Alessia Polemi, Ph.D. – Curriculum Vitae

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Objective

I am a highly motivated individual, willing to expand my knowledge. I consider myself to be an effective team player with good leadership skills and an analytical approach to problems solving. I am a senior level scientist with over 20 years of experience in progressively responsible positions, developing new ideas in the areas of engineering, physics, mathematics, and education. I have an international reputation of excellence, and strong presentation skills. I have mentored and tutored students and young colleagues over the course of my career with passion and success. I have worked on many projects, both in academia and in industry.

Education

MARCH 2003 | Ph.D. In Information Engineering (Curriculum: ELECTROMAGNETIC WAVES) | University of Siena, Italy

- Thesis dissertation: "Frequency Domain Green's Function for Periodic Large Phased Arrays in Multilayered Dielectric Regions" (thesis advisor: Prof. R. Tiberio)

JULY 1999 | M.S. (Cum Laude) In Telecommunication Engineering | University of Siena, Italy

- Thesis dissertation: "*Green's Functions for phased arrays of dipoles on dielectric slab*" (supervisors: Prof. S. Maci, Prof. R. Tiberio, Prof. A. Toccafondi)

Professional Experience

2015 TO PRESENT | Global Research Leader | Checkpoint Systems, Thorofare, NJ

I lead the global research activities for Checkpoint Systems worldwide, including:

- Investigation and analysis of novel technologies applicable in retail
- Investigation of novel materials to lower cost of manufacturing
- Design and realization of RFID tags for different RF environments
- Modeling of EAS systems for anti-theft solutions
- Design of antenna systems

2015 TO PRESENT | Co-Founder and CTO | epoXtal LLC, Philadelphia, Pa

- epoXtal is a start-up with main objective is to develop advanced tunable thin films for the production of tunable RF devices for telecommunications markets and IoT technologies

2015 TO PRESENT | Adjunct Professor | Drexel University, Philadelphia, Pa

- Teaching "Electronic and Photonic Properties of Materials" - MATE351, MSE Department, Drexel University

2012 TO 2015 | Research Professor | Drexel University, Philadelphia, Pa

Research activity at MSE department on tunable materials, nano-optics and solar, including:

- Writing proposals
- Teaching
- Mentoring undergraduate students in MSE, ECE and Physics
- Research on plasmonics, 2DEG, photovoltaics, photonics, tunable complex oxides

2006 TO 2017 | Assistant Professor | University of Modena, Italy

Research activity within the electromagnetic field group at the School of Engineering.

- Tenured in 2009
- Teaching courses at various level in Antennas, Microwave, Photonics, Radio Propagation
- Research activities in antenna analysis and design, RFID systems, photonics and plasmonics
- Mentoring graduate and undergraduate students

2014 TO 2015 | Adjunct Professor | Rutgers University, New Brunswick, Nj

- Teaching the course Optoelectronics, cross-linked grad and undergrad
- Teaching the course Solar Cells, cross-linked grad and undergrad. This course was originally created ad-hoc

2010 TO 2012 | Research Scientist | Drexel University, Philadelphia, Pa

Research activity at the Chemistry department on the nano-optics and nano-plasmonic.

- Published 11 peer-reviewed papers (one invited) on nano-plasmonic
- Attended international conferences and delivered presentations on research
- Mentored undergraduate students

2011 TO PRESENT | Free Lance Interpreter/Translator | Nationality Service Center, Philadelphia, Pa

Providing interpreting/translation services for English/Italian assessments, meetings, testing:

- Assessment meetings between Italian individuals/families and nursing/caring agencies
- Interpreter supervisor for Bridging the Gap

2011 TO 2016 | Free Lance Tutor | Wyzant

- Italian, math-related topics, physics

2008 | Visiting Professor | University of Pennsylvania, Philadelphia, Pa

Research activity with Prof. Nader Engheta and other members of his group on nano-plasmonic.

- Published 2 peer-reviewed papers

2003 TO 2006 | Post-Doc scholar | University of Siena, Italy

Research and teaching activities within the electromagnetic field group at the School of Engineering, advisor Prof. Stefano Maci.

