



# Walter Fuscaldo

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## Personal Information

First Name Walter

Last Name Fuscaldo

## Working Activities

Jul. 2020 – Today **Researcher**, *Institute for Microelectronics and Microsystems*, Italian National Research Council.

Duration 3 years

Activities Analysis and design of low-profile reconfigurable antennas for satcom applications; analysis and design of terahertz filters; terahertz characterization of materials; wireless power transfer in the radiative near field; design of microwave frequency selective surface radar absorbing materials; optimization of 1-D leaky-wave antennas

- Achievements
- co-PI of granted PRIN 2022 SAFE (Spiral and Focused Electromagnetic Fields). Total budget: 275 k€. CNR-IMM budget: 105 k€.
  - National scientific qualification as Associate Professor. Academic Recruitment Field: 09/F1 *Electromagnetic Fields*.
  - Minerva Prize Honorable Mention for outstanding research performance in Engineering at Sapienza University of Rome. Validity: 18/11/2020–18/11/2029.
  - Tutor for the course *Communications Technology* and Tutor and Professor for the course *Electronics and Measurements* at UniNettuno University.
  - Topic Editor – *MDPI Crystals*
  - COST Action CA 18223 *Future communications with higher-symmetric engineered artificial materials*, Role: Management Committee Substitute Member for Italy. Duration: 2021–2023.
  - COST Action CA 18223 *Future communications with higher-symmetric engineered artificial materials* Short Term Scientific Mission (STSM) 15/06/2021 – 04/07/2021. Budget: 3.5k€.
  - Co-Guest Editor – *MDPI Appl. Sci. – Special Issue* “Technology and Application of Microwave Communication and Antenna Design”
  - Review Editor – *ISP Frontiers in Signal Processing – Radar Signal Processing* Section
  - Advisor of 2 PhD students
  - Advisor of 12 Ms. C. students from Sapienza University of Rome, Roma Tre University, and UniNettuno University.
  - 5 prototypes (4 Bessel-beam launchers at 30 GHz for PRIN 2017 project, 1 microwave absorber for MDBA project)
  - Collaborator in 4 projects (see section [Projects and Grants](#) for further details).

Jan. 2018 – Jun. 2020 **Postdoctoral Research Fellow**, *Department of Information Engineering, Electronics, and Telecommunications*, Sapienza University of Rome, Rome, Italy.

Mar. 2017 – Sep. 2017

Duration 36 months

Activities Design and optimization of Fabry–Perot cavity leaky-wave antennas at THz; frequency-domain/time-domain near-field focusing (e.g., Bessel and Bessel–Gauss beams, X-waves, etc.) through leaky-wave radiating systems; generation of vortex beams (OAM) through higher-order cylindrical leaky waves; advances in leaky-wave theory and leaky-wave antennas; design of graphene-based reconfigurable THz antennas; design and prototyping of phased arrays for software-defined radar applications; time-domain analysis of ground penetrating radar (GPR) data.

- Achievements
- Associate Editor – *IET Microwaves, Antennas and Propagation* and *IET Electronic Letters* journals
  - 4 book chapters
  - Advisor of 1 Bs. C. and 9 Ms. C. students from Sapienza University of Rome.
  - 16 peer-reviewed international journal papers
  - 30 peer-reviewed international conference papers
  - 3 peer-reviewed national conference papers
  - 1 prototype ( $2 \times 8$  array of patches for Leonardo S.p.A. project)
  - Collaborator in 5 projects (see section [Projects and Grants](#) for further details).
  - 8 awards (see section [Awards](#) for further details)

Jun. 2018 – Aug. 2018 **Visiting Scientist**, *NATO STO - Centre for Maritime Research and Experimentation (CMRE)*, La Spezia, Italy.

Sep. 2017 – Dec. 2017

Sep. 2014 – Dec. 2014

Duration 9 months

Activities Ship Detection/Tracking using multistatic Global Position Satellite (GPS) signals; Electromagnetic modeling of scattering problems for ship detection in maritime scenarios through Global Navigation Satellite System Reflectometry (GNSS-R) signals and through high-resolution radars.

- Achievements NATO works with sensitive information and limits access to individuals with proper security clearance. Most of the material performed in this time frame is considered of strategic importance and thus marked as NATO Unclassified (further information on NATO security classification can be found at <https://www.nato.int>). As a consequence, the related works are not publicly released by virtue of a *non-disclosure agreement*.
- 2 peer-reviewed international journal papers
  - 3 peer-reviewed international conference papers
  - 1 peer-reviewed national conference paper
  - 1 project with the Office of Naval Research (ONR) for research activities
  - planning collaborations with ONR for next year projects.
  - creating a research network between NATO-STO CMRE, University of Rome Sapienza, and University of Naples Federico II.

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## Internships

May 2016 – Sep. 2016 **Intern/Ph.D. Student**, *University of Houston*, Houston (TX), USA

Duration 4 months

Supervisors Prof. David R. Jackson *University of Houston*, Prof. Alessandro Galli *Sapienza University of Rome*

Description Analytical framework for the evaluation of different figures of merit (beamwidth, directivity, sidelobe level, and etc.) of leaky-wave antennas.

