



Padova, 21 marzo 2023

Reducing inequalities with an equitable distribution of water: thanks to Andrea Rinaldo's studies today it is possible

THE "WATER NOBEL" TO ANDREA RINALDO

The winner of the Stockholm Water Prize 2023 is Italian, Professor of Hydraulic Constructions at the University of Padua

«Water for me is home: Venice, where I was born and raised. And water is family: my grandfather had a maritime construction company, my father, a brother, my father-in-law and my brother-in-law are hydraulic engineers like me, one of my sons has a PhD in Coastal Engineering. My dream was (and is) to help save Venice, the city that lives on water but risks dying on water».

This is how Andrea Rinaldo tells his passion for hydraulic studies that, since the flood of 1966, when he lived in Venice at the age of twelve, has guided his academic and research path, bringing him to the highest worldwide recognition in the sector.

«Water is an essential good for everyone – **says Prof. Andrea Rinaldo** – : as the poet W.H Auden writes "thousands have lived without love, not one without water".

My research and those of the people who have worked with me in recent years, had and have as its purpose to make the distribution of water equitable for all in the context of a general progressive reduction of social and economic inequalities and a correct ecological perception of the processes controlled by water.»

«The sustainable management of an essential asset such as water, a precious resource to be safeguarded, as it is limited, is a crucial challenge for our society – **says Daniela Mapelli, rector of the University of Padua** -. The University of Padua is therefore proud of the prestigious award given to Professor Andrea Rinaldo, whom I would like to congratulate. An award that goes to seal not only his extraordinary academic competence, but also the strong civil passion that has always seen him commit himself to a fair distribution of water, a fundamental objective to pursue the reduction of economic and social inequalities of the planet»

[Here the Stockholm International Water Institute press release:](#)

Hydrologist Andrea Rinaldo wins Stockholm Water Prize 2023
STOCKHOLM, SWEDEN (21 MARCH 2023)

The world-renowned hydrologist Andrea Rinaldo is awarded the Stockholm Water Prize 2023 for his ground-breaking research on river networks, demonstrating their significance in the spread of solutes, aquatic species, and diseases.



Andrea Rinaldo

Professor Andrea Rinaldo is a leading authority in hydrologic sciences. His pioneering research has led to new insights into the complex ways in which water shapes the Earth's surface and ecosystems, and has provided in-depth knowledge of how solutes and populations move at varying speed, both on and beneath the Earth's surface.

Professor Rinaldo's quantitative analyses provide a fundamental understanding of rivers as ecological corridors. With the development and maintenance of such corridors being largely responsible for the spread of aquatic species and their populations, this research is key for helping policies and practices improve the preservation of species. Professor Rinaldo's models for water's role in disease transmission have been applied to real-world hotspots of diseases, such as cholera and schistosomiasis in Haiti, South Sudan, and Burkina Faso, linking fundamental research to real-life application.

On being awarded the Stockholm Water Prize, Professor Rinaldo said: "I am humbled by, and proud of, following in the footsteps of previous laureates, especially those I know – or knew and miss sorely – and admire wholeheartedly. I am very grateful to the Nominating Committee, the Stockholm International Water Institute, and the Royal Swedish Academy of Sciences, for their selection and motivation."

In its citation, the Stockholm Water Prize Nominating Committee said: "Professor Rinaldo is a thought leader in hydrologic sciences whose conceptual and quantitative models have provided in-depth understanding to the fields of hydrogeomorphology and ecohydrology. In his research, he has uncovered the key connections between river networks and the spread of solutes, aquatic species, and diseases."

SIWI's Executive Director Torgny Holmgren commented: "Andrea Rinaldo has significantly advanced our understanding of the complex interactions between the hydrologic cycle, ecological processes, and landscape evolution. His models have provided us with invaluable tools to preserve and protect life through informed policies and practices."

