Curriculum vitae

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Bibliometric Data (January 2025)

Scopus: Documents: 48; Citations: 833; h-index: 12.
Web of Science: Documents: 40; Citations: 724; h-index: 12.

Working experiences

December 2021 – ongoing
University of Bologna
Assistant professor / Researcher
in the Department of Civil, Chemical, Environmental and Materials Engineering (3 years contract)
Supervisor: Prof. M.C. Bignozzi
Research project: "Product and process sustainability of ceramic tile production"; Responsible of **geopolymer synthesis and characterization lab**.

November 2017 – December 2021
University of Bologna
Postdoctoral Research Associate
in the Department of Civil, Chemical, Environmental and Materials Engineering (4 years fellowship)
Supervisor: Prof. M.C. Bignozzi
Research project: "Study of corrosion resistance and development of protective methods for metallic alloys for industrial and cultural heritage application".

Education

November 2014 - November 2017 (Date of the Doctoral degree: 7th May 2018)
University of Bologna, Italy
PhD (with scholarship Grant from MIUR)
in the Department of Civil, Chemical, Environmental and Materials Engineering
XXX cycle, A.Y. 2017-2018
Curriculum: Materials Engineering and Industrial Biotechnologies | Disciplinary Sector: ING-IND/22 Materials Science and Technology | Supervisor: Prof. M.C. Bignozzi | Co-supervisors: Prof. C. Chiavari, Prof. E. Bernardi, Prof. C. Martini, Dr. L. Robbiola | PhD thesis: "Atmospheric corrosion of outdoor bronze: mechanism of decay and conservation strategies", within the European **Project B-IMPACT** (Bronze-IMproved non-hazardous PAtina CoaTings), for cultural heritage applications (in the frame of M.ERA.Net Transnational Call 2013).

January 2017 - April 2017
Université de Toulouse II - Jean Jaurès, Toulouse, France
"Marco Polo" Scholarship (II Session, 2016)
for a visiting period funded by the University of Bologna, as Visiting Student Research Collaborator to the Laboratoire TRACES (UMR 5608).
Supervisor: Dr. L. Robbiola

February 2016 - May 2016

Université de Toulouse II - Le Mirail, Toulouse, France
Visiting Student research Collaborator
at the Laboratoire TRACES (UMR 5608)
Supervisor: Dr. L. Robbiola
January 2015
University of Bologna, Italy
Professional Engineering License in Civil and Environmental Engineering
School of Engineering and Architecture (II Session, 2014).

April 2014 - October 2014
University of Bologna, Italy
Attending Graduate Student
to the Department of Civil, Chemical, Environmental and Materials Engineering (DICAM).
Supervisor: Prof. M.C. Bignozzi

September 2007 - March 2014
University of Bologna, Italy
Master's degree in Building Engineering / Architecture
School of Engineering and Architecture (grade: 108/110)
Master Degree Thesis (defended the 18th March 2014) in "Chemistry and Technology for Building Materials" entitled "The influence of short fibres and foaming agents on the physical and thermal behaviour of geopolymer composites for building engineering", in collaboration with the Geopolymer Centre Group at the Curtin University (Perth, Western Australia).
Supervisor: Prof. M.C. Bignozzi | Co-supervisors: Dr. S. Manzi, Prof. A. van Riessen, Dr. W.D.A. Rickard

October 2013 - January 2014
University of Bologna, Italy
Internship
in the Department of Civil, Chemical, Environmental and Materials Engineering, dealing with "Study of geopolymer porosity for applications in Civil Engineering"
Supervisor: Prof. M.C. Bignozzi

March 2013 - October 2013
Curtin University, Perth, Western Australia
Study grant FOR FINAL Dissertation and RESEARCH ABROAD (II Session, 2012)
funded by the School of Engineering and Architecture of the University of Bologna, Italy
for a Visiting period (7 months) to the Geopolymer Centre Group.
Supervisor: Prof. A. van Riessen | Co-Supervisor: Dr. W.D.A. Rickard