- Achievements
- 2 peer-reviewed international journal papers
  - 2 peer-reviewed international conference papers
  - starting a fruitful collaboration with Prof. IEEE Fellow David R. Jackson: the worldwide recognized expert in leaky waves and leaky-wave antennas.

Jan. 2015 – Jul. 2015 **Intern/Ph.D. Student, IETR UMR CNRS 6164, Rennes, France**  
Jan. 2014 – Mar. 2014

Duration 9 months

Supervisors Alessandro Galli *Sapienza University of Rome*, and Mauro Ettore *University of Rennes 1*

Description Development of a theoretical framework for the analysis of nondiffracting waves generated through Bessel-beam launchers at millimeter waves.

- Achievements
- 3 peer-reviewed international journal papers
  - 9 peer-reviewed international conference papers
  - 1 peer-reviewed national conference paper
  - 1 prototype (first experimental demonstration of Bessel beams through higher-order leaky modes at millimeter waves).

Jan. 2013 – Jul. 2013 **Intern/Thesis Student, IETR UMR CNRS 6164, Rennes, France**

Duration 6 months

Supervisors Prof. Alessandro Galli *Sapienza University of Rome*, and Prof. Ronan Sauleau *University of Rennes 1*

Description Analytical study and pre-design of a 40 GHz Bessel beam launcher for near-field applications.

- Achievements
- Preparation of manuscripts for peer-reviewed journals and conferences
  - Master's degree with honors (see section [Education](#)).

Mar. 2012 – May. 2012 **Intern/Master Student, ELT Elettronica S.p.A., Rome, Italy.**  
Sep. 2011 – Jan. 2012

Duration 6 months

Supervisors Antonio Manna and Fabrizio Trotta *ELT S.p.A.*

Description Design of 1-D and 2-D arrays of Vivaldi antennas. Design of conformal arrays of dual-polarized quadruple ridged horn over the 6–18 GHz Band. Full-wave simulation, analysis of results, and documentation.

- Achievements
- Mastering full-wave commercial solvers for electromagnetic analysis
  - Development of an antenna library for ELT S.p.A.

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## Education

Nov. 2013 – Feb. 2017 **Ph. D. in Information and Communication Technology, Sapienza University of Rome (Italy) and University of Rennes 1 (France).**

- Duration 3 years. This is currently the standard duration in Italy. Since 2016 PhD students must defend their thesis within the fourth year.
- Title *Advanced Radiating Systems Based on Leaky Waves and Nondiffracting Waves*
- Supervisors Prof. Alessandro Galli *Sapienza University of Rome* and Dr. Mauro Ettore *University of Rennes 1*
- Examination Committee Prof. Giuseppe Schettini, Prof. Alessandro Toscano *Roma Tre University*, Prof. IEEE Fellow Francisco Medina-Mena *University of Seville*
- Grade Ph.D. degree (*cum laude* and with the *Doctor Europaeus label*); international cotutelle agreement between Sapienza University of Rome and University of Rennes 1.
- Description Investigation of near-field focusing systems generating Bessel beams through leaky modes in the millimeter-wave frequency range. Theoretical analysis and design of near-field focusing systems generating limited-dispersive, limited-diffractive X-waves. Analysis and design of reconfigurable leaky-wave antennas based on graphene and nematic liquid crystals whose main beam can electronically be steered at fixed frequency. Note that all publication records reported below also include contributions achieved during the internships performed in the PhD time frame.
- Achievements
- Advisor of 1 Bs. C. student from Sapienza University of Rome.
  - I was the recipient of a 3-years PhD national grant at the University of Rome Sapienza (ranked second out of more than 40 participants). National grants are assigned in accordance to the scores of a competitive entrance exam test.
  - 10 peer-reviewed international journal papers
  - 21 peer-reviewed international conference papers
  - 5 peer-reviewed national conference papers
  - 2 awards (see section [Awards](#) for further details): 1) The Young Engineer Prize at the European Microwave Conference, 2016; 2) The Yarman-Carlin Student Award at the IEEE Mediterranean Microwave Symposium, 2015
  - 2 French mobility grants from Matisse École Doctorale
  - 2 European mobility grants from NEWFOCUS project
  - 2 annual projects (collaborator) financed by Sapienza University of Rome.

Jan. 2011 – Jul. 2013 **M. Sc. in Telecommunications Engineering**, *Sapienza University of Rome*, Rome, Italy.

Duration 2 years

Grade 110/110 "summa cum laude".

Title *Design of Advanced Radiating Systems based on Leaky Waves for the Generation of Bessel Beams*

Supervisors Prof. Alessandro Galli *Sapienza University of Rome*, and Prof. Ronan Sauleau *University of Rennes 1*

Description Design of Bessel beam launcher using higher-order leaky-wave modes.

