CURRICULUM VITAE

FORMATO EUROPEO/EUROPEAN FORMAT

PERSONAL INFORMATION

Name	**PATRICK FIORENZA**
Address	**VIA CLAUDIO MONTEVERDI 42/44, 95032, BELPASSO (CT), ITALY**
Mobile	**+39 3471142042**
E-mail	**patrick.fiorenza@imm.cnr.it**
Nationality	Italian
Date of birth	26.02.1980

WORK EXPERIENCE

CNR code:	**N. MATRICOLA 14556**
Dates (from – to)	From 1st December 2011 up today
Name and address of employer	IMM-CNR, Catania (Istituto per la Microelettronica e Microsistemi del Consiglio Nazionale delle Ricerche)
Type of business or sector	Innovative materials for Power electronics and Radio frequency applications
Occupation or position held	Researcher Level III
Main activities and responsibilities	**Responsible for the Scanning Probe Microscopy (SPM) laboratory at IMM-CNR Catania; In charge for the research activity on "nanocharacterization of dielectrics materials for power electronics applications"**
Date	From December 2006 to December 2010
Occupation or position held	Post-Doc
Name and address of employer	IMM-CNR, Catania (Istituto per la Microelettronica e Microsistemi del Consiglio Nazionale delle Ricerche)
Tutor	Dr. Vito Raineri
Main activities and responsibilities	Innovative capacitors with high capacitance density for Power electronics and Radio frequency applications
Funding	NUOTO Project (New materials with Ultra high k dielectric constant fOr Tomorrow wireless electronics) Grant No. NMP3-CT-2006-032644
Date	From December 2010 to December 2011
Occupation or position held	Post-Doc
Name and address of employer	**IMM-CNR, Catania** (Istituto per la Microelettronica e Microsistemi del Consiglio Nazionale delle Ricerche)
Tutor	Dr. Vito Raineri
Main activities and responsibilities	Fabrication and characterization of high capacitance density capacitors
Funding	**LAST POWER** (europian project)

Date	From 1st February to 30th August 2005
Occupation or position held	**Scholarship founded by Marie Curie project APROTHIN**
Name and address of employer	IMEC Leuven (Belgium)
Tutor	Prof. Wilfried Vandervorst
Main activities and responsibilities	Charge trapping studies at nanometer scale by SPM
Main activities and responsibilities	Characterization by SPM of **radiofrequency MEMS** devices

EDUCATION AND TRAINING

Date	2003- 2006
	Ph.D. in Materials Science
Name and type of organisation providing education and training	Università di Catania, Italia.
Principal subjects occupational skills covered	**Scanning Probe Microscopy (SPM); dielectrics; semiconcductror devices**
Title of qualification awarded	19.02.2007
Level in National classification	Level 8
Date	1998-2003
Name and type of organisation providing education and training	Università di Catania, Italia
Principal subjects occupational skills covered	Solid state Physiscs; Semiconductors Physics; Materials Physics; Molecular Spectroscopy Structure of Matter.
Title	**Laurea in Fisica.**
Title of qualification awarded	28.10.2003
Mark	109/110.
Thesis Title	"Conduzione e intrappolamento di carica in ossido di praseodimio (Pr_2O_3)".
Tutors	Prof. E. Rimini, Dr. V. Raineri and Dr. R. Lo Nigro (CNR-IMM), Catania, Italy.

RESEARCH ACTIVITIES

Research sectors	Interaction between novel insulators material onto wide band gap semiconductrors (SiC, GaN). Wide band gap semiconductor devices characterization (Diodes, MOSFETs, HEMTs, ecc). Development of novel scanning probe methodologies for the physical investigation in wide band gap semiconductors and dielectrics.
Recent Scientific Activities.	Development of capacitors for power electronics application, focusing on the nanoscale electrical properties of thin insulating layers (interface carrier transport, charge trapping and dielectric breakdown).

Selected recent Pubblications

Physics and technology of gallium nitride materials for power electronics
F Roccaforte, P Fiorenza, R Lo Nigro, F Giannazzo, G Greco
(2018) LA RIVISTA DEL NUOVO CIMENTO 41 (12), 625-681

Fiorenza, P., Iucolano, F., Nicotra, G., Bongiorno, C., Deretzis, I., La Magna, A., Giannazzo, F., Saggio, M., Spinella, C., Roccaforte, F.
Electron trapping at SiO2/4H-SiC interface probed by transient capacitance measurements and atomic resolution chemical analysis
(2018) Nanotechnology, 29 (39), art. no. 395702, .