- Published peer reviewed papers on antennas and RF propagation
- Teaching the Microwave Circuits and Electromagnetic modeling courses
- Attended national and international conferences and presented research

2003 TO 2006 | Co-Founder and President | Wavecomm srl, Italy

Wavecomm srl is a startup electronic engineering company, active in the areas of radiofrequency electronics, wireless technologies and antennas, with main targets in transportation, automotive, military and civil defense, industrial and building automation, renewable energy. My functions included:

- Developing products based on wireless technologies, such as Radio Frequency IDentification (RFID) and Wireless Sensor Networks (WSN)
- Providing customized technical consultancy, design and development, prototyping, product engineering and manufacturing
- Managing product design, budget, and clients

Research Interests

- Optical and thermal plasmonics
- Tunable devices for RF-microwave-millimeter wave applications
- RF/NFC/RFID systems and IoT sensors
- Printed and in-mold electronics
- Antenna design
- Asymptotic and numerical methods

Publications

BOOK CHAPTERS

[B1] M. FIORINI, A. POLEMI, F. TESTI, A. COSTI, Radio Frequency Identification Systems, in MARCONI 09, Wireless communications: from signals to sounds. The contribution of G. Marconi, Nobel Prize winner in 1909. Edited by A. Savini, published by IET, 2009

JOURNALS

[J1] ASIA SARYCHEVA, ALESSIA POLEMI, YUQIAO LIU, KAPIL DANDEKAR, BABAK ANASORI, YURY GOGOTSI. 2D titanium carbide (MXene) for wireless communications. SCIENCE ADVANCES, 4, 9 2018

[J2] Z. GU, S. PANDYA, A. SAMANTA, A. R. DAMODARAN, C. J. G. MEYERS, G. XIAO, S. LIU, A. DASGUPTA, S. SAREMI, A. POLEMI, L. WU, A. PODPIRKA, A. WILL-COLE, C. J. HAWLEY, P. K. DAVIES, R. A. YORK, I. GRINBERG, L. W. MARTIN, AND J. E. SPANIER. Resonant domain-wall-enhanced tunable microwave ferroelectrics. NATURE, 560, 622–627, 2018

[J3] J.E. SPANIER, V. FRIDKIN, A. M. RAPPE, A. R. AKBASHEV, A. POLEMI, Y. QI, S. M. YOUNG, Z. GU, C. J. HAWLEY, D. IMBRENDA, G. XIAO, C. L. JOHNSON. Power conversion efficiency exceeding the Shockley-Queisser limit in a ferroelectric insulator. NATURE PHOTONICS, 10, 611–616, 2016

[J4] A. POLEMI, S. MACI. A Leaky Wave antenna at optical frequency. J. APPL. PHYS., 112, 074320, 2012

[J5] A. POLEMI, K.L. SHUFORD. Effect of dielectric coating on enhancement and quenching in nanospheres. CHEM. PHYS. LETTERS, 546, 129-132, 2012.

[J6] A. POLEMI, K.L. SHUFORD. Distance dependent quenching effect in nanoparticle dimers. J. CHEM. PHYS. 136, 184703, 2012

[J7] A. POLEMI, A. ALU', N. ENGHETA. Nanocircuit Loading of Plasmonic Waveguides. IEEE Trans. on ANTENNAS AND PROPAGATIONS, 60, 9, 4381 – 4390, 2012.

[J8] A. POLEMI, K.L. SHUFORD. Sensing Properties of a Fabry-Perot Dielectric Structure and Dimer Nanoparticles. Invited Paper. JOURNAL OF NANOTECHNOLOGY, 745390, 2012

[J9] A. POLEMI, K.L. SHUFORD. Transmission line equivalent circuit model applied to a plasmonic grating nanosurface for light trapping. OPTICS EXPRESS, 20, S1, A141-A156, 2012

[J10] A. POLEMI, K.L. SHUFORD, Fabry-Perot Effect on Dimer Nanoantennas. PHOTONIC AND NANOSTRUCTURES - FUNDAMENTALS AND APPLICATIONS, 10, 1, 36-45, 2012

[J11] A. POLEMI, K.L. SHUFORD. Two-Dimensional Plasmonic Nanosurface for Photovoltaics. J. APPL. PHYS., 110, 11, 114313, 2011

[J12] A. POLEMI, S. WELLS, N.V. LAVRIK, M.J. SEPANIAK, K.L. SHUFORD. Dispersion characteristics in the Disk-on-Pillar array nanostructure for SERS. J. PHYS. CHEM. C, 115, 28, 13624-13629 2011