Andrea Rinaldo is a professor of hydrology and water resources at the École Polytechnique Fédérale de Lausanne and at the University of Padova. He was born in Venezia, Italy, where, he says, the power and importance of water inevitably became a significant part of his life. During his career, Professor Rinaldo has co-authored more than 320 peer-reviewed articles for the most prestigious academic journals in hydrology, ecology, and physics, as well as interdisciplinary journals such as *Science* and *Nature*. In the 1970s, he played for Italy's national rugby team, and he is currently a member of the Board of Directors of the European Professional Club Rugby in Lausanne.

The Stockholm Water Prize is awarded by SIWI in cooperation with the Royal Swedish Academy of Sciences. The Prize will be presented to the laureate Professor Rinaldo by H.M. King Carl XVI Gustaf of Sweden, official patron of the Prize, on 23 August, during World Water Week. Founding partners of Stockholm Water Prize are Ålandsbanken, Bacardi, PDJ Foundation, WEF, and Xylem.



ANDREA RINALDO
born in Venice (IT) on September 13, 1954



Professor of Hydrology and Water Resources, and Director, Laboratory of Ecohydrology, École Polytechnique Fédérale Lausanne (CH)

EDUCATION/HONORARY DEGREES

Dott Ing BS+MS 1978 Università di Padova, (IT) (110/110 *summa cum laude*)
Ph.D. 1983 Purdue University, West Lafayette (US)
D.Sc. (*honoris causa*) 2014 Université du Québec-Laval & INRS (CA)

ACADEMIC RECORD (excerpts)

FULL PROFESSOR, Italian Academic System, (1985-)
PROFESSOR OF CIVIL & ENVIRONMENTAL ENGINEERING, Dipartimento di Ingegneria Civile e Ambientale, *Università di Padova* (IT) (1992-)
VISITING PROFESSOR & RESEARCH ASSOCIATE, Ralph M. Parsons Laboratory, Dept of Civil & Environmental Engineering, *Massachusetts Institute of Technology* (US) (1993–2001)
VISITING PROFESSOR, Dept of Civil & Environmental Engineering, *Princeton University* (US) (2004-2007)
PROFESSOR OF HYDROLOGY & WATER RESOURCES, and DIRECTOR, Laboratory of Ecohydrology (ECHO), *École Polytechnique Fédérale Lausanne* (2008-2024) (ETH Board extension, granted to 2024)
Director, Institute of Environmental Engineering, *École Polytechnique Fédérale Lausanne* (2010-2014, 2022)
Senior Adjunct Researcher, EAWAG, Dübendorf (CH) (2011-2017)
FACULTY FELLOW, Hagler Institute for Advanced Studies, Texas A&M University, 2018-2022
INAUGURAL NEIL ARMSTRONG DISTINGUISHED VISITING FELLOW, Purdue University, 2019-2022

ACADEMY MEMBERSHIP / AWARDS / MEDALS

International Prizes/Awards:

E. MUNSON AWARD, Purdue University (1982)
P. GATTO RESEARCH AWARD, Accademia Nazionale dei Lincei, Rome (1984)
HYDROLOGICAL SCIENCES AWARD (formerly Horton Award), American Geophysical Union (1999)
FELLOW, American Geophysical Union (2000)
DALTON MEDAL, European Geosciences Union (2005)
ERC ADVANCED GRANT FELLOWSHIP (2008)
BORLAND & HYDROLOGY DAYS AWARD, Colorado State University (2010)
4TH PRINCE SULTAN ABDULAZIZ INTERNATIONAL WATER PRIZE (Creativity), Riyadh (2010)
LUIGI TARTUFARI INTERNATIONAL PRIZE, Geosciences, Accademia Nazionale dei Lincei, Rome (2014)
DISTINGUISHED SCHOLAR MEDAL, Am. Soc. Agricultural Biological Engineering, New Orleans (2015)
FACULTY FELLOW, Hagler Institute for Advanced Studies, Texas A&M University, (2018-2023)
INAUGURAL NEIL ARMSTRONG DISTINGUISHED VISITING FELLOW, Purdue University, (2019-2021)
DISTINGUISHED ENGINEERING ALUMNUS AWARD, Purdue University (2021)

