Curriculum Vitae

VALENTINA MANUELA SIRACUSA

Associate Professor of Chemical Technologies
Department of Chemical Sciences, University of Catania, Italy

Date and place of birth: 9 March 1972, Catania, Italy

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Research in polymer chemistry, sustainable materials and food packaging, with expertise in gas transport, structure–property relationships, biodegradability and life cycle assessment. Academic and industrial research experience includes scientific leadership, international collaborations and university teaching.

EDUCATION

First degree in Industrial Chemistry

University: University of Catania, Italy

Award: Laurea in Industrial Chemistry, five-year Italian degree

Dates studied: 1990–1995, full-time; awarded 23 November 1995

Classification: 110/110 cum laude

Dissertation: Thermoplastic/thermosetting blends as matrices for composite materials

Doctor of Philosophy

University: University of Catania, Faculty of Engineering, Italy

Award: PhD in Polymeric Materials for Special Applications, XV cycle

Dates: 2000–2003; awarded 24 February 2003

Thesis: Synthesis and structure–property relationships of copolyesters based on aromatic acids

Postdoctoral research training

University of Bologna, Department of Applied Chemistry and Materials Science. Fellowship commencing 1 July 2005, awarded for two years. Research: Polymers for special applications: synthesis, characterisation and structure–property relationships.

Professional qualification: Qualified to practise as a chemist in Italy, May 1996

PROFESSIONAL EXPERIENCE

A Current academic appointment

Job title: Associate Professor of Chemical Foundations of Technologies

Dates: 1 December 2006–present

Employer: University of Catania, Department of Chemical Sciences

Address: Viale Andrea Doria 6, 95125 Catania, Italy

Disciplinary field: CHEM-06/A, formerly CHIM/07; group 03/CHEM-06

Description of duties

Conduct and coordinate research on polymeric materials, including renewable and biodegradable polymers, copolyesters, composites and nanocomposites. Investigate chemical structure, morphology, thermal and mechanical behaviour, gas permeability and functional performance, particularly for food packaging.

Develop research on the environmental performance of materials and processes using life cycle assessment (LCA) and carbon footprint analysis. Lead research collaborations and contracts with academic and industrial partners, plan experimental activities, interpret results and disseminate findings through scientific publications and conferences.

Lead the University of Catania research unit in PRIN 2022 TECH4PATH, investigating non-thermal technologies for the inactivation of emerging viral, bacterial and protozoan pathogens on fruit and vegetable products (2022YB8ABM; CUP E53D23011070006).

Teach Chemistry for Electronic Engineering and Food Chemistry for Food Science and Technology. Responsibilities include lectures, practical teaching, student support and examinations. Contribute to doctoral programmes and university research evaluation and governance.

B Concurrent visiting appointment and industrial research

Job title: Visiting Professor

Dates: 2006–present

Host institution: University of Bologna, Department of Agricultural and Food Sciences (DISTAL) and CIRI Agroalimentare, Cesena, Italy

Campus address: Piazza Goidanich 60, Cesena, Italy

Develop applied and industrial research on innovative, sustainable and biobased polymers for food packaging. Activities include chemical, physical, thermal, mechanical and functional characterisation; barrier properties; stability and suitability for food-contact applications; biodegradability; and environmental assessment.

Coordinate the long-standing Catania–Bologna collaboration with Professor Marco Dalla Rosa and the Cesena research group. Contribute to research agreements, industrial contracts, experimental planning and the transfer of research findings to food and packaging applications. Teach Environmental Impact Studies and Certification.

PROFESSIONAL EXPERIENCE

C Research fellow

Employer: University of Catania, Engineering

Dates: 1 June 1999–30 November 2006

Research fellowship in Chemistry and Macromolecular Materials on “Flame-retardant additives for polymeric materials”. Initial appointment: 1 June 1999–30 September 2003; renewals: 1 October 2003–30 September 2005 and 1 October 2005–30 November 2006. The fellowship ended on taking up the Associate Professor appointment.

D Postdoctoral research fellow

Host institution: University of Bologna, Department of Applied Chemistry and Materials Science

Dates: 1 July 2005–31 August 2007

Postdoctoral research on the synthesis, characterisation and structure–property relationships of polymers for special applications.

