ELEONORA GADDUCCI

PhD student

PROFILE

As a PhD student, I have been part of Thermochemical Power Group (TPG) of the University of Genoa since October 2018. My activities here started during the Master's Degree Thesis, where I focused on hydrogen technologies. I have now gained a three-year experience on PEM Fuel Cells technology: in this field, I learnt to work autonomously on different fields. I oversee the experimental campaign at the HI-SEA Laboratory of the University of Genoa (240 kW installation of PEMFC with balance of plant), which gave birth to different publications presented at international conferences; I have deepened my knowledge on the evaluation of a single FC and of the system's performance; I can individuate and solve technical issues that may arise from the experimental activity; I am in charge of acquiring and analysing the database from the results of the experimental campaign, to develop test protocols and recovery procedures for PEMFCs; thanks to additional courses during the PhD studies, I have strengthened my knowledge on PEMFC materials, degradation, catalysts characteristics and electrochemical techniques for the investigation of degradation phenomena; I am working on a Matlab model to foresee the effects of degradation and then estimate the useful life of a PEMFC. During this experience, I also had the opportunity to improve my skills in other languages and I approved the national exam to access the Order of the Engineers.

EDUCATION

September 2016 – October 2018	**Università degli Studi di Genova – Université Savoie-Mont Blanc** (Chambéry, France) **Double Degree**: European Master's in Engineering for Energy and Sustainable Buildings (EMESB), Master's Degree in Energy Engineering. Main fields: renewable energy, fuel cell technologies, electric power systems, power plants, biofuels. Final score: 107/110.
September 2017 – March 2018	**Université Savoie-Mont Blanc** (France) Winner of **Erasmus+** scholarship for participation in EMESB to obtain a Double Degree.
September 2012 – March 2016	**Università degli Studi di Genova** Bachelor's Degree in Industrial Engineering – Environmental and Energy Engineering. Final Score: 102/110.
September 2014 – March 2015	**Universidad de Salamanca** (Spain). Winner of a scholarship for **Erasmus+** project at Chemical Engineering school.
2007 – 2012	Liceo "O. Grassi" (Savona). Scientific High School Diploma. Final score: 100/100.

WORK EXPERIENCE AND PROJECTS

November 2018 – Current	**PhD student at Università degli Studi di Genova** Main fields: stationary and transient analysis of the **PEM Fuel Cell system** of the HI-SEA Laboratory in Savona, data extraction and analysis from experimental tests, study of the correlation between the main parameters of the system. Development of Matlab models of PEMFC systems.
February 2020– April 2020	**Visiting PhD at IFE – Oslo** Collaboration with **Institute for Energy Technology** in the context of project MoZEES. Development of research areas of common interest for IFE and the University of Genoa concerning PEMFC modelling and understanding of degradation mechanisms. The exchange period in Oslo started on the 3rd of February and had to stop earlier (30th of March) than the initial plan, due to COVID-19 emergency. It will be resumed in the next future.
March 2018 – October 2018	**Master's Degree Thesis "Theoretical and experimental study of fuel cells for marine application"**. Work developed in the HI-SEA Laboratory of the University of Genova for assessment of the technology for marine applications. Data extraction, management and processing via Excel and Matlab; study of the system's response under different conditions.
March 2017 – February 2018	**200-hour collaboration at Università di Genova** Data extraction from software **DEMS** (Decentralized Energy Management System); data management and processing via Excel; production of Power Points; presentation of the Smart Polygeneration Microgrid (SPM) Project.

September 2015 – March 2016 **Bachelor's Degree Thesis** "Sustainable Ways for Methanol Production: Thermo-Economic Analysis": participation in **European Project "MefCO$_2$"** (simulation of different plant configurations via a dedicated software; data extraction from load curves; data analysis; etc.).

2013 – Current **Teaching experience** Private lessons to Primary and Secondary School students (Mathematics, Chemistry, Physics, flute trainer).

PUBLICATIONS

July 2019 **Proceedings of European Fuel Cell Forum 2019 – Low temperature fuel cells/electrolysers and H2 processing, Luzern:**

- *Analysis of consequences of cells rupture on PEMFC module performance* (E.Gadducci, L.Magistri, T.Lamberti)
- *Assessment of PEMFC performance for marine application* (E.Gadducci, L.Magistri, T.Lamberti)

September 2019 **Design and development of a laboratory for the study of PEMFC system for marine applications** (Borgogna,G., Speranza, E., Lamberti, T., Nicola Traverso, A., Magistri, L., Gadducci, E., Massardo, A.F., Olivieri, P.), https://doi.org/10.1051/e3sconf/201911302020

December 2019 **Proceedings of EFC19, Napoli:**

- *Recovery procedure for 30 kW Nuvera Orion PEMFC stacks* (E.Gadducci, T.Lamberti, L.Magistri, A.F.Massardo) – extended abstract
- *Experimental assessment of FCS for marine application* (E.Gadducci, T.Lamberti, L.Magistri, A.F.Massardo) – extended abstract

Current **To be submitted/submitted for review:**

- *BoP incidence on a 240 kW PEMFC system in a ship-like environment, employing a dedicated fuel cell stack model* (E.Gadducci, T.Lamberti, L.Magistri, A.F.Massardo)
- *Recovery procedure for 30 kW Nuvera Orion PEMFC stacks* (E.Gadducci, T.Lamberti, L.Magistri, A.F.Massardo) – full paper
- *Experimental assessment of FCS for marine application* (E.Gadducci, T.Lamberti, L.Magistri, A.F.Massardo) – full paper
- *Review of degradation issues on PEMFC – a focus on catalyst and membrane* (E.Gadducci, L.Magistri, D.Bellotti)
- *Catalyst degradation under different testing conditions – a review* (E.Gadducci, L.Magistri, A.F.Massardo) – extended abstract for EFCF2021 – Luzern

SKILLS

Interpersonal Self-motivated, capable of working under pressure. Very good organization and communication skills when team working. Enthusiastic about improving skills. Strong sense of multiculturalism and professionalism. Passionate about sustainability in everyday life.

Languages and certificates

Italian	English	Spanish	French	Portuguese
Mother tongue	C1	C1	B1	B1
-	PET, FCE, OLS	DELE	University certification	-

Informatics

Proficient user	**Microsoft Windows**, **Microsoft Office**
Independent user	**Java**, **Matlab-Simulink**, **OpenStudio**, **EnergyPlus**, **SketchUp**

Personal interests Love learning new languages and travelling. Flute player in "Coro Flautistico Savonese Hamelin" and participation in "Orchestre d'Harmonie Municipale de Chambéry (OMH)". Co-founder of **Kitchen FootPrint** project, startup concerning the development of algorithms for a fast evaluation of the impact of agri-food products on the market. Awards: *Cleantech and energy* winner at **SmartCup Liguria** and *Social Innovation* winner at **Premio Nazionale dell'Innovazione** (PNI) in December 2020.

Driving licence B