Academy Memberships (excerpts):

Fellow, ISTITUTO VENETO DI SCIENZE LETTERE ED ARTI, Venice (1995) (IVSLA Board, 2007-), President (2021-)
Fellow, ACCADEMIA GALILEIANA DI SCIENZE, LETTERE ED ARTI, Padova (1999)
Fellow, ACCADEMIA NAZIONALE DELLE SCIENZE (detta dei XL), Rome (2014) (XL Board, 2017-2020)
Fellow, ACCADEMIA NAZIONALE DEI LINCEI, Rome (2019)
Fellow, THE WATER ACADEMY, Oslo (1999)
International Member, ROYAL SWEDISH ACADEMY OF SCIENCES, Stockholm (2006)
International Member, US NATIONAL ACADEMY OF ENGINEERING, Washington (2006)
International Member Member, US NATIONAL ACADEMY OF SCIENCES, Washington (2012)
Foreign Associate, AMERICAN ACADEMY OF ARTS AND SCIENCES, Cambridge (2018)

SUPERVISION OF GRADUATE STUDENTS/POSTDOCTORAL FELLOWS

Andrea Rinaldo supervised and mentored more than 70 MS students, 41 Ph.D. students, and 14 postdocs. Among former doctoral students and postdocs holding Faculty positions: A Bellin (Trento); P Salandin (Padova), V Fiorotto (U Trieste), M Marani (Duke, Padova), R Rigon (Trento), P D'Odorico (UC Berkeley), A Fiori (Roma 3), A Giacometti (Cà Foscari Venice), M Pannone (Basilicata), S Fagherazzi (Boston U), L Mari (Milan Polytechnic), G Botter (Padova), A D'Alpaos (Padova), E Bertuzzo (Cà Foscari Venice), S Suweis (Padova), A Giometto (Cornell U), B. Schäfli (U Bern), L Carraro (U Zurich)

OTHER ACADEMIC RESPONSIBILITIES (excerpts)

Director, Doctoral School of *Civil & Environmental Engineering Sciences*, Università di Padova (Italy) (1999-2007); several Chair Committee Member, Italian Ministry for University and Research (MIUR) (1986-2007); EPFL Academic Promotions Committee (2009-2011); ENAC Academic Promotions Committee, EPFL (2011-, as Chairman 2011-2014). PhD Committees (besides own Institutions): Massachusetts Institute of Technology, Wageningen Agricultural University, KTH Stockholm, University of Stockholm, Princeton University, University of Sidney, ETHZ. International Scientific Committees (excerpts): *SENSE Environmental Sciences* Review Committee (NL) (2008), *CCES* Steering Board, ETHZ (CH) (2008-2020); Scientific Advisory Board, *Helmholtz-Zentrum für Umweltforschung* (UFZ), Leipzig (GE) (2011-2014); Scientific Advisory Board, Università Cà Foscari Venice (IT) (2014-); Comitato Ambiente, Accademia Nazionale dei Lincei (2012-); Steering and Advisory Committee of the *International Year of Basic Sciences for Sustainable Development*, UNESCO (2022-2023); European Academy Science Advisory Council, (2015, 2022-). Award and Medal Committees: *Gatto Award*, Accademia dei Lincei (2004-2014); *AGU Hydrological Sciences Award* (2003-2005) (Chairman, 2005); *AGU Horton Medal* (2004-2006); *EGU Dalton Medal* (2005-2007); *AGU Fellows Union Committee* (2005-2010); *Sackler Prize Committee*, US National Academy of Sciences, 2018; *Matteucci Medal Committee*, Accademia dei XL (2018-2021); *Datei Medal Committee*, as Chairman (2012-); *AGU Simpson Medal Committee* (2022). Editorial Board: *Advances in Water Resources* (1994-2004); *Water Resources Research* (2001-2013); *Proceedings of the US National Academy of Sciences* (2013-). Editor: *Advances in Water Resources* (2011-15); *PNAS* (2014-2024)

