CURRICULUM VITAE OF
MONICA RIVA

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Monica Riva (

Current position. Professor at the Dept. of Civil and Environmental Engineering (DICA) of the Politecnico di Milano (Polimi).

Affiliation. Adjunct Professor at the Department of Hydrology and Water Resources of the University of Arizona.

Education. Graduated in Civil Engineering (hydraulics), Polimi (1996). Doctoral Degree in Hydraulic Engineering, Polimi (2000).

ACADEMIC RECORD

2013 – : Adjunct Associate Professor, Dept. of Hydrology and Water Resources, The University of Arizona, Tucson, Arizona, USA.

2013 – 2015: Associate Professor, Dept. of Civil and Environmental Engineering (DICA), Polimi.

2011 – 2013: Associate Professor, Dept. of Environmental, Hydraulic, Infrastructures and Surveying Engineering (DIIAR), Polimi.

2002 – 2010: Assistant Professor, DIIAR, Polimi.

2013, 2014: Professeur Invité at the University of Strasbourg, France.

2011, 2012: Visiting Professor at the Dept. of Hydrology and Water Resources, The University of Arizona, Tucson, Arizona, USA.

2008: Visiting Scientist at the CNRS/INSU, Poitiers (France). Program: HTHS, Hydrodynamic and Transfers in Hydrogeological Systems, EC2CO/MACH-1: Modeling of Heterogeneous Carbonate Aquifers.

1999, 2006: Visiting Scientist at Dept. of Hydrology and Water Resources, The University of Arizona, Tucson, Arizona, USA.

1999 – 2002: Assistant Researcher ("Assegnista di ricerca"), DIIAR, Polimi.

RESEARCH ACTIVITY

Research activity has been focused mainly (about 130 publications, of which more than 80 on international journals included in the Journal Citation Report) on subsurface flow and transport dynamics, parameter estimation, stochastic groundwater hydrology, probabilistic well capture zones, scaling in hydrology, stochastic inverse modeling, uncertainty quantification, multiphase flows, oil recovery, experimental, analytical and numerical methods, interpretation and modeling of experimental data, groundwater management. One of her main contributions is the development of exact and approximated formalisms for prediction of groundwater flow fields processes governing the spreading of conservative and reactive

solutes in hydro-geo-chemically heterogeneous geomaterials by means of conditional moments of the state variable of interest. On the basis of such theoretical framework original analytical and numerical solutions of the investigated processes have been derived. She developed and applied innovative stochastic and upscaling techniques to study multiphase flow features of immiscible and miscible fluids. She has developed a theory (sub-Gaussian models) able to capture the non-Gaussian and scaling behavior exhibited by many hydrological-hydrogeological-environmental variables. She has introduced novel metrics to perform global sensitivity analysis across multiple interpretive models with uncertain parameters.

She is a leading scientist of the Groundwater research group of Polimi (DICA). The last peer review (year 2010) has evaluated this group as Excellent at international level.

KEY WORDS OF THE RESEACH ACTIVITY: Flow and transport processes in the subsurface; Stochastic approaches; Uncertainty quantification; Local and Global Sensitivity analysis; Risk analysis; Effective, Equivalent and Apparent parameters; Probabilistic estimation of capture zones of wells-springs; Characterization of aquifers and geostatistical inversion; Probabilistic reconstruction of geo-materials (facies) and hydraulic properties; Deterministic and stochastic upscaling techniques; Scaling of stochastic processes and fractal nature of environmental variables; Data assimilation; Multiphase flows; Sub-Gaussian Processes.

Metrics (updated in June 2019)

h-index: 22 (Scopus), 21 (ISI), 25 (Google Scholar).

Total citations: 1430 (Scopus), 1250 (ISI), 1750 (Google Scholar), i10-index: 52

TEACHING ACTIVITY AT POLIMI

Graduation courses

Tenure of courses

2011 – : Groundwater (10 credits, School of Civil and Environmental Engineering).

2009 – : Fluid Mechanics (8 credits, School of Industrial Engineering)

2003 – 2008: Fluid Mechanics II (5 credits, School of Industrial Engineering)

2002 – 2006: Fluid Mechanics I (5 credits, School of Industrial Engineering)

2000 – 2001: Fluid Mechanics (10 credits, School of Industrial Engineering)

Teaching assistance

2004 – 2010: Groundwater (School of Civil and Environmental Engineering)

1997, 1999 – 2000: Fluid Mechanics (School of Industrial Engineering)

1996 – 1997: Hydraulics (School of Civil and Environmental Engineering)

Phd courses

2007: Inverse Geostatatistical models (PhD in Environmental and Infrastructure Engineering, DIIAR, Polimi)

2011: Probabilistic capture zones (PhD program of SIPD, Polimi).