[J13] D. BHANDARI, S. M. WELLS, A. POLEMI, I. I. KRAVCHENKO, K. L. SHUFORD, M. J. SEPANIAK. Stamping High-Aspect-Ratio Plasmonic Nanoarrays on SERS-Supporting Platforms. JOURNAL OF RAMAN SPECTROSCOPY, 42, 11, 1916-1924, Nov. 2011

[J14] A. POLEMI, A. ALU', N. ENGHETA. Guidance Properties of Plasmonic Nanogrooves: comparison between the Effective Index Method and the Finite Integration Technique. ANTENNAS AND WIRELESS PROPAGATION LETTERS, 10, 199-202, 2011

[J15] A. POLEMI, E. RAJO-IGLESIAS, S. MACI, Analytical Dispersion Characteristics of a Gap-Groove Waveguide. PROGRESS IN ELECTROMAGNETICS RESEARCH M, 18, 55-72, 2011

[J16] A. POLEMI, S. MACI, P-S. KILDAL. Dispersion Characteristics of a Metamaterial-Based Parallel-Plate Ridge Gap Waveguide Realized by Bed of Nails. IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, 59, 3, 904 – 913, 2011

[J17] S. WELLS, A. POLEMI, N.V. LAVRIK, K.L. SHUFORD, M.J. SEPANIAK, Efficient Disk on Pillar Substrates for Surface Enhanced Raman Spectroscopy Analysis. CHEM. COMM., 47, 3814-3816, 2011

[J18] A. POLEMI, S. M. WELLS, N.V. LAVRIK, M.J. SEPANIAK, K.L. SHUFORD. Local Field Enhancement of Pillar Nanostructures for SERS. J. PHYS. CHEM. C, 114, 42, 18096–18102, 2010

[J19] K.A. MEYER, A. POLEMI, K.L. SHUFORD, W.B. WHITTEN, R.W. SHAW. Surface Coating Effects on the Assembly of Gold Nanospheres. NANOTECHNOLOGY, 21, 415701, 2010

[J20] A. POLEMI, S. MACI. Closed form expressions for the modal dispersion equations and for the characteristic impedance of a metamaterial-based gap waveguide. Special Issue of MICROWAVE METAMATERIALS: APPLICATION TO DEVICES, CIRCUITS AND ANTENNAS, 4, 8, 1073–1080, 2010

[J21] L. VINCETTI, A. POLEMI. Numerical Analysis of Propagating and Radiating Properties of Hollow Core Photonic Band Gap Fibres for THz Applications. IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, 58, 7, 2465 - 2468, 2010

[J22] M. BORGARINO, A. POLEMI, A. MAZZANTI. Low-Cost Integrated Microwave Radiometer for Ground-based Applications. IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUE, 57, 12, pp. 3011-3018, 2009

[J23] F. VIPIANA, A. POLEMI, S. MACI, and G. VECCHI. A mesh-adapted closed-form regular kernel for 3d singular integral equations. IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, 56, 6, 1687 - 1698, 2008

[J24] A. POLEMI, G. CARLUCCIO, M. ALBANI, A. TOCCAFONDI, and S. MACI. Incremental theory of diffraction for complex point source illumination. RADIO SCIENCE, 42, RS6S23, 2007

[J25] L. VINCETTI, A. POLEMI, and M. ZOBOLI. Microstrip array antenna for fire-detection applications. MICROWAVE AND OPTICAL TECHNOLOGY LETTERS, 49, 2279–2282, 2007

[J26] A. POLEMI and S. MACI. On the polarization properties of metamaterial lenses. IEEE ANTENNAS AND WIRELESS PROPAGATION LETTERS, 5, 306–310, 2006

[J27] L.B.FELSEN, S. MACI, A. POLEMI, and A. TOCCAFONDI. High- frequency Green's function for a semi-infinite array of electric dipoles on a grounded slab. Part III: Phase-matched wave interactions and numerical results. IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, 53,1663–1671, 2005

[J28] S. MACI, A. TOCCAFONDI, A. POLEMI, and L.B.FELSEN. High- frequency green's function for a semi-infinite array of electric dipoles on a grounded slab. Part II: Spatial domain parameterization. IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, 53, 1364–1376, 2005

