University Academic Curriculum Vitae

Personal information

Name: Massimiliano Schiavo
Place of birth:
Date of birth:
Nationality:
Address:
Mobile Phone:
E-Mail: massimiliano.schiavo@unibz.it

Education since leaving school

- 2015, BS in Civil Engineering, University of Padova (Italy)
- 2018, MS in Civil Engineering, Hydraulics specialization, University of Padova (Italy)
- 2023, PhD in Groundwater Hydraulics, Politecnico di Milano (Italy)

Present appointment

- Post-doctoral Research Fellow
- 01/06/2023
- Research Fellow
- University of Padova (Italy), dept. of Land, Agriculture, Forestry, and Environment
- Development of probabilistic methods for debris-flow events modeling, assessment and prediction

Professional experience

From / to	Job title	Name of academic Institution	Academic level	responsibilities
01/06/2023 - 28/02/2025	Research Fellow	University of Padova	PhD	AGR/08, Debris-flow modeling
16/03/2022 - 15/03/2023	Research Fellow	University of Padova	MS-PhD	AGR/08, Stochastic hydrology
01/11/2018 - 28/02/2022	PhD Student	Politecnico di Milano	MS	ICAR/01, Groundwater Hydraulics
18/04/2018 - 30/08/2018	Editorial Assistant	Eurowaste S.r.l.	MS	Editorial Office

Awards and personal achievements

- Selected for a visiting postdoctoral position at the University of Florida within the Gator Glaciology Group (see https://www.gatorglaciology.com/), November-December 2024. Advisor: Dr. Emma MacKie.
- Winner Candidate for a postdoctoral position at the Ecole Polytechnique de Lausanne (EPFL, CH) within the CHANGE Lab (see https://www.epfl.ch/labs/change/), Sep 2023. Advisor: Dr. Sara Bonetti.
  Disclaimer: The winner has declined every position and funding source to stay as a postdoctoral fellow at the University of Padua.
- Winner of two postdoctoral ('assegni di ricerca') positions at the University of Padua between 2022 and 2023 (see Education and Academic Career).
- Winner of the PhD position at the Politecnico di Milano within the 34th PhD cycle in Environmental and Infrastructure Engineering Course, Sep 2018. Advisor: Prof. Alberto Guadagnini, and Prof. Monica Riva.

Experience in academic teaching

Lecturer and teaching assistant to three different institutions.

1) Free University of Bozen-Bolzano.
   - Lecturer for 1 MS course (3 CP): Advanced Geomatics (47032A), a.y. 2024-2025. Starting in March 2025. See at https://www.unibz.it/en/faculties/agricultural-environmental-food-sciences/master-environmental-management-mountain-areas/course-offering/
2) University of Padova. Teaching Assistant for BSc courses (2 courses):
   - *Climate changes and hydrogeological hazard mitigation* (a.y. 2023-2024).
   - *Hydraulics and Hydrology* (a.y. 2023-2024).
3) Politecnico di Milano. Teaching Assistant for BSc and MSc courses (5 courses):
   - *Hydraulics* (a.y. 2019-20, 2020-21), BSc in Civil Engineering.
   - *Fluid Mechanics* (a.y. 2019-20, 2020-21), BSc in Energy Engineering.
   - *Groundwater Hydraulics* (a.y. 2018-19), MSc in Environmental Engineering.

Projects Participation

- RETURN project (multi-Risk science for resilient communities under a changing climate), University of Padova, 2023-2024.
- RESILIENCE project (http://resilience.stat.unipd.it/), University of Padova, 2022-2023.
- Characterization of Arsenic concentrations in groundwater for effective planning and management of drinking well operations. Lario Reti Holding S.p.A., Politecnico di Milano, 2018-2022.

Member of Editorial Boards and panels

- Member of the Topical Advisory Panel for *Geosciences* (MDPI).

