

Matteo Zago - Curriculum Vitae

Education

Academic year 2002-2003 matriculation in Energy Engineering at Politecnico di Milano.

Academic year 2004-2005 Bachelor's degree in Energy Engineering at Politecnico di Milano, final grade 110/110. Thesis title: "Feasibility study of a biomass combined heat and power plant".

Academic year 2007-2008 Master of Science in Energy Engineering at Politecnico di Milano, final grade 110/110. Thesis title: "Evaluation of energy efficiency in different heating plants for residential application".

March 2013 Doctor in Philosophy cum laude in Nuclear Science and Energy Technology (STEN XXV cycle), at Politecnico di Milano, thesis title: "DMFC modeling: mass transport phenomena and electrochemical impedance spectroscopy", supervisor Prof. R. Marchesi.

Academic position

February 2014 Professor Assistant (RTD-a) in Engineering Thermodynamics at Department of Energy, Politecnico di Milano.

June 2017 Professor Assistant (RTD-b) in Engineering Thermodynamics at Department of Energy, Politecnico di Milano.

June 2020 Associate Professor in Engineering Thermodynamics at Department of Energy, Politecnico di Milano.

Research experience

2009-2010 Research assistant for Prof. R. Marchesi at Politecnico di Milano.

June-July 2012 Visiting at Deutsches Zentrum für Luft- und Raumfahrt (DLR), Stuttgart, Germany, prof. Wolfgang Bessler.

2013-2014 Research assistant for Prof. A. Casalegno at Politecnico di Milano.

May 2016 Visiting at University of Knoxville, USA, Prof. Matthew Mench.

Since 2010, he participates at the research activities of the MRT Fuel Cell Laboratory, today composed of 18 people, including full professor (1), associate professors (3), PhD students (7), research assistants (3), M.Sc. students (9). Since 2015 he leads the activity on flow batteries technology.

Main research projects

2011-2014 Participation in the research activities of the European project "PREMIUM ACT", FCH-JU FP7 call.

2014-2017 Participation as task leader in the research activities of the European project "SECOND ACT", FCH-JU FP7 call.

2014-2015 Co-responsible of the research project with ENI s.p.a. "Modeling analysis of flow battery system".

2016-2017 Co-responsible of the research project with ENI s.p.a. "Modeling analysis of flow battery system and development of innovative electrodes".

2017-2018 Principal investigator of the project "Innovative flow batteries" funded by Fondi Ateneo per la Ricerca di Base (FARB) of Politecnico di Milano.

2018-2019 Co-responsible of the research project with ENI s.p.a. "Innovative vanadium redox flow batteries".

2020-2022 Principal investigator of the project "Enhanced manufacturing process of barriers for flow batteries" funded by Italian Ministry of Economic Development.

2021-2022 Principal investigator of the research project with Solvay Specialty Polymers s.p.a. "Experimental and modelling analysis of mass transport phenomena in vanadium redox flow batteries".

2023-2024 Co-responsible of the research project with X-Nano “Experimental characterization of electrodes in redox flow batteries”.

2023-today Scientific coordinator of the research project “Materiali Innovativi per Sistemi di Accumulo Ibrido – MIAMI”, funded by Ministero della Transizione Ecologica.

2024-today Principal investigator of the research project with a2a s.p.a. “Development of hybrid hydrogen-vanadium redox flow batteries”.

Teaching experience

2009-2015 Teaching assistant at Politecnico di Milano in Engineering Thermodynamic and Heat Transfer course for Proff. A Casalegno, R. Marchesi and F. Rinaldi.

2015-2022 Professor of Engineering Thermodynamics and Heat Transfer for students of Management Engineering.

2017-2021 Professor of Fundamentals of Energy Technologies for students of Management Engineering

2022-Today Professor of Engineering Thermodynamics and Heat Transfer for students of Mechanical Engineering.

Publication activity

Author of 30 publications on ISI indexed journals (h index 16, citations >700, average journal IF>5), more than 50 contributions to international conferences and 1 invited presentation in international workshops.

WO 2019/197917, M. Zago, A. Casalegno, Flow battery with membrane having different selectivities, Priority IT 102018000004325 (09.04.2018).

WO 2021/181319, F. Di Fonzo, E. Rovera, A. Casalegno, M. Zago, G. Nava, F. Fumagalli, Electrode for a flow battery and production method, Priority IT 102020000005482 (13.03.2020).

Research topics

Experimental analysis of electrochemical energy devices and related components, focusing on transport phenomena and degradation, adopting properly developed in-situ technique (segmented cell with locally resolved electrochemical and mass transport measurements, local impedance spectroscopy and voltammetry).

Development and validation of physical models for electrochemical energy devices and related components, to simulate performance, transport phenomena, electrochemical impedance, degradation phenomena and to optimize overall operation and components.

Design of locally engineered innovative components and novel architecture for electrochemical energy devices - combining modelling analysis and experimental investigation, to enhance performance, lifetime and economic competitiveness.

The mentioned research activities are carried out for different technologies, in particular flow batteries and low temperature fuel cells (DMFC, PEMFC).