europass Curriculum vitae

PERSONAL INFORMATION

Elisa Iacomini

Department of Mathematics and Computer Science, University of Ferrara

+39 3493684468

elisa.iacomini@unife.it

docente.unife.it/elisa.iacomini researchgate.net/profile/Elisa-Iacomini

ORCID 0000-0002-0981-2086

Gender F | Nationality Italian

EDUCATION

01/11/2016 – 31/10/2019 PhD in Mathematical models for Engineering, Electromagnetics and Nanosciences

At: Department of Basic and Applied Sciences for Engineering (SBAI), Sapienza University of Rome

Thesis title: *Mathematical Models and Methods for Traffic Flow and Stop & Go waves*

Supervisors: Prof. Fabio Camilli and Dr. Emiliano Cristiani

Thesis defense: 10/02/2020

Final evauation: Optimum (Ottimo)

10/2013 – 20/07/2016 Master in Applied Mathematics

at: Department of Mathematics, Sapienza University of Rome

Thesis title: *A numerical approach to uncertainty quantification for vehicular traffic models on large networks (original language: Un approccio numerico alla quantificazione dell'incertezza per modelli di traffico veicolare su grandi reti)*

Supervisors: Prof. Maurizio Falcone and Dr. Emiliano Cristiani

Thesis defense: 20/07/2016

Grade: 110/110 cum laude

09/2010 – 29/10/2013 Bachelor in Mathematics

At: Department of Mathematics, Sapienza University of Rome

Thesis title: *Some optimization methods for multiobjective problems (original language: Alcuni metodi di ottimizzazione per problemi multiobiettivo)*

Supervisor: Prof. Maurizio Falcone

Thesis defense: 29/10/2013

Grade: 108/110

09/2005 – 07/2010 Scientific high school diploma

At: Liceo Scientifico Statale P. Ruffini, Viterbo

Final grade: 100/100 cum laude

ACADEMIC POSITIONS

01/01/2023 – present Junior Assistant Professor (RTDa) at University of Ferrara

At: Department of Mathematics and Computer Science, University of Ferrara, Italy

Research project: *National Centre for HPC, Big Data and Quantum Computing*

Research group of: Prof. Lorenzo Pareschi
Scientific area: Numerical analysis (MAT/08)

01/07/2020 – 31/12/2022 **Post-Doc at RWTH Aachen**

At: Institute of Geometry and Applied Mathematics (IGPM), RWTH Aachen, Germany
Research project: *Cluster of Excellence Internet of Production*
Research topic: Numerical methods for uncertainty quantification for hyperbolic conservation laws and filtering methods for parameter identification problems.
Research group of: Prof. Michael Herty
Scientific area: Numerical analysis (MAT/08)

01/01/2020 – 30/06/2020 **Post-Doc at University of Mannheim**

At: Scientific Computing Research Group (SciCom), School of Business Informatics and Mathematics, University of Mannheim, Germany
Research topic: Numerical methods for hyperbolic time-delayed conservation laws with applications to vehicular traffic models.
Research group of: Prof. Simone Göttlich
Scientific area: Numerical analysis (MAT/08)

VISITING PERIODS

26/08/2024 – 28/08/2024 **Visiting at KIT**

At: Group of Scientific Calculus, Karlsruhe Institute of Technology, KIT (Germany)
Research topic: Non intrusive methods for uncertainty quantification.
Research group of: Prof. Martin Frank

06/08/2024 – 09/08/2024 **Visiting at RWTH Aachen**

At: Eddy group, RWTH Aachen (Germany)
Research topic: Development of particle methods for parameters identification and uncertainty quantification.
Research group: Research Training Group Energy, Entropy e Dissipative Dynamics (EDDY)

09/07/2023 – 15/07/2023 **Visiting at RWTH Aachen**

At: RWTH Aachen (Germany)
Research topic: Development of particle methods for inverse problems and parameter identification.
Research group of: Prof. Michael Herty

01/10/2018 – 2/12/2018 **Ph.D. visiting period**

At: Scientific Computing Research Group (SciCom), School of Business Informatics and Mathematics, University of Mannheim, Germany
Research topic: Development of numerical methods for hyperbolic equations with delay.
Fundings *Fellowship Ipid4all* by the German Federal Ministry of Education and Research.
Research group of: Prof. Simone Göttlich