[J29] M. ALBANI, F. CAPOLINO, A. CUCINI, L. B. FELSEN, S. MACI, F. MARIOTTINI, E. MARTINI, A. POLEMI, R. TIBERIO, and A. TOCCAFONDI. The truncated floquet wave diffraction theory for planar phased arrays: an overview. FIELDS, NETWORKS, COMPUTATIONAL METHODS, AND SYSTEMS IN MODERN ELECTRODYNAMICS, edited by P. Russer, M. Mongiardo, Springer Proceedings in Physics, 97, 75-93, Springer-Verlag, Berlin, 2005

[J30] R. TIBERIO, A. TOCCAFONDI, A. POLEMI, and S. MACI. Incremental theory of diffraction, a new improved formulation. IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, 52, 2234–2243, 2004

[J31] S. MACI, A. POLEMI, A. TOCCAFONDI, and L. B. FELSEN. High- frequency Green's function for an infinite periodic line array of phased electric dipoles on an infinite stratified grounded dielectric slab. ELECTROMAGNETICS IN A COMPLEX WORLD: CHALLENGES AND PERSPECTIVES, Springer series, 89–107, 2004

[J32] A. POLEMI, A. TOCCAFONDI, and S. MACI. High-frequency Green's function for a semi-infinite array of electric dipoles on a grounded slab. Part I: formulation. IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, 49, 1667–1677, 2001

CONFERENCE PROCEEDINGS

[C1] M. CELLI, A. POLEMI, L. VINCETTI. Nitride-based plasmonic nanoantenna for future CMOS integration. RiNem, 12-14 September, 2016, Parma, Italy

[C2] A. POLEMI, S. MACI. Leaky-wave slot antennas at optical frequencies. Antennas and Propagation Society International Symposium 2012, IEEE, Chicago, IL, July 4-8, 2012

[C3] A. POLEMI, K.L. SHUFORD. Nano-Corrugated Plasmonic Surface for Light Trapping. Antennas and Propagation Society International Symposium 2012, IEEE, Chicago, IL, July 4-8, 2012

[C4] A. POLEMI, K. SHUFORD. Fabry-Perot Effect on Dimer Nanoantennas. MRS Conference 2011, San Francisco, CA, April 25-29, 2011

[C5] M. BODILJEVAC, A. POLEMI, S. MACI, Z. SIPUS. Analytic approach to the anlysis of ridge and groove waveguides - comparison of two methods. In Eucap 2011, Rome, Italy, April 11-15, 2011

[C6] K. SHUFORD, A. POLEMI, S.M. WELLS, M.J. SEPANIAK, N.V. LAVRIK. Pillar nanosurfaces for SERS. In Antennas and Propagation Society International Symposium 2010, IEEE, Toronto, Canada, July 11-17, 2010

[C7] A. POLEMI, A. ALU', N ENGHETA. Nanocircuit loading of optical plasmonic waveguides. In Antennas and Propagation Society International Symposium 2010, IEEE, Toronto, Canada, July 11-17, 2010

[C8] A. POLEMI, E. RAJO-IGLESIAS, S.MACI. Analytical Dispersion Characteristics of Gap-Groove Waveguides. In Antennas and Propagation Society International Symposium 2010, IEEE, Toronto, Canada, July 11-17, 2010

[C9] A. POLEMI, S. M. WELLES, N.V. LAVRIK, M.J. SEPANIAK, K. SHUFORD. Local field enhancement of Pillar nano arrays for SERS. In Plasmonics: Gordon Research Conferences (GRC), Colby, ME, June 13-18, 2010

[C10] V. SETTI, L. VINCETTI, A. POLEMI. Propagating and Radiating Properties of Broadband Hollow Core Fibers in Terahertz Spectral Region. In European Conference on Antennas and Propagation: EUCAP 2010, Barcelona, Spain, 12-16 April 2010

[C11] A. POLEMI, S. MACI, P.S. KILDAL. Approximated Closed Form Characteristic Impedance for the Bed of Nails-based Gap Waveguide. In European Conference on Antennas and Propagation: EUCAP 2010, Barcelona, Spain, 12-16 April 2010

[C12] L. VINCETTI, A. POLEMI. Hollow Core Fibre for THz Applications. In Antennas and Propagation Society International Symposium 2009, IEEE, Charleston, SC, 1-5 June 2009