Fiorenza, P., Greco, G., Schiliro, E., Iucolano, F., Nigro, R.L., Roccaforte, F.
Determining oxide trapped charges in Al2O3 insulating films on recessed AlGaN/GaN heterostructures by gate capacitance transients measurements
(2018) Japanese Journal of Applied Physics, 57 (5), art. no. 050307, .

Greco, G., Fiorenza, P., Iucolano, F., Severino, A., Giannazzo, F., Roccaforte, F.
Conduction Mechanisms at Interface of AlN/SiN Dielectric Stacks with AlGaN/GaN Heterostructures for Normally-off High Electron Mobility Transistors: Correlating Device Behavior with Nanoscale Interfaces Properties
(2017) ACS Applied Materials and Interfaces, 9 (40), pp. 35383-35390.

Fiorenza, P., Greco, G., Iucolano, F., Patti, A., Roccaforte, F.
Channel Mobility in GaN Hybrid MOS-HEMT Using SiO2 as Gate Insulator
(2017) IEEE Transactions on Electron Devices, 64 (7), art. no. 7927758, pp. 2893-2899.

Schilirò, E., Fiorenza, P., Di Franco, S., Bongiorno, C., Saggio, M., Roccaforte, F., Lo Nigro, R.
Effect of SiO2 interlayer on the properties of Al2O3 thin films grown by plasma enhanced atomic layer deposition on 4H-SiC substrates
(2017) Physica Status Solidi (A) Applications and Materials Science, 214 (4), art. no. 1600365, .

Fiorenza, P., Greco, G., Vivona, M., Giannazzo, F., Di Franco, S., Frazzetto, A., Guarnera, A., Saggio, M., Iucolano, F., Patti, A., Roccaforte, F.
Electrical characterization of trapping phenomena at SiO2/SiC and SiO2/GaN in MOS-based devices
(2017) Physica Status Solidi (A) Applications and Materials Science, 214 (4), art. no. 1600366, .

Fiorenza, P., Greco, G., Giannazzo, F., Iucolano, F., Roccaforte, F.
Effects of interface states and near interface traps on the threshold voltage stability of GaN and SiC transistors employing SiO2 as gate dielectric
(2017) Journal of Vacuum Science and Technology B: Nanotechnology and Microelectronics, 35 (1), art. no. 01A101, .

Schilirò, E., Fiorenza, P., Greco, G., Roccaforte, F., Lo Nigro, R.
Plasma enhanced atomic layer deposition of Al2O3 gate dielectric thin films on AlGaN/GaN substrates: The role of surface predeposition treatments
(2017) Journal of Vacuum Science and Technology A: Vacuum, Surfaces and Films, 35 (1), art. no. 01B140, .

Fiorenza, P., La Magna, A., Vivona, M., Roccaforte, F.
Near interface traps in SiO2/4H-SiC metal-oxide-semiconductor field effect transistors monitored by temperature dependent gate current transient measurements
(2016) Applied Physics Letters, 109 (1), art. no. 012102, .

Schilirò, E., Lo Nigro, R., Fiorenza, P., Roccaforte, F.
Negative charge trapping effects in Al2O3 films grown by atomic layer deposition onto thermally oxidized 4H-SiC
(2016) AIP Advances, 6 (7), art. no. 075201, .

Fiorenza, P., Di Franco, S., Giannazzo, F., Roccaforte, F.
Nanoscale probing of the lateral homogeneity of donors concentration in nitridated SiO2/4H-SiC interfaces
(2016) Nanotechnology, 27 (31), art. no. 315701.

Vivona, M., Fiorenza, P., Sledziewski, T., Krieger, M., Chassagne, T., Zielinski, M., Roccaforte, F.
Electrical properties of SiO2/SiC interfaces on 2°-off axis 4H-SiC epilayers
(2016) Applied Surface Science, 364, pp. 892-895.

Lo Nigro, R., Fisichella, G., Battiato, S., Greco, G., Fiorenza, P., Roccaforte, F., Malandrino, G.
An insight into the epitaxial nanostructures of NiO and CeO2 thin film dielectrics for AlGaN/GaN heterostructures
(2015) Materials Chemistry and Physics, 162, art. no. 18192, pp. 461-468.

Fiorenza, P., Greco, G., Iucolano, F., Patti, A., Roccaforte, F.
Slow and fast traps in metal-oxide-semiconductor capacitors fabricated on recessed AlGaN/GaN heterostructures
(2015) Applied Physics Letters, 106 (14), art. no. 142903, .