TEACHING ACTIVITY

19/09/2024 – 17/12/2024 **Lecturer of a Master course**

At: Department of Mathematics and Computer Science, University of Ferrara, Italy
Course: *Stochastic optimization methods* for the Master's degree program in Artificial Intelligence, Data Science and Big Data (40 hours – 5 ETCS)

19/09/2024 – 17/12/2024 **Lecturer of a Bachelor course**

At: Department of Mathematics and Computer Science, University of Ferrara, Italy

Course: *Numerical Calculus* for the Bachelor's degree program in Computer Science (8 hours – 1 ETCS)

17/06/2024 – 26/06/2024 **Lecturer of PhD course**

At: Department of Mathematics and Computer Science, University of Ferrara, Italy

Course: *An introduction to uncertainty quantification for PDEs* for the doctoral program in Mathematics at the Universities of Ferrara, Modena-Reggio Emilia and Parma (5 hours – 2 ETCS)

28/02/2024 – 07/06/2024 **Lecturer of a Master course**

At: Department of Mathematics and Computer Science, University of Ferrara, Italy

Course: *Foundations of Data Science* for the Master's degree program in Artificial Intelligence, Data Science and Big Data (24 hours – 3 ETCS)

28/02/2024 – 07/06/2024 **Lecturer of a Bachelor course**

At: Department of Mathematics and Computer Science, University of Ferrara, Italy

Course: *Numerical Analysis 2* for the bachelor's degree program in Mathematics (10 hours – 1 ETCS)

25/09/2023 – 22/12/2023 **Lecturer of a Master course**

At: Department of Mathematics and Computer Science, University of Ferrara, Italy

Course: *Numerical optimization and applications to data processing* for the Master's degree program in Mathematics (8 hours – 1 ETCS)

07/02/2022 – 16/02/2022 **Lecturer of a PhD course**

Presso: Department of Basic and Applied Sciences for Engineering (SBAI), Sapienza University of Rome, Italy

Course: *An introduction to hyperbolic conservation laws and applications* for the PhD program in Mathematical models for Engineering, Electromagnetics and Nanosciences, and Mathematics of Sapienza University of Rome (10 hours – 3 ETCS)

10/2022 – 01/2023 **Tutor of a Master course**

At: Institute of Geometry and Applied Mathematics (IGPM), RWTH Aachen, Germany

Course: Exercise class for *Continuous optimization* for the Master's degree program in Mathematics (26 hours)

04/2021 – 07/2021 **Tutor of a Master course**

At: Institute of Geometry and Applied Mathematics (IGPM), RWTH Aachen, Germany

Course: Exercise class for *Nonlinear optimization* for the Master's degree program in Mathematics (26 hours)

12/02/2020 – 10/06/2020 **Lecturer of a Master course**

At: Scientific Computing Research Group (SciCom), School of Business Informatics and Mathematics, University of Mannheim, Germany

Course: *Numerik Partieller Differentialgleichunge (Numerics for partial differential equations)* for the Master's degree program in Mathematics (50 hours – 8 ETCS)

09/2017 – 12/2019 **Tutor of a Bachelor course**

At: Department of Civil and Industrial Engineering, Sapienza University of Rome

Course: Exercise class for *Analysis 1* for the Bachelor's degree program in Chemical Engineering (30 hours per year)

09/2019 – 12/2019 **Tutor of a Bachelor course**

Presso: Department of Information Engineering, Electronics and Telecommunications, Sapienza University of Rome

Course: Exercise class for *Analysis 1* for the Bachelor's degree program in Communications Engineering and Electronics (30 hours)

02/2019 – 06/2019 **Tutor of a Bachelor course**

At: Department of Economics, Sapienza University of Rome, Latina campus

Course: Exercise class for *Mathematics* for the Bachelor's degree program in Economics (30 hours)

09/2018 **Contract Lecturer**

At: Department of Civil and Industrial Engineering, Sapienza University of Rome

Course: *Precourses in Mathematics* for the Bachelor's degree programs in Engineering (30 hours)

09/2017 – 12/2017 **Tutor of a Bachelor course**

Presso: Department of Information Engineering, Electronics and Telecommunications, Sapienza University of Rome

Course: Exercise class for *Analysis 1* for the Bachelor's degree program in Computer Engineering (30 hours)

OTHER TEACHING ACTIVITIES

06/2024 **Stage of Mathematics**

At: Department of Mathematics and Computer Science, University of Ferrara, Italy

Topic: Seminar entitled *"Math on the Road"* to students in the fourth grades of high schools to introduce the math degree program.

