



Roberto Revelli Curriculum Vitae

Name

Roberto Revelli

Contact

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Professional positions

31/12/2018-now	Full Professor at Politecnico di Torino (Polito)
01/2005-12/2018	Associate Professor at Polito
11/1999-12/2004	Researcher at Polito
09/1997-10/1999	Fellowship researcher. Post PH.D. program on the topic "Transport phenomena in heterogeneous media"

Education

02/1994-08/1997	PH.D. on Hydraulics. (University of Florence) Dissertation title: River-aquifer interaction and effects on pollutant transport. Advisor: Sebastiano Sordo
02/1993-02/1994	Military Service
09/1987-02/1993	Master degree in Civil Engineering (Hydraulics) at Polito. Dissertation title "On the incomplete self-similarity law for the velocity distribution in turbulent uniform flow". Advisors: Sebastiano Sordo and Luigi Butera

Professional experiences

08/2016-11/2018	Marie Skłodowska-Curie Fellow (Duke University and Polito)
11/2017-11/2018	Visiting Associate Professor at Department of Environment, Land and Infrastructure Engineering (DIATI) – Polito (Return phase of the Marie Skłodowska-Curie grant agreement "ECO.G.U.S" H2020 #701914)



- 07/2016-11/2017 Visiting Associate Professor at Pratt School of Engineering – Duke University (Outgoing phase of the Marie Sklodowska-Curie grant agreement "ECO.G.U.S" H2020 #701914)
- 05/2015-06/2015 Visiting Scholar at Pratt School of Engineering – Duke University
- 01/2012-09/2015 Vice Director of the DIATI – Polito

Boards/Committees (recent)

Term membership on the Graduate Faculty – Duke University – Pratt School of Engineering

Auditor for MIUR

Scientific Committee of Hydroaid: Management of Water Resources Institutes

Board for the Management of the DIATI

Board for the Management of Master Degree Course in Civil Engineering (Polito)

Board for the Management of Master Degree Course in Environmental Engineering (Polito)

Academic Board of the PhD in Water and territory management engineering (Polito)

National Group for Mathematical Physics.

XXXVII National Congress of Hydraulics, Reggio Calabria (Italy), 2020

XXXIV National Congress of Hydraulics, Bari (Italy), 2014

ORME – Water wheels and hydroelectric production", Polito, 2014

CCWI 2013, Computing and Control for Water Industry – Information for Water Systems and Smart Cities, 12th CCWI International Conference, Perugia (Italy), 2013

Advisor for the Court of Accounts (Corte dei Conti), Piemonte Section.

Academic honors and awards

IFIT 2018 – Second International Conference of IFToMM ITALY (29-30 November 2018, Cassino, Italy) Silver Best Application Paper Award for the paper "Franco W., Ferraresi C., Revelli R. (2019) Power transmission and mechanisms of an old water mill, Mechanisms and Machine Science,68, 29-37, doi: 10.1007/978-3-030-03320-0_4"

Highly Cited Papers (WoS): Boano F., Harvey J.W., Marion A., Packman A.I., Revelli R., Ridolfi L., Wörman A. (2014) Hyporheic flow and transport processes: Mechanisms, models, and biogeochemical implications, Reviews of Geophysics, 52(4), 603-679, doi:10.1002/2012RG000417

2010 Special Prize (GII): "Hydraulics and Historical Gardens Restoration: the water games in the Racconigi Royal Park" by Cavagnero P., Revelli R. and Sordo S.

Italian National Scientific Qualifications awarded for Full Professor positions – ASN 2012 – 08/A1 Hydraulics, Hydrology, Hydraulic and Marine Constructions

Editorial



Cogent Engineering - Taylor & Francis Group

FREIJ: Forestry Research and Engineering: International Journal - MedCrave

Ukrainian Academic Science of Kiev

Reviewer International journals (e.g. Advances in Water Resources, Environmental Modeling and Assessment, Environmental Science and Pollution Research, Geophysical Research Letters, Hydrological Processes, Hydrology and Earth System Science, International Journal for Numerical Methods in Fluids, International Journal of Heat and Mass Transfer, Journal of Fluid Mechanics, Journal of Hydroinformatics, Journal of Hydrology...)

