

Department of Information Engineering

Università Politecnica delle Marche



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CURRICULUM VITAE

Andrea Di Donato, Ph.D.

Institutional webpage:

www.univpm.it/Entra/Engineering_1/docname/idsel/602/docname/ANDREA%20DI%20DONATO

ORCID: 0000-0002-8936-0453

Education:

- **Ph.D.** Degree in Electronic and Telecommunication, Title of the PhD thesis: "Design of multi-mode electro-optic modulators" under the super-vision of Prof. T. Rozzi, Department of Bioengineering and Electromagnetism, Polytechnic University of Marche, Italy (19 January 2004).

- **Laurea Degree** in Electronic and Telecommunication Engineering (110/100 cum Laude), Title of thesis: "Optical methods based on Speckle detection to measure surface velocity" under the super-vision of Prof. E. P. Tomasini, Department of Bioengineering and Electromagnetism, University of Ancona, Italy (March 2000).

Employment:

- **Assistant Professor** in Department of Information Engineering, Polytechnic University of Marche, P.zza Roma, Ancona Italy (2008-Present).

- **Research Scholar** at John A. Paulson School of Engineering and Applied Sciences, group of Prof. F. Capasso, Harvard University, Cambridge, MA (April 2016-2018)

- **Founder of Micro&Nano Lab**, a Spin-Off of Polytechnic University of Marche, P.zza Roma, Ancona, Italy (2014-2016).

- **Project-based Contract** with SOMACIS Inc. (Hallmark Circuits Inc.), Via Jesina, 17, 60022 Castelfidardo (AN). Activity: design and characterization of Polymeric Optical Printed Circuit Board (2007).

- **Research Fellowship** in Integrated optics. Activity: Analysis and characterization of opto-electronic circuits. Institution: Polytechnic University of Marche, Ancona, Italy (2007).

- **Research Fellowship** in Electromagnetics. Activity: Microwave and optical wave interaction inside anisotropic waveguide. Institution: Polytechnic University of Marche, Ancona, Italy (2006).

- **Research Fellowship** in Electromagnetics. Activity: Project of independent- polarization electro-optic devices, Institution: Polytechnic University of Marche, Ancona, Italy (from 2003 to 2005).

Didactic Support and Teaching Courses:

Institution: Department of Information Engineering, Polytechnic University Polytechnic of Marche, Ancona, Italy:

- A.A. 2014/2015 Optical Components and Circuits (Electronic Engineering)



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- Training course in Electromagnetic Modeling. The course was supported by the National Research Project PON R&C 2007-2013 cod. id. locale PON01_01224/F4
- A.A. 2012/2013/2014 Optical Components and Circuits (Electronic Engineering)
- A.A. 2010/2011 Optical Components and Circuits (Telecommunication Engineering)
- A.A.2010/2011 Electronic Measurements (Automatics and Informatics)
- A.A.2008/2009 CAD Technique for Telecommunications (Telecommunication Engineering)

Research Projects:

- Participation to the European project: "All-Phononic circuits Enabled by Opto-mechanics PHENOMEN", H2020 – FETOPEN 2014-2015-RIA, n. 713450 (2016-2019).
- Participation to the project: "NSF GFRP Grant DGE1144152, Development of a novel technique for sub-femtonewton force spectroscopy", at Harvard John A. Paulson School of Engineering and Applied Sciences (SEAS), Harvard University, (2016-2018).
- Participation to the project MIUR-DAAD Joint Mobility, supported by "Deutscher Akademischer Austauschdienst German Academic Exchange Service" (DAAD) and by "Ministero dell'Istruzione, dell'Università e della Ricerca" (MIUR). Title of the project: "Scanning Microwave Microscopy and Nano/Micro-robotics for manipulation and characterization of 2D-materials and biological samples" (2016-2018).
- Participation to the European project: FP7-ICT-2011-8 (2012-2014): "Carbon based smart systems for wireless applications – NANO RF", FP7-ICT-2011-8.
- In 2007-2008, Member of the research unit (UNIVPM) for a National project within F.A.R. (Fondo Agevolazioni Ricerca), D.M. 593 del 08/08/2000 –n. 8920/DSPAR/03, with company SO.MA.CI.S Inc. title of the project: "Opto-Electronic Circuit Boards, OECB"

