Curriculum Vitae -Iulia Martina Bulai-Associate Professor (updated 9/02/2025)

Personal Information

Surname/First name	Bulai Iulia Martina
e-mail (PEC)	imbulai@uniss.it (martina.bulai@pec.it)
Nationality	Italian/Roumanian
Date of Birth	27/06/1988
Webpage	https://iuliamartinabulai.github.io

Education

FEB 2017	**Ph.D. in Mathematics**, *University of Torino*.
Supervisor	Prof. Ezio Venturino
2013	**Master of Science in Mathematics**, *University of Torino*.
Supervisor	Prof. Elena Cordero
2011	**Bachelor's degree in Mathematics**, *University of Torino*.
Supervisor	Prof. Catterina Dagnino and Paola Lamberti

Current position and previous positions

JAN 2025–present	**Associate professor In Numerical Analysis, MATH/05**, *Department of Chemical, Physical, Mathematical and Natural Sciences, University of Sassari*.
JAN 2022–DEC 2024	**Tenure-track assistant professor (Ricercatrice a tempo determinato di tipo B - SSD: MAT/05 1/01/2022-22/10/2023 , MAT/08 23/10/2023-present)**, *Department of Chemical, Physical, Mathematical and Natural Sciences, University of Sassari*.
AUG 2019–DEC 2021	**Assistant Professor in Numerical Analysis, (Ricercatrice a tempo determinato di tipo A - SSD: MAT/08)**, *Department of Mathematics, Informatics and Economics, University of Basilicata*.
MAR 2019–JUL 2019	**Post-Doc Research Fellow**, *Department of Information Engineering, University of Padova*, Department of excellence (2018 - 2022)., Title: "Next- generation modeling of wave and network properties in pancreatic islets".
Supervisor	Prof. Morten Gram Pedersen
MAR 2017–MAR 2019	**Post-Doc Research Fellow**, *Department of Information Engineering, University of Padova*, Department of excellence (2018 - 2022)., Title:"Spatiotemporal and Stochastic Simulation Studies of Calcium Channels Effects in Endocrine Cells".
Supervisor	Prof. Morten Gram Pedersen

Qualifications

JAN 2023–JAN 2034 National Scientific Qualification for Associate Professor in Numerical Analysis MAT/08 (Abilitazione Scientifica Nazionale per Professore di II fascia in MAT/08).

Research areas of interest

- Numerical methods; Software development; Approximation theory.
- Graph signal processing; Computational time-frequency analysis and applications.
- Mathematical modeling with applications to real life problems, such as: cancer, Covid-19, electrical activity and Ca+ dynamics in endocrine cells, epidemiology, ecology, eco-epidemiologi, wastewater bioremediation.
- Slow/fast bifurcation analysis; excitation waves; Geometrical singular perturbation theory (GSPT), bifurcation diagrams.

Research funding

JUN 2024 University research grant (UNISS), as member: DM 737/2021, Bando interno per la ricerca collaborativa tra Ateneo di Sassari e Ateneo di Cagliari 2024, 19.673,23 Euro. Title: "Studio di modelli nelle scienze della vita".

JAN 2024 MGR 2023 research grant, as PI: Mobilità Giovanni Ricercatori 2024, 12.300 Euro. Title: "Mathematical modeling and control theory".

JUN 2023 PRIN 2022 research grant Under 40, as PI: Progetti di Rilevante Interesse Nazionale 2023-2025, 187.500 Euro. Title: "TIme-varying signals on Graphs: REal and COmplex methods - TIGRECO".

APR 2023 University research grant (UNISS), as member: Interdisciplinary research projects, 2023-2025, 34.762,18 Euro. Title: "RIACT - RIpristino degli Ambienti Costieri con approcci Transdisciplinari".

FEB 2023 INdAM–GNCS research grant, as member: INdAM–GNCS Project 2023, 2023-2024, 6.600 Euro. Title: "Approssimazione ed integrazione multivariata con applicazioni ad equazioni integrali".

JAN 2023 Fondazione Sardegna research grant, as member: Progetti di ricerca di base dipartimentali, 2023–2024, 73.300 Euro. Title: "Sviluppo di un sistema di monitoring ambientale e di early warning per i cambiamenti climatici e possibili effetti sulla dinamica delle popolazioni".

DEC 2021 INδAM research grant, as PI: Finanziamento GNCS Giovani Ricercatori 2021–2022, 1.500 Euro. Title: "Wavelet packets approximation on graphs".

OCT 2020 INδAM research grant, as PI: Finanziamento GNCS Giovani Ricercatori 2020–2021, 1.500 Euro. Title: "Modeling Covid-19 considering asymptomatic cases and avoid contacts".

2020 RIL research grant, as PI: Ricerca di Interesse Locale 2020–2021, 958,87 Euro. Title: "Modelli matematici per il Covid-19".

2020 INdAM–GNCS research grant, as member: INdAM–GNCS Project 2020, 2020–2021, 6.400 Euro. Title: "Approssimazione multivariata ed equazioni funzionali per la modellistica numerica".

JUL 2019–DEC 2021 Research grant: RTdA Attraction and International Mobility: AIM1852570–Num. Attività 1–Linea 1, Potenza–IT.

MAR–JUL 2019 Research grant: Assegno di ricerca di tipo A, Padova–IT. Title: "Next- generation modeling of wave and network properties in pancreatic islets".

OCT 2018 INδAM research grant, as PI: Finanziamento GNCS Giovani Ricercatori 2018–2019, 1200 Euro. Title: "Fermare le onde: un analisi geometrica del modello discreto PDE di beta-cellule accoppiate".

MAR 2017–MAR 2019 Research grant: Assegno di ricerca di tipo A, Padova–IT. Title: "Spatiotemporal and Stochastic Simulation Studies of Calcium Channels Effects in Endocrine Cells".

OCT 2016 INδAM research grant: Finanziamento GNCS Giovani Ricercatori 2016–2017, 1200 Euro. Title: "Eficienza dell'immobilizzazione dei funghi su supporti di forme geometriche diverse, un modello matematico".

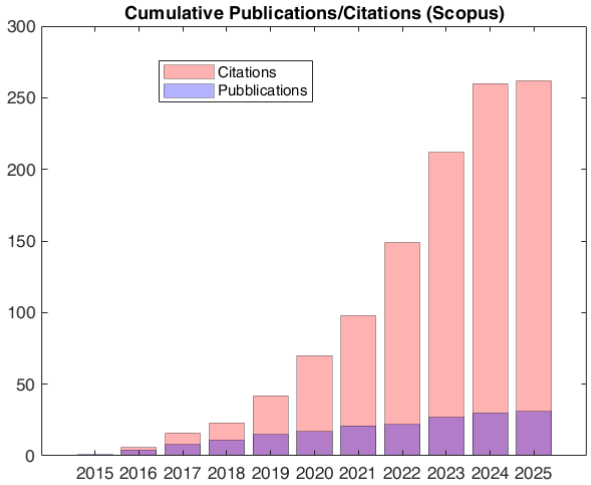
Publications

Indicators related to scientific production (updated on 25/09/2024):

-Total number of citations 263 (Scopus), 365 (Google scholar)

-H index 8 (Scopus), 10 (Google scholar)

-Publications 32 (Scopus), 42 (Google scholar)



Peer-reviewed journals

JP31 S. Bagella, I.M. Bulai, M. Malvasi, G. Orrù, A theoretical model of plant species competition: The case of invasive *Carpobrotus* sp. pl. and native Mediterranean coastal species. To appear in *Ecological Informatics,* 2025.

