

## Curriculum Vitae

### Fabrizio Frezza

Department of Information Engineering, Electronics and Telecommunications (DIET)  
“La Sapienza” University of Rome, Italy

#### Teaching:

Advanced Electromagnetics and Scattering (6 ECTS), for M.Sc. in Electronics Engineering and M.Sc. in Atmospheric Science and Technology  
Artificial Materials, Metamaterials and Plasmonics for Electromagnetic Applications (6 ECTS), for M.Sc. in Nanotechnology Engineering and M.Sc. in Electronics Engineering  
Microwaves Part II, for M.Sc. in Electronics Engineering  
Basic Electromagnetic Fields (9 ECTS), for B.Sc. in Information Engineering, at Latina

#### Research overview:

Electromagnetic waveguides, antennas and resonators, mathematical and numerical methods, electromagnetic scattering, optics, free electromagnetic propagation, thermonuclear plasma heating, anisotropic media, artificial materials and metamaterials, plasmonics, biomedical applications, cultural-heritage and environment applications, artificial intelligence applications to electromagnetic sensing and diagnostics, magnetic resonance applications, electrical transmission lines, electromagnetic compatibility, spectroscopy, terahertz applications, technological transfer, history of science and technology.

#### Present Position:

Full Professor of Electromagnetic Fields, “La Sapienza” University of Rome, 2005-present  
Faculty of Information Engineering, Informatics and Statistics (I3S)  
Department of Information Engineering, Electronics and Telecommunications (DIET)  
“La Sapienza” Research Center for Nanotechnology Engineering (CNIS)  
“La Sapienza” Research Center for Aerospace Research (CRAS)  
STITCH Research Center (Sapienza information-based Technology Innovation Center for Health)  
Research and Service Center Saperi&Co Sapienza, member of the executive board and of the scientific board

#### International Research Projects (last 5 years):

Staff Member of the research project European Research Council (ERC), Advanced Grant: SpatioTemporal Multimode complex optical Systems (STEMS)  
Staff Member of the research Project Horizon 2020, Marie Skłodowska Curie Actions: Multiscale Optical Frequency Combs: Advanced Technologies and Applications (MOCCA)  
Participating in the European Project Horizon 2020, Clean Sky: EM compatibility ANALYSIS & Statistical Techniques in aeronautics (ANALYST)  
Participating in the international project: Advanced skin effect models for future 3D wide bandgap power modules, Luleå University of Technology (Svezia), University of L’Aquila (Italy), Polytechnic of Zurich (Switzerland)  
National representative (substitute), Management Committee, COST Action TU1208 “Civil Engineering Applications of Ground Penetrating Radar” (until 2017)

#### National Research Projects (last 5 years):

Participant in the research project Italian Ministry of University and Research (MIUR), PRIN call 2017: Nonlinear photonics with Metal-less Nanoantennas and metasurfaces (NOMEN)  
Participant in the research project T-MENS (techniques of functional magnetic resonance of brain), Center for Studies and Researches “Enrico Fermi” and Santa Lucia Foundation (IRCCS), Rome, Italy  
Participant in the research project funded by the Italian Lazio Region, Platform for the Integrated Multimodal Analysis in Applied Neurosciences (PAMINA), Center for Studies and Researches “Enrico Fermi” and Santa Lucia Foundation (IRCCS), Rome, Italy (until 2018)  
Head of the Italian Space Agency (ASI) research project: “Techniques of three-dimensional (3D) evaluation of cellular growth and morphology in microgravity condition through electromagnetic diffraction (CellTer)” (until 2016).

