PERSONAL INFORMATION

Family name, given name: COLUSSI Sara
Born in Udine, on June 28th 1975
website: https://catalysis.uniud.it/the-group/senior-staff/sara-colussi
http://orcid.org/0000-0001-5316-1746

EDUCATION

- 24/05/2006: **PhD in Chemical and Energetic Technologies**

Department of Chemical Sciences and Technologies, University of Udine, Italy
Title of thesis: Palladium-based catalysts for the catalytic combustion of methane

- 12/06/2002: **Master Degree in Chemical Engineering**

Department of Chemical, Environmental and Raw Material Engineering, University of Trieste, Italy

CURRENT POSITION

From 3/06/2022: Associate professor of Industrial Chemistry (ING-IND/27)
Polytechnic Department, University of Udine

PREVIOUS POSITIONS

- 03/06/2019-2/06/2022: Research Assistant L. 240/2010 (art. 24 lett. b)

Polytechnic Department, University of Udine

- 16/04/2017-2/06/2019: research fellow at the Polytechnic Department of the University of Udine; title of the research project "Development of ceria-based catalytic coatings for soot and NO_x abatement from diesel engines", partially funded within the project Interreg Coat4Cata "Development of coatings and coating processes for the catalytic treatment of exhaust gases"
- 04/04/2012 – 3/04/2017: Research Assistant L. 240/2010 (art. 24 lett. a)

Polytechnic Department, University of Udine

- 3/06/2011 – 03/04/2012: Research Assistant (L. 230/2005)

Polytechnic Department, University of Udine

- 16/11/2010 – 31/05/2011: Fellowship at the Chemical Sciences and Technologies Department, University of Udine within the project InterReg IV "Novel materials for the abatement of pollutants from car exhausts gases"
- 15/11/2006 – 14/11/2010: research fellow at the Chemical Sciences and Technologies Department, University of Udine; research topic: "Study of catalysts for energetic applications: catalytic combustion and hydrogen production", partially funded by the Italian Ministry of University and Research within the project FISR "Matrices of Hydrogen Microcombustors"
- 10/11/2005 – 09/11/2006: research fellow at the Chemical Sciences and Technologies Department, University of Udine; research topic: "Synthesis and characterization of catalyst materials for hydrogen combustion" within the project FISR "Matrices of Hydrogen Microcombustors"
- 4/04/2003-3/10/2004: awarded with a fellowship by Regione Friuli Venezia Giulia within Measure D4 of the European Social Fund (Improvement of Human Resources in Research and Development); title of the research project: "Study of rare earth-based catalysts for catalytic combustion" carried out at the Chemical Sciences and Technologies Department, University of Udine
- 1/11/2002-31/10/2005: PhD in Chemical and Energetic Technologies, Chemical Sciences and Technologies Department, University of Udine

• 09/2002-12/2002: collaboration with the Department of Chemical, Environmental and Raw Material Engineering, University of Trieste (prof. Ireneo Kikic); title of the research project: "Development of programs for the simulation of nanoparticles precipitation processes with supercritical fluids"

INSTITUTIONAL COMMITMENTS

• From December 2020: member of the Academic Board for the PhD in Environmental and Energy Engineering Science, University of Udine
• From September 2020: member of the Council of Industrial Engineering for Environmental Sustainability
• From January 2021: Responsible of Orientation for the bachelor course in Industrial Engineering for Environmental Sustainability

COORDINATION OF RESEARCH PROJECTS

• From January 2022: Supervisor of PhD research program funded within the Italian program PON "Research and Innovation"
• December 2020-January 2022: Responsible of research project "Eco-friendly catalysts for waste-to-energy processes" funded within the program Go for IT by the Italian Ministry of University and Research through the Italian Conference of the Rectors
• June 2015-June2018: co-Principal Investigator for the research project "Three-Way Catalyst Materials for Compressed Natural Gas Vehicles" funded by Ford Motor Company within the Ford University Research Program Award
• 04/04/2012-8/03/2016: Responsible of Research Unit and Principal Investigator for the project "Novel Catalytic Systems for hydrogen rich streams purification" (cod. RBFR10S4OW) within the program FIRB – Future in Research 2010 funded by the Italian Ministry of University and Research

