

Alessandra Marini

### **Overview:**

Alessandra Marini is Full Professor of Structural Engineering at the Department of Engineering and Applied Sciences of the University of Bergamo, where she coordinates the PhD program in Sustainable Technologies for Industrial and Construction Engineering and is a member of the Academic Senate. She teaches Rehabilitation of historic masonry building, Structural Engineering, and Seismic Retrofit of RC Buildings.

Her research supports the transition towards a low-carbon society, promoting eco-efficiency, resilience, and safety in the built environment. The focus is on the integrated and sustainable retrofit of historic masonry buildings and reinforced concrete structures, with a life-cycle thinking approach, on the development of innovative seismic mitigation techniques, on the re-engineering of retrofit solutions to enhance sustainability, and on innovative solutions for the protection of monumental heritage.

She is co-founder of two academic spin-offs, Di.Mo.Re (since 2012) and Erreditre (since 2022), research-driven companies that transfer academic knowledge into projects with high social impact, fostering innovation and sustainability in the construction sector.

### **Extended CV**

Alessandra Marini is Full Professor of Structural Engineering (CEAR/07-A) at the Department of Engineering and Applied Sciences (DISA), University of Bergamo (UNIBG) since 2021; she is coordinator of the PhD program in *Sustainable Technologies for Industrial and Construction Engineering*, a member of the Board of the Graduate School, and a member of the Academic Senate of the University of Bergamo.

Previously, she was Associate Professor at DISA from 2013, and a Researcher at the University of Brescia (UNIBS) from 2002 to 2013. She was a member of the PhD Board in *Natural Risks Assessment and Management* at the Department of Civil, Architectural, Environmental, Territorial Engineering and Mathematics of the University of Brescia from 2013 to 2017. Research Associate (49% appointment) at the Graduate School of the Department of Civil, Environmental and Structural Engineering, University of Colorado at Boulder, USA (2003–2004); previously Visiting Professor (2001, 5 months) and Visiting Scholar (1999–2000, 12 months) at the same university.

### **EDUCATION**

- \_ PhD in “Design and Conservation of Structures”, XIII Cycle, University of Trieste, 2001.
- \_ MSc in Civil Engineering, University of Brescia, 1997.
- \_ Scientific High School Diploma and language certificate, Liceo Calini, Brescia, 1990.

### **TEACHING ACTIVITIES**

- \_ Lecturer of “Masonry Building Retrofit and Strengthening”; “Structural Engineering” (2013–present); “Seismic Retrofit of RC Buildings” (2022–present); “RC and Prestressed Concrete Structural Elements” (2013–2023) in the Civil Construction Engineering program at UNIBG.
- \_ Contract Professor of *Structural Rehabilitation* in the Graduate Course “Land and Environmental Engineering”, University of Brescia, 2012–2020.
- \_ Supervisor of 8 PhD students and 10 post-docs at the University of Bergamo (2013–present); previously supervisor of 2 PhD students at UNIBS.
- \_ Advisor of 50 MSc theses at the University of Bergamo and 70 at the University of Brescia, 2008–present.

## RESEARCH ACTIVITIES

Her research aims to support the transition toward a low-carbon society, highlighting the role of structural engineering in improving eco-efficiency, resilience, and safety of the built environment. The focus is on integrated and sustainable retrofit of historic masonry buildings and existing reinforced concrete structures, through national and international collaborations. Main topics include: the development of a sustainability-informed design and verification framework based on Life Cycle Thinking; the definition of functional performance objectives for sustainability (design for circularity, durability, reparability, incremental implementation, among others); the development of innovative and sustainable seismic risk mitigation techniques for reinforced concrete buildings; the reengineering of retrofit solutions according to sustainability principles; and the assessment and mitigation of structural risk for historic and monumental buildings.