KEYNOTE (K) & NAME LECTURES (excerpts)

THE DALTON LECTURE, Wien (2005); THE KOVACS LECTURE, Paris (2006); THE MOORE LECTURE, Charlottesville (2007); THE CARL GUSTAV BERNHARD LECTURE, Royal Swedish Academy of Sciences (2007); THE BOUSSINESQ LECTURE, Amsterdam (2008); THE BORLAND LECTURE, Fort Collins (2010); THE PRINCE ABDULAZIZ WATER LECTURE, Riyadh (2010); 200TH ANNIVERSARY LECTIO MAGISTRALIS, Istituto Veneto di Scienze Lettere ed Arti, Venice (2011); THE WATER INSTITUTE DISTINGUISHED SCHOLAR LECTURE, Gainesville (2012); 418TH ANNIVERSARY LECTIO MAGISTRALIS, Accademia dei Concordi, Rovigo (2013); (K) International Conference RIVERFLOW, Lausanne (2014); AGU CHAPMAN CONFERENCE on *Catchment spatial organization and complex behavior*, Luxembourg (2014); (K) DISTINGUISHED SCHOLAR LECTURE, American Society of Biological and Agricultural Engineering, New Orleans (2015); the HONORIS CAUSA DOCTORATE LECTURE, INRS, Québec City (2014); (K) International IRTG Conference *Integrated Hydrosystem Modelling*, Tübingen (2015); (K) International Workshop on *Living systems: from interaction patterns to critical behavior*, Venice International University (2016); (K) IECID 2017 *Impact of Environmental Changes on Infectious Diseases*, ICTP Trieste (2017); HAGLER DISTINGUISHED SCHOLAR Lecture, Texas A&M University, College Station (2018); (K) IAHR General Congress, Trento (2018); NEIL ARMSTRONG DISTINGUISHED SCHOLAR Lecture, Purdue University, West Lafayette (2019); DISTINGUISHED LECTURER SERIES, University of Utrecht (2021); DISTINGUISHED LECTURES, Purdue University (2021); DISTINGUISHED LECTURE SERIES Global Institute for Water Security, Saskatchewan (2021); (K) International conference *Current issues in climate research* (Lincei, Rome, 2021); *CERN Colloquia*, Geneva (2022); (K) *Ignacio Rodríguez-Iturbe Memorial Symposium*, Texas A&M, College Station (2022); (K) *Symposium honoring Prof. Gedeon Dagan on the occasion of his 90th Birthday*, Israeli Academy of Sciences and Humanities, Jerusalem (2023).

Invited presentations also include: i) a total of ~50 Invited Talks at AGU and EGU annual Meetings (Hydrology, Geomorphology, Nonlinear Geophysics); ii) >200 invited Seminars.

ORGANISATION OF INTERNATIONAL CONFERENCES (excerpts)

Convener: Several sessions at AGU and EGU (Ecohydrology, Nonlinear dynamics, Catchment scale transport) (1992-2012) Summer Schools on *Environmental Dynamics*, Istituto Veneto di Scienze, Lettere ed Arti, Venice, Italy, among which: *Pathways to Environmental Sustainability* (2008) *Climate Forcings and Global Patterns* (2009), *Global Biogeochemical Cycles* (2012), *Discounting and evaluating environmental policies* (2014), *Climate Science* (2022). *Latsis Symposium on Ecohydrology*, EPFL (2011) (with Marc B. Parlange); Monte Verità Symposium *Thirty years of Groundwater Hydrology*, 2011; *Colloquio Linceo on Ecohydrology* (2020) (with G. Seminara). He has been co-convener of several sessions at AGU and EGU annual meetings.

