

Curriculum vitae

Michele Larcher

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I. PROFESSIONAL POSITION:

2025-ongoing: Full Professor in the scientific sector CEAR-01/A (Hydraulics) at the Free University of Bozen-Bolzano, Faculty of Agricultural, Environmental and Food Sciences.

2024-2025: Associate Professor in the scientific sector CEAR-01/A (Hydraulics) at the Free University of Bozen-Bolzano, Faculty of Agricultural, Environmental and Food Sciences.

2023-2024: Associate Professor in the scientific sector ICAR/01 (Hydraulics) at the Free University of Bozen-Bolzano, Faculty of Engineering.

2016-2023: Associate Professor in the scientific sector ICAR/01 (Hydraulics) at the Free University of Bozen-Bolzano, Faculty of Science and Technology.

2005-2016: Assistant Professor (“ricercatore confermato”) in the scientific sector ICAR/01 (Hydraulics) at the University of Trento, Department of Civil, Environmental and Mechanical Engineering.

2003-2005: Post-doc at CUDAM (University center for the defense of mountain areas), University of Trento, and self-employed Professional Engineer.

II. EDUCATION:

Ph.D. in Hydraulic Engineering, University of Padova, Italy (2003).

Master in Environmental Engineering, 110/110 summa cum laude, print dignity and honor mention for the career, University of Trento, Italy (1998).

III. HABILITATIONS:

National Scientific Habilitation (Abilitazione Scientifica Nazionale 2016-2018, I quadrimestre) as full professor in the scientific area 08/A1 (Hydraulics, Hydrology, Hydraulic and maritime constructions).

National Scientific Habilitation (Abilitazione Scientifica Nazionale 2012) as associate professor in the scientific area 08/A1 (Hydraulics, Hydrology, Hydraulic and maritime constructions).

Habilitation for the exercise of the engineering profession (1999).

IV. LANGUAGES:

Italian: first language

German: second language, fluent (level C1: Bilingualism certificate A of the Autonomous Province of Bolzano-Bozen)

English: foreign language, fluent (level C1 *IELTS* certificate: listening 7.0, reading 8.5, writing 7.0, speaking 7.0, overall band score 7.5)

V. VISITING APPOINTMENTS:

July-August 2016, Visiting Associate Professor, Department of Civil and Environmental Engineering, Cornell University, NY, USA.

March 2016, Visiting Scientist, Max Planck Institute for the Physics of Complex Systems (MPIPKS), Dresden, Germany.

October-November 2013, Visiting Scientist, Kavli Institute for Theoretical Physics, University of California at Santa Barbara, CA, USA.

July 2012 – January 2013: Visiting Scientist, Department of Civil and Environmental Engineering, Cornell University, NY, USA.

June - September 2007: Visiting Scientist, Department of Theoretical and Applied Mechanics, Cornell University, NY, USA.

June 2005: Visiting Scientist, National Taiwan University (Taipei) and National Chung-Hsing University (Taichung), Taiwan.

February - March 2001: Visiting Scientist, Public Works Research Institute, Tsukuba, Japan.

VI. INVITED SEMINARS AND LECTURES:

Impacts of extreme events on mountain stream ecosystems in a changing climate – Conference Ecosystem restoration and ecosystem functions recovery under climate change, Bolzano, 15 December 2025, invited speaker.

Hydraulic hazards in small mountain river basins – PhD Autumn School in Security, Risk and Vulnerability: Insights from the RETURN project, Sestri Levante, 22-26 September 2025, invited seminar.

New approaches for the assessment of hydraulic hazard in small mountain basins – Conference Meteorological Extreme Events – Forecasting, Impact, Case studies, Bolzano, 16-17 December 2024, invited speaker.

Debris flows, Lahars and Huacicos: modelling erosive flash floods – International conference on Discrete Simulation and Continuum Modeling of Granular Matter, Fasano, Italy, 21–26 May 2023, invited speaker.

Ponti in piccoli bacini con elevato trasporto di sedimenti – 43rd Italian Conference on Integrated River Basin Management, Arcavacata di Rende (CS), 25-26 November 2022, invited speaker.

Double-segregation in dense, inclined, dry granular flows, Symposium SegSed - Size Segregation in Sediment Transport Double-segregation in dense, inclined, dry granular flows, IRSTEA, Grenoble, 13 May 2019, invited speaker.

Segregation in dense, inclined, layered granular flows, IUTAM (International Union of Theoretical & Applied Mechanics) Symposium on the Dynamics of Complex Fluids and Interfaces, Indian Institute of Technology Kanpur, India, 17– 20 December, 2018, invited speaker.

A simple lecture on complex fluids: implications for engineering and everyday life, Taiwan-Italy Symposium, National Chung Hsing University, Taichung (Taiwan), 29 October – 2 November 2018, invited speaker.

Granular segregation in dense, layered, inclined flows of spheres, EGU General Assembly 2018, session GM1.5/HS11.17/NH1.22/SSP3.18 - The importance of granular processes and segregation in geophysical flows: implications for landscape evolution and hazard analysis, Vienna (Austria), 8-13 April 2018, invited speaker.

Schlitzsperrren zur hydrodynamischen Kontrolle der Sedimente, Fachtagung “Stand der Technik im Naturgefahren-Ingenieurwesen”, University of Natural Resources and Life Sciences (Boku), Vienna (Austria), 21-23 February 2018, invited speaker.

Tecniche di ingegneria idraulica per la protezione idrogeologica del territorio alpino, VI° Edizione dell’Incontro delle Commissioni di Ingegneria Geotecnica, Ingegneria Geotecnica: Monitoraggio, Pendii, Dighe, Bolzano, 30 November 2017, invited speaker.