[C13] A. POLEMI, S. MACI, P-S. KILDAL. Searching for Analytic Modal Solutions for the Gap Waveguide. In URSI International Symposium 2009, IEEE, Charleston, SC, 1-5 June 2009

[C14] A. POLEMI, L. VINCETTI, M. ZOBOLI, 2.45 GHz Radio Transponder Antenna for SAW sensors, XVII RiNEm, Riunione Nazionale di Elettromagnetismo,Lecce, Italy, 15-19 September 2008

[C15] G. MANNI, A. POLEMI, M. BORGARINO, L. VINCETTI. Ku-Band Radiometer Antenna Characterization in University Test Facilities. In URSI International Symposium 2008, IEEE, San Diego, CA, 5-12 July 2008

[C16] A. POLEMI, A. TOCCAFONDI. Dual Band Slot-Type Binocular Antenna for RFID applications. In Antennas and Propagation Society International Symposium 2008, IEEE, San Diego, CA, 5-12 July 2008

[C17] F. VIPIANA, A. POLEMI, S. MACI, G. VECCHI. A Regularized Multi-layered Green's Function. In Antennas and Propagation Society International Symposium 2008, IEEE, San Diego, CA, 5-12 July 2008

[C18] A. POLEMI, F. VIPIANA, F. MARIOTTINI, G. VECCHI, S. MACI. MoM-Oriented Array Green's Function for the Analysis of Large Finite Arrays. In Antennas and Propagation Society International Symposium 2008, IEEE, San Diego, CA, 5-12 July 2008

[C19] F. VIPIANA, A. POLEMI, G. VECCHI, and S. MACI. Hybrid spatial- spectral analysis of periodic structures. In Antennas and Propagation Society International Symposium 2006, IEEE, pp. 2867–2870, Albuquerque, NM, 9-14 July 2006

[C20] F. VIPIANA, A. POLEMI, S. MACI, and G. VECCHI. Spectral filtering of the spatial green's function. In Antennas and Propagation Society International Symposium 2007, IEEE, Honolulu, HI, 10-16 June 2007

[C21] L. VINCETTI, A. POLEMI, and M. ZOBOLI. Microstrip array antenna for fire-detection applications. In Antennas and Propagation Society International Symposium 2007, IEEE, Honolulu, HI, 10-16 June 2007

[C22] F. VIPIANA, A. POLEMI, G. VECCHI, and S.MACI. Spectral filtering for space-domain analysis of periodic structures. In The European Conference on Antennas and Propagation: EUCAP 2006, Nice, France, 6-9 Nov 2006

[C23] L. VINCETTI, A. POLEMI, and M. ZOBOLI. Microstrip array antenna for fire-detection applications. In The European Conference on Antennas and Propagation: EUCAP 2006, Nice, France, 6-9 Nov 2006

[C24] A. POLEMI, M. ALBANI, G. CARLUCCIO, A. TOCCAFONDI, and S. MACI. Incremental theory of diffraction for complex source illumination. In The European Conference on Antennas and Propagation: EUCAP 2006, Nice, France, 6-9 Nov 2006

[C25] A. TOCCAFONDI, S. MACI, A. POLEMI, M. ALBANI, and F. CAPOLINO. The contributions of prof. Roberto Tiberio to the incremental theory of diffraction for electromagnetic. In Antennas and Propagation Society International Symposium 2006, IEEE, pp. 2461–2464, Albuquerque, NM, 9-14 July 2006

[C26] A. POLEMI and S. MACI. Polarization properties of planar dielectric lenses. In Antennas and Propagation Society International Symposium 2006, IEEE, pp. 3357–3360, Albuquerque, NM, 9-14 July 2006

[C27] A. POLEMI, M. ALBANI, G. CARLUCCIO, A. TOCCAFONDI, and S. MACI. Generalization to complex source excitation of the incremental theory of diffraction. In Antennas and Propagation Society International Symposium 2006, IEEE, pp. 1857–1860, Albuquerque, NM, 9-14 July 2006

[C28] G. MANARA, P. NEPA, A. POLEMI, and A. TOCCAFONDI. Recent developments in diffraction theory for impedance structures. In Antennas and Propagation Society International Symposium 2006, IEEE, pp. 2470– 2473, Albuquerque, NM, 9-14 July 2006