September 2002 - June 2007
Liceo Scientifico Enrico Fermi, Bologna, Italy
Scientific High school Degree

Research activities

Main research activities	The common theme of the research is related to the assess of **the durability of sustainable materials** in the **Construction and Cultural Heritage field**. The main research activities developed in the last 10 years can be summarized as follows: 1. Investigation of the **corrosion behaviour** and **degradation mechanisms of different materials:** - corrosion resistance of **steel in alternative binders** (alkali activated materials/geopolymers) for **civil engineering** applications; - **corrosion behaviour** of different metals and alloys (cast irons, high-strength low alloy steels, corrosion resistant alloys) and the assessment of **innovative organic and metallic protective coatings** for **Constructions and other industrial fields**; - efficiency and development of **conservation strategies** for the improvement of **corrosion resistance** of **metallic alloys** (*e.g.* Cu-based alloys) and **natural and artificial stones**, for **Cultural Heritage** applications; - Development of methodologies for studying **material decay**, especially the simulation of **atmospheric corrosion conditions by artificially ageing methods** considering the environmental and geometrical exposure conditions;

	- Study of the **interaction between environmental parameters** (pollutants, rainfalls and atmospheric depositions) and **materials in the field of Cultural Heritage**. Main studied materials are metallic alloys (e.g. Cu-based alloys) and natural and artificial stones 2. Development of **sustainable binders as promising alternative for construction materials**, detailed as follows: - Optimization of mix designs of **low-environmental-impact ceramic-like materials** with high mechanical and durability performances for **civil engineering** applications (**alkali activated materials/geopolymers**). - Optimization of mix design, fresh and hardened properties of **alkali activated materials** produced from **industrial by-product precursors**, as alternative binders in the field of construction materials. - Designing and investigation of **sustainable porous materials** for **high temperature applications** and **membrane** development.
Active collaborations	1. Prof. **A. van Riessen**, Prof. **W.D.A. Rickard** and Dr. **Les Vickers** (Curtin University, Perth, Australia) *Development of light-weight geopolymer composites for high temperature applications* 2. Dr. **L. Robbiola** (Laboratoire TRACES Université Toulouse Jean Jaurès, Francia), Dr. **N. Gartner** and Dr. **T. Kosec** (Slovenian National Building and Civil Engineering Institute (ZAG), Slovenia), Prof. **A. Balbo** (*Centro di Studi sulla Corrosione Aldo Daccò, Univeristy of Ferrara, Italy*) *B-IMPACT PROJECT: Protection strategies for outdoor bronze for Cultural Heritage* 3. Prof. **E. Redaelli**, Prof. **F. Lollini**, Prof. **M. Carsana** (Politecnico di Milano, Italy) *Assessment of the use of reclaimed asphalt pavement for the production of sustainable concretes* 4. Prof. **E. Bernardi**, Prof. **C. Chiavari** and Prof. **C. Martini** (University of Bologna, Italy) *Artificial ageing of cultural heritage substrates to produce representative surfaces* 5. Prof. **A. Dal Pozzo** and Prof. **A. Tugnoli** (University of Bologna, Italy) *Environmental assessment of consolidation treatments for natural and artificial stones for Cultural Heritage* 6. Prof. **L. Tositti** (University of Bologna, Italy) *Radiological analysis of several alkali activated materials as construction materials* 7. Prof. **E. Sassoni** (University of Bologna, Italy) *Durability of calcium phosphate treatments for the conservation of natural and artificial stones*
National and international projects	Active participation to some European projects and International Scientific programmes and application for a National project: 1. Participation to the National Scientific Programs *"Sustainable concrete made with recycled asphalt pavement (RAP-CON)"* (https://rapcon.chem.polimi.it/), in the frame of the "Circular Economy for a sustainable future" call in 2019, funded by Cariplo Foundation (**2020-2023**). 2. Collaboration as subcontractor to the European project *"NeSSIE: North Sea Solution for innovation in corrosion for energy"* (http://nessieproject.com/), Vanguard Initiative and co-funded by the European Maritime and Fisheries Fund (**2017-2019**). 3. Submission as Participant of the research project proposal *"Conservation of outdoor monuments: influence of UV radiation and atmospheric particulate matter (PM) in the mechanism of decay of metals and of their protective treatments"* within the ALMA Idea Grant of the University of Bologna (Principal Investigator: Dr. C. Chiavari; other participants: Dr. S. Raffo and Dr. E. Venturini). The proposal gained a score of 86.5/100 (threshold 70/100) (**2017**). 4. Active team member of the European project *"B-IMPACT: Bronze-IMproved non-hazardous PAtina CoaTings"* (Pratica MIUR n. 2897), in the frame of M.ERA.Net Transnational Call 2013 (www.b-impact.cloud), funded for 2 years by MIUR (**2015-2017**). 5. Participation to the International Scientific Programs *"Outdoor bronze corrosion: nanoscale XPS investigation of protective coating on representative substrates"*, in February 2016 (Proposal 20160149) to the Synchrotron SOLEIL (Beamline Antares), Saint Aubin, France (**2016**). 6. Participation to the International Scientific Programs *"XPS nanoscale investigation of gilded bronze corrosion"*, in February 2015 (Proposal 20140296) to the Synchrotron SOLEIL (Beamline Antares), Saint Aubin, France (**2015**).
Editorial board activity	1. Activity of Topic Editor for the special collection "Women in Science: Materials 2023" for Frontiers in Materials journal (IF (2023) = 2.6), ISSN: 2296-8016 https://www.frontiersin.org/research-topics/57108/women-in-science-materials-2023 2. Activity of guest editor for the **Special issue: "Corrosion of Metallic and Ceramic Coatings in Biomedicine and Cultural Heritage and Coatings for Its Prevention"** for Coatings journal (MDPI, IF(2023) = 2.9), ISSN 2079-6412, October 2021 - April 2022, https://www.mdpi.com/journal/coatings/special_issues/corrosion_metallic_ceramic; 3. activity of **Reviewer Editor** for Frontiers in Materials journal – Environmental degradation of materials (IF(2023) = 2.6), ISSN: 2296-8016 (since 19/10/2021); 4. participation to the **"Topic Editorial board"** of the Materials journal (MDPI, IF (2023) = 3.1), ISSN 1996-1944 (since 8/10/2020);