- Achievements
- Average mark score of 29.1/30 + 6 “laude” marks on a total of 15 exams with written and oral tests during the 2 years Laurea career
  - In 2013, the M. Sc. in Telecommunications Engineering resulted as one of the two courses of the faculty of Information Engineering of Sapienza University of Rome with the lowest scores achieved by their students (an average final grade of 105.2 and an average mark score of 25.0). Data taken from [www.almalaurea.it](http://www.almalaurea.it).
  - In 2013, the Information Engineering Faculty and in particular the Telecommunications Engineering course at Sapienza University of Rome have been among the three highest-demanding M. Sc. degrees in Italy (as highlighted by the low scores achieved by their students). Data taken from [www.almalaurea.it](http://www.almalaurea.it)
  - 6 months internship by ELT Elettronica S.p.A., Rome, Italy, aimed at designing a 6-18 GHz dual-pol quad-ridged horn, and a 2-D array of Vivaldi antennas using a commercial CAD solver.

Sep. 2007 – Dec. 2010 **B. Sc. in Communications Engineering**, *Sapienza University of Rome*, Rome, Italy.

Duration 3 years

Title *Analytical Methods for Electromagnetic Radiation Problems*

Grade 110/110.

Supervisor Prof. Alessandro Galli *Sapienza University of Rome*

Description Multipole expansion and spherical harmonics expansion in electromagnetic problems.

- Achievements
- Average mark score of 27.2/30 + 2 “laude” marks on a total of 23 exams with written and oral tests during the 3 years Laurea career
  - Less than 1% of the students enrolled in Engineering courses at Sapienza University of Rome achieve full marks at the Bachelor Degree. Indeed, in 2010, the B. Sc. in Information Engineering resulted as the faculty of the Sapienza University of Rome with the lowest score achieved by their students (an average final grade of 97.5 and an average mark score of 23.9). Data taken from [www.almalaurea.it](http://www.almalaurea.it)
  - In 2010, the Information Engineering Faculty and in particular the Telecommunications Engineering course at Sapienza University of Rome have been among the ten highest-demanding B. Sc. degrees in Italy (as highlighted by the low scores achieved by their students). Data taken from [www.almalaurea.it](http://www.almalaurea.it).

Sep. 2006 – Sep. 2007 **B. Sc. in Mathematics**, *Sapienza University of Rome*, Rome, Italy.

Duration 1 year

Description I started my bachelor study at the faculty of Mathematics, where I regularly succeeded the first year. Afterwards, I preferred to enroll in the Engineering curriculum where I restarted my student career from the beginning. I got the Bachelor's degree in Telecommunications Engineering within the regular three-years time frame, although I started one year later with respect to my peers.

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## Other Schools and Courses

Years 2014 – 2015 **ESoA Schools** (the whole list and certificates can be provided upon request)

Description I have attended two courses of the European School of Antennas. The ESoA school is the most important and biggest PhD school of Electromagnetic Engineering and Antennas in the world.

Years 2014 – 2015 **Academic Courses** (as above)

Description I have attended 5 M. Sc. and 1 PhD courses from the department of Mathematics, Physics and Engineering at Sapienza University of Rome.

Years 2012 – 2016 **Academic Online Courses** (as above)

Description I have attended 9 online courses offered by several prestigious universities through the web platform Coursera.

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## Awards

Nov. 2021 **Minerva Prize (Honorable Mention)**

W. Fuscaldo, "Advanced Radiating Systems Based on Leaky Waves and Nondiffracting Waves", *PhD Thesis*

Description There is one prize and one honorable mention for those who contributed to significant progress with their research activity in their field. All alumni, postdoc, and PhD students who attended a PhD in Sapienza University of Rome in the past 3 years can apply. I was awarded the honorable mention in the area of Engineering.

Sep. 2020 **Young Scientist Award in Fields and Waves, Electromagnetic Theory and Applications**

W. Fuscaldo, A. Benedetti, D. Comite, P. Burghignoli, P. Baccarelli, and A. Galli, "Diffractive and focusing properties of Bessel–Gauss beams in electromagnetics," *URSI-GASS*, Rome, Italy, 29 Aug. –05 Sep. 2020.

Description The prize is given to the best works and presented at the *33rd General Assembly and Scientific Symposium (URSI-GASS)*. The applicant must be less than under 35 years of age by the conference date. The applicant must be listed as the first author as well as the presenting author of a paper submitted for oral presentation. The committee evaluates the quality of the work as well as the CV of the applicant.

2021, 2020 and 2019 **IEEE Antennas and Propagation Society Reviewer Award**

Description The prize is assigned to the outstanding reviewers of the journal *IEEE Transactions on Antennas and Propagation*.

2019 and 2018 **Publons Peer Review Award**

Description The prize is assigned to those who ranked in the top 1% reviewers in a given field on Publons' global reviewer database, determined by the number of peer review reports performed during the Award year. In 2019 I was awarded in the *Cross-field* and *Engineering* fields. In 2018 I was awarded in the *Engineering* field.

