

## Personal Data

<b>Name</b>	Matteo
<b>Surname</b>	Cialone
<b>Date of birth</b>	9 <sup>th</sup> November 1985
<b>Place of birth</b>	L'Aquila (Italy)
<b>WoS stats</b>	Total publications: 11; total citations: 23; <i>h</i> -index: 3.
WoS ResearcherID	X-5373-2019
<b>Scopus stats</b>	Total publications: 11; total citations: 26; <i>h</i> -index: 3.
Scopus Author Identifier	57198501355
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## Work and education

- Present - 2021 **Postdoctoral researcher on applied superconductivity in the group of SuPerconducting and other INnovative materials and devices institute (SPIN)**, *Consiglio Nazionale delle Ricerche (CNR)*, Genova, Italy.
- Supervisor Dr. Valeria Braccini
- Description I am involved in the framework of the HIBiSCUS (High performance-low cost Iron BaSed Coated condUctorS for high field magnets) project led at the SPIN-CNR unit by Dr. Valeria Braccini (PRIN project awarded to PI Prof. Marina Putti). My role in the project is synthesis and study of the correlation between transport properties and the material structure. I am involved in the deposition of superconducting Fe-based thin films via pulsed laser deposition, structural characterization, measurements of transport properties, and the fabrication of metallic substrates for coated conductors.
- 2020 - 2019 **Postdoctoral researcher in the group of smart nanoengineered materials, nanomechanics and nanomagnetism (G-nm<sup>3</sup>)**, *Autonomous University of Barcelona*, Cerdanyola, Spain.
- Project Involved in the framework of the SPIN-PORICS project (ERC Consolidator Grant, Agreement Nr. 648454 awarded to Prof. Jordi Sort)
- Supervisor Prof. Jordi Sort
- Description The SPIN-PORICS project aims to integrate engineered nanoporous materials into novel energy-efficient spintronic applications. In particular I am focused into the development of innovative solutions for the selective control of the magnetic properties of ferromagnetic porous nanostructures through the use of the electric field. I developed the work flow that using a combination of different lithographies, lift-off and selective etching techniques allows to obtain devices based on magnetoelectric materials.

- 2019 - 2015 **Ph.D. Chemistry and Materials Science - Awarded with honors**, *University of Torino & INRiM*, Torino, Italy.  
**Marie Curie research fellow - Smart Electrodeposited Alloys for Environmentally sustainable applications (SELECTA - H2020-MSCA-2014 Nr.642642)**  
 Thesis *Low dimensional dense and nanoporous Fe-based alloys for smart materials*  
 Supervisors Prof. Paola Rizzi & Dr. Paola Tiberto  
 Description Deposition of thin films and nanostructure of different FePd stoichiometry both via sputtering techniques and via electrochemical deposition. Study of the film morphology via scanning electron microscopy and atomic/magnetic force microscopy. Characterization of the thin film microstructure via grazing angle x-ray diffraction and transmission electron microscopy. Study of magnetic properties via different kind of magnetometers. Optimization of dedicated post deposition treatments for the stabilization of metastable phases. Fabrication of ferromagnetic nanostructure via both electron beam lithography and focus ion beam. Development of an innovative method for the measurement of the magnetostriction of ferromagnetic thin film using standard atomic force microscopy. Development of an innovative method to acquire of local lateral resolved hysteresis loop on ferromagnetic nanostructure.
- 2015 **M.Sc. Physics**, *Freie Universität Berlin*, Berlin, Germany.  
 Thesis *Photoemission electron microscopy study of multiferroic systems*  
 Supervisor Prof. Dr. Alexei Erko  
 Direct advisors Dr. Florian Kronast & Dr. Sergio Valencia Molina  
 Description Study of magnetoelectric coupling at room temperature in a two phase artificial system. A wedge of iron is grown on a single crystal of barium titanate. Magnetic state of the iron as a function of electric applied field is imaged in photoemission electron microscope exploiting the x-ray magnetic circular dichroism at Bessy II synchrotron radiation facility in Berlin.
- 2011 **B.Sc. Physics**, *Università degli studi dell' Aquila*, L'Aquila, Italy.  
 Thesis *Experimental study of graphene oxide edges through electron microscopy and x-ray spectroscopy techniques*  
 Supervisors Prof. Luca Ottaviano & Prof. Gianni Profeta  
 Description Characterization of nano flakes of graphene oxide through scanning electron microscopy and subsequent chemical analysis by means of x-ray photoemission spectroscopy.