RESEARCH PROJECTS (excerpts)

Several Projects funded as PI (in particular from the *European Union* and the *Swiss National Funds*), among which:

ERC Advanced Grant RINEC 22761 (2009-2014)

SNF 200021_172578/1 *Optimal control of intervention strategies for waterborne disease epidemics* (2016-2022)

SNF SINERGIA CRSII5_186422 / 1: *Linking Linking statistical physics, bioengineering, hydrology and fluid mechanics with metabolic theories of ecology across microbial ecosystems: theory and high-throughput experiments* (2019-2023)

IN THE NEWS (excerpts). See list of press releases in: <https://www.epfl.ch/labs/echo/>

A Profile of Andrea Rinaldo (Gabrielsen, P., *Proceedings of the US National Academy of Sciences*, 111(11), 3900-3902, 2014)

<https://www.pnas.org/content/111/11/3900>

Interviews and public Lectures:

<http://abouthydrology.blogspot.com/2014/05/acceptance-speech-given-by-andrea.html>

<https://www.youtube.com/watch?v=z3jIbP7uE>

SCIENTIFIC ACHIEVEMENTS

Author of four monographs and more than 300 papers in peer-reviewed scientific journals, more than 27,700 citations with *h*-index 101 and *i10*-index 249 (*h*-index 56 and *i10*-index 197 since 2018)¹. Andrea Rinaldo has authored, with Ignacio Rodriguez-Iturbe, the research monograph *Fractal River basins. Chance and Self-Organization* (published in its 2nd edition by Cambridge University Press in 2001, publication **1.** below), considered the standard reference of its field². The recently published book *River networks as ecological corridors. Species, populations, pathogens*, published by Cambridge University Press in 2020 (publication **6.** below, coauthored with M. Gatto and I. Rodriguez-Iturbe) is a coherent follow-up that capitalizes on the insight gained on nature's making of rivers as substrates for ecological interactions. The underlying research has been carried out mostly in his ECHO Lab at EPFL in the past 15 years. The book won the PROSE Award for the Environmental Science category for books appeared in 2020 by the Association of American Publishers (2021). Overall, he authored 52 papers published in general science journals (*Nature*, *Science* and *PNAS*). Among recognitions³, his election to the US National Academy of Sciences in the class of Environmental Sciences and Ecology (Section 63) is the most coveted.

Field, laboratory and theoretical work in the general field of water controls on biota is carried out at Rinaldo's *Laboratory of Ecohydrology* (known as the ECHO Lab), established in 2008 at EPFL, built around a single-recipient 5-year ERC Advanced Grant (2009). Experimental work in the wet Lab at EPFL has been ongoing for more than 10 years now, and has had a high impact on the field of water borne diseases (see e.g. publication **7.** below). Rinaldo's Lab also carried out directly a significant amount of field work in Haiti, Bangladesh, Burkina Faso, and in various catchments in Switzerland.

Andrea Rinaldo's research drew together an integrated ecohydrological framework, which blends laboratory, field, and theoretical evidence focused on hydrologic controls on biota, and has contributed substantially to our understanding of the function of river networks as ecological corridors. This function is relevant to a number of key ecological processes that control the spatial ecology of species and biodiversity in the river basin, the population dynamics and biological invasions along waterways, and the spread of waterborne disease. As examples, one counts metapopulation persistence in fluvial ecosystems, metacommunity predictions of fish diversity patterns in large river basins, geomorphic controls imposed by the fluvial landscape on elevational gradients of species' richness, zebra mussel invasions of iconic river networks, and the spread of proliferative kidney disease in salmonid fish; or of devastating chronic (schistosomiasis) or epidemic (cholera) infections in human communities. A well-known theoretical contribution by Andrea Rinaldo is that ecological processes in the fluvial landscape are so constrained by hydrology and by the matrix for ecological interactions (the directional dispersal embedded in fluvial and host/pathogen mobility networks), that predictability by spatially-explicit approaches is warranted. Accounting for these drivers required spatial descriptions that have now produced a broad range of results illustrating the predictive power of the methods and the coherent conceptual framework that produced them. Hard-gained experimental and field work supported the theoretical idea. In the process, Andrea Rinaldo was one of the founders and main contributors to establishing Ecohydrology as a new and now mainstream science. Quite possibly, his Laboratory of Ecohydrology at EPFL was the first of its kind (2008), and currently there exist several of them, worldwide.

