

GIOVANNI MICHELE PORTA

PERSONAL INFORMATION

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PUBLICATIONS

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

Full list of papers in scientific journals:

1. Khan, A. U., Riva, M., **Porta, G.M.**, Mauri, E., Moscatelli, D., & Guadagnini, A. (2026). Experimental and modeling investigations for high-efficiency removal of polar iodinated contrast media from water through engineered clays. *Chemical Engineering Journal Advances*, 27, 101351. <https://doi.org/10.1016/j.cej.2026.101351>
2. Panahi, M., **Porta, G.M.**, Riva, M., & Guadagnini, A. (2026). Physics-informed differentiable solvers for learning parametric solution manifolds in heterogeneous physical systems. *PNAS Nexus*, 5(6), pgag195. <https://doi.org/10.1093/pnasnexus/pgag195>
3. Khan, A. U., Riva, M., **Porta, G.M.**, Ronca, R. R., & Guadagnini, A. (2026). A unified framework for assessing water quality indices under data and model weight uncertainty. *Water Research*, 301, 126033. <https://doi.org/10.1016/j.watres.2026.126033>
4. Niu, S., Zou, Z., Shu, L., & Porta, G. M. (2026). Single collector capture model analysis of particle deposition: Effects of hydrodynamics, particle size, and collector geometry. *Advances in Water Resources*, 210, 105233. <https://doi.org/10.1016/j.advwatres.2026.105233>
5. Dawi, M. A., Starnoni, M., Siena, M., **Porta, G.M.**, & Sanchez-Vila, X. (2025). Direct Numerical Simulation of Solute Transport in Bioclogged Porous Media. *Water Resources Research*, 61(12), e2025WR041939. <https://doi.org/10.1029/2025WR041939>
6. **Porta, G. M.**, Baioni, E., (2025) Upscaling Transport and Sorption Processes via Spatial Markov Model in a Three-Dimensional Porous Domain, *ARC Geophysical Research* (1), 12. doi: <https://doi.org/10.5149/ARC-GR.1654>
7. Manzoni, A., De Barros, F. P. J., **Porta, G. M.**, Riva, M., & Guadagnini, A. (2025). Deep Learning for Connectivity Identification in Random Subsurface Flows: A Methodological Workflow for Early Solute Arrival Time Quantification. *Journal of Geophysical Research: Machine Learning and Computation*, 2(2), e2024JH000574. <https://doi.org/10.1029/2024JH000574>
8. **Porta, G. M.**, Casse, L., Manzoni, A., Riva, M., Maggi, F., & Guadagnini, A. (2025). Pesticides application rate maps in the European Union at a 250 m spatial resolution. *Scientific Data*, 12(1), 725. <https://doi.org/10.1038/s41597-025-05031-7>
9. Volponi, S. N., **Porta, G. M.**, Al-Zghoul, B. M., Bolster, D., & Johnson, W. P. (2025). Inferring experimental colloid removal with an inverse two-population model linking continuum scale data to nanoscale features. *Advances in Water Resources*, 197, 104905. <https://doi.org/10.1016/j.advwatres.2025.104905>
10. Volponi, S. N., Al-Zghoul, B. M., **Porta, G. M.**, Bolster, D., & Johnson, W. P. (2025). Interception History Drives Colloid Transport Variance in Porous Media. *Environmental Science & Technology*, 59(6), 3165–3171. <https://doi.org/10.1021/acs.est.4c06509>
11. Baioni, E., Fiantanese, G., & **Porta, G. M.** (2025). Data-driven assessment of climate change and vegetative cover dynamics in traditional oases. *Journal of Hydrology: Regional Studies*, 59, 102266. <https://doi.org/10.1016/j.ejrh.2025.102266>
12. Panahi, M., Porta, **G. M.**, Riva, M., & Guadagnini, A. (2025). Modeling parametric uncertainty in PDEs models via Physics-Informed Neural Networks. *Advances in Water Resources*, 195, 104870. <https://doi.org/10.1016/j.advwatres.2024.104870>
13. Conni, G., Piccardo, S., Perotto, S., **Porta, G. M.**, & Icardi, M. (2025). HiPhome: High-Order Projection-Based Homogenization for Advection-Diffusion-Reaction Problems. *Multiscale Modeling & Simulation*, 23(1), 640–667. <https://doi.org/10.1137/23M1604989>

