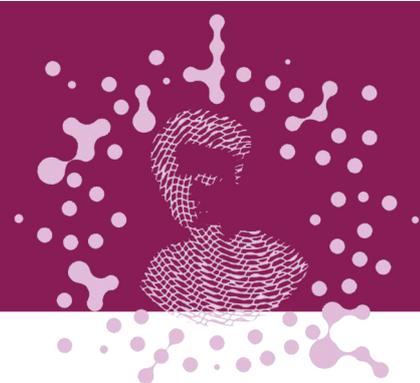




Marie Curie Postdoc Fellowship

2026



1. Supervisor

Supervisor: Prof. Marco Giorgetti, School of Science and Technology/Chemistry Division

Marco Giorgetti is a **Full Professor of Analytical Chemistry at the University of Camerino**. He leads the **Spectroscopy, Electrochemistry and Energy (S2E) Research Group** at the University of Bologna and the University of Camerino (<https://site.unibo.it/spectro-electrochem-energy-research-group/en>).

He served as the local coordinator of the **Erasmus Mundus Joint Master's Degree in "Advanced Spectroscopy in Chemistry"** from 2012 to 2025, and he has also coordinated several Erasmus exchange agreements between the University of Bologna (where he has worked until 2025) and European universities, including Lille, Leipzig, and Madrid.

His research focuses on the **structural and electronic characterization of materials**, especially **battery and solid-state materials**, using core-level X-ray spectroscopic techniques (e.g., XAS, XRPD, XTM, XPS, XRF). He also works on applied electrochemistry, sensor development, and the synthesis and characterization of materials for advanced batteries. Additionally, he has applied **Prussian blue-based** materials in sensors, ion exchange systems, and batteries, and has strong expertise in **data analysis methodologies**.

He pioneered the **in situ characterization of energy materials using synchrotron radiation X-ray absorption techniques**. Marco has coordinated about 35 projects at synchrotron radiation facilities, including LURE (Orsay, France), SRS-Daresbury (Warrington, UK), ESRF (Grenoble, France), Brookhaven National Laboratory (Upton, NY, USA), ELETTRA (Trieste, Italy), and SOLEIL (France). His most recent projects involve operando and ex situ characterization of zinc-ion batteries (ELETTRA and CERIC proposals, and a SOLARIS proposal).

ORCID: 0000-0001-7967-8364

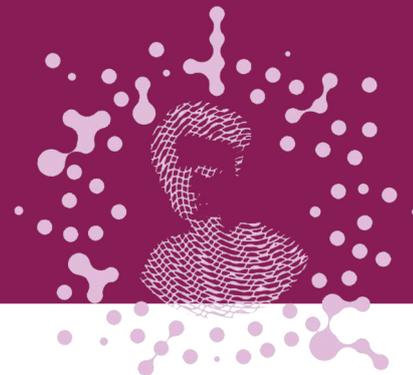
5 of the most significant/recent publications

1. Daniele Callegari, Giulia Maranini, Claudia Triolo, Mariam Maisuradze, Hemanth Beere, Abdelhaq Nassiri, Umberto Anselmi-Tamburini, Saveria Santangelo, Marco Giorgetti, Mauro Coduri, *High Entropy Layered Cathode with Single-Crystal Morphology for High-Performance Sodium-Ion Batteries* *Small* **11**, e11833 (2026). doi: doi.org/10.1002/smll.202511833
2. Min Li, Mariam Maisuradze, Ilaria Carlomagno, Juan Reyes Herrera, Jasper Rikkert Plaisier, Giovanni Agostini, and Marco Giorgetti *Synchrotron Radiation Investigation of Reaction Mechanism of Manganese Prussian Blue Analogue in Aqueous Zn-Mn Electrolyte* *J. Phys: Energy* **7**, 045027 (2025). doi: 10.1088/2515-7655/ae09fc
3. Min Li, Mariam Maisuradze, Zulkarnaen Paputungan, Reinhard Denecke, Jasper Rikkert Plaisier, Giuliana Aquilanti, Giovanni Agostini, and Marco Giorgetti *Excess of Zn to relieve the structural distortion of manganese hexacyanoferrate in aqueous Zn-ion battery* *J. Mater. Chem. A* **13**, 11314-11322 (2025). DOI: <https://doi.org/10.1039/d4ta08889a>
4. Min Li, Mariam Maisuradze, Angelo Mullaliu, Ilaria Carlomagno, Giuliana Aquilanti, Jasper Rikkert Plaisier, and Marco Giorgetti *Structural Evolution of Manganese Prussian Blue Analogue in Aqueous ZnSO4 Electrolyte* *Small* **20**, 2404584 (2024). doi: 10.1002/smll.202404584
5. Mariam Maisuradze, Ilaria Carlomagno, Angelo Mullaliu, Min Li, Giuliana Aquilanti, Marco Giorgetti *"2D X-ray fluorescence imaging as a probe for charge state distribution of manganese in aged MnHCF-based electrodes"*



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J. Phys. Chem. C **127**, 21498-21503 (2023). doi: 10.1021/acs.jpcc.3c06061

Past projects (from 2020)

2025: HORIZON-MSCA-2024-COFUND-01-01. PROJECT DESTINY2 101217158. "DOCTORATE PROGRAMME ON EMERGING BATTERY STORAGE TECHNOLOGIES INSPIRING YOUNG SCIENTISTS 2". 100.800 EURO., Local coordinator (Unibo)

2025: Research contract: Ferrari. 45.000 euro. PI.