JP30 I.M. Bulai, M.C De Bonis, C. Laurita, Numerical solution of metastatic tumor growth models with treatment. *Applied Mathematics and Computation*, 484, 128988, 2025.

JP29 I. M. Bulai, M. Sensi, S. Sottile, A geometric analysis of the SIRS compartmental model with fast information and misinformation spreading. *Chaos, Solitons and Fractals: the interdisciplinary journal of Nonlinear Science, and Nonequilibrium and Complex Phenomena*, 185, 115104, 2024.

JP28 I. M. Bulai, A. S. Teixeira, Modeling a rehab-recovery-relapse cycle with community dependence via ODEs. *Journal of Biological Systems*, 1-18, 2024.

JP27 F. Montefusco, A. Procopio, I. M. Bulai, F. Amato and C Cosentino, Role of ultrasensitivity in biomolecular circuitry for achieving homeostasis. *Nonlinear Dynamics*, 112, 5635–5662, 2024.

JP26 F. Acotto, I. M. Bulai, E. Venturino, Prey herding and predators' feeding satiation induce multiple stability. *Communications in Nonlinear Science and Numerical Simulation*, 127, 107564, 2023.

JP25 I. M. Bulai, M. Salvia, Approximation of basins of attraction for bistable dynamical system for olive disease control. *Applied Numerical Mathematics*, 200, 138-147, 2023.

JP24 I. M. Bulai, S. Saliani, Spectral graph wavelet packets frames. *Applied and Computational Harmonic Analysis*, 66, 18-45, 2023.

JP23 I. M. Bulai, F. Montefusco, M.G. Pedersen, Stability analysis of a model of epidemic dynamics with nonlinear feedback producing recurrent infection waves. *Applied Mathematics Letters*, 136, 108455, 2022.

JP22 I.M. Bulai, M.C De Bonis, C. Laurita, V. Sagaria, MatLab Toolbox for the numerical solution of linear Volterra integral equations arising in metastatic tumor growth models. *Dolomites Research Notes on Approximation*, 15(2), 13-24, 2022.

JP21 F. Montefusco, A. Procopio, I.M. Bulai, F. Amato, M.G. Pedersen and C. Cosentino, Interacting with COVID-19: How population behavior, feedback and memory shaped recurrent waves of the epidemic. *IEEE Control Systems Letters*, 7, 583-588, 2023.

JP20 I.M. Bulai, M.C De Bonis, C. Laurita, V. Sagaria, Modeling metastatic tumor evolution, numerical resolution and growth prediction. *Mathematics and Computers in Simulation*, 203, 721-740, 2023.

JP19 I.M. Bulai, E. Amico, How political choices shaped Covid connectivity: the Italian case study. *Plos One*, 16(12): e0261041, 2021.

JP18 S. Allegretti, I. M. Bulai, R. Marino, M. A. Menandro and K. Parisi. Vaccination effect conjoint to fraction of avoided contacts on a Sars-Cov-2 mathematical model. *Mathematical Modelling and Numerical Simulation with Applications*, 1(2), 56 - 66, 2021.

JP17 C. Berardo, I. M. Bulai, E. Venturino, Interactions Obtained from Basic Mechanistic Principles: Prey Herds and Predators. *Mathematics*, 9(20), 2555, 2021.

JP16 I. M. Bulai, A. C. Esteves, F. Lima, E. Venturino, A mathematical modeling approach to assess biological control of an orange tree disease. *Applied Mathematics Letters*, 118, 107140, 2021.

JP15 I. M. Bulai, S. Depickère, V. Hirata, E. Vargas Bernal, Influence of asymptomatic people on malaria transmission: a mathematical model for a low-transmission area case. *Journal of Biological Systems*, 28(1), 167-182, 2020.

JP14 I. M. Bulai, F. Hilker, Eco-epidemiological interactions with predator interference and infection. *Theor Popul Biol*, 130, 191-202, 2019.

JP13 N. Britton, I. M. Bulai, S. Saussure, N. Holst, E. Venturino, Can aphids be controlled by fungus? A mathematical model. *Applied Mathematics and Nonlinear Sciences*, 4(1), 79 - 92, 2019.

JP12 I. M. Bulai, M. G. Pedersen, Stopping waves: Geometric analysis of coupled bursters in an asymmetric excitation field. *Nonlinear Dynamics*, 96, 1927–1937, 2019.

JP11 P. Baptista, I. M. Bulai, T. Gomes, E. Venturino, Modeling the interactions among phythopatogens and phyllosphere microorganisms for the biological disease control of *Olea europaea* L.. *Mathematical Biosciences*, 308, 42-58, 2017.

JP10 P. K. Tiwari, I. M. Bulai, F. Bona, E. Venturino, A. K. Misra, Human population effects on the Ulsoor lake fish survival. *Journal of Biological Systems*, 26(4), 603–632, 2018.

JP9 I. M. Bulai, M. G. Pedersen, Hopf bifurcation analysis of the fast subsystem of a polynomial phantom burster model. *Dolomites Research Notes on Approximation*, 11(3), 3-10, 2018.

JP8 I. M. Bulai, F. Spina, G. C. Varese, E. Venturino, Waste-water bioremediation using white rot fungi: validation of a dynamical system with real data obtained in laboratory. *Mathematical Methods in the Applied Sciences*, 41, 4195–4207, 2018.

JP7 P. K. Tiwari, I. M. Bulai, A. K. Misra and E. Venturino, Modelling the direct and indirect effects of pollutants on the survival of fish in water bodies. *Journal of Biological Systems*, 25(3), 521–543, 2017.

JP6 I. M. Bulai, E. Venturino. Shape effects on herd behaviour in ecological interacting population models. *Mathematics and Computers in Simulation*, 141, 40-55, 2017.

JP5 I. M. Bulai, E. Venturino. Two mathematical models for dissolved oxygen in a lake. *Journal of Mathematical Chemistry*, 55, 1481–1504, 2017.

JP4 M. Berra, I. M. Bulai, E. Cordero and F. Nicola. Gabor Frames of Gaussian Beams for the Schrödinger equation. *Applied and Computational Harmonic Analysis*, 43(1), 94-121, 2017.

