

PERSONAL INFORMATION

Camporeale, Carlo Vincenzo (orcid.org/0000-0002-7311-6018).

Date of Birth: *March 2, 1976*.

<http://www.envirofluidgroup.it/it/documenti-persone/34-carlo-camporeale/24-carlo-camporeale.html>

SHORT CV

Carlo Camporeale is a water scientist with expertise in fluid mechanics, morphodynamics, stochastic processes, pattern formation in geophysics and biological fluid mechanics. He holds a degree in Environmental Engineering and a Ph.D. in Hydraulic Engineering and he is currently Associate Professor in Fluid Mechanics and Hydraulics in the Department of Environment Land and Infrastructure Engineering of Politecnico di Torino (Italy). His scholarly activities are documented by more than one 80 publications, including **60** papers in ISI peer-reviewed international journals, and a patent. His ISI papers have received 980 citations in total (according to ISI Web of Science), 825 if one excludes self-citations. His h-index is 17 (according to Scopus) or 16 (according to ISI Web of Science).

AWARDS

- **Torricelli Prize for the best young Italian scientist in Water Engineering and Hydraulics in the period 2008-2010**. The prize was awarded by the Italian Water Engineers Association (GII), under the recommendations of an international selection committee.
- On 5 April 2017 he has obtained the Italian *National Scientific Qualification* as Full Professor in the scientific sector 08/A1 (Hydraulics, Hydrology and Hydraulic Structures)
- Recipient, in years 2008, 2009, and 2010, of the award for excellence in research granted by the Polytechnic of Turin

ACADEMIC APPOINTMENTS

Assistant Professor, 2007-2013, DIATI, Politecnico di Torino (Italy)

Associate Professor, 2014-present, DIATI, Politecnico di Torino (Italy)

FELLOWSHIPS

2013 Visiting Professor, Laboratoire d'Hydrodynamique of Ecole Polytechnique (Paris)

2009 Visiting Professor, University of Washington, Department of Applied Mathematics

2008 Laboratory activity in the Total Environment Simulator (University of Hull, UK).

TEACHING ACTIVITIES

He has been teaching at the Politecnico di Torino (student evaluations available upon request) since 2005. His teaching portfolio includes (in bold are reported the courses currently held):

- Courses in the Bachelor degree program (Hydraulics, **Fluid Mechanics**),
- Courses in the Master degree program (**Industrial Fluid Mechanics**, **River Hydraulics**, Hydropower plants) .
- Specilizing Master Program (Water in Industrial processes)
- Courses for Ph.D students (**Morphological Instabilities in alluvial, karst and glacial environments**).
- Cycle of lectures for the "Training course on management of water resources" of "HydroAid: Management of Water Resources Institute" (UNO).

In September 2017 he was invited to take a lecture (4 hours) on “Stochastic methods in Riparian vegetation modelling” for Ph.D students in a pre-conference school at the 10th Symposium of River, Coastal and Estuarine Morphodynamics

MENTORING

30 out of his 57 ISI papers have been written with one of his Ph.D. students.

- Ph.D. students co-advised with L. Ridolfi: Eliana Perucca (2005/2007), Francesco Visconti (2009/2011, **winner of GII award for the best Doctoral Thesis in Water Engineering, Italian Water Engineers Association**), Stefano Tealdi (2009/2011), Riccardo Vesipa (2010/2012), Andrea Guala (2011/2013, **Winner of Quality Award by the Doctoral school of Politecnico di Torino**, now he is post-doc at VHIR Vall d'Hebron Research Institute, Barcelona)
- Ph.D. students advised by PI: Elisa Mantelli (2013/2015, **winner of Quality Award by the Doctoral school of Politecnico di Torino, now she is post-doc at Stanford University**), Matteo Bertagni (2015-present), Giulia Cardillo (2016-present), Luca Salerno (2019-), Melissa Latella (2019-).
- Post-doctoral fellows supervised by PI: Eliana Perucca (2008); Riccardo Vesipa (2013-present), Andrea Guala (2014-2015)

INSTITUTIONAL RESPONSIBILITIES

- Faculty member of Civil and Environ. Eng. (2007-present), and Mech. Eng. (2010-present) of Politecnico di Torino.
- Member of Doctoral Committee of Civil and Environmental Engineering (2016-present).
- Member of the “**Joint Committee on Teaching / Comitato Paritetico della Didattica - CPD**” of Politecnico di Torino (2016-present).
- Invited Member of the final examination Committee for the Ph.D title, University of Trento (November, 2014).
- Invited Member of the final examination Committee for the Ph.D title, University of Genoa (May, 2018).
- Graduate Student Advisor for **28** Bachelor theses and **41** Master theses.