	5. participation to the **"Topic Editorial board"** of the Coatings journal (MDPI, IF(2023) = 2.9), ISSN 2079-6412, in the section "*Corrosion, wear and erosion*" (since 8/10/2020); 6. participation to the **Editorial board** of the Journal of Mineral Metal and Material Engineering (Scientific Array), ISSN: 2414-2115 (since 9/10/2019).
Conference organization	1. Participation to the International Scientific Committee of the RILEM SPRING CONVENTION 2024 Advanced construction materials and processes for a carbon neutral society (Mialn, Italy, 10th – 12th April 2024, https://rilem.cte-eventi.com/committees/)
Reviewing	Actions as Reviewer for the following International peer-reviewed journals: **Anais da Academia Brasileira de Ciências**, (ScholarOne Manuscripts), **Corrosion Science** (Elsevier), **Egyptian Journal of Chemistry** (NIDOC), **Environmental science and Pollution Research** (Springer), **Heritage Science** (Springer), **Journal of Building Engineering** (Elsevier), **Journal of Cellular plastics** (SAGE Journals), **Journal of Cleaner Production** (Elsevier), **Journal of Construction and Building Materials** (Elsevier), **Journal of Cultural Heritage** (Elsevier), **Journal of Reinforced Plastics and Composites** (SAGE Journals), **Materials** (MDPI), **Materials Letter** (Elsevier), **Materials Science & Technology** (Taylor & Francis Online), **Open Ceramics** (Elsevier), **Scientific Reports** (Nature Research), **Sustainable Chemistry and Pharmacy** (Elsevier) and **Waste and Biomass Valorization** (Springer).
Grants	1. **4 year-Postdoctoral fellowship** funded by the University of Bologna (**2017-2022**); 2. **3 year-PhD grant** at the University of Bologna funded by MIUR (**2014-2017**); 3. **scholarship grant for final dissertation** and 7 months of research abroad funded by the University of Bologna (**2013**).
Periods abroad	1. **3 months** of visiting during **PhD** at the Laboratoire TRACES (UMR 5608) of the University of Toulouse II - Jean Jaurès, Toulouse, France (**2017**). 2. **3 months** of visiting during **PhD** at the Laboratoire TRACES (UMR 5608) of the University of Toulouse II - Jean Jaurès, Toulouse, France (**2016**). 3. **7 months** of visiting for Master thesis preparation at the Geopolymer Centre Group of the Curtin University, Perth, Australia (**2014**).
Memberships	1. Member of **International Union of Laboratories and Experts in Construction Materials, Systems and Structures (RILEM)** since 2020 and active participation to the **Technical committees (TC): TC-294-MPA: Mechanical properties of alkali-activated concrete** (2020-2024), **TC 283-CAM: Chloride transport in alkali-activated materials** (2020-2024), and **TC CUC: Carbon dioxide uptake by concrete during and after service life**, since 2024. 2. Member of the **Italian Metallurgy Association (AIM)** for the years 2015 - 2023, Italy. 3. Member of the **Italian Association of Material Engineer (AIMAT)** for the years 2016, 2017 and 2021-2024, Italy. 4. Member of the **Italian Ceramics Society (ICerS)** for the year 2015, 2022 and 2024, Italy. 5. Member of **Material Advantage (AM)**, USA. 6. **ACerS President's Council of Student Advisors (PCSA)** Delegate, for the years 2014/2015 e 2015/2016, USA.