2011: Basics of Stochastic Approaches in Hydrogeology, (training of early researcher financed by the EU

Marie Curie Initial Training Network IMVUL)

2013: Stochastic Approaches in Groundwater, (PhD in Environmental and Infrastructure Engineering, DICA, Polimi).

II Level Master

2019:Pumping and Dewatering, II Level Master in Tunnel Engineering; Polimi (March 2019).

Tutor/advisor of 8 PhD theses and of numerous master theses.

Currently tutor/advisor of 2 PhD students.

SPECIAL PROFESSIONAL/EDITORIAL ACTIVITIES

2019 - Council Member of Interpore (International Society for Porous Media)

2018- Editor of the International Journal *Encyclopedia of Geosciences*, European Geosciences Union (EGU)

2016 – Subsurface Hydrology and Groundwater sub-division chair at the EGU General Assembly.

2014 – Secretary of the Italian Chapter of Interpore

2013 –: Editor of the International Journal *Hydrology and Earth System Sciences*, EGU.

2010 – : Associate Editor of the International Journal *Water Resources Research*, American Geophysical Union (AGU).

2010 – : Convener of sessions on *Subsurface Hydrology* at the EGU General Assembly.

2004 – 2010: Member of the scientific committee of the European Conference on Geostatistics for Environmental Applications (GeoENV)

2004 – 2009: Associate Editor of the International Journal *Reviews of Geophysics*, AGU.

Expert, Research Proposal Evaluation Panels (Israeli Science Foundation, Israel; Fondazione Cassa di Risparmio Padova e Rovigo, Italy).

Reviewer for several international journals (Journal Hydrology and Heart System Sciences, Reviews of Geophysics, Water Resources Research, Advances in Water Resources, Journal of Contaminant Hydrology, Journal of Hydrology, Transport in porous media, Hydrogeology Journal, Stochastic Environmental Research and Risk Assessment).

Member of several committees for the selection of PhD student, post-doc (Assistant Researcher), Researcher, Associate and Full Professor candidates.

INSTITUTIONAL ACTIVITIES

2019 – Vice-Director of the PhD programme in Environmental and Infrastructure Engineering, DICA, Polimi

2014 – 2016: Member of the international committee of DICA

2012 –: Responsible of the Doctoral Program in Environmental and Infrastructure Engineering. Profile A - “Hydraulic Engineering”, Polimi.

2012 – : Member of the collegium and of the junta of the PhD programme in Environmental and Infrastructure Engineering, DICA, Polimi

KEY RESEARCH PROJECTS

Coordinator of the Water JPI project WE-NEED (2016-2019) "WatEr NEEDs, Availability, Quality and Sustainability" funded by MIUR (Ministry of Education, Research and University of Italy, 2016-2019), within the ERA-NET Cofund Water Works 2014. The main motivation underlying the activity of WE-NEED is to develop new management strategies to assist the sustainable use and protection of groundwater resources (www.we-need.polimi.it).

She has coordinated the project GEMINO- Bridging across observable multiscale processes and modeling" (2009-2012). GEMINO has been financed by Polimi through a competition (judged by international referees) for young scientists on issues of significant social interest. The project starts from the observation that in many aquifer tests the information conveyed by each measured process may be far from complete so that one is confronted with the problem of fusing data of various nature to achieve the desired level of knowledge. GEMINO proposes to develop, test, and apply a physically-based and observation-inspired hierarchical framework for modeling three-dimensional dynamics of groundwater systems across multiple spatial scales. The use of such a framework is ideally suited to the fusion of data from several techniques and varying degrees of resolutions and spatial coverage within the context of predictive models.

She was the Principal Investigator of the following projects:

- "Hydroelectric energy by osmosis in coastal areas" financed by MIUR (Ministry of Education, Research and University of Italy, 2013-2015). The key objective of this project is to assess the effect of heterogeneity and (conceptual and parametric) uncertainty on the ability to predict the dynamics of salt water intrusion and up-coning.
- "Valutazione del contributo di fondo naturale del cromo esavalente nei corpi idrici montani, al fine di classificare correttamente lo stato chimico ai sensi della direttiva 2000/60/CE" (Arpa Emilia Romagna 2014-2015).

