

CV SINTETICO

PERSONAL INFORMATION

Family name, First name: Mattei, Maria Rosaria

Affiliation: Department of Mathematics and Applications "R. Caccioppoli", University of Naples Federico II

• CURRENT POSITION

14/10/2021 - today

Research Fellow according to art. 24, comma 3, lett. b) of Law n. 240/2010

Field: 01/A4 - Mathematical Physics

Department of Mathematics and Applications "Renato Caccioppoli",
University of Naples Federico II, Naples, Italy.

• EDUCATION

17/12/2014

Joint PhD Degree in *Environmental Technologies*

Erasmus Mundus Joint Doctorate Programme in Environmental Technology
for Contaminated Solids, Soils and Sediments (ETeCoS3)

The Joint PhD Degree has been issued by: University of Cassino and Southern
Lazio (Italy), UNESCO-IHE - Institute for Water Education (the Netherlands),
Université Paris-Est (France).

PhD Thesis: *Mathematical Modelling of Multispecies Biofilms for Wastewater
Treatment.*

• MAIN RESEARCH INTERESTS

Mathematical modelling of biological and physical processes by ordinary and partial differential equations

Free-boundary problems

Hyperbolic partial differential equations

Numerical simulations

• RESEARCH ACTIVITY AT NATIONAL AND INTERNATIONAL INSTITUTES

IN ITALY

18/12/2017 – 13/10/2021

Research Fellow according to art. 24, comma 3, lett. a) of Law n. 240/2010

Field: 01/A4 - Mathematical Physics

Department of Mathematics and Applications "Renato Caccioppoli",
University of Naples Federico II, Naples, Italy.

1/5/2015 - 17/12/2017

Post-Doctoral Research Fellow

Field: Mathematical Physics - SSD MAT/07

Research Project: Mathematical models of biofilm structure and
development

Supervisor: Prof. Berardino D'Acunto

Department of Mathematics and Applications "Renato Caccioppoli",
University of Naples Federico II, Naples, Italy.

1/11/2011 - 31/10/2014

PhD Student

Erasmus Mundus Joint Doctorate Programme in Environmental Technology
for Contaminated Solids, Soils and Sediments (ETeCoS3)

Department of Civil and Mechanical Engineering
University of Cassino and Southern Lazio (Italy)

ABROAD

Feb 2013 - Dec 2013

Visiting PhD Student

Center for Biofilm Engineering, Montana State University (USA)

April 2014 - Sep 2014

Visiting PhD Student

University Paris-Est Marne La Vallée (France)

Jan 2018 - June 2018

Visiting Researcher

Fields Institute - Research for Mathematical Sciences, Toronto, Ontario (Canada)

• **RECENT CONFERENCES AND WORKSHOPS**

SIAM/CAIMS Annual Meeting and SIAM Conference on Imaging Science (AN20/IS20), Virtual Conference - Originally scheduled in Toronto (Canada), 06-17 July 2020, Scientific communication: "Modelling the role of planktonic cells in biofilm formation and development".

XX International Conference on Waves and Stability in Continuous Media (WASCOM 2019), Maiori (Italy), 10-14 June 2019, scientific communication: "Modeling Cell Motility in Biofilms".

Organizer of the Minisymposium on "Multiscale modeling of biofilms as complex ecological systems" during the 2019 Annual Meeting and Conference of the Society for Mathematical Biology, Centre de Recherches Mathématiques (CRM), Université de Montreal, Montreal (Canada), 22-26 July 2019 (http://www.smb2019.org/index_e.php).

11th European Conference on Mathematical and Theoretical Biology (ECMTB 2018), Science Faculty of Lisbon University, Lisbon (Portugal), 23-27 July 2018, scientific communication: "A modeling and simulation study of the invasion phenomenon in biofilm reactors".

Workshop on Mathematics for Complex Microbial Systems, Fields Institute for Research in Mathematical Sciences, Toronto (Canada), 07-11 May 2018, scientific communication: "A modeling and simulation study of the invasion phenomenon in biofilm reactors".

• **COORDINATION AND PARTICIPATION IN RESEARCH PROGRAMS AND FUNDED PROJECTS**

26/07/2019 - 31/12/2020: Principal Investigator of Progetto Giovani G.N.F.M. 2019 "Modelling and analysis of complex microbial systems: application to biofilms".