Teaching activity

Teaching activities	Teaching **of academic courses at the University of Bologna:** **2024-2025:** *Corrosione e protezione dei materiali* – **60 h** Master degree in Mechanical Engineering and Chemical Engineering **2023-2024:** *Corrosione e protezione dei materiali* – **60 h** Master degree in Mechanical Engineering and Chemical Engineering **2022-2023:** *Corrosione e protezione dei materiali* – **60 h** Master degree in Mechanical Engineering and Chemical Engineering **Tutor grants at the University of Bologna:** **2021-2022:** related to the academic course of *Corrosione e protezione dei materiali M* - **20 hours** Master Degree in Mechanical Engineering (Teacher: Prof. M.C. Bignozzi); **2021-2022:** related to the academic course of *"Chimica e tecnologia dei materiali T"* - **20 hours** Bachelor Degree in Civil Engineering (Teacher: Prof. E. Franzoni); **2020-2021:** related to the academic course of *"Corrosion and Protection of metallic offshore structures"* - **30 hours** Master Degree in Chemical and Process Engineering (Teacher: Prof. M.C. Bignozzi); **2019-2020:** related to the academic course of *"Corrosion and Protection of metallic offshore structures"* - **30 hours** Master Degree in Chemical and Process Engineering (Teacher: Prof. M.C. Bignozzi);