02/2024 **Mathematics Olympiad**

At: Department of Mathematics and Computer Science, University of Ferrara, Italy

Topic: Math Olympiad training for high schools' classes with Liceo Scientifico A. Roiti of Ferrara and P. Paleocapa of Rovigo (4 hours)

07/2022 **Instructor at ECMI Modelling week**

At: University of Verona

Topic: Impact of stop and go waves in vehicular traffic

04/2022 – 06/2022 **Seminars Supervision**

At: Institute of Geometry and Applied Mathematics (IGPM), RWTH Aachen, Germany

Topic: Nonlinear Optimization

PUBLICATIONS

Peer-Reviewed Papers

1. Z. Mo, X. Chen, X. Di, **E. Iacomini**, C. Segala, M. Herty, M. Lauriere, A Game-Theoretic Framework for Generic Second Order Traffic Flow Using Mean Field Games and Adversarial Inverse Reinforcement Learning, *Transportation Science*, 2024. DOI: 10.1287/trsc.2024.0532

2. M. Herty, **E. Iacomini**, Filtering methods for coupled inverse problems, *SIAM Journal on Applied Dynamical Systems (SIADS)*, 2023. DOI: 10.1137/22M1483839

3. N. Guglielmi, **E. Iacomini**, A. Viguerie, Identification of Time Delays in COVID-19 Data, *Epidemiologic Methods*, 2023. DOI: 10.1515/em-2022-0117

4. M. Rom, M. Brockmann, M. Herty, **E. Iacomini**, Machine learning tools in production engineering, *The International Journal of Advanced Manufacturing Technology*, Volume 121, 4793–4804, 2022. DOI: 10.1007/s00170-022-09591-5

5. M. Herty, **E. Iacomini**, G. Visconti, Recent trends on nonlinear filtering for inverse problems, *Communications in Applied and Industrial Mathematics*, 13(1), 10–20, 2022. DOI: 10.2478/caim-2022-0002

6. M. Herty, **E. Iacomini**, Uncertainty quantification in hierarchical vehicular flow models, *Kinetic and Related Models*, 15(2), 239–256, 2022. DOI: 10.3934/krm.2022006

7. N. Guglielmi, **E. Iacomini**, A. Viguerie, Delay differential equations for the spatially resolved simulation of epidemics with specific application to COVID-19, *Mathematical Methods in the Applied Sciences*, 45(8), 4752-4771, 2021. DOI: 10.1002/mma.8068

8. S. Gerster, M. Herty, **E. Iacomini**, Stability analysis of a hyperbolic stochastic Galerkin formulation for the Aw-Rascle-Zhang model with relaxation, *Mathematical Biosciences and Engineering* , 18(4), 4372–4389, 2021. DOI: 10.3934/mbe.2021220

9. S. Göttlich, **E. Iacomini**, T. Jung, Properties of the LWR model with time delay, *Networks & Heterogeneous Media*, 15(2), 31–47., 2021. DOI: 10.3934/nhm.2020032

10. **E. Iacomini**, P. Vellucci, Contrarian effect in opinion forming: insights from Greta Thunberg phenomenon, *The Journal of Mathematical Sociology*, 47(2), 123–169, 2021. DOI: 10.1080/0022250X.2021.1981310

11. E. Cristiani, **E. Iacomini**, An interface-free multi-scale multi-order model for traffic flow, *Discrete & Continuous Dynamical Systems-Series B*, 25(11), 2019. DOI: 10.3934/dcdsb.2019135

12. F. Camilli, R. De Maio, **E. Iacomini**, A Hopf-Lax formula for Hamilton-Jacobi equations with Caputo time derivative, *Journal of Mathematical Analysis and Applications*, 477(2), 1019–1032, 2019. DOI: S0022247X19303828