01/01/2020 - today: Participation to the research activities, member of the Selection Committee, PhD Committee and Management Committee of the Marie Curie European Joint Doctorate Program in "Exploiting metal-microbe applications to expand the circular economy (M2EX)", funded by the Research Executive Agency (REA) of European Committee as part of HORIZON 2020 Program. Main Institutions involved: University of Naples Federico II, Spanish National Research Council - CSIC Sevilla, National University of Ireland, Université de Limoges, Universidade de Porto. International Coordinator: Prof. Fernando Feroso.

01/09/2019 - today: Participation to the research activities of "CEOMED - Employing circular economy approach for OFMSW management within the Mediterranean countries" funded by the Programme "European Neighbourhood Instrument – Cross-Border Cooperation in the Mediterranean Area (ENI CBC MED) 2014-2020. Main Institutions involved: University of Naples Federico II, IDENER, Spanish National Research Council - CSIC Sevilla, Democritus University of Thrace, Centro di Biotechnologie di Sfax, Università di Amman.

01/05/2018 – 31/03/2021: Participation to the research activities of "VOLAC - Valorization of OLive oil wastes for sustainable production of biocide-free Antibiofilm Compounds" (rif. pratica 2017-0977), funded as part of the joint call for integrated research on industrial biotechnologies and bioeconomy 2017 edition, implementing the collaboration agreement between the Cariplo Foundation and Innovhub. Institutions involved: University of Milan, University of Naples Federico II, C&F Energy società agricola srl.

01/01/2018 - 30/06/2018: Participation to the training and research activities of Thematic Program on "Emerging challenges in Mathematical Biology", Fields Institute for Research in Mathematical Sciences, Toronto, Ontario, Canada.

01/07/2017 - 30/06/2018: Participation to the research activities of Progetto Giovani G.N.F.M. 2017 "Analysis

of complex biological systems". Principal Investigator: Dr. Luigi Frunzo

01/06/2016 - 31/05/2017: Participation to the research activities of Progetto Giovani G.N.F.M. 2016 "Emerging behaviors and self-organization in hyperbolic reaction-diffusion systems in the biological and ecological fields". Principal Investigator: Prof. Giancarlo Consolo

01/03/2016 - 18/11/2017: Participation to the research activities of Working Group 5 (Mathematical Modeling) of COST Action ES1302 European network on "Ecological Functions of Trace Metals in Anaerobic Biotechnologies". International coordinator: Prof. Fernando G. Feroso.

- **SUPERVISION OF STUDENTS**

From 2015 Co-supervised 1 Bachelor's, 2 Master's students, and the following PhD students:

Anastasia Kostrytsia, Marie Sklodowska-Curie - ITN European Joint Doctorate ABWET (Advanced Biological Waste-to-Energy Technologies) Research Project: Microbial competition control in high rate anaerobic reactors fed with industrial wastewaters.

Bikash Chandra Maharaj, Marie Sklodowska-Curie - ITN European Joint Doctorate ABWET (Advanced Biological Waste-to-Energy Technologies) Research Project: Mathematical modelling and optimization based control of trace element dosing in anaerobic digestion of solid waste.

Daniele Bernardo Panaro, XXXIII Cycle PhD in Mathematics and Applications, University of Naples Federico II. Project title: Mathematical modeling of dry anaerobic digestion.

Alberto Tenore, XXXIII Cycle PhD in Mathematics and Applications, University of Naples Federico II. Project title: Mathematical modelling of multispecies algal biofilms for wastewater treatment.

Fabiana Russo, XXXIV Cycle PhD in Mathematics and Applications, University of Naples Federico II. Project title: Mathematical modeling of algal biofilms aimed to remove nutrients for urban wastewater treatment.

Grazia Guerriero XXXIV Cycle PhD in Mathematics and Applications, University of Naples Federico II. Project title: Mathematical modeling of the autotrophic denitrification process with biological sulfur as electron donor.

- **NATIONAL SCIENTIFIC QUALIFICATION**

Achievement of the National Scientific Qualification (ASN) as Associate Professor on 13/07/2018 for the Field 01/A4 "Mathematical Physics".

- **SCIENTIFIC ASSOCIATIONS**

2016 - today Member of the National Group for Mathematical Physics (G.N.F.M.) of INdAM.
2018 - today Member of European Society for Mathematical and Theoretical Biology (ESMTB).