E Graduate research technician

Employer: University of Catania, Chemical Institute, Faculty of Engineering

Dates: 1 October 1996–31 October 1999

Appointed through a competitive selection for European BRITE project BE 95-1315, coordinated by Imperial Chemical Industries (ICI). Worked within an international academic and industrial consortium including DASA, CASA, Schindler, SNECMA, ETH, IVW, Aérospatiale, SAERTEX and the universities of Louvain-la-Neuve and York.

F Research contractor

Employer: University of Catania

Dates: 1 January–31 October 1996

Research under the POP 90–93 programme, in collaboration with the Sicilian Region and the Ispra Centre, on tertiary and quaternary recycling of plastic residues.

Additional early teaching and industrial training

1998/99 and 1999/2000: Contract Lecturer in Applied Chemistry Technologies, University of Catania, University Diploma in Mechanical Engineering; 50 hours of lectures and exercises per academic year, with student support and examinations.

September–December 1996: Leonardo da Vinci traineeship at Clariant, Innovation Polymer Additives, Huningue, France, supported by a SINTESI scholarship.

August 1994: Visiting Student at the ICI RUSTI research laboratory, Daresbury, United Kingdom, supported by a scholarship and hosted by Professor D. T. Clark.

PUBLISHED MATERIAL

Scientific output

Author and co-author of peer-reviewed journal articles, reviews, editorials, book chapters and encyclopedia contributions on polymer chemistry, sustainable food packaging, gas barrier properties, biodegradation and environmental assessment.

Scopus indexed output: 143 documents; h-index 42; 7,997 citations, as at October 07, 2026 (https://www-scopus-com.ezproxy.unibo.it/authid/detail.uri?authorId=6603024912)

Web of Science: 143 documents, h-index 41; 6,878 citations, as at October 07, 2026 (https://www-webofscience-com.ezproxy.unibo.it/wos/author/record/481565)

ORCID:https://orcid.org/0000-0001-9055-5082

Books and editorial contributions

Co-editor, with Nadia Lotti, Michelina Soccio and Alexey L. Iordanskii, of Polymers from Renewable Resources, MDPI. ISBN 978-3-0365-8578-9 (print); 978-3-0365-8579-6 (PDF). DOI: 10.3390/books978-3-0365-8579-6.

Contributor to Antimicrobial Food Packaging, including “Packaging Material in the Food Industry” in the 2016 edition and the 2025 second edition; and to Nanostructured Materials for Food Packaging Applications, with Nadia Lotti, on “Polymer-CNT composites for food packaging” (2024).

Author or co-author of contributions on sustainable packaging, polylactic acid in food packaging, biobased plastics, food waste as a source of packaging materials, polymer surface modification, intelligent packaging and shelf life, and LCA in the polymer sector. Publications include Elsevier reference works and Wiley-VCH volumes.

Contributor to Italian editions of chemistry textbooks, including Fondamenti di chimica by T. L. Brown, H. E. LeMay and co-authors (EdiSES), with work on the thermodynamics chapter, and Fondamenti di chimica generale by R. Chang and co-authors (McGraw-Hill Education).

OTHER DETAILS

Scientific leadership and industrial research

PRIN 2022 TECH4PATH

Scientific lead of the University of Catania research unit. Research on non-thermal treatments against emerging pathogens in fruit and vegetable products, linking food safety, technological performance and environmental assessment.

COST Action FUR4Sustain CA18220 | 2019–2023

Co-leader of Working Group 4 in the European network on furan-based chemicals and materials for sustainable development. Contributions covered applications, innovation, market diffusion, LCA and sustainability, knowledge transfer and dissemination.

Collective scientific assessment on agrifood plastics | From January 2023

Scientific coordinator in the collective assessment coordinated by DEPE/INRAE-CNRS, involving the French Ministry of Agriculture and Food, Ministry of Ecological Transition and Agency for Ecological Transition.

TEPASS | September 2010–February 2013

Scientific lead for the University of Catania in Technologies for Safe and Sustainable Food, funded by the Emilia-Romagna Region. Research on the physicochemical characterisation and biodegradability of plastic films for food shelf-life studies. Industrial partners: OROGEL, DECO Industrie, APOFRUIT Italia, INFIA and NEGRONI.

