th</sup> - 28<sup>th</sup> January 2011

11<sup>th</sup> - 22<sup>th</sup> January 2010

Campaigns at the Commissariat à l'énergie atomique et aux énergies alternatives (CEA) of Arpajon, Paris (France)

On-line characterization of Yb/Er-doped optical fiber amplifiers under gamma-ray radiations.

Referee for International Journals

#### Reviewer

**OSA** publications (*Optics Letters, Applied Optics, Optical Materials Express, Optics Express, JOSA B*)

**Trans. Tech. Publications INC** (*Material Science Forum*)

**IEEE** Publications (*Transactions on Electron Devices*)

**AIP** Publications (*Journal of Applied Physics, Applied Physics Letters*)

**MDPI** (*Photonics, Applied Sciences*)

**ELSEVIER** (*Applied Surface Science, Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms*)

#### Member of Editorial Board

"*Scanning*" - Impact Factor 1.932

( Hindawi and John Wiley & Sons Publishing Partnership)

ISSN: 0161-0457 (Print);

ISSN: 1932-8745 (Online)

<https://www.hindawi.com/journals/scanning/about/>

#### Member of Editor Topic Team

"*Materials*" - Impact Factor 3.623

(MDPI)

ISSN: 1996-1944

## EDUCATION

October 2009 - September 2012

## PhD in Optics and Photonics

Issued in Partnership Program (cotutelle in French) between the Laboratoire Hubert Curien and the Physics Department of Palermo, under the supervision of Prof. Youcef Ouerdane and Prof. Marco Cannas.

- Laboratoire Hubert Curien - 18, Rue B. Lauras - F-42000 Saint-Etienne – France

- Dipartimento di Fisica, Università degli Studi di Palermo - via Archirafi, 36- I90123 Palermo – Italy

Thesis title: Radiation hardening of optical fiber amplifier - Thesis Dissetation July 4<sup>th</sup> 2013.

- Private subvention from the industry ixFiber SAS (Lannion, France).
- Awarded by the VINCI grant 2010 for the Mobility in PhD Thesis (Partnership Program): 4500 €.

Attended courses during the PhD:

- Photonics at short and ultra-short times. Engineering of the laser pulses: from nanosecond to femto-second (Saint-Etienne, France, 2011).
- Introduction to the scanning electron microscopy and elemental micro-analysis applied to materials (Saint-Etienne, France, 2011).
- Surfaces functionalized by optical micro/nano-structurations (Saint-Etienne, France, 2012).

Academic years  
1999/2000 - 2006/2007

## Master degree in Physics

Dipartimento di Scienze Fisiche e Astronomiche, Università di Palermo - via Archirafi, 36 I-90123 Palermo – ITALY

Thesis title: *Effects of Gallium on the optical properties of SiO<sub>2</sub>* (solid-state physics field) under the supervision of Prof. Marco Cannas. Evaluation: 106/110 (March 20<sup>th</sup>, 2008)

## PERSONAL SKILLS

Mother tongue  
Other language(s)

Italian

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	B2	B2	C1
French	C1	C1	B2	B2	C1

Common European Framework of Reference for Languages: A1/A2: Basic User – B1/B2: Independent User – C1/C2: Proficient User

Driving Licence

B (Italian Licence)

Computer skills

- Operating System: Windows XP - 7 - 8.
- Office applications: Word, Excel, PowerPoint.
- Document Markup Language: Latex.
- Data Analysis: Sigmaplot, Origin, Peakfit.
- Programming Languages: Matlab, Mathematica.
- Graphics Software: CorelDraw, Gimp.
- Image Processing: ImageJ,
- Instruments software.
- Email and Internet.

REFERENCES ARE AVAILABLE ON REQUEST.

DATA

FIRMA

20/10/2021

A handwritten signature in black ink, reading "Marilena Vivona". The signature is written in a cursive, flowing style.