Francesco Rossella

Associate Professor

Curriculum Vitae

Prof. Francesco Rossella
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Personal information

Family name, First name: Rossella, Francesco
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Education

01/2007	**PhD, Physics (Experimental Cond Mat)**, Univ. of Pavia, Italy
07/2006	Diploma di Formazione Superiore Post-Laurea, Scuola Avanzata di Formazione Integrata (SAFI) Istituto Universitario di Studi Superiori di Pavia (IUSS), Italy.
07/2002	**MsC, Physics**, Università di Pavia, Italy (110/110 cum laude)

Current positions

04/2024 – present	**Associate professor**, Università degli studi di Modena e Reggio Emilia UNIMORE), Dipartimento di Scienze Fisiche, Informatiche e Matematiche, Modena, Italy
	Head of Laboratory & Group Leader, Nanodevice Fabrication and Transport Laboratory
2021 – present	**Associate researcher, INFN** Sezione di Pavia – National Institute for Nuclear Physics, Pavia, Italy

Previous positions

04/2021 – present	**Tenured assistant professor,** Università degli studi di Modena e Reggio Emilia UNIMORE), Dipartimento di Scienze Fisiche, Informatiche e Matematiche, Modena, Italy
01-03/2021	**CNR researcher**, III level. Istituto Nanoscienze-CNR, Pisa
12/2016 – 12/2020	**Assistant professor**, Scuola Normale Superiore (SNS), Faculty of Science, Pisa, Italy Scientific responsible of the Magneto-transport laboratoty, NEST, Scuola Normale Superiore
11/2012 - 11/2016	**Post doctoral fellow**. NEST Laboratory, Scuola Normale Superiore, Pisa, Italy.
10/2011 - 3/2012	**Visiting fellow**. LNCMI-Toulouse, France.
6/2011 - 10/2012	**Visiting researcher.** Physics Dept "A.Volta", Università di Pavia, Italy.
5/2008 - 5/2011	**Post doctoral fellow**. Physics Dept "A.Volta", Università di Pavia, Italy.
11/2006 – 5/2008	**Research assistant/post doc**. Physics Dept E19, TU Muenchen, Germany & Chem. Phys. Dept "M. Rolla", Università di Pavia, Italy.
11/2003 – 11/2006	**Physics PhD student**. Physics Dept "A.Volta", Università di Pavia, Italy.
02/2003 – 11/2003	**Research assistant**. Physics Dept "A.Volta", Università di Pavia, Italy.

Scientific biography

Francesco Rossella is tenured assistant professor at Dipartimento di Scienze Fisiche, Informatiche e Matematiche of the **University of Modena e Reggio Emilia** (UNIMORE), where he **coordinates a group of 15 researchers** and **leads the *Nanodevice Fabrication and Transport Laboratory* (*https://www.nanofab.unimore.it/*)**.

Appointed teacher (course responsible, lecturer and laboratory assistant) starting from 2003 at four universities in Italy (Univ. of Pavia, Scuola Normale Superiore, Univ. of Pisa, UNIMORE). Courses thaught: **Quantum Technologies, Physics Condended Matter, Laboratory of Physics Condensed Matter, Laboratory of Nanosctructures**, Electromagnetism, General Physics.

Recipient of research founding for a total amount of 1.5 M€ / 9 years, that he managed under his direct responsibility.

He was scientific supervisor of more than 25 researchers including assistant professors, research fellows, graduate and undergraduate students.
Coauthor of > 110 publications in peer reviewed journals (including: Nature Nanotechnology, Advanced Materials, ACS Nano, Advanced Functional Materials, Nano Letters, Nanomedicine, Nano Research, Nanoscale, Nanomaterials, Carbon) that generated >1650 citations, h-index 25(Scholar).
Author of 28 invited, keynote or plenary talks at international conferences.
He chaired several international conferences (>250 participants) and was member of the organizing committee of international conferences, and of science exhibitions and initiatives.
Editorial board member for nanoscience and nanotechnology journals including Nanotechnology (IOP), Nanoexpress (IOP), Nanomaterials (MDPI), Materials (MDPI), Frontiers. He collaborates with groups hosted in top-rank research institutions, including Hitachi Cambridge Lab at Cambridge UK, Institute of Physics of the Chinese Academy of Science, Basel University, Tyndall National Institute, Moscow Institute for Physics and Engineering, European Magnetic Field Laboratory.

Physics graduated (cum laude, 2002) and PhD (2007) at the University of **Pavia** (UniPV), postdoc and visiting scientist from 2007 to 2011 at **Technische Universität München**, **Universidad Autónoma de Madrid**, **Universidad Complutense de Madrid**, **Universidad de Salamanca** and **High Magnetic Field Laboratory (Grenoble, Toulouse)**.
From 2009 to 2012 he won > 10 visiting research grants within EU and national programs, to work in the characterization of low dimensional structures including 2D materials, nanofabrication, surface science.
In 2012 he joined **Scuola Normale Superiore (SNS)** as postdoc, working in the nanofabrication and characterization of semiconductor nanostructure for quantum devices and nanoscale optoelectronics.
From 2016 to 2020 he was **assistant professor at SNS** (position granted upon open competition).
From 2020 to date he is researcher of Istituto Nanoscienze-CNR (presently on-leave).
At NEST, the National Enterprise for nanoScience and Nanotechnology in Pisa, Italy, from 2016 he was scientific responsible for the transport laboratory of Scuola Normale, which includes facilities for the study of transport phenomena in nanodevices.
With a solid experimental background in the investigation of semiconductor and carbon-based nanomaterials, **in the last 10 years he focused on the physics and technology of nanomaterial-based devices including advanced manipulation and nanofabrication and characterization techniques, with a strong bias towards device applications in quantum technologies.** Leader in nanoelectronics, accesses to class ISO 7 cleanroom with state of the art optical/electron beam lithography for nanopatterning/nanofabrication of nanodevices based on nanostructured materials.
His skills cover a broad range from nanofabrication and surface nanopatterning to electronics and optoelectronics in nanodevices and contactless spectroscopies (Raman, photoluminescence, optical reflectance/absorption/transmission).

