MODELLO **B** — versione del modello A

# Leonardo Marchese

*Curriculum vitae*

## PERSONAL DATA

Born in Stigliano (MT), Italy, on 1960, August 1st.
Lives in Alessandria and Grugliasco (TO), Italy

## BIO AND EDUCATION

Leonardo Marchese graduated in Industrial Chemistry from the University of Turin in July 1985 with top marks (110/110 magna cum laude). He subsequently obtained a PhD in Chemical Sciences from the same university in September 1990.

## UNIVERSITY CAREER

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|---|---|
| 2005- | Full Professor of Physical Chemistry, University of Piemonte Orientale |
| 1998-2005 | Associate Professor of Physical Chemistry, University of Piemonte Orientale |
| 1994-1998 | Researcher of Physical Chemistry, University of Torino |
| 1992-1994 | Assistant Researcher, University of Torino |

## UNIVERSITY POSITIONS

| | |
|---|---|
| 2020- | Member of the administration board of the Proplast Consortium |
| 2015-2023 | Member of the Senate, University of Piemonte Orientale |
| 2015-2023 | Director of the Department of Science and Technological Innovation, University of Piemonte Orientale |
| 2011-2015 | Vice-Director of the Department of Science and Technological Innovation, University of Piemonte Orientale |
| 2011-2015 | President of the course degree “Science of materials”, University of Piemonte Orientale |
| 2008-2013 | Director of the Master “Materials for Energy and Environment”, University of Piemonte Orientale |
| 2008-2011 | Director of the Department of Science and Advanced Technologies”, University of Piemonte Orientale |
| 2005-2008 | President of the three-year degree program in Chemistry and the master's degree program in Chemical Sciences, University of Eastern Piedmont |

## SCIENTIFIC POSITIONS

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|---|---|
| 2024- | Director of the Research and Development Center for Environmental Remediation and Protection (RisPA Center), a UPO/Syensqo Joint-Lab |
| 2023- | Project Leader of five integrated laboratories between the University Hospital of Alessandria and the Department of Science and Technological Innovation |
| 2022- | Coordinator of the Project of the "Ministero dell'Ambiente e della Sicurezza Energetica (MASE)" titled "Eco sustainable Development of Ultra porous Polymers and Carbons for Storage and Transport of hydrogen" (ECOSTORE-H2) |
| 2005-2020 | Coordinator of the Nano-SiSTeMI Interdisciplinary Centre, Università del Piemonte Orientale |
| 2005-2020 | Member of the Technical and Scientific Board of the Proplast Consortium |
| 2017-2020 | Coordinator of the European Project (H2020) "MULTI-site organic-inorganic HYbrid CATalysts for MULTI-step chemical processes" (MULTI2HYCAT) |
| 2013-2016 | Coordinator of the European Project (7$^{th}$ FP) "Global solar spectrum harvesting through highly efficient photovoltaic and thermoelectric integrated cells" (GLOBASOL) |
| 2009-2012 | Coordinator of the European Project (7$^{th}$ FP) "Innovative Materials for Future Generation Excitonic Solar Cells" (INNOVASOL) |
| 2005-2008 | Coordinator of the European Project (6$^{th}$ FP) "Novel Inorganic Nanostructured Materials and Devices with Enhanced Photoemission Activity and Thermal Stability" (STABILIGHT). |
| 2016 | Guest Editor of the theme issue of "Catalysis Today" (Elsevier) devoted to the recent advances of porous materials for the heterogeneous catalysis |
| 2013 | Guest Editor of the theme issue of "Physical Chemistry Chemical Physics" (Royal Society of Chemistry) titled "Physical-chemistry at the cross-road of advanced oxide materials". |
| 2009 | Guest Editor of the theme issue of "Journal of the Material Chemistry" (Royal Society of Chemistry) titled "Layered materials: Structure and Properties" |
| 2008 | Guest Editor special issue of "Microporous and Mesoporous Materials" (Elsevier) titled "Innovative Applications of Layered Materials, from Catalysts to Nanotechnology". |

## MAIN FIELDS OF INTEREST

1. Physical-chemistry of the solid state, surfaces and host-guest interactions
2. Nanomaterials for health, the environment and energy
3. Heterogeneous catalysis
4. Porous materials for gas storage and separation and for pollutant capture

## CURRENT ISSUES OF RESEARCH

The research activities are focused on the development of materials for various applications in catalysis, biomedicine, optoelectronics, hydrocarbon pollutant removal, and gas storage and separation. All these systems are characterized using state-of-the-art experimental and theoretical multi-technique approaches, often involving the use of *in situ* spectroscopies assisted by computational methodologies for the interpretation of the results,. Particular emphasis has been placed on the development of combined FTIR/ss-NMR techniques, including the use of molecular probes.