[C29] M. ALBANI, F. CAPOLINO, A. CUCINI, S. MACI, F. MARIOTTINI, E. MARTINI, A. POLEMI, and A. TOCCAFONDI. An overview of the truncated Floquet wave diffraction theory. In Antennas and Propagation Society International Symposium 2006, IEEE, pp. 1237–1240, Albuquerque, NM, 9-14 July 2006

[C30] R. TIBERIO, A. POLEMI, and A. TOCCAFONDI. Uniform and incremental formulations for the diffraction at the edge of a truncated dielectric screens. In 18th International Conference on Applied Electromagnetics and Communications, 2005. ICECom 2005, pp. 1–4, Dubrovnik, Croatia, 12-14 Oct. 2005

[C31] A. POLEMI, F. MARIOTTINI, and S. MACI. Hybrid numerical/asymptotic approach for the analysis of rectangular array greens function in a multilayered dielectric slab. In 18th International Conference on Applied Electromagnetics and Communications, 2005. ICECom 2005, pp. 1–6, Dubrovnik, CR, 12-14 Oct. 2005

[C32] R. TIBERIO, A. POLEMI, and A. TOCCAFONDI. UTD-based formulation for the diffraction at the edge of a truncated dielectric screens: Surface wave phenomenology. In Antennas and Propagation Society International Symposium 2005, IEEE, volume 4b, pp. 255–258, Washington, DC, 20-25 June 2005

[C33] A. TOCCAFONDI, R. TIBERIO, and A. POLEMI. An incremental theory of diffraction for edges in impedance surfaces. In Antennas and Propagation Society International Symposium 2004, IEEE, pp. 283–286, Columbus, OH, 22-27 June 2004

[C34] R. TIBERIO, A. POLEMI, and A. TOCCAFONDI. Surface wave-space wave diffraction mechanisms at the edge of joined planar screens. In Antennas and Propagation Society International Symposium 2004, IEEE, pp. 1987–1990, Columbus, OH, 22-27 June 2004

[C35] A. POLEMI, A. NENCINI, A. MACI, and A. Toccafondi. High-frequency green's function for a sectoral array of electric dipoles on a grounded slab. In 18th International Conference on Applied

Electromagnetics and Communications, 2003. ICECom 2003, pp. 294–299, Dubrovnik, CR, 1-3 Oct. 2003

[C36] A. POLEMI, A. CUCINI, and S. MACI. Hybrid mom-high frequency anal- ysis of large arrays of printed dipoles. In Antennas and Propagation Society International Symposium, 2001. IEEE., pp. 790–793, Boston, ME, 8-13 July 2001

[C37] A. POLEMI, A. TOCCAFONDI, and S. MACI. High frequency description of the field radiated by a strip array of printed dipoles. In Antennas and Propagation Society International Symposium, 2000. IEEE., pp. 514– 517, Salt Lake City, UT, 16-21 July 2000

PATENTS

[P1] "Engineered Dielectric Meta-materials". Application Ser. No. 62/447,242. January 2017.

[P2] "High-efficiency bulk photovoltaic effect devices". Application n. 62/370,381. August 2016.

[P3] "Miniaturized planar inverted folded antenna (PIFA) for mountable UHF tags design". Application n. 14982575 . December 2015

Specialized Education for Professional Development

2006 | European School of Antennas, Antenna Center of Excellence | University of Dubrovnik, Croatia

- Advanced Mathematics for Antenna Analysis

2005 | European School of Antennas, Antenna Center of Excellence | University of Siena, Italy

- High Frequency Methods and Travelling Wave Antennas

2005 | European School of Antennas, Antenna Center of Excellence | Polytechnic of Turin, Italy

- Computational EM for Antenna Analysis

2005 | European School of Antennas, Antenna Center of Excellence | Denmark Technical University – Ticra, Denmark

- Reflector Antennas: Analysis and Design

2002 | PhD school | University of Ancona, Italy

- Ground-Penetrating Radar

2002 | PhD school | Chalmers University of Technology, Gothenburg, Sweden

- Artificial Magnetic Conductors, Soft and Hard surfaces, and their Use in Antenna Analysis and Design

2000 | PhD school | University of Siena, Italy

- Functional analysis elements.
- Interpolation and approximation of curves and surfaces.
- Optimization Methods.
- Wavelets.