2025: PNRR MSCA2024, 2D-HYBRID-BAT, "Design and Optimization of 2D SiGe- and SnGe-Based Methyl Hybrid Materials for Enhanced Lithium and Sodium-Ion Battery Performance: Electrochemical Properties and Structure-property Relationship" Tutor

2025: Project ENEA-MASE, local coordinator, "Tecnologie di accumulo elettrochimico e termico" 40.000 euro

2024: 2 PNRR positions partially financed by FERRARI and FAAM. 60.000 euro. PI

2023: PRIN 2012 (2015CL3APH_001) – OPHELIA: Operando studies of High-Entropy oxide-based materials for Na-Ion battery cathodes, Principal Investigator. 98.870 euro.

2023: Research contract: Ferrari. 12.000 euro.

2023: Full PhD funded by Ferrari. 75.000 euro.

2023: 3 positions Full PhD funded by the Chinese Scholarship Council, 145.800 euro

2022: Coordinator (Local – Department of Industrial Chemistry). Project: MIAMI. "Materiali Innovativi per Sistemi di Accumulo Ibrido". Bando MITE 2021. 373.659 euro.

2021: Research contract Acomon. Caratterizzazione mediante prove sperimentali di compositi (polimero + sale) al fine di valutare la conducibilità elettrica e ionica e i meccanismi che la determinano, sia utilizzando tecniche elettrochimiche che spettroscopiche. 45.000 euro

1995-2025: Coordination of more than 35 projects in synchrotron radiation facilities including the LURE (Orsay, France), SRS-Daresbury (Warrington, UK), ESRF (Grenoble, France), Brookhaven National Laboratory (Upton, NY, USA), ELETTRA (Trieste, Italy), SOLEIL (Saint Aubin, France).

2020: Full PhD funded by the CERIC-ERIC consortium. 68.082 euro.

2020-2025: ERASMUS+: HIGHER EDUCATION – ERASMUS MUNDUS JOINT MASTER DEGREES. Agreement nr. 2019-1409 -001-001 – "Advanced Spectroscopy in Chemistry Master's Course"

EMJMD ASC: HIGHER EDUCATION – ERASMUS MUNDUS JOINT MASTER DEGREES. Agreement nr. 2015-2517 – "Advanced Spectroscopy in Chemistry Master's Course"

Contacts marco.giorgetti@unicam.it; marco.giorgetti@unibo.it

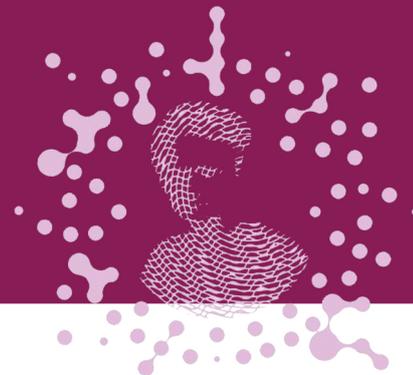
2. Research Group and Facilities

Laboratory & Facilities: Electrochemistry and analytical chemistry laboratories at the University of Camerino and the University of Bologna, operating in synergy within the Spectroscopy, Electrochemistry and Energy (S2E) Research Group.



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Research Network: S2E is at the forefront of spectroscopy-electrochemistry in the energy sector, with a mission to advance sustainable technologies. Our research spans battery materials synthesis, electrochemical characterization, and structural analysis, prioritizing affordability and safety. Our group has experience in both, ex-situ and operando spectroscopical investigation of battery systems. Advanced analytical methods of characterization are often applied, including synchrotron techniques.

web page: <https://site.unibo.it/spectro-electrochem-energy-research-group/en>

3. Research Thematic Area/Project Idea

Title of the project (thematic area): Advanced characterization techniques for investigating degradation mechanisms in battery electrode bulk materials and their interfaces

Macroarea: PE; **keywords:** Batteries, cathode, anode, x-ray characterization, interface, interphases.

Project Overview: Developing advanced batteries for high-performance use requires understanding how materials behave under several conditions such as fast charging/discharging, high energy demand, and long-term operation. Combining **laboratory analytical techniques** with **X-ray diffraction and spectroscopy** enables detailed analysis of both liquid and solid-state batteries. This approach links battery **microstructure** with **local chemistry, crystal phases, and oxidation states**, helping researchers identify degradation mechanisms and performance limitations.

Outstanding candidates interested in applying for MSCA PF are encouraged to get in touch for a preliminary scientific discussion. In the most recent MSCA round, two candidates supervised within our research framework achieved evaluation scores of 94.2/100 and 84.6/100, reflecting strong competitiveness at the European level.

4. Candidate and Career Plan

Expected background of the candidate

Research background in: electrochemistry, solid-state chemistry, materials chemistry, energy storage, or related areas are welcome.

Competences and knowledge to be developed by the candidate

The project will develop competencies in advanced battery materials and electrochemical systems, including the analysis of liquid and (possible) solid-state batteries under demanding operating conditions, the application of techniques such as X-ray Diffraction and X-ray Spectroscopy to investigate crystal structures, oxidation states, and local chemistry, and the ability to correlate battery microstructure, crystal phases, and electrochemical behavior in order to identify degradation mechanisms and performance limitations within the broader fields of Materials Science and Electrochemistry.