Jun. 2019 **Young Scientist Award in CEM, EMC, Scattering & EM Theory**

W. Fuscaldo, D. R. Jackson, and A. Galli "New Beamwidth Formulas for 1-D Leaky-wave Antennas: A Review", *PIERS*, Rome, Italy, 17-20 June 2019.

Description The prize is given to the best work presented at the *41st Photonics & Electromagnetics Research Symposium*. The applicant must have a PhD degree in science/engineering and under 40 years of age by the conference date. The applicant must be listed as the first author as well as the presenting author of a paper submitted for oral presentation. The committee evaluates the quality of the work as well as the CV of the applicant. In that occasion the was composed by: Prof. Qing Huo Liu *Duke University*, Prof. Yury Shestopalov, *University of Gavle*, Prof. Eng Leong Tan *Nanyang Technological University*.



- Sep. 2018 **Best Paper Award in Applied Electromagnetics (Barzilai Prize)**  
 D. Comite and W. Fuscaldo, "Focusing Through Cylindrical Leaky Waves", *XXII RiNEM*, Cagliari, Italy, 03-06 September 2018.
- Description The prize is given to the best work presented at the *Riunione Nazionale di Elettromagnetismo*. All authors must be younger than 35 years old at the time of the presentation. The committee is composed by three national experts (in that occasion the committee was composed by: Prof. Sandra Costanzo, *University of Reggio Calabria*, Prof. Antonio Iodice, and Prof. IEEE Life Fellow Ovidio Maria Bucci *University of Naples, Federico II*). The committee evaluates the quality of the oral presentation (I was the presenter) and the originality of the work.
- Apr. 2018 **Best Paper Award in Electromagnetics and Antenna Theory**  
 W. Fuscaldo et al., "Design Criteria of X-Wave Launchers for Millimeter-Wave Applications", *12th European Conference on Antennas and Propagation (EuCAP18)* London, UK, 9-13 April 2018.
- Description The prize is given to the best work presented at the *European Conference on Antennas and Propagation*. The eligible works must prepare a poster in addition to the oral presentation. The originality of the work, the quality of the oral presentation, and interaction at the poster session are evaluated by a committee of recognized international experts (in that occasion the committee was composed by: Prof. IEEE Fellow Andrea Neto, *Technical University of Delft* Prof. IEEE Fellow Richard W. Ziolkowski *University of Arizona*, and Prof. IEEE Fellow Juan Mosig, *École Polytechnique Fédérale de Lausanne*).
- Jan. 2018 **IEEE AP-S Student Award, Chapter Center-Southern Italy**  
 W. Fuscaldo, "Advanced Radiating Systems Based on Leaky Waves and Nondiffracting Waves", *PhD Thesis*, 27 February 2017.
- Description The prize is given to the best research document (original article, thesis, etc.) produced in the year 2017. The works are evaluated by a committee of recognized national experts (in that occasion the committee was composed by: Prof. Alessandra Costanzo *University of Bologna Alma Mater*, Prof. IEEE Fellow Maurizio Bozzi *University of Pavia*, Prof. Paola Pirinoli *Politecnico di Torino*).
- Oct. 2016 **Young Engineer Prize**  
 W. Fuscaldo, P. Burghignoli, P. Baccarelli, A. Galli, "Efficient 2-D Leaky-Wave Antenna Configurations Based on Graphene Metasurfaces", *46th European Microwave Conference (EuMC16)* London, UK, 3-7 October 2016.

Description The prize is given to the best paper presented by young researcher (under 30) at the European Microwave Conference. The Young Engineer Prize is the most prestigious award for a young researcher working in the field of microwaves. The European Microwave Week is the biggest european event (about 4000 attendees, and 1500 delegates) in the context of microwaves

Dec. 2015 **Yarman-Carlin Student Award (2<sup>nd</sup> prize)**

W. Fuscaldo, P. Burghignoli, P. Baccarelli, A. Galli, "Graphene-based Reconfigurable Leaky-Wave Antennas for THz Applications", *2015 IEEE 15th Mediterranean Microwave Symposium (MMS15)*, pp.282-285, Lecce, Italy, 2015.

Description The prize is given to the best paper presented by students (under 35 years old) participating at the IEEE Mediterranean Microwave Symposium. The committee is composed by four international experts (in that occasion the committee was composed by: Prof. Salvatore Caorsi, *University of Pavia*, Prof. Mohamed Essaaidi, *Abdelmalek Essaadi University*, Prof. IEEE Fellow Levent Gürel *Bilkent University*, and Prof. IEEE Fellow Siddik Yarman, *Istanbul University*). The committee evaluates the quality of the oral presentation and the originality of the work.

