

Elena Ficara, Ph.D.
Ricercatore/[Assistant Professor](#)



Politecnico di Milano

DICA (Dipartimento di Ingegneria Civile e Ambientale), sezione Ambientale
[DICA \(Department of Civil and Environmental Engineering\), Environmental Section](#)

Pzza L. da Vinci 32,
20133 Milano, Italy
tel. +39 02 2399 6407
fax. +39 02 2399 6499
Mobile: +39 347 58 36 079

EDUCATION

- PhD in Sanitary Engineering in 2001 at Politecnico di Milano with a Thesis on “pH-stat and DO-stat techniques to monitor the activated sludge process”. Tutor: Prof. Alberto Rozzi.
- Master Degree in Environmental Engineering at Politecnico di Milano, full marks (100/100) in 1997. Master thesis: “Protection of the biological nitrification process from toxic pulses in industrial wastewater” carried out at the Laboratory of Microbial Ecology, University of Ghent (B). Tutors: Prof. Alberto Rozzi, Prof. Dr. ir. Willy Verstraete.

ACADEMIC CARRIER

- Since 2015 she is Associate Professor at Politecnico di Milano, Department of Civil and Environmental Engineering
- Since 2005 she is Assistant Professor at Politecnico di Milano, Department of Hydraulics Environmental Infrastructure and Survey Engineering, Environmental Division.
- From 2001 to 2005 she worked at Politecnico di Milano as Post-Doc student.

TEACHING ACTIVITIES

- From A.Y. 2000-2001 to A.Y. 2005-2006 she served as Teaching Assistant for the following Institutional Courses at Politecnico di Milano:
 - *Sanitary Engineering I* (5 ECTS)
 - *Sanitary Engineering II* (5 ECTS)
 - *Environmental Reactor Engineering* (5 ECTS).
- From 2006-2007 to 2008-2009 she was lecturer of *Environmental Reactor Engineering* (5 ECTS).
- Since the A.Y. 2009-10 she has been lecturer of *Fundamentals of Environmental Technologies* (8 ECTS).
- Since the A.Y. 2014 she is co-lecturer of '*Environmental reactors and biological processes applied to environmental-sanitary engineering*' (5 ECTS) within the Ph.D. school in Environmental and Infrastructure Engineering - “Environmental Technologies” sub-area at Politecnico di Milano.
- Since the A.Y. 2017-18 she has been lecturer of the course “*Pollution Management*” (5 ECTS) at Politecnico di Milano
- During the last 3 years: she has tutored 2 Ph.D. theses in Sanitary Engineering, and 12 Master Theses in Environmental Engineering, she served as reviewer or as member of the examination committees of 2 Ph.D. students within the European Doctorate framework.

RESEARCH ACTIVITY

- Her research activity focuses on aerobic and anaerobic biological treatments applied to wastewaters or organic wastes, recent research topics being:
 - Optimization of biogas production from the anaerobic digestion of agro-wastes via biological process monitoring and mathematical modelling.

