

# CURRICULUM VITAE

CLAUDIA TORO



## PERSONAL INFORMATION

Claudia Toro

Nationality Italian

## WORK EXPERIENCE

Dates	December 2016 –To date
Name and address of employer	Technosind S.r.l. Via di Vannina 88 Roma www.technosind.it
Occupation or position held	Fixed term contract Administrative and scientific collaboration for the development of a heat pump based energy storage system.
Dates	15 September 2014 -15 November 2016
Name and address of employer	Consiglio Nazionale delle Ricerche, IGAG, c.o.Dipartimento di Ingegneria Meccanica e Aerospaziale, Sapienza Università di Roma, Via Eudossiana 18, 00184, Rome, Italy
Occupation or position held	Researcher Research topic: Environmental impact of energy conversion system, Energy recovery from waste (biomass, biogas, landfill gas), modeling and analysis of complex energy conversion system (High Temperature Fuel Cell, Desalination, Renewable power plant: PV and hybrid, geothermal) or stand-alone and cogenerative applications.
Dates	1 September 2013-1 October 2013
Name and address of employer	University of Pennsylvania, Department of Mechanical Engineering and Applied Mechanics
Occupation or position held	Visiting Researcher on a TEE scholarship - Transatlantic Partnership for Excellence in Engineering awarded through selection by the European Commission Teaching activities: Seminars on the following topics "Principles of Energy Conversion system simulation: Steady-state and dynamic simulations" and " Exergetic and thermo-economic optimization based on the POD-RBF procedure: theory and case studies". Research activities: development of a collaboration with Prof. Noam Lior for a study on the application of optimization methodologies to innovative renewable power systems.
Dates	September 2011-August 2014
Name and address of employer	University of Roma "Sapienza" Department of Mechanical ad Aerospace Engineering
Occupation or position held	Post Doc Research Fellow: Scientific sector: ING-IND 08, Machinery Research topic: Environmental impact of energy conversion system, Energy recovery from waste (biomass, biogas, landfill gas), modeling and analysis of complex energy conversion system (High Temperature Fuel Cell, Desalination, Renewable power plant: PV and hybrid) for stand-alone and cogenerative applications.
Dates	June 2011- December 2011
Name and address of employer	Centro Studi Orvieto

Occupation or position held	Technical and scientific collaboration to the project AGRIEN Energy from wood biomass: development of an economic-logistic model for the agro-energy chain of the municipality of Orvieto (Italy).
Dates	June 2011
Name and address of employer	Gruppo Genesis S.r.l.
Type of business or sector	Training company
Occupation or position held	16 hours Training lecture on "Energy conversion of biomass" held at the Dalla Torre Impianti company in Codognè (TV- Italy)
Dates	February 2008 –September 2012
Name and address of employer	Technosind S.r.l. Via Alessandro Torlonia 10 Roma www.technosind.it
Type of business or sector	Coordination of R&D activities mainly in primary and secondary raw material treatments.
Occupation or position held	Fixed term contract Administrative and scientific collaboration for the development of the European Community fouded project "EUREKA 3895 LILIEX"  -Draw up of administrative-tecnical Due Diligence for the for the construction of photovoltaic systems on the whole national territory.
Dates	<i>May 2005 -May 2006</i> <i>January 2005- May 2005</i> <i>September 2004-December 2004</i>
Name and address of employer	Technosind S.r.l. Via Alessandro Torlonia 10 Roma www.technosind.it
Type of business or sector	Coordination of R&D activities mainly in primary and secondary raw material treatments.
Occupation or position held	Fixed term contract Administrative and scientific collaboration for the coordination of the European Community fouded project "AITEKIN COOP-CT-2003-506667: Combination of AI techniques and software with advanced reactor equipment for efficient kinetics analysis in the chemical industry. - assistance in the coordination of the project -Correspondence with national (Polimeri Nova System) and international partners (UOP, University of Manchester) -preparation of monthly reports in English
Dates	<i>November 2001-March 2002</i> <i>March 2002- July 2002</i>
Name and address of employer	Technosind S.r.l. Via Alessandro Torlonia 10 Roma www.technosind.it
Type of business or sector	Coordination of R&D activities mainly in primary and secondary raw material treatments.
Occupation or position held	Administrative and scientific collaboration.

