



PATRIZIA SAVI

## Curriculum Vitae

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Nationality: Italy

Date of Birth: March 6<sup>th</sup> 1959

Languages: Italian (native speaker)  
English (fluent)

Present position: Associate Professor of Electromagnetic Fields at Politecnico di Torino  
Head of Remote Sensing, Carbon-Based Materials and Sensors Laboratory

Work address: Politecnico di Torino,  
Electronics and Telecommunications Department (DET)  
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### Education

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**1974-1978** *Liceo classico*, C. Cavour, Torino, Italy.

**1978-1985** *Laurea* (equivalent to Master Degree) in Electronic Engineering from Politecnico di Torino, Italy.

**1994** Diploma of piano from *Conservatorio Giuseppe Verdi* of Torino, Italy.

### Main research topics (most recent on top)

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- Biosensors based on graphene and other carbon based materials
- Shielding properties of composites and cement filled with carbonaceous material
- Global Navigation Satellite System Reflectometry (GNSS-R) for soil moisture retrieval
- Time domain reflectometry for dielectrics and soil characterization
- Numerical methods: method of moment, finite element method
- Waveguide discontinuities and microwave filters
- Frequency selective surfaces
- Analysis of dielectric radomes

## Detailed Research activities

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- **1998 - now:**  
Associate Professor in the group of Applied Electromagnetics and Photonics (Microwave sensors and materials) of the Electronic and Telecommunications Department, worked on numerical methods (high-order finite element method); mobile communication channel modeling; time-domain reflectometry measurements for dielectric and soil characterization; measurements of aeronautic cable-harness submitted to EM illumination. Current research topics: microwave analysis and applications of composite materials and films based on carbon fiber, carbon nanotubes, graphene and biochar, Global Navigation Satellite System Reflectometry (GNSS-R) for soil moisture retrieval.
- **1988 - 1998:** Researcher at the Centro Studi Propagazione e Antenne (CESPA) of the National Research Council of Italy, worked on the main research topics of the Center: antennas and diffraction, optics for telecommunications, microwave circuits and devices. Obtained relevant results published in international journals on analysis and design of dielectric radomes for prediction and correction of the bore-sight errors in airborne radar systems, analysis and synthesis of Frequency Selective Surfaces. Introduced a new Italian patented filter configuration with coupling dual-mode cavities and a new algorithm for the synthesis of filters with an arbitrary number of mono-modal cavities.
- **1986-1987:** Consultant at Aeritalia Caselle, Torino, worked on: electromagnetic models based on the geometrical theory of diffraction for the analysis of the interaction between the aircraft and the on-board antennas, near-field antenna measurements with spherical near-field techniques, update of computer codes dealing with spherical near-field far-field transformation based on the spherical waves expansion.
- **1986:** Research activity at Electronic Department of Politecnico di Torino for the analysis of guided propagation in periodic structures.

## International and national cooperation

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- Since 2018 cooperation with Dr. Yan Jia, Nanjing University of Posts and Telecommunications, Nanjing 210046, China, on GNSS Reflectometry.
- Cooperation with Prof. K. Naishadham, Georgia Technology, Atlanta, USA, 'visiting professor' at Politecnico di Torino from June 2017 to April 2018 on tunable devices.
- Cooperation with Dr. Ololade Sanusi (vising PhD student, 2017) and Prof. Langis Roy of Department of Electrical, Computer and Software Engineering, Faculty of Engineering and Applied Science, UOIT, Canada, on microstrip antennas.
- Since 2019 cooperation with Dr. Isabella Natali-Sora, Università di Bergamo, Italy, on carbon-based cementitious composites.

- Since 2017 Cooperation with Dr. Simone Quaranta University of Ontario Institute Technology: Faculty of Science, Oshawa, ON, Canada, now at CNR ISMN, Istituto per lo Studio dei Materiali Nanostrutturati.
- Since 2013 cooperation with the Department of Applied Science and Technology (DISAT) of Politecnico di Torino, Materials and Processes for micro and nano Technology group.

### Other activities and recognitions

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**2016** Senior Member of the *Institute of Electrical and Electronics Engineers (IEEE)*.

Member of the Technical Committee of the Conference IEEE, International Symposium on Antennas and Propagation (APSYM 2016), Cochin, India, 15 – 17 December **2016**.

Organizer in cooperation with prof. K. Naishadham, Georgia Tech, Atlanta, of the workshop SWS03: Nanotechnology Applications of Antennas and Wireless Sensing, (EuCAP 2019), Paris, France, 19-24 March **2017**.

**2018** Winner of a project Proof of Concept (PoC) ‘A glucose RF biosensor (RaFrBio), Vertis Venture 3 Technology Transfer VV3TT 2018 POC Program, January 2019-March 2021.

Invited paper to the Convened Session ‘GNSS antennas and antennas system’, 13th European Conference on Antennas and Propagation (EuCAP 2018), Krakov, Poland, 31 March – 5 April, **2019**.