## Projects and Grants

### Italian Projects

Title			
Spiral and Focused Electromagnetic Fields			
Years	Funder	Budget	Role
2023–2025	MUR (PRIN 2022)	270 k€	Co-PI

  

Title			
Reconfigurable Near-Field LWAs for mm-W/THz Applications			
Years	Funder	Budget	Role
2022	Sapienza University of Rome	15 k€	Collaborator

  

Title			
Wireless Power Transfer for Wearable and Implantable Devices			
Years	Funder	Budget	Role
2019–2021	MIUR (PRIN 2017)	800 k€	Collaborator

Title			
Expert System for the Mitigation of Risks in Agriculture			
Years	Funder	Budget	Role
2019–2020	Lazio Innova	150 k€	Collaborator

Title			
Planar Traveling-Wave Antennas with Higher or Broken Symmetries			
Years	Funder	Budget	Role
2020	Sapienza University of Rome	35 k€	Collaborator

Title			
Efficient Radiating Systems for High-Frequency Wireless Power Transfer			
Years	Funder	Budget	Role
2019	Sapienza University of Rome	15 k€	Collaborator

Title			
Advanced Leaky-Wave Radiators for 5G Wireless Communications			
Years	Funder	Budget	Role
2018	Sapienza University of Rome	15 k€	Collaborator

Title			
Focusing Electromagnetic Fields with Leaky Waves for ICT Applications			
Years	Funder	Budget	Role
2017	Sapienza University of Rome	15 k€	Collaborator

Title			
Ship Detection/Tracking Using Multistatic GPS Signals			
Years	ID Number	Budget	Role
2017	N00014-16-13157	35 k€	Collaborator

**ONR Projects**

		Title		
<b>Leonardo S.p.A. Projects</b>	Graph-IR Development			
	Years	ID Number	Budget	Role
	2023–2026	COLB-CTR-2022-LED-18-A	1.1 M€	Collaborator
	Title			
<b>MBDA Projects</b>	Study of a Radiating System for Software-Defined Radar Applications			
	Years	ID Number	Budget	Role
	2017	COLB-CTR-2017-009-A	15 k€	Collaborator
	Title			
<b>MBDA Projects</b>	Realization of a Planar Microwave Absorber for EM Scattering			
	Years	ID Number	Budget	Role
	2021–2022	85855/19-03-2021	25 k€	Collaborator
	Title			
<b>CNR Bilateral Projects</b>	Two-dimensional nanomaterials toward THz optoelectronic applications			
	Years	ID Number	Budget	Role
	2019–2025	CNR-BAS (2019–2022, 2022–2025)	6 k€	Collaborator
	Title			
<b>Italian Grants</b>	Strongly resonant all-dielectric metasurfaces based on quasi-dark. . .			
	Years	ID Number	Budget	Role
	2022–2024	021/06506-0	44 k€	Collaborator
	Title			
<b>Italian Grants</b>	Technical Support to the Faculty of Information Engineering			
	Years	Funder	Budget	Role
	2017 – 2018	Sapienza University of Rome	5 k€	Collaborator

**French Mobility Grants**  
(each proposal is evaluated by a committee of experts in the field)

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Title			
Exact Analytical Formulas for Leaky-Wave Antennas			
Years	Funder	Budget	Role
2016	École Doctorale Matisse (City of Rennes)	800 €	PhD Student

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**European Mobility Grants**  
(each proposal is evaluated by a committee of experts in the field)

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Title			
Bessel beams and X-Wave modes at millimeter waves			
Years	Funder	Budget	Role
2015	École Doctorale Matisse (City of Rennes)	1.6 k€	PhD Student

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Title			
Focus Wave Modes Through a Bessel-Beam Launcher at mm-Waves			
Years	Funder	Budget	Role
2015	European Science Foundation (Newfocus)	6.4 k€	PhD Student

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Title			
Near-Field Focusing at mm-W by means of High-Order Leaky Modes			
Years	Funder	Budget	Role
2014	European Science Foundation (Newfocus)	3.2 k€	PhD Student

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## Mobility

Period	Place	Institution	Role
Mar. 2023 (1 week)	Rennes, France	Université de Rennes	Researcher
Nov/Dec. 2022 (1 week)	São Paulo, Brazil	Universidade Estadual de Campinas	—
Jul. 2021/22 (2 weeks)	Sofia, Bulgaria	Bulgarian Academy of Sciences	—
Jun. 2021 – Jul. 2021	Rennes, France	Université de Rennes	—
Jun. 2018 – Aug. 2018	La Spezia, Italy	NATO-STO CMRE	Visiting Scientist
Sep. 2017 – Dec. 2017	—	—	—
Sep. 2014 – Dec. 2014	—	—	—
May 2016 – Sep. 2016	Houston, TX, USA	University of Houston	PhD Student
Dec. 2017 – Jun. 2018	Rome, Italy	Sapienza University	Research Fellow
Sep. 2016 – Sep. 2017	—	—	—
Jul. 2015 – May 2016	—	—	PhD Student
Dec. 2015 – Jan. 2015	—	—	—
Mar. 2014 – Sep. 2014	—	—	—
Jun. 2013 – Jan. 2014	—	—	—
Jan. 2015 – Jul. 2015	Rennes, France	Université de Rennes 1	PhD Student
Jan. 2014 – Mar. 2014	—	—	—
Jan. 2013 – Jun. 2013	—	—	Master Student

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## Educational Activities

Mar. 2019–Today **Academic Courses**

Period Sep. 2022–Today

Title Laboratory of Excel for Business

Role Co-teching

Institution UNINT University, Faculty of Economics (B. Sc. in Economics and International Management).