Awards and honors

- Winner of National grant "Funding Grant for Basic Research Activities (FFABR) - FFO 2017" based on the evaluation of the publications achieved during the years 2012-2016
- Best Conference Paper Award at International conference 3M-Nano, Taipei Taiwan, 2014
Title of the paper: "Microwave Microscopy for Nanoscale Characterization, Imaging and Patterning of Graphene" by T. Monti, A Di Donato, D. Mencarelli, G. Venanzoni, A. Morini, M. Farina, I. V. Vlassiuk and A. Tselev
- National Scientific Habilitation (ASN) for Associate Professor 2018
- ISSNAF (Italian Scientists and Scholars in North America Foundation)) Internships 2014
<http://www.issnaf.org/internships.html>
- Semifinalist at Mass-Challenge competition 2014 (MIT Boston, Cambridge, USA)
- Winner of National Business Plan Competition E-Capital (2013): <https://www.ecapital.it>

Visiting:

- Visiting PhD student in Bath (UK) August 2001, supervisor Prof J. K. Sarma, University of Bath.
- Visiting research in Tyndall National Institute, Cork (IR), August 2013, in the framework of European project: FP7-ICT-2011-8 (2012-2014).
- Internship at Mind the Bridge, start-up school November 2014, 450 Townsend St, 94107, San Francisco.

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Research Area:

- Fiber Optic Low-coherence Systems
- Fiber Optic Scanning Interferometry Microscopy
- Scanning probe Microscopy and Scanning Microwave Microscopy
- Synthetic Optical Holography
- Photonic Force Microscopy

Reviewer of Elsevier (Outstanding Review from Optics & Laser Technology 2015), OSA, IEEE and IOP journals

Kind Regards
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LIST OF PUBLICATIONS:

International Journals

- 1) A. Di Donato et al. “**Heterodyne Phase Shifting Method in Scanning Probe Microscopy.**”
Journal of the Optical Society of America A, January 2021
<https://doi.org/10.1364/JOSAA.415042>
- 2) R. Castagna et al. “**Near-Frequency Photons Y-Splitter**”, Applied Materials Today, Vol. 19,
June 2020, 100636 <https://doi.org/10.1016/j.apmt.2020.100636>
- 3) M. Farina et al. (2019) “**Inverted scanning microwave microscope for in vitro imaging and characterization of biological cells**”, Appl. Phys. Lett. 114, 093703
<https://doi.org/10.1063/1.5086259>
- 4) A. Di Donato et al. (2019) “**Synthetic optical holography for in-depth imaging of optical vortices in speckle patterns**”, AIP Advances 9, 015211 <https://doi.org/10.1063/1.5053564>
- 5) L. Liu, A. Di Donato, V. Ginis, S. Kheifets, A. Amirzhan, F. Capasso (2018) “**Three-dimensional measurement of the helicity-dependent forces on a Mie particle**” Phys. Rev. Lett. 120, 223901 <https://doi.org/10.1103/PhysRevLett.120.223901>
- 6) L. Liu, S. Kheifets, V. Ginis, A. Di Donato, F. Capasso (2017) “**Elliptical orbits of microspheres in an evanescent field**”, *Proceedings of the National Academy of Sciences of the United States of America*, 114, pp. 11087-11091 ISSN: 1091-6490
<https://doi.org/10.1073/pnas.1714953114>
- 7) S. Lo Turco, A. Di Donato, L. Criante (2017) “**Scattering effects of glass-embedded microstructures by roughness-controlled fs-laser micromachining**”, *Jour. of Micromechanics and Microengineering*, 27, ISSN: 0960-1317 <https://doi.org/10.1088/1361-6439/aa6b3b>
- 8) M. Farina et al. (2016) “**Investigation of Fullerene Exposure of Breast Cancer Cells by Time-Gated Scanning Microwave Microscopy**”, *IEEE Transactions on MTT*, 64, 12, pp. 4823-4831 ISSN: 0018-9480 <https://doi.org/10.1109/TMTT.2016.2623312>