	2019-2020: related to the academic course of *"Chimica e tecnologia dei materiali T"* - **30 hours** Bachelor Degree in Building Engineering, University of Bologna (Teacher: Dr. A. Fregni). **2017-2018:** related to the academic course of *"Corrosion and Protection of metallic offshore structures"* - **30 hours** Master Degree in Chemical and Process Engineering (Teacher: Prof. M.C. Bignozzi). **Seminars** and **Laboratory practice exercises** for the following academic coursed at the University of Bologna: 1. Seminar (4 h) on "*Corrosion and material protection*" in the framework of the Specialization course MACOF (Composite materials course held in Faenza, Italy) promoted by the University of Bologna in the A.Y. 2022/2023 and 2023/2024. 2. *"Tecnologia dei materiali e chimica applicata"* for the Master's degree course of Building Engineering/Architecture, A.Y. 2014/2015, 2015/2016, 2016/2017, 2018/2019, 2019/2020 and 2020/2021 (Teacher: Prof. M.C. Bignozzi), 2019-2020 (Teacher: Dr. E. Sassoni). 3. *"Corrosione e protezione dei materiali M"* for the Master's degree courses of Mechanical Engineering and Chemical Engineering, A.Y. 2014-2015, 2015-2016, 2016-2017, 2017-2018, 2018-2019, 2019-2020 and 2020/2021 (Teacher: Prof. M.C. Bignozzi). 4. *"Materials and corrosion of offshore structures and equipment"* for the Master's degree courses of Offshore Engineering, A.Y. 2018-2019, 2019/2020 and 2020/2021 (Teacher: Prof. M.C. Bignozzi). 5. *"Chimica e tecnologia dei materiali T – A-K"* for the Bachelor's degree course of Civil Engineering, A.Y. 2014-2015, 2015-2016 e 2016-2017 (Teacher: Dr. S. Manzi).
Co-supervising of degree thesis	**Co-advisor of 6 PhD Theses** in the frame of the *"Materials Engineering and Industrial Biotechnologies" curriculum* in the Department of Civil, Chemical, Environmental and Materials Engineering of the University of Bologna: 2024-2027: Co-supervision of the PhD student **Carlotta Pacente** Project: *"Formulation and characterization of innovative building materials as carbon sink"* 2022-2025: Co-supervision of the PhD student **Alessio Gabrielli** Project: *"Study of innovative phosphate-based treatments for the conservation of cultural heritage"* 2022-2025: Co-supervision of the PhD student **Jitendra Patel** Project: *"Development of Sustainable and Durable Dry-Mix Cementitious Mortar/Adhesive for Tile Laying System"* 2021-2024: Co-supervision of the PhD student **Riccardo Fabris** Project: *"Novel glass-ceramic glazes with enhanced surface properties for porcelain stoneware tiles"* 2020-2023: Co-supervision of the PhD student **Greta Ugolotti** Project: *"Conservation of built heritage: preservation of challenging substrates by phosphate treatments"* 2019-2022: Co-supervision of the PhD student **Alessandro Filipponi** Project: *"novel asymmetric geopolymer membranes for oil/water emulsions separation"* **Supervisor of no. 3 Master degree theses in Chemical Engineering at the University of Bologna of the following candidates:** 1. **Arianna Gualducci** ("*Studio della durabilità di materiali ad attivazione alcalina come rivestimenti protettivi nell'ingegneria chimica*", 2023) 2. **Mykola Spivak** ("*Resistenza all'attacco chimico degli smalti ceramici: influenza delle materie prime attraverso il Design of Experiments*", 2024) 3. **Emilio Minichiello** ("*Geopolimeri a base di metacaolino e scarti ceramici: analisi della porosità e della durabilità*", 2024) **Co-supervisor of the following degree theses at the University of Bologna:** 1. no. 18 theses for the Master's degree course in Building Engineering/Architecture (Supervisor: Prof. M.C. Bignozzi), for the Master's degree course in Chemical and Process Engineering (Supervisor: Prof. M.C. Bignozzi) and for the Master's degree Course in Industrial Chemistry (Supervisor: Prof. C. Martini). 2. no. 3 theses for the Bachelor's degree Course in Industrial Chemistry (Supervisor: Prof. C. Martini), in Mechanical Engineering (Supervisor: Prof. C. Martini) and in Energetic Engineering (Supervisor: Prof. C. Martini).