- \_ Author of over 175 publications (90 Scopus-indexed), including 4 book chapters and 50 papers in international journals since 2001 (RESEARCHER IDENTIFIERS; ORCID: 0000-0002-1798-2966; Scopus: 7103323155).
- \_ Associate Editor of the international journal *Journal of Earthquake Engineering* (since 2022) and of the international Open Access journal *Frontiers in the Built Environment – Earthquake Engineering* (since 2018); reviewer for leading journals including *ASCE Journal of Structural Engineering*, *ACI Journal*, *Bulletin of Earthquake Engineering*, among others.
- \_ Winner of the *International Green Apple Awards for Environmental Construction and Architectural Heritage* for the research “Seismic risk and environmental sustainability”, 2016, London.

## COORDINATION / PARTICIPATION IN RESEARCH AND INDUSTRIAL PROJECTS

Selection of projects:

- \_ Scientific Coordinator of UniBG research team in the HORIZON-NEB-2025-01-BUSINESS-03 Project “**REVAIL** - Reclaiming building products for increasing the value of materials through their re-assembly and integration in buildings' retrofit through new circular business model”, PI Miren Juaristi, EURAC Research. (Project budget: €3,997,000; funding granted to UniBG: €399,000 eligible costs), 2026 – ongoing.

### \_ERIES-DICABE

- \_ National Coordinator of “**WP13** – Life Cycle and Sustainability of Buildings and Infrastructures”, within the national Civil Protection Department project “2024–2026 ReLuis”.
- \_ Scientific Coordinator of the research group from DISA–University of Bergamo within the project “Housing Advancements for Better Inclusive and Technological Living – **HABIT**” (PI: Deldossi srl, Eng. M. Deldossi), funded by Regione Lombardia (ERDF 2021–2027) under the “COLLABORA & INNOVA” call (Project budget: €3,600,000;

funding granted to UniBG: €228,000 out of €572,000 eligible costs), 2025 – ongoing.

\_ UNIBG-RU Coordinator for the National Project **GENESIS – Seismic Risk Management for the Touristic Enhancement of Southern Italy’s Historic Centers**, involving 9 universities (PI: Univ. Chieti Pescara, Prof. E. Spacone) and 14 SMEs and large companies. (Project budget € 8,873,812). From 2023 – ongoing.

\_ Individual Expert for the European Commission within the **Pilot Project Integrated techniques for the seismic strengthening and energy efficiency of existing buildings**, coordinated by the Joint Research Centre. 2019–2021.

\_ Coordinator of UNIBG research unit in the Civil Protection Department project *2019–2021 ReLuis – WPS – Rapid and Low-Impact Integrated Interventions*; National Coordinators: Prof. A. Prota, F. Da Porto. 2019–2021, 2024–2026.

\_ Scientific Coordinator of the DISA-UNIBG research group in the project **Smart Citizens and Cities – SCC Innovation hub & Living Lab Network**, funded by Regione Lombardia (Innovation Hub Call 2014–2020).

Activities involve integrated architectural-energy-structural retrofit of a residential building using a prefabricated timber shell exoskeleton, modular, demountable, and recyclable (Project budget € 9,895,000, UniBG € 186,000), 2020 – ongoing.

\_ Project Leader and Scientific Coordinator of UNIBG research unit in the industrial research project **AdESA – New System for the Energy, Seismic and Architectural Retrofit of Existing Buildings**, ranked first among 63 proposals and funded by Regione Lombardia (“SMART LIVING” program). Developed in partnership with Marlegno srl (lead), Harpaceas srl, Edilmatic s.r.l. and UniBS. Focus: application of a modular prefabricated shell exoskeleton for integrated retrofit of a gymnasium in Brescia, conceived with LCT approach (Project budget € 1,667,400, UniBG € 470,000), 2018–2020.

\_ Scientific Coordinator of UNIBG research unit in **Domus Pulchra: a low-carbon, anti-seismic, passive, wood and straw residential module**, funded by Regione Lombardia (“SMART LIVING” program; Project budget € 681,500, UniBG € 120,000), 2018–2020.

\_ Recipient of 3 competitive two-year university research grants: a) **STAR – Supporting Talented Researchers – Action 1 – 2021** for “Integrated retrofit of existing buildings with Life Cycle Thinking approach”; b) **STAR – Supporting Talented Researchers 2017** for “Demolition or Retrofit? Models for the Residual Life Assessment of Buildings”; c) **ITALY-2015: Young Talented Italian Researchers** for “Sustainable Retrofit of Post-War Buildings through Double Envelope for Structural Reinforcement, Energy Efficiency, Architectural and Urban Regeneration”.