¹ Source *Google Scholar* (<http://scholar.google.ch/citations?user=27F9Y3cAAAAJ&hl=it&oi=ao>). Statistics as of January 13, 2023.

² see http://psipw.org/index.php?option=com_content&view=article&id=389&Itemid=225&lang=en

³ A summary of AR's achievements is in P. GABRIELSEN, A profile of Andrea Rinaldo, *PNAS*, 111, 3900, 2014.

The overarching theme of Andrea Rinaldo's work is the investigation on how the physical structure of the hydrologic environments affects biodiversity, species invasions, and waterborne disease spread by embedding the relevant ecology into the core geoscience of river networks. The relation between the geosciences (the study of the form fluvial ecosystems) is explored from the perspective of ecosystems produced by fluvial processes and forms. In the case of the ecosystem services provided by the river basin, his work showed that time is ripe for retooling our decision-making basis. Andrea Rinaldo's work has changed how we understand the interface between the hydrosphere and the biosphere.

Related tools developed in his ECHO Lab also significantly contributed to COVID-19 research (see e.g. publication 8.). This happened serendipitously, owing to the expertise developed on spatially-explicit mathematical models of infectious waterborne and water-based disease spread (in particular epidemic cholera and endemic schistosomiasis, e.g. publication 6.), acquired in the study of waterborne and water-based disease studies which is central to Ecohydrology.

TEN SIGNIFICANT PUBLICATIONS

1. Rodriguez-Iturbe, I. and A. RINALDO, *Fractal River Basins. Chance and Self-Organization*, Cambridge University Press, New York, 2001 (2175 citations)
2. Banavar, J.R., A. Maritan, A. RINALDO, Size and form in efficient transportation networks, *Nature*, 399, 130-133, 1999 (911 citations)
3. RINALDO A, W.E. Dietrich, R. Rigon, G.K. Vogel, I. Rodriguez-Iturbe, Geomorphological signatures of varying climate, *Nature*, 374 (6523), 632-635, 1995 (184 citations, Nature cover)
4. RINALDO, A., I. Rodriguez-Iturbe, R. Rigon, E. Ijjasz-Vasquez, R.L. Bras, Self-organized fractal river networks, *Physical Review Letters*, 70(6), 822-825, 1993 (345 citations)
5. RINALDO, A., A. Marani, R. Rigon, Geomorphological Dispersion, *Water Resources Research*, 27(4), 513-525, 1991 (397 citations)
6. RINALDO, A., M. Gatto, I. Rodriguez-Iturbe, *River networks as ecological corridors. Species, populations, pathogens*, Cambridge University Press, New York, 2020 (PROSE Award for the Environmental Science category from the Association of American Publishers 2021)
7. Carrara, F., F. Altermatt, I. Rodriguez-Iturbe, A. RINALDO, Dendritic connectivity controls biodiversity patterns in experimental mtacommunities, *Proceedings of the US National Academy of Sciences*, 109, 5761-5766, 2012 (296 citations)
8. Gatto, M., E. Bertuzzo, L. Carraro, L. Mari, S. Miccoli, R. Casagrandi, A. RINALDO, Spread and dynamics of the COVID-19 epidemic in Italy: effects of emergency containment measures, *Proceedings of the US National Academy of Sciences*, 117(19), 10484-10491, 2020 (962 citations, WoS and Scopus Highly Cited Paper)
9. Muneepceerakul, R., E. Bertuzzo, H.J. Lynch, W.F. Fagan, A. RINALDO, I. Rodriguez-Iturbe, Neutral metacommunity model predicts fish diversity patterns in Mississippi-Missouri river basin, *Nature*, 453, 220-229, 2008 (387 citations)
10. Banavar, J.R., J. Damuth, A., Maritan, A. RINALDO, Supply-demand balance and metabolic scaling, *Proceedings of the US National Academy of Sciences*, 99, 10506-10509, 2002 (263 citations)