JP3 M. Righero, I. M. Bulai, M. A. Francavilla, F. Vipiana, Mirko Bercigli, A. Mori, M. Bandinelli, G. Vecchi. Hierarchical bases preconditioner to enhance convergence of the CFIE with multiscale meshes. *IEEE Antennas and Wireless Propagation Letters*, 15, 1901 - 1904, 2016.

JP2 I. M. Bulai, E. Venturino. Biodegradation of organic pollutants in a water body. *Journal of Mathematical Chemistry*, 54, 1387–1403, 2016.

JP1 I. M. Bulai, R. Cavoretto, B. Chialva, D. Duma, E. Venturino. Comparing disease-control policies for interacting wild populations. *Nonlinear Dynamics*, 79, 1881–1900, 2015.

Book Chapters

BC3 I. M. Bulai, Modeling COVID-19 Considering Asymptomatic Cases and Avoided Contacts. *Trends in Biomathematics: Modeling, Optimization and Computational Problems*, Springer International Publishing,

2021.

BC2 H. Laurie, E. Venturino, I. M. Bulai, Herding induced by encounter rate, with predator pressure influencing prey response. *Dynamical Systems in Biology and Natural Sciences*, Springer-SIMAI series, 63-93, 2019.

BC1 P. Baptista, C.Berardo, I. M. Bulai, T. Gomes, E. Venturino, Modeling the endophytic fungus *Epicoccum nigrum* action to fight the "olive knot" disease caused by *Pseudomonas savastanoi* pv. *savastanoi (Psv)* bacteria in *Olea europea* trees. *Trends in Biomathematics: Modeling, Optimization and Computational Problems*, Springer Cham, 189-207, 2018.

Conference proceedings

P8 I. M. Bulai, S. Saliani. Coefficients of Chebyshev Polynomial Approximation for Spectral Graph Wavelet Packet Kernels. *AIP Conference Proceedings,*, To appear, 2023.

P7 F. Montefusco, I. M. Bulai, Exploiting Ultrasensitivity for Biomolecular Implementation of a Control System without Error Detection. *8th IFAC Conference on Foundations of Systems Biology in Engineering*, 52, 149-155, 2019.

P6 I. M. Bulai, A.C. Esteves E. Venturino. A mathematical model for a diseased orange tree. *Proceedings of the 17th International Conference on Computational and Mathematical Methods in Science and Engineering*, 2017.

P5 I. M. Bulai, E. Venturino. Competition between algae and fungi in a lake: a mathematical model. *Proceedings of the 16th International Conference on Computational and Mathematical Methods in Science and Engineering*, 2016.

P4 I. M. Bulai, F. Spina, G. C. Varese, E. Venturino. Wastewater bioremediation using white rot fungi: validation of a dynamical system. *Biomath Communications*, 3, 1, 2016.

P3 I. M. Bulai, E. Venturino. The Beddington-De Angelis and the HTII product response functions: application to polluted ecosystems biodegradation. *AIP Conference Proceedings,* AIP Conf. Proc. 1738, 390002, 2016.

P2 I. M. Bulai, E. Venturino. A mathematical model for the biodegradation of organic pollutants in a lake. *Proceedings of the 15th International Conference on Computational and Mathematical Methods in Science and Engineering,* 2015.

P1 I. M. Bulai, B. Chialva, D. Duma, E. Venturino. Do niches help in controlling disease spread in ecoepidemic models? *Proceedings of the 2013 International Conference on Computational and Mathematical Methods in Science and Engineering*, 2013.

Submitted/Work in progress

S1 I.M. Bulai, M.C De Bonis, C. Laurita, A new MATLAB software for numerical computation of biological observables for metastatic tumor growth. (Under review)

S2 S. Allegretti, I. M. Bulai, S. Lenhart, G. Orrù, Optimal control of virotherapy in a tumor model.

WP9 I. M. Bulai, F.Gladiali, B. Pellacci, Mathematical model for proliferation, invasion and treatment of a tumor in space.

WP8 I. M. Bulai, F. Ferraresso, F.Gladiali, Optimal control of monomers and oligomers degradation in an Alzheimer's disease model.

WP7 F. Acotto, I. M. Bulai, F.Gladiali, E. Venturino, Modeling the dissolution and control of amyloid-beta plaques in Alzheimer disease.

WP6 I.M. Bulai, G. Orrù, T.J. Steger, Numerical computation of the combinatorial structure of the fundamental domain in the hyperbolic complex space.

WP5 I.M. Bulai, L.Fermo, T.J. Steger, Approximation of automorphic forms.

WP4 I. M. Bulai, J. Tabak-Sznajder, M. G. Pedersen, Bursting versus spiking: Systematic investigation of how patterns of electrical activity control local Ca2+ and hormone release.

WP3 I. M. Bulai, M. G. Pedersen, Burst of burst problem for a phantom bursting model.

WP2 F. Acotto, I. M. Bulai, M. Salvia, E. Venturino, An epidemiological mathematical model assuming non well-mixed population, an application to Covid-19.

Other works

- I. M. Bulai, M. Righero, G.Vecchi, F. Vipiana, Algorithms for the generation of MR basis using interpolant gRWG and Algorithm for cell grouping strategy. *In cooperation with the research institute ISMB, LACE group.*

Software released

2025 MPSC: Model Plant Species Competition Toolbox. Developed by Iulia Martina Bulai, Giulia Orrù. `https://github.com/IuliaMartinaBulai/MTGM_Toolbox`.

2024 MTGM: Metastatic Tumor Growth Modeling Toolbox. Developed by Iulia Martina Bulai, Maria Carmela De Bonis, Concetta Laurita. `https://github.com/IuliaMartinaBulai/MPSC_Toolbox`.

2023 VIE-Toolbox: Volterra Integral Equation Toolbox. Developed by Iulia Martina Bulai, Maria Carmela De Bonis, Concetta Laurita, Valeria Sagaria. `https://github.com/IuliaMartinaBulai/VIE_Toolbox`.

2022 SGWPT: Spectral Graph Wavelet Packet Transform Toolbox. Developed by Iulia Martina Bulai, Sandra Saliani. `https://github.com/IuliaMartinaBulai/SGWPT_Toolbox`.

Invited presentations to national and international conferences

AUG 2024 **Invited talk:** "Wavelet packets and graph signal processing" at Santaló school Data Science, Signal Processing and Harmonic Analysis, Buenos Aires-AR.

JUL 2024 **Invited contributed talk:** "Stopping waves: geometric analysis of coupled bursters" at 1st International American Mathematical Society (AMS) and Unione Matematica Italiana (UMI) Joint Meeting, Palermo-IT.

MAY 2024 **Invited talk:** "Modeling fast information and slow(er) disease spreading: a geometric analysis" at the University of Tennessee, Mathematics Department, Tennessee-USA.