Personal skills

Languages	Italian: **mother tongue** English (understanding, speaking and writing): **proficient user** French (understanding, speaking and writing): **independent user**
Organisation and job-related skills	**Multidimensionality** in terms of: 1. **Research activities and interests**, from the investigation of mechanism of decay and conservation procedures for metallic alloys in the field of Cultural Heritage (during the 3-years PhD research project) to the synthesis and characterisation of innovative materials for the Civil Engineering sector and Ceramics Industry;

	2. Skills in the design and writing of **European Project,** as well in the organisation and management, achieved in the various steps of B-IMPACT project. 3. **Research project design** and **management**, as well as redaction of reports of research collaboration with local industries, in the field of mechanical, pharmaceutical and offshore engineering. 4. **Autonomous thinking**, as evidenced by the role of first author in 15/36 papers for international peer-reviewed journals and for conference proceedings and of corresponding author in 13/36 international publications. 5. Ability to quickly **assimilate new research skills**, as shown by the publications in some different fields.
Communication and social skills	1. Ability to **work autonomously** and to **integrate** with profit in research teams. Ability to **coordinate** working groups, as shown by the supervision of students, coordination of technicians and different professional figures for the research activities. 2. Ability to **work in different research groups abroad** and to **consolidate working relationships** and **collaborations** with the Laboratoire TRACES, Université Jean Jaurès, Toulouse, France (Dr. L. Robbiola) and to the Geopolymer Centre Group of the Curtin University, Perth WA (Prof. A. Van Riessen e Dr. W.D.A. Rickard), which allowed the publications of different international papers. 3. Good **communication skills** in the presentation of **scientific results**, as shown by different oral presentations in National and International conferences; but also in several **dissemination activities**. 4. Ability to **adapt to new working contexts** and **enthusiasm** for new projects and for the problem solving, thanks to the experiences in different international research groups. 5. **Good interpersonal skills** and **discussion** within research teams and study groups. 6. **Team spirit** and sharing of common aims, developed in several years of team sport activities.
Technical skills	Use of several analytical techniques for the investigation of alloys and their corrosion properties, as well the characterisation of anticorrosive organic and metallic coatings. Physical and mechanical characterisation of binder materials for applications in Civil Engineering. Among the others: 1. **electrochemical corrosion testing**, as measurement of corrosion rate by **weight loss corrosion test** and **polarisation curves**, Electrochemical Impedance Spectroscopy (**EIS**); **accelerated ageing tests**, as Dropping and wet&Dry testing, Salt Fog testing and environmental ageing in the Climate Chamber coupled with UV lamp. 2. Sample preparation for **metallographic examination**; **Optical Microscopy** and Scanning Electron Microscopy (**SEM** and **SEM/FEG**) coupled with Energy-dispersive X-ray Spectroscopy (**EDS**); Fourier Transform Infrared Spectroscopy (**FT-IR**); Glow-discharge Optical Emission Spectroscopy (**GD-OES**); X-ray diffraction (**XRD** and **GXRD**); micro-Raman Spectroscopy; X-ray Photoelectron Spectroscopy (**XPS**) and cross-section preparation, morphological and elemental characterisation by Focused Ion Beam (**FIB**). Experience in **Nano-XPS**, thanks to the participation to two research programs in the field of Cultural Heritage to **Soleil Synchrotron**, in Paris, France (ANTARES Beam Line). 3. **Mechanical testing** (Compressive, Flexural and Tensile tests), in the characterisation of physical properties, as Mercury Intrusion Porosimetry (**MIP**) and **N_2 gas adsorption technique** (BET method) and of high temperature behaviour, as Thermogravimetric analysis (**TGA**), Differential Scanning Calorimetry (**DSC**), **thermal conductivity** and **fire resistance**. Ability to set-up **specific testing procedures** when needed for the research. 4. Good knowledge of **project management tools** as GANTT and monitoring reports.
Computer skills	1. Advanced knowledge of Microsoft Office™ tools (**Word, Excel** and **Power Point**); knowledge of software for data processing (**Igor pro**) and for the imaging editing and processing (**Adobe Photoshop** and **Image J**). 2. Good knowledge of using vector drawing software (**AutoCad, Rhinoceros, 3ds Max** and **SolidThinking Evolve**); knowledge for the processing of EDS data (**Oxford Inca** and **Oxford AZtecEnergy**) and for the interpretation of XPS data (**Thermo Scientific™ Avantage software**). 3. Basic knowledge of computer simulation softwares (**MatLab**) and skills in the use of programming languages (**Turbo Pascal, Fortran, Processing** and **LabView**).