She was a leading scientist of the following projects:

- FracRisk – Furthering the knowledge base for reducing the Environmental Footprint of Shale Gas Development (European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No. 636811, 2016-2018). The objectives of FracRisk were to develop a knowledge base for understanding, preventing and mitigating the potential impact of the exploration and exploitation through hydraulic fracturing (fracking) of significant shale gas reserves found throughout Europe, and to develop a decision support tool for risk quantification of the environmental impacts of the technology.

- Modeling geochemical compaction within reactive fluxes at the basin scale (2009 – 2015 funded by Eni S.p.A.).

- Water Alternate Gas Injection (2011 – 2017; funded by Eni S.p.A.).

- History matching for characterization of reservoir facies by stochastic inversion methodologies (2011 – 2014; funded by Eni S.p.A.).

- EU Marie Curie Initial Training Network IMVUL (Towards Improved Groundwater Vulnerability Assessment) funded by the European Union, within the call FP7-PEOLE-2007-1-1-ITN (2008-2012). The main motivation underlying the activity of IMVUL is to train researchers in the major issues, scientific challenges and operational problems in groundwater vulnerability that face the groundwater industry today, through a combination of research and industry related training.

She was coordinator assistant and she participated to the European Consortium W-SAHaRA (Stochastic Analysis of Well-Head Protection and Risk Assessment) funded by the European Union, within the Fifth Framework Program (2000-2003). The main motivation underlying the activity of W-SAHaRA was the need to recognize the importance of the heterogeneity of natural geological materials and its impact on the sustainable management and development of drinking well fields.

She participated to several projects founded by the Italian Ministry of Research and Education. The more recent grants are:

- "Statistical estimation of heterogeneity in complex randomly heterogeneous geologic media" (2006-2008).
- NUMQUES 'Advanced Numerical Techniques for Uncertainty Quantification in Engineering and Life Science Problems' (2009 – 2012).

INVITED TALKS

- Prediction of Uncertainty in well capture regions, Florida State University, Tallahassee, USA, January, 2007.
- Geostatistical characterization of a fluvial unconfined aquifer based on pumping test data from four wells, Vienna, EGU General Assembly, 2007.
- Stochastic Modeling of an experimental site, H+ Reseau National de sites hydrogéologiques, Poitiers, 6-8 October, 2008.
- Geostatistical Inversion of Moment Equations of Groundwater flow, workshop: Numerical Solution of Stochastic Partial Differential Equations, Politecnico di Torino, May 10-13, 2010.
- Scaling of hydrologic variables and their extremes (Black Swans and Dragon Kings!), University of Arizona, October 31, 2012.
- Homogenization approach for multiphase flow in porous media, University of Strasbourg, June, 2013.
- Characterization of sedimentary basins in the presence of mechanical and geochemical compaction, IAHR-7th International Groundwater Symposium, Perugia, September, 2014.
- New Model for scalable non-Gaussian random fields, International Symposium on Sustainable Development in Water Resources and Ecological Environment, Guangzhou, China, March 2016.
- The Generalized Sub-Gaussian Model: Theory and Applications, FrontUQ2018, Quantification in Subsurface Environments, Pavia, September 2018
- Sensitivity Analysis and Uncertainty Quantification in hydrogeology, Modelling, Workshop: Simulation and Risk Assessment for Fractured Geological Media, March 27- 28, 2019.
- WE-NEED: WatEr NEEDs, availability, quality and Sustainability, Workshop on Diffusive Contaminants,: June 11, Regione Lombardia, 2019

PROFESSIONAL SOCIETIES

American Geophysical Union; European Geophysical Union; Interpore; National Groundwater Association; Board of Engineers (Italy).