APR 2024 **Invited contributed talk:** "Wavelet packets and graph signal processing" at Workshop TIGRECO 2024 "TIme-varying signals on Graphs: REal and COmplex methods", Bergamo-IT.

FEB 2024 **Invited talk:** "Building Professional Networks/Finding Research Collaborators" at Global Woman Breakfast Uniss (GWB 2024), Sassari-IT.

FEB 2024 **Invited contributed talk:** "Modeling fast information and slow(er) disease spreading: a geometric analysis" at 15th Conference on Dynamical Systems Applied to Biology and Natural Sciences (DSABNS 2024), Lisbona-PT.

DEC 2023 **Invited contributed talk:** "Polynomial Approximation for Spectral Graph Wavelet Packet Kernels" at Scientific toolkit for kernel-based approximation and its applications (SToK 2023), Camerino-IT.

SEP 2023 **Invited contributed talk:** "Wavelet packets and graph neuronal signal processing" at International Conference of Numerical Analysis and Applied Mathematics (ICNAAM), Crete-EL.

SEP 2023 **Invited contributed talk:** "Modeling metastatic tumor evolution, numerical resolution and growth prediction" at International Association for Mathematics and Computers in Simulations (IMACS), Roma-IT.

AUG 2023 **Two invited contributed talks:** "Bistability of a mathematical model for the control of an olive tree disease" and "Wavelet packets and graph neuronal signal processing" at Italian Society of Applied and Industrial Mathematics (SIMAI), Matera-IT.

JUL 2023 **Invited contributed talk:** "Control Metastatic Tumor Growth: from Modeling to Numerical Results" at SIAM Conference on Control and Its Applications (CT23), Philadelphia, Pennsylvania-USA.

JUL 2023 **Invited contributed talk:** "Bistability of a mathematical model for the control of an olive tree disease" at the Workshop At the interface of Agriculture, Artificial Intelligence, Mathematics and Earth Observation applications (MathAIEOapp), Bari-IT.

JUN 2023 **Invited contributed talk:** "Graph signal processing and wavelet packets" at Challenges and Advances in Numerical Analysis (CaNA), Cagliari-IT.

JUL 2022 **Invited contributed talk:** "Modeling metastatic tumor growth, numerical resolution and prediction" at Functional Analysis, Approximation Theory and Numerical Analysis, Matera-IT.

JUN 2022 **Invited contributed talk:** "Mathematical models and network approach to better understand Covid-19" at Convegno e Assemblea GNCS 2022, Montecatini Terme–IT.

JUN 2022 **Invited contributed talk:** "Covid-19 from a network perspective" at Models in Population Dynamics, Ecology and Evolution, MPDEE, Torino–IT.

SEP 2021 **Invited contributed talk:** "Modeling metastatic tumor growth, numerical resolution and prediction" at 5th Dolomites Workshop on Constructive Approximation and Applications, 2021, Virtual.

JUL 2021 **Invited contributed talk:** "Modeling Covid-19 considering asymptomatic cases and avoided contacts" at ECCOMAS Young Investigators 2021, Virtual.

OCT 2020 **Invited contributed talk:** "Geometric analysis of a phantom bursting model" at Virtual Advances in Differential Equations and Numerical Analysis, ADENA.

MAY 2020 **Invited talk:** "Validation of a dynamical system with real data applied to wastewater treatment" at Seminari Padovani di Analisi Numerica, SPAN2020, Padova–IT. **Postponed**.

FEB 2020 **Invited talk:** "Geometrical analysis of mixed-mode bursting oscillations in a multiple-timescale model" at Convegno e Assemblea GNCS 2020, Montecatini Terme–IT.

MAY 2018 **Invited talk:** "Stopping waves: geometric analysis of coupled bursters" and chair at Seminari Padovani di Analisi Numerica, SPAN2018, Padova–IT.

FEB 2018 **Invited talk:** "Competing for resources in the presence of infection: Mathematical models of foraging interference and disease transmission" at Convegno e Assemblea GNCS 2018, Montecatini Terme–IT.

DEC 2018 **Invited contributed talk:** "Interactions among phythopatogens and phyllosphere microorganisms" at International Workshop Modeling tools - Survey Meeting of the COST Action FA1405, Torino–IT.

JUN 2017 **Invited talk:** "The role of fungi in biological systems, a mathematical approach" at Cerimonia di consegna diplomi, Dottorato in Matematica XXIX ciclo, (Graduation Ceremony, Doctorate in Mathematics XXIX cycle), Torino – IT.

MAY 2017 **Invited contributed talk:** "A mathematical model for an olive tree" at 2nd International Workshop Franco-Italian Mathematical Ecology Days, Torino – IT.

International conference contributions and schools

JUN-JUL 2024 **Contributed talk:** "Control Metastatic Tumor Growth: from Modeling to Numerical Results" at Joint annual meeting of the Korean Society for Mathematical Biology and the Society for Mathematical Biology (KSMB-SMB) Seoul–KOR.

JUN 2024 **Participant** at SIAM Conference on Life Sciences (LS24) Held Jointly with Mathematics of Planet Earth (MPE24) Portland–USA.

MAY-JUN 2024 **Contributed talk:** "Control Metastatic Tumor Growth: from Modeling to Numerical Results" at International Conference on Differential Equations: Theory and Applications (ICDE), Forth Myers–USA.

MAY 2024 **Contributed talk:** "Modeling fast information and slow(er) disease spreading: a geometric analysis" at Biology and Medicine Trough Mathematics Conference (BAMM), Richmond–USA.

FEB 2024 **Participant** at Convegno e Assemblea GNCS 2024, Rimini–IT.

JUL 2023 **Contributed talk:** "Wavelet packets and graph neuronal signal processing" at the Annual Meeting of the Society for Mathematical Biology (SMB), Columbus–USA.

JUN 2023 **Poster:** "Stopping waves: geometric analysis of coupled bursters" at Dynamical Systems in the Life Sciences Conference (DSLS23), Columbus–USA.

JUN 2023 **Contributed talk:** "Modeling metastatic tumor growth, numerical resolution and prediction" at the International Conference on Approximation Theory and Application, UMI-TAA. Cetraro–IT.

MAY 2023 **Contributed talk:** "Bistability of a mathematical model for the control of an olive tree disease" at the Workshop Modellistica Socio-Epidemiologica, MSE. Napoli–IT.

FEB 2023 **Participant** at Workshop Software for Approximation, SA2023, Torino–IT.

JAN 2023 **Participant** at Approximation: Theory, Methods and Applications, ATMA2023, Padova–IT.

SEP 2022 **Contributed talk:** "Modeling metastatic tumor growth, numerical resolution and prediction" at GIMC SIMAI YOUNG 2022 Workshop, Pavia–IT.