Invited speaker (recent)

“Eco.G.U.s. - ECOsystem services for resilient and sustainable cities: an ecohydrological approach for Green Urban Spaces”, NoonTalk #27, DIATI, Polito, November 11th, 2018

“The Flow of Ideas: Leonardo and Water”, Centre for Medieval and Renaissance Studies, UCLA, Los Angeles, May 20th – 21st, 2016

“MiniHydro: resource for territory”, ARS.UNI.VCO, Verbania, 2013

Teaching activities (recent)

2021: Environmental Hydraulics ((Polito - Environmental Engineering)

2021: Hydraulics (Polito - Civil Engineering)

2020: Environmental Hydraulics ((Polito - Environmental Engineering)

2020: Hydraulics (Polito - Civil Engineering, Environmental Engineering)

2019: Environmental Hydraulics ((Polito - Environmental Engineering)

2019: Hydraulics (Polito - Civil Engineering, Environmental Engineering)

2018: Environmental Hydraulics ((Polito - Environmental Engineering)

2018: Hydraulics (Polito - Civil Engineering, Environmental Engineering)

2016: River Hydraulics ((Polito - Civil Engineering)

2016: Hydraulics (Polito - Civil Engineering, Environmental Engineering)

2015: Water basin Management (Polito – Master Water Engineering for Drinking and Industrial Use)

2015: River Hydraulics ((Polito - Civil Engineering)

2015: IUWM Integrated Urban Water Management (Polito – Master Water Engineering for Drinking and Industrial Use)

2015: Hydraulics (Polito - Civil Engineering, Environmental Engineering)

2014: Transport processes in rivers (Polito Doctorate School - Environmental Engineering)

2014: River Hydraulics ((Polito - Civil Engineering)

2014: Hydraulics (Polito - Civil Engineering, Environmental Engineering)

Teaching coordination (recent)



2015: Technical course on water supply systems, (e-learning) (HydroAid)

2015: II Level Specializing Master Program “Water Engineering for Drinking and Industrial Use”, IV edition (Polito)

2014: Water Management Planning (HydroAid - Watsam - Torino)

2014: IUWM: Integrated Urban Water Management (HydroAid - Watsam - Ethiopia)

2014: II Level Specializing Master Program “Water Engineering for Drinking and Industrial Use”, III edition (Polito)

Other Teaching activities (recent)

Epanet in IUWM contest: the Watsam project as a support to Arba Minch (Ethiopia) water utilities management, Undergraduate Course CEE 463L - Water Resources Engineering, Duke University

Water wheels and hydropower production for cultural heritage valorization, CREDA Onlus, Monza (It)

Water wheels and minihydro, Univer, Borgosesia (It)

Energy from water: how a drop can turn on a lamp, EnvironSchool, Lessons for High School Students

Professional responsibility and ethics: risk management in flooded areas, College of Architects, Imperia (It)

Tutoring

More than 200 Bachelor's and Master of Science's degree thesis

More than 30 apprenticeship programs

PhD students: Boano Fulvio (2006) “Solute transport in rivers and hyporheic zones”, Cotto Ilenia (2007) “Water harvesting in developing countries”, Demaria Andrea (NC) Solute transport in rivers, Gossa Paolo (NC) Water and agriculture, Borra Stefania (NC) Hyporheic process, Cavagnero Paolo (2010) “Dialogue between Hydraulics, History and Architecture: the restoration of historical gardens and Leonardo experiments”, Bardini Laura (2013) “Impact of hyporheic zones on nutrient dynamics”, Scibetta Marco (2013) “Novel approaches for water network management”, Rizzo Anacleto (2014) “Modelling human-made wetlands for a sustainable development”, Quaranta Emanuele (2017) “Investigation and optimization of the performance of gravity water wheel”, Adane Woldemedhin (PhD in progress) “Evaluation of Water Harvesting Technologies in SNNPR Region of Ethiopia” - African center of excellence in water management (Addis Abeba, Ethiopia), Busca Francesco (PhD in progress) “Ecosystem services quantification in urban green spaces”.

Post-Doc students: Bardini Laura – Biogeochemical processes in rivers; Boano Fulvio – Hyporheic processes; Cavagnero Paolo – Environmental impacts of small hydropower generator; Kudryavtseva Morse Nataliya – Renewable energy production (hydroelectric and marine energy) – Grant Scientific Responsible; Quaranta Emanuele – Renewable energy production from water wheels and pico-hydropower generators, Scibetta Marco – Advances in water network management; Vidali Cristina – Water wheels and renewable energy production;

Erasmus Project “Expert program of Erasmus-Mundus”, prof. Ramesh Kumar Maskey, University of Kathmandu, Nepal.