Fiorenza, P., Frazzetto, A., Guarnera, A., Saggio, M., Roccaforte, F.
Fowler-Nordheim tunneling at SiO2/4H-SiC interfaces in metal-oxide-semiconductor field effect transistors
(2014) Applied Physics Letters, 105 (14), art. no. 142108, .

Roccaforte, F., Fiorenza, P., Greco, G., Vivona, M., Lo Nigro, R., Giannazzo, F., Patti, A., Saggio, M.
Recent advances on dielectrics technology for SiC and GaN power devices
(2014) Applied Surface Science, 301, pp. 9-18.

Greco, G., Fiorenza, P., Giannazzo, F., Alberti, A., Roccaforte, F.
Nanoscale electrical and structural modification induced by rapid thermal oxidation of AlGaN/GaN heterostructures
(2014) Nanotechnology, 25 (2), art. no. 025201 .

Roccaforte, F., Fiorenza, P., Greco, G., Nigro, R.L., Giannazzo, F., Patti, A., Saggio, M.
Challenges for energy efficient wide band gap semiconductor power devices
(2014) Physica Status Solidi (A) Applications and Materials Science, 211 (9), pp. 2063-2071.

ADDITIONAL INFORMATION

Patrick Fiorenza received the M.Sc. in Physics and the PhD in Material Science from the University of Catania in 2003 and 2007, respectively. In 2005, he was visiting scientist at IMEC (Belgium). Since 2011 he is Researcher at CNR-IMM. His research activity is mainly focused on carrier transport, trapping phenomena and reliability at MIS and MS interfaces in SiC and GaN. He has a recognized experience in characterization of advanced materials and devices by scanning probe microscopy. He is co-author of 120 papers and three book chapters. He was member of the local organizing committee of Hetero-SiC-WASMPE 2009 and WOCSDICE2011, and .was involved in several European and national projects (NUOTO, NetFISiC, Last Power, Ambition Power). He is principal investigator for the CNR-IMM unit of the project GRIFONE (2015-2018) within the FlagERA call. Since 2018, he collaborates with European Commission Research Executive Agency as Project evaluator. He has been invited speaker at the 16th conference on Defect-Recognition, Imaging and Physics in Semiconductors (DRIP XVI 2015). He has been invited speaker at the 13th conference on *Expert Evaluation and Control of Compound Semiconductor Materials and Technologies* (EXMATEC XIII 2016). He has been invited speaker at the 12th conference on *European Conference on Silicon Carbide and Related Materials* (ECSCRM 2018). *He helds a h-index of 21 (Google Scholar)*

TRATTAMENTO DEI DATI PERSONALI, INFORMATIVA E CONSENSO

Il D.Lgs 30/06/2003, n. 196 "*Codice in materia di protezione dei dati personali*" **e il GDPR (Regolamento UE 2016/679)** regolano il trattamento dei dati personali, con particolare riferimento alla riservatezza, all'identità personale e al diritto di protezione dei dati personali; l'interessato deve essere previamente informato del trattamento.
La norma in considerazione intende come "trattamento" qualunque operazione o complesso di operazioni concernenti la raccolta, la registrazione, l'organizzazione, la conservazione, la consultazione, l'elaborazione, la modifica, la selezione, l'estrazione, il raffronto, l'utilizzo, l'interconnessione, il blocco, la comunicazione, la diffusione, la cancellazione e la distruzione di dati, anche se non registrati in una banca dati.

Ai sensi del Decreto Legislativo n. 196 del 30/06/2003 e del GDPR (Regolamento UE 2016/679) io sottoscritto **Patrick Fiorenza** autorizzo il CNR al trattamento dei dati contenuti nel *Curriculum Vitae* allegato alla proposta riguardante il Progetto comune di ricerca "GHOST II: **G**raphene **H**eterostructures with ultra-thin films **O**f Nitride **S**emiconduc**T**ors for advanced electronics", nell'ambito dell'Accordo di cooperazione bilaterale CNR/HAS (Ungheria)- 2019-2021.

In compliance with the Italian Legislative Decree No. 196/2003 and the EU Regulation 2016/679, I (name and surname) **Patrick Fiorenza** *hereby authorize CNR to process my personal data contained in the Curriculum Vitae attached to the proposal submitted within the Bilateral Cooperation Agreement CNR/HAS (Hungary) – 2019-2021 for the joint research project* "GHOST II: **G**raphene **H**eterostructures with ultra-thin films **O**f Nitride **S**emiconduc**T**ors for advanced electronics"
barrare la casella (flag the box) X *Si, acconsento (Yes I consent)*

Catania, April 08, 2021

Patrick Fiorenza