MAR 2022 **Poster:** "Modeling Metastatic Tumor Growth, Numerical Resolution and Prediction" at SIAM Conference on Analysis of Partial Differential Equations (PD22), On-line.

FEB 2022 **Participant** at Workshop Software for Approximation, SA2022, On-line.

JAN 2022 **Participant** at Winter Workshop on Complex System, On-line.

NOV-DEC 2021 **Contributed talk:** "Graph signal processing and wavelet packets" at the 10th International Conference on Complex Networks and their Applications. On-line.

NOV 2021 **Contributed talk:** "Graph signal processing and wavelet packets" at Approximation: Theory, Methods and applications, ATMA2021, Reggio Calabria–IT.

SEP 2021 **Contributed talk:** "Graph signal processing and wavelet packets" at International Conference on Computational Harmonic Analysis, ICCHA2021, On-line.

AUG 2021 **Contributed talk:** "Stopping waves: geometric analysis of coupled bursters" at 13th International Society for Analysis its Applications and Computations (ISAAC) Congress 2021, On-line.

FEB 2021 **Contributed talk:** "A dynamical system and network approach to better understand Covid-19" at SMB Mathematical Epidemiology and Math Education Joint Workshop 2021, On-line.

FEB 2021 **Participant** at Workshop Dynamical Systems Applied to Biology and Natural Sciences, DSABNS 2021, On-line.

FEB 2021 **Participant** at Winter Workshop on Complex System, On-line.

DEC 2020 **Poster:** "Geometric analysis of a phantom bursting model" at Virtual Annual Conference on Complex Systems (ECCS or CCS).

NOV 2020 **Contributed talk:** "Modeling Covid-19 considering asymptomatic cases and avoid contacts" at Virtual 20th International Symposium on Mathematical and Computational Biology, BIOMAT.

AUG 2020 **Poster:** "Modeling Covid-19 considering asymptomatic cases and avoid contacts" at Virtual Annual Meeting of the Society for Mathematical Biology, SMB2020.

JAN 2020 **Participant** at Winter Workshop on Complex System, Charmey–CH.

JUL 2019 **Contributed talk:** "Geometrical analysis of mixed-mode bursting oscillations in a multiple-timescale model of bursting electrical activity" at Annual Meeting of the Society for Mathematical Biology, Montreal–CAN.

MAY 2019 **Poster:** "Bursting versus spiking: Systematic investigation of how patterns of electrical activity control local Ca^{2+} and hormone release" at Quantitative Aspects of Membrane Fusion and Fission, BPS Thematic Meeting, Padova–IT.

FEB 2019 **Poster:** "Stopping waves: Geometric analysis of coupled bursters in an asymmetric excitation field" at Winter Workshop on Complex Systems, Zakopane–PL.

OCT 2018 **Poster:** "Bursting versus spiking: Systematic investigation of how patterns of electrical activity control local Ca^{2+} and hormone release" at Nanoscale mathematical modeling of synaptic transmission, calcium dynamics, transduction and cell sensing, Pisa–IT.

JUL 2018 **Contributed talk:** "Stopping waves: geometric analysis of coupled bursters in an asymmetric excitation field" and chair at Annual Meeting of the Society for Mathematical Biology and the Japanese Society for Mathematical Biology, Sydney–AU.

JUN 2018 **Participant** at Joint CAMBAM/NSERC-CREATE in Complex Dynamics Summer School, McGill University, Montreal–CAN.

FEB 2018 **Contributed talk:** "A new mathematical model for pancreatic β cells: geometric analysis of coupled bursters" at Ninth Workshop Dynamical Systems Applied to Biology and Natural Sciences, DSABNS 2018, Torino – IT.

JAN-FEB 2017 **Contributed talk:** "A mathematical model for an olive tree" at Eight Workshop Dynamical Systems Applied to Biology and Natural Sciences, DSABNS 2017, Évora – PT.

NOV 2016 **Contributed talk:** "Shape effects on herd behavior in ecological interacting population models" at 1st International Workshop Franco-Italian Mathematical Ecology Days, Torino – IT.

OCT 2016 **Contributed talk:** "Fungi and wastewater bioremediation: mathematical models" at Seminari dei dottorandi, (Doctoral Student Seminars), Turin – IT.

JUL 2016 **Contributed talk:** "Competition between algae and fungi in a lake: a mathematical model" at 16th International Conference Computational and Mathematical Methods in Science and Engineering, CMMSE2016, Rota – ES.

JUN 2016 **Contributed talk:** "Waste-water bioremediation using white rot fungi: validation of a dynamical system" at International Conference on Mathematical Methods and Models in Biosciences and the School for Young Scientists, BIOMATH2016, Blagoevgrad–BU.

JAN 2016 **Participant** at School on Physics Applications in Biology, (ICTP South American Institute for Fundamental Research), San Paolo–BR.

JAN 2016 **Participant** at V Southern-Summer School on Mathematical Biology, (ICTP South American Institute for Fundamental Research), San Paolo–BR.

DEC 2015 Poster at **Welcome home**, Turin – IT.

SEP 2015 **Contributed talk:** "The Beddington-De Angelis and the HTII product response functions: application to polluted ecosystems biodegradation" at 13th International Conference Of Numerical Analysis And Applied Mathematics, ICNAAM2015, Rhodes – GR.

SEP 2015 **Participant** at CAMo: from molecules to modelling, Turin – IT.

JUL 2015 **Contributed talk:** "A mathematical model for the biodegradation of organic pollutants in a lake" at 15th International Conference Computational and Mathematical Methods in Science and Engineering, CMMSE2015, Rota – ES.

NOV 2014 **Contributed talk:** "Shape effects on herd behavior in ecological interacting population models" at Seminari dei dottorandi, (Doctoral Student Seminars), Turin – IT.

OCT 2014 **Participant** at Computational Harmonic Analysis - with Applications to Signal and Image Processing School, (CIRM), Marsiglia – FR.

JUN 2014 **Participant** at Strobl14: Modern time-frequency analysis, Strobl – AT.

Teaching activities

Undergraduate students' supervision

2022 Martina Salvia, thesis title: "An epidemiological mathematical model assuming non well-mixed population, an application to Covid-19", University of Basilicata.

2022 Stefania Allegretti, thesis title: "Modeling oncolytic virotherapy", University of Basilicata.

Scientific advisor scholarships

15 APR-14 OCT 2024 Scientific advisor of a post graduate scholarship: "Mathematical modeling and analysis of biological systems" on the projects FAR2020MONTEFUSCOF and FAR2020STEGERT. Giulia Orrù, University of Sassari.

1 AUG 2023-31 MAR 2024 Scientific advisor of a post graduate scholarship: "Study of mathematical models for population dynamics and biodiversity distribution" on the project FDS2223Bagella. Giulia Orrù, University of Sassari.