LIST OF PUBLICATIONS

Paper in international refereed Journals

1. Riva M., A. Guadagnini, F. Ballio (1999), Time Related Capture Zones for Radial Flow in Two-Dimensional Randomly Heterogeneous Media, *Stochastic Environmental Research and Risk Assessment*, 13(3), 217-230, doi: 0.1007/s004770050040.
2. Riva M., A. Guadagnini, S.P. Neuman, S. Franzetti (2001), Radial flow in a bounded, randomly heterogeneous aquifer, *Transport in Porous Media*, 45(1), 139-193, doi:10.1023/A:1011880602668
3. Guadagnini A., M. Riva, S.P. Neuman (2003), Three-dimensional steady state flow to a well in a randomly heterogeneous bounded aquifer, *Water Resour. Res.*, 39(3), 1048, doi: 10.1029/2002WR001443.
4. Guadagnini A., X. Sanchez-Vila, M. Riva, M. De Simoni (2003), Mean travel time of conservative solutes in randomly heterogeneous unbounded domains under mean uniform flow, *Water Resour. Res*., 39(3), 1050, doi:10.1029/2002WR001811.
5. Tartakovsky D.M., A. Guadagnini, M. Riva (2003), Stochastic averaging of nonlinear flows in heterogeneous porous media, *J. Fluid. Mech.*, vol. 492, pp 47-62, doi:10.1017/S002211200300538X.
6. Neuman S.P., A. Guadagnini, M. Riva (2004), Type-curve estimation of statistical heterogeneity, *Water Resour. Res*., 40, W04201, doi:10.1029/2003WR002405.
7. Stauffer F., A. Guadagnini, A. Butler, H.-J. Franssen, N. Van De Wiel, M. Bakr, M. Riva, L. Guadagnini (2005), Delineation of source protection zones using statistical methods, *Water Resources Management*, 19, 163 – 185, doi: 10.1007/s11269-005-3182-7.
8. Riva M., X. Sanchez-Vila, A. Guadagnini, M. De Simoni, M. Willmann (2006), Travel time and trajectory moments of conservative solutes in two-dimensional convergent flows, *J. Contam. Hydrol.*, 82, 23-43, doi:10.1016/j.jconhyd.2005.06.014.
9. Riva M., A. Guadagnini, M. De Simoni (2006), Assessment of uncertainty associated to the estimation of well catchments by moment equations, *Adv. Water Res.*, 29, 676-691, doi:10.1016/j.advwatres.2005.07.005.
10. Riva M., L. Guadagnini, A. Guadagnini, T. Ptak , E. Martac (2006) Probabilistic study of well capture zones distribution at the Lauswiesen field site, *J. Contam. Hydrol.*, 88(1-2), 92-118, doi:10.1016/j.jconhyd.2006.06.005.
11. Neuman S.P., A. Blattstein, M. Riva, D.M. Tartakovsky, A. Guadagnini, T. Ptak (2007), Type curve interpretation of late-time pumping test data in randomly heterogeneous aquifers, *Water Resour. Res*., 43, W10421, doi:10.1029/2007WR005871
12. Neuman S.P., M. Riva, A. Guadagnini (2008), On the geostatistical characterization of hierarchical media, *Water Resour. Res*., 44, W02403, doi:10.1029/2007WR006228.
13. Riva M., A. Guadagnini, D. Fernandez-Garcia, X. Sanchez-Vila, T. Ptak (2008), Relative importance of geostatistical and transport models in describing heavily tailed breakthrough curves at the Lauswiesen site, *J. Contam. Hydrol*, 101, 1-13, doi:10.1016/j.jconhyd.2008.07.004.
14. Riva M., A. Guadagnini (2009), Effects of evolving scales of heterogeneity on hydraulic head predictions under convergent flow conditions, *Hydrogeology Journal*, 17(4), 817-825, doi:10.1007/s10040-008-0396-9.
15. Riva M., A. Guadagnini, J. Bodin, F. Delay (2009), Characterization of the Hydrogeological Experimental Site of Poitiers (France) by stochastic well testing analysis, *Journal of Hydrology*, 369 (1-2), 154-164, doi:10.1016/j.jhydrol.2009.02.040.
16. Riva M., A. Guadagnini, X. Sanchez-Vila (2009), Effect of sorption heterogeneity on moments of solute residence time in convergent flows, *Mathematical Geosciences*, 41, 835-853, doi:10.1007/s11004-009-9240-96.
17. Hendricks Franssen H.J., A. Alcolea, M. Riva, M. Bakr, N. van der Wiel, F. Stauffer, A. Guadagnini (2009), A comparison of seven methods for the inverse modelling of groundwater flow. Application to the characterisation of well catchments, *Adv. Water Res.*, 32(6), 851-872, doi:10.1016/j.advwatres.2009.02.011.
18. Riva M., M. Willmann (2009), Impact of the choice of the log-transmissivity variogram structure on groundwater flow and transport predictors, *Adv. Water Res.*, 32(8), 1311-1322, doi:10.1016/j.advwatres.2009.05.007.
19. Riva M., A. Guadagnini, S. P. Neuman, E. Bianchi Janetti, B. Malama (2009), Inverse analysis of stochastic moment equations for transient flow in randomly heterogeneous media, *Adv. Water Res.*, 32, 1495-1507, doi:10.1016/j.advwatres.2009.07.003.