**1. Development of innovative materials for the environmental and heterogeneous catalysis**

Experimental and theoretical physico-chemical study of innovative catalytic materials for environmental catalysis and for the preparation of "fine chemicals" through Green Chemistry processes. Design, preparation, and characterization of heterogeneous nanostructured catalysts for catalytic (or photocatalytic) abatement and decontamination of toxic chemical and biological agents harmful to human health and the environment.

**2. Development of porous materials for capture, separation or storage of gases or compounds of energetic or environmental relevance**

Preparation and optimization of polymeric, inorganic, organic/inorganic hybrid porous solids, and ultra-porous carbon-based materials for environmental protection, with particular attention to:
i) materials for the capture and storage of $H_2$, $CO_2$, and $CH_4$;
ii) adsorbent materials for the removal of greenhouse gases and organic molecules (PFAS, dyes, etc.) and antibiotics from contaminated water.

Experimental and theoretical studies of host–guest interactions are carried out to evaluate the surface properties of adsorbent materials.

**3. Novel materials for the production of energy through processes with low environmental impact**

Preparation of materials with different structures and chemical compositions for the optimization of devices for low environmental impact energy production (photovoltaic cells, fuel cells, etc.).

**4. Spectroscopic and diffractometric studies of cementitious materials.**

The studies concern the composition and structure, investigated through combined spectroscopic and diffraction techniques (i.e. ss-NMR/XRD), of the crystalline and amorphous phases constituting cements (or cement precursors), as well as kinetic studies ("Time-Resolved *In Situ* Multi-Nuclear MAS NMR Spectroscopy") of their evolution under hydration processes or in the presence of atmospheric agents.

**5. Organic/inorganic luminescent nanomaterials for biomedical applications.**

Development of luminescent multifunctional nanomaterials for biomedical applications (photodynamic therapy and theranostic).

## CURRENT FUNDED PROJECTS

| PROGRAMME | FUNDED PROJECT |
|---|---|
| Private funds | Research and Development Center for Environmental Remediation and Protection (RisPA Center) |
| MITE 2022 | Eco sustainable Development of Ultra porous Polymers and Carbons for Storage and Transport of hydrogen" (ECOSTORE-H2) |

## TOP FIVE PAPERS

1. L. Smith, L. Marchese, A.K. Cheetham, J.M. Thomas, P.A. Wright, J. Chen and R.E. Morris, "*On the Nature of Water Bound to a Solid Acid Catalyst*", ***Science***, 271 (1996) 799-802; 196 citations (*Scopus* 24.05.2026)
2. H.O. Pastore, S. Coluccia and L. Marchese, "*Porous aluminophosphates: From molecular sieves to designed acid catalysts*" **Annual Review of Materials Research**, 35 (2005) 351-395; 249 citations (*Scopus* 24.05.2026)
3. I. Braschi, G. Gatti, G. Paul, C.E. Gessa, M. Cossi and L. Marchese, "*Sulfonamide Antibiotics Embedded in High Silica Zeolite Y: A Combined Experimental and Theoretical Study of Host-Guest and Guest-Guest Interactions.*", ***Langmuir***, 26 (2010) 9524-9532; 67 citations (*Scopus* 24.05.2026)
4. M. Errahali, G. Gatti, L. Tei, G. Paul, G. A. Rolla, L. Canti, A. Fraccarollo, M. Cossi, A. Comotti, P. Sozzani and L. Marchese, "*Microporous hyper-crosslinked aromatic polymers designed for methane and carbon dioxide adsorption*", ***J. Phys. Chem. C***, 118 (2014) 28699–28710; 116 citations (*Scopus* 24.05.2026)
5. G. Paul, C. Bisio, I. Braschi, M. Cossi, G. Gatti, E. Gianotti, L. Marchese, "*Combined solid-state NMR, FT-IR and computational studies on layered and porous materials*", **Chemical Society Reviews**, 100 (2018) 5684-5739; 160 citations (*Scopus* 24.05.2026).

## FURTHER INFORMATION

- L. Marchese co-authored **309 publications** on high impact international journals or books of wide international diffusion and **8 patents** receiving **12,185 citations**, **h-index 60** (*source Scopus* 24.05.2026)
- As PI (*Principal Investigator*) he has coordinated **4 European projects** (1 H2020, 2 FP7 e 1 FP6) and **7 national projects** (PRIN, MIUR, MASE, Piemonte Region and Banking Foundations).
- He has been Responsible of Research Units in **1 European projects** and 11 **national projects** (PRIN, MIUR, Ministero Ambiente, Piemonte Region, POR-FESR, FESR-FSE, ecc.), and of several contracts for industrial research.

- For basic and industrial research activities, since 2000, he has managed **26,8 million €**, of which 13,4 million € for the activities of UPO researchers.