- 9) A. Di Donato, S. Lo Turco, L. Criante (2016) "**Scanning optical cavity for internal roughness measurement of embedded micro-structures**", *Thin Solid Films*, 19, ISSN: 0040-6090
<https://doi.org/10.1016/j.tsf.2016.06.037>
- 10) R. Castagna, A. Di Donato, L. Nucara, Ji-H. Xu, D. E. Lucchetta and F. Simoni (2016) "**Structured Beam Diffraction**" *Optics Letters*, 41, 7, p. 1462-1465 ISSN: 0146-9592
<https://doi.org/10.1364/OL.41.001462>
- 11) A. Di Donato, M. Farina (2015) "**Synthetic holography based on scanning microcavity**", *AIP Advances*, 5, 117125 <https://doi.org/10.1063/1.4935802>
- 12) D.E Lucchetta, P. Spegni, A. Di Donato, F. Simoni, R. Castagna (2015) "**Hybrid surface-relief/volume one dimensional holographic gratings**" *Optical Materials*, 42. pp. 366-369
<https://doi.org/10.1016/j.optmat.2015.01.028>
- 13) A. Di Donato, L. Criante, S. LoTurco, M. Farina (2014) "**Optical microcavity scanning 3D tomography**", *Optics Letters*, 39 19, pp. 5495-5498 <https://doi.org/10.1364/OL.39.005495>
(selected by the editors of OSA for publication in VJBO, special feature of OSA's Optics Infobase)
- 14) A. Di Donato, T. Pietrangelo, T. Da Ros, T. Monti, M. Farina (2014) "**Contrast-phase Imaging of Fixed-Cells through Micro-Cavity Scanning Microscopy**", *Optical Data Processing and Storage*, 1 pp.12–15 <https://doi.org/10.2478/odps-2014-0003>
- 15) M. Farina, T. Ye, G. Lanzani, A. Di Donato, G. Venanzoni, D. Mencarelli, T. Pietrangelo, A. Morini, P. E. Keivanidis (2013) "**Fast Ultrahigh-Density Writing of Low Conductivity Patterns on Semiconducting Polymers**", *Nature Communications*, 4
<https://doi.org/10.1038/ncomms3668>
- 16) A. Di Donato, T. Pietrangelo, A. Anzellotti, T. Monti, A. Morini, M. Farina (2013) "**Infrared imaging in liquid through an extrinsic optical microcavity**", *Optics Letters*, 38, 23, pp. 5094- 5097 *(selected by the editors of OSA for publication in VJBO, special feature of OSA's Optics Infobase)* <https://doi.org/10.1364/OL.38.005094>
- 17) T. Monti, A. Di Donato, D. Mencarelli, G. Venanzoni, A. Morini, M. Farina (2013) "**Near-Field Microwave Investigation of Electrical Properties of Graphene-ITO Electrodes for LED Applications**", *IEEE Journal of Display Technology*, 9, 6, pp. 504-510
<https://www.osapublishing.org/jdt/abstract.cfm?URI=jdt-9-6-504>
- 18) A. Di Donato, A. Morini , M. Farina (2013) "**Optical Fiber Extrinsic Micro-Cavity Scanning Microscopy**" *Electromagnetic Waves*, 133, pp. 347-366
<http://www.jpier.org/PIER/pier.php?paper=12072504>
- 19) M. Farina, A. Di Donato, D. Mencarelli, G. Venanzoni, A. Morini, (2012), "**High Resolution Scanning Microwave Microscopy for Applications in Liquid Environment**" *IEEE Microwave and Wireless Components Letters*, 6341859, pp. 595-597
<https://doi.org/10.1109/LMWC.2012.2225607>
- 20) M. Farina, A. Di Donato, T. Monti, T. Pietrangelo, T. Da Ros, A. Turco, G. Venanzoni, A. Morini (2012) "**Tomographic effects of near-field microwave microscopy in the**