#### International scientific activity:

Institutional representative, Board of the European School of Antennas (ESoA), from 2004

Promoter of the proposal to allocate at “La Sapienza” University of Rome a Milestone of the Institute of Electrical and Electronics Engineers (IEEE) in honor of Giovanni Giorgi and his International Measurement System (approved)

Institutional Member, “Metamorphose”, Virtual Institute on Artificial Materials and Metamaterials

Council Member, International Research Center on Mathematics and Mechanics of Complex Systems (M&MOCS)

Full Member, Sigma Xi, The Scientific Research Society

Senior Member, Institute of Electrical and Electronics Engineers (IEEE)

Senior Member, Optical Society of America (OSA)

Member of Quadrato della Radio Association (from 2018)

Italian University Consortium for Telecommunications (CNIT), member of the scientific board.

Scientific Council Member, Microwave Engineering Center for Space Applications (MECSA).

### **Visiting Professorship:**

Aalto University, Finland: 2012 and 2013

University of Lancaster, UK: 2014

Queen’s University of Belfast (QUB), UK: 2015, 2016, and 2017

Cardiff University, UK: 2018

University of Kent, UK: 2019

### **International Teaching Activity:**

Coordinator and Teacher of the Course, for Ph.D. students and company designers “Traveling-Wave Antennas”, in 2005 and 2008, in the framework of the European School of Antennas (ESoA), Rome, Italy

Coordinator and Teacher of the Course, for Ph.D. students and company designers, “Leaky Waves and Periodic Structures for Antenna Applications”, in the framework of the European School of Antennas (ESoA), in 2011, 2014, 2017, and 2021, Rome, Italy

### **Editorial Activity:**

Topical Editor of Journal of the Optical Society of America A, 2014-2017 (first term) and 2017-2020 (second term)

Director of Book Series on Electromagnetism and Optics (L’Ondivaga), Aracne Editions, Rome, from 2013

Co-Editor of the volume “New Frontiers in Radiation and Guidance Phenomena: a Tribute to Arthur A. Oliner”, Borgia, Rome, December 2007

Scientific Committee of Italian Journal of Composites and Nanotechnologies (Materials, Aerospace, Special Technologies), from 2005

Co-Editor of the Special Issue of “Atti della Fondazione Giorgio Ronchi”, January-April 2004.

### **Awards and recognitions:**

2018, co-opted to the Quadrato della Radio Association

2016, one paper rewarded at International URSI Symposium on Electromagnetic Theory

2015, one paper rewarded at URSI Atlantic Radio Science Conference

2014, three papers rewarded at International URSI General Assembly and Scientific Symposium on Electromagnetic Theory

2013, one paper rewarded at International URSI Symposium on Electromagnetic Theory

2013, one paper rewarded at 6th UCMMT conference

2012, Best Paper Award at International Symposium on Antennas and Propagation

2010, “Sapienza Ricerca” Prize

1994, “Giorgio Barzilai” Prize

1986, “Giovanni Carosio” Prize.

### **Interdisciplinary Scientific Event organization (last 3 years):**

Studying energetic and mechanical properties of electromagnetic fields with a novel format of Maxwell’s equations (21-6-2019)

Aquaphotomics: Water Mirror Approach in Science (24-5-2019)

Electromagnetic Environmental Effects (E3) for Aerospace applications (17-5-2019)

Applications of Artificial Intelligence to Medical Diagnostics (2-5-2019)

The Mysteries of Water (21-3-2019)  
In Memory of Algeri Marino after 50 years from his death (14-5-2018)  
Robotics for the human body. Technological applications for surgery (10-5-2018)  
Patents for industrial inventions: requirements and strategies (24-6-2016)  
Restoration of ancient stained glass windows: methods and applications (16-4-2016).

**Citations (Google Scholar):**

no. = 3502; H index = 29, i10-index = 88.