Research Interests

- Semiconductor-Based And Hybrid Quantum Technologies
- Energy Conversion and Harvesting
- Iontronics And Sensing
- Quantum electronics, electronic/ thermal transport in nanostructures, nanoscale thermoelectrics, single electron devices
- Nanowire-based systems and devices, including metamaterials
- Semiconductor and hybrid metal-semiconductor nanostructures, carbon-based nanomaterials

Professional Qualifications

12/2017	Qualification for **Associate Professor**, (Physics of Matter) MIUR, Italy
02/2013	Qualification for **"Maître de conférences. Milieux denses et matériaux"**, Ministere de l'Enseignement Superieur et de la Recherche Scientifique, France.

Teaching

I have been teaching overall for approximately fifteen (15) years starting from 2003, except the period 2011-2015 in which I dedicated myself exclusively to experimental research activities.

In the period 2016-2023 I taught (in English) as unique appointed teacher of courses offered to classes of international students, generally not exceeding 30 units, of the following study programs:

- *master degree and doctorate in Physics and Nanosciences at UNIMORE*
- *master degree (Physics, Chemistry, Mathematics) and doctorate (Nanoscience, Physics) at Scuola Normale Superiore, Pisa*
- *master degree in "Materials and Nanotechnology" at the University of Pisa.*

In the period 2003-2010 I taught (in Italian) at the University of Pavia, as a reader, trainer, laboratory assistant and tutor for BSc courses offered to classes of national students, even larger than 100 units, of various study programs, including:

- *Building Engineering and Architecture (exerciser, Physics course)*
- *Earth Sciences (exerciser and laboratory assistant, Physics course Experimental)*
- *Pharmacy (reader, preparatory course for Physics and Mathematics)*
- *Pharmaceutical Chemistry (laboratory assistant, Experimental Physics course)*

I have always carried out teaching activities in person with the exception of the periods in which the restrictions due to the Covid health emergency imposed online lessons, which I regularly carried out using the meet (at Scuola Normale) and teams (at University of Pisa) platforms.

Teaching at UNIMORE (unique appointed teacher)

2022– 2024:	Laboratory of nanosctructures (60 h/y, MSc "Physics and Nanoscience") Fisica b (48 h/y, BSc "Mathematics")
2021 – 2022:	Laboratory of Physics Condensed Matter (30 h/y, MSc "Physics and Nanoscience") Fisica b (48 h/y, BSc "Mathematics") Fisica a (30 h/y, BSc "mathematics " and "Chemistry")

Teaching at Scuola Normale Superiore (unique appointed teacher)

2018 – 2020:	Quantum Technologies, systems and methods (20 h/y, MSc & PhD, Scuola Normale Superiore and Univ. of Pisa)
2017 – 2020:	Physics Nanostructures (10 h/y, MSc & PhD, Scuola Normale Superiore and Univ. of Pisa)
2016 – 2020:	Physics Seminar series: Phys. Cond. Matt. Experimental Physics (30 h/y, MSc & PhD, Scuola Normale Superiore and Univ. of Pisa) Physics Cond. Matt. (20 h/y, MSc & PhD, Scuola Normale Superiore and Univ. of Pisa)

Teaching at Università di Pisa (lecturer)

2016 – presente:	Nanostructured Materials (6 h/y, MSc "Materials and Nanotechnology", Univ. of Pisa and Scuola Normale Superiore)

Teaching activity at Università di Pavia

2008/2009	*Member of examination board* - Optics (Physical Science and Technology); Experimental Physics (Earth Science)
2006/2008	*Lecturer (20h) & member of examination board* - Physical Technologies and Cultural Heritage (Phys. Sci. Tech.) - Optics (Phys. Sci. Tech.); - Experimental Physics (Earth Science)
2005/2006	*Lecturer & laboratory assistant (30h), member of examination board* - Physics (Construction Engineering – Architecture) - Optics (Phys. Sci. Tech., Physical Technologies and Cultural Heritage, Phys. Sci. Tech).