1 MAY-30 SEP 2022 Scientific advisor of a post graduate scholarship: "Studio di modelli epidemiologici caratterizzati da classi non omogenee con applicazione a Covid-19" on the project FAR2019BELLAZZINI. Martina Salvia, University of Sassari.

Member of degree committees

2020/2021 Member of degree committee in Mathematics, University of Basilicata.

2019/2020 Member of degree committee in Mathematics, University of Basilicata.

Teaching

2024/2025 Professor (titolare del corso) for training courses for school teaching class A28: **Didattica della matematica**: la costruzione del ragionamento matematico e fondamenti matematici, 3CFU, 18h. University of Sassari.

2024/2025 Professor (titolare del corso) for bachelor in CTF (Chimica e Tecnologia Farmaceutica): **Mathematics** (Matematica con elementi di statistica), 6CFU, 57h. University of Sassari.

2023/2024 Module in the **Introduction to Scientific Research Course for PhD**, (Corso di Avviamento alla ricerca scientifica per PhD) University of Sassari.

2023/2024 Professor (titolare del corso) for bachelor in CTF (Chimica e Tecnologia Farmaceutica): **Mathematics** (Matematica con elementi di statistica), 6CFU, 57h. University of Sassari.

2022/2023 Professor (titolare del corso) for bachelor in CTF (Chimica e Tecnologia Farmaceutica): **Mathematics** (Matematica con elementi di statistica), 7CFU, 56h. University of Sassari.

2021/2022 Professor (titolare del corso) for bachelor in Pharmacy: **Mathematics** (Matematica con elementi di informatica e statistica), 7CFU, 56h. University of Sassari.

2020/2021 Professor (titolare del corso) for bachelor in mathematics: **Complements of Scientific Computing** (Complementi di calcolo scientifico), 6CFU, 56h. University of Basilicata.

2019/2020 Professor (titolare del corso) for bachelor in mathematics: **Complements of Scientific Computing** (Complementi di calcolo scientifico), 6CFU, 56h. University of Basilicata.

2016/2017 Teaching assistant (professore a contratto) for bachelor in engineering: **Analysis 1**, 6CFU of 12 CFU, 50h. Politecnico di Torino.

2015/2016 Teaching assistant for bachelor in agrarian: **Mathematics**. University of Torino.

Training courses

2023 Faculty development course (as student). Teaching training project for University of Sassari researchers (4 modules 6h each).

Self-governance

Member of committees in selection procedures

2024 Member of the committee for the admission for the educational path of class A28, University of Sassari. Bando D.R.n.1863/2024, Prot.n. 61718, 18/06/2024.

2024 President of the committee for the assignment of a postdoc research grant in Mathematical Analysis (MAT/05), University of Sassari. Also as scientific advisor. Bando D.D.n. 162/2024, Prot.n. 772, 11/06/2024.

2024 President of the committee for the assignment of one scholarship, University of Sassari. Also as scientific advisor. Bando D.D.n.62/2024, Prot.n. 322, 22/03/2024.

2023 President of the committee for the assignment of a postdoc research grant in Numerical Analysis (MAT/08), University of Sassari. Also as scientific advisor. Bando D.D.n. 312/2023, Prot.n. 1677, 1/12/2023.

2023 Member of the committee for the assignment of teaching tutoring activities, University of Sassari. Bando D.D.n. 175/2023, Prot. n. 1104, 31/07/2023.

2023 Member of the committee for the assignment of teaching tutoring activities, University of Sassari. Bando D.D.n. 2213/20223, Prot. n. 79996, 19/07/2023.

2023 President of the committee for the assignment of one scholarship, University of Sassari. Also as scientific advisor. Bando D.D.n. 112/2023, Prot.n. 824, 16/06/2023.

2022 President of the committee for the assignment of one scholarship, University of Sassari. Also as scientific advisor. Bando D.D.n. 109/2022, Prot.n. 689, 3/05/2022.

Institutional roles

2024-present Member of Departmental Committee of Third Mission.

2023-present Member of Teacher training courses A28 (as second teacher).

Commission of trust

Assignments for scientific journals

Scientific Journal Referee: Nonlinear Dynamics; Advances in Difference Equations; BioSystems; Mathematics and Computers in Simulation; Biometrical Journal; Applied Mathematics and Computation; Fractal and Fractional; IFAC-PapersOnLine; Mathematics; International Journal of Environmental Research and Public Health; Chaos, Solitons and Fractals; Applied Numerical Mathematics; Letters in Biomathematics; International Journal of Modeling, Simulation, and Scientific Computing; Letters in Biomathematics; Annali dell'Università di Ferrara; Symmetry; Mathematical Modelling and Numerical Simulation with Applications; Journal of Biological Systems; Plos One; Mathematics and Computers in Simulation; Dolomites Research Notes on Approximation; PLOS Complex Systems; IEEE Control Systems Letters.

2022-present **Editorial board member** of Mathematical Modelling and Numerical Simulation with Applications (MMNSA).

2022-present **Editorial board member** of Frontiers in Complex Systems, Multi and cross disciplinary complexity.

2023-present **Review Editor** for Plos Complex Systems.

OCT 2024-DEC 2025 **Guest editor** for the SI "NAMAS - Numerical Analysis & Modelling in Applied Sciences" of the Journal of Approximation Software.

OCT 2024-DEC 2025 **Guest editor** for the SI "NAMAS - Numerical Analysis & Modelling in Applied Sciences" of the Journal of Computational and Applied Mathematics.

OCT 2024-DEC 2025 **Guest editor** for the SI "Numerical Analysis & Modelling in the Life Sciences: A topical collection in honor of the 70th birthday of Ezio Venturino" of the Journal of Mathematical Biology.

2024-present **Journal manager** for Journal of Approximation Software.

Assignments in research societies

2020-2023, 2023-2026 **Elected council member** of Complex System Society for two mandates of three years each.

2020-2023, 2023-2026 **Elected member of the Steering Committee** for Conference on Complex Systems, CCS, for two mandates of three years each.

Other assignments

2021, 2022 **Program Committee** for the International Conference on Complex Networks and their Applications.

2025 **Program Committee** for the International School and Conference on Network Science 2025.

2022, 2023, 2024 **Program Committee** for the Conference on Complex Systems.

MAR 2022-present **Scientific evaluator** for the Register of Expert Peer Reviewers for Italian Scientific Evaluation (RePRISE)- 1 project evaluated.

2024 **Program Committee** for the Conference NetSci-X.

JUL 2024-present **Scientific evaluator** for the International expert panels of Slovak Research and development agency (SRDA).

2024 **Scientific committee** for the conference "NAMAS - Numerical Analysis & Modelling in Applied Sciences".

Memberships of scientific societies and groups

2024–present Member of Artificial Intelligence and Machine Learning UMI Subgroup, AI-ML.

2023–present Member of Society for Industrial and Applied Mathematics, SIAM. Activity groups: Control and System Theory, Life Sciences, Mathematics of Planet Earth.