CONFERENCE ORGANIZATION

• 11/07/2014 – 14/07/2014: "Fundamentals and Applications of Cerium Dioxide in Catalysis" workshop (Udine), Member of the organizing committee

RESEARCH INTERESTS

I am currently part of the Research Group of Catalysis for Energy and Environment at the University of Udine. My main research activities involve the study and development of catalyst materials for energy and environmental applications. The study has been carried out in general by the design and synthesis of new materials as well as from a fundamental point of view by the chemico-physical characterization of the materials and its correlation with catalytic activity. In particular, I have studied palladium-based materials for methane catalytic oxidation, for both energy production and methane abatement from natural gas fuelled vehicles. This expertise, documented by a number of papers, has been particularly acknowledged by the 3-years funding (2015-2018) received from Ford Motor Company within Ford University Research Program Award on the topic "Three-Way Catalyst Materials for Compressed Natural Gas Vehicles". Other research topics involve the synthesis and characterization of ceria nanostructures (nanocubes, nanorods) for different catalytic applications (propane and DME combustion, oxidation and preferential oxidation of CO, oxidation of formaldehyde etc.), the preparation and characterization of catalysts by solution combustion synthesis and the catalytic purification of hydrogen rich streams. In the last few years my studies have been focused on the preparation of catalysts by mechanochemical milling, in particular for methane oxidation and dry reforming, CO_2 capture and hydrogenation with renewable hydrogen and NO_x adsorption. The experience gained with these research activities, mainly regarding synthesis methodologies and study of the redox

properties of the materials, has led to several national and international collaborations, mainly in the field of CO_2 capture and conversion for the production of e-fuels and other value-added chemicals.

MAIN NATIONAL AND INTERNATIONAL RESEARCH COLLABORATIONS

• Prof. J. Rodriguez, Dr. S. Senanayake, Characterization of catalysts for methane oxidation and dry reforming, Brookhaven National Laboratory, Upton, NY, USA
• Prof. J. Llorca, Structural and morphological characterization of catalysts, Institut de Techniques Energetiques and Centre for Nanoengineering, Polytechnical University of Catalunya, Barcelona, Spain
• Prof. Robert J. Farrauto, Catalysts for water gas shift reaction, Oxidation catalysts, Earth and Environmental Engineering Department, Columbia University, New York, USA
• Prof. Javier Perez Ramirez, Ceria and ceria-zirconia based catalysts for oxidation reactions, Institute for Chemical and Bioengineering, Department of Chemistry and Applied Biosciences, ETH Zurich, Switzerland
• Dr. G. Landi, dr. L. Lisi, prof. A. Di Benedetto, Purification of H_2-rich streams, Research Institute on Combustion – CNR and Department of Chemical, Materials and Industrial Production Engineering, University of Naples Federico II, Naples, Italy
• Prof. A. Gayen, Ceria-based catalytic materials, Solution combustion synthesized materials, Department of Chemistry, Jadavpur University, Kolkata, India

TEACHING AND SUPERVISION ACTIVITIES

Supervisor or co-supervisor of 6 PhD students since 2013, and of several bachelor and master degree students.
- From AA 2022-2023: Professor, Industrial Process Safety and Environmental Protection, bachelor degree in Industrial Engineering for Environmental Sustainability, University of Udine
- From AA 2021-2022: Professor, Separation Processes, bachelor degree in Industrial Engineering for Environmental Sustainability, University of Udine
- 2020-2021: Professor, Special Chemical Technologies, master degree in Engineering for Energy and Environment, University of Udine
- From 2013-2014 to 2019-2020: Professor, Wastewater treatment processes, master degree in Engineering for Energy and Environment, University of Udine
- 2006-2007, 2008-2009, 2009-2010: Professor, Special Chemical Technologies, master degree in Management Engineering, University of Udine
- 2010-2011, 2011-2012: Professor, Environmental Chemical Engineering Principles, master degree in Environmental Engineering, University of Udine

REVIEWING ACTIVITY

Reviewer of several international journals (ACS Catalysis, Angewandte Chemie International Edition, Applied Catalysis A and B, Catalysis Science and Technology, Industrial & Engineering Chemistry Research, Journal of Catalysis, Nature Sustainability, RSC Advances, Small and many others)

PUBLICATION ACTIVITY

As of April 2023 (Scopus), author of 55 publications on peer reviewed journals, with 2289 citations and h-index 26.