ANDREA RINALDO

List of publications⁴

BOOKS

RINALDO, A., M. Gatto, I. Rodriguez-Iturbe, *River networks as ecological corridors. Species, populations, pathogens*. Cambridge University Press, New York, 2020 (PROSE Award for the Environmental Science category from the Association of American Publishers 2021)

RINALDO, A., *Del rugby. Verso una ecologia della pallaovale*, Marsilio, Venice, 2017 (CONI special prize 2017)

RINALDO, A., *Il governo dell'acqua. Ambiente naturale e Ambiente costruito*, Marsilio, Venice, 2009 (Final Five, Premio internazionale Galileo per la divulgazione scientifica, 2009)

Rodriguez-Iturbe, I., A. RINALDO, *Fractal river basins. Chance and self-organization*, Cambridge University Press, New York, 1997 (2001 2nd edition, 2148 citations)

JOURNAL PAPERS

2022

[334] Levin, SA, A. RINALDO, Ignacio Rodríguez-Iturbe (1942–2022): A review of a pathbreaking academic career combining chance and self-organization, *Proceedings of the US National Academy of Sciences* 119(49), e2217606119, 2021

[333] Benettin, P, Rodriguez, N. B., Sprenger, M., Kim, M., Klaus, J., Harman, C. J., van der Velde, Y., Hrachowitz, M., Botter, G., McGuire, K. J., Kirchner, J. W., RINALDO, A., McDonnell, J.J. Transit time estimation in catchments: Recent developments and future directions. *Water Resources Research*, 58(11), 2022

[332] Cheraghi, M, A. RINALDO, Sander, G.C., P. Perona, A. Cimatoribus, J. Seifeddine, D.A. Barry, Applicability of the landscape evolution model in the absence of rills, *Frontiers in Earth Science*, 10, 872711, 2022

[331] Lemaitre, J.C, D. Pasetto, M. Zanon, E. Bertuzzo, L. Mari, S. Miccoli, R. Casagrandi, M. Gatto, A. RINALDO, Optimal control of the spatial allocation of COVID-19 vaccines: Italy as a case study, *PLoS Computational Biology*, 18(7), e1010237, 2022

[330] Bassi, R, G. Seminara, A. RINALDO, The intrusion of ecology into hydrology and morphodynamics, *Rendiconti Lincei*, 33(2), 213-216, 2022

[329] RINALDO, A, I. Rodriguez-Iturbe, Ecohydrology 2.0, *Rendiconti Lincei*, 33(2), 245-270, 2022

[328] Nehemi MF, P. Benettin, S. Allen, A. RINALDO, L.L. Lehmann, J.J. McDonnell, Phloem water isotopically different to xylem water: Potential causes and implications for ecohydrological tracing, *Ecohydrology*, 15(3), e2417, 2022

[327] Asadollahi, M, Nehemi M.F., J.J. McDonnell, A. RINALDO, P. Benettin, Toward a closure of catchment mass balance: Insight on the missing link from a vegetated lysimeter, *Water Resources Research*, 58, e202WR030698, 2022

[326] Volkov, I., A. Tovo, A. Anfodillo, A. RINALDO, A. Maritan, J. Banavar, Seeing the forest for the trees through metabolic scaling, *PNAS Nexus*, 1(1), pgac008, 2022