## TEACHING EXPERIENCE

Dates	1 October 2015-1 January 2016
Name and address of employer	University of Roma "Sapienza", Faculty of Engineering
Occupation or position held	Teaching of the course of "Diagnostic of energy conversion systems" of the Master Degree Course of Energy Engineering.
Dates	1 March 2016-June 2016

Name and address of employer University of Roma "Sapienza", Faculty of Engineering

Occupation or position held Teaching of the course of "*Thermoeconomics & sustainability*" of the English Master Degree Course of Energy and Mechanical Engineering.

## EDUCATION AND TRAINING

Dates 28 March 2011

Title of qualification awarded **Ph.D in Energetic Engineering**  
Thesis title " Modeling, simulation and exergy analysis of solide oxide fuel cell - gas turbine hybrid systems"

University University of Roma "Sapienza"  
Department of Mechanical and Aerospace Engineering  
Advisor: Prof. Enrico Sciubba

Principal subjects Main objective of the research:

- Solid oxide fuel cell hybrid systems analisys
- Development of a modular computational code for the simulation of energy conversion systems
- Exergy analysis of complex energy systems

Dates 21 June-3 July 2010

Principal subjects Summer school of Thermodynamics, University of Rome- Sapienza

Title of qualification awarded Principles of Thermodynamics, Principles of Exergy Analysis, Heat and Mass Transfer, Entropy Generation in Fluid Flow, Computational Thermo-Fluid-Dynamics, Entropy and Entropy Production in Non-Equilibrium Systems, Generalization of Thermodynamics to Microscopic Systems: Equilibrium and Non-Equilibrium Considerations.  
Diploma, 6 ECTU

Dates 6-18 July 2009

Principal subjects Summer school of Thermodynamics, Università di Roma- La Sapienza

Title of qualification awarded Thermodynamics, heat exchange, Numerical fluid dynamics  
Diploma, 6 ECTU

Dates 12 Febbraio 2007

Title of qualification awarded **Master's Degree in Mechanical Engineering** cum laude,  
Thesis Title " Multidimensional modeling of solide oxide fuel cell systems fuelled by syngas", developed through the aid of a finite element method software.

University University of Roma "Tor Vergata"

Academic year 2004-2005 Recipient of a merit scholarship from the University of Roma "Tor Vergata"

Dates 26 October 2004

Title of qualification awarded **Bachelor's Degree in Mechanical Engineering**  
Thesis title "Development of a model simulating a tubular solid oxide fuel cell", in Fortran environment.

University University of Roma "Tor Vergata"

Dates 12 July 1999

Title of qualification awarded Diploma of secondary school in Classical Studies

## PUBLICATIONS

### Journal

Toro, C.; Rocco, M.; Colombo, E., Exergy and Thermo-economic Analyses of Central Receiver Concentrated Solar Plants Using Air as Heat Transfer Fluid. *Energies* 2016, 9, (11), 885. DOI: 10.3390/en9110885

Toro, C.; Lior, N., Analysis and comparison of solar-heat driven Stirling, Brayton and Rankine cycles for space power generation. *Energy* 2016, 1-16. DOI: 10.1016/j.energy.2016.11.104

Sciubba, E.; Tocci, L.; Toro, C., Thermodynamic analysis of a Rankine dual loop waste thermal energy recovery system. *Energy Conversion and Management* 2016, 122, 109-118. DOI: 10.1016/j.enconman.2016.05.066

Elisa Guelpa, Claudia Toro, Adriano Sciacovelli, Roberto Melli, Enrico Sciubba, Vittorio Verda: Optimal operation of large district heating networks through fast fluid-dynamic simulation. *Energy* 05/2016; 102:586-595. DOI:10.1016/j.energy.2016.02.058

Emanuela Colombo, Matteo V. Rocco, Claudia Toro, Enrico Sciubba: An exergy-based approach to the joint economic and environmental impact assessment of possible photovoltaic scenarios: A case study at a regional level in Italy. *Ecological Modelling* 11/2014; DOI:10.1016/j.ecolmodel.2014.11.006

Roberto Capata, Claudia Toro: Feasibility analysis of a small-scale ORC energy recovery system for vehicular application. *Energy Conversion and Management* 06/2014; volume 86(2014):1078-1090. DOI:10.1016/j.enconman.2014.06.024