CIRI Agroalimentare and RESCAPE | May 2012–August 2013

Scientific lead for a research contract awarded by CIRI Agroalimentare, University of Bologna, under European project RESCAPE (FOOD-CT-2006-036018), WP5: innovative egg treatments to reduce bacterial contamination of egg surfaces and contents.

STMicroelectronics | January–May 2008

Scientific lead for a commissioned research collaboration on the physicochemical characterisation of technological materials used in photovoltaic panels.

ChaTGraLowS | April–June 2016

Scientific lead for a research collaboration with Dr Carlo Ingrao under FIR/2014, project C10D71. LCA and carbon footprint assessment of graphene synthesis and production technologies, including potential industrial processes.

Innovamol and Wellker | December 2017–March 2018

Scientific lead for mechanical, spectroscopic and oxygen/carbon dioxide barrier characterisation of reusable plastic containers for innovative transdermal applications.

OTHER DETAILS

Participation in funded projects and research programmes

BRIT-NEXT, September 2025–December 2027: participation in the modernisation of the B.R.I.T. research infrastructure, funded through PR FESR Sicilia 2021–2027, Action 1.1.4.

PRIN 2007 (2007YKCFWM_003): active polymer films with moisture absorbers for maintaining microbiological and sensory food quality, including environmental sustainability assessment.

Ambition Power (PON01_00700), October 2010–March 2012: research collaboration for Consorzio Catania Ricerche, with a documented commitment of 400 hours.

STI-TAM (PON02_00153_2849085): technologies for treating shipping liquid waste and protecting the marine environment. SEAPORT (PON02_00153_2939551): innovative technologies for energy and environmental sustainability in shipyards and port areas. Both within PON Research and Competitiveness 2007–2013.

FIR/2014 ChaTGraLowS (C10D71): charge transport in graphene and low-dimensional structures, modelling and simulation. Departmental Energy and Materials project, September 2017–September 2018: synthesis and characterisation of polyhedral oligomeric silsesquioxanes (POSS), including barrier properties of supporting polymer matrices.

University of Catania PIACERI, Line 2: university research collaboration. MaMeX: interdepartmental research on advanced physicochemical materials and methods for the removal of xenobiotic contaminants.

International research collaborations with scientific responsibility

Russian Federation: collaboration with Alexey L. Iordanskii, Svetlana G. Karpova and Anatoly A. Olkhov at the Semenov Institute of Chemical Physics, Emanuel Institute of Biochemical Physics and Plekhanov Russian University of Economics. Research on the synthesis, properties and technological applications of biodegradable materials produced by microorganisms.

Sweden and Iran: scientific responsibility for the University of Catania in collaborations with Kristiina Oksman, Luleå University of Technology, and Mehdi Jonoobi, University of Tehran, within an Italy–Iran–Sweden network on sustainable materials and nanocomposites.

Brazil: collaboration with Paulo José do Amaral Sobral, University of São Paulo and Food Research Center, on materials and technologies for food applications.

India: collaboration with Swarup Roy, Arushri Nehra and Deblina Biswas, School of Bioengineering and Food Technology, Shoolini University.

National Scientific Qualification

Qualified for appointment as Full Professor in Chemical Foundations of Technologies, Italian National Scientific Qualification (ASN), sector 03/B2, awarded 25 October 2018 and valid until 25 October 2030.

OTHER DETAILS

Awards and scientific recognition

Included in the Stanford/Elsevier top 2% scientist rankings reported for 2023, 2024 and 2025. Previously included among University of Catania researchers in the standardised citation-indicator database published in PLOS Biology, based on data through 2018.

ScholarGPS Highly Ranked Scholar – Lifetime, Food Packaging specialty (2024).

CARTASI CAMPUS graduation award; ENPAS merit scholarships during university studies; University of Catania merit awards and tuition exemptions; AIM scholarship for the 1996 Mario Farina school on polymer degradation and stabilisation. International training scholarships supported research at ICI and an industrial traineeship at Clariant.

Invited research evaluation

DFG, Germany (2026): international expert panel for the Priority Programme “New Recyclable Composites” (SPP 2528). FWF, Austria (2025): evaluator of “Green Superabsorbers based on Biodegradable Polyesters” within the ESPRIT programme.