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17. Manzoni, A., **Porta, G. M.**, Guadagnini, L., Guadagnini, A., & Riva, M. (2024). A comprehensive framework for stochastic calibration and sensitivity analysis of large-scale groundwater models. *Hydrology and Earth System Sciences*, 28(12), 2661–2682. <https://doi.org/10.5194/hess-28-2661-2024>
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21. Ceresa, L., Guadagnini, A., Rodríguez-Escales, P., Riva, M., Sanchez-Vila, X., & **Porta, G. M.** (2023). On Multi-Model Assessment of Complex Degradation Paths: The Fate of Diclofenac and Its Transformation Products. *Water Resources Research*, 59(1). <https://doi.org/10.1029/2022WR033183>
22. Baioni, E., **Porta, G. M.**, Cattaneo, N., & Guadagnini, A. (2022). Assessment of Hydrological Processes in an Ungauged Catchment in Eritrea. *Hydrology*, 9(5), 68. <https://doi.org/10.3390/hydrology9050068>
23. Pescimoro, E., Icardi, M., **Porta, G. M.**, & Bianchi, M. (2022). Emergence of non-Fickian transport in truncated pluri-Gaussian permeability fields. *GEM - International Journal on Geomathematics*, 13(1), 17. <https://doi.org/10.1007/s13137-022-00207-4>
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27. Baioni, E., Mousavi Nezhad, M., **Porta, G. M.** & Guadagnini, A. (2021). Modeling solute transport and mixing in heterogeneous porous media under turbulent flow conditions. *Physics of Fluids*, 33(10), 106604, selected as featured article by the journal Editors. <https://doi.org/10.1063/5.0065734>
28. Ceresa, L., Guadagnini, A., **Porta, G. M.**, & Riva, M. (2021). Formulation and probabilistic assessment of reversible biodegradation pathway of Diclofenac in groundwater. *Water Research*, 117466. <https://doi.org/10.1016/j.watres.2021.117466>
29. Ceriotti, G., Geloni, C., Dalla Rosa, M., Guadagnini, A., & **Porta, G. M.** (2021). Probabilistic assessment of field-scale CO₂ generation by Carbonate/Clay Reactions in sedimentary basins. *Hydrology and Earth System Sciences*, 3539–3553. <https://doi.org/10.5194/hess-25-3539-2021>
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 45. Dell'Oca, A., **Porta G.M.**, Guadagnini, A., & Riva, M. (2018). Space-time mesh adaptation for solute transport in randomly heterogeneous porous media. *Journal of Contaminant Hydrology*, 212, 28–40. <https://doi.org/10.1016/j.jconhyd.2017.07.001>
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 53. Ranaee, E., Riva, M., **Porta G.M.**, & Guadagnini, A. (2016). Comparative assessment of three-phase oil relative permeability models. *Water Resources Research*, 52(7), 5341–5356. <https://doi.org/10.1002/2016WR018872>
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 65. **Porta, G.M.**, Perotto, S., & Ballio, F. (2012). Anisotropic mesh adaptation driven by a recovery-based error estimator for shallow water flow modeling. *International Journal for Numerical Methods in Fluids*, 70(3), 269–299. <https://doi.org/10.1002/flid.2688>
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Proceedings and book chapters:

1. Rrokaj, S. Kurt, A., Adhikari, R. S., Kethiri, M. A., **Porta, G.M.**, Tedeschi, C., Molinari, D. (2025). A Tool for

- Assessing and Surveying Building Vulnerability in Algeria. In: Augelli, F., Bortolotto, S. (eds) Cultural Heritage Preservation for Vulnerable Territories. Creativity, Heritage and the City, vol 8. Springer, Cham. https://doi.org/10.1007/978-3-031-97721-3_13
2. Baioni, E., Guergazi, S., **Porta, G.M.** (2025). Water and Soil Quality Assessment in M'Chouneche Oasis (Algeria). In: Augelli, F., Bortolotto, S. (eds) Cultural Heritage Preservation for Vulnerable Territories. Creativity, Heritage and the City, vol 8. Springer, Cham. https://doi.org/10.1007/978-3-031-97721-3_10
 3. Biraghi, C.A., Ceriotti, G., **Porta, G.M.**, Tadi, M. (2019) Development and implementation of a quantitative multi-metrics methodology to characterize urban permeability. Proceedings of the Annual International Conference on Architecture and Civil Engineering, pp. 134-144. https://doi.org/10.5176/2301-394X_ACE19.588
 4. Guadagnini A., Guadagnini L., **Porta G.M.**, Cerroni D., Formaggia L., Scotti A., Zunino P., Ruffo P. Modelling the feedback between glaciation, geochemical and mechanical compaction on sedimentary basin evolution *Offshore Mediterranean Conference and Exhibition 2017*, Ravenna, Italy, 29-31 March 2017.
 5. Esfandiari, B., **Porta, G.M.**, Perotto, S., & Guadagnini, A. (2015). Anisotropic Mesh and Time Step Adaptivity for Solute Transport Modeling in Porous Media. In S. Perotto & L. Formaggia (Eds.), *New Challenges in Grid Generation and Adaptivity for Scientific Computing* (Vol. 5, pp. 231–260). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-06053-8_12
 6. Ruffo, P., **Porta G.M.**, Colombo, I., Scotti, A., & Guadagnini, A. (2014). Global Sensitivity Analysis of Geochemical Compaction in a Sedimentary Basin. Presented at the First EAGE Basin & Petroleum Systems Modeling Workshop, Dubai, United Arab Emirates. <https://doi.org/10.3997/2214-4609.20143789>
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