Roberto Melli, Enrico Sciubba, Claudia Toro: An application of the Proper Orthogonal Decomposition method to the thermo-economic optimization of a dual pressure, combined cycle powerplant. *Energy Conversion and Management* 05/2014; DOI:10.1016/j.enconman.2014.04.005

Ekaterina Cheremnykh, Marta Cianfrini, Enrico Sciubba, Claudia Toro: An Integrated Exergy Approach for the Optimal Matching of Internal and External Heating Plants in Building Conditioning Systems. *Energy and Buildings* 04/2013; DOI:10.1016/j.enbuild.2013.02.014

Roberto Melli, E Sciubba, C Toro, A Zoli-Porroni: An Improved POD Technique for the Optimization of MSF Processes. *International Journal of Thermodynamics* 12/2012; 15(4-4):231-238. DOI:10.5541/ijot.424

Amati Valentina, Sciubba Enrico, Toro Claudia, Andreassi Luca: Modelling and Simulation of a Hybrid Solid Oxide Fuel Cell Coupled with a Gas Turbine Power Plant. *International Journal of Thermodynamics* 09/2009; 12(3).

Luca Andreassi, Claudia Toro, Stefano Ubertini: Modeling Carbon Monoxide Direct Oxidation in Solid Oxide Fuel Cells. *Journal of Fuel Cell Science and Technology* 05/2009; 6(2-2):0213071-02130715. DOI:10.1115/1.3080552

Luca Andreassi, Claudia Toro, Stefano Ubertini, Modello 3D di celle a combustibile ad ossidi solidi alimentate da miscele di idrogeno e monossido di carbonio, *La Termotecnica*, Vol. 5 Giugno 2009 Anno LXIII e Vol. 7 September 2009 Anno LXIII

### Conference

Andrea Catalano, Matteo V. Rocco, Claudia Toro, Emanuela Colombo, Enrico Sciubba *Simulation and comparative Thermo-economic analysis of Central Receiver Concentrated Solar plants using air as heat transfer fluid*, Proceedings of ECOS2016, Portoroz, Slovenia, June 2016

Asfaw Beyene · Enrico Sciubba · Lorenzo Tocci · Claudia Toro, Modelling and simulation of waste heat recovery systems for marine applications, *Proceedings of ECOS2015*, Pau, France, June 2015

Sebastiano Luca Romano, Enrico Sciubba, Claudia Toro, Design and thermoeconomic evaluation of a waste plant with an integrated co2 chemical sequestration system for ch4 production, *Proceedings of ASME IMECE 2014*, Montreal, Canada, November 2014.

Ricardo Salazar, Enrico Sciubba, Claudia Toro , Exergy analysis and optimization of a building air conditioning system in tropical climate, *Proceedings of ASME IMECE 2014*, Montreal, Canada, November 2014.

Emanuela Colombo, Matteo V. Rocco, Claudia Toro, Enrico Sciubba, An exergy-based approach to the joint economic and environmental impact assessment of possible photovoltaic scenarios: a case study at a regional level in Italy, *Proceedings of ECOS2014*, Turku, Finland, June 2014.

Claudia Toro, Noam Lior, Analysis and comparison of different thermal cycles for power generation in space, *Proceedings of ECOS2014*, Turku, Finland, June 2014

Fabrizio Ferraro, Enrico Sciubba, Claudia Toro, *Integrated study of a minimum exergy destruction building conditioning system*, *Proceedings of ASME IMECE 2013*, San Diego, CA, USA November 2013.

Sara Cosentino, Elisa Guelpa, Roberto Melli, Adriano Sciacovelli, Enrico Sciubba, Claudia Toro, Vittorio Verda, Identification of the optimal operational strategy of a large district heating network through pod modeling, *Proceedings of ECOS2014*, Turku, Finland, June 2014

Matteo Rocco, Claudia Toro, Exergy based methods for economic and environmental analysis applied to a 320 MW combined cycle power plant, In proceeding of: JETC 2013 12th Joint European Thermodynamics Conference, July 2013, Brescia, Italy

Roberto Melli, Enrico Sciubba, *Claudia Toro*, *An application of the Proper Orthogonal Decomposition method to the Thermo-Economic Optimization of a Dual Pressure, Combined Cycle Powerplant*, *Proceedings of ECOS2013*, Guilin, China, June 2013.