**Patents:**

1. Leaky-wave antenna based on stepped rectangular waveguide, #RM95A000590 (1995)
2. Software for the calculation of electromagnetic-wave scattering from an arbitrary number of cylindrical objects buried in a dielectric halfspace, #009073 (2013)
3. System for acquisition and comparison of graph curves, #RM2014A000045 (2014).
4. Applications of Artificial Intelligence to medical diagnostics (in progress)

**Post-doctoral fellows and Ph.D. students, graduation year and last known position:**

1. Lara Pajewski, 2004, Associate Professor, Sapienza University of Rome, Italy, DIET Department
2. Giampiero Lovat, 2005, Assistant Professor, Sapienza University of Rome, Italy, DIAEE Department
3. Simone Paulotto, 2006, Apple Inc., Cupertino, USA
4. Alessandro Ciorba, 2008, Italian Ministry of Defense, Rome, Italy
5. Paolo Nocito, 2009, Italian Presidency of the Council of Ministers, Rome, Italy
6. Piero Angeletti, 2010, ESA-ESTEC Research Center, Noordwijk, The Netherlands
7. Felice M. Vanin, 2012, ESA-ESTEC Research Center, Noordwijk, The Netherlands
8. Fabrizio De Paolis, 2013, ESA-ESOC Research Center, Londra, UK
9. Elisa Spinozzi, 2013, GEM Electronics Company, San Benedetto del Tronto (Ascoli Piceno), Italy
10. Nicola Tedeschi, 2013, Research Assistant, Sapienza University of Rome, Italy, DIET Department
11. Roberto Laurita, 2014, Value Team Co., Rome, Italy
12. Fabio Mangini, 2014, Assistant Professor, University of Brescia
13. Endri Stoja, 2014, Fraunhofer Institute FHR, Germany
14. Marco Tannino, 2015, Vatican Radio, Vatican City
15. Muhammad Khalid, 2016, Italian Institute of Technology (IIT), Lecce, Italy
16. Carlo Santini, 2016, High-School Teacher, Rome, Italy
17. Vincenzo Pascale, Autumn 2016, Space Engineering Co.
18. Fabio Pelorossi, Autumn 2016, ESA-ESOC Research Center, Darmstadt, Germania
19. Santo Prontera, 2017, High-School Teacher, Rome, Italy
20. Emiliano Sassolini, 2017, High-School Teacher, Rome, Italy
21. Vincenzo Schena, 2017, Thales Alenia Space Co., Rome, Italy
22. Patrizio Simeoni, 2017, National Transport Authority, Dublin, Ireland
23. Fabrizio Timpani, 2017, High-School Teacher, Rome, Italy
24. Andrea Veroli, 2017, EsseQuamVideri Company, Rome, Italy
25. Badrul Alam, 2018, Research Assistant, Polytechnic University of Bari, Italy
26. Pietro Paolo Di Gregorio, 2018, So. Tel. Co., Rome, Italy
27. Enrico Lia, 2018, ESA-ESTEC Research Center, Noordwijk, The Netherlands
28. Maria Denise Astorino, 2019, Research Assistant, University of L'Aquila, Italy
29. Lorenzo Dinia, 2019, Mindray Medical International Co., USA
30. Sidra Batool, course third year
31. Alessandro Calcaterra, course third year
32. Maurizio Troiano, course third year
33. Fangcheng Huang, course second year
34. Khushboo Munir, course second year
35. Mehwish Nisar, course second year
36. Roberto Leuzzi, course first year
37. Francesca Ponti, course first year
38. Yongdiao Wen, visiting student, University of Aeronautics and Astronautics, Nanjing, China

**Past Positions:**

Associate Professor, "La Sapienza" University of Rome, 1998-2004

Temporary Professor of Electromagnetic Fields, "La Sapienza" University of Rome, 1994-1997

Assistant Professor, "La Sapienza" University of Rome, 1990-1998.


**Education:**

*Laurea* Degree (*cum laude*) in Electronic Engineering, "La Sapienza" University of Rome, 1986

Doctoral degree (PhD) in Applied Electromagnetism and Electrophysical Sciences, "La Sapienza" University of Rome, 1991.

**Further Studies** (at Pontificia Universitas Gregoriana, PUG, Rome, Italy):

Philosophy, Biblical exegesis, Cinema, Painting

A handwritten signature in blue ink that reads "Fabrizio Fresco". The signature is written in a cursive, flowing style with a long horizontal tail at the end.