13. M. Briani, E. Cristiani, **E. Iacomini**, Sensitivity analysis of the LWR model for traffic forecast on large networks using Wasserstein distance, *Communications in Mathematical Sciences*, 16(1), 123–144, 2018. DOI: 10.4310/CMS.2018.v16.n1.a6

Book Chapters

14. **E. Iacomini**, Overview on uncertainty quantification in traffic models via intrusive method, *SEMA SIMAI Springer Series, 2023.* DOI: 10.1007/978-3-031-29875-2-6

15. M. Behery, P. Brauner, H. A. Zhou, ...**E. Iacomini** ..., G. Lakemeyer, Actionable artificial intelligence for the future of production, *Internet of Production: Fundamentals, Methods and Applications, Springer International Publishing Cham*, 2023. DOI: 10.1007/978-3-030-98062-7-4-1

16. C. Balzotti, **E. Iacomini**, Stop-and-go waves: A microscopic and a macroscopic description, *Mathematical Descriptions of Traffic Flow: Micro, Macro and Kinetic Models, Springer International Publishing*, 63–78, 2021. DOI: 10.1007/978-3-030-66560-9-4

PhD Thesis

17. **E. Iacomini,** Mathematical Models and Methods for Traffic Flow and Stop & Go waves, Department of Basic and Applied Sciences for Engineering (SBAI), Sapienza University of Rome, 2020.

INVITED FOR SEMINARS AND LECTURES

28/08/2024 Series of seminars on “Modern Applied and Computational Mathematics (MACM)”, KIT Karlsruhe, Germany

Title of the seminar *Uncertainty quantification in traffic flow models*.

08/08/2024 Series of seminars organized by “Research Training Group Energy, Entropy e Dissipative Dynamics (EDDY)", RWTH Aachen, Germany

Title of the seminar *Uncertainty quantification in traffic flow models*.

15/02/2024 Series of seminars on “Modeling and Computation Seminar”, organized by the Applied Mathematics Program group at University of Arizona, U.S.A.

Title of the seminar *Traffic flow models with uncertainty*.

15/12/2021 Series of seminars on “Numerical Differential Modeling”, organized by the Applied Mathematics group at Sapienza University of Rome, Italy

Title of the seminar *Uncertainty quantification for traffic flow models via a stochastic Galerkin approach*.

12/11/2020 Series of seminars “OMS Seminar”,organized by the Management Science group at RWTH Aachen, Germany.

Title of the seminar *Mathematical models for traffic flow and Stop-and-Go waves*.

26/05/2020 Series of seminars on “Numerical Differential Modeling”, organized by the Applied Mathematics group at Sapienza University of Rome, Italy

Title of the seminar *A Time-delayed first order model for traffic flow and its properties*.

27/02/2020 Series of seminars organized at the Institute for Geometry and Applied Mathematics (IGPM), RWTH Aachen, Germany.

Title of the seminar *An interface-free multi-scale multi-order model for traffic flow*.

20/02/2020 Series of seminars on “Scientific Computing Research Seminar” organized by the Scientific Computing research group at University of Mannheim, Germany.

Title of the seminar *An interface-free multi-scale multi-order model for traffic flow*.

24/09/2019 Series of seminars organized at the Computer Science department, University of Verona, Italy.

Title of the seminar *A new multi-scale model for traffic flow*.

11/12/2018	Series of seminars on “Numerical Differential Modeling”, organized by the Applied Mathematics group at Sapienza University of Rome, Italy
Title of the seminar	*A new multi-scale model for traffic flow*.
20/11/2018	Series of seminars “KWIM: Women in Mathematics”,Konstanz University, Germany
Title of the seminar	*A new multi-scale model for traffic flow*.
14/11/2017	Series of seminars on “Numerical Differential Modeling”, organized by the Applied Mathematics group at Sapienza University of Rome, Italy
Title of the seminar	*Sensitivity analysis of the LWR model for traffic forecast on large networks using Wasserstein distance*.