*Roberto Melli, Enrico Sciubba, Claudia Toro, Alessandro Zoli Porroni*, An example of thermo-economic optimization of a CCGT by means of the proper orthogonal decomposition method, *Proceedings of ASME IMECE2012*, Houston, TX, USA November 2012

*Roberto Capata, Enrico Sciubba, Claudia Toro*, *The gas turbine hybrid Veichle LETHE@ at UDR1: the on-board innovative ORC energy recovery system – feasibility analysis*, *Proceedings of ASME IMECE2012*, Houston, TX, USA November 2012

Luca Moliterno, Claudia Toro, Modeling and simulation of a boiler unit for steam power plants, *ECOS 2012*, Poster Session, 25-29 June 2012, Perugia, Italy

Claudia Toro, Enrico Sciubba, Marta Cianfrini , *An exergy based method for the optimal integration of a building and its heating plant. Part 1: comparison of domestic heating systems based on renewable sources*, *Proceedings of ECOS2012* 25 June 2012, Perugia, Italy

Claudia Toro, Ekaterina Cheremnykh, Marta Cianfrini, Enrico Sciubba , *A General Procedure for the Optimal Integration of Buildings and their Energy Plants*, *Proceedings of WEC 2011* Ginevra, Svizzera, September 2011

Claudia Toro, Ekaterina Cheremnykh, Marta Cianfrini, Enrico Sciubba, *A Novel Integrated Exergetic Approach for the Optimization of Building Conditioning systems*, *Proceedings of ECOS 2011- Novi Sad (Serbia)* July 2011

Enrico Sciubba, Claudia Toro, *Modeling and Simulation of a Hybrid PV/Thermal collector*, *Proceedings of ECOS 2011- Novi Sad (Serbia)* July 2011

Claudia Toro, Stefano Esposito, Enrico Sciubba, *Process Simulation and Exergy Analysis of a Reverse Osmosis Desalination Plant Powered by Photovoltaic Panels in Basra (Iraq)*,

Proceedings of ASME- ESDA 2010, ASME 2010 Biennial Conference on Engineering systems design and analysis, Istanbul, Turkey, July 2010.

Claudia Toro Enrico Sciubba, *Modelling and simulation of a hybrid SOFC/GT system for an aircraft auxiliary power unit*, proceedings of ASME-ATI-UIT, ASME-ATI-UIT Conference on thermal and Environmental Issues in Energy Systems, Sorrento, Italy May 2010.

Claudia Toro, Valentina Amati, Enrico Sciubba, *Exergy analysis of a solid oxide fuel cell-gas turbine hybrid power plant*, Proceedings of IMECE 2008, ASME-IMECE 2008 (International Mechanical Engineering Congress and Exposition), October 31-November 6, Boston MA, USA, 2008. Paper awarded: " Best student Paper ASME-IMECE Advanced Energy systems division 2008".

Claudia Toro, Valentina Amati, Enrico Sciubba, Luca Andreassi, *Modelling and Simulation of a Hybrid Solid Oxide Fuel Cell Coupled with a Gas Turbine Power Plant*, Proceedings of ECOS 2008 (Krakow-Poland), "ECOS 2008 21st International Conference on Efficiency, Cost, Optimization, Simulation and Environmental Impact of Energy Systems", Kraków, POLAND, June 24 – 27, 2008.

Luca Andreassi, Claudia Toro, Stefano Ubertini, *Modello 3D di celle a combustibile ad ossidi solidi alimentate da miscele di idrogeno e monossido di carbonio*, Proceedings 63° Congresso ATI 23-26 Settembre 2008, Palermo.

## PERSONAL SKILLS AND COMPETENCES

MOTHER TONGUE

ITALIAN

OTHER LANGUAGE(S)

- Reading
- Writing
- Speaking

### English

Excellent

Excellent

Excellent

Computer skills and competences

Windows: Excellent

Word, Excel, Access, Power Point, Outlook: Excellent

Mathematica: Excellent

Autocad: good

Programming Languages: Fortran, C++, Matlab

Process simulation: cycle tempo, Aspen

FEM : Comsol Multiphysics

Roma 08 April 2016

Claudia Toro