La modellazione fisica e matematica come strumento progettuale per la difesa idrogeologica del territorio, Italia Sicura, Progettare l’Assetto Idrogeologico, Bolzano – NOI Techpark, 23 Novembre 2017, invited speaker.

Alpine experts @unibz, Alpine expert days, NOI-Techpark 13-14 novembre 2018, invited speaker.

52° Corso di Cultura in Ecologia - Debris flows in a changing environment: processes, controls, consequences, University of Padova, San Vito di Cadore, Italy, 6-8 June 2016, invited speaker.

Max Planck Institute for the Physics of Complex Systems (MPIPKS), Dresden, Germany, March 2016, invited speaker.

Alpine Convention, 2nd International Conference on Integrative Sciences and sustainable development of rivers, Lumière Lyon 2 University, France, 22 June 2015, invited presenter.

Kavli Institute for Theoretical Physics, University of California at Santa Barbara, CA, USA, October 2013, invited speaker.

Teaching professor of “Granular flows”, Doctoral Course Grasmach, Université catholique de Louvain, Belgium, 2011, invited lecturer.

University of Rennes I, France, January 2009, invited speaker.

Cornell University, Department of Theoretical and Applied Mechanics, Ithaca (NY), USA, June 2007, invited speaker.

International Conference on Hillslope Stabilization and Environmental Restoration, Taipei, Taiwan, June 2005, invited general lecture.

Isaac Newton Institute for Mathematical Sciences, Cambridge (UK) October 2003, invited speaker.

Public Works Research Institute, Tsukuba, Japan, February 2001, invited speaker.

VII. ACADEMIC TEACHING AT THE FREE UNIVERSITY OF BOZEN-BOLZANO:

Idrologia e Idraulica, 9 CFU, SSD AGR/08, Bachelor in Agricultural, Food and Mountain Environmental Sciences (L-25), Free University of Bozen-Bolzano, A.Y. 2023/24 - ongoing. Teaching language: Italian.

Natural risks in mountain areas: processes and mitigation strategies, 3 CFU, SSD AGR/08, Master in Environmental Management of Mountain Areas (LM-73), Free University of Bozen-Bolzano, A.Y. 2023/24 - ongoing. Teaching language: English.

Fluidmechanik, 6 CFU, SSD ICAR/01, Bachelor in Industrial and Mechanical Engineering (L-9), Free University of Bozen-Bolzano, A.Y. 2013/14 – ongoing. Teaching language: German.

Physik I, 9 CFU, SSD FIS/01, Bachelor in Industrial and Mechanical Engineering (L-9), Free University of Bozen-Bolzano, A.Y. 2020/21, 2021/22, 2022/23. Teaching language: German.

Physics I, 9 CFU, SSD FIS/01, Bachelor in Industrial and Mechanical Engineering (L-9), Free University of Bozen-Bolzano, A.Y. 2023/24. Teaching language: English.

Fundamentals of Physics, 6 CFU, SSD FIS/03, Bachelor in Agricultural, Food and Mountain Environmental Sciences (L-25), Free University of Bozen-Bolzano, A.Y. 2023/24. Teaching language: English.

Applications of fluid mechanics to energy engineering, 6 CFU, SSD ICAR/01, Master in Energy Engineering (LM-30), Free University of Bozen-Bolzano, A.Y. 2016/17 – 2021/22. Teaching language: English.

Advanced applications of fluid mechanics, 3 CFU, SSD ICAR/01, PhD Programme in Sustainable Energy and Technologies, Free University of Bozen-Bolzano, A.Y. 2019/20 – ongoing. Teaching language: English.

Valutazione del rischio idro-geologico, SSD ICAR/01, II level Master HyRMA on Sustainable management of hydro-geological risk in mountain environments, Free University of Bozen-Bolzano, A.Y. 2018/19 - ongoing. Teaching language: Italian.

Realizzazione e manutenzione delle opere di difesa, SSD ICAR/02, II level Master HyRMA on Sustainable management of hydro-geological risk in mountain environments, Free University of Bozen-Bolzano, A.Y. 2018/19 - ongoing. Teaching language: Italian.

Progettazione degli interventi strutturali di mitigazione, SSD ICAR/02, II level Master HyRMA on Sustainable management of hydro-geological risk in mountain environments, Free University of Bozen-Bolzano, A.Y. 2018/19 - ongoing. Teaching language: Italian.

Aspetti e valutazioni socioeconomiche del rischio idro-geologico, SSD AGR/08, II level Master HyRMA on Sustainable management of hydro-geological risk in mountain environments, Free University of Bozen-Bolzano, A.Y. 2022/23 - ongoing. Teaching language: Italian.

VIII. INNOVATIVE ACADEMIC TEACHING:

Responsible for unibz of the ERC/MSCA Project *POSEIDON (imProve Offshore infraStructure rEsilience agaInst geohazarDs tOWards a chaNging climate)*, aimed at developing an international training program for PhD students and young researchers and offering interdisciplinary knowledge and skills across multiple functional and operational scales of the offshore critical infrastructures, promoting the mobility of PhD students between multiple research institutions. Unibz is involved as an associated partner and participates in the research activities taking benefit of competences on granular flows and non-Newtonian fluids rheology, combing theoretical and experimental approaches, for example, via advanced imaging for the three-dimensional analysis of granular flows. The goal is translating the theoretical knowledge of hydraulics and granular flows to the design, operation and environmental compatibility of offshore infrastructures, protecting them from extreme natural events. The involved institutions within the network are Universiteit Twente (NL), Christian Albrechts Universität Kiel (DE), Universität Bremen (DE), Institut Francais de Recherche pour l'Exploitation de la Mer (FR), Stiftelsen NorgesGeoteksnike Institutt (NO), Cathie Associates SA (UK), OPTUM Computational Engineering (DK), United Kingdom Research and Innovation (UK), DNV AS, State of the Art Engineering BV (NL), Université de Bretagne Occidentale (FR), OSLOMET Storby Universitetet (NO), The University of Warwick (UK), The University of Liverpool (UK), Norges Teknisk-Naturvitenskapelige Universitet NTNU (NO). Project cost center: EG1B05 EJCPI2023. Project duration: 01-03-2024 – 29-02-2028. <https://poseidon-dn.eu/team/>.