- Experimental Physics (Earth Science)

Lecturer (40h): Introductory Course for Student from High School- Math.s and Physics (Pharmacy)

2004/2005 *Lecturer & laboratory assistant (30h), member of examination board*
- Physics (Construction Engineering – Architecture)

Laboratory Assistant (10h)
- Experimental Physics (Pharmaceutical Chemistry)

2003/2004 *Lecturer & laboratory assistant (30h), member of examination board*
- Physics (Construction Engineering – Architecture)

Tutor (30h): Physics (Biotechnology)

2002/2003 *Tutor (30h):* Experimental Physics II (Physics); - Physics (Pharmacy)

Scientific Divulgation

- Scuola FIM "Una Settimana da Scienziato", 6-10/02/2023, Dipartimento FIM, UNIMORE, hands-on "Dentro il nanomondo" http://www.outreach.fim.unimore.it/site/home/stage--scuole/una-settimana-da-scienziato.html
- Scuola FIM "Una Settimana da Scienziato", 6-10/02/2023, Dipartimento FIM, UNIMORE, presentazione "Le nanotecnologie" http://www.outreach.fim.unimore.it/site/home/stage--scuole/una-settimana-da-scienziato.html
- BRIGHT-NIGHT 2020 - La Notte Europea delle Ricercatrici e dei Ricercatori, 27/11/2020, *La termoelettricità* *https://www.sns.it/it/evento/bright-night-2020* *https://www.youtube.com/watch?v=rdtxGFPLOvU&list=PLBuORDoKog3n8DaiUqxoOcsNlPn0Wqq72&index=10*
- OPEN DAY @NEST 2019, *Semiconductor Nanostructure Systems and Devices*
- F18 - Conferenza Italiana Studenti di Fisica 2018, Pisa, 20-23 Aprile 2018 (http://ai-sf.it/cisf18/), "Semiconductor Nanowire Science&Tech: Q-technologies, energy harvesting, optoelectronics & sensors"
- NEST presentation for secondary school Licei Tecnologici,2017 NEST, Pisa, Italy, Le nanotecnologie
- NEST Activity presentation for Radbound University students, 03/05/2016 - NEST, Pisa, Italy, *Magneto-transport in low dimensional systems: Nanowire-based zero-dimensional systems*
- Progetto "12 autobus", INFN-SISSA in occasione de "World Year of Physics 2005", 2005, Membro di commissione, unità di Pavia (https://scienzapertutti.infn.it/548-concorsi-n/anno-fisica/1191-2005-anno-mondiale-della-fisica; https://scienzapertutti.infn.it/images/stories/pdf/scienzapertutti_concorso_autobus.pdf)
- SEMISUPER06 -Interactive exhibition with live experiments, University of Pavia, 2006.

Referee Activity for PhD Thesis (partial list)

2024 Daniel Vaquero Monte, Universidfad de Salamanca
"MAgnetotransport and photocurrent spectroscopy in 2D materials"

2018 Ilir Aliaj, Scuola Normale Superiore
"Charge transport and X-ray spectroscopic investigation pf graphene-LaAl=3/SrTiO3 hybrid systems"

2012 Clara González-Santander de la Cruz. Depto. Física de Materiales, Univ. Complutense de Madrid. "*Interactions, external fields and disorder in low-dimensional systems."*

2013 Cayetano Sanchez-Fabres Cobaleda. Facultad de Ciencias Físicas, Univ. de Salamanca.
"Fabrication and characterization of graphene nanodevices."

2011 Mario Amado Montero, Universiodad de Salamanca
"Estructura electronica y propiedades de transporte en grafeno y otros sistemas nanoscopicos"

Scientific supervisor (undergrad, grad., PhD, reserach fellows, young researchers with >3y. experience) partial list

2023 - present Leonardo Martini, Researcher, UNIMORE
2D materials engineering

2023 - present Luca Nappi, MSc student, UNIMORE
Nanodevice Iontronics with semiconducting nanowires

2023 - present Matteo Barduzzi, MSc student, UNIMORE
Computational and experimental phonon engineering in semiconducting nanowires

2023 - present Alberra Carella, PhD student, UNIMORE
Sustainable nanomaterials for battery and supercapacitor technology development

2023 - present Arslan Lauiquat, PhD student, UNIMORE
2D electronics: Impact of Electric Field on Electric Double Layer Transistors