## Academic activity of supervision and trainings

- A.Y. **Training**, *Universitat Autònoma de Barcelona, Cerdanyola*, Spain.  
 2019/2020 Training of the students of the early stage researcher students of the **mCBEEs** ITN on the Vibrating-sample Magnetometer (VSM).
- A.Y. **Master thesis**, *University of Turin, department of physics*, Torino, Italy.  
 2018/2019  
 Title Preparation of nanosystems for biomedical applications by physical techniques and study of their magnetic and hyperthermic properties.  
 Student Valerio Vallana
- A.Y. **Bachelor thesis**, *University of Turin, department of chemistry*, Torino, Italy.  
 2018/2019  
 Title Synthesis, characterization and dealloying of thin films of Fe<sub>70</sub>Pd<sub>30</sub>.  
 Student Giuliana Ducano
- A.Y. **Master thesis**, *University of Turin, department of chemistry*, Torino, Italy.  
 2017/2018

Title Synthesis and characterization of FePd thin films for magnetic applications.  
Student Vanessa Bordignon

## Stays in public or private research centres and universities

- 1/5/2019 - **Universitat Autònoma de Barcelona**, *Department of physics, Cerdanyola, Spain.*  
31/12/2020 Secondment with the task of the synthesis of sub-micron FePd structures via electrodeposition into pre-patterned substrates.
- 9/1 - **Leibniz Institute for solid state and materials research**, *Department of chemistry of functional materials, Dresden, Germany.*  
10/3/2017 Secondment with the task of developing of a suitable electrolyte for the electrodeposition of FePd. Electrodeposition of FePd thin films with tunable stoichiometry.
- 28/11 - **Chalmers University of Technology**, *Department of Industrial and Materials Science, Goteborg, Sweden.*  
9/12/2016 Secondment with the task of studying the composition of FePd thin films via X-ray photoemission spectroscopy.
- 1/5/2014 - **Helmholtz Zentrum Berlin**, *BESSY II storage ring, Berlin, Germany.*  
30/7/2015 Student assistant with the task of supporting the research activities at the S-PEEM end station of UE49 - PGM beamline. Design and development of dedicated sample holders for custom experiments.
- 1/4 - **Brandenburg University of Technology**, *Department of mathematics, natural science and computer science, Cottbus, Germany.*  
30/7/2012 Research project "Graphene - Writing graphene: ion-beam modification of thin polymer layer" with the main task of maintenance and improvement of a scanning tunneling microscope with the scope to develop a system capable to perform in-situ characterization of atomic layer deposited thin films.
- A.Y. **Student assistant**, *University of L'Aquila, L'Aquila, Italy.*  
2009/2008 Support to the activity of Center for Electron Microscopy of University of L'Aquila.
- 1/10/2007 - **Technical University of Wien**, *Department of applied physics, Wien, Austria.*  
1/04/2008 Erasmus of six month during which I was involved in a project work on surface analysis. Analysis of surface of Solid Oxides Fuel Cells were analyzed by means of x-ray photoemission electron spectroscopy.