Responsible for unibz of the international H2020-MSCA-COFUND doctoral program *CLEAR-Doc* (H2020-EU.1.3. - EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Grant Agreement N°101034248) in cooperation with Université Gustave Eiffel (FR). The program allows the supervision of the PhD student Santiago Caro Alba in cotutele between unibz (PhD in Sustainable Energy and Technologies) and the Université Gustave Eiffel and the cofounding of his scholarship. Project duration: 2022-2025.

Responsibile for unibz of the *EUREGIO Mobility Fund 2023* for the project EJCPI2023 – Euregio Joint Computational Physics Initiative funded by the Euroregion Trentino - South Tyrol – Tyrol. The project is relevant to an innovative, international academic teaching initiative involving the interaction of professors, researchers and students of the Department of Physics of the University of Trento, of the Institut für Theoretische Physik of the University of Innsbruck and of the Faculty of Engineering of unibz within the Master in Energy Engineering and the PhD program in Sustainable Energy and Technologies. A joint workshop was organized in Trento on 14-15 March 2024. A.Y. 2023/2024. Project cost center: EG1B05 EJCPI2023. Project duration: 01-10-2023 - 25-09-2024.

Responsibile for unibz of the *EUREGIO Mobility Fund 2019* for the project EJCPI2020 – Euregio Joint Computational Physics Initiative funded by the Euroregion Trentino - South Tyrol – Tyrol. The project is relevant to an innovative, international academic teaching initiative involving the interaction of professors, researchers and students of the Department of Physics of the University of Trento, of the Institut für Theoretische Physik of the University of Innsbruck and of the Faculty of Science and Technology of unibz

within the Master in Energy Engineering. Also two workshops were planned, in order to allow students sharing the results of their projects and experiences, but they were cancelled due to the Covid-19 pandemic. Project cost center: TN1B15. Project duration: 01.10.2019 - 30.06.2021

Responsibile for unibz of the *EUREGIO Mobility Fund 2018* for the project EJCPI – Euregio Joint Computational Physics Initiative funded by the Euroregion Trentino - South Tyrol – Tyrol. The project is relevant to an innovative academic teaching initiative involving the interaction of professors, researchers and students of the Department of Physics of the University of Trento, of the Institut für Theoretische Physik of the University of Innsbruck and of the Faculty of Science and Technology of unibz within the Master in Energy Engineering, A.Y. 2018/2019.

UNITEDBZ: Member of the *comitato di indirizzo* for the project *Unitedbz (Integrazione di rifugiati e richiedenti asilo nella vita universitaria)*, in representation of the Faculty of Science and Technology of unibz, 2017 – 2023.

IX. ACADEMIC TEACHING AT THE UNIVERSITY OF TRENTO:

Teaching Professor of *Elements of hydraulics and hydraulic constructions*, Bachelor in Environmental Engineering and Bachelor in Civil Engineering, A.Y. 2013/14 - 2015/16.

Teaching Professor of the module of *Hydraulics* (equivalent to half course) within the course *Hydraulic constructions with notions of hydraulics*, University of Trento, Master course in Architecture and Building Engineering, A.Y. 2014/15.

Teaching Professor of *Design and management of irrigation plants*, Interfaculty Bachelor in Viticulture and Enology (University of Trento, University of Udine and Edmund Mach Foundation), A.Y. 2013/14 – 2014/15.

Teaching Professor of *Irrigation plants*, Bachelor in Industrial and Food Engineering, A.Y. 2007/08 to 2012/13.

Teaching Professor of the *Granular Flows* module within the “Fluid mechanics” Doctoral Course in Environmental Engineering, A.Y. 2010/11.

Teaching Professor of *Water/soil interaction and irrigation techniques*, Interfaculty Master Course (Padova-Udine-Verona) in Viticulture, Enology and Wine Markets, A.Y. 2006/07 to 2009/10.

Teaching Assistant of *Fluvial engineering*, Master Course in Environmental Engineering, A.Y. 2010/11 - 2015/16.

Teaching Assistant of *Fluvial engineering and river restoration*, Master Course in Environmental Engineering, A.Y. 2005/06 to 2009/10.

Teaching Assistant of *Project of fluvial engineering*, Master Course in Environmental Engineering, A.Y. 2005/06 to 2009/10.

Teaching Assistant of *River restoration*, Master Course in Environmental Engineering, A.Y. 2000/01 to 2004/05.

X. SCIENTIFIC ACTIVITY:

The scientific activity of Michele Larcher is focused on themes relevant to hydraulics and fluid mechanics. He is involved in the study of granular flows and non-Newtonian fluid rheology, with applications to environmental (e.g. geophysical flows) and industrial engineering (e.g. modern foods, solid fuel conversion systems). His studies are theoretical and experimental, and he also developed original and widely references imaging methods for the three-dimensional experimental analysis of granular flows, suitable for tracking the trajectories of the individual grains and reconstructing the velocity, velocity fluctuations (granular temperature) and concentration fields.