2022 - present Diego Ferri, MSc, UNIMORE

	Ambipolar INSb nanowire devices, UNIMORE
2023 - present	Muhammed Isram, PhD student, UNIMORE
	Nanotechnologies for Thermoelectrics
2021	Samuele Cornia, research fellow, UNIMORE
	Semiconductor-based quantum technology platforms
2020	Alberto Betti, MSc, Scuola Normale Superiore
	1D electronic transport in semiconductor nanowires: impact of ion-gating
	Giada Bucci, MSc, Univ. Pisa
	Nanowire platforms for machine learning
	Lorenzo Peri, MSc, Scuola Normale Superiore
	Thermal conductivity reduction in InAsSb nanowires for thermoelectric applications
	Alessia Colosimo, PhD student, Scuola Normale Superiore
	A multi-technique approach to nanoscale heat transfer
	(joint PhD fellowship Scuola Normale Superiore - Université Claude Bernard Lyon 1)
	Emilio Marconi, MSc, Univ. Pisa
	Dynamics of disordered materials for ion-gating of nanodevices
2019 - now	Valeria Demontis, research fellow, Scuola Normale Superiore
	Preparation and characterization of semiconductor nanowire metasurfaces
	Alessia Colosimo, MSc, UniPisa
	Thermally driven ion-gating in semiconductor nanowire devices
2018 - now	Sedighe Salimian, research fellow, Istituto Nanoscienze-CNR (co-supervisore con Lucia Sorba).
	Transport spectroscopy in nanoscale semiconductor heterostructures
	Domenic Prete, MSc, Scuola Normale Superiore, Pisa
	Iontronic functionalities in nanodevice applications
	Isha Verma, PHìhd student, Scuola Normale Superiore, Pisa (co-supervisore con Lucia Sorba).
	Growth and electronic characterization of semiconductor nanostructures
2018/2019	Boyu Wang, MSc, UniPisa
	Transport spectroscopy of core-shell InAs/InP/GaSb heterostructure nanowires
	Lixuan Wei, MSc, UniPisa
	Transport spectroscopy of InSb nanoflags
	Stefano Servino, MSc, UniPisa
	Tuning tunneling rates nanowire quantum dots
2017/2018	Domenic Prete, MSc, UniPisa
	Thermoelectric effect in nanowire quantum dots
2016 – 2018	Valeria Demontis, research fellow, NEST, Scuola Normale Superiore and Istituto Nanoscienze-CNR
	Realizzazione di sistemi e dispositivi nano-strutturati e caratterizzazione delle loro proprietà di trasporto.
2015 – 2016	Mirko Rocci, research fellow, Scuola Normale Superiore, Pisa.
	Fabrication and characterization of nanostructures for quantum transport.
2014	Cayetano Cobaleda, research fellow,. Scuola Normale Superiore, Pisa.
	Fabrication and characterization of nanostructures for quantum transport.
2009/2010	Fabio Dionigi, MSc (110/110 con lode). Dip. Fisica Università di Pavia.
	“Gas bidimensionale di elettroni in regime Hall quantistico.”
2009/2010	Cesare Marco Lazzarini, BSc. Dip. Fisica Università di Pavia.
	“Il grafene e il suo utilizzo nel fotovoltaico.”
	Jose Maria Caridad, PhD student, Università di Pavia
	Raman imaging of graphene
2008/2009	Jan Postuma, BSc. Dip. Fisica Università di Pavia.
	“Celle Solari, Stato dell’Arte e Innovazioni Future.”
	Ismael Colino (visiting student Dip. Fisica Univ. di Pavia da UNiv. di Salamanca)
	Semiconductor wafer characterization combining magnetotransport, Optical and Lifetime Measurements

Institutional responsibilities (partial list)

2018-2021:	Vice-coordinator of the Innovation & Demonstration Node of the Scuola Normale Superiore macro-node in the "Centro di Competenza ARTES 4.0" (Advanced Robotics and enabling digital Technologies & Systems 4.0)
	Faculty Committee Member PhD degrees, Scuola Normale Superiore, Pisa
	PhD Committee Member and Reviewer, Scuola Normale Superiore, Pisa
2017-2021:	Graduate Student Advisor, Scuola Normale Superiore, Pisa
	Post Doctoral Fellow Advisor, Scuola Normale Superiore, Pisa
	Faculty Committee Member for admission to Nanoscience PhD course, Scuola Normale Superiore, Pisa
	Scientific responsible of the Magneto-Transport Lab. at the NEST Initiative of Scuola Normale Superiore
2016 – 2018:	Faculty Committee Member for admission of Undergraduates, Scuola Normale Superiore, Pisa
Since 2016:	Faculty Member (temporary), Scuola Normale Superiore, Pisa
Since 2014:	Committee Member for Recruitment of Scientist, Scuola Normale Superiore, Pisa
2008 – 2010:	MSc Physics degree Committee Member and Reviewer, Univ. of Pavia
2004 – 2007:	Committee Member of the Interdepartmental Center for Studies and Researches for the Conservation of Cultural Heritage, Univ. of Pavia

Commissions of Trusts (partial list)

2017-2021:	Committee Member for Recruitment of Scientists, National Research Council (CNR) – Nanoscience Institute, Pisa
2017-2021:	Member of the technical panel in Calls for Tenders, NEST Laboratory, Pisa
2013:	PhD degree Review panel Member, Faculty of Physics, Univ. of Salamanca (ES)
2011-2012:	PhD degree Review panel member, Univ. Complutense of Madrid (ES)
2005:	Committee Member, World Year of Physics 2005, INFN-SISSA 12 Bus Project, Pavia Univ.

Extra-Institutional responsibilities (partial list)

Since 2024	**E**xecutive Committee member, Italian Association for Thermoelectricituy (AIT)
2023	**R**eviewer, FLAG-ERA Call 2023
	Reviewer, Swiss National Science Foundation
2022	**S**takeholder& partecipants, Survey on Scientific Indicators, Lund University - School of Economics and Management and The University of Tokyo - Institute for Future Initiative
Since 2021:	**R**egistrata disponibilità come revisore per la VQR 2015-2019 (SSD FIS/01-03-07, settori ERC PE3_10-3-4, PE7_5, PE4_4)
	Stakeholder committee member, EU Horizon 2020 research and innovation program - European Metrology Programme for Innovation and Research – "High throughput metrology for nanowire energy harvesting devices" (NanoWires, project n. 19ENG05)
	Stakeholder, Educational Rankings Department Center for Promotion of Educational Services - Belarusian State University of Informatics and Radioelectronics (www.bsuir.by)
Since 2020:	**E**xpert collaborator, "Agencia Estatal de Investigación", BECA (Spanish State Research Agency)