Research interests:



Fluid mechanics, water network management, ecohydraulics and renewable energy

Ecohydrology and ecosystem services

Fluid mechanics and transport processes in streams Hyporheic flow and exchange processes, biogeochemical behavior of nutrients in natural and built systems

Historic hydraulics

Peer-reviewed papers (recent)

Rosini, C., Revelli, R., (2020) A Scoring Matrix Method for Integrated Evaluation of Water-Related Ecosystem Services Provided by Urban Parks, *Environmental Management*, 66: 756–769 doi: 10.1007/s00267-020-01369-3

Quaranta, E., Revelli R., (2020) Performance Optimization of Overshot Water Wheels at High Rotational Speeds for Hydropower Applications, *Journal of Hydraulic Engineering*, 146(9): 06020011, doi: 10.1061/(ASCE)HY.1943-7900.0001793

Butera, I., Fontan, S., Poggi, D., Quaranta, E., Revelli, R. (2020) Experimental Analysis of Effect of Canal Geometry and Water Levels on Rotary Hydrostatic Pressure Machine, *Journal of Hydraulic Engineering*, 146 (3), art. no. 04019071, doi: 10.1061/(ASCE)HY.1943-7900.0001690

Franco, W., Ferraresi, C., Revelli, R. (2019) Functional analysis of piedmont (Italy) ancient water mills aimed at their recovery or reconversion, *Machines*, 7 (2), art. no. 32, doi: 10.3390/machines7020032

Quaranta E., Revelli R. (2018) Gravity water wheels as a micro hydropower energy source: A review based on historic data, design methods, efficiencies and modern optimizations, *Renewable and Sustainable Energy Reviews*, 97, 414-427, doi: 10.1016/j.rser.2018.08.033

Rizzo A., Bresciani R., Masi F., Boano F., Revelli R. and Ridolfi L. (2018) Flood reduction as an ecosystem service of constructed wetlands for combined sewer overflow, *Journal of Hydrology*, 560, 150-159, doi: 10.1016/j.jhydrol.2018.03.020

Revelli R., Porporato A. (2018) Ecohydrological model for the quantification of ecosystem services provided by urban street trees, *Urban Ecosystem*, 21(3), 489-504, doi:10.1007/s11252-018-0741-2

Boano F., Rizzo A., Samsó R., García J., Revelli R., Ridolfi L. (2018) Changes in bacteria composition and efficiency of constructed wetlands under sustained overloads: a modeling experiment, *Science of The Total Environment*, 612, 1480-1487, doi:10.1016/j.scitotenv.2017.08.265

Pelak N., Revelli R., Porporato A. (2017) A dynamical systems framework for crop models: Toward optimal fertilization and irrigation strategies under climatic variability, *Ecological Modelling*, 365, 80-92, doi:10.1016/j.ecolmodel.2017.10.003

Quaranta E., Revelli R. (2017) CFD simulations to optimize the blades design of water wheels, *Drinking Water Engineering and Science*, 10(1), 27-32, doi:10.5194/dwes-10-27-2017

Revelli R. (2017) Urban Forests, Ecosystem Services and Modeling, *Forestry Research and Engineering: International Journal*, 1(2), doi:10.15406/freij.2017.01.00009

Banzato C., Butera I., Revelli R., Vigna B. (2017) Reliability of the VESPA index in identifying spring vulnerability level, *Journal of Hydrologic Engineering*, 22(6), 04017008, doi:10.1061/(ASCE)HE.1943-5584.0001498