He studied sediment transport, debris flows, mudflows and snow avalanches dynamics, both from the point of view of base research and of applied research, such as the development of design criteria and patents for

check dams in steep torrents. He participated to many support programs to territorial survey agencies, among the others finalized to hazard mitigation in the Campania Region (Italy) and in the state of Vargas (Venezuela) after the tremendous debris flow disasters that affected Sarno in 1998 and Vargas in 1999, and was requested in 2014 to develop a planning and design procedure for integral risk mitigation systems in the Province of Bolzano, Italy. Presently he is mainly involved in the study of extreme meteorological events in the context of climate change, with the objective of developing hydraulic hazard mitigation strategies in mountain areas. As a recognition of his reputation in this field, he was appointed as national coordinator of the project RETURN-PB (New approaches for the evaluation of hydraulic hazard in small river catchments, bando a cascata PNRR), involving 14 Italian research institutions in developing a set of guidelines for the hydrogeological protection and risk mitigation in mountain regions. He is also, since 2022, national coordinator of the working group promoted by the Italian Group of Hydraulics (GII) dealing with the effects of debris flows on the hydraulic compatibility of bridges.

XII. PATENTS AND TECHNOLOGICAL TRANSFER:

Bianchini, P., Larcher, M. (2019). National patent presented at the Ufficio Italiano Brevetti e Marchi: “Struttura di ritenuta dei sedimenti in corsi d'acqua”. Patent number: 102019000016637.

Bianchini, P., Larcher, (2020) International patent presented at the World Intellectual Property Organisation (WIPO): “Sediment retention structure in rivers”. Patent number: [PCT/IB2020/058701](https://patentscope.wipo.int/search/en/patent.jspx?ref=no&db=wipo&no=1).

Bianchini, P., Larcher, M. (2021) International patent presented at the World Intellectual Property Organisation (WIPO): “Sediment retention structure in water courses”. 25.03.2021, patent number: WO2021053592A1.

Bianchini, P., Larcher, M. (2022) International patent presented at the World Intellectual Property Organisation (WIPO): “Sediment retention structure in rivers”. Australia, 07.04.2022, patent number: AU2020350206A1.

Bianchini, P., Larcher, M. (2022) International patent presented at the World Intellectual Property Organisation (WIPO): “Sediment retention structure in waterway”. China, 29.04.2022, patent number: CN114423903A.

Bianchini, P., Larcher, M. (2022) International patent presented at the World Intellectual Property Organisation (WIPO): “Estrutura de retenção de sedimentos em cursos de água” (Sediment retention structure in water courses). Brasil, 24.05.2022, patent number: BR112022003658A2.

Bianchini, P., Larcher, M. (2022) International patent presented at the World Intellectual Property Organisation (WIPO): “Sediment retention structure in water courses”. Europe, 27.07.2022, patent number: EP4031715A1.

Bianchini, P., Larcher, M. (2022) International patent presented at the World Intellectual Property Organisation (WIPO): “Sediment retention structure in water courses”. USA, 27.10.2022, patent number: US2022341113A1.

Bianchini, P., Larcher, M. (2022) International patent presented at the World Intellectual Property Organisation (WIPO): “水路における流送土砂堰き止め構造” (Sediment retention structure in rivers). Japan, 29.11.2022, patent number: JP2022549779A.

Scientific responsible for the elaboration of a set of procedures for integrated planning systems for the mitigation of flood risk in the Autonomous Province of Bolzano, 2014.

XIII. PARTICIPATION IN EXHIBITIONS

Gallery *Environmental Risks and Civil Defence* at the Museum of Natural Sciences (MUSE) in Trento: exhibit on granular snow avalanches and exhibit on hydraulic hazard and river restoration, 2013-ongoing. <https://www.muse.it/en/home/explore-the-museum/museums-exhibition/2nd-floor/environmental-risks-and-civil-defence/>

XIV. EDITORIAL ACTIVITIES AND CONFERENCES ORGANIZATION:

Member of the Organizing Committee on the international congress *Discrete Simulation and Continuum Modeling of Granular Matter 2026*, Fasano (Italy), 16 - 22 May 2026.

Member of the Organizing Committee on the international congress *Discrete Simulation and Continuum Modeling of Granular Matter 2025*, Fasano (Italy), 3 - 9 May 2025.

Member of the Organizing Committee on the international congress *Salamina Grain Works 2024*, Fasano (Italy), 5 - 11 May 2024. The Conference was sponsored by unibz.

Member of the Organizing Committee on the international congress *Discrete Simulation and Continuum Modeling of Granular Matter*, Fasano (Italy), 21 – 26 May 2023. The Conference was sponsored by unibz.

Member of the Organizing Committee on the international congress *Discrete and Continuum Modeling of Natural Systems*, Fasano (Italy), 20 May – 3 June 2022.

Member of the Local Organizing Committee of the 5th *European IAHR Congress*, Trento, Italy, 12-14 June 2018.

Member of the Scientific Secretariat of the XXIX Italian Conference of Hydraulics and Hydraulic Constructions, Trento, 7-10 September 2004.

Guest editor of the special issue *Granular Flows Modeling and Simulation* on the journal *Water-Switzerland* (Q1 quartile), 2022.