Organization of Conferences

- **Organizing commitee member**, NMDC'23, Nanotechnology Materials and Devices Conference (NMDC), October 22-25, 2023 | Paestum, Italy (https://ieeenmdc.org/2022/nmdc-2023-call-for-papers/)
- **Conference Track Editor**, "Fundamentals and applications of nanotubes, nanowires, quantum dots and other low dimensional materials", NMDC'23, October 22-25, 2023 | Paestum, Italy
- **Conference Track Editor**, "Nanodiamond and Nanocarbon structures: materials and devices", ", NMDC'23, October 22-25, 2023 | Paestum, Italy
- **Chairman**, CMD30, Minicolloquium "Nanodevice Iontronics", Milano, September 4-8, 2023
- **Co-organizer**, MRM2023/IUMRS-ICA2023, Tokyo, December 2023, Symposium: Thermoelectric Materials for Sustainable Development
- **Chairman**, CMD29, Manchester, August 21st –26th, 2022, "Nanodevice Iontronics" (http://cmd29.iopconfs.org/Home)
- **Chairman**, GiTE2022, Pisa, February 16st –17th, 2022, Associazione Italina di termoeettricità (https://ait.icmate.cnr.it/)
- **Chairman**, annual meeting of the national project PRIN2017 "PELM", Pisa, October 15st, 2021 (https://r1.unitn.it/pelm/events/)
- **Chairman**, CMD2020GEFES, on-line conference, "Iontronics and the field effect control of semiconductor nanodevices" (https://eventos.uam.es/28512/section/23693/2020-joint-conference-of-the-condensed-matter-divisions-of-eps-cmd-and-rsef-gefes.html)

- **Chairman**, Nanowire Week 2019 International Conference (250 participants) – September 23-27, 2019, Pisa (http://webtheory.sns.it/nanowireweek2019/)
- **Organizing Committee member**, International Conference Nanoscience and Nanotechnology 2009 Frascati
- **Organizing Committee member**, International Conference Nanoscience and Nanotechnology 2008 Frascati

Editorial Boards

- Lead Guest Editor, **Physica Status Solidi (RRL) – Rapid Research Letters** (Wiley) - Special Issue: Nanodevice Iontronics
- Editorial board member, **Electronic Materials** (MDPI), 12/2022 - now
- Topical Advisory Panel member, **Sensors** (MDPI), 2022-present
- Associate Editor, **Frontiers in Photonics**, section Quantum Optics, 2022-present
- Associate Editor, **Frontiers in Photonics**, section Optical Nanostructure, 2022-present
- Editorial board member, **Nano Express** (IOP), https://iopscience.iop.org/journal/2632-959X/page/Editorial_board
- Lead Guest Editor, **Nanotechnology** (IOP) - Focus issue on Nanowires 2021 https://iopscience.iop.org/journal/0957-4484/page/focus-nanowires-2021
- Lead Guest Editor, **Nanotechnology** (IOP) - Focus issue on Nanowires 2019 https://iopscience.iop.org/journal/0957-4484/page/focus_on_nanowires_2019
- Lead Guest Editor, **Materials** (MDPI)., Special Issue "Advances in Nanoscale and Low-Dimensional Functional Materials" https://www.mdpi.com/journal/materials/special_issues/2X6C0LTTZK
- Lead Guest Editor, **Materials** (MDPI) - Special Issue "Semiconductor Nanowire Devices and Applications" https://www.mdpi.com/journal/materials/special_issues/Semiconductor_Nanowire
- Guest Editor, Nanotechnology (IOP) - Focus on Waste-Heat Harvesting via Thermoelectric Conversion: Materials, Devices and Systems for Sustainable Energy Technologies (https://iopscience.iop.org/journal/0957-4484/page/focus-waste-heat-harvesting-thermoelectric-conversion-materials)
- Guest Editor, **Nanotechnology** (IOP) - Focus issue on Nanowires 2021 – Sensors and actuators: chemical, biological, optical, microfluidic (https://iopscience.iop.org/journal/0957-4484/page/focus-nanowires-2021)
- Guest Editor, **Nanotechnology** (IOP) - Focus issue on Nanowires 2019 – Sensors and actuators: chemical, biological, optical, microfluidic (https://iopscience.iop.org/journal/0957-4484/page/focus_on_nanowires_2019)

Referee Activity for International Journals

- **Review Editor**, Frontiers in Photonics, **Frontiers in Photonics – Quantum Optics** specialty section https://www.frontiersin.org/journals/photonics/sections/quantum-optics#editorial-board
- Reviewer Board, **Nanomaterials** (MDPI, https://www.mdpi.com/journal/nanomaterials/submission_reviewers)
- Referee per:

  Nature (***Nature Communications***, ***Light***, *Scientific Reports)*
  APS (***Phys. Rev. Lett.***, *J. Nanosci. Nanotech)*
  ACS (***Nano Letters***, *J.Phys.Chem., J.Phys.Chem., Appl. Mat. Interfaces, Applied Nanomaterials)*
  IOP (***Nanotechnology***, *Nano Express, New Journal of Physics, Physica Scripta)*
  Wiley (***Small***, *J. Raman Spectr.*, ***Laser Photonic Rev.***)
  Elsevier (***Carbon***, *Solid State Comm., Mat. Sci. Eng. B, JOLT)*
  OSA (***Optic Express***)
  MDPI (***Nanomaterials***, *Materials, Electronics, Crystals, International Journal of Molecular Sciences)*
  Springer (J. Mater. Eng. Perf.)
  Taylor & Francis (Phyl. Mag Phyl. Mag. Lett.)
  RSC (***Chem. Comm.***, *Nanoscale Advances)*
  Bentham (Curr. Nanomat.)
  Electrochemical Society