## Participation in Research Projects

### As principal investigator

- 18 - **Synchrotron proposal.**  
24/10/2021 Awarded with 144 hours of beamtime for the *Structural studies of superconducting Fe(Se,Te) microstructures via X-ray diffraction* (REF. Nr. 18207390), at KMC2 beamline, BESSY II storage ring, Berlin, Germany.
- 23 - **Synchrotron proposal.**  
26/5/2021 Awarded with 72 hours of beamtime for the *Unraveling the origin of magnetoelectric effects on arrays of ordered nanoporous iron oxide microdisks* (REF. Nr. 2020094553), at BOREAS beamline, ALBA synchrotron light facility, Bellaterra, Spain.
- 8 - **Synchrotron proposal.**  
12/5/2020 Awarded with 72 hours of beamtime for the *Unraveling the origin of magnetoelectric effects in nanoporous iron oxide thin films* (REF. Nr. 25376), at I10 beamline, Diamond light source, Oxfordshire, United Kingdom.
- 10 - **Synchrotron proposal.**  
16/5/2019 Awarded with 144 hours of beamtime for the *Structural studies of electrodeposited FePd and FeCu nanostructures via X-ray diffraction* (REF. Nr. 18207390), at KMC2 beamline, BESSY II storage ring, Berlin, Germany.

### As investigator

- Present-2020 **HiBISCUS.**  
High performance-low cost iron based coated conductors for high field magnets. Financed by the Ministero dell'istruzione, dell'università e della ricerca (Agreement PRIN 2017). **Principal investigator:** Prof. M. Putti (CNR-SPIN coordinator: Dr. V. Braccini)

## 2019-2020 **SPINPORICS.**

Merging Nanoporous Materials for Energy-Efficient Spintronics. Financed by the European Research Council (Consolidator Grant - Agreement Nr. 648454). **Principal investigator:** Prof. J. Sort

## 2015-2018 **SELECTA.**

Smart ELECTrodeposited Alloys for environmentally sustainable applications: from advanced protective coatings to micro/nano-robotic platforms. Financed by the European Commission (Marie Skłodowska-Curie Innovative Training Networks (ITN-ETN - H2020-MSCA-2014 Nr.642642). **Principal investigator:** Prof. J. Sort

## Main collaborations

- Prof. J. Sorts' group at the Physics Department of Universitat Autònoma de Barcelona, Bellaterra, Spain.
- Prof. E. Silva's group at Department of Industrial, Electronic and Mechanical Engineering, University of Roma tre, Roma, Italy.
- Dr. G. Celentano's group at ENEA, Frascati Research Center, Rome, Italy.
- Prof. L. Gozzelino's group at Department of Applied Science and Technology, Politecnico di Torino, Torino, Italy.
- Prof. M. Putti's group at Physics department of the University of Genova, Italy.
- Dr. G. Riuss from the microelectronic institute of Barcelona (IMB-CNM-CSIC), Spain.
- Dr. A. Nicolenco from the Institute of Applied Physics, Chisinau, Moldova.
- Prof. P. Rizzi's group at Chemistry department and NIS of the University of Torino, Italy.
- Dr. P. Tiberto's group at Italian Institute for Metrological Research (INRiM), Torino, Italy.
- Prof. Z.H. Barber's group from the Device Materials group at University of Cambridge, Cambridge, United Kingdom.
- Dr. A. Gebert's group from the Department of functional materials of the Leibniz Institute for Solid State and Material Research, Dresden, Germany.

## Patents

- J.Sort, E. Manendez, M. Cialone, V. Sireus, A. Nicolenco, J. de Rojas, G. Rius - *Electric-field programmable magnetic switching in arrays of interconnected patterned dots for neuromorphic and stochastic data processing*. Application nr. PCT/EP2021/060062 - Under revision.

