Andrea Casalegno - Curriculum Vitae

Born 7/1/1978 in Milan, Italy.

EDUCATION

- Academic year 1997-1998 Matriculation in Mechanical Engineering, at Politecnico di Milano
- September 2001-April 2002 Participation at Erasmus Programme in TU Delft, The Netherlands, where attends courses of International Master in Mechanical Engineering
- Academic year 2001-2002 Degree in Mechanical Engineering, Energy specialization, at Politecnico di Milano, final grade 95/100. Thesis title: “Study of a biomass integrated gasifier - Molten Carbonate Fuel Cell power system”
- June 2007 Doctor in Philosophy cum laude in Energetics, at Politecnico di Milano, thesis title: “Direct methanol fuel cell: experimental analysis and models development”, supervisor Prof. E. Pedrocchi

ACADEMIC POSITION

- December 2008 Professor Assistant in Engineering Thermodynamics at Department of Energy, Politecnico di Milano
- November 2014 Associate Professor in Engineering Thermodynamics at Department of Energy, Politecnico di Milano
- January 2018 Full Professor in Engineering Thermodynamics at Department of Energy, Politecnico di Milano

RESEARCH EXPERIENCE

- 2003-2004 Research assistant for Prof. E. Pedrocchi at Politecnico di Milano
- 2005-2010 Participation in realization and management of MRT Fuel Cell Laboratory, Politecnico di Milano
- 2007-2008 Research assistant at MRT Fuel Cell Laboratory, Department of Energy, Politecnico di Milano
- November 2007 - August 2016 Secretary of the Technical Committee CT105 Fuel Cell of the Italian Electrotechnical Commission, Italian member of workgroup IEC/TC 105/WG 11 " Single Cell Test Method for PEFC"
- Since 2009, he manages projects and funds of the MRT Fuel Cell Laboratory and coordinates the related research group, today composed of 18 people, including assistant professors (2), PhD students (4), research assistants (3), M.Sc. students (9)
- May 2015 Visiting at University of New Mexico, USA, Prof. Plamen Atanassov
- March 2016-Today Affiliation at the Centre for Nano Science and Technology of Istituto Italiano di Tecnologia (IIT)
- June 2016 Visiting at University of Connecticut, USA, Prof. Radenka Maric
- August 2016-Today President of the Technical Committee CT105 Fuel Cell of the Italian Electrotechnical Commission

RESEARCH PROJECTS

- 2007-2009 Participation in the project “Experimental investigation of water transport through components of polymer electrolyte fuel cell” co-funded by “Young Researcher Funding Project 2007” of Politecnico di Milano
- 2008-2010 Participation in research and coordination activities of the two-years project “Micro and nano materials development for direct methanol fuel cell”, co-funded by Fondazione Cariplo, Applied Research 2007
- 2009-2015 Participation in the definition of the project “Real FC”, funded by Regione Lombardia. Participation in research activities as Scientific Coordinator
- 2011-2015 Participation in the definition of the project “Microgen30”, Industria2015 call, funded by Italian Government. Participation in research activities as Task leader
- 2011-2014 Participation in the definition of the project “STAR”, Ricerca di Sistema call, funded by Italian Government. Participation in research activities as WP leader
- 2011-2014 Participation in the definition of the European project “PREMIUM ACT”, FCH-JU FP7 call. Responsible for Polimi, participation in research activities as WP leader

- 2014-2017 Participation in the definition of the European project “SECOND ACT”, FCH-JU FP7 call. Responsible for Polimi, participation in research activities as WP leader
- 2018-Today Participation in the definition of the European project “ID-FAST”, FCH-JU H2020 call. Responsible for Polimi, participation in research activities as WP leader
- 2008-Today Responsible of several international collaborations on fuel cell and flow battery research activities with industries, universities and research centres
- 2007-Today He raised and managed funds for more than 2 M€, 70% coming from competitive funding calls and 30% from industrial collaborations.

TEACHING EXPERIENCE

- 2004-2009 Teaching assistant at Politecnico di Milano in Engineering Thermodynamic and Heat Transfer course for Prof. A Rota and in Energetics for Prof. E. Pedrocchi
- 2008-Today Teaching activities in STEN PhD courses about electrochemical conversion, Politecnico di Milano
- 2009-2013 Professor of Engineering Thermodynamics for students of Civil and Environmental Engineering
- 2013-Today Professor of Engineering Thermodynamics and Heat Transfer for students of Mechanical Engineering
- 2008-Today Supervisor/advisor of more than 40 Master of Science theses and 8 PhD theses
- 2014-Today participation in the Board of Professors of STEN PhD course, Politecnico di Milano
- 2016-Today Professor of Electrochemical Energy Conversion and Storage for students of Energy Engineering

PUBLICATION ACTIVITY

- Author of 90 publications, including 47 papers on ISI indexed journals (h index 16, citations >650, average journal IF>3.5) and 10 invited presentations in conferences, workshops and seminars
- 2011-2017 Session chairman and Scientific committee member in several international conferences about fuel cell
- Patent PCT/IT2017/000120 “Locally engineered PEM cells components with optimized operation for improved durability”, priority date 19/6/2017, owned by Politecnico di Milano

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
- System analysis of electrochemical energy devices, including components degradation effect, to overcome technological issues and to develop innovative operating strategies for performance and lifetime maximization

The mentioned research activities are carried out for different technologies, in particular low temperature fuel cell (PEMFC, DMFC, HT-PEMFC) and batteries (flow battery, Li-ion battery), and applications, i.e. automotive, stationary and portable power production, stationary energy storage.