XV. PARTICIPATION IN SCIENTIFIC COMMITTEES:

Member of the *Research and Innovation Advisory Board (Consulta per la Ricerca e Innovazione)* of the Autonomous Province of Bolzano-Bozen. Article 5 of the provincial law 14/06 on 'Research and Innovation' establishes that the role of the Advisory Board is to develop proposals for guidelines and priorities to support science and innovation, which are used for drafting the Provincial Multi-Year Plan for Scientific Research and Innovation. The Advisory Board also provides opinions on the Provincial Multi-Year Plan for Scientific Research and Innovation and may present proposals to strengthen the South Tyrolean system within the framework of international research and technology collaborations. Additionally, the Advisory Board may propose initiatives or programs to promote research and innovation activities within the Province. In charge in the period 2014-2019.

Member of the *Technical Committee* (Comitato tecnico previsto dalla Legge provinciale 14/06 della Provincia di Bolzano) of the Autonomous Province of Bolzano-Bozen. Article 7 of the above-mentioned law on 'Research and Innovation' establishes that the Technical Committee is appointed by the Provincial Councillor and remains in office for the duration of the legislative term. The Technical Committee provides opinions on projects submitted in accordance with the above-mentioned law and, upon request of the competent division, also on specific activity programs, initiatives, and special projects, having a strategic role in the scientific development of the Autonomous Province of Bolzano. In charge in the period 2014-2019 and 2019 – 2024.

Substitute Member of the *Technical Committee* (Comitato tecnico previsto dalla Legge provinciale 14/06 della Provincia di Bolzano) of the Autonomous Province of Bolzano-Bozen. Article 7 of the above-mentioned law on 'Research and Innovation' establishes that the Technical Committee is appointed by the Provincial Councillor and remains in office for the duration of the legislative term. The Technical Committee provides opinions on projects submitted in accordance with the above-mentioned law and, upon request of the competent division, also on specific activity programs, initiatives, and special projects, having a strategic role in the scientific development of the Autonomous Province of Bolzano. In charge in the period 2024 – 2028.

Responsible of the *national research group on small river basins* within the project RETURN-PB (New approaches for the evaluation of hydraulic hazard in small river catchments, bando a cascata PNRR), involving 14 Italian research institutions in developing a set of guidelines for the hydrogeological protection and risk mitigation in mountain regions. The institutions coordinated by the Free University of Bozen are

Università degli Studi di Milano, Università degli Studi di Brescia, Università della Calabria, Università degli Studi di Salerno, Università degli Studi di Perugia, CNR-IRPI Perugia, Università della Basilicata, Università degli Studi di Pavia, Università degli Studi di Campania L. Vanvitelli, Istituto Superiore per la Protezione e la Ricerca Ambientale (ISPRA), Università degli Studi di Napoli Parthenope, Università degli Studi di Messina, Università degli Studi di Trento. 2024 – ongoing.

Responsible of the *national research group on the [hydraulic compatibility of bridges](#)* affected by debris flows, promoted by the Italian Group of Hydraulics (GII). The institutions coordinated by the Free University of Bozen are Università degli Studi di Messina, Università degli Studi di Trento, Politecnico di Milano, Politecnico di Torino, Università degli Studi di Padova, Università di Palermo, Università degli Studi di Napoli Federico II. 2022 – ongoing.

XVI. INSTITUTIONAL SERVICE AT THE FREE UNIVERSITY OF BOZEN-BOLZANO:

CRUI (Conference of Italian University Rectors) Representative for PhD Programmes, 2026 –present.

Coordinator, PhD programme *Sustainable Energy and Technologies (SET)*, 2023 – present.

President, Joint Studies Committee (Commissione didattica paritetica), Faculty of Science and Technology, 2016 – 2023.

Member, Faculty Council, Faculty of Agricultural, Environmental and Food Sciences, 2024 – present.

Member, Faculty Council, Faculty of Engineering, 2023 – 2024.

Member, Faculty Council, Faculty of Science and Technology, 2016 – 2023.

Member, Research Board, Faculty of Engineering, 2023 – present.

Member, Teaching Board, Faculty of Engineering, 2023 – present.

Member, PhD programme Committee in *Sustainable Energy and Technologies (SET)*, 2016 –present.

Member, Study Council of the Second Level Master HYRMA (Gestione sostenibile del Rischio idrogeologico in Ambienti montani), 2022 – present.

Member, Council of the Master in *Energy Engineering*, 2016 – present.

Member, Council of the Bachelor in *Industrial and Mechanical Engineering*, 2016 – present.

Member, Advisory Board of the *Unitedbz* initiative (Integration of refugees and asylum seekers into university life as extracurricular students), representing the Faculty of Science and Technology, 2017 – 2023.

Supervisor of RTDs and ARs and of Bachelor, Master and PhD students.

XVII. INSTITUTIONAL SERVICE AT THE UNIVERSITY OF TRENTO:

Delegate for the *Students orientation* by the School of Civil and Environmental Engineering, 2005-2016.

Aggregate member of the *Commission for the habilitation to the engineering profession* in 2006, 2008, 2009, 2010, 2011, 2013.

Teaching professor and co-organizer of the *Summer school on granular flows and sediment transport*, Trento, 24-31 July 2013.

Teaching professor and co-organizer of the *Summer school on environmental granular flows*, Trento, 28 July-1 August 2014.

Teaching professor and co-organizer of the Winter school *Mechanics of sediment transport: theory and models*, Trento, 25-29 January 2016.

Member of the *Committee for Industrial and Food Engineering*, 2010-2012.

Member of the Committee of the Doctoral School in Civil, Environmental and Mechanical Engineering , 2013-2016.

Member of the Committee of the Doctoral School in Environmental Engineering, 2006-2013.

Member of the Didactic Council *of the School of Civil Engineering*, 2013-2016.

Member of the Didactic Council *of the School of Environmental Engineering*, 2005-2016.

Supervisor of Bachelor, Master and PhD students.