## Conferences and seminars

- 13- **iWOE conference.**
- 15/10/2021 attendance of the International Workshop on Oxide Electronics, Genova (Italy) - **Contributed talk** "Voltage-induced ON switching of magnetism in ordered array of nanoporous iron oxide microdisks".
- 11- **Materials challenges conference.**
- 13/04/2021 attendance of the Materials Challenges for Memory, virtual conference - **Presentation of the poster** "Electric-field control of magnetism in arrays of nanoporous iron oxide microdisks".
- 7- **JEMS conference.**
- 11/12/2020 attendance of the Joint European Magnetic Symposia, Lisboa (held virtually) - **Contributed talk** "Control of Magnetism in Porous Iron Oxide Films and Nanostructures via Electric Field Induced Magneto-Ionic Effect".
- 26- **Heraeus Seminar.**
- 29/1/2020 attendance of the Energy Efficient Magnetoelectric Materials by Ionic Approaches: Fundamentals, Challenges and Perspectives, Bad Honnef (Germany) - **Presentation of the poster** "Magnetoelectric effects in nanoporous CoPt microstructures".

- 30/1 - **MAGNET conference.**
- 1/02/2018 attendance of the Italian Conference on Magnetism, Messina - **Contributed talk** "Magnetic force microscopy study of electrodeposited FePd sub-micron structures" .
- 3-7/92018 **JEMS conference.**  
attendance of the Joint European Magnetic Symposia, Mainz - **Contributed talk** "Magnetization reversal in electrodeposited FePd sub-micron structures" .
- 15-20/72018 **ICM conference.**  
Attendance of the International Conference on Magnetism, San Francisco - **Presentation of the poster** "Influence of deposition techniques on the magnetic properties and microstructure of FePd thin films".  
**Presentation of the poster** "Innovative technique for thin films magnetostriction measurements by scanning probe microscopy".
- 18-23/62017 **ISMAM conference.**  
Attendance of the 24<sup>th</sup> international symposium on metastable, amorphous and nanostructured materials, San Sebastian. **Presentation of the poster** "Comparative study of sputtered and electrodeposited FePd thin films".
- 12-15/72016 **EMSA conference.**  
Attendance of the 11<sup>th</sup> European magnetic sensors and actuators conference, Torino. **Presentation of the poster** "Structural and magnetic characterization of Fe<sub>1-x</sub>Pd<sub>x</sub> thin films".
- 20-15/52015 **DPG conference.**  
Attendance of the 79<sup>th</sup> Deutsche Physikalische Gesellschaft spring meeting in Berlin. **Presentation of the poster** "Photoemission electron microscopy of two phase multiferroics system".
- [Conference as organizer](#)
- 18-15 May **Graphita.**  
2011 Organization and attendance of Graphita Workshop, a multidisciplinary and intersectorial European conference/workshop on synthesis, characterization and technological exploitation of Graphene, held at Laboratori Nazionali del Gran Sasso - Assergi - L'Aquila.

## Awards and professional recognitions

- February **Journal front cover.**  
2019 Front Cover of the *IEEE Transactions on Magnetics*, February 2019, Volume 55, Number 2
- November **Journal front cover.**  
2018 Front Cover of the *IEEE Transactions on Magnetics*, November 2018, Volume 54, Number 11
- April 2018 **INTERMAG conference.**  
Awarded with the "People's choice" prize in the "Art in magnetism" contest for the image *My nano sunflowers*
- July 2018 **ICM conference.**  
Awarded with the "Judge's choice" prize in the "Magnetism as Art Showcase" contest for the image *One explosion*
- July 2018 **ICM conference.**  
Awarded with a student travel grant for the attendance of the international conference on magnetism in San Francisco

## Trainings

- 21 - **Italian School on Magnetism, University of Torino, Torino, Italy.**
- 25/5/2018 Attendance of the Italian school of magnetism in advanced magnetic materials and devices for biomedical applications. Presentation of the poster "Magnetic force microscopy study of the magnetization reversal in electrodeposited FePd sub-micron structures".
- 7/1 - **Winter school, University of Cambridge, Cambridge, United Kingdom.**
- 12/1/2018 Gateway to industry: Introducing materials to market. Practical aspects. Contributed as speaker.
- 3 - 7/9/2017 **Summer school, University of Ioannina, Ioannina, Greece.**  
Gateway to Academics: Materials modelling for target applications. Contributed as speaker.