- Quaranta E., Katopodis C., Revelli R., Comoglio C. (2017) Turbulent flow field comparison and related suitability for fish passage of a standard and a simplified low gradient vertical slot fishway, *River Research and Applications*, 33, 1295–1305, doi:10.1002/rra.3193
- Quaranta E., Revelli R. (2016) Hydraulic behavior and performance of breastshot water wheels for different numbers of blades, *Journal of Hydraulic Engineering*, 143(1), 04016072, doi:10.1061/(ASCE)HY.1943-7900.0001229
- Vidali C., Fontan S., Quaranta E., Cavagnero P., Revelli R. (2016) Experimental and dimensional analysis of a breastshot water wheel, *Journal of Hydraulic Research*, 54(4), 473-479, doi:10.1080/00221686.2016.1147499
- Boano F., Fiore S., Revelli R. (2016) Chlorate formation in water distribution systems: A modeling study, *Journal of Hydroinformatics*, 18(1), 115-125, doi:10.2166/hydro.2015.079
- Quaranta E., Revelli R. (2016) Optimization of breastshot water wheels performance using different inflow configurations. *Renewable Energy*, 97, 243-251, doi:10.1016/j.renene.2016.05.078
- Quaranta E., Revelli R. (2015) Output power and power losses estimation for an overshot water wheel, *Renewable Energy*, 83, 979-987, doi:10.1016/j.renene.2015.05.018
- Rizzo A., Boano F., Revelli R., Ridolfi L. (2015) Groundwater impact on methane emissions from flooded paddy fields, *Advances in Water Resources*, 83, 340-350, doi:10.1016/j.advwatres.2015.07.005
- Quaranta E., Revelli R. (2015) Performance characteristics, power losses and mechanical power estimation for a breastshot water wheel, *Energy*, 87, 315-325, doi:10.1016/j.energy.2015.04.079
- 静水力学の基礎を築くまで水の重さにまつわる知的な旅:レオナルド・ダ・ヴィンチの軌跡 P. カバネ口, R. リベリ, 瀧本裕士 訳, **Parity** 2015. (Japan translation of the paper Cavagnero, P., Revelli R. (2014) The weight of water, *Physics Today*, 67 (8), 41-46, doi:10.1063/PT.3.2481)
- Boano F., Fiore S., Revelli R. (2014) Modeling the fate of disinfection by-products in water distribution systems, *Procedia Engineering*, 89(C), 255-261, doi:10.1016/j.proeng.2014.11.185
- Boano F., Harvey J.W., Marion A., Packman A.I., Revelli R., Ridolfi L., Wörman A. (2014) Hyporheic flow and transport processes: Mechanisms, models, and biogeochemical implications, *Reviews of Geophysics*, 52(4), 603-679, doi:10.1002/2012RG000417
- Cavagnero R., Revelli R., (2014) The weight of water, *Physics Today*, 67(8), 41-46, doi:10.1063/PT.3.2481
- Scibetta M., Boano F., Revelli R., Ridolfi L. (2014) Community detection as a tool for district metered areas identification, *Procedia Engineering*, 70, 1518-1523, doi:10.1016/j.proeng.2014.02.167
- Rizzo A., Langergraber G., Galvão A., Boano F., Revelli R., Ridolfi L. (2014) Modelling the response of laboratory horizontal flow constructed wetlands to unsteady organic loads with HYDRUS-CWM1, *Ecological Engineering*, 68, 209-213, doi:10.1016/j.ecoleng.2014.03.073
- Rizzo A., Boano F., Revelli R., Ridolfi L. (2014) Decreasing of methanogenic activity in paddy fields via lowering ponding water temperature: A modeling investigation, *Soil Biology and Biochemistry*, 75, 211-222, doi:10.1016/j.soilbio.2014.04.016
- Vico G., Revelli R., Porporato A. (2014) Ecohydrology of street trees: Design and irrigation requirements for sustainable water use, *Ecohydrology*, 7(2), 508-523, doi:10.1002/eco.1369

Book chapters (recent)



Marchionni V, Daly E., Revelli R. (2019) Ecohydrology of Urban Ecosystems, 533-571, In Dryland Ecohydrology, D'Odorico, P., Porporato, A., Wilkinson Runyan, C. (Eds.), Springer Nature Switzerland, doi: 10.1007/978-3-030-23269-6_20

Franco W., Ferraresi C., Revelli R. (2019) Power transmission and mechanisms of an old water mill, Mechanisms and Machine Science, 68, 29-37, doi: 10.1007/978-3-030-03320-0_4

Cavagnero P., Revelli R. (2015) Water games in the Royal Park of Racconigi. In: Maria Adriana Giusti, Paolo Cornaglia "The wakeup of the garden: from hortus to landscape, analysis, experiences and comparisons". Pacini-Fazzi Ed., Pisa, ISBN/ISSN 978-88-6550-480-2 (it)

Cavagnero P., Boano F., Camporeale C., Revelli R., Ridolfi L. (2014) The use of hydroelectric power plants in alpine environment: historical analysis of the biogeomorphological impacts. The Chisone and Stura di Demonte cases. In: Corrado F., Di Bella E., Valentina Porcellana V. "New research challenges in alpine spaces". Franco Angeli Ed., Milano. ISBN: 9788820479084 (it)

International Conferences (recent)

Rosini C., Revelli R. (2018) A systemic design application for resources management in urban green spaces. First World Forum on Urban Forests, 27-30 November, Mantova.

Butera I., Fontan S., Poggi D., Quaranta E., Revelli R., (2018) Laboratory results on the effect of channel geometry on a Rotary Hydraulic Pressure Machine. In: EGU General Assembly 2018, EGU2018-7705, April 8th-13th, Wien, Austria.