2022–present Member of Approssimazione Numerica ed Analitica di dati e di Funzioni con Applicazioni SIMAI Subgroup, ANA&A.

2021–present Member of Modellistica Socio-Epidemiologica UMI Subgroup, MSE.

2020–present Member of Mathematical Epidemiology SMB Subgroup.

2020–present Member of Mathematical Neuroscience SMB Subgroup.

2020–present Member of Mathematical Oncology SMB Subgroup.

2020–present Member of Teoria dell'Approssimazione e Applicazioni UMI Subgroup, T.A.A.

2020–present Member of Unione Matematica Italiana, UMI

2020–present Member of Società Italiana di Matematica Applicata e Industriale, SIMAI.

2019–present Member of Research ITalian network on Approximation, RITA.

2019–present	Member of European Women in Mathematics, EWM.
2019–present	Member of Complex Systems Society, CCS.
2019	Member of Biophysical Society, BPS.
2016–present	Member of Society for Mathematical Biology, SMB.
2016–present	Member of Gruppo Nazionale per il Calcolo Scientifico, GNCS-INδAM.
2013–2015	Member of Gruppo Nazionale per l'Analisi Matematica, la Probabilità e le loro Applicazioni, GNAMPA-INδAM.

Mobility

4 MAY- 16 JUN 2024	Department of Mathematics, University of Tennessee, Prof. Suzanne Lenhart guest's. Knoxville-USA.
20-25 SEP 2021	Department of Mathematics and Computer Science, University of Cagliari, Prof. Luisa Fermo guest's. Cagliari- IT.
1 OCT 2020- 31 MAR 2021	Medical Image Processing Lab. The lab is jointly between École polytechnique fédérale de Lausanne (EPFL) and the University of Geneva. OCT in presence and NOV-MAR in smart working. Prof Dimitri Van De Ville guest's. Geneva- CH.
22-28 JAN 2017	Institute of Environmental Systems Research, University of Osnabrück, Prof. Frank Hilker guest's. Osnabrück-DE.
1 AUG- 30 SEP 2016	Institute of Environmental Systems Research, University of Osnabrück, Prof. Frank Hilker guest's. Osnabrück-DE.
1 SEP- 31 MAR 2015	Istituto Superiore Mario Boella (ISMB). Laboratory for Antennas and Electromagnetic Compatibility (LACE), Turin-IT.
1 FEB- 31 MAR 2014	Numerical Harmonic Analysis Group (NuHAG). University of Vienna, Prof. Hans Georg Feichtinger guest's. Vienna-AT.

Invited guests

24-26 MAR 2024	Prof. Luisa Fermo, University of Cagliari, Italy.
2-7 APR 2021	Prof. Ezio Venturino, University of Torino, Italy.
2-13 APR 2021	Dott. Francesca Acotto, University of Torino, Italy.

Major collaborations

S. Lenhart, (Optimal control theory, University of Tennessee, US), F. Acotto and E. Venturino, (Mathematical modelling, University of Torino, IT), S. Saliani (Graph signal processing and harmonic analysis, Parthenope University, IT), M.C. De Bonis, C. Laurita, V. Sagaria (Numerical analysis, University of Basilicata, IT), S. Bagella, F. Ferraresso, F.Gladiali, G. Orrù and M. Malavasi (Modeling and applications, University of Sassari, IT), M. Salvia (Modeling and approximation, University of Basilicata, IT), S. Allegretti (Modeling, University of Basilicata, IT), M. Sensi (Fast-slow analysis, Technical University of Torino, IT), S. Sottile (Fast-slow analysis, University of Bologna, IT), M. G. Pedersen, (Mathematical modelling of cellular processes, University of Padova, IT), C. Berardo (Mathematical modelling, University of Helsinki, IT), E. Amico (Network neuroscience, EPFL, CH).

P. Baptista and T. Gomes (Biology, Polytechnic Institute of Braganca, PT), H. Laurie (Mathematical ecology, University of Cape Town, South Africa), P. K. Tiwari (Mathematical modelling, Kolkata University, India), A. K. Misra (Mathematical modelling, Banaras Hindu University, India) F. Montefusco (Control Systems Engineering, Parthenope University of Naples, IT), F. Spina and G. C. Varese (environmental biotechnology, University of Torino, IT), F. Hilker (Modelling environmental and ecological systems, Osnabrück University, DE), A.S. Teixeira (Complex systems, University of Lisbon, PT), T. Steger (Fake planes, University of Sassari, IT), L. Fermo (Approximation theory, University of Cagliari, IT).

Organization of scientific meetings

Conferences

SEP 2024 **Organizer** of conference "Modelli nelle scienze della vita", Cagliari – IT. `https://web.unica.it/unica/page/it/antonio_greco_avs_modelli_nelle_scienze_della_vita`

SEP 2024 **Organizer** of conference "Numerical Analysis & Modelling in Applied Sciences" (NAMAS-2024), Gaeta – IT. `https://sites.google.com/view/namas-24/home`

OCT 2023 **Organizer** of conference "Chiaccherate nonlineari", Alghero – IT. `https://sites.google.com/view/chiaccheratenonlineari2023/home-page`

SEP 2015 **Co-organizer** of conference CAMo: from molecules to modeling, Turin – IT.

Workshops

APR 2023 **Organizer** of workshop PRIN 2022: Time-varying signals on graphs: real and complex methods – TIGRECO, Bergamo – IT. `https://sites.google.com/view/tigreco/workshop-2024`

NOV 2016 **Co-organizer** of 1st International Workshop Franco-Italian Mathematical Ecology Days, Turin – IT.

Minisymposia

SEP 2024 **Minisymposia co-organizer:** "Mathematical imaging and signal processing" at Dolomites Workshop on Constructive Approximation and Applications (DWCAA) Alba di Canazei – IT. `https://sites.google.com/view/dwcaa24/home-page`

Awards and grants

Awards

JUN 2021 Team first classified (me as PI) to the PROPOSAL GAMIFICATION DAY of the workshop Think tank on Scientific Computing and funding opportunities, Camerino 18-19 June 2021.

JUN 2016 Best Student Presentation Award at BIOMATH 2016 and the School for Young Scientists, Blagoevgrad–BU.

Grants

2020 SNSF grant: Travel Grant 2020, 200 CHF.

2019 SMB grant: Landahl-Busenberg Travel Grants 2019, 500 USD.

JUL 2018 SMB grant: Landahl Travel Grants 2018, 750 USD.

JUN 2018 Financial support to participate at 2018 Joint CAMBAM/NSERC-CREATE in Complex Dynamics Summer School, Montreal–CAN.

JUN 2016 SMB grant: SMB Financial Aid Grant BIOMATH 2016.