- 3 - 7/9/2017 **Workshop**, *Chalmers University of Technology, Goteborg, Sweden.*  
Bridging innovation and entrepreneurship with sustainable materials development. Contributed as speaker.
- 29/5 - **Crystallography school**, *University of Torino, Interdepartmental Centre for Crystallography*  
7/6/2017 (*Crisdi*), *Torino, Italy.*  
Attendance of the basic and advanced courses.
- 29 - **Workshop**, *Happy Plating, Wiener Neustadt, Wien, Austria.*
- 31/08/2016 Micro and nano-electrodeposition for MEMS/NEMS and micro/nano-robotic platforms. Overview of lithography methods. Impact to society. Contributed as speaker.
- 6 - **Workshop**, *IFW, Dresden, Germany.*
- 10/03/2016 Training on research methodologies, characterization techniques and reporting scientific results. Contributed as speaker.
- 3 - **Workshop**, *University of Kragujevac, Vrnjacka Banja, Serbia.*
- 7/11/2015 Fundamentals of electrodeposition of metallic alloys: state-of-the-art at European and International levels. Contributed as speaker.

## Trainings in soft skills

- 7 - **Interview skills**, *University of Cambridge, Cambridge, United Kingdom.*  
12/1/2018 Trainer: Ms. Katie Hewitt
- 3 - 7/9/2017 **Competitive Grant Writing**, *University of Ioannina, Ioannina, Greece.*  
Trainer: Ms. Lotte Jaspers, Yellow Research
- 29 - **How to write scientific papers**, *Happy Plating, Wiener Neustadt, Wien, Austria.*  
31/08/2016 Trainer: Prof. Lindsay Greer, editor of Philosophical Magazine
- 6 - **Effective oral presentations**, *IFW, Dresden, Germany.*  
10/03/2016 Trainer: Mr. Jean-Luc Doumont, Principiae
- 3 - **EURAXESS network**, *University of Kragujevac, Vrnjacka Banja, Serbia.*  
7/11/2015 Internationalization of research, bridging scientific research environment between Eastern and Western Europe. Trainer: Prof. Dr. Miroslav Trajanovic - Serbia EURAXESS network, Researchers in Motion, pan-European initiative

## Institutional responsibilities

- 2018-present **Reviewer.**  
Reviewer for the journal Materials Chemistry and Physics
- 2019-present **Reviewer.**  
Reviewer for the journal Applied Surface Science
- 2015-2018 **Students representative.**  
Representant of the student in the framework of the MSCA-ETN Action SELECTA with responsibility on the project management
- 2015-Present **MCAA.**  
Member of the Marie Curie Alumni Association