- Object-Oriented Programming

Teaching Experience

2020 | Adjunct Professor| Drexel University, Philadelphia, Pa

- Engineering Reliability, undergraduate course

2019-2020 | Adjunct Professor| Drexel University, Philadelphia, Pa

- Applied Engr Analy Methods III, MS and graduate course

2013 TO PRESENT | Research Professor and Adjunct Professor| Drexel University, Philadelphia, Pa

- Electronic and Photonic properties of materials, undergraduate course

2011 TO 2017 | Assistant Professor | University of Modena, Italy

- 1 credit Photonics, graduate course
- 1 credit Advanced Photonics, graduate course

2015 SPRING | Adjunct Professor | Rutgers University, New Brunswick, Nj

- Solar Cells, undergraduate and graduate course

2014 FALL | Adjunct Professor | Rutgers University, New Brunswick, Nj

- Optoelectronics I, undergraduate and graduate course

2009 TO 2005 | Assistant Professor | University of Modena, Italy

- Radio Propagation, graduate course
- Electromagnetic Fields, undergraduate course
- Microwave Laboratory, graduate course

2005 | Lecturer | European School of Antennas, Antenna Centre Of Excellence, University of Siena, Italy

Lectures presented within graduate seminar *High Frequency Methods and Travelling Wave Antennas*

- Green's Function of the Dielectric Slab
- Scattering from a Perfectly-Conducting Half-Plane

2002 TO 2005 | Instructor (post-doc) | University of Siena, Italy

- Electromagnetic Modeling, graduate course
- Design of Microwave Circuits, graduate course

2003 | Instructor | University of Messina, Italy

Lecture presented within graduate *seminar Master on Microwave Systems and Technologies for Telecommunications*

- Numerical Methods for Electromagnetics

2003 | Instructor (PhD Student) | University of Siena, Italy

- Antennas, graduate course

- Microwaves, graduate course
- Electromagnetic Fields, undergraduate course

Thesis Supervision

GRADUATE THESIS

- Nitride-based plasmonic nanoantenna for future CMOS integration (Michele Celli, 2016)
- Analysis of Backscattering from Planar Fresnel Lenses (Erio Gandini, 2009. Erio Gandini is now Research scientist at TNO, Netherlands Organisation for Applied Scientific Research)
- Devices for the Monitoring of Electromagnetic Interferences during Timing in Sport Races Throughout Rfid Systems (Luca Morandini, 2009. Luca Morandini is now manufacturing engineer at CEM Spa - Karcher group)
- Design of a Dual Band Antenna for Rfid Applications in the UHF Band (Javier M. Asenjo, 2008)
- Saw Sensors (Marcello Di Clemente, 2008. Marcello di Clementi is now Representative Technical Sale Italian Market at AZO, Inc)
- Design and Characterization of a Printed Dipole Antenna With Unbalanced Feeding (Lorenzo Santunione, 2007)
- Electromagnetic Characterization of Transitions Between Coaxial Cable And Microstrip (Guido Santamaria, 2007. Guido Santamaria is now Software and Automation engineer at B&G Automation)
- Wimax: Man Wireless Technology (Daniele Ciccarese, 2006)
- Antenna for Biomedical Rfid Application (Michele Gravina, 2006)
- Extension of the Incremental Theory of Diffraction to Complex Sources (Giorgio Carluccio, 2005. Giorgio Carluccio is now PostDoc at Delft University, the Netherlands)
- Asymptotic Green's Function for a Sectoral Array of Elementary Sources on a Dielectric Slab (Alberto Nencini, 2002)
- Generalized Pencil of Function Technique for Multilayered Printed Structures (Giacomo Donzelli, 2001. Giacomo Donzelli is now Software Solution Manager at Altran Italia S.p.A.)