XVIII. PROJECTS:

SEDILAB – Innovative Sediment Monitoring in the Laboratory and Alpine Streams. Principal Investigator. EFRE-FESR (ERDF 2021-2027), 2026-28, 276 113 €.

MEASURE – validation of the hydrological time series of the gauging Station on the Funes River. Principal Investigator. Research contract of the Civil Protection Agency of the Autonomous Province of Bozen-Bolzano, 2025-26, 6800 €.

BUILDERS – Fluid Dynamics Laboratory for Applied Research - Infrastructure for Sustainability, Hydrogeological Hazard, and Two-phase Flows. Co-investigator. EFRE-FESR, 2025-27, 776 752 €.

NEXTWATER_ST – A Nexus perspective for adapting water management in South Tyrol to future changes. Participant. Grant of the Autonomous Province of Bozen-Bolzano, 2025-27, 157 000 €.

AMID – Analysis of mitigation from clogging by sediments and logs during the extreme events of the collection of the Chievo Verona dam. Participant. Cariverona Foundation, 2024-26, 80 000 €.

RETURN-PB – New approaches for the evaluation of hydraulic hazard in small river catchments. National coordinator of the “bando a cascata” of the PNRR project RETURN (Multi-Risk science for resilient communities under a changing climate), 2023-25, 600 000 €.

POSEIDON – improve Offshore infrastructure resilience against geohazards towards a changing climate. Principal Investigator. ERC/MSCA application, call HORIZON-MSCA-DN-2022, 2023 – 2028.

Qsed Funes – Rehabilitation of the hydrometric station of San Pietro on the Rio Funes, Principal Investigator. Agency for Civil Protection of the Autonomous Province of Bolzano, 2023, 36750 €.

TANDEM – Hybrid Transient-machine learning approach for ANomaly DETECTION and classification in water transmission Mains. Co-investigator. PRIN2022, 2023-25, 87 686 €.

FluEMMA – An interdisciplinary approach to study sediment Flushing operations from alpine reservoirs. Participant. PRIN2022, 2023-25, 69 000 €.

ENCLOSURE – Research agreement for the Estimation, Calculation and modeling of solid transport outside the Range of application of the most known Experimental formulas. Participant. Autorità di Bacino Distrettuale delle Alpi Orientali, 2023-24, 32 500 €.

EXTREME – EXTREME Events in Mountain Environments, Principal investigator. Bando RC 2022 della Libera Università di Bolzano, 2022, 120000 €, 36 months.

OnFoods – Research and Innovation Network on Food and Nutrition Sustainability, Safety and Security, Partenariato Esteso PNRR, Participant, 2022, 1 660 913 €.

iNEST – Interconnected Nord-Est Innovation Ecosystem, Partenariato Esteso PNRR, Participant, 2022, 3 833 988 €.

Innichen – Realization of two physical models in the laboratory (Innichen PM1), Co-investigator. Committente: Abteilung 26: Brand- und Zivilschutz (Autonome Provinz Bozen Südtirol), 88078 €, 16 months, 2021-2022.

SETTLES – Sediment management at hydropower plants. Participant. Internal fund unibz, 2021-24, 70 000 €.

DIADEM – Data driven anomaly detection for sustainable water and energy smart grids management. Participant. Internal fund unibz, 2021-25, 179 416 €.

RAZOR – Mitigation of the hydraulic hazard and ecological restoration in the stretch of the Adige between Bronzolo and Ora. Participant. Ufficio Sistemazione Bacini Montani Sud of the Autonomous Province of Bozen-Bolzano, 2021-22, 8200 €.

SILL-PM2 – Experimentation on a physical laboratory model to experimentally verify the hydraulic behavior of the current state of the Sill check dam. Participant. Agency for Civil Protection of the Autonomous Province of Bozen-Bolzano, 2021, 32750 €.

SILL-PM3 – Experimentation on a physical laboratory model to experimentally verify the hydraulic behavior of the current state of the Sill check dam - ADDENDUM. Participant. Agency for Civil Protection of the Autonomous Province of Bozen-Bolzano, 2021, 16350 €.

GRASEG – Size and density segregation in granular flows, Principal investigator. CRC funds of the Free University of Bozen-Bolzano, 2020, 100000 €, 36 months.

GPP4Build – Green Public Procurement for buildings, Participant. INTERREG I-A 2014-2020, 2019-22, 85800 €, 24 months.

TESES-URB – Techno-economic methodologies to investigate sustainable energy scenarios at urban level. Participant. Internal fund unibz, 2019-23, 182 500 €.

DFII – Debris Flow 2, Principal investigator. Maccaferri innovation Center, 2018-22, 28200 €.

RIM-FluB – Refractive Index Matching analysis of FLUIDized Bed reactors. Principal investigator. Internal funds of the Free University of Bozen-Bolzano, 2018-21, 50000 €.

THE_DYSCO – THERmo-fluid DYnamics of Solid fuels Conversion systems: Optimization strategies. Principal investigator. Internal funds of the Free University of Bozen-Bolzano, 2017-21, 100000 €.

ACE – Advanced Computations and Experiments for anisotropic particle transport in turbulent flows. Co-investigator. PRIN 2017, 2019-23, 110000 €.

MOIEREF – Methods for optimization and integration given energy prices and renewable resources forecasts. Participant. Internal funds of the Free University of Bozen-Bolzano, 2017, 182000 €, 36 months.

OPTIMUM_hydro – OPTIMUM dynamic optimization of programmable hydropower plants – hydrology. Participant. 3rd Call for Innovation of the Autonomous Province of Bozen-Bolzano, 2017, 24 months.

TURB HYDRO – Hydro Turbines optimization for a sustainable production. Participant. EFRE-FESR, 2018-22, 567 096 €.

LTFD – Thermo Fluid Dynamics, infrastructures for applied research to business and industry in South Tyrol. Participant. First EFRE-FESR Call 2015, 849600 €, 36 months.

AI_ALPEN_laives – Agreement on cooperation for research activities relating to the analysis, the characterization of the performance and optimization of drinking water water supply systems. Participant. Research frame agreement, Autonomous Province of Bozen/Bolzano, 36 months.

WATERWORKS 2014 COFUNDED CALL: responsible of WP4 (*Defence structures against sediments*), STEEP STREAMS – Solid Transport Evaluation and Efficiency in Prevention: Sustainable Techniques of Rational Engineering in Advanced MethodS, European Community, 2016. 449364€, 24 months.

CLIMAWARE – *Granular flow extremes: floods, sediment transport, debris flows and snow avalanches*. Responsible of WP3. University of Trento, 2015. 200000 € (50000 € for WP3), 18 months.

E-LEARNING – Development of the e-learning module *The restoration of Alpine torrents*. Principal investigator. Università della Calabria, 2014. 20130 €, 12 months.

SEDALP – Elaboration of a set of procedures for integrated planning systems for the mitigation of flood risk. Responsible. Autonomous Province of Bolzano/Bozen, 2014. 85000€.

MUSE: – Principal responsible, Design of the exhibits for the gallery “Environmental Risks and Civil Protection” for the Museum of Natural Sciences - MUSE (project reference CIG XB505C705B), Museo delle Scienze di Trento, 2013. 60000€, 12 months.

PARAMOUNT: Principal responsible, Rheological characterization of snow avalanches (Alpine Space; Project reference: 2-2-2-AT - subcontractor), Autonomous Province of Trento, 2012. 100000€, 7 months.

GNFM 2008: Responsible of the Research Unit of Trento, Young Researchers Project 2008: “Theoretical, numerical and experimental modelling of debris flows”, National Group for Mathematical Physics, 2008. 10000€.

Short Term Mobility 2007: principal responsible, CNR, 2007. 20000€.

PRIN 2005: Participant to the research program, Rheology of granular and pyroclastic flows: physical and numerical modelling (prot. 2005047032_004), MIUR, 2005. 100000€, 24 months.

IRASMOS: Participant to the research program, Integral Risk Management of Extremely Rapid Mass Movements (FP6; Project Reference: 018412), European Community, 2005. 319650€, European Community, 33 months.

IMPACT, Participant to the research program, Investigation of Extreme Flood Processes and Uncertainty (Project Reference: EVG1-CT-2001-00037), European Community, 2001. 67470€, 36 months.

THARMIT, Participant to the research program, Torrent Hazard Control in the European Alps: Practical tools and methodologies for hazard assessment and risk mitigation (FP5; Project Reference: EVG1-CT-1999-00012), European Community, 2000.

XIX. LIST OF SELECTED PUBLICATIONS:

Peer-reviewed international journals:

Tajmoussavilangerudi, A., Viretto, C., Anzelini, N., Stringari, A., Prati, A., Larcher, M., Gobbetti, M., Di Cagno, R., Ali Zein Alabiden Tlais (2025). “Unlocking microbial interactions: Multi-Plant-based-substrate fermentation with water kefir starters for functional beverage innovation”, *Current Research in Food Science*, 11, 101194. <https://doi.org/10.1016/j.crfs.2025.101194>

Menapace, A., Dhawan, P., Dalla Torre, D., Kaffas, K., Crespi, A., Larcher, M., Righetti, M., Cannon, A.J. (2025). “Review of bias correction methods for climate model outputs in hydrology”, *Journal of Hydrology*, 660, 133213. <https://doi.org/10.1016/j.jhydrol.2025.133213>

Menapace, A., Ferreira Rodrigues, A., Dalla Torre, D., Larcher, M., Herrera, M., Brentan, B. (2025) “Sensors prioritisation for hydrological forecasting based on interpretable machine learning”. *Journal of Hydrology*, 663, 134015. <https://doi.org/10.1016/j.jhydrol.2025.134015>