INVITED SPEAKER AT CONFERENCES AND WORKSHOPS

25/11/2024 – 27/11/2024	Invited speaker at the Workshop *LYStriMester "Mathematics: what else?" Socialysm: Social Sciences and Mathematics*, Istituto Nazionale di Alta Matematica Francesco Severi, Rome.
22/01/2024 – 26/01/2024	Invited speaker at the Workshop *Modeling, analysis, and control of multi-agent systems across scales*, Centro di ricerca matematica Ennio De Giorgi, (CRM), Pisa.
Title of the seminar	*Traffic flow models with uncertainty*.
15/12/2021 – 17/12/2021	Invited speaker at the Conference *Numerical aspects of hyperbolic balance laws and related problems – Young Researchers Conference*, University of Verona
Title of the seminar	*Uncertainty quantification for traffic flow models via a stochastic Galerkin approach*.

PARTICIPATION TO CONFERENCES AND WORKSHOPS

16/09/2024 – 20/09/2024	*4th edition of the Conference of Young Applied Mathematicians YAMC,* Rome, Italy
Invited speaker at MS of the seminar:	“Uncertainty quantification in Traffic Flow Models” (Minisymposium *Exploring efficient advanced numerical methods for Partial Differential Equations).*
10/07/2024 – 12/07/2024	2nd edition of the *GIMC SIMAI YOUNG 2024* , Naples, Italy
Invited speaker at MS of the seminar:	“Exploring uncertainty in Traffic Flow Models” (Minisymposium *Efficient numerical methods for evolutionary pde with applications).*
Organizer of the MS:	Particles in Numerical Simulations: trends and applications.
03/06/2024 – 07/06/2024	*9th European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS 24),* Lisbon, Portugal
Invited speaker at MS of the seminar:	“Multiobjective optimization via filtering methods” (Minisymposium *Novel kinetic approaches in optimization and uncertainty quantification).*
27/02/2024 – 01/03/2024	*SIAM Conference on Uncertainty Quantification (SIAM UQ24),* Trieste, Italy
Invited speaker at MS of the seminar:	“Uncertainty Quantification in Traffic Flow Models” (Minisymposium *Quantifying Parameter Uncertainty in Random Differential Equations).*
Organizer of the MS:	Quantifying Uncertainty in Kinetic and Hyperbolic PDEs: Numerical Insights.

29/01/2024 – 31/01/2024	*Workshop on Integrated Mathematical approaches to Socio-Epidemiological Dynamics,* Trento, Italy
Speaker of the seminar:	"Time-Delay differential models for epidemics".
10/09/2023 – 16/09/2023	16^{th} *Hirschegg workshop on conservation laws* , Hirschegg, Austria
Speaker of the seminar:	Uncertainty quantification in vehicular traffic flows.
28/08/2023 – 01/09/2023	2023 edition of the bi-annual *Congress of the Italian Society of Applied and Industrial Mathematics (SIMAI 2023)*, Matera, Italy
Organizer of the MS:	Kinetic equations: numerical methods and applications.
20/08/2023 – 25/08/2023	10^{th} *International Congress on Industrial and Applied Mathematics (ICIAM 2023),* Tokyo, Japan
Invited speaker at MS of the seminar:	"Uncertainty quantification in vehicular traffic models" (Minisymposium *Interfaces between kinetic equations and many-agent social systems)*
19/06/2023 – 23/06/2023	*Numerical Aspects of Hyperbolic Balance Laws and Related Problems,* Cortona, Italy
Poster session:	"Online parameter identification".
26/02/2023 – 03/03/2023	*SIAM Conference on Computational Science and Engineering (CSE23),* Amsterdam, Netherlands
Invited speaker at MS of the seminar:	"Uncertainty Quantification in Hierarchical Vehicular Traffic Models" (Minisymposium *Uncertainty Quantification for Physical Flow Networks).*
20/02/2023 – 22/02/2023	Final Workshop PRIN 2017 *Innovative Numerical Methods for Evolutionary Partial Differential Equations and Applications,* Catania, Italy
Speaker of the seminar:	"Uncertainty quantification in traffic models via intrusive method"
03/07/2022 – 09/07/2022	*European Consortium for Mathematics in Industry Modelling week, (ECMI MW 22),* Verona, Italy
Speaker of the seminar:	"Impact of stop and go waves in vehicular traffic"
20/06/2022 – 24/06/2022	*XVIII International Conference on Hyperbolic Problems: Theory, Numerics, Applications* (HYