

# CV Riccardo Mereu

Nationality: Italian

[riccardo.mereu@polimi.it](mailto:riccardo.mereu@polimi.it)

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## PROFESSIONAL AND ACADEMIC POSITIONS

- March 2018 – Present     **Assistant Professor**  
Department of Energy - Politecnico di Milano (Italy)  
Main Activities: Experimental and Numerical Modeling (LPM, CFD) for single and multiphase phenomena (turbulence, heat transfer, condensation) for low-carbon energy plant and industrial applications. Course: “Innovative Technologies for Energy” (5 CFU) – Bachelor Degree in Energy Engineering
- Jan 2012 – Jan 2018     **Research Associate – Adjunct Professor**  
Department of Energy - Politecnico di Milano (Italy)  
Courses at Bachelor Degree in Energy Engineering – Politecnico di Milano:  
- 2012-2017: “Fundamentals of Energy Sciences” (5 CFU)  
- 2017-present: “Innovative Technologies for Energy” (5 CFU)
- May – Aug 2014     **Visiting Researcher – EU-EASED Fellow**  
Laboratory of Advanced Nuclear Energy - Tokyo Institute of Technology (Japan)
- Sep 2010 – Dec 2011     **Post-Doc**  
Department of Nuclear Science and Engineering – MIT (USA)
- May – Sep 2009     **Visiting Researcher**  
Laboratory of Advanced Nuclear Energy - Tokyo Institute of Technology (Japan)
- Jan 2009 – Aug 2010     **Research Associate**  
Department of Energy - Politecnico di Milano (Italy)

## EDUCATION

- April 2009     **Doctoral Degree in Energy Engineering**  
Politecnico di Milano
- April 2005     **Master of Science in Mechanical Engineering** - score 110/110  
University of Cagliari

## RESEARCH ACTIVITIES

The research activities of last years, in collaboration with different research groups such as CFDLab@Energy of Politecnico di Milano, Prof. Minoru Takahashi Lab of TITech, Prof. Jacopo Buongiorno Lab of MIT, Prof. Hisashi Ninokata Lab of TITech have focused on some of the fundamental aspects of fluid dynamics and heat transfer. The main goal has been to improve the capability of computational fluid dynamics (CFD) to reproduce and model intrinsically complex phenomena such as **turbulence, natural and forced convective heat transfer** and **multiphase transport** developing, validating and applying physics-based models for CFD to energy industry components and processes. These activities were carried out through the use of **experimental techniques** and numerical modelling tools (**Lumped Parameter Models** and **CFD approach**).

## EDUCATIONAL ACTIVITIES

### Academic Teaching (Politecnico di Milano)

- Sep 2017 – present      **Teacher**  
Course: Innovative Technologies for Energy, 5 CFU, SSD: ING-IND/10  
Undergraduate course in Energy Engineering, Politecnico di Milano  
Delivering ex-cathedra lessons and hands-on exercises on energy resources and forecast, design and sizing of technologies based on renewable resources, environmental and economic aspects of renewable and fossil fuel resources
- Sep 2017 – present      **Teaching Assistant**  
Course: CFD for Energy Engineering, 8 CFU, SSD: ING-IND/10  
Graduate course in Energy Engineering, Politecnico di Milano  
Lecturer: Prof. Fabio Inzoli  
Delivering ex-cathedra lessons - Student support and hands-on exercises
- Sep 2012 – Sep 2017      **Teacher**  
Course: Fundamentals of Energy Sciences, 5 CFU, SSD: ING-IND/10  
Undergraduate course in Energy Engineering, Politecnico di Milano  
Delivering ex-cathedra lessons and hands-on exercises on energy resources and forecast, technological, environmental and economic aspects of renewable and fossil fuel resources
- Mar 2010 – Sep 2010      **Teaching Assistant**  
Course: Fundamentals of Energy Sciences, 5 CFU, SSD: ING-IND/10  
Undergraduate course in Energy Engineering, Politecnico di Milano  
Lecturer: Prof. Emanuela Colombo  
Delivering ex-cathedra lessons - Student support and hands-on exercises
- Sep 2008 – May 2009      **Teaching Assistant**  
Course: CFD for Energy Engineering, 10 CFU, SSD: ING-IND/10  
PhD course in Energy Engineering, Politecnico di Milano  
Lecturer: Prof. Fabio Inzoli  
Delivering ex-cathedra lessons - Student support and hands-on exercises
- Sep 2006 – Sep 2010      **Teaching Assistant**  
Course: Computational Fluid Dynamics, 8 CFU, SSD: ING-IND/10  
Graduate course in Energy Engineering, Politecnico di Milano  
Lecturer: Prof. Emanuela Colombo – Prof. Fabio Inzoli  
Delivering ex-cathedra lessons - Student support and hands-on exercises
- Mar 2006 – Sep 2007      **Teaching Assistant**  
Course: Thermodynamics and Heat Transfer, 8 CFU, SSD: ING-IND/10  
Undergraduate course in Energy / Environmental Engineering, Politecnico di Milano  
Lecturer: Prof. Emanuela Colombo – Prof. Fabio Inzoli  
Delivering ex-cathedra lessons - Student support and hands-on exercises

### Lecturer and Course Evaluation

Academic Year	Course Title	# Students Registered	# Survey Responses	Evaluation	Instructor Evaluation	Course Evaluation	Scale
2017-18	Innovative Technologies for Energy	47	Still in progress	Still in progress	Still in progress	Still in progress	4
2016-17	Fundamentals of Energy Sciences	24	22	High	3.50	3.45	4
2015-16	Fundamentals of Energy Sciences	16	15	High	3.79	3.20	4
2014-15	Fundamentals of Energy Sciences	28	28	High	3.28	3.29	4
2013-14	Fundamentals of Energy Sciences	36	33	Average	3.17	3.00	4
2012-13	Fundamentals of Energy Sciences	54	Not provided	Not provided	Not provided	Not provided	4

### Other Educational Contributions

Nov 2015

**Teacher**

Course: Decision Support System (DSS) tool and guidelines for energy access in refugees' camps, 10h

Intensive Course for EU project Set4Food, University of Cartagena (Colombia)  
Delivering ex-cathedra lessons and hands-on exercises

July 2015

**Teacher**

Course: Energy: the global scenario and its role for a sustainable development, 36h  
Undergraduate Summer School in Engineering, University UniAndes (Colombia)  
Delivering ex-cathedra lessons and hands-on exercises

March 2015

**Teacher**

Course: An Introduction to CFD and Open-Source: OpenFOAM code, 30h  
Intensive Course for EU project ENERGISE in Engineering, Jimma University (Ethiopia)  
Delivering ex-cathedra lessons and hands-on exercises

July 2009 – July 2014

**Teacher**

Course: Appropriate technologies for development projects in energy field, 20h  
Undergraduate Summer School in Engineering, University UniAndes (Colombia)  
Delivering ex-cathedra lessons

Oct 2012

**Teacher**

Lecture: Technology trends: Solar Photovoltaic, thermal and thermodynamics, 10h  
Course: Training Course on Options and best practices for renewable energy technologies for productive uses in the Mediterranean region, UNIDO (Tunisia)

Delivering ex-cathedra lessons and hands-on exercises

Oct 2011 **Co-teacher**  
 E-learning course: Solar Thermal Technology, 20h  
 ICS-UNIDO web platform registered members, ICS-UNIDO – Politecnico di Milano  
 Co-responsible for course contents and digital support material

### BSc – MSc – PhD Theses Supervisor/Reader

	Total	Defended	In Progress
Bachelor's	14	11	3
Master's	20	16	4
As Supervisor	9	6	3
As Reader	11	10	1
PhD	2	2	

### PhD Theses

Apr 2015 – Dec 2016 **External Supervisor (Visiting PhD)**  
 Candidate: Radu Secareanu  
 Thesis: "Water Leak Sealing of Damaged Reactors by Liquid Metal"  
 PhD Candidate in Nuclear Engineering at University Politehnica Bucharest (Romania)  
 Academic Supervisor Prof. Dr. Ing. Ilie Prisecaru

Jan 2016 – Dec 2016 **External Supervisor (Visiting PhD)**  
 Candidate: David Bravo  
 Thesis: "Precision Background Stability and Response Calibration in Borexino: Prospects for Wideband, Precision Solar Neutrino Spectroscopy and BSM Neutrino Oscillometry Through a Deeper Detector Understanding"  
 PhD Candidate in Physics at Virginia Tech University (USA)  
 Academic Supervisor Prof. Bruce Vogelaar

## PUBLICATIONS

Scopus Author ID: 36084917300

International Journals (ISI)	17
International or National Conferences (Scopus)	11
International or National Conferences (ISBN)	30
Book Chapters	4

### Selected Papers of International Journals (WoS-Scopus)

- J1. Messaggi M., Canzi P., **Mereu R.**, Baricci A., Inzoli F., Casalegno A., Zago, M. (2018). Analysis of flow field design on vanadium redox flow battery performance: Development of 3D computational fluid dynamic model and experimental validation. APPLIED ENERGY, vol. 228, p. 1057-1070, doi: 10.1016/j.apenergy.2018.06.148.
- J2. Dang Le, Q., **Mereu, R.**, Besagni, G., Dossena, V., Inzoli, F. (2018). Computational Fluid Dynamics Modeling of Flashing Flow in Convergent-Divergent Nozzle. Journal of Fluids Engineering, Transactions of the ASME, 140 (10). doi: 10.1115/1.4039908.
- J3. Bravo-Berguño, D., **Mereu, R.**, Cavalcante, P., Carlini, M., Ianni, A., Goretti, A., Gabriele, F., Wright, T., Yokley, Z., Vogelaar, R.B., Calaprice, F., Inzoli, F. (2018). The Borexino Thermal Monitoring & Management System and simulations of the fluid-dynamics of the Borexino detector under asymmetrical, changing boundary

- conditions. Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, 885, pp. 38-53. doi: 10.1016/j.nima.2017.12.047.
- J4. Baricci A., **Mereu R.**, Messaggi M., Zago M., Inzoli F., Casalegno A. (2017). Application of computational fluid dynamics to the analysis of geometrical features in PEM fuel cells flow fields with the aid of impedance spectroscopy. APPLIED ENERGY, vol. 205, p. 670-682, ISSN: 0306-2619, doi: 10.1016/j.apenergy.2017.08.017
- J5. Ferrari G., Federici D., Schito P., Inzoli F., **Mereu R.** (2017). CFD study of Savonius wind turbine: 3D model validation and parametric analysis. RENEWABLE ENERGY, vol. 105, p. 722-734, ISSN: 0960-1481, doi: 10.1016/j.renene.2016.12.077
- J6. **Mereu R.**, Federici D., Ferrari G., Schito P., Inzoli F. (2017). Parametric numerical study of Savonius wind turbine interaction in a linear array. RENEWABLE ENERGY, vol. 113, p. 1320-1332, ISSN: 0960-1481, doi: 10.1016/j.renene.2017.06.094
- J7. Gregu G., Takahashi M., Pellegrini M., **Mereu R.** (2017). Experimental study on steam chugging phenomenon in a vertical sparger. INTERNATIONAL JOURNAL OF MULTIPHASE FLOW, vol. 88, p. 87-98, ISSN: 0301-9322, doi: 10.1016/j.ijmultiphaseflow.2016.09.020
- J8. Besagni G., **Mereu R.**, Inzoli F., Chiesa P. (2017). Application of an integrated lumped parameter-CFD approach to evaluate the ejector-driven anode recirculation in a PEM fuel cell system. APPLIED THERMAL ENGINEERING, vol. 121, p. 628-651, ISSN: 1359-4311, doi: 10.1016/j.applthermaleng.2017.04.111
- J9. Secareanu R., **Mereu R.**, Takahashi M., Inzoli F., Prisecaru I. (2016). Experimental and numerical study of freezing and flow characteristics of Wood's Metal injection in a water pool. APPLIED THERMAL ENGINEERING, vol. 103, p. 1261-1277, ISSN: 1359-4311, doi: http://dx.doi.org/10.1016/j.applthermaleng.2016.04.136
- J10. Mandelli S., Barbieri J., **Mereu R.**, Colombo E. (2016). Off-grid systems for rural electrification in developing countries: Definitions, classification and a comprehensive literature review. RENEWABLE & SUSTAINABLE ENERGY REVIEWS, vol. 58, p. 1621-1646, ISSN: 1364-0321, doi: 10.1016/j.rser.2015.12.338
- J11. Besagni G., **Mereu R.**, Inzoli F. (2016). Ejector refrigeration: A comprehensive review. RENEWABLE & SUSTAINABLE ENERGY REVIEWS, vol. 53, p. 373-407, ISSN: 1364-0321, doi: 10.1016/j.rser.2015.08.059
- J12. Besagni G., **Mereu R.**, Di Leo G., Inzoli F. (2015). A study of working fluids for heat driven ejector refrigeration using lumped parameter models. INTERNATIONAL JOURNAL OF REFRIGERATION, vol. 58, p. 154-171, ISSN: 0140-7007, doi: 10.1016/j.ijrefrig.2015.06.015
- J13. Besagni G., **Mereu R.**, Chiesa P., Inzoli F. (2015). An Integrated Lumped Parameter-CFD approach for off-design ejector performance evaluation. ENERGY CONVERSION AND MANAGEMENT, vol. 105, p. 697-715, ISSN: 0196-8904, doi: 10.1016/j.enconman.2015.08.029
- J14. **Mereu R.**, Colombo E., Inzoli F. (2013). Numerical analysis of fluid dynamics and thermal characteristics inside a wavy channel. INTERNATIONAL JOURNAL OF NUMERICAL METHODS FOR HEAT & FLUID FLOW, vol. 23, p. 1049-1062, ISSN: 0961-5539
- J15. Colombo E., Inzoli F., **Mereu R.** (2012). A methodology for qualifying industrial CFD: The Q3 approach and the role of a protocol. COMPUTERS & FLUIDS, vol. 54, p. 56-66, ISSN: 0045-7930, doi: 10.1016/j.compfluid.2011.10.003
- J16. Merzari E., Ninokata H., **Mereu R.**, Colombo E., Inzoli F. (2011). URANS SIMULATION OF CONFINED PARALLEL JET MIXING. NUCLEAR TECHNOLOGY, vol. 175, p. 538-552, ISSN: 0029-5450

*Riccardo Mereu*