Memberships

- Member of the Italian Hydraulics Group (GII)
- Member of the Italian Hydrological Society (HIS)
- Member of the Society of Petroleum Engineers (SPE)

Peer reviewer for internationally indexed journals

- Journal of Hydrology (Elsevier)
- The Science for the Total Environment (Elsevier)
- Water Resources Research (AGU)
- Hydrology and Earth Science Systems (Copernicus)
- Scientific Reports (Springer Nature)
- Hydrogeology Journal (Springer)
- Applied Water Science (Springer)
- Hydrological Processes (Wiley)
- Ecological Indicators (Elsevier)
- Groundwater for Sustainable Development (Elsevier)
- Applied Sciences (MDPI)
- Geosciences (MDPI)
- Hydrology (MDPI)
- Processes (MDPI)
- Sustainability (MDPI)
- Water (MDPI)
- Acque Sotterranee - Italian Journal of Groundwater

Chairman and co-chairman

- Co-convener at the European Geoscience Union (EGU), Section SC3.16 “Meet the editors (1): how to write and revise your manuscript”,

https://meetingorganizer.copernicus.org/EGU23/session/47003

Selected Activities

- Invited Speaker, University of Florida (Fl, US), Geological Sciences Dept. Brief seminar on “Preferential Groundwater pathways upon geological and energetic uncertainty sources”. November 2024.
- Invited Speaker, RWTH Aachen Technical University, Geography Dept. . Seminar on “Monte Carlo methods for the probabilistic delineation of debris-flow pathways”. June 2024.
- Invited Speaker, École Nationale Supérieure de Géologie de Nancy (FRA), GeoRessources RING Dept. Brief seminar on “Preferential Groundwater pathways upon geological and energetic uncertainty sources”. September 2023.
- Invited Speaker, Czech Technical University of Prague (CZE), Soil and Water Conservation Dept. Brief Seminar on “Groundwater pathways, discharges, and thermodynamics from a geological viewpoint”. June 2023.
- Invited Speaker, Geology and Earth Sciences 4th World Congress, Rome https://geology-earthscience.com/speakers. Talk: “Entropy, fractality, and thermodynamics of preferential groundwater pathways”. June 2023.
- Invited Speaker, Czech Technical University of Prague (CZE), Soil and Water Conservation Department. Brief Seminar on “Preferential pathways in complex groundwater systems”. July 2022.
- PhD Course. Introduction to Geostatistics 2019 (Prof. Jaime Gomez-Hernandez) - June 2019.
- PhD Course. GEOframe 2020 (Prof. Riccardo Rigon) – January 2020.
- PhD Course. DIWAT Autumn School 2020 (Dr. Rudy Rossetto, Sant’Anna Pisa) – November 2020.
- PhD Course. Lake Como Autumn School 2021, Agricultural Engineering and Soil System Science (Prof. Marco Acutis, State Univ. of Milan) – October 2021.

Publications

- **Schiavo, M.** (2025). *Quantile-Based Approach for Improving the Identification of Preferential Groundwater Networks*. *Water* 2025, *17*(2), 282; https://doi.org/10.3390/w17020282
- **Schiavo, M.**, Gregoretti, C., Boreggio, M., Barbini, M., & Bernard, M. (2024). Probabilistic identification of debris-flow pathways in mountain fans within a stochastic framework. Journal of Geophysical Research: Earth Surface, 129, e2024JF007946. https://doi.org/10.1029/2024JF007946
- **Schiavo, M.**, Giambastiani, B. M. S., Greggio, N., Colombani, N., and Mastrocicco, M. (2024). *Geostatistical assessment of groundwater Arsenic contamination in the Padana Plain*. Science for the Total Environment. https://doi.org/10.1016/j.scitotenv.2024.172998
- Barbini, M., Bernard, M., Boreggio M., **Schiavo, M.**, and Gregoretti C. (2024) An alternative approach for the sediment control of in-channel stony debris flows with an application to the case study of the Ru Secco Creek (Venetian Dolomites, Northeast Italy. Frontier on Earth Sciences, Vol. 12.

