

CV MASSIMO SANTARELLI (POLITO)

1. Personal data (age, diplomas, nationality, gender etc)

Massimo Gian Luca SANTARELLI, born in Aosta (Italy) on 24.07.1968

Mechanical Engineer. Ph.D. in Thermodynamics and Heat Transfer

Associate Professor in Thermodynamics and Heat Transfer, Department of Energy, Politecnico di Torino

2. Research career

Author of around 150 papers in international journals and conferences.

Several activities on the topic of Thermo-economic Analysis and Optimization of energy systems, and in particular to the Environomics sector, in which the energy systems are studied from the thermodynamic, economic and environmental point of view.

The main research activity is linked to the topic of fuel cell and hydrogen, and their integration with renewable sources:

- experimental activity and modelling on SOFC generator and Balance of Plant;
- experimental activity and modelling on PEMFC single cells and stacks;
- experimental activity and modelling of high pressure electrolysis fed by renewable sources;
- modelling, analysis and optimization of energy systems based on integration of RES and H₂.

Projects in the topic of hydrogen: European projects (SOFCOM, ENFIELD, ENFICA-FC, SELECT-CD, Explore Energy, Virtual Hub), national projects (FISR 2005, PRIN 2008 and 2009, EOS and EBE Projects, Micro CHP Project, Celco Yacht Project, PFHC Project, MULTISS Project, NanoSOFC Project, HySyPower Project, Mhyto Project).

Experimental activity at the HySyLab laboratory (PEMFC and metal hydrides), EOS laboratory (CHP-100 and SFC-5 SOFC generators) and Centro Ricerche Edison (single SOFC tubular and planar).

Member of High-Quality Laboratory (LAQ) IN.TE.S.E. (Technology Innovation for Energy Sustainability) of Politecnico di Torino: SOFC single cells and short stacks; high pressure PEM electrolysis.

Chair for Italy of ISO/TC 197 “Hydrogen Technologies”.

3. Teaching experience (+ give the names of your present courses)

The teaching experience is on the wide topic of Applied Thermodynamics (Thermodynamics and Heat Transfer, Second Course on Thermodynamics), and in the specific topic of Fuel Cells (Hydrogen Technologies and Fuel Cells, Not-conventional Systems for the Production of Energy).

At present, my courses are: (a) Hydrogen Technologies and Fuel Cells; (b) Special Topics in Mechanical Engineering: Fuel cells (with University of Illinois at Chicago); (c) Thermodynamics and Heat Transfer; (d) Second Course on Thermodynamics; (e) Environmental Pathways I, Environmental Pathways II, Advanced Renewable Energy Systems (at KTH-Stockholm)

4. Publications in the last year

1. Leone P., Lanzini A., Santarelli M., Cali M., Sagnelli F., Boulanger A., Scaletta A., Zitella P., Methane-free biogas for direct feeding of solid oxide fuel cells, *Journal of Power Sources*, Vol. 195, pp. 239-248, 2010.

2. Santarelli M., Cabrera M., Calì M., Solid Oxide Fuel Based Auxiliary Power Unit for Regional Jets: Design and Mission Simulation With Different Cell Geometries, *Journal of Fuel Cell Science and Technology*, Vol. 7 (2), 2010.
3. Medina P., Santarelli M., Analysis of water transport in a high pressure PEM electrolyzer, *International Journal of Hydrogen Energy*, Vol. 35, pp. 5173-5186, 2010.
4. Lanzini A., Leone P., Pieroni M., Santarelli M., Beretta D., Ginocchio S., Experimental investigation and modelling of direct internal reforming of biogases in tubular SOFC, Proceedings of FUELCELL2010, the 8th International Conference on Fuel Cell Science, Engineering and Technology, June 14-16, 2010, Brooklyn, New York, USA.
5. Lanzini A., Leone P., Santarelli M., Utilisation of biogas from an urban sewage treatment plant in a solid oxide fuel cell, Proceedings of FUELCELL2010, the 8th International Conference on Fuel Cell Science, Engineering and Technology, June 14-16, 2010, Brooklyn, New York, USA.
6. Santarelli M., Gariglio M., De Benedictis F., Delloro F., Calì M., Orsello G., SOFC 5 kWe CHP field unit: effect of the methane dilution, *Fuel Cells - From Fundamentals to Systems*, Vol. 3, pp. 453-462, 2010.
7. Torchio M., Santarelli M., Energy, environmental and economic comparison of different powertrain/fuel options using well-to-wheels assessment, energy and external costs – European market analysis, *Energy*, Vol. 35, pp. 4156-4171, 2010
8. Lanzini A., Santarelli M., Orsello G., Residential Solid Oxide Fuel Cell Generator Fuelled by Ethanol: Cell, Stack, and System Modeling with a Preliminary Experiment, *Fuel Cells - From Fundamentals to Systems*, Vol. 10 (4), pp. 654–675, 2010
9. La Licata B, Sagnelli F., Boulanger A., Lanzini A., Leone P., Zitella P., Santarelli M., Bio-hydrogen production from organic wastes in a pilot plant reactor and its use in a SOFC, *International Journal of Hydrogen Energy*, in press.
10. Marangio F, Pagani M., Santarelli M., Calì M., Concept of a high pressure PEM electrolyser prototype, *International Journal of Hydrogen Energy*, in press.
11. Leone P., Lanzini A., Delhomme B., Ortigoza-Villalba G.A., Santarelli M., Smeacetto F., Salvo M., Ferraris M., Experimental Evaluation of Planar SOFC single unit cell with Crofer22APU plate assembly, *Journal of Fuel Cell Science and Technology*, in press.
12. Smeacetto F., Salvo M., Leone P., Santarelli M., Ferraris M., Performance and testing of joined Crofer22APU/glass-ceramic sealant/ anode-supported-SOFC in dual atmosphere, *Material Science*, in press.
13. Santarelli M., Cabrera M., Model and Simulation of Hybrid SOFC- μ GT Fed by Biogenous Fuels as APU for Regional Jets, *Journal of Aircraft*, in press.
14. Romeo G. Cabrera G., Borello F., Cestino E., Santarelli M., Air cooling of a 2 seater fuel cells powered aircraft: dynamic modeling and comparison with experimental data, *ASCE's Journal of Aerospace Engineering*, in press.

Books

Milewski, J., Świrski, K., Santarelli, M., Leone, P., Advanced Methods of Solid Oxide Fuel Cell Modeling, Series: Green Energy and Technology, Springer Ed., 1st Edition., 2011, XIV, 226 p. 209 illus., 39 in color., Hardcover

6. Website reference

http://www.swas.polito.it/rubrica/scheda_pers.asp?matricola=003570