Maria Losurdo

Date of Birth: August 16, 1966 Town of Birth: Bisceglie (BA), Italy Nationality: Italy
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PRESENT POSITION

Director of the Institute CNR-ICMATE, Istituto di Chimica della Materia Condensata e di Tecnologie per l'Energia

EDUCATION/ BACKGROUND: Master Degree: **Chemistry**(Italy**) ;** PhD: **Material Science** (Italy**);** Post Doc**: Optics** (France**,** Ecole Polytechnique); Post Doc**: Surface Science:** Chemistry Dept. University of North Carolina at Chapel Hill, NC-USA**, Materials & Device Engineering (**USA**-**Dept. Electrical and Computer Engineering, Duke University)

PROFESSIONAL EXPERIENCE

2019: Acting Director, Institute of Nanotechnology, CNR
2018: Professor at XXXVII Summer Courses by University of the Basque Country - San Sebastian, Spain (30 hours academic validity)
2016-PRESENT: Professor Materials Engineering-Dept Material Science&Engineering-UniversityBari-Italy
2015: Invited lecturer at Universidad Autonoma de San Luis Potosi-Mexico
2013-present Expert Consultant for Industrial projects for Ministry of Economic and **Industrial** Development
2012: Visit Scientist Department of Chemistry at Seoul National Univ. Korea (Topic: Graphene growth)
2011 Industry Consultant HORIBA SaS, Tokyo, Japan
2010: Invited Lecturer Dept. Material Engineering, Shandong University-China
2010-present: Director of Researh, Institute of Nanotechnology, Italian National Council of Research, Italy
2001-2010: Senior Scientist CNR-IMIP, Institute Inorganic Methodologies nd Plasmas Bari, Italy
2003-2008: Adjunct Professor Dept. Electrical and Computer Engineering, Duke University, NC, USA
2000-2018: Visiting Scientist Dept. Electrical and Computer Engineering Duke University, NC, USA
1997: Visiting Scientist Dept of Chemistry University of North Carolina, NC, USA
1996-2001: Researcher CSCP-CNR, Centro di Studio per la Chimica dei Plasmi, Italy

HONORS AND AWARDS:

2015: Certificate of Recognition from the Optical Society of Americas (OSA)
2010: Horiba SaS Industry Award for "Contribution to Innovation and Dissemination of Opical methodologies to Material Science".
2005: "Best Paper Award" MRS-Material Research Society, (Boston, MA, US)
[Awarded to the top four papers]
1993: Outstanding PhD Award "G. Stampacchia" -Università "La Sapienza" of Rome (Italy)
[Awarded to the best scientific paper published in a JCR journal by a PhD student]
1990: "Enichem" Industrial Award for utstanding Thesis in Chemistry

PATENTS FILED:

2022: "Reconfigurable Plasmonic Photodetector and Fabrication Method" **15/2022epo**
2022: Multiband Multi-polarization Plasmonic Photodetector and Fabrication Method **EP22465517.5/17.03.2022**
2015: "Electronic Platform for Sensing and Control of Electrochemical Reactions"_International Publication Number: WO 2015/187227 A2
2008: "Low-temperature graphene synthesis via metal-SiC eutectic phase formation"; submitter names: A. Brown, Maria Losurdo, T.H. Kim, S.D. Scott; File #2968 07/01/2008; role of M. Losurdo: contributed to the invention by offering concepts/ideas that broadened its scope.(Filed in USA)

INTERNATIONAL PROJECTS as Principal Investigator:

2020-present **Coordinator of the EC H2020 FET-OPEN Project "PHEMTRONICS**" (GA899598) "*Active Optical Phase-Change Plasmonic Transdimensional Systems Enabling Femtojoule and Femtosecond Extreme Broadband Adaptive Reconfigurable Devices*"
2019-present Principal Investigator for CNR-NANOTEC-Bari of the Project MIUR-PON ARS01_01007 *"EleGaNTe - Electronics on GaN-based Technologies*"
2019-present Principal Investigator of Project "Materiali e Plasmi Multifunctionali" DFM AD003.334 (PdGP 2019-2020, 2020-2021, 2021-2023)

2016-2020 WP-Leader of the H2020 project "TWINFUSYON" (GA692034) "*Twinning for Improving Capacity of Research in Multifunctional Nanosystems for Optronic Biosensing"*

2012-2016 Scientific Coordinator of the 7FP European project "MEM4WIN" (GA 314578) "*Ultra thin glass membranes for advanced, adjustable and affordable quadruple glazing windows for zero-energy buildings using graphene*"

2009-2012: Principal Investigator in the 7FP European project "NIMNIL" (GA 228637)*"Large Area Fabrication of 3D Negative Index Materials by Nanoimprint Lithography"*

2008-2010: Coordinator of the 7FP European Project "NanoCharM" (NMP3-CA-2007-218570) *"Multifunctional NanoMaterials Characterisation exploiting Ellipsometry and Polarimetry"*

2005-2007: Principal Investigator for contract ONR (Office of Naval Research, USA) (05-SC-ONR-1051) *"Fundamental Studies of GaN HFET Synthesis on SiC"*

2003-2005: Principal Investigator for Contract N°03-SC-ONR-1038 (Office of Naval Research, USA) (03-SC-ONR1038) "*Molecular Beam Epitaxy of GaN HFETs on SiC"*

2000-2002: Partner in 5FP EUROPEAN PROJECT "ASINET" (GA G5RT-CT-2001-05012) "a-Si Deposition Network"