Description Fundamentals of Excel software with applications to economics/business-oriented case studies.

Period Feb. 2022–Today

Title Communication Technologies

Role Tutor

Institution UniNettuno University, Faculty of Engineering (B. Sc. in Computer Engineering).

Description Linear and permanent systems, Fourier analysis, convolution and correlations between signals, analog and digital modulations, noise and noise figure, information theory.

Period Sep. 2021/May 2023–Today

Title Electronics and Electronic Measurements

Role Tutor/Professor

Institution UniNettuno University, Faculty of Engineering (B. Sc. in Computer Engineering).

Description From analog to digital components (diodes, BJT and MOS transistors, inverters, flip-flops, DAC/ADC, memories, etc.), uncertainty estimation, spectral analysis.

Period Mar.–May 2019, Mar.–May 2020, Apr.–May 2021

Title Laboratory of Microwave and Antenna Engineering, held by Prof. P. Baccarelli

Role Co-teaching

Institution Roma Tre University, Department of Engineering (B. Sc. in Electronic Engineering).

Description Transmission lines; scattering of plane waves; guided waves and resonators; two-port networks and their matrix representations; periodic structures; computational electromagnetics.

Apr. 2020 **ESoA Lectures**

Apr. 2017

Title Electromagnetic Properties of Graphene; Graphene Leaky-Wave Antennas

Institution Sapienza University of Rome European School of Antennas (ESoA)

Course Leaky Waves and Periodic Structures for Antenna Applications organized by Prof. F. Frezza (15 attendees)



Description The ESoA school is the most important and biggest PhD school of Electromagnetic Engineering and Antennas in the world.

Achievements In 2017, I ranked 10<sup>th</sup> out of 100 teachers (among which there are 17 IEEE Fellows as Nader Engheta, *University of Pennsylvania*, to name but one) for the quality of the speech. The rank is determined by the scores of the evaluation sheets that each participating student has to compile at the end of the course.

Sep. 2022 **Workshops**

Mar. 2017

Title Microwave Generation of Localized Waves Through Leaky Waves

Institution European Microwave Week (EuMW 2022) in Milan, Italy, 25–30 Sep., 2022

Course Workshop WS10: Electromagnetic Waves in Daily Life: Research Insights from Young Professionals, organized by P. Savi, *Giacomo Paolini* and F. Benassi *University of Bologna*, (xx attendees)

Description EuMW is one of the most important conference (about 1500 participants) in the context of microwave technology.

Title Perspectives of Tunable Leaky-Wave Antennas based on Graphene in the THz range

Institution European Conference on Antennas and Propagation (EuCAP 2017) in Paris, France, 19–24 Mar., 2017

Course Workshop SWS03: Nanotechnology Applications of Antennas and Wireless Sensing, organized by P. Savi, *Politecnico di Torino* and K. Naishadham *Georgia Institute of Technology*, (20 attendees)

Description EuCAP is one of the most important conference (about 1300 participants) in the context of antennas and propagation.

May 2014 – Today **Seminar Activity**

Description I have given several talks in different prestigious universities and institutions

- February 2022, The Wilhelm and Else Heraeus Foundation (invited talk for the seminar *Metamaterials – Designing Wave Propagation with a Focus on Electrodynamics* organized by M. Günter, V. Perlick, D. Philipp, and C. Lümmerzahl, 30 attendees)
- October 2019 – Today, University of Rome Sapienza (invited talks for PhD course held by Prof. Burghignoli, 10 attendees)
- May 2018 – Today, Roma Tre University (invited talks for the M. Sc. course held by Prof. P. Baccarelli, 10 attendees)
- Apr. 2014 – Today, University of Rome Sapienza (invited talks for the M. Sc. courses held by Prof. P. Burghignoli and Prof. A. Galli, 15 attendees)
- Aug. 2016, University of New Orleans (invited talk for the PhD program supervised by Prof. Leszek Malkinski, 15 attendees)
- Sep. 2016, University of Houston (invited talk for the M. Sc. course held by Prof. IEEE Fellow David R. Jackson, 30 attendees)

Mar. 2016 – Today **Advisor Activity**

Description I have been an advisor of 26 students (3 Ph.D., 21 M. Sc., 2 B. Sc.)