## Publications

- M. R. Khan, A. Leo, A. Nigro, A. Galluzzi, M. Polichetti, V. Braccini, M. Cialone, M. Scuderi, G. Grimaldi - *Effective Magnetic Field Dependence of the Flux Pinning Energy in FeSe<sub>0.5</sub>Te<sub>0.5</sub> Superconductor* - Materials **14 (18)** (2021) - DOI: 10.3390/ma14185289
- G. Barrera, F. Celegato M. Cialone, M. Coisson, P. Rizzi, P. Tiberto - *Structural, wetting and magnetic properties of sputtered Fe<sub>70</sub>Pd<sub>30</sub> thin film with nanostructured surface induced by dealloying process* - Nanomaterials **11(2)** (2021) - DOI: 10.3390/nano11020282
- M. Cialone, F. Celegato, F. Scaglione, G. Barrera, D. Raj, M. Coisson, P. Tiberto, P. Rizzi - *Nanoporous FePd alloy as multifunctional ferromagnetic SERS-active substrate* - Applied Surface Science **53** (2021) - DOI:10.1016/j.apsusc.2020.148759
- M. Cialone, A. Nicolenco, S. Robbenholt, E. Menendez, G. Rius, J. Sort - *Voltage-induced ON switching of magnetism in ordered arrays of non-ferrimagnetic nanoporous iron oxide microdisks* - Advanced Materials Interfaces **8** (2021) - DOI: 10.1002/admi.202001143
- E. Dislaki, M. Cialone, F. Celegato, P. Rizzi, P. Tiberto, S. Vadilonga, D. Töbrens, J. Sort, E. Pellicer - *Unraveling the properties of sharply defined submicron scale FeCu and FePd magnetic structures fabricated by electrodeposition onto electron-beam-lithographed substrates* - Materials & Design **193** (2020) - DOI: 10.1016/j.matdes.2020.108826
- M. Coisson, W. Hüttenes; M. Cialone, G. Barrera, F. Celegato, P. Rizzi, Z. H. Barber, P. Tiberto - *Measurement of thin film magnetostriction using field-dependent atomic force microscopy* - Applied Surface Science **52** (2020) - DOI: 10.1016/j.apsusc.2020.146514
- G. Barrera, F. Scaglione, M. Cialone, F. Celegato, M. Coisson, P. Rizzi, P. Tiberto - *Structural and Magnetic Properties of FePd Thin Film Synthesized by Electrodeposition Method*. Materials **13(6)** (2020) - DOI: 10.3390/ma13061454
- G. Barrera, F. Celegato, M. Coisson, M. Cialone, P. Rizzi, P. Tiberto - *Formation of free standing magnetic particles by solid state dewetting of Fe<sub>80</sub>Pd<sub>20</sub> thin films*. Journal of Alloys and Compounds **742** (2018) - DOI: 10.1016/j.jallcom.2018.01.373
- M. Cialone, F. Celegato, M. Coisson, G. Barrera, G. Fiore, R. Shvab, U. Klement, P. Rizzi, P. Tiberio. - *Tailoring magnetic properties of multicomponent layered structure via current annealing in FePd thin films*. Scientific Reports **7** (2017) - DOI: 10.1038/s41598-017-16963-5
- A. Palau, S. Valencia, N. Del-Valle, C. Navau, M. Cialone, A. Arora, F. Kronast, D.A. Tennant, X. Orbados, A. Sanchez, T. Puig - *Encoding Magnetic States in Monopole-Like Configurations Using Superconducting Dots*. Advanced Science **3(11)** (2016) - DOI: 10.1002/advs.201600207
- S. Martins, J. de Rojas, Z. Tan, M. Cialone, A. Lopeandia, J. Herrero-Martin, J. L. Costa-Kramer, E. Menendez, J. Sort - *Dynamic electric-field-induced magnetic effects in Cobalt oxide thin films: towards magneto-ionic synapses* . Nanoscale , Under revision
- G. Barrera, F. Celegato, M. Cialone, M. Coisson, P. Rizzi, P. Tiberto - *Role of the substrate crystallinity on morphological and magnetic properties of Fe<sub>70</sub>Pd<sub>30</sub> nanoparticles obtained by the solid-state dewetting* . Sensors, Under revision
- D. Torsello, M. Fracasso, R. Gerbaldo, G. Ghigo, F. Laviano, A. Napolitano, M. Iebole, M. Cialone, N. Manca, V. Braccini, A. Leo, G. Grimaldi, A. Vannozzi, G. Celentano, E. Silva, M. Putti, L. Gozzelino- *Proton irradiation effects on the superconducting properties of Fe(Se,Te) thin films*. Submitted to Transactions on Applied Superconductivity
- L. Piperno, A. Vannozzi, V. Pinto, A. Augieri, A. Angisani Armenio, F. Rizzo, A. Mancini, A. Rufoloni, G. Celentano, V. Braccini, M. Cialone, M. Iebole, N. Manca, A. Martinelli, M. Putti, G. Sotgiu, A. Meledin - *Chemical CeO<sub>2</sub>-based buffer layers for Fe(Se,Te) films*. Submitted to Transactions on Applied Superconductivity

## Personal Skills

Good problem solving skills gained all along training and educational path.