INTERNATIONAL ACTIVITIES/EDUCATION COMMITTEES:

International Supervisor and Examiner of PhD theses in: Neuromoprhics – Photonics Department - Muenster University, Muenster, Germany; External Evaluator for PhD theses in Physics and Optics - Universidad de Cantabria, Spain; Material Science at Laughborough University (UK); Optics at NTNU-Norwegian University of Science and Technology –Trondheim, Norwey; Plasmonics at Dept. of Physics and Astronomy, Queen's University; Semiconductors at Belfast, Ireland, Dept. Material Chemistry, Universite Marie-Blascal, Clermond-Ferrand, France

EDITORIAL ACTIVITIES/BIBLIOGRAPHY:

2020 **Guest Editor of the Special Issue of Journal of Applied Physics "***Plasmonics: Enabling Functionalities with Novel Materials"*https://publishing.aip.org/publications/journals/special-topics/jap/plasmonics-enabling-functionalities-with-novel-materials/

2020 **Guest Editor of the Special Issue of Nanomaterials "***Plasmonics and Nano-Optics from UV to THz*"https://www.mdpi.com/journal/nanomaterials/special_issues/Plasmonics_Nano_optics

2019 **Guest Editor of the Special Issue of Applied Science** "*Design and Applications of Plasmonic Materials*"https://www.mdpi.com/journal/applsci/special_issues/plasmonic_materials

2017 **Co-editor of the e-Book** "Best-Practices for Biofunctionalisation of Innovative Materials" Eds: M. Losurdo, M. Orlita, K. Hingerl, J. Humlicek ISBN 978-3-200-05312-0(eBook)

2013 **Editor of the book** "Ellipsometry at the Nanoscale" Springer-Verlag, (ISBN 978-3-642-33955-4)

2010 **Editor of the e-book** "Defining and Analysing the Optical Properties of Materials at the Nanoscale" (ISBN 978-3-901578-22-9)

2019-present Editorial Board of the Int. Journal "*Applied Science*"

2018-present Editorial Board of the Int. Journal "*Nanomaterials"*

2017-present Honorable Editorial Board/Reviewer Committee Member of International Journal of Scientific Research in Physics and Applied Sciences (ISSN 2348-3423)

2005-2019: Associate Editor for the Int. Journal "*The European Physical Journal: Applied Physics*"

2011-2015: Co-Editor for the International Journal "*ISRN Materials Science*"

PUBLICATION OVERVIEW

h-index: 46 as from Google Scholar
Book Chapters: 7 Book Chapters including the Handbook of Crystal Growth
Journal Articles: >300 peer-reviewed publications in international journals
Conference Presentations: Over 400 Oral and Poster Presentations

INVITED TALKS and SEMINARS: more than 50 invited talks at International conferences, including 4 opening plenary talks.

RESEARCH SYNOPSIS:

Mission: to create functional materials such as thin films, nanostructures and metasurfaces, to develop new processes for materials fabrication and to reveal and control the interplay between nanoscale structure and physico-chemical properties.

Statement: address the knowledge of properties of materials and nanosystems and tailor them by surface processing, both at the nanoscopic and macroscopic level, to incorporate them into unique applications of societal and technological impact

Materials: 2D-Materials, Graphene, Plasmonic systems, metals nanostructures, Silicon-based materials, III-Vs (GaAs, GaAsBi, GaAsBiP, …), III-Nitrides (GaN, InN, InGaN, AlGaN, InAlGAN, ...), SiC, ZnO- based semiconductors, dielectric and high-k oxides (VO_2 TiO_2, Al_2O_3, MgO, Er_2O_3, $LiAl_2O_3$, $LiGa_2O_3$, ...), Transparent conductive oxies (TCOs); materials for photovoltaics (Si-based, Si_3N_4, a.SiC, CdSe/CdTe, etc.), organic conjugated polymer thin films, molecular systems, biomolecules, proteins and DNA functionalized surfaces.

Synthesis Approaches: lab scale to medium –scale CVD (Chemical Vapour Deposition), MBE (Molecular Beam Epitaxy), Plasma Processes, PECVD (Plasma Enhanced Chemical Vapour Deposition), PVD (Physical Vapour Deposition, e.g. sputtering), self-assembly, Wet Chemistry Functionalisation; Spin Coating.

Technologies: Photonics, Optoelectronics, Micro- and nano-electronics, Plasmonics, Bio- and Chemo-Sensing, Sustainable energy production and storage, i.e. Photovoltaics, Hydrogen technologies.

She has built a non-conventional remote-plasma MOCVD system for epitaxy of III-nitrides, i.e., GaN, InN, InGaN, on sapphire, SiC, GaN-templates and silicon and implemented MBE (molecular beam epitaxy) with alterntive plasma configurations and real time optical monitoring tools, working on the relation between epitaxial growth, microstructure, morphology, heterostructures, transport, and device properties in wide bandgap InGaAlN III-Nitrides semiconductors for LEDs and HEMTs applications.

She has been one of the pioneering researchers in the chemical vapour deposition (CVD) of large area (e.g. $10x10cm^2$) graphene materials on any substrate. Already in 2009 she was awarded one of the first European projects on CVD graphene and related metamaterials. Later on, this activity evolved to include other 2D materials

She is one of the pioneering researchers in the field of alternative materials for plasmonics, creating the concept of "broadband active tunable phase change plasmonics"

Nowadays, she is one of the pioneers of the phase-change 2D and transdimensional materials, including novel optically activated phase-change chalcogenies and oxide materials for ultrafast (femtoscale) photonics.