COMMISSIONS OF TRUST

- Reviewer for *Nature-Geo., PNAS, Sci. Rep., Geophys. Res. Lett., J. Fluid Mech., J. Geophys. Res., Geology, Water Res. Resour., ASCE J. Hydraul. Engng., Earth Sur. Proc. Land., J. Hydrol., Adv. Water Resour. and Hydrol. Sci. J.*
- Reviewer for the National Science Foundation (US).
- Member of the editorial board of AIMS Geosciences.
- Guest Editor for a Special Issue of *Adv. Water Resour.*, titled “*Ecogeomorphological feedbacks of water fluxes, sediment transport and vegetation dynamics in rivers and estuaries*” **93** (B), pp 151-336 (2016).

MAJOR INTERNATIONAL COLLABORATIONS

Peter Schmid (hydrodynamic instability) Imperial College UK; **Jean-Marc Chomaz** (fluid mechanics), Laboratoire d'Hydrodynamique of Ecole Polytechnique (Paris); **Paolo Perona** (eco-morphodynamics), University of Edinburgh UK; **Angela Gurnell** (biogeography), Queen Mary, London, UK; **Christian Schoof** (glaciology), University of British Columbia, Vancouver. **Annunziato Siviglia** (eco-morphodynamics), ETH, Zurich; **Stephen Morris** (pattern formation) University of Toronto; **Pietro Salizzoni** (pollution dispersion) Ecole Central de Lyon.

ABROAD ACTIVITIES

- In 2008 he was visiting professor in the University of Washington, Department of Applied Mathematics, in collaboration with Prof. Criminale.
- In 2010 he was involved in EU hydralab III programme with experiments at the total Environment

Simulator of the University of Hull (UK).

- He stayed at Laboratoire d'Hydrodynamique of Ecole Polytechnique (Paris) from February to August 2013 collaborating with Jean Marc Chomaz and Peter Schmid.

CONCLUDED SCIENTIFIC PROJECTS

A list of the finalized projects is reported hereinafter, wherein Carlo Camporeale has served as project coordinator and/or collaborator. The total funded amount is 503000€.

- Role of (riparian and in-stream) vegetation on the morphodynamic response of river systems (Budget: 60000 €, role PI: collaborator), funded by the Italian Ministry for University and Research. Period: 2003-2005.
- Analysis and review of previous studies dealing with the hydraulic assessment of Tanaro River, at Cittadella Bridge of Alessandria, (Budget: 20000 €, role PI: collaborator), funded by Alessandria City Council, Period 2005-2006.
- Interactions between morphodynamic and ecology in river and riparian environments" (Budget: 50000 €, role PI: collaborator), funded by the Italian Ministry for University and Research. Period: 2006-2008.
- Research on the problems related to DDT transport in rivers downstream from the industrial plants at Pieve Vergonte (Budget: 30000 €, role PI: collaborator), funded by Regione Piemonte, Period 2008-10
- Processes of interactions between river morphodynamics and riparian vegetation dynamics" (Budget: 50000 €, role PI: collaborator), funded by the Italian Ministry for University and Research. Period: 2008-2010.
- Technological innovation in the water-energy-wood production chain: pilot project in Tanaro catchment (**Budget: 213000 €, role PI: scientific responsible and coordinator**), funded by Regione Piemonte. Period: 2011-2013.
- Assessment of small hydropower production potential in North-western Italy, Funded by EU (Interreg IV), (Budget: 80000 €, role PI: collaborator), Period 2011-2013.