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- Prati, A., Larcher, M., Jenkins J. T., La Ragione L. (2024). “Particle motion in a bed under a rigid plate, submerged and oscillated over its surface, and bed morphologies induced by flexible plates”. *J. Fluid Mech.* 993, A16. <https://doi.org/10.1017/jfm.2024.705>
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- Jenkins, J.T., Larcher, M. (2023). “Granular Segregation in Gravity-Driven, Dense, Steady, Fluid-Particle Flows over Erodible Beds and Rigid, Bumpy Bases”. *Water* 15(14), 2629. <https://doi.org/10.3390/w15142629>
- Mendes, S.V., Aleixo, R., Larcher, M., Amaral, S., Ferreira, R.M.L. (2023). “Dataset of velocities of dry granular flows in a partially obstructed tilted chute”. *Data in Brief* 51, 109676. <https://doi.org/10.1016/j.dib.2023.109676>
- Wankhade, R., Pernigotto, G., Larcher, M. (2023). “A Literature Review on Methods and Metrics for the Analysis of Outdoor Air Displacement Conditions in the Urban Environment”. *Energies* 16(6), 2577. <https://doi.org/10.3390/en16062577>
- Dhawan, P., Dalla Torre, D., Zanfei, A., Menapace, A., Larcher, M., Righetti, M. (2023). Assessment of ERA5-Land Data in Medium-Term Drinking Water Demand Modelling with Deep Learning. *Water*, 15(8), 1495. <https://doi.org/10.3390/w15081495>
- Artoni, R., Richard, P., Larcher, M., Jenkins, J.T. (2022). “Self-diffusion in inhomogeneous granular shearing flows”, *Physical Review E* 106(3), L03290. <https://doi.org/10.1103/PhysRevE.106.L032901>
- Neveu, A., Larcher, M., Delannay, R., Jenkins, J.T., Valance, A. (2022). “Particle segregation in inclined high-speed granular flows”. *Journal of Fluid Mechanics* 935, A41. <https://doi.org/10.1017/jfm.2022.51>
- Artoni, R., Larcher, M., Jenkins, J.T., Richard, P. (2021). “Self-diffusion scalings in dense granular flows”. *Soft Matter*, 17(9), 2596-2602. <https://doi.org/10.1039/d0sm01846e>
- Köhler, A., Guio-Pérez, D.C., Prati, A., Larcher, M., Pallares, D. (2021) “Rheological effects of a gas fluidized bed emulsion on falling and rising spheres”. *Powder Technology* 393, 510-518. <https://doi.org/10.1016/j.powtec.2021.07.064>
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- Spinewine, B., Capart, H., Larcher, M., Zech, Y. (2003). "Three-dimensional Voronoï imaging methods for the measurement of near-wall particulate flows". *Experiments in Fluids*, 34, 227-241. <https://doi.org/10.1007/s00348-002-0550-4>
- Busnelli, M. M., Stelling, G., Larcher, M. (2002). Closure to "Numerical morphological modeling of open-check dams" by Marcela M. Busnelli, Guus S. Stelling, and Michele Larcher, *Journal of Hydraulic Engineering*, ASCE, 128 (9), 873-873. [https://doi.org/10.1061/\(ASCE\)0733-9429\(2002\)128:9\(873\)](https://doi.org/10.1061/(ASCE)0733-9429(2002)128:9(873))
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Armanini, A., Larcher, M. (2001). “Rational criterion for designing opening of slit check dam”, *Journal of Hydraulic Engineering*, ASCE, 127(2), 94-104. [https://doi.org/10.1061/\(ASCE\)0733-9429\(2001\)127:2\(94\)](https://doi.org/10.1061/(ASCE)0733-9429(2001)127:2(94))

Articles in professional journals:

Larcher, M., Aronica, G.T., Ballio, F., Claps, P., Comiti, F., Di Cristo, C., Lanzoni, S., Longoni, L., Menapace, A., Papini, M., Prati, A., Rosatti, G., Termini, D., Vacca, A., Zugliani, D., 2024. Bridges in small basins with intense sediment transport and debris flow, *Procedia Structural Integrity* 62, 633-639 <https://doi.org/10.1016/j.prostr.2024.09.088>

Larcher, M., Armanini, A. (2018). Schlitzsperrren zur hydrodynamischen Kontrolle del Sedimente. Wildbach- und Lawinenverbau: Zeitschrift für Wildbach-, Lawinen-, Erosions- und Steinschlagschutz 181, 27. https://www.wlv-austria.at/images/download/Heft_181_Sperrenbau%20-%20Sperrentypen%20-%20Sperrenfunktionen_06_2018.pdf

Parts of book:

Armanini, A., Fraccarollo, L., Larcher, M. (2005). “Debris Flow”. *Encyclopedia of Hydrological Sciences*, M. G. Anderson Editor. John Wiley & Sons, Chapter 142, Vol. 4(12), 2173-2186 (invited paper).

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International Conferences:

Prati A., Menapace A., Larcher M. (2024). Preliminary Statistical Analysis of a Large Hydraulic and Hydrological Dataset for Mudflows and Debris Flows Events in The South Tyrol Region (Italy). 15th International Conference on Hydroinformatics (HIC), Beijing (China), 26-30 May 2024, p. 394. <https://doi.org/10.3850/iahr-hic2483430201-394>

Prati A., Larcher M., Jenkins J.T., La Ragione, L. (2023). Particles bed morphology under oscillating stiff and flexible plates. 40th IAHR World Congress, Vienna (Austria) 26-31 August 2023.

Kostner, M.K., Zanfei, A., Menapace, A., Alberizzi, J.C., Renzi, M., Larcher, M., Righetti, M. (2023). *Digitisation for Sustainable Water Supply Systems: The Case of Optimal Pressure Management*. Lecture Notes in Networks and Systems, 2023, 745 LNNS, 579–589. https://doi.org/10.1007/978-3-031-38274-1_48

Menapace, A., Dalla Torre, D., Zanfei, A., Dhawan, P., Larcher, M., Righetti, M. (2022). Assessment of the Short-Term Streamflow Forecasting Using Machine Learning Fed by Deutscher Wetterdienst ICON Climate Forecasting Model. Proceedings of the IAHR World Congress, 2022, 4915–4921.

Wankhade, R., Pernigotto, G., Larcher, M. (2022). Preliminary CFD Parametric Simulations of Low- and Medium-Density Urban Layouts. Building Simulation Applications, 2022-June, 377–385. https://pro.unibz.it/library/bupress/publications/fulltext/9788860461919_47.pdf

Mendes, S., Farias, R., Aleixo, R., Larcher, M., Viseu, T., Ferreira, R. (2022) *Experimental characterization of dry granular flows through sudden constrictions*. River Flow 2022, Kingston and Ottawa (Canada), 8-10 November 2022. <https://doi.org/10.1201/9781003323037-34>

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- Larcher, M., Jenkins, J.T. (2009). “The Influence of Size Segregation in Particle-Fluid Flows”. *AIP Proceedings*, vol. 1145, p. 1055-1058.
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