Coordinated Research Grants (partial list)

Project Title	*Funding source*	*Amount (Euros)*	*Period*	*Role and managed budget (euros)*
Cavi innovativi in fibra ottica per trasmissione dati altamente performanti e a zero-rilascio di sostanze tossiche in acqua potabile, per consentire l'adozione in Italia delle tecnologie di connessione 5G e superiori dati i vincoli infrastrutturali esistenti.	**POR FERS Toscana 2014-2020. Asse 1 – Azione 1.1.5 sub a1**	**3 M**	**2021-2022 (2 anni)**	**Coordinatore Organismo di Ricerca - Scuola Normale 450 k**
Photonic Extreme Learning Machine: from neuromorphic computing to universal optical interpolant, strain gauge sensor and cancer morphodynamic monitor (PELM) https://r1.unitn.it/pelm/	**MIUR - PRIN 2017**	**0.83 M**	**2019 – 2021 (3 anni)**	**Coordinatore unità Scuola Normale 150 k**
ULTRAfast thermodynamics at the NANOscale (ULTRANANO)	**MIUR - Futuro in Ricerca 2013**	**0.52 M**	**2013 – 2017 (3 anni)**	**Coordinatore unità Scuola Normale 230 k**
QUANtum Technologies Experimental Platform (QUANTEP) https://agenda.infn.it/event/23230/contributions/116177/attachments/73224/92622/Quantep_preventivi.pdf	**INFN-Call2021 Quantum Technology**	**1 M**	**2019 – 2021 (3 anni)**	**Coordinatore unità Scuola Normale 120 k**
Basic research founding	Scuola Normale Superiore	8 k	2017-2018 (2 anni)	Principale coordinatore
NANOscale semiconductors GATEd by ionic liquids: multifunctional devices for nanoelectronics and optoelectronics (NANOGATE)	Scuola Normale Superiore	10 k	2019-2021 (2 anni)	Principale coordinatore
Nanowire for Energy Harvesting	Scuola Normale Superiore	15 k	2017-2019 (2+1 anni)	Principale coordinatore

2018 CNR - Short Term Mobility Program .
"Spettroscopia di magneto-trasporto in eterostrutture a nanofilo semiconduttore", **1k€**, 2 settimane. Ricercatore su invito.

Nel periodo 2009/2012 EuroMagNet - II Exchange Program, EU contract number 228043.
Due "Secondment" finanziate. **8 k€,** 4 mesi. Ricercatore a contratto su invito.

Nel periodo 2009/2012 Infraestructuras científico técnicas singulares - (ICTS-MICINN, Spain).
4 esperimenti finanziati. **5 k€,** 1.5 mesi. Ricercatore su invito.

Nel periodo 2008/2012 EuroMagNet - II Transnational Access Program, EU contract number 228043.
13 esperimenti finanziati. **20 k€,** 3 mesi. Utente esterno.

Awards

- 2012: premio nazionale per le nanoscienze NEST 2012 (5 k€)
- 2004: migliore tesi, SAFI-IUSS, Univ. di Pavia (2 k€)

Research grants participated (partial list)

Titolo del progetto	*Ente finanziatore*	*Entità complessiva finanziamento (euro)*	*Periodo*	*Ruolo*
"Centro di Competenza ARTES 4.0" (Advanced Robotics and enabling digital Technologies & Systems 4.0)	MiSE	10.6 M	2019 - 2023 (5 anni)	vice-coordinatore, "Innovation & Demonstration Node", macronodo di Scuola Normale
EELISA innoCORE (EELISA INNOvation and COmmon REsearch Strategy)	Horizon 2020 – Science with and for Society program	~1M	2021-now	Membro del board proponente - Scuola Normale Superiore (budget SNS 120k)

12/2016 – 12/2017 CNR – SEED
"Core/shell nanowires for electronics and thermoelectrics"
20 k€, 1 anno

12/2016 – 12/2017 CNR – SEED
"Hybrid Single Spin Quantum Circuits"
20 k€, 1 anno

2015/2016 CNR-Bilateral project Italia-Russia
50 keuro, 3 anni

Participations to Projects Founded through Competitive Calls

2012/2014 Scuola Normale Superiore (accordo MISE-ICE-CRUI).
"Development of graphene-based fast THz detector operating at room temperature (TERAGRAPH)." Assegnista di ricerca (1 anno).

2009/2011 Fondazione Cariplo.
"Quantum & Mesoscopic Nanodevices in collaboration with European Laboratories and Large Scale facilities (QUANTDEV)." Assegnista di ricerca (2 anni).

2007/2009 Fondazione Cariplo.
"Diluted magnetic oxides thin films: Towards transparent spintronics."
Assegnista di ricerca (1 anno).

2006/2008 Fondazione Cariplo.
"Development of new materials and demonstration of prototypes of polymer and solid oxide fuel cells." Assegnista di ricerca (1.5 anni).