20. Bianchi Janetti E., M. Riva, , S. Straface, A. Guadagnini (2010), Stochastic characterization of the Montaldo Uffugo research site (Italy) by geostatistical inversion of moment equations of groundwater flow, *Journal of Hydrology*, 381, 42-51, doi:10.1016/j.jhydrol.2009.11.023.
21. Riva M., L. Guadagnini, A. Guadagnini (2010), Effect of uncertainty of lithofacies, conductivity an porosity distributions on stochastic interpretations of a field scale tracer test, *Stochastic Environmental Research and Risk Assessment*, 24, 955-970, doi:10.1007/s00477-010-0399-7.
22. Riva M., A. Guadagnini, F. De Gaspari, A. Alcolea (2010), Exact sensitivity matrix and influence of the number of pilot points in the geostatistical inversion of moment equations of groundwater flow, *Water Resour. Res*., 46, W11513, doi:10.1029/2009WR008476
23. Barahona-Palomo M., M. Riva, X. Sanchez-Vila, E. Vazquez-Sune, A. Guadagnini (2011), Comparison of impeller flowmeter and particle-size distribution techniques for the characterization of hydraulic conductivity variability, *Hydrogeology Journal*, 19(3), 603-612 doi:10.1007/s10040-011-0706-5
24. Riva M., M. Panzeri, A. Guadagnini, S. P. Neuman, (2011), Role of model selection criteria in geostatistical inverse estimation of statistical data- and model-parameters, *Water Resour. Res*., 47, W07502, doi:10.1029/2011WR010480.
25. Straface S., F. Chidichimo, E. Rizzo, M. Riva, W. Barrash, A. Revil, M. Cardiff, A. Guadagnini (2011), Joint inversion of steady-state hydrologic and self-potential data for 3D hydraulic conductivity distribution at the Boise Hydrogeophysical Research Site, *Journal of Hydrology*, 407 (1-4), pp. 115 - 128, doi:10.1016/j.jhydrol.2011.07.013
26. Cadini F., J. De Sanctis, A. Cherubini, E. Zio, M. Riva, A. Guadagnini (2012), An integrated simulation framework for the performance assessment of radioactive waste repositories, *Annals of Nuclear Energy*, 39, 1-8, doi:10.1016/j.anucene.2011.09.002
27. Siena M., A. Guadagnini, M. Riva, S. P. Neuman (2012), Extended power-law scaling of air permeabilities measured on a block of tuff, *Hydrology and Earth System Sciences*, 16, 29-42, doi:10.5194/hess-16-29-2012
28. Porta G.M., M. Riva, A. Guadagnini (2012), Upscaling solute transport in porous media in the presence of an irreversible bimolecular reaction, *Adv. Water Res.*, 35, 151-162, doi:10.1016/j.advwatres.2011.09.004.
29. Cadini F., J. De Sanctis, A. Cherubini, E. Zio, M. Riva, A. Guadagnini (2012), Nominal range sensitivity analysis of peak radionuclide concentrations in randomly heterogeneous aquifers, *Annals of Nuclear Energy*, 47, 166-172, doi: 10.1016/ j.anucene.2012.05.005
30. Riva M., P. Ackerer, A. Guadagnini (2012) Interpretation of flowmeter data in heterogeneous layered aquifers, *Journal of Hydrology*, 452-453, 76-82, doi: 10.1016/j.jhydrol.2012.05.040
31. Bianchi Janetti E.; I. Dror; M. Riva; A. Guadagnini; B. Berkowitz (2012) Estimation of single-metal and competitive sorption isotherm through Maximum likelihood and model quality criteria, *Soil Science Society of America Journal*, 76:1229–1245, doi:10.2136/sssaj2012.0010
32. Guadagnini A., S. P. Neuman, M. Riva (2012), Numerical Investigation of Apparent Multifractality of Samples from Processes Subordinated to Truncated fBm, *Hydrological Processes*, 26, 2894-2908, doi: 10.1002/hyp.8358
33. Guadagnini, A., M. Riva, and S.P. Neuman (2012), Extended power-law scaling of heavy-tailed random air-permeability fields in fractured and sedimentary rocks, *Hydrol. Earth Syst. Sci*., 16, 3249-3260, doi:10.5194/hess-16-3249-2012.
34. Porta G.M, J.F. Thovert, M. Riva, A. Guadagnini, P.M. Adler (2012) Microscale simulation and numerical upscaling of a reactive flow in a plane channel, *Physical Review E*, 86(3), p. 1-15.
35. Riva M., S.P. Neuman, A. Guadagnini (2013) Sub-Gaussian models of processes with heavy-tailed distributions applied to air permeabilities of fractured tuff, *Stochastic Environmental Research and Risk Assessment*, 27(1), 195-207, doi: 10.1007/s00477-012-0576-y
36. Formaggia L., A. Guadagnini, I. Imperiali, V. Lever, G. Porta, M. Riva, A. Scotti, L. Tamellini (2013), Global Sensitivity Analysis through Polynomial Chaos Expansion of a basin-scale geochemical compaction model, *Computational Geosciences*, 17(1), 25-42, doi 10.1007/s10596-012-9311-5
37. Panzeri, M., M. Riva, A. Guadagnini, and S. P. Neuman (2013), Data assimilation and parameter estimation via ensemble Kalman filter coupled with stochastic moment equations of transient groundwater flow, *Water Resour. Res*., 49, 1334-1344, doi:10.1002/wrcr.20113.
38. Ciriello V., V. Di Federico, M. Riva, F. Cadini, J. De Santis, E. Zio, A. Guadagnini (2013), Polynomial chaos expansion for global sensitivity analysis applied to a model of radionuclide migration in a randomly heterogeneous aquifer, *Stochastic Environmental Research and Risk Assessment*, 27, 945-954, doi 10.1007/s00477-012-0616-7
39. Bianchi Janetti E., I. Dror, M. Riva, A. Guadagnini, X. Sanchez-Vila, B. Berkowitz (2013) Mobility and interaction of heavy metals in natural soils, *Transport in porous media*, 97:295-315, doi: 10.1007/s11242-013-0125-2