ON-GOING GRANTS

<i>Project Title</i>	<i>Funding source</i>	<i>Amount (Euros)</i>	<i>Period</i>	<i>Role</i>
Hemodynamic evaluation of arterial pressure from ecocardiographic imaging through a fluid dynamic approach.	Université franco-italienne (Progetto VINCI)	60000	2016-2018	Coordinator
Development and validation of a mathematical model for esteem of central blood pressure in normal subjects and in patients with proximal aorta dilatation (in collaboration with Molinette Hospital, Torino)	Italian Ministry of Health	150000	2016-2018	Coordinator of the Politecnico Research-Unit

<p>“JOINT RESEARCH PROJECTS WITH TOP UNIVERSITIES” Joint doctorate project in collaboration with ETH Zurich</p>	Compagnia di San Paolo	80000	2018-2020	Coordinator and Ph.D supervisor
<p>COST ACTION [CA16208]: Knowledge conversion for enhancing management of european riparian ecosystems and services</p>	EU	80000 (just for the first six months)	2018-2021	Management Committee Substitute

PATENTS

Carlo Camporeale is inventor of a patent, along with Ridolfi L., Guala A., Milan A. and Veglio T, titled: "NICAVE, Non-Invasive Concerted Aortic-Ventricular Evaluation" (n. [2017IT-TO01191](#)). The patent is the result of the collaboration between Polytechnic of Turin and the Faculty of Medicine of Turin.

MOST RELEVANT PUBLICATIONS

Under review

Bertagni M., **Camporeale C.** (2018) Alternate bar amplitude with suspended load. Under review on *Water Resources Research*.

Peer Reviewed Journals

2018

1. Bertagni M., Perona P., **Camporeale C.** (2018) Parametric Transitions between bare and vegetated states in water driven patterns. In PROCEEDING OF THE NATIONAL ACADEMY SCIENCE, 201721765; DOI: 10.1073/pnas.1721765115

2017

2. Bertagni M., **Camporeale C.** (2017) Nonlinear and subharmonic stability analysis in film-driven morphological patterns., In PHYSICAL REVIEW E, vol. 96 n. 5, 053115.
3. **Camporeale, C.** (2017) An asymptotic approach to the crenulation instability., In: JOURNAL OF FLUID MECHANICS, vol. 826, pp. 636-652.
4. **Camporeale, C.**; Vesipa, R.; Ridolfi, L. (2017) Convective-absolute nature of ripple instabilities on ice and icicles. In: PHYSICAL REVIEW FLUIDS, vol. 2 n. 5.
5. Vesipa, R.; **Camporeale, C.**; Ridolfi, L. (2017) Effect of river flow fluctuations on riparian vegetation dynamics: Processes and models. In: ADVANCES IN WATER RESOURCES, vol. 110, pp. 29-50.
6. Vesipa, R.; **Camporeale, C.**; Ridolfi, L. (2017) Effect of sampling time in the laboratory investigation of braided rivers. In: WATER RESOURCES RESEARCH, vol 53.
7. Guala A; **Camporeale C**; Ridolfi L; Mesin L (2017) Non-invasive aortic systolic pressure and pulse wave velocity estimation in a primary care setting: An in silico study. In: MEDICAL ENGINEERING & PHYSICS, vol. 42, pp. 91-98.

2016

8. Tosello, F.; Guala, A.; Leone, D.; **Camporeale, C.**; Bruno, G.; Ridolfi, L.; Veglio, F.; Milan, A. (2016) Central pressure appraisal: Clinical validation of a subject-specific mathematical model. In: PLOS ONE vol. 11 n. 3, e0151523
9. D'Alpaos, Andrea; Toffolon, Marco; **Camporeale, C.** (2016) Ecogeomorphological feedbacks of water fluxes, sediment transport and vegetation dynamics in rivers and estuaries. In: ADVANCES IN WATER RESOURCES, vol. 93, pp. 151-155.
10. Scarsoglio, S.; **Camporeale, C.**; G., Andrea; Ridolfi, L. (2016) Fluid dynamics of heart valves during atrial fibrillation: a lumped parameter-based approach. In: COMPUTER METHODS IN BIOMECHANICS AND BIOMEDICAL ENGINEERING, vol. 19 n. 10, pp. 1060-1068.
11. Vesipa, R.; **Camporeale, C.**; Ridolfi, L. (2016) Recovery times of riparian vegetation. In: WATER RESOURCES RESEARCH, vol. 52
12. Caruso, Alice; Vesipa, Riccardo; **Camporeale, C.**; Ridolfi, Luca; Schmid, Peter J. (2016) River bedform inception by flow unsteadiness: A modal and nonmodal analysis. In: PHYSICAL REVIEW. E vol. 93 n. 5.

2015

13. Guala, A.; **Camporeale, C.**; Ridolfi, L. (2015) Compensatory Effect between Aortic Stiffening and Remodelling during Ageing. In: PLOS ONE, vol. 10 n. 10, e0139211
14. **Camporeale, C.** (2015) Hydrodynamically locked morphogenesis in karst and ice flutings. In: JOURNAL OF FLUID MECHANICS, vol. 778, pp. 89-119.
15. Guala A.; **Camporeale C.**; Tosello F.; Canuto C.; Ridolfi L. (2015) Modelling and Subject-Specific Validation of the Heart-Arterial Tree System. In: ANNALS OF BIOMEDICAL ENGINEERING, vol. 43 n. 1, pp. 222-237.
16. Vesipa, R.; **Camporeale, C.**; Ridolfi, L. (2015) Noise-driven cooperative dynamics between vegetation and topography in riparian zones. In: GEOPHYSICAL RESEARCH LETTERS, vol. 42.
17. Carlo Camporeale; Peter J. Schmid (2015) Parametric resonance in unsteady watertable flow. In: JOURNAL OF FLUID MECHANICS, vol. 768, pp. 524-548.
18. Anselmino M; Scarsoglio S; **Camporeale C**; Saglietto A; Gaita F; Ridolfi L (2015) Rate Control Management of Atrial Fibrillation: May a Mathematical Model Suggest an Ideal Heart Rate? In: PLOS ONE vol. 10 n. 3
19. Mantelli, E.; **Camporeale, C.**; Ridolfi, L. (2015) Supraglacial channel inception: Modeling and processes. In: WATER RESOURCES RESEARCH
20. Vesipa, R.; Ridolfi, L.; **Camporeale, C.** (2015) Thin-film-induced morphological instabilities over calcite surfaces. In: PROCEEDINGS - ROYAL SOCIETY. MATHEMATICAL, PHYSICAL AND ENGINEERING SCIENCES, vol. 471, p. 20150031.

2014

21. P. Perona; B. Crouzy; S. Mclelland; P. Molnar; **C. Camporeale** (2014) Ecomorphodynamics of rivers with converging boundaries, vol. 39, pp. 1651-1662.
22. Stefania Scarsoglio; Andrea Guala; **Carlo Camporeale**; Luca Ridolfi (2014) Impact of atrial fibrillation on the cardiovascular system through a lumped-parameter approach. In: MEDICAL & BIOLOGICAL ENGINEERING & COMPUTING vol. 52 n. 11, pp. 905-920.
23. Riccardo Vesipa; **Carlo Camporeale**; Luca Ridolfi; Jean Marc Chomaz (2014) On the convective-absolute nature of river bedform instabilities. In: PHYSICS OF FLUIDS, vol. 26 n. 12, 124104-. - ISSN 1070-6631

2013

24. Stefano Tealdi; **Carlo Camporeale**; Luca Ridolfi (2013) Inter-species competition-facilitation in stochastic riparian vegetation dynamics. In: JOURNAL OF THEORETICAL BIOLOGY, vol. 318, pp. 13-21.
25. **Camporeale, C**; Mantelli, E; Manes, C. (2013) Interplay among unstable modes in films over permeable walls. In: JOURNAL OF FLUID MECHANICS, vol. 719, pp. 527-550.
26. **C. Camporeale**; E. Perucca; L. Ridolfi; A.M. Gurnell (2013) Modeling the interactions between river morphodynamics and riparian vegetation. In: REVIEWS OF GEOPHYSICS, vol. 51 n. 3, pp. 379-414.