EPSRC, United Kingdom (2022): evaluation of research on environmentally benign polymer packaging materials and systems. Canada Excellence Research Chairs (2022): scientific assessment of an application on innovative, environmentally sustainable (bio)polymer materials.

ANR, France: evaluation of research proposals in Materials and Processes (2016) and Bioeconomy (2021), including WASABIO. Ghent University Research Council, Belgium (2017): international evaluation in polymer materials for food packaging.

Editorial service

Editorial and advisory roles include Future Foods (Elsevier, from 2020); Discover Food (Springer Nature, from 2021), Discover Materials, Discover Molecules and Discover Polymers; Polymers and International Journal of Molecular Sciences (MDPI); Frontiers in Food Science and Technology, including Food Packaging and Preservation (from 2021); Sustainable Polymer and Energy (from 2023); and Exploration of BioMat-X (from 2023).

Additional editorial board service includes Reference Module in Food Science; Nutrition and Food Science Journal; Advances in Materials; Asian Journal of Life Sciences; American Journal of Biomedical Science & Research; Annals of Food Processing and Preservation; Journal of Coating Technology and Innovation; Journal of Biochemical Sciences; and Synthesis, Characterization and Processing of New Materials for Innovative Applications.

Invited guest editor for special issues on renewable polymers, biobased and biodegradable packaging, gas transport, polymer modification, biomedical materials, resource recovery, circular economy and LCA. Journals include Polymers, Materials, International Journal of Molecular Sciences, Sustainability, Resources, International Journal of Polymer Science, Journal of Cleaner Production and The International Journal of Life Cycle Assessment.

OTHER DETAILS

University teaching and professional training

University of Catania: Chemistry for Electrical, Electronic and Computer Engineering programmes from 2006/07, with documented leave periods. In 2024/25 and 2025/26: Chemistry for Electronic Engineering (9 ECTS, 79 hours) and Food Chemistry for Food Science and Technology (6 ECTS, 49 hours).

University of Bologna, Cesena: teaching on polymeric food-packaging materials in 2008/09; Environmental Impact Studies and Certification in 2018/19–2022/23 and 2024/25–2025/26 (4 ECTS, 40 hours: 24 lectures and 16 practical activities).

IreCOOP, Forlì: professional training from 2015 to 2024 in LCA, carbon footprint, environmental impacts of agrifood systems, packaging and circular economy. Demetra (2024): 12 hours of training on carbon footprint in industrial processes.

Amirkabir University of Technology, Tehran (March 2022): Senior Lecturer at the International Winter School of Injectable and Implantable Drug Delivery Systems; four hours in English on advances in polymer-based drug delivery systems.

Institutional and doctoral service

University of Catania: Chemical Sciences Scientific Committee (2005–2007); university research-project evaluation committee (2006–2007); University Scientific Research Committee (2006–2009); departmental executive board (2007–2008).

Doctoral faculty member in Materials and Technological Innovation for Engineering and Architecture, University of Catania (2008–2011), and in Chemical Sciences.

Member of the doctoral examination committee in Civil, Environmental and Materials Engineering, University of Bologna (from 2016).

Selected conference leadership and invited presentations

IOCPS 2025: scientific committee member, session chair and invited speaker on biobased, biodegradable, compostable and recyclable polymers. Polymer Connect 2025, Tenerife: invited keynote speaker and session chair. Polymer Connect 2024, Athens: keynote on furan-based polymers for sustainable monomaterial food packaging.

Materials 2022, Boston: oral presentation on biobased polymers derived from 2,5-furandicarboxylic acid.

Bioplastic 2016, Alicante: invited speaker presentation on sustainable bioplastics and furanoates. Additional contributions at Polymers 2024, RETASTE 2022, FWSC 2022 and SCI/AICIng 2025.

Scientific or organising committee roles: Global Summit on Material Science and Engineering, Paris (2025); Polymer Visions, Kraków (2025); International Conference on Green Chemistry and Renewable Energy, Tokyo (2023).

Professional memberships

American Chemical Society; Italian Chemical Society (from 2019); Italian Association of Chemistry for Engineering, AICIng (from 2004); Italian LCA Network (from 2018); Italian Scientific Group of Food Packaging, GSICA (2008).