



Elisabetta Arato

Full professor

✉ elisabetta.arato@unige.it

☎ +39 010 3352926

☎ +39 346 7439478

Education and training

1986

PhD in Chemical Engineering

The fluidynamics of multiphase systems in oxygen blowing conversion processes

University of Genova - Genova - IT

1982

Masters Degree in Chemical Engineering

110 e lode e dignità di stampa

University of Genova - Genova - IT

Academic experience

2019 - ONGOING

Full Professor in Fundamentals in Chemical Engineering

University of Genoa - Genoa

1992 - 2019

Associate Professor in Fundamentals in Chemical Engineering

University of Genova - Genova - IT

1990 - 1992

Researcher

University of Genova - Genova - IT

1988 - 1989

Researcher

Ansaldo Ricerche Genova - Genova - IT

Transport phenomena and temperature distribution in phosphoric acid fuel cells

1986 - 1987

Researcher

Fondazione Donegani Novara - IT

Formulation of a parametric evaluation system for kinetic models

1983

Researcher

Italimpianti s.p.a. Genova - Genova - IT

Fluidynamics of multiphase systems in oxygen blowing conversion processes

Language skills

Italian

Mother tongue

English

Independent

French

Independent

Teaching activity

Full time Full Professor sector 09/D2 (Sistemi, Metodi e Tecnologie dell'Ingegneria Chimica e di Processo) at the Civil, Chemical and Environmental Engineering Department (DICCA) at the Polytechnic School at University of Genova.

Reference person for ERASMUS student mobility among different European Universities.

Professor of the Bachelor and Master Degree in Chemical and Processes Engineering:

- *Principi di Ingegneria Chimica 1 - Modulo di Termodinamica Chimica in Sistemi Ideali;*
- *Principi di Ingegneria Chimica 2 - Modulo di Termodinamica Chimica in Sistemi non Ideali*

Professor of the Master Degree in Environmental Engineering:

- *Industrial Processes and Products - Modulo di Renewable Energy production*

Postgraduate research and teaching activity

Supervision of PhD students, residents and post-doctoral fellows

Supervision of 11 doctoral theses and 14 research fellows.

PhD committees membership

Since 2013, member of the Teaching Board of the Doctoral School in Sustainable Energy and Technologies SET of the Faculty of Science and Technology of the Free University of Bolzano.

Postgraduate (PhD) teaching activity

Professor of the *Thermodynamics of Open Systems* teaching of the PhD in Fluidynamics and Environmental Engineering Processes of the University of Genoa.

Research interests

My research activity has been conducted in two principal fields:

- 1) experimental-interpretive: laboratory research, including the development of physical simulation models, testing, experimental programming, analysis and correlation of experimental data;
- 2) numerical simulation of systems: study of mathematical models for the simulation of traditional chemical engineering processes and planning and development of relatively new processes through the correct prediction of the physical equilibrium and transport properties.

My research activity was initially focused on traditional topics of chemical engineering, such as the fluid-dynamics of metallurgic reactors, simulation of traditional facilities, data analysis and parameter estimation. Then, my study has been concerned with new and technologically relevant subjects:

- simulation of fuel cell systems (PAFC, SOFC, PEMFC, MCFC) for the production of electrical energy;
- energy valorisation of different biomasses;
- study of oxygen transport mechanisms at the liquid-vapour interface of liquid metals of technological interest in a vacuum or controlled atmosphere.

Grants

2019 - ONGOING

Add your value ADIUVA - 2019-1-IT02-KA203-063392

Erasmus+ Programme KA2 Strategic Partnership Key Action
Principal investigator

2018 - ONGOING

HARnessing Degradation mechanisms to prescribe Accelerated Stress Tests for the Realization of SOC lifetime prediction Algorithms (AD ASTRA)

European Union H2020 FCHJU2 - BE
Participant

2017 - ONGOING

LIFE LIBERNITRATE - Responsible reduction of nitrates in the comprehensive water cycle

LIFE+
Participant

2017 - 2018

Agorà Piter on board

Participant

2013 - 2016

OXYTHERM Thermophysical properties of liquid alloys

under oxygen influence

Agenzia Spaziale Italiana - IT
Participant

2011 - 2013

SEMITHERM Investigation of thermophysical properties of liquid semiconductors in the melt and in the undercooled state under microgravity

Agenzia Spaziale Italiana - IT
Participant

2010 - 2012

MCFC-CONTEX MCFC catalyst and stack component degradation and lifetime Fuel Gas CONTaminant effects and EXtraction strategies

European Union
Participant

2010

Ricerca di Sistema Elettrico

Ministero Sviluppo Economico -ENEA - IT
Participant

2006 - 2009

Utilizzo di idrogeno prodotto da gassificazione di residui della lavorazione del grezzo per la produzione di energia elettrica tramite fuel-cells

Isab Energy Services (ERG) - IT - IT
Participant

Editorial activity

CIVR evaluator for Panel 09 (Industrial and information engineering) and REPRISE evaluator.

Revision activities for the following international scientific journals: ChemBioEng Reviews, Chemical Engineering Journal, Chemical Engineering Research and Design, Electrochimica Acta, Energies, European Polymer Journal, Bioresource Technology, Industrial & Engineering Chemistry Research, Journal of Analytical and Applied Pyrolysis, Journal of Materials Research, Journal of Membrane Science, Journal of Atmospheric and Solar-Terrestrial Physics, Particuology, Reaction Kinetics, Mechanisms and Catalysis, Renewable Energy, Solid State Ionics, Surface Science, Sustainability, Technologies.

Assignments abroad

Teaching Staff Mobility STA at the Polytechnic University of Valencia (Spain) in the academic year 2013/2014 and 2016/2017.

Other professional activities

- Co-author of MCFC-D3S (*Molten Carbonate Fuel Cell Dynamic and steady State Simulation*) calculation code - copyright by Ansaldo Fuel Cells, 27/01/2006.
- Co-author of the International patent by Ansaldo Fuel Cells *Method and System of Operating Molten Carbonate Fuel Cell* EP1834371B1, 13/07/2006.
- Patent Application in Italia e Spagna n° R-19654-2017 submitted by the University of Genova, Università Politecnica de Valencia and Università de Valencia entitled *Obtención de sílice funcionalizada a partir de residuos de paja de arroz para la adsorción de nitratos*.
- Since May 2019 president of the non-profit consortium company *Innovative Technologies for Environmental Control and Sustainable Development - TICASS scrl* which brings together 47 SMEs, large enterprises and research centers, including the University of Genoa and is the managing body of the Ligurian Regional Research and Innovation Center on *Energy, Environment, Sustainable Development - EASS*.