Revelli R., Porporato A., A dynamical system for the modeling of ecosystem services provided by urban green spaces (2018) In: EGU General Assembly 2018, EGU2018- 7490, April 8th-13th, Wien, Austria.

Quaranta E., Katopodis, C., Revelli R., Comoglio, C. (2018) Investigation of the hydrodynamic effects of bed slope in vertical slot fishways by 3D numerical simulations. In: 5th IAHR EUROPE CONGRESS New challenges in hydraulic research and engineering, June 12th-14th, Trento, Italy.

Pelak N., Revelli R., Porporato A. (2017) Impact of Seasonal Variability in Water, Plant and Soil Nutrient Dynamics in Agroecosystems, H21J-1610. In: 2017 AGU Fall Meeting, December 11th-15th, New Orleans, USA

Quaranta, E., Revelli R. (2016) CFD simulations to optimize the design of water wheels: study case of an existing breastshot water wheel. In: 14th International CCWI Conference, IWC, Computing and Control for the Water Industry, November 7th-9th, Amsterdam, Netherland

Revelli R., Pelak N., and Porporato A. (2016) Optimal Management of Water, Nutrient and Carbon Cycles of Green Urban Spaces, H51G-1561. In: 2016 AGU Fall Meeting, 12-16 Dec 2016, San Francisco, CA.

Quaranta, E., Fontan, S., Cavagnero, P., Revelli R. (2015) Efficiency of traditional water wheels. 36th IAHR World Congress, June 29th- July 3rd, The Hague, Netherlands.

Boano F., Fiore S., Revelli R. (2014) Modeling the fate of disinfection byproducts in water distribution systems. In: WDSA2014 Water Distribution System Analysis, July, 14th-17th, Bari, Italy

Cavagnero P., Revelli R. (2014) Laboratory analyses for the optimization of traditional breastshot waterwheels. In: Hydroenergia 2014, May 21st -23rd, Istanbul, Turkey

Quaranta E., Vidali C., Fontan S., Cavagnero P., Revelli R., (2014) Laboratory analysis of a breastshot water wheel. In: Hydro2014 International Conference and Exhibition: Building on Recent Development Progress, 13-15 October 2014, Cernobbio – Italy



National Conferences (recent)

Quaranta E., Revelli R., An improved Morin equation to estimate the performance of undershot and breastshot water wheels, IDRA2018, XXXVI Convegno Nazionale di Idraulica e Costruzioni Idrauliche, Ancona, 12-14 Settembre 2018.

Manes C., Quaranta E., Revelli R., Kemp P. and Comoglio C., On the drag coefficient of vegetation patches, IDRA2018, IDRA2018, XXXVI Convegno Nazionale di Idraulica e Costruzioni Idrauliche, Ancona, 12-14 Settembre 2018.

Quaranta E., Comoglio, C., Revelli R., Katopodis C., (2016) Numerical simulations of flow field in vertical slot fishways. In: XXXV National Congress of Hydraulic and Hydraulic Infrastructures, 749-752, September 14th-17th, Bologna, Italy

Vidali C., Quaranta E., Fontan S., Cavagnero P., Revelli R. (2014) Water wheels optimization and renewable energy production. In IDRA14 - XXXIV National Congress of Hydraulic and Hydraulic Infrastructures, September, 8th-10th, Bari, Italy (it)

Coordination of research and technology transfer groups and projects (recent)

Green-roof-lab. Part of the project “Dept. of Excellence – L.232/2016”. Funder: MIUR

Marie Sklodowska-Curie grant agreement ”ECO.G.U.S. - ECOSystem services for resilient and sustainable cities: an ecohydrological approach for Green Urban Spaces ” (#701914). Funder: European Union’s Horizon 2020 research and innovation programme.

O.R.M.E. Optimization of technical components and energy efficiency of watermills. Funders: POR-FESR 07/13.

WATSAM: Support to Arba Minch (Ethiopia) Town water utility and Municipality in the water & sanitation sector through capacity building and partnership development with Italian water organizations. Funders: ACP-EU Water Facility FED/2011/279-318.

Eco-compatible hydroelectric production of energy from waterworks: sustainability on the Piedmont Region. Funders: CIPE, Inter-Ministerial Committee for Economic Planning (CIPE), Italy.

Torino, February 15, 2021

Prof. Roberto Revelli



POLITECNICO DI TORINO

Dipartimento di Ingegneria
dell'Ambiente, del Territorio
e delle Infrastrutture