40. Riva M., S. Mambretti, S. Chaynikov, P. Ackerer, O. Fasunwon, A. Guadagnini (2013) A new general analytical solution for infiltration structures design, *Journal of hydraulic engineering*, 139(6), 637-644, doi:10.1061/(ASCE)HY.1943-7900.0000718.
41. De Barros F., A. Guadagnini, D. Fernandez Garcia, M. Riva, X. Sanchez-Vila (2013) Controlling Scaling Metrics for Improved Characterization of Well-Head Protection Regions, *Journal of Hydrology*, 494, 107-115, doi: 10.1016/j.jhydrol.2013.04.040.
42. Porta G., Chaynikov S., Riva M., and Guadagnini A. (2013) Upscaling solute transport in porous media from the pore scale to dual- and multi- continuum formulations, *Water Resour. Res*., 49, 1-15 doi: 10.1002/wrcr.20183
43. Riva M., S.P. Neuman, A. Guadagnini, M. Siena (2013) Anisotropic scaling of Berea sandstone log air permeabilities statistics, *Vadose Zone Journal*, 12(3), doi: 10.2136/vzj2012.0153
44. Riva M., S.P. Neuman, A. Guadagnini (2013) On the identification of Dragon Kings among extreme valued outliers , *Nonlinear Processes in Geophysics*, 20(4), 549-561, doi: 10.5194/npg-20-549-2013
45. Porta G.M., S. Chaynikov, J.-F Thovert, M. Riva, A. Guadagnini, P.M. Adler (2013) Numerical investigation of pore and continuum scale formulations of bimolecular reactive transport in porous media, *Adv. Water Res*, 62, 243-253,doi: 10.1016/j.advwatres.2013.09.007
46. Guadagnini, A., S.P Neuman, M.G. Schaap and M. Riva (2013) Anisotropic statistical scaling of vadose zone hydraulic property estimates near Maricopa, Arizona, *Water Resour. Res*., 49, doi:10.1002/2013WR014286.
47. Guadagnini, A., S.P Neuman, M.G. Schaap and M. Riva (2014) Anisotropic statistical scaling of soil and sediment texture in a stratified deep vadose zone near Maricopa, Arizona, *Geoderma*, 214, 217-227, doi: 10.1016/j.geoderma.2013.09.008
48. Perulero Serrano R., L. Guadagnini, M. Riva, M. Giudici, A. Guadagnini (2014) Impact of two different geostatistical hydro-facies simulation strategies on head statistics under non-uniform groundwater flow conditions, *Journal of Hydrology*, 508, 343-355, doi: 10.1016/j.jhydrol.2013.11.009
49. Siena M., Riva M., Hyman J. D., Winter C. L. and A. Guadagnini (2014) Relationship between pore size and velocity probability distributions in stochastically generated porous media, *Physical Review E*, 89(1), 013018, doi: 10.1103/PhysRevE.89.013018
50. Guadagnini A.,· M. J. Blunt, M. Riva, B. Bijeljic (2014) Statistical Scaling of Geometric Characteristics in Millimeter Scale Natural Porous Media, *Transport in Porous Media*,101(3), 465-475, doi: 10.1007/s11242-013-0254-7