Good organizational skills gained as organizer of both cultural and scientific events.

Good attitude in working in team and in an international environment gained during work and educational experiences abroad.

Knowledge of different operating systems, in particular Linux (mainly Ubuntu distribution).

Knowledge of different software for data and image analysis (mainly ImageJ and Gwiddion).

General knowledge of photo editing and graphics software. Basic attitude in code writing (mainly bash and python for the data analysis).

## Languages

Italian **Mother tongue**

English **Proficient user (C1)**

Spanish **Independent user (B2)**

Catalan **Independent user (B1)**

German **Basic user (A2)**

## Interests

- Travels

- Technology

- Cooking

- Enology

## CV summary

With this short summary, I would like to describe the milestones of my scientific career. I want to proceed with an inverse chronological order and highlight the motivations and achievements reached during my journey. From January 2021, I am working in the SuPerconducting and other INnovative materials and devices institute (SPIN) of the Consiglio Nazionale delle Ricerche (CNR), Genova, Italy. Here, I was granted a postdoctoral scholarship in the framework of the HiBiSCUS project (High performance-low cost Iron BaSed Coated condUctorS for high field magnets). My role in this project is to correlate the structural properties of iron-based superconducting thin films with their superconducting properties (i.e., critical current, critical temperature). In particular, I focus on the deposition of thin films by, their structural characterization, and the measurement of superconducting properties, especially critical temperature and critical current. I am also involved in optimizing metallic substrates as substrates for the fabrication of coated conductors. This current project has allowed me to enrich my knowledge since it represents a change from the topics I had previously pursued during previous research. In my earlier work as a postdoctoral researcher at the Autonomous University of Barcelona, I joined the Group of Smart Nanoengineered Materials, Nanomechanics. Here, I was working in the framework of the SPINPORICS project (ERC Consolidator Grant, Agreement Nr. 648454 ) in the field of magnetoelectric effect in porous materials. In particular, I focused on implementing innovative solutions to increase the technology readiness level of concepts formulated in the field of modulation of the magnetic properties of nanoporous materials through an electric field. As a result of this postdoctoral work, we have synthesized a porous material based on iron oxides, whose magnetic properties can be tuned at will by using an electric field. Also, this step represented a slight change in the topic of my work compared to the research I carried out during my Ph.D. I was selected to carry out the Ph.D. within the Smart electrodeposited alloys for environmentally sustainable applications (SELECTA) European Training Network (grant agreement Nr. 642642). This innovative training network (ITN) was part of Marie Skłodowska-Curie Actions, funded by the European Commission in the framework of the Horizon 2020 program. During my Ph.D., I focused on studying the correlation between Fe-based alloys' structural, magnetic, and mechanical properties in the form of thin films and nanostructures, both compact and porous. This research work was carried out mainly at the Italian Metrology Institute and the University of Turin. Being part of an ITN allowed me to work with partners from all over Europe. Indeed, I had the opportunity to spend several periods abroad at partner institutions, where I acquired new skills and established several collaborations. Moreover, this ITN program gives great attention to the development of the so-called soft skills, mainly for disseminating scientific results (both for a specialized and a general audience) and writing projects for European grants. At the end of this period, I obtained my doctorate in chemistry and materials science, awarded with honors. Before starting the Ph.D. I worked as a student assistant at the PEEM beamline at BESSY II synchrotron in Berlin. Apart from the user support and beamline maintenance, I focused on studying the strain-mediated magnetoelectric effect in the artificial two-phase multiferroic structure. The latter was also the topic of my master thesis in Physics, awarded by the Freie Universitaet of Berlin.

In conclusion, each step in my career matches a slight change in topic. I believe this is a strategy to increase my knowledge and skills and an occasion to bring prior knowledge into the new field, as I believe these *contaminations* are very fruitful. The central element of this multidisciplinary approach has been the study of the interconnection between the structure and the properties of materials, which is necessary to develop innovative materials that meet the technological challenges of today.