2012

27. Visconti F.; Stefanon L.; **Camporeale C.**; Susin F.; Ridolfi L.; Lanzoni S. (2012) Bed evolution measurement with flowing water in morphodynamics experiments. In: EARTH SURFACE PROCESSES AND LANDFORMS, vol. 37 n. 8, pp. 818-827.
28. Perona P.; Molnar P.; Crouzy B.; Perucca E.; Jiang Z.; McLelland S.; Wüthrich D.; Edmaier K.; Francis R.; **Camporeale C.**; Gurnell A. (2012) Biomass selection by floods and related timescales: Part 1. Experimental observations. In: ADVANCES IN WATER RESOURCES, vol. 39, pp. 85-96.
29. **Camporeale C.**; Ridolfi L. (2012) Hydrodynamic-Driven Stability Analysis of Morphological Patterns on Stalactites and Implications for Cave Paleoflow Reconstructions. In: PHYSICAL REVIEW LETTERS vol. 108 n. 23, 238501-1
30. **Camporeale C.**; Ridolfi L.; (2012) Ice ripple formation at large Reynolds numbers. In: JOURNAL OF FLUID MECHANICS, vol. 694, pp. 225-251.
31. R. Vesipa; **C. Camporeale**; L. Ridolfi (2012) Transient growths of stable modes in riverbed dynamics. In: EUROPHYSICS LETTERS, vol. 100 n. 6, 64002.
32. Guala, Andrea; **Camporeale, Carlo**; Ridolfi, Luca (2012) A lumped hydrodynamic model to assess ageing and hypertension effects on the aortic stiffness. In: EUROPEAN JOURNAL OF MECHANICS. B, FLUIDS , vol. 35, pp. 111-116.
33. Vesipa R.; **Camporeale C.**; Ridolfi L. (2012) A shallow-water theory of river bedforms in supercritical conditions. In: PHYSICS OF FLUIDS vol. 24 n. 9, 094104-1-094104-15.
34. **Camporeale C.**; Canuto C.; Ridolfi L. (2012) A spectral approach for the stability analysis of turbulent open-channel flows over granular beds. In: THEORETICAL AND COMPUTATIONAL FLUID DYNAMICS, vol. 26 n. 1, pp. 51-80.

2011

35. Tealdi S.; **Camporeale C.**; Ridolfi L. (2011) Long-term morphological river response to hydrological changes. In: ADVANCES IN WATER RESOURCES, vol. 34 n. 12, pp. 1643-1655.
36. **Camporeale C.**; Ridolfi L. (2011) Modal versus nonmodal linear stability analysis of river dunes. vol. 23 n. 10, 104102-.
37. Tealdi S.; **Camporeale C.**; Ridolfi L. (2011) Modeling the impact of river damming on riparian vegetation. In: JOURNAL OF HYDROLOGY vol. 396 n. 3, pp. 302-312.
38. Ridolfi L.; **Camporeale C.**; D'Odorico P.; Laio F. (2011) Transient growth induces unexpected deterministic spatial patterns in the Turing process. In: EUROPHYSICS LETTERS, vol. 95 n. 1.

2010

39. **Camporeale C.**; Ridolfi L (2010) Interplay among river meandering, discharge stochasticity and riparian vegetation. In: JOURNAL OF HYDROLOGY, vol. 382, pp. 138-144.
40. Tealdi S.; **Camporeale C.**; Perucca E; Ridolfi L (2010) Longitudinal dispersion in vegetated rivers with stochastic flows. In: ADVANCES IN WATER RESOURCES, vol. 33, pp. 562-571.

41. Visconti F; **Camporeale C.**; Ridolfi L. (2010) Role of discharge variability on pseudomeandering channel morphodynamics: Results from laboratory experiments., vol. 115 n. F04042, F04042.
42. Boano F.; **Camporeale C.**; Revelli R. (2010) A linear model for the coupled surface-subsurface flow in a meandering stream. In: WATER RESOURCES RESEARCH, vol. 46.

2009

43. Perucca E; **Camporeale C.**; Ridolfi L (2009) Estimation of the dispersion coefficient in rivers with riparian vegetation. In: ADVANCES IN WATER RESOURCES, vol. 32, pp. 78-87.
44. **Camporeale C.**; Gatti F; Ridolfi L (2009) Flow non-normality-induced transient growth in superposed Newtonian and non-Newtonian fluid layers. In: PHYSICAL REVIEW E, STATISTICAL, NONLINEAR, AND SOFT MATTER PHYSICS, vol. 80, 036312.
45. Perona P; **Camporeale C.**; Perucca E; Savina M; Molnar P; Burlando P; Ridolfi L (2009) Modelling river and riparian vegetation interactions and related importance for sustainable ecosystem management. In: AQUATIC SCIENCES, pp. 266-278.
46. **Camporeale C.**; Ridolfi L. (2009) Nonnormality and transient behavior of the de Saint-Venant-Exner equations. In: WATER RESOURCES RESEARCH vol. 45, pp. 1-12.

