

PERSONAL INFORMATION

Roberto Gunnella



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📅 **Date of birth** 14 May 1964 | **Nationality** Italian

WORK EXPERIENCE

November 2006 – Present

Associate Professor of Physics SSD FIS/03, SC 02/B1 University of Camerino

2018 Full professor national habilitation

1998-2006 University Research Assistant Univ. of Camerino

1996 PhD in Physics

VISITING SCIENTIST

November 2013 Invited professor National Synchrotron Radiation Laboratory Hefei (China)

09/2002-05/2003 Invited Professor Tohoku University (Japan)

July 1998 and January 2000 Invited Professor Univ. Rennes Lab Palms (France)

October 1999 Visiting Scientist Boston University (USA)

1996 Post-doc CNRS Laboratoire LEPES Grenoble (France)

1992-1993 Fellowship student SRC laboratory Stoughton (USA)

EDUCATION AND TRAINING

1994–1996 **PhD - Thesis**

Title: "The Photoelectron and Auger electron diffraction in the investigation of interfaces of interest in Si/Ge technology.", University of Perugia - Italy

1990 **Bachelor of Physics**

Degree (110/110) in Physics, University "La Sapienza " Rome

FIELDS OF RESEARCH ACTIVITY

Ab-initio calculations of atomic cross sections involved in several electron and x-ray spectroscopies for condensed matter in various field of investigations :

Nanometric and low dimensional systems, including magnetic and topological materials for sensors and quantum technologies

NanoBiomaterials from waste resources for environmental remediation, and pervasive sustainable applications

Energy materials used in photo-catalysis, photovoltaics and faradaic/non faradaic processes for efficient energy conversion and accumulation

RECENT SEMINARS AND INVITATIONS

September 2019. "Structural evolution of Lithium Manganate cathodes during the first cycles of charge and discharge", E-MRS 2019 Fall Meeting, which will be held at the University of Technology in Warsaw (Poland)

March 2019. - "Physics of lithiation and delithiation in metal oxide nanoparticles", Int'l Conference on Supercapacitors, Energy Storage and applications. ICSEA-2019 C-MET Thrissur India .

February 2018 "Report on the activity of the time resolved spectroscopies working group in EUSPEC" Final whole action meeting in Lisbon-Euspec , Faculdade de ciencias and tecnologia,

INNOVATION IN RESEARCH

- 1995 I was among the first persons to introduce the low electron energy multiple scattering to interpreting photoelectron diffraction patterns to reconstruct accurately surface structures of solids.
- 2012 I was among the first to use electro-spray to grow trilayer solvent effect free heterostructures for organic photovoltaics.
- 2015 I was among the first to use soft x-ray NEXAFS for tomography of SEI layers in studies of anodes and cathodes in Li+ batteries.

BIBLIOMETRIC PARAMETERS

> 130 papers
H index >26
About 2200 citations

DIRECTOR OF SCHOOLS AND WORKSHOPS

- September 2019 Chairman of the Bilateral workshop Italy-India (Ministero degli affari esteri e cooperazione internazionale): Within the Executive Programme of Scientific and Technological Cooperation "Renewable energy technologies at the crossroads of "glocal" energy grids" - Camerino
- July 2017 Codirector of the EUSPEC – COST School XTRAM "X-ray UV Time resolved Advanced Methods" , Erice EFMCS (Italy)
- April 2016 Chairman of the EUSPEC – COST workshop "XUV spectroscopies and time resolved dynamics" Elettra Synchrotron- Trieste

MANAGEMENT

- 2014 Responsible of International Erasmus programs for students and PhD in Physics
- 2020 Coordinator of the Material Science curriculum at the Doctoral School in UNICAM
- 2022 Coordinator of the Energy and Environment materials curriculum of the Master in Physics in UNICAM
- 2014 Management committee member of EUSPEC MP1306 Cost action and Working Group leader of the time resolved spectroscopies
- 2014 Representative of Faculty members at the University of Camerino, Chamber of Representations
- 2006- Representative for University of Camerino of Italian Consortium of Physics of Matter (CNISM)

TUTORING

- I have been supervisor of 7 PhD students and over ten master students, of both academical and industrial research (ASML, Loccioni, CAEN, Solid Power).

TECHNOLOGY TRANSFER AND DISSEMINATION AT INNOVATION ECOSYSTEMS

- 2021- Director of Master in Innovation of materials for Circular Economy" and coordinator of the pool of companies supporting the Master-
- 2016- President of Egg-Technology srl - Unicam Spin-off company in Energy technologies aiming at deploying advanced systems for improving efficiency.

- Recently Funded Project**
- 2022-2025 MSCA Doctoral Network EUSpecLab (101073486) (call HORIZON-MSCA-2021-DN-01) "European Spectroscopy and theoretical methods laboratory for materials"
 - 2020-22 INFN Thematic Call: QUANTEP (Quantum Technology Experimental Platform)" . Implementation of a complete Silicon Photonics Integrated Circuit for Quantum Computation with linear quantum optics circuits and single photons. INFN- Perugia RU involved in quantum algorithm and Machine learning tools of data processing and technology transfer good practices.
 - 2020-23 PSR Marche - Misura 16.1 - "BIOCERTO Certification and digital badge of regional wine production by advanced physico-chemical analyses and blockchains"
 - 2018-19 H2020-SMEInst-2018-2020-1, SME Project "Making distributed Combined Heat and Power (CHP) generation with zero pollution convenient", grant agreement N. 874958