51. Panzeri, M., M. Riva, A. Guadagnini, and S. P. Neuman (2014), Comparison of Ensemble Kalman Filter groundwater-data assimilation methods based on stochastic moment equations and Monte Carlo simulation, *Adv. Water Res*, 66, 8-16, doi: 10.1016/j.advwatres.2014.01.007
52. Riva M., X. Sanchez-Vila, A. Guadagnini (2014), Estimation of spatial covariance of log conductivity from particle size data, *Water Resour. Res*., 50, doi:10.1002/2014WR015566.
53. Siena M., A. Guadagnini, Riva M., Bijeljic B., Pereira Nunes J. P. and Blunt M.J. (2014) Statistical scaling of pore-scale Lagrangian velocities in natural porous media, *Physical Review E*, 90, 023013, doi: 10.1103/PhysRevE.90.023013.
54. Porta G.M., L. Tamellini, V. Lever, M. Riva (2014) Inverse modeling of geochemical and mechanical compaction in sedimentary basins through Polynomial Chaos Expansion, *Water Resour. Res*., 50, 12, 9414-9431,doi: 10.1002/2014WR015838.
55. Odling N.E., R.P. Serrano, M.E.A. Hussein, M. Riva, A. Guadagnini (2015) Detecting the vulnerability of groundwater in semi-confined aquifers using barometric response functions, *Journal of Hydrology*, 520, 143-156.
56. Bianchi Janetti E., M. Riva, A. Guadagnini (2015) Three-phase Permeabilities: upscaling, analytical solutions and uncertainty analysis in elementary pore structures, *Transport in porous media*, 106, 2, 259-283, doi 10.1007/s11242-014-0400-x
57. Riva M., A. Guadagnini, A. Dell'Oca (2015) Probabilistic assessment of seawater intrusion under multiple sources of uncertainty, *Adv. Water Res*, 75, 93-104, doi:10.1016/j.advwatres.2014.11.002
58. Guadagnini A., S. P. Neuman, T. Nan, M. Riva, C. L. Winter (2015), Scalable statistics of correlated random variables and extremes applied to deep borehole porosities, *Hydrol. Earth Syst. Sci*., 19, 1-17, doi:10.5194/hess-19-1-2015.
59. Panzeri, M., M. Riva, A. Guadagnini, and S. P. Neuman (2015), EnKF coupled with groundwater flow moment equations applied to Lauswiesen aquifer, Germany, *Journal of Hydrology*, 521, 01, 205-216, doi**:** 10.1016/j.jhydrol.2014.11.057
60. Ranaee E., G. M. Porta, M. Riva, M. J. Blunt, A. Guadagnini (2015), Prediction of three-phase oil relative permeability through a sigmoid-based model. J. Petrol.Sci. Eng., 126, 190-200, doi: 10.1016/j.petrol.2014.11.034
61. Garing C., P. Gouze, M. Kassab, M. Riva, A. Guadagnini (2015) Anti-correlated Porosity–Permeability Changes During the Dissolution of Carbonate Rocks: Experimental Evidences and Modeling, *Transport in porous media*, 107, 2, 595-621, doi 10.1007/s11242-015-0456-2.
62. Siena M., J. D. Hyman, M. Riva, A. Guadagnini, C. L. Winter, P. K. Smolarkiewicz, P. Gouze, S. Sadhukhan, F. Inzoli, G. Guédon, and E. Colombo (2015), Direct Numerical Simulation of Fully-Saturated Flow in Natural Porous Media at the Pore-

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