- 2023 Daniele Pirrone, Ph. D. student, Analysis and characterization of passive filters based on metasurfaces for terahertz wireless communications, supervised by Prof. R. Beccherelli, Uninettuno University
- 2022 Luca Del Biondo, M. Sc. student, Analysis of radiative near-field wireless links through Bessel-beam launchers, supervised by Prof. P. Burghignoli, Sapienza University of Rome
- 2022 Elena Ballarini, M. Sc. student, Electromagnetic characterization of innovative metasurfaces for leaky-wave antennas, supervised by Prof. A. Galli, Sapienza University of Rome
- 2022 Marco Toni, M. Sc. student, Reconfigurable THz leaky-wave antennas based on hybrid metal-graphene metasurfaces, supervised by Prof. A. Galli, Sapienza University of Rome
- 2022 Elahehsadat Torabi, Ph. D. student, Beam steering by the liquid crystal based leaky-wave antenna, supervised by Prof. D. Erricolo, University of Illinois at Chicago
- 2022 Seheime Ali, M. Sc. student, Waveguiding structures based on line waves, supervised by Prof. P. Baccarelli, Roma Tre University
- 2022 Mathieu Lézé, M. Sc. student, Analysis of leaky-wave antennas for Bessel-beam generation, supervised by Prof. P. Burghignoli, Sapienza University of Rome and École Nationale Supérieure de l'Électronique et ses Applications, France
- 2022 Tiziano Zecchinelli, M. Sc. student, Scattering and leakage phenomena for linear arrays of graphene-coated dielectric cylinders, supervised by Prof. P. Baccarelli, Roma Tre University
- 2022 Luca Arcara, M. Sc. student, Project, realization, and test of a temperature-control system based on micro-controller for liquid-crystal-based phase shifters for satcom applications, supervised by Prof. R. Beccherelli, Uninettuno University
- 2022 Daniele Pitotti, M. Sc. student, Project, realization, and test of a micro-controller for liquid-crystal-based phase shifters for satcom applications, supervised by Prof. R. Beccherelli, Uninettuno University
- 2021 Jacopo Cencioni, M. Sc. student, Design of metasurfaces for antenna arrays, supervised by Prof. A. Galli, Sapienza University of Rome
- 2021 Edoardo Negri, M. Sc. student, Leaky-wave radiating systems for wireless power transfer applications in the radiative near field, supervised by Prof. A. Galli, Sapienza University of Rome
- 2020 Francesca Imperato, M. Sc. student, Design of reconfigurable THz leaky-wave antennas based on liquid crystals and metasurfaces, supervised by Prof. A. Galli, Sapienza University of Rome

- 2020 Alessandro Tinti, M. Sc. student, Design and development of printed gap waveguide transitions for future mm-wave automotive radars, supervised by Prof. A. Galli, Sapienza University of Rome
- 2020 Manuel Luciarini, M. Sc. student, Innovative designs for omni-synthetic wideband antennas, supervised by Prof. A. Galli, Sapienza University of Rome
- 2020 Giancarlo Merola, M. Sc. student, Planar bull-eye antennas radiating twisted Bessel beams, supervised by Prof. P. Burghignoli, Sapienza University of Rome
- 2020 Elisa Pietrangeli, M. Sc. student, Reconfigurable synthesis techniques for terahertz graphene-based 1-D unidirectional leaky-wave antennas, supervised by Prof. A. Galli, Sapienza University of Rome
- 2020 Andrea Petricca, M. Sc. student, Multifunctional active electronically scanned arrays, supervised by Prof. A. Galli, Sapienza University of Rome
- 2019 Francesco Mancini, M. Sc. student, Analysis and design criteria for the generation of higher-order cylindrical leaky waves, supervised by Prof. P. Burghignoli, Sapienza University of Rome
- 2018 Silvia Tofani, Ph. D. student, Static and reconfigurable devices for near-field and far-field terahertz applications, supervised by Prof. A. Galli, Sapienza University of Rome
- 2018 Daniele Palombi, M. Sc. student, Bessel-Gauss beams through cylindrical leaky waves, supervised by Prof. P. Burghignoli, Sapienza University of Rome
- 2017 Matteo Colantonio, B. Sc. student, Analysis of terahertz feeders for Fabry-Perot cavity leaky-wave antennas, supervised by Prof. A. Galli, Sapienza University of Rome
- 2017 Paolo De Santis, M. Sc. student, Study of TE-TM waves launchers in azimuthally-symmetric planar structures, supervised by Prof. P. Burghignoli, Sapienza University of Rome
- 2017 Alessandro Boesso, M. Sc. student, Leaky-wave planar structures for the generation of nondiffracting beams, supervised by Prof. P. Burghignoli, Sapienza University of Rome
- 2017 Andrea Giraldi, M. Sc. student, Study of graphene-based radiating devices for terahertz applications, supervised by Prof. A. Galli, Sapienza University of Rome
- 2016 Francesca Moratti, B. Sc. student, Electromagnetic analysis of homogenized metasurfaces, supervised by Prof. IEEE Fellow P. Lampariello, Sapienza University of Rome

Nov. 2013 – Today **Exam Evaluation Activity**

Description I have contributed to the evaluation of different undergraduate students of Telecommunications and Electronics Engineering doing the final exam of Electromagnetics Fields held by Prof. Alessandro Galli and Prof. IEEE Fellow Paolo Lampariello, respectively, at University of Rome Sapienza.