- Editorial activity**
- 2020- Ed. Board of Applied Science <https://www.mdpi.com/journal/applsci/editorseditorialboard>
 - 2021- Editorial Board "Nanotechnology and Applied Nanosciences" in Applied Sciences
 - 2011-2017 Editorial Board Member of the Surface Science section of Journal of Physics: condensed Matter

- Patents** Industrial research in the field of the cogeneration by fuel cells assisted by both electric and thermal storage within the company Egg-technology:
- Patent pending N. 102015000054629 "Energetic System for buildings"
 - Patent pending N. 102016000007103 "Island electric and thermal power system for buildings"

PERSONAL SKILLS

Mother tongue Italian

Other languages

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C2	C1	C1	C1
French	C1	C2	B1	B2	A2

Levels: A1 and A2: Basic user – B1 and B2: Independent user – C1 and C2: Proficient user
[Common European Framework of Reference for Languages](#)

- Computer skills**
- Competent with Java, Python and Fortran
 - Experience with Windows and Linux

Driving licence B

SOME RECENT PUBLICATIONS

[1] Antonella Balerna, Samanta Bartocci, Giovanni Batignani, Alessandro Cianchi, Enrica Chiadroni, Marcello Coreno, Antonio Cricenti, Sultan Dabagov, Andrea Di Cicco, Massimo Faiferri, Carino Ferrante, Massimo Ferrario, Giuseppe Fumero, Luca Giannessi, Roberto Gunnella, Juan Jose Leani, Stefano Lupi, Salvatore Macis, Rosa Manca, Augusto Marcelli, Claudio Masciovecchio, Marco Minicucci, Silvia Morante, Enrico Perfetto, Massimo Petrarca, Fabrizio Pusceddu, Javad Rezvani, Jose Ignacio Robledo, Giancarlo Rossi, Hector Jorge Sanchez, Tullio Scopigno, Gianluca Stefanucci, Francesco Stellato, Angela Trapananti, and Fabio Villa. "The Potential of EUPRAXIA@SPARC_LAB for Radiation Based Techniques". In: *CONDENSED MATTER* 4.1 (Mar. 2019).

- [2] Davide Badoni, Roberto Gunnella, Andrea Salamon, Vincenzo Bonaiuto, Valentino Liberali, Gaetano Salina, Fabio De Matteis, Andreas Mai, Matteo Salvato, Luca Colavecchi, Giovanni Paulozzi, Fausto Sargeni, Giovanni Di Giuseppe, Paolo Proposito, Alberto Stabile, Luca Frontini, and Patrick Steglich. "Design and test of silicon photonic Mach-Zehnder interferometers for data transmission applications". In: *PROCEEDINGS OF 2020 ITALIAN CONFERENCE ON OPTICS AND PHOTONICS (ICOP)*. Ed. by SM Pietralunga and S Selleri. Italian Conference on Optics and Photonics (ICOP), ELECTR NETWORK, SEP 08-11, 2020. Univ Parma; IEEE; IEEE Photon Soc Italy Chapter; Consorzio Nazl Interuniversitario Telecomunicazioni; Soc Italiana Ottica Fotonica; Soc Italiana Elettronica; IEEE Photon Soc; Photonics21; Soc Italiana Elettromagnetismo. 2020.
- [3] S. Kazim, M. Ali, S. Palleschi, G. D'Olimpio, D. Matrippolito, A. Politano, R. Gunnella, A. Di Cicco, M. Renzelli, G. Moccia, O. A. Cacioppo, R. Alfonsetti, J. Strychalska-Nowak, T. Klimczuk, R. J. Cava, and L. Ottaviano. "Mechanical exfoliation and layer number identification of single crystal monoclinic CrCl₃". In: *NANOTECHNOLOGY* 31.39 (Sept. 2020).
- [4] A. Di Cicco, G. Polzoni, R. Gunnella, A. Trapananti, M. Minicucci, S. J. Rezvani, D. Catone, L. Di Mario, J. S. Pelli Cresi, S. Turchini, and F. Martelli. "Broadband optical ultrafast reflectivity of Si, Ge and GaAs". In: *SCIENTIFIC REPORTS* 10.1 (Oct. 2020).
- [5] Shafaq Kazim, Roberto Gunnella, Marco Zannotti, Rita Giovannetti, Tomasz Klimczuk, and Luca Ottaviano. "Determination of the refractive index and wavelength-dependent optical properties of few-layer CrCl₃ within the Fresnel formalism". In: *JOURNAL OF MICROSCOPY* 283.2 (Aug. 2021), pp. 145–150.
- [6] S. Javad Rezvani, Nicola Pinto, Roberto Gunnella, Alessandro D'Elia, Augusto Marcelli, and Andrea Di Cicco. "Engineering Porous Silicon Nanowires with Tuneable Electronic Properties". In: *CONDENSED MATTER* 5.4 (Dec. 2020).
- [7] Dario Matrippolito, Luca Ottaviano, Jing Wang, Jinjin Yang, Faming Gao, Mushtaq Ali, Gianluca D'Olimpio, Antonio Politano, Stefano Palleschi, Shafaq Kazim, Roberto Gunnella, Andrea Di Cicco, Anna Sgarlata, Judyta Strychalska-Nowak, Tomasz Klimczuk, Robert Joseph Cava, Luca Lozzi, and Gianni Profeta. "Emerging oxidized and defective phases in low-dimensional CrCl₃". In: *NANOSCALE ADVANCES* 3.16 (Aug. 2021), pp. 4756–4766.

Nota Ai sensi e per gli effetti del DPR 28 dicembre 2000, n. 445, il sottoscritto, sotto la propria responsabilità, attesta la veridicità delle dichiarazioni riportate nel presente curriculum