UNDERGRADUATE THESIS

- Wide Band Patch Antennas Design (Gagliardi Giuseppina, 2008)
- Analysis and Design of a Planar Antenna for UWB Applications (Enrico Busi, 2007)

Research Grants and Contracts

ACADEMIC (Total>$700K)

- 2015. NSF STTR. *CMOS-Compatible Oxide Films for Tunable Microwave Technology*.
- 2009–2010. EuroStar Project. *New Production Process for Medical Bags Based on RadioFrequency Sterilization and ICT*. Role: Senior Investigator
- 2009–2010. European Space Agency (ESA), European Antenna Modeling Library (EAML). *TT&C Coverage in Complex Environments*. Role: Principal Investigator
- 2005–2007. European Antenna Modeling Library (EAML), contract with ESA-ESTEC. *Green's Function for Stratified Environments.* Role: Principal Investigator
- 2005–2006. Antennas Centre of Excellence (ACE), VI Framework Program WP. 3.1.1 *European School of Antennas*. Role: Co-Principal Investigator

- 2005–2007. PRIN (Progetto di ricerca di interesse nazionale). *Microwave Radiometer for Fire Monitoring*. Role: Principal Investigator
- 2004–2005. Antenna Centre of Excellence (ACE), V Framework Program WP. 1.1.1 *Integration, WP. 3.1.1 European School of Antennas*. Role: Senior Investigator
- 2003–2005. Progetto di ricerca di interesse nazionale (PRIN). *Electromagnetic Models for Analysis of Passive Reflectarrays*. Role: Co-Principal Investigator
-
- 2000–2002. Italian Space Agency (ASI). *Reflectarrays for Satellite Applications*. Role: Senior Investigator
- 2000–2002. Piano d'Ateneo per la Ricerca (PAR). *Antenna Installation for Wireless Communication Systems*. Role: Senior Investigator

COMMERCIAL (Total>$450K)

- 2008. Department of Information Engineering (University of Modena and Reggio Emilia) – MD spa (NDA-protected). *SAW sensors*. Role: Principal Investigator
- 2007–2008. Department of Information Engineering (University of Modena and Reggio Emilia) – Polytechnic of Turin*. Evolution and Evolutionary Maintenance of European Antenna Modeling Library* Components. Role: Principal Investigator
- 2005–2006. Department of Information Engineering (University of Siena) – IDS spa. *Green's Functions for Dielectric Multilayers; Extension to Magnetic Sources*. Role: Principal Investigator
- 2004–2005. Consorzio Etruria ed Innovazione scpa. *Electromagnetic Scattering from Non-Perfectly Conducting Half-Planes and Junctions Between Planes: UTD and ITD Formulation*. Role: Senior Investigator
- 2003–2004. Consorzio Etruria ed Innovazione scpa. *Feasibility and Design of an Automatic Identification System on Controlled Areas Based on the Standard ISO/IEC 15693*. Role: Senior Investigator
- 2002–2003. Department of Information Engineering (University of Siena) – IDS spa. *Incremental Theory of Diffraction for Dielectric Screens*. Role: Senior Investigator
- 2000–2002. Department of Information Engineering (University of Siena) – IDS spa. *Green's Function for Multilayered Materials*. Role: Senrior Investigator
- 2000–2001. Department of Information Engineering (University of Siena) – IDS spa. *Electromagnetic Models for Prediction of Scattering Objects*. Role: Senior Investigator

Memberships and Affiliations

- Institute of Electrical and Electronics Engineering (IEEE), member
- IEEE Antennas and Propagation Society (IEEE AP-S), member
- Institution of Engineering and Technology (IET), past member and student adviser
- National qualification for engineers at the University of Florence (Italy)

Professional Service

Chairman of Conference Sessions:

- International Conference on Applied Electromagnetics and Communications, ICECom, Dubrovnik, CR, 12-14 Oct. 2005
- Antennas and Propagation Society International Symposium, Honolulu, Hi, 10-16 June 2007
- Antennas and Propagation Society International Symposium, Charleston, SC, 1-5 June 2009

Reviewer in Journals and Conferences:

- IEEE Trans. Antennas and Propagation
- IEEE Antennas and Wireless Propagation Letters
- IEEE Transactions on Microwave Theory and Techniques
- IEEE Microwave and Wireless Components Letters
- Journal of Selected Topics in Quantum Electronics
- Journal of Physical Chemistry
- Journal of Applied Physics
- Optics Express
- Journal of Nanotechnology
- IET Microwaves, Antennas and Propagation

Professional Software Competency

- Main Operating systems
- MS Office
- CorelDraw
- Latex
- Fortran
- Mathematica
- Matlab
- AWR Microwave Office
- Electromagnetic simulation software: CST Microwave Studio – Comsol – HFSS – Feko - Grasp

Professional References

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