

Benjamin Fuchs

*PhD in Signal Processing and Telecommunications
Electrical Engineer*



Personal Information

Bio Sketch Male, French.

Born on May 28th, 1981 in Rennes, France.

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Actual Position

Full-time CNRS researcher (with tenure) at the Institute of Electronics and Telecommunications of Rennes (IETR), France.

Education

2016 **HDR (Habilitation à Diriger des Recherches)**, *Electronics*, University of Rennes 1, France.

title: "Contributions to the analysis and synthesis of electromagnetic field for antenna design and microwave imaging" (in french).

Keywords: signal processing, inverse problems, convex optimization, electromagnetic modeling.

2004–2007 **Ph.D.**, *Signal Processing and Telecommunications*, University of Rennes 1, France.

title: "Stratified lenses associated with real sources - Theoretical analysis and experimental validations in millimeter waves" (in french).

Keywords: Lens antennas, millimeter wave antennas, electromagnetic modeling (spherical wave expansion, mode matching technique), antenna characterization, printed technology.

2004 **MSc degree**, *Electronics*, National Institute of Applied Sciences (INSA) Rennes, France.

1999–2004 **Engineering degree**, *Electronics and Communication Systems*, INSA Rennes, France.

Professional Experience

2009–today **CNRS Researcher**, Institute of Electronics and Telecomm. of Rennes (IETR), France.

2017 **Invited Professor (1 Month)**, University of Trento, Italy.

2011–2012 **Research Assistant (on leave from CNRS)**, EPFL, Switzerland.

Member of the Laboratory of Electromagnetics and Acoustics (LEMA). Responsible of several project workpackages and project proposals. Technical advisor of several Ph.D. students. Teaching activities.

2008–2009 **Postdoctoral Researcher**, EPFL-LEMA.

Member of the LEMA, working under the supervision of Prof. J.R. Mosig and A. Skrivervik. Participation in several research projects and proposal writings. Teaching activities.

2005–2007 **Visiting Scholar**, University of Colorado at Boulder, USA.

Member of the Microwave & RF laboratory headed by Prof. Z. Popovic. Total stay of 8 months. Development of electromagnetic code based on spherical wave expansion to model lens antennas.

2004–2007 **Ph.D. student**, University of Rennes 1, France.

Languages & Skills

Languages French (mother tongue), English (fluent), German (basics).

CAD SW CST Microwave Studio, Ansys HFSS and Designer, EMSS FEKO.

Programming MatLab, C, Fortran, Julia.

Hardware Anechoic chamber, network analyzer, spectrum analyzer.

Scientific Production

Summary 31 journal papers (19 as first author)
4 contributions to conference convened sessions
45 conference papers
2 international patents
1 contribution to a book chapter

Full List http://perso.univ-rennes1.fr/benjamin.fuchs/Publication_List_BFuchs.pdf

Invited Seminars **Technical University of Denmark, Denmark - June 2017**, *Host: Prof. M. Mattes.*
Three instances of inverse problem for microwave measurements.

University of Trento, Italy - Feb. 2017, *Host: Prof. P. Rocca.*

Two Instances of Microwave Inverse Problem: Antenna Diagnostic and Phase Retrieval.
On the use of Convex Relaxation for Array Synthesis Problems.

Skoltech, Moscow, Russia - July 2016, *Host: Prof. A. Polymeridis.*

Application of Convex Relaxation to Array Synthesis and Antenna Selection Problems.

University of Cassino, Italy - Oct. 2015, *Host: Prof. M.D. Migliore.*

Antenna Arrays - Application and Synthesis Methods.

EPFL, Switzerland - Oct. 2014, *Host: Dr. M. Mattes.*

Array Synthesis Problems via Convex Relaxation.

University of Trento, Italy - Dec. 2013, *Host: Prof. P. Rocca.*

Antenna Array Synthesis via Convex Optimization.

Supervision & Teaching Experience

PhD Thesis co-supervision

2014– **Mina Bjelogrić**, *EPFL - LEMA now LTS5 (CH)*, director: Dr. M. Mattes.
“Contributions to 3D Microwave Imaging (tentative title)”.

2011–2014 **Marc Esquiús Morote**, *now at EPCOS TDK (DE)*, director: Prof. J.R. Mosig.
“Horn Antennas and Dual-Polarized Circuits in Substrate Integrated Waveguide (SIW) Technology”.

2008–2013 **Marco Letizia**, *now at PSE, EPFL (CH)*, director: Prof. J.R. Mosig.
“Circularly polarized multi-beam antenna system for high-altitude-platforms”.

2007–2011 **Francesco Merli**, *at Apple (USA) and now Huber+Suhner (CH)*, director: Prof. A. Skrivervik.
“Implantable antennas for biomedical applications”.

Master Student Supervision

2008 **Edgar Duran Ramirez**.
“Antenna design for clearance sensor in harsh environment”.

2008 **Vladimir Litun**.
“Design of an antenna array for feeding a dielectric lens at 30 GHz”.

Teaching

- 2015-... **Electromagnetism**, 36h/year.
Exercises at Bachelor level, INSA Rennes, France
- 2014-... **Antenna Measurements**, 24h/year.
Experiments at Master level, INSA Rennes, France
- 2010 **Microwave and Millimeter Wave Antenna Design**, 12h.
Experiments at PhD level - European School of Antenna, IETR, France
- 2008-2012 **Electromagnetics and Microwaves**, 30h.
Lectures at Bachelor and Master level, EPFL, Switzerland
- 2007 **Optical Fibers**, 10h.
Lectures at Master level, University of Rennes 1, France
- 2004-2007 **Telecommunications and Signal Processing**, 150h.
Lectures, exercises and experimental classes at Bachelor level, IUT of Saint Malo, France

Professional Service & Responsibilities

Program Leader MOX (parameters and model estimation in complex media): transversal program to foster interdisciplinary research (signal processing, communication, imaging) between members of IETR laboratory.

Membership IEEE Senior Member.

Reviewer for IEEE Transactions on Antennas and Propagation, IEEE Antennas and Wireless Propagation Letters, IEEE Antennas and Propagation Magazine, IEEE Transactions on Signal Processing, IEEE Signal Processing Letters, Progress in Electromagnetics Research, IET Microwaves, Antennas and Propagation, Journal of Electromagnetic Waves and Applications.

Contribution to Conf. **Member of the Technical Program Committee** at EuCAP 2016 (European Conference on Antennas and Propagation).

Session chair at EuCAP conferences - session: lens antennas (2016) - sessions: Array Antenna Design and millimeter wave antennas at EuCAP (2013) - session: reflector and lens antennas (2012).

PhD EPFL, Switzerland - July 2015.

Examinator "Adaptive millimeter-wave and THz antenna devices based on dielectric elastomer actuators", Pietro Romano.

University of Trento, Italy - Dec. 2013.

"An innovative methodological approach based on compressive sensing for the synthesis and control of antenna arrays", by Matteo Carlin.

Interests

Sports: golf, squash, tennis, ski and hiking. Travels.