

GIOVANNI MICHELE PORTA

Curriculum vitae

PERSONAL INFORMATION

Place and date of birth: Milano (Italy), 29/10/1981

Work Address: Department of Civil and Environmental Engineering, Politecnico di Milano, Piazza Leonardo da Vinci 32, 20133, Milano, Italy

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[Orcid](#) - [Scholar](#)

RESEARCH PROFILE

Associate Professor in Environmental and Water Resources Engineering with expertise in uncertainty quantification, scientific machine learning, inverse modelling and computational methods for water resources, porous media and environmental systems. My research develops uncertainty-aware computational methods that integrate physics-based modelling and data-driven approaches to improve the prediction of flow, transport and reactive processes across scales ranging from the pore to the catchment and geological scale. Applications include groundwater and surface water systems, contaminant transport, soil processes and subsurface energy resources. A central aspect of my work is translating methodological advances into practical solutions for environmental management through collaborations with academia, industry and government. Current research focuses on trustworthy AI, physics-informed machine learning and uncertainty-aware modelling for environmental systems.

CAREER HIGHLIGHTS

- Associate Professor at Politecnico di Milano since 2018.
- Leadership roles in competitive national, European and industrial research projects in uncertainty quantification, environmental modelling and water resources.
- Co-Principal Investigator of five industry-funded research projects with Eni S.p.A. developing stochastic modelling, inverse methods and machine learning approaches for geological and environmental systems.
- Project Manager of the Horizon Europe Marie Skłodowska-Curie Doctoral Network REMEDI (European Industrial Doctorate).
- Scientific Coordinator of the Off Campus Cascina Nosedo, a Living Lab on urban water management, soil health and circular economy (since 2024).
- Primary supervisor of 10 completed PhD candidates, with two PhD students currently under supervision.

ACADEMIC APPOINTMENTS

From 2018: **Associate professor**, Dept. of Civil and Environmental Engineering, Politecnico di Milano.

2015-18: **Assistant professor**, Dept. of Civil and Environmental Engineering, Politecnico di Milano.

2010-15: **Research associate**, Dept. of Civil and Environmental Engineering, Politecnico di Milano.

2013-15: **Adjunct professor**, School. of Industrial and Information Engineering, Politecnico di Milano.

RESEARCH FUNDING AND LEADERSHIP

My research programme has been supported through competitive European, national, international and industry-funded projects spanning uncertainty quantification, scientific machine learning, groundwater and contaminant transport, environmental modelling and water resources engineering. My role has progressively evolved from research collaborator to principal investigator, research unit coordinator and scientific leader of multidisciplinary projects involving academic, government and industrial partners.

Research Leadership

Co-Principal Investigator – Industrial projects funded by Eni SpA

2016–2021

Research focus: Uncertainty quantification, Bayesian inverse modelling and scientific machine learning for geological and environmental systems.

Project Manager – Horizon 2020 – REMEDI

2021–2025

Research focus: Reactive transport modelling and groundwater remediation within a Marie Skłodowska-Curie Doctoral Network.

Scientific Leader – Polisocial Award (Polimi) – AMAZING

2023–2024

Research focus: Sustainable water management and resilient human settlements.

Research Unit Coordinator – PRIN

2023–2025

Research focus: Uncertainty quantification of coupled flow and contaminant transport models.

Major Collaborative Projects, ongoing:

- Horizon Europe URSOILL (2025–2029)
- Horizon Europe ICOSHELLs – Experimental Site Coordinator (2024–2028)
- AGROBLUE – Lead Technical Expert (Italian Agency for Development Cooperation) (2026–2028)

Contribution to past projects (selected grants):

- Horizon 2020 MSCA-RISE RECYCLE
- Water JPI WE-NEED
- University of Sydney Research Excellence Initiative
- MSCA ITN IMVUL

Research Impact and Translation

- **Industry collaboration.** Principal Investigator of five industry-funded projects with Eni S.p.A. translating uncertainty quantification and inverse modelling into decision-support tools for geological and environmental systems.
- **Living Labs.** Scientific Coordinator of the Off Campus Cascina Nosedo Living Lab and Experimental Site Coordinator within the Horizon Europe projects URSOILL and ICOSHELLs, integrating environmental modelling with stakeholder engagement and co-design approaches.
- **International development.** Lead Technical Expert in the AGROBLUE project supporting water security assessment and sustainable water resources management in Kenya.
- **Knowledge exchange.** Development of long-term collaborations with CSIRO, the University of Sydney and European partners to promote the application of computational modelling and uncertainty analysis to environmental management.

INTERNATIONAL COLLABORATIONS

My research has been developed through long-term collaborations with universities, research organisations and industry across Europe, North America and Australia. These collaborations have supported joint research projects, visiting appointments, doctoral supervision, research exchanges and the development of internationally funded research programmes.

Australia

CSIRO Agriculture & Food (2026)

Visiting Researcher. Research on uncertainty quantification, scientific machine learning and soil carbon modelling.