JAN 2016 Financial support to participate at V Southern-Summer School on Mathematical Biology and School on Physics Applications in Biology, San Paolo–BR.

JUL–SEP 2016 Erasmus Plus Traineeship grant, University of Osnabrück, Germany.

2014–2017 Three–year Ph.D scholarship sponsored by the University of Torino.

2008-2013 Scholarship sponsored by Edisu.

Third mission

2023 **Article in SIAM News Blogs**. Title: "Model Represents Metastatic Tumor Growth to Explore Treatments". https://www.siam.org/publications/siam-news/articles/model-represents-metastatic-tumor-growth-to-explore-treatments

2020 **Article in MaddMaths! MAtematica Divulgazione Didattica.** Title: "I modelli matematici, strumenti potenti ai tempi della pandemia Covid-19". https://maddmaths.simai.eu/divulgazione/i-modelli-matematici-strumenti-potenti-ai-tempi-della-pandemia-covid-19/

2020 **Article in European Women in Mathematics (EWM) Newsletter 34**. Title: "Modelling, a powerful tool in the time of the COVID-19 pandemic". https://www.europeanwomeninmaths.org/bulai-modelling/

2019 **Press article in La Republica, Napoli**. https://napoli.repubblica.it/cronaca/2019/08/01/news/potenza_all_universita_venti_nuovi_ricercatori-232542615/

2019 **Interview TGR Basilicata**. https://www.youtube.com/watch?v=MNfgtk_uvAY

2014 **Interview "Matematica - TRACKS Notte dei Ricercatori"**. https://www.youtube.com/watch?v=P6SvvXyGPTU

2014 **Researchers' Night** in Torino, an European level popularization of science event.

Research experience

First time I approached research was during my master studies at the University of Torino when from a project assigned to my team we published a paper in a high impact journal, Nonlinear Dynamics. In the first years of the doctoral program, I focused on a couple of different research topics, in analysis and applied mathematics. I finally decided to draft my thesis in mathematical biology. I have finished the degree with good and substantial scientific achievements. We have considered a few problems of common interest, and I have been quite responsive, really performing a very sizeable amount of work, leading to some interesting results. Two have been published in JMC, the others in Mathematics and Computers in Simulation, J of Biological Systems, Mathematical Methods in the Applied Sciences. I also published several other works, joint with other international coauthors. Overall, my research output to date amounts to thirty published papers in international high-level journals, three book chapters and eight conference proceedings, who altogether received more than 250 citations (Scopus), significantly increased the last three year. In the past years, when in Torino, I was actively taken part in our weekly doctoral seminar, presenting my achievements on my research topics, and illustrating some relevant papers in the current literature. I would like to point out also that in the years elapsed from achieving the doctorate, I have already taken part in more than fifty international conferences, with active contributions in the most part of them and some invited contributions (twenty-four). I also have been awarded a few travel grants for taking part in these events and rewarded for the best student presentation at BIOMATH2016. I had the chance to be part of the organizing committee of eight international events.

I have demonstrated to be willing to travel to make new experiences already during the doctoral program, starting my PhD with a two months visiting at the Prof. H. G. Feichtinger lab (NuHAG). Notable is the one-month-long stay in Sao Paulo, Brazil, in January 2016, taking part in two international schools in modeling, where I could work in an interdisciplinary team of young researchers and later publish our result in J of Biological Systems. I have also visiting for two months, under the Erasmus program, the University of Osnabrück in the summer 2016, and establishing scientific ties there, as well as a number of other Institutions in the following years such as a six months visiting at EPFL (both in presence and smart-working) in Prof. Dimitri Van De Ville's lab and a one month visiting Prof. Suzanne Lenhart at the University of Tennessee. From the above cited experiences I learned how important interdisciplinary work is. I gained much from all these experiences and shown that I am willing to work hard to achieve my goals. One of the goals for my future career is to be able to lead an interdisciplinary research group.

In my PhD thesis, under the supervision of Prof. E. Venturino, I have mainly considered a number of problems in mathematical biology. The first part of the thesis is concerned with biological wastewater bioremediation using fungi. I formulated and studied the biodegradation of pollutants in water bodies. The second part of the dissertation considers problems in ecology, for interacting populations. An application concerns the disease caused by pathogenic fungi on an olive tree. All the models introduced are new. My contributions concern the mathematical assessment of the features of the models, equilibria and their stability and bifurcation diagrams. I also contributed in a decisive way to the formulation of the model for general interacting populations, behaving in herds. The quality of the thesis is good, and I have had an original idea in one of the models in consideration. My background is strong. Together with my supervisor we have further collaborated on a model for the use of fungi for water purification, in collaboration with biologists' colleagues in Torino, and later in a few other papers in mathematical ecology, some of them related on the populations' herd behavior.

In the postdoctoral experience, I have spent time at the University of Padua, in the Prof. MG. Pedersen's group, shifting my interests to a new field, on mathematical modeling of subcellular and cellular systems responsible for hormone secretion. I was quite quick in learning the biological and mathematical background needed for the modeling and analytical studies. In a few months I adapted and performed appropriate analysis of existing models with tools from dynamical systems theory, which provided the insight that allowed me to produce a modified, biophysically realistic model of beta-cells that behave much more like experimentally observed results. This work is published in Nonlinear Dynamics. Another project I worked on during my stay at University of Padua is about explaining the "burst-of-burst" phenomenon (Mixed-Mode Bursting Oscillations solutions) through the canard phenomenon. I have also worked on a bioengineering project, where I have analysed the main difference between bursting and spiking in terms of Ca2+ release. Further, I have continued the active participation in international conferences, also in the organizational aspects, especially the annual SMB meeting, where I have presented my own results. Exploiting these possibilities, I also developed a large number of international scientific collaborations.

I also had a Research Assistant Professor position in the University of Basilicata, in Potenza, on a specific research project, where I have started two new collaborations. One with the numeric group about reformulating a Partial Differential Equations metastatic tumor growth model in a Volterra Integral Equation of the second type and its numerical resolution. And a second one, with Sandra Saliani, we have been the first ones introducing the spectral graph wavelet packet on graphs for a single data point in the same fashion as for classical wavelet packet transform.

Now I have a tenure track position at the University of Sassari where I continue to collaborate with the colleagues from the previous institutions, but I have also gained my independence in choosing the research problems, on which work on and also my own network of collaborators/students. Overall, I am a person with whom it is easy to collaborate, highly active and responsive to needs that may arise. I am positive that I will be a good researcher, making good contributions in science in the future.

Other skills

- Use of mathematical software Matlab, Maple, Xppaut, Calc, Latex, Mathematica, GeoGebra, GiD.
- B italian driving licence, climbing, amateur dancing.

Languages written and spoken

Romanian	Mother tongue	
Italian	Advanced	*self-assessed european level C2.*
English	Advanced	*self-assessed european level C1.*
French	Basic	*self-assessed european level A2.*