\_ Coordinator of the “Structural Retrofit Team” within the **EUTOPIA** Working Group, launched as part of the PRIN 2009 project “Integrated Retrofit of Social Housing” (PI: Prof. M. Montuori, Univ. of Brescia), 2009–2015.

\_ Participant in POR-FESR Project **SeCon System: Ecological Systems for Sustainable Construction** (PI: Prof. P. Riva; Project budget € 1,800,000, UniBG € 410,000), 2013–2015.

\_ Participant in **COFIN2004** project *Innovative Techniques and Materials for Seismic Reinforcement of Existing Structures* (PI: Prof. E. Spacone, Univ. of Brescia), 2005–2006.

\_ Participant in **NSF (USA)** project *Propagation of Uncertainties in the Analysis of Non-Linear RC Frames for Performance-Based Seismic Engineering* (PIs: Prof. E. Spacone, J. Conte), 2003–2004.

## **COORDINATION OF TECHNOLOGY TRANSFER CONTRACTS WITH SMEs AND PUBLIC INSTITUTIONS**

Selection of contracts:

\_ Scientific Lead of the project with EURAC – European Academy for the development and testing of methodologies for assessing different integrated intervention scenarios aimed at the energy and structural retrofit of buildings (€ 39,900), 2023 – present.

\_ Co-Scientific Lead of the project with EKORU s.r.l. for the structural conception of prefabricated and modular

exoskeletons in cold-formed sheet metal and autoclaved aerated concrete for the integrated retrofit of existing buildings (with Prof. P. Riva); (€ 70,000) 2019 – present.

\_ Scientific Lead of the research agreement with Marlegno s.r.l. for the “Development of prefabricated timber roofs with seismic resistance and thermal insulation” (€ 50,000), 2017 – 2018.

– Scientific Lead of 2 research agreements with ALER (Azienda Lombarda Edilizia Residenziale) – Brescia–Cremona–Mantova for: a) development of methodologies to prioritize seismic risk mitigation interventions for ALER’s building stock in high seismicity areas (former Zone 2, approx. 475 buildings) (€ 40,000), 2018 – 2022; b) feasibility assessment for integrated retrofit interventions on existing buildings using exoskeletons, 2016 – present.

– Scientific Lead of the UNIBG unit in collaboration with EURAC for: a) *ARCHIMEDES: ARCHitectural Modules and Devices for Adaptable Envelope Solutions*; b) a decision-support tool for planned maintenance of entire building portfolios (CerPLAN-Stru), to define cost-effective renovation scenarios coupling seismic and energy interventions, 2017 – present.

– Scientific Lead of the contract with the Municipality of Brescia for the application of a protocol for simplified seismic risk assessment and decision criteria for multi-year planning of the city’s building stock retrofit (€ 37,000), 2019 – 2020.

## CONFERENCES

She has been a speaker and participant at national and international conferences, sometimes serving on organizing and scientific committees. Selected contributions:

\_ Member of the Scientific Committee of the ICC Italian Concrete Conference – Bergamo, 24–26 June 2025.

\_ Member of the Scientific Committee of SAHC 2025 – *Heritage Conservation Across Boundaries* – EPFL Lausanne, 15–17 September 2025.

\_ Keynote speaker: “*Shaping the Sustainability Transition: Challenges for Conceptual Structural Design*”. The 9th Nigel Priestley Seminar, Pavia, 30 May 2025.

\_ Member of the Scientific Committee of the ICC Italian Concrete Conference – Florence, 19–21 June 2024.

\_ Member of the Scientific Committee of SAHC 2023 – *Heritage Conservation Across Boundaries* – Kyoto, Japan, 12–15 September 2023.

\_ Member of the organizing committee of the Special Session *Combined Seismic and Environmental Renovation of Existing Buildings*, 3rd European Conference on Earthquake Engineering and Seismology, Bucharest, Romania, 4–9 September 2022.