The University of Sydney (2017–present)

Visiting Academic and Research Affiliate (multiple appointments totalling approximately 26 months). Long-term collaboration on groundwater, contaminant transport, uncertainty quantification and environmental modelling.

Other major collaborations

University of Notre Dame, USA (2016)

Visiting Researcher. Collaboration on computational methods for porous media and contaminant transport.

CNRS – Institut PPrime, France (2011)

Visiting Researcher (3 months). Research on numerical methods for hydraulic and environmental modelling.

RESEARCH SUPERVISION AND MENTORING

Doctoral Supervision

- Primary supervisor of 10 completed PhD candidates since 2013.
- Current primary supervisor of 2 PhD candidates.
- Supervisor of doctoral researchers within the Horizon Europe Marie Skłodowska-Curie Doctoral Network REMEDI.

Mentoring of Early-Career Researchers

- Supervision and mentoring of postdoctoral researchers and research associates working on nationally funded, European and industry-funded research projects.
- Supervision of researchers involved in long-term collaborative programmes with industry and international partners.

PhD Examination

External examiner for doctoral dissertations at:

- Imperial College London (United Kingdom)
- Universitat Politècnica de Catalunya (Spain)
- Technical University of Munich (Germany)

Internal examiner at Politecnico di Milano.

EDITORIAL, PROFESSIONAL AND ACADEMIC SERVICE

Editorial Responsibilities

- Associate Editor, Hydrogeology Journal (2017–2021).
- Associate Editor, Stochastic Environmental Research and Risk Assessment (2016–2021).
- Guest Editor of two topical collections for the International Journal on Geomathematics.

Scientific Community Service

- Member of the Communications Committee of the International Society for Porous Media (InterPore) (2016–2022).
- Reviewer for leading international journals including (approximately 20 manuscripts annually).

Scientific Leadership and Conference Organisation

Member of the Scientific and Local Organising Committee of the international workshop Frontiers of Uncertainty Quantification in Subsurface Environments (FrontUQ18).

Organiser of scientific sessions at international conferences including:

- SIAM Conference on Geosciences
- SIAM Conference on Uncertainty Quantification
- European Geosciences Union General Assembly

Recognition

- Nominated Outstanding Reviewer, American Geophysical Union (2019).
- Junior Marchi Lecturer, Italian Group of Hydraulics (GII) (2019).
- InterPore Rosette Award for outstanding service to the International Society for Porous Media (2019).

EDUCATION

2007-2010: **PhD in Hydraulic Engineering** at Politecnico di Milano (with honours).

Thesis title: Anisotropic Mesh Adaptation for Shallow Water Modelling.

Topic of research: two-dimensional modelling of river and floodplain flow through the Shallow Water Equations, implementation of mesh and time step adaptation techniques.

2006: **Master's degree in Civil Engineering**, at Politecnico di Milano.

TEACHING

Since 2011 I have taught undergraduate and postgraduate courses in fluid mechanics, hydraulics and water resources engineering at Politecnico di Milano, integrating modelling-based approaches and active learning methodologies.

Course responsibility

- Fluid Mechanics (2012–present)
- Hydraulics and Applied Hydraulics (2011–2013; 2017–present)

International teaching

- Unit lecturer, *Advanced Water Resources Engineering*, University of Sydney (2019).

Doctoral education

- Regular lecturer in PhD courses on groundwater modelling, reactive transport and uncertainty quantification at Politecnico di Milano.

PUBLICATIONS AND PRESENTATIONS

My publication record is accessible online through my [ORCID](#), [Google Scholar](#) and [Scopus](#) profiles.

Invited talks

Selected list of invited research seminars

- Australian National University – Institute for Water Futures (2026)
- CSIRO Agriculture & Food (2026)
- Monash University (2026)
- University of New South Wales (2019, 2022, 2026)
- University of Sydney (2019)
- Technical University of Munich (2021)
- Technical University of Catalonia (UPC, Barcelona, 2017, 2021)
- University of Notre Dame, USA (2016)

Selected invited talks at conferences and workshops:

1. Porta G.M. Modelling contaminant transport under uncertainties, INTRUSION25 workshop, Bari June 30th – July 2nd 2025.
2. Porta G.M., Learning across scales: upscaling solute transport in porous media through Spatial Markov models, SIAM Conference on Computational Science and Engineering, 1-5 March 2021, online conference.
3. Porta G.M., Tamellini L., Colombo I. Modeling under uncertainty of fluid flow and compaction processes at sedimentary basin scale, VII International Conference on Coupled Problems in Science and Engineering, Rhodes, Greece, 12-14 June 2017.
4. Porta G.M., Comparative assessment of continuum-scale models of bimolecular reactive transport in porous media under pre-asymptotic conditions, PMPM/Interpore UK joint annual meeting, Edinburgh, 13-15 January 2016.