**2020** Invited paper to IEEE APSYM-2020 International Symposium on Antennas and Propagation organized by the Department of Electronics, Cochin University of Science and Technology (CUSAT), Cochin, India.

Reviewer of MIUR for projects PRIN and FIRB. Inserted in the list scientific expert REPRISE of MIUR.

Reviewer for IET Electronics Letters, Sensors, Micromachines, Polymers, IEEE Transaction on Electromagnetic Compatibility, IEEE Transaction on Antennas and Propagation, IEEE Transaction on Wireless Communications, IEEE Antennas and Wireless Propagation Letters, EURASIP Journal on Wireless Communications and Networking, IEEE Transaction on Instrumentation and Measurements, Electromagnetics Progress in Electromagnetic Research, and many others.

### Teaching activities

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More than 50 courses at Politecnico di Torino in Italian and in English. Among the others: Electromagnetic Fields, Electromagnetic Compatibility, Radiofrequency Issues in Wireless Systems, Radar and Remote Sensing.

Scientific advisor of several Master thesis students and PhD students: Advisor of 4 PhD students, advisor of more than 80 Master thesis student, co-advisor of more than 16 Master thesis student.

Project coordinator of Alta Scuola Politecnica (ASP):

- Pol.Gr.O.R.A.T., A new Concept for Cubesat Missions, 2017
- RaFRBio, A RF glucose sensor, 2018.

## Research Contracts

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- *Electromagnetic shielding evaluation by waveguide technique and electrical permittivity measurements on carbon-modified cementitious composites and relevant advice for EMI shielding*, Italcementi, Bergamo, Italy, October 2019-October 2020.
- *Complex Permittivity measurements on carbon-modified cementitious mixtures*, Italcementi, Bergamo, Italy, June 2017-June 2018.
- *Characterization of RF electrical properties of carbon-based composites*, Thales Alenia Space, Torino, Italy, 2016.
- *Assessment of electrical performance of structures based on CFRP laminates composites filled with graphene and carbon nanotubes*, Thales Alenia Space, 2015.
- *SMAT-F2: Surveillance and monitoring of the territory for civil purposes based on unmanned aircraft system*, Regione Piemonte, (WP3, responsible for the research line D3.1.1 Sensor Configuration), 2013-2015.
- *HIRF High Intensity Radiated Field*, European Project, 2010-2013.
- *Center for Multimedia Radio Communications (CERCOM)*, Politecnico di Torino, responsible for the research line WP1.4: Radio Channel modeling, 2001-2004.
- *Feasibility study for the realization of filters in rectangular waveguide and reciprocal diplexer for millimeter waves*, MIKOM s.r.l. Monza, Italy, 1995.
- *Electromagnetic characterization of frequency selective screens*, CSELT, Torino, Italy, 1991.
- *Four-channel radiometer diplexer design*, Matra Espace S.A., Toulouse, France, 1990.
- *Study of electromagnetic windows*, Electronic SpA, Roma, 1990.
- *Modelling of dielectric radomes*, Aeritalia SpA, Caselle, Torino, Italy, 1989.

## Scientific Publications

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Co-authored 45 international journal papers, three book chapters, and more than 100 international conference papers. On Scopus 95 entries with 875 citations and h-index 16, (20/01/2021).

For a complete list:

<https://iris.polito.it/cris/rp/rp05452?start=0&sortBy=6&order=ASC&type=all#.YAigO-hKjDc>

Most cited papers:

- R. Orta, P. Savi, R. Tascone, D. Trincherò, "Synthesis of multiple-ring resonator filters for optical system," *IEEE Photonics Technology Letters*, vol. 7, pp. 1447-1449, Dec. 1995, Scopus citations: 123.

- F. Dovis, R. Fantini, M. Mondin, P. Savi, "Small scale fading for High Altitude Platform (HAP) propagation channels," *IEEE Journal of Selected Areas in Communication*, vol. 20, no. 3, pp. 641-647, Apr. 2002, Scopus citations: 78.
- R. A. Khushnood, S. Ahmad, P. Savi, J.-M. Tulliani, M. Giorcelli, G.A. Ferro, "Improvement in electromagnetic interference shielding effectiveness of cement composites using carbonaceous nano/micro inerts," *Construction and Building Materials*, vol. 85, pp. 208-216, April 2015, Scopus citations: 59.
- P. Savi, M. Miscuglio, M. Giorcelli, A. Tagliaferro, "Analysis of microwave absorbing properties of epoxy MWCNT composites," *Progress in Electromagnetic Research Letters*, vol. 14, pp.63-69, 2014, Scopus 53.
- M. Yasir, P. Savi, S. Bistarelli, A. Cataldo, M. Bozzi, L. Pellegrini, S. Bellucci, "A Planar Antenna with Voltage-Controlled Frequency Tuning Based on Few-Layer Graphene", *IEEE Antennas and Wireless Propagation Letters*, vol. 16, pp. 2380-2383, June 2017, Scopus citations: 42.