\_ Member of the Scientific Committee, Italian Concrete Conference ICC 2022, Naples, 12–15 October 2022.

\_ Keynote speaker, “Life cycle perspective in RC building integrated renovation”, XIV International Conference on Building Pathology and Constructions Repair – CINPAR, Florence, June 2018.

\_ Organizer of Special Session *Integrated Renovation Strategies Targeting Sustainability, Safety and Resilience of Existing Buildings*, European Conference on Earthquake Engineering, Thessaloniki, June 2018.

\_ Organizer of Special Session *Life Cycle Thinking: Seismic Engineering and Sustainability*, XVII National Conference ANIDIS “L’Ingegneria Sismica in Italia”, Pistoia, Italy, September 2017.

\_ Invited speaker, *Need for coupling energy refurbishment with structural strengthening interventions*, Workshop: EUTOPIA Urbanscape Expectations, Brescia, May 2017.

\_ Member of the Scientific Committee, *SAFESUST Workshop – A roadmap for the improvement of earthquake resistance and eco-efficiency of existing buildings and cities*, Joint Research Centre, Ispra, November 2015.

\_ Invited speaker, *Coupling energy refurbishment with structural strengthening in retrofit interventions*, SAFESUST Workshop, Joint Research Centre, Ispra, November 2015.

## WORKING GROUPS AND ASSOCIATIONS

- \_ Member of the international fib Task Group TG.SAG.2: Sustainable Concrete Structures, Convenor: Agnieszka Bigaj-van Vliet, since 2023.
- \_ Member of the National Working Group “CNR Corrosione”.
- \_ Member of Working Group 15 “Combined Seismic and Environmental Upgrading of Existing Buildings” of the European Association for Earthquake Engineering (EAEE), 2022 – present.
- \_ Area Lead for the “Green Building” section of LE2C – Lombardy Energy Cleantech Cluster, 2020 – present.
- \_ Member of the Scientific Committee of *Edinnova*, a network of companies promoting sustainability and innovation in the construction sector.
- \_ Member of the Working Group “Durability and Resilience” of Green Building Council (GBC) Italy for the development of a protocol for sustainable, energy and structural retrofit of residential buildings.
- \_ Member of the Life Cycle Assessment (LCA) Italian Association, 2017–2018.
- \_ Board Member of the Brescia Order of Engineers for two terms, 2009–2017. She coordinated the “Professional Skills Development and Training Commission”, responsible for multi-year training plans for engineers and managing the introduction of mandatory continuing professional development. She was also a member of the “Structures Commission” during the first term.
- \_ Member of the Scientific Committee of the “Study and Research Center for the Conservation and Recovery of Architectural and Environmental Heritage”, University of Brescia, 1998–2010.

## PATENTS

Co-inventor of the European patent *Tubular connector for mixed wood–concrete beams*, owned by the University of Bergamo (EP2058448). 2012.

## TECHNOLOGY TRANSFER ACTIVITIES AND CONSULTING

- \_ Co-founder and partner of the University of Bergamo academic spin-off *Erreditre Ingegneria*. 2022 – present.
- \_ Co-founder and partner of the University of Bergamo academic spin-off *DiMoRe srl*. The spin-off, now counting more than 18 engineers (including 10 PhDs), transfers knowledge from academia to practice, applying non-conventional and innovative procedures in diagnostics, structural monitoring, and innovative retrofit and strengthening of existing buildings and infrastructures. At DiMoRe, she carries out specialist consulting, research activities, diagnostic studies, monitoring, and assessments of static and seismic vulnerability of existing buildings and structures. 2012 – present.
- \_ Lecturer/Instructor in more than 40 continuing education seminars/courses for engineers and architects’ professional Orders, and for the National Civil Protection Department within AeDES courses on post-earthquake damage assessment.

## MISCELLANEOUS

She promotes awareness-raising activities to disseminate a culture of seismic risk prevention in Italy. As part of these activities, she was a Speaker at TEDxBrescia with the talk *Earthquakes are not a matter of bad luck* (2017).