- investigation of muscle cells interacting with multi-walled carbon nanotubes”, *Applied Physics Letters*, 101 <https://doi.org/10.1063/1.4767518>
- 21) M. Farina, A. Lucesoli, T. Pietrangelo, A. Di Donato, S. Fabiani, G. Venanzoni, D. Mencarelli, T. Rozzi, A. Morini (2011) “**Disentangling Time in a Near-Field Approach to the Scanning Probe Microscopy**”, *Nanoscale*, 3, (9), pp. 3589-3593
<https://doi.org/10.1039/C1NR10491H>
- 22) M. Farina, D. Mencarelli, A. Di Donato, G. Venanzoni, A. Morini (2011) “**Calibration Protocol for Broadband Near-Field Microwave Microscopy**”, *IEEE Transactions on Microwave Theory and Techniques*, 59, 10, pp. 2769-2776
<https://doi.org/10.1109/TMTT.2011.2161328>
- 23) M. Farina, A. Lucesoli, A. Di Donato, D. Mencarelli, L. Maccari, G. Venanzoni, A. Morini and T. Rozzi (2010) “**Algorithm for reduction of noise in ultramicroscopy and application to near-field microwave microscopy**”, *IET Electronics Letters*, 46, 1, pp. 50-52
<https://doi.org/10.1049/el.2010.2859>
- 24) A. Di Donato, M. Farina, D. Mencarelli, A. Lucesoli, S. Fabiani, T. Rozzi, G. Angeloni, G.M. Di Gregorio (2010) “**Stationary Mode Distribution and Sidewall Roughness Effects in Overmoded Optical Waveguides**”, *IEEE/OSA Journal of Lightwave Technology*, 28, 10, pp. 1510-20 <https://doi.org/10.1109/JLT.2010.2045154>
- 25) A. Di Donato, M. Farina, A. Lucesoli, L. Maccari, D. Mencarelli, G. Angeloni, G. M. Di Gregorio, T. Rozzi (2008) “**Parasitic Coupling Effects in Multimode Buried Channel Waveguides Arrays for O-PCB Interconnects**”, *IEEE/OSA Journal of Lightwave Technology*, 26, pp. 3124-3130 <https://doi.org/10.1109/JLT.2008.925047>
- 26) L. Scalise, A. Di Donato (2008) “**Non-Contact 2D in-Plane Speckle Velocimeter**”, *IEEE Transactions on Instrumentation and Measurement*, 57, pp. 1261-1267
<https://doi.org/10.1109/TIM.2007.915456>
- 27) A. Di Donato, T. Rozzi (2006) “**A Theory of Multi-Mode Travelling Wave Modulators**” for RF Photonics *IEEE Transactions on Microwave Theory and Techniques*, 54, pp. 724-734
<https://doi.org/10.1109/TMTT.2005.862637>
- 28) D. Mencarelli, A. Di Donato, T. Rozzi, (2006). “**Analytical study of the optical spectrum shifts in a modulating channel**”, *IEEE/OSA Journal of Lightwave Technology*, 24, 2,
<https://doi.org/10.1109/JLT.2005.862469>
- 29) A. Di Donato, L. Scalise, L. Zappelli (2004) “**Non-contact speckle-based velocity sensor**”, *IEEE Transactions on Instrumentation and Measurement*, 53, pp. 51-57
<https://doi.org/10.1109/TIM.2003.821482>
- 30) L. Pierantoni, A. Di Donato, T. Rozzi (2004) “**Full-wave analysis of photonic bandgap integrated optical components by the TLM-IE method**”, *IEEE/OSA Journal of Lightwave Technology*, pp. 2348 – 2358, 22, 10, <https://doi.org/10.1109/JLT.2004.833300>
- 31) A. Di Donato, D. Mencarelli, T. Rozzi (2004) “**Accurate time-domain analysis of microwave and optical signal interaction in electro optic devices**”, *IEEE Transactions on Microwave*

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Theory and Techniques, 52, 12, pp. 2704-2711,

<https://doi.org/10.1109/MWSYM.2004.1339078>

Kind Regards
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