doi:10.3389/feart.2024.1340561

- **Schiavo, M.** (2024). *Numerical impact of variable volumes of Monte Carlo simulations of heterogeneous conductivity fields in groundwater flow models*. J. Hydrol. (634), 131072, https://doi.org/10.1016/j.jhydrol.2024.131072.
- **Schiavo, M.** (2024). *Spatial modeling of the water table and its historical variations in Northeastern Italy via a geostatistical approach*. Groundwater for Sustainable Development, https://doi.org/10.1016/j.gsd.2024.101186.
- Wederni, K., **Schiavo, M.**, Haddaji, Y., Bouri, S., and Colombani, N. (2024). SEAWAT Scenarios Evaluating Links between the Southern Gabès (TN) Confined Aquifer and the Mediterranean Sea. Water, 16(19):2865. http://dx.doi.org/10.3390/w16192865
- **Schiavo, M.**, Colombani, N., and Mastrocicco, M. (2023). *Modeling stochastic saline groundwater occurrence in coastal aquifers*. Wat. Res., 235,119885. DOI: 10.1016/j.watres.2023.119885.
- **Schiavo, M.** (2023). *Entropy, fractality, and thermodynamics of groundwater pathways.* J. Hydrol. 617 (4), 128930. DOI: 10.1016/j.jhydrol.2022.128930
- **Schiavo, M.** (2023). *The role of different sources of uncertainty on the stochastic quantification of subsurface discharges in heterogeneous aquifers.* J. Hydrol. 617 (4), 128930. DOI: 10.1016/j.jhydrol.2022.128930
- **Schiavo, M.** (2023). *Improved groundwater modeling by incorporating geological information from hydrogeological sections*. Acque Sotterranee - Italian Journal of Groundwater, 12(4), 2023-692. https://doi.org/10.7343/as-2023-692
- Li, T., **Schiavo, M.**, and Zumr, D. (2023). *Mutual relationships between evapotranspiration and soil water storage in a small agricultural catchment and their consistency from a statistical viewpoint*. Soil and Water Research. DOI: 10.17221/60/2023-SWR
- **Schiavo, M.**, Riva, M., Guadagnini, L., Zehe, E., and Guadagnini, A. (2022). *Probabilistic identification of Preferential Groundwater Networks*. J. Hydrol. 610 (26), 127906. DOI: 10.1016/j.jhydrol.2022.12790
- **Schiavo, M.** (2022). *Probabilistic delineation of subsurface connected pathways in alluvial aquifers under geological uncertainty*. J. Hydrol. 615 (22), 128674. DOI: 10.1016/j.jhydrol.2022.128674
- **Schiavo, M.** (2023). *Stochastic determination of groundwater flow pathways, discharges, and well-catchments upon energy-based and geostatistical approaches*. PhD Final Dissertation, Politecnico di Milano, Sep. 5 2023. https://hdl.handle.net/10589/207652

Statement of interest

Research experience spans theoretical and numerical topics and machine learning, motivated toward understanding physical phenomena and applications to real problems. My research mainly focuses on subsurface flow dynamics of saturated soils, geostatistics, stochastic analyses of flow in heterogeneous environments, and uncertainty quantification in groundwater systems. Moreover, novel machine learning and information theory-based approaches are under

development, with an emphasis on geostatistical methods of automatic learning and data processing. Current research activities include (i) heterogeneous 2D and 3D aquifer geological modeling, (ii) stochastic investigation and modeling of groundwater bodies; (iii) stochastic modeling of contaminants (e.g. PFAS) or saline intrusion; (iv) energy-based groundwater hydrology, (v) delineation of well catchment protection areas, (vi) the role of stochastic piezometric modeling in advanced agricultural engineering (vii) stochastic and extremes hydrology. In detail:

- Independent MATLAB user.
- Development of own codes for machine learning applied to geostatistical problems.
- Geological modeling of facies upon geological data (boreholes, stratigraphic profiles, hydrogeological cross-sections). Analysis of alluvial, sedimentary, and fluvio-glacial facies for conceptual geological models.
- Geostatistical methods (2-points, variogram-based, training images) for geological models of facies and geomaterials. Softwares: own MATLAB codes, GSLIB, SGEMS.
- Monte Carlo approaches for probabilistic frameworks applied to hydrogeology, water resources, and earth sciences.
- Extraction and delineation of paleochannels, terrain analysis (even stochastic) upon geological and stratigraphic information.
- Groundwater modeling and non-reactive transport (MODFLOW, MODPATH).
- Bias-correction analytical/numerical methods for climate models and rain gauge data
- Debris-flow routing models and hazard evaluation.
- Working in GIS environments and large dataset management

Language competence

Italian: mother tongue.
English: C1 (TOEFL Score: 99/120 IBT).

Driving License: B

Date

Signature