2002/2005 MIUR – FIRB (FIRB RBNE01KZ94).
"Realizzazione di microdispositivi fotonici in niobato di litio. MIUR." Ricercatore a contratto (1 anno).

2003/2005 MIUR - EC grant Azione Integrata España-Italia HI0211.
"Crecimiento y caracterización de los materiales ferroeléctricos $LiNbO_3$ estequiométrico, $LiTaO_3$ y $Sr_xBa_{1-x}Nb_2O_5$ para su aplicación como materiales fotónicos."
Dottorando

2010/2012 Universidada de Salamanca - Laboratorio de Bajas Temperaturas.
"Study and development of new technologies for energy generation based on thin film solar cells." Ricercatore su invito (~2 mesi)

2007/2009 Regione Lombardia and Università di Pavia (Project REGLOM06).
"Dalla scienza del materiali alla biomedicina molecolare - Percorsi scientifico formativi per giovani ricercatori." Assegnista di ricerca.

Scientific production

Co-author of 114 peer-reviewed publications, ~1800 citations , H-index 25 (Scholar)

I presented and I am co-author of about 110 contributions to conferences, among which 21 invited, keynote and plenary talks and 26 contributed talks.

https://scholar.google.com/citations?user=oTaAt74AAAAJ&hl=it&oi=ao

https://www.scopus.com/authid/detail.uri?authorId=8923633000

https://orcid.org/0000-0002-0601-4927

Invited seminars at international and national universities and research institutions (partial list)

- "Ionic thermoelectric nanodevices", Engineering Physics Department seminar, McMaster University, Hamilton, Canada, September 30, 2021
- "Polarization control with semiconductor nanowires", national meeting INFN project QUANTEP, Quantum experimental platforms, September 09, 2020
- "Engineering electronic functionalities in nanowire-based devices: advantages from heterostructuring and electrostatic doping", February 17th 2020, Dipartimento di Scienze Fisiche, Informatiche e Matematiche, Università di Modena e Reggio Emilia, Modena, Italia (https://www.magazine.unimore.it/site/home/prossimi-eventi/scheda820011976.html)
- Supercapacitore nanostrutturato attivato termicamente, JOINT TECHNOLOGY TRANSFER OFFICE (JOTTO) FAIR, May 2019, Lucca, Italy
- The InAs/InP self-assembled nanowire technology for QICT and other applications, June 20th 2018, **National Research Council, Ottawa, Canada**
- "Ionic liquid gating of InAs nanowire-based field effect transistors". June 18th 2018, **Special CPM Seminar,** Centre for the Physics of Materials, **Mc Gill University, Montreal, Canada** (https://www.physics.mcgill.ca/seminars/CPM_old.html#CPMJC)
- "Semiconductor nanowire platforms for thermoelectrics", September 30th 2016, **Electronic Kinetics Lab, Chernogolovka, Russia.**
- "Quantum transport in heterostructured nanowires", July 2016, **Hitachi Cambridge Laboratory, Cambridge (UK).**
- "Quantum Transport in Heterostructured Nanowires", June 21st 2016, NANO Colloquia 2016, NEST Laboratory, Pisa, Italy.
- "Two-dimensional electrons: optical and transport experiments in high magnetic field", February 11th 2010, **LNCMI-Toulouse, France**.
- "Two-dimensional electrons: optical and transport experiments in high magnetic fields", January 19th 2010, Physics Dept. "A. Volta" **Colloquia, Univ. of Pavia, Italy**.
- The Cariplo Project in Pavia: state of the art and perspectives", February13th 2007, **ZAE Bayern, Garching, Germany.**

Invited lectures at international and national conferences and workshops

- "III-V Semiconductor nanowire thermoelectrics". **CMD30 FisMat 2023** jont conference, Milano , Italy– September 4-8, 2023 (Invited)
- "Semiconductor nanowire thermoelectrics: gate-controlled ZT, giant reduction of thermal conductivity, thermoelectric-gating". International Workshop Thermoelectric Materials: from materials chemistry and physics to devices (IWT2023), 12-14th April 2023, Abbaye aux Dames, **Caen, France** (Invited)
- "Semiconductor Nanowires: A Nanomaterial Platform for Energy Conversion Technologies", 11th International Conference of the African Materials Research Society (AMRS2022), 12-15 December 2022, **Dakar, Senegal** (keynote)
- "Semiconductor nanowire thermoelectrics", International Union of Materials Research Societies – International Conference on Advanced Materials, IUMRS – ICAM 2021. August 14 – 19, 2022. **Cancún, México** (keynote)
- "III-V semiconductor nanowire electric double layer transistors gated by ionic liquids", International Conference on Nanotechnology 21st edition of **IEEE NANO**, july 28th to 30th, 2021 (invited)
- "Electrolyte gated nanowire field-effect transistor for advanced control of thermoelectric functionalities", Giornata Italiana della Termoelettricità GiTE 2021, February 17-18, 2021 Pisa, Italy (invited)
- "Electrolyte gated nano-transistors for advanced control of thermoelectric functionalities", International Meet & Expo on Semiconductors, Optoelectronics and Nanostructures (SEMICONMEET2021), September 16-18, 2021 **Porto, Portugal** (invited)
- "Advanced field effect control in semiconductor nanowire based devices", **Nano-M&D 2019 - Conference – UNISA, Salerno, Italy**, June 2019 (Invited)