[325] Trevisin, C., J.C. Lemaitre, L. Mari, R. Casagrandi, S. Miccoli, M. Gatto, A. RINALDO, *Journal of the Royal Society Interface*, 19 (188), 20210844, 2022

[324] Bertassello, L.E., J.W. Jawitz, E. Bertuzzo, A. RINALDO, J.T. Hoverman, P.S.C. Rao, Persistence of amphibian metapopulation occupancy in dynamic wetlandscapes, *Landscape Ecology*, 37(3), 695-711, 2022

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[319] Mari, L., Casagrandi, R., Bertuzzo, E., Pasetto, D., Miccoli, S., RINALDO, A., & Gatto, M., The epidemicity index of recurrent SARS-CoV-2 infections. *Nature Communications*, 12(1) doi:10.1038/s41467-021-22878-7, 2021

[318] Benettin, P., M.F. Furlan, M. Asadollahi, D. Pratt, M. Bensimon, J.J. McDonnell, A. RINALDO, Tracing and closing the water balance in a vegetated lysimeter, *Water Resources Research*, 57(4), e2020WR029049, 2021

⁴ Entries taken from the *Web of Science* and *Google Scholar*. Total number of *Web of Science* entries: 332. Total number of Edited Books, Papers in Proceedings, Book Chapters and Abstracts (unreported here): ~340. Author and coauthor of four edited books (unreported here).

- [317] Nehemy, M.F., P. Benettin, M. Asadollahi, D. Pratt, A. RINALDO, J.J. McDonnell, Tree deficit and dynamic source water partitioning, *Hydrological processes*, 35(1), e144004, 2021
- [316] Meggiorin, M., G. Passadore, S. Bertoldo, A. Sottani, A. RINALDO, Assessing the long-term sustainability of the groundwater resources in the Bacchiglione basin (Veneto, Italy), *Italian Journal of Groundwater*, 10(1), 35--48, 2021
- [315] Koçillari, L., M. Olson, S. Suweis, R. P. Rocha, A. Lovison, F. Cardin, T. Dawson, A. Echeverría, A. Fajardo, S. Lechthaler, C. Martínez-Pérez, C. R. Marcati, K-F Chung, J. A. Rosell, A. Segovia-Rivas, C. B. Williams, E. Petrone-Mendoza, A. RINALDO, T. Anfodillo, J.R. Banavar, A. Maritan, The widened pipe model of plant hydraulic evolution, *Proceedings of the US National Academy of Sciences*, 118(22), e2100314118 (1—8), 2021
- [314] Mari, L., E. Bertuzzo, D. Pasetto, S. Miccoli, R. Casagrandi, A. RINALDO, M. Gatto, The epidemicity index of recurrent SARS-CoV-2 infections, *Nature Communications*, 12, 2752, 2021
- [313] Pasetto, D., J.C. Lemaître, E. Bertuzzo, M. Gatto, A. RINALDO, Range of reproduction number estimates for COVID-19 spread, *Biochemical and Biophysical Research Communications*, 538, 253-258, 2021
- [312] Serafino, M., G. Cimini, A. Maritan, A. RINALDO, G. Caldarelli, True scale-free networks hidden by finite size effects, *Proceedings of the US National Academy of Sciences*, 118(2), e2013825118, 2021
- [311] Bertassello, L., E. Bertuzzo, G. Botter, J.W. Jawitz, A.F. Aubenaud, J.T. Hoverman, A. RINALDO, P.S.C. Rao, Dynamic spatio-temporal patterns of metapopulation occupancy in patchy habitats, *Royal Society Open Science*, 8(1), 201039, 2021
- [310] Rodriguez-Iturbe, I., Z.J. Chen, A. RINALDO, On the fractal structure of soil moisture fields, *Advances in Water Resources*, 147, 103926, 2021
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