- Digestate treatment: the application of partial nitrification/denitrification or of the fully autotrophic pathway (partial nitrification/anammox) for cost effective nitrogen removal.
 - Improvement of anaerobic degradability of lignocellulosic materials by chemical-physical and biochemical pretreatments.
 - Improvement of the energy balance of WWTP by integration of microalgae production within the typical WWTP treatment train.
 - Microalgal culturing on wastewaters and on digestates from waste sludge or agro-wastes digestion for the simultaneous bioremediation and resource recovery.
- In the past, she has been active in the following research topics:
 - Monitoring of biochemical processes by respirometry, titrimetry, manometry and microcalorimetry.
 - Development of laboratory and field instruments and measuring protocols for the on-line and off-line monitoring of biological activities in sludge samples.
 - Evaluation of long term effects of low-dose ozonation on excess sludge reduction and biomass activity on large wastewater treatment plants treating urban and industrial wastewater.
- She was or is involved as a research participant within the following competitive projects:
 - “Integrated water recycling and emission abatement in the textile industries” EC: ENV4-CT95-0064 (1995-1998).
 - ‘EOLI- Project Efficient Operation of Urban Wastewater Treatment Plants’ 1 November 2002 - 31 October 2005.
 - COFIN2000: ‘Sviluppo di biosensori per il controllo dei processi di depurazione delle acque’
 - EC COST624: Optimal Management of Wastewater Systems (1999-2002)
 - Integrated actions ‘Italia-Spagna’ – A.F. 2003, IT1052, ‘Sviluppo ed applicazione di biosensori a titolazione per trattamenti biologici delle acque reflue, inclusi i bioreattori a membrana’
 - BRAIN Project – Biotechnologies for nitrogen reduction from digestates from agricultural digesters to promote environmental sustainability of biogas production. Funded by the Italian Ministry of agriculture and Forestry.
 - The Energy Factory, Funded by the Cariplo Foundation
 - COST action Acronym “Water20_20”, code ES1202, Title: “Conceiving Wastewater Treatment in 2020. Energetic, environmental and economic challenges (Water_2020)”, 2012/2016
 - FP7-PEOPLE-IRSES-2008: Co-advising PhD for IT Research In the Mediterranean region
 - MicroGate: Use of MICROalgae to mitigate nitrogen pollution from agricultural wastewaters (2015-2016), Funded by Cariplo Foundation, as Principal Investigator.
 - “Bio-ethanol and methane production from pretreated microalgae “BIOMETHALG”, as Principal Investigator, exchange program financed by the Galileo Program 2016, from the Italo-French University.
 - IMAP project “Integration of microalgal based processes in wastewater treatment. Using microalgae in wastewater”, Funded by Cariplo Foundation, National project on competitive call 2016-2018
 - The microalgae hub “Using microalgae to sustain the agro-food sector in the Cremona area by reducing the pollution load of agrowastewater with microalgae while producing valuable products and supporting the development of algal-based technologies and processes”, Funded by Cariplo Foundation, National project on competitive call 2016-2020
 - VADEMECUM “Valorization of agro-industrial wastes through microalgal-based biorefinery”, Funded by Cariplo Foundation, National project on competitive call 2016-2020
 - TRETILE “Treatment/valorization of industrial wastewaters. Improving the sustainability of the textile industry (ink-jet Printing) by: optimizing wastewater treatment, recovering valuable products”, Funded by Cariplo Foundation, National project on competitive call 2018-2020
 - Wast4Bioplast “Turning wastewater into valuable bioplastics: by integrating algae culturing as a sidestream process in WWTP, co-fermenting algae and waste-sludge to produce a VFA rich fermentate for PHA production, using microalgal biomass as a filler for bioplastic production”, Funded by Cariplo Foundation, National project on competitive call 2019-2021

INTERNATIONAL COLLABORATIONS

In recent years and with common papers:

- INRAe – Narbonne (F), H el ene Carr ere, JP Stejer, Jerome Harmand
- INRA – Montpellier (F), Abdellatif Barakat
- INRIA - Nice (F), Olivier Bernard
- Universit  di Girona, LEQUIA, prof. Jesus Colprim
- APESA (F), Florian Monlau
- Universitat Polit cnica de Catalunya BarcelonaTech, GEMMA, J. Garc a
- EPFL –  cole polytechnique f d rale de Lausanne, C. Holliger

OTHER INFOS

- From 2005 to 2008 she was in the Editorial Board of the ISI journal Water SA.
- Since A.Y. 2009-10 she is Environmental Engineering Socrates Departmental Coordinator.
- Co-Editor of the Water Science and Technology special issue on “Impacting the environment with innovation in wastewater treatment” of the
- Co-editor the Frontiers collection Boosting the Potential of Algae for Biomass Production, Valorisation, and Bioremediation
- She was in the Scientific Committee of:
 - the 11th IWA Conference on Instrumentation Control and Automation, ICA2013, 18-20 September 2013, Narbonne, France.
 - the 2nd IWA Specialized International Conference, ecoSTP2014 - EcoTechnologies for Wastewater Treatment, Technical, Environmental & Economic Challenges, Verona, Italy, 23-27 June 2014
 - AIDIC, Venezia, 25-28 March 2018.
 - 16th World Congress on Anaerobic Digestion - Delft 23-27 June
 - IWAAlgae2019 - Algal Technologies and Stabilization Ponds for Wastewater Treatment and Resource Recovery, Valladolid (Spain) 1-2 July, 2019
 - EcoSTP2021 - 5th International Conference on Ecotechnologies for Wastewater Treatment, Milan, Italy - June 21-25, 2021
- Member of the editorial board of technical national Journal “Ingegneria dell’Ambiente”
- Member of the International Water Association
- Member of the European Algal Biomass Association
- Elected member of the steering committee of the Italian microalgae biomass association (AISAM)

Bibliometric metrics (Scopus, 12/2021):

- h-index: 22
- Documents by author: 77
- Total citations: 1900+

Moreover, she has authored more than 100 conference papers; 12 national scientific publications; 2 National patents; 2 chapters in international books.

Milano, December 2021