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## Scientific Activities

### Oct. 2018 – Today **Organizer Activity**

- Description I have organized the following sessions at:
- EuCAP23 (Florence, Italy), Convened Session: *Unconventional Electromagnetic Phenomena in Wave Propagation and Beam Focusing*
  - EuCAP20 (Copenhagen, Denmark), Convened Session: *Near-Field Focusing and Pulse Generation Through Localized Waves*
  - PIERS19 (Rome, Italy), Special Session: *Localized Waves: Science and Applications*

### Apr. 2018 – Today **Chairman Activity**

- Description I served as a Chair or Co-chair at:
- EuCAP23 (Florence, Italy), Convened Session: *Unconventional Electromagnetic Phenomena in Wave Propagation and Beam Focusing*
  - EuMW22 (Milan, Italy) Regular Session: *Advances in Electromagnetic Modeling and Numerical Techniques*
  - EuMW21 (London, UK) Regular Session: *Advances in Electromagnetic Modeling and Numerical Techniques*
  - EuCAP21 (Virtual Event), Regular Session: *Fundamental Research and Emerging Technologies – Antennas*
  - EuCAP20 (Copenhagen, Denmark), Convened Session: *Near-Field Focusing and Pulse Generation Through Localized Waves*
  - PIERS19 (Rome, Italy), Special Session: *Localized Waves: Science and Applications*
  - EuCAP18 (London, UK), Regular Session: *Antennas for Future Applications*

### 2019 – Today **Editor Activity**

- Description I serve as Associate Editor for the following journals:
- IET Microwaves, Antennas, and Propagation, since 2019.
  - IET Electronic Letters, since 2020.
  - MDPI Crystals (Topic Editor), since 2020.
  - MDPI Appl. Sci. (Co-Guest Editor, Special Issue “Technology and Application of Microwave Communication and Antenna Design,” 2023)
  - Frontiers in Signal Processing – Radar Section (Review Editor), since 2020.

Dec. 2014 – Today **Author Activity** (the whole publications list is provided apart.)

- Overview
- Bibliometric data (Google Scholar)
    - h-index: 17
    - i10-index: 25
    - citations: 926
  - 146 peer-reviewed documents (4 invited book chapters, 49 published journal papers, 5 journal papers under review or under preparation, 75 international conference papers, 3 international conference paper under review, 10 national conference papers)
  - First author of 29/49 journal papers
  - First author of 37/75 conference papers
  - Authored 24/49 journal papers on IEEE (17/49 on IEEE Trans. Antennas Propag.), and 32/49 on IEEE, or American Institute of Physics (AIP), Optica, or American Physical Society (APS), or Wiley journals.

Jun. 2014 – Today **Reviewer Activity**

Overview Around 350 reviews for peer-reviewed international journals and conferences (an average of 50 per year in the last 7 years)

- Description I frequently serve as a Reviewer (see [publons.com/a/1277806](https://publons.com/a/1277806)) for:
- *IEEE Transactions Antennas and Propagation* (**163 review scores**)
  - *IEEE Transactions Microwave Theory and Techniques*
  - *IEEE Transactions on Nanotechnology*
  - *IEEE Antennas and Wireless Propagation Letters*
  - *IEEE Journal of Lightwave Technology*
  - *IEEE Access*
  - *NATURE Scientific Reports*
  - *OSA Journal of the Optical Society of America A*
  - *OSA Journal of the Optical Society of America B*
  - *IOP Journal of Physics D: Applied Physics*
  - *IOP Journal of Optics*
  - *IOP Material Research Express*
  - *SPRINGER Nanoscale Research Letters*
  - *AIP Journal of Applied Physics*
  - *AIP Applied Physics Letters*
  - *AIP Physics of Plasmas*
  - *AIP Advances*
  - *IET Microwaves, Antennas and Propagation*
  - *IET Electronics Letters*
  - *TAYLOR & FRANCIS Waves in Random and Complex Media*
  - *MDPI Electronics*
  - *WILEY International Journal of Numerical Modeling: Electronic Networks, Devices and Fields*
  - *CAMBRIDGE International Journal of Microwave and Wireless Technology*

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## References

Prof. Alessandro Galli, Sapienza University of Rome, Department of Information Engineering, Electronics and Telecommunications, Rome, Italy

Prof. David R. Jackson, University of Houston, Department of Electrical and Computer Engineering, Houston, TX, USA

Prof. Ronan Sauleau, Université de Rennes 1, Institut d'Électronique et des Technologies du numéRique, Rennes, France

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## Languages

Italian	Mother tongue
English	Fluent
French	Good
Spanish	Common usage
Portuguese	Common usage

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## Computer skills

Operating Systems	Windows, Linux (basic)
Programming Languages	C, Java, Python, FORTRAN (basic)
EM CAD Tools	Ansys HFSS, CST Microwave Studio, FEKO, COMSOL Multiphysics
Circuit CAD Tools	PSpice/OrCAD
Computational softwares	MATLAB, Mathematica
Markup Languages	LaTeX, HTML
Web development and database	PHP, MySQL

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## Driving Licenses

Italian Driving License - Category B Vehicle

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## Interests

Science	Mathematics, Physics, and Biology
Arts	Literature, Cinema, and Music
Sport	Soccer, Running, and Chess