2008

47. Revelli R; Boano F; **Camporeale C.**; Ridolfi L. (2008) Intra-meander hyporheic flow in alluvial rivers. In: WATER RESOURCES RESEARCH, vol. 44, W1242.
48. **Camporeale C.**; Perucca E; Ridolfi L. (2008) Significance of cutoff in meandering river dynamics. In: JOURNAL OF GEOPHYSICAL RESEARCH, vol. 113, F01001.

2007

49. **Camporeale C.**; Perona P; Porporato A; Ridolfi L (2007) Hierarchy of models for meandering rivers and related morphodynamic processes. In: REVIEWS OF GEOPHYSICS, vol. 45 n. RG1001.
50. **Camporeale C.**; Ridolfi L. (2007) Noise-induced phenomena in riparian vegetation dynamics. In: GEOPHYSICAL RESEARCH LETTERS vol. 34, L18406-1-L18406-4.
51. **Camporeale C.**; Ridolfi L. (2007) Reply to comment by S. Nadarajah on "Riparian vegetation distribution induced by river flow variability: A stochastic approach". In: WATER RESOURCES RESEARCH, vol. 43(6), W06602-1-W06602-1.
52. Perucca E.; **Camporeale C.**; Ridolfi L (2007) Significance of the riparian vegetation dynamics on meandering river morphodynamics. In: WATER RESOURCES RESEARCH, vol. 43, W03430.

2006

53. **Camporeale C.**; Ridolfi L (2006) Convective nature of planimetric instability in meandering river dynamics. In: PHYSICAL REVIEW E, STATISTICAL, NONLINEAR, AND SOFT MATTER PHYSICS, vol. 73, 026311-026311-8.
54. Perucca E; **Camporeale C.**; Ridolfi L (2006) Influence of river meandering dynamics on riparian vegetation pattern formation. In: JOURNAL OF GEOPHYSICAL RESEARCH , vol. 111, G01001-.
55. **Camporeale C.**; Ridolfi L (2006) Riparian vegetation distribution induced by river flow variability: A stochastic approach. In: WATER RESOURCES RESEARCH, vol. 42 n. W10415, pp. 1-13.
56. Boano F; **Camporeale C.**; Revelli R; Ridolfi L. (2006) Sinuosity-driven hyporheic exchange in meandering rivers. In: GEOPHYSICAL RESEARCH LETTERS, vol. 33, pp. 1-4.

2005

57. Perucca E; **Camporeale C.**; Ridolfi L (2005) Nonlinear analysis of the geometry of meandering rivers. In: GEOPHYSICAL RESEARCH LETTERS vol. 32, L03402-0.

58. **Camporeale C.**; Perona P.; Porporato A.; Ridolfi L. (2005) On the long term behavior of meandering rivers. In: WATER RESOURCES RESEARCH vol. 41, pp. 1-13.

Book Chapters

1. Cavagnero P.; Boano F.; Camporeale C.; Revelli R.; Ridolfi L. (2014) *Lo sfruttamento idroelettrico in ambiente alpino: analisi storica degli impatti biogeomorfologici lungo l'asta dei torrenti Chisone e Stura di Demonte*. In: Nuove frontiere della ricerca per i territori alpini. FRANCO ANGELI, Milano, p. 1.
2. Boano F; Camporeale C; Revelli R; Ridolfi L. (2007) *Patterns of vertical exchange flux between a meandering river and the hyporheic zone*. In: Transport in phenomena hydraulics / Pawel M. Rovinski. Institute of Geophysics, Polish Academy of Science, WARSAW, pp. 31-39.
3. Camporeale C; Perona P; Ridolfi L. (2006) *Hydrological and geomorphological significance of riparian vegetation in arid regions*. In: Dryland Ecohydrology / D'ODORICO P; PORPORATO A. Springer, DORDRECHT, pp. 161-180.