- "Growth of III-V Semiconductor Nanowires and Transport Experiments in Nanowire-based Devices", Highlights in Nanoscience workshop, NEST-SNS, June 10-11, 2019 (Invited)
- "Iontronics: fundamentals, applications and the case of ionic liquid-gated InAs nanowire FETs", **Nanoscience and Nanotechnology 2018, LNF Frascati, Italy,** December 18-20, 2018. (Invited)
- "Iontronics or controlling electronics via ionic motion and arrangement: fundamentals and applications", **Nanoinnovation Conference 2018, Rome, Italy,** September 11-14, 2018. (Keynote)
- "Stark-effect controlled heterostructured NW-QD-SEDs", Dynamics of energy transfer at the nanoscale - Workshop, **Helmoltz Zentrum Berlin, Germany**, September 25-27, 2017. (Invited)
- "Strategies for benchmarking the thermoelectric properties of nanosystems", Plenary lecture, February 23rd 2017, Thermoelectricity days, **Chemistry Dept, Univ. of Torino, Italy.** (Plenary)
- "Studio e caratterizzazione di nanostrutture di carbonio", Convegno dell'Unità di Ricerca di Pavia del Consorzio Nazionale Interuniversitario per le Scienze Fisiche della Materia - **CNISMeeting2009, Pavia**, Italy (Invited)
- "Realizzazione di una apparecchiatura per misure di Termoluminescenza". 2a Settimana dell'Archeometria _ 2003, Pavia, Italy. (Invited)
- " Datazione con Termoluminescenza di laterizi dalla chiesa di S. Felice a Pavia", 2a Settimana dell'Archeometria _ 2003, Pavia, Italy. (Invited)

Invited lectures at schools organized by international and national universities and research institutions

- "Hybrid nanoscale thermoelectrics", Summer School, PhD program in Science and Technology of Bio and Nanomaterials, Università Ca' Foscari di Venezia, 30-31/08/2021
- "Multidimensional transport measurements in semiconductor nanostructures", Scientifica Data Analysis School 2019 _ 26/11/2019, Sala Multimediale Bakunin (Complesso San Silvestro), Scuola Normale Superiore, Pisa, Italy (https://indico.sns.it/event/8/contributions/105/)
- "Extracting information from multidimensional data / Hands-on", Scientifica Data Analysis School 2019 _ 26/11/2019, Sala Multimediale Bakunin (Complesso San Silvestro), Scuola Normale Superiore, Pisa, Italy (https://indico.sns.it/event/8/contributions/104/)
- "Hybrid semiconductor nanowire-superconducting tunnel Junction devices: quasi-particle spectroscopy, thermometry and nanorefrigeration" **Invited Lecture serie, Interaction of radiation with quantum devices**, November 27th — December 1st, **Moscow State Pedagogical University, Laboratory of Quantum Detectors, Moscow, Russia** (http://irq2017.quant.physics.mpgu.edu/)

Research Visits (partial list)

I spent a total period of approximately 30 months at different universities and international and national research centers as an invited or contract researcher, user of facilities and student.

1 mese nel 2018	McGill University-Montreal, Prof. G. Gervais and NRC Ottawa, Dr. Guy Austing Visiting scientist
2 settimane nel 2017	Universite Grenoble Alp and Neel Institut, Dr. Benjamin Sacepe Visiting research
2 settimane nel 2017	Chernogolowka, Prof. Khrapai group & St. Petersburg, Prof. Dubrovsky group Visiting researcher
2 settimane nel 2016	Electronic Kinetics Lab, Moscow Institute for Physics and Engineering, Russia. Visiting researcher..
2 settimane nel 2015	European Magnetic Field Laboratory – Toulouse, France. External User. Magneto-transport experiments.
8 mesi nel periodo 2009/2012	Laboratoires National de Champs Magnetic Intense – Toulouse, France. Guest Researcher & external user. Magneto-transport/photoluminescence spectroscopy
1 mesi nel periodo 2009/2011	Laboratoires National de Champs Magnetic Intense – Grenoble, France. External User. Magneto-transport/photoluminescence experiments.
1 mese nel periodo 2009/2010	Institute for Systems based on Optoelectronics and Microtechnology, Universidad Politécnica de Madrid, Spain. External User. Processing of nanoelectronic devices.
1 mese nel 2008	Laboratorio de Bajas Temperaturas, University of Salamanca, Spain. Visiting post-doc. Electron transport and magneto-transport experiments.
9 mesi nel periodo 2006/2008	Physics Dept E19, TU München, Germany. Visiting post-doc. Development and functional test of solid oxide fuel cells.
1 mese nel periodo 2004/2005	Crystal Growth Laboratory, Materials Physics Dept, Autonoma Univ. in Madrid,Spain. Visiting PhD student. Grow and sample preparation of single crystals oxide.
2 mesi nel 2004	Quantum Electronics & Nonlinear Optics Lab, Electronics Dept, Univ. di Pavia, Italy. Visiting PhD student. Electro-optical experiments.
4 mesi nel periodo 2001/2002	Thermoluminescence Laboratory, Material Science Dept, Milano-Bicocca Univ., Italy. Visiting undergraduate student. Thermoluminescence-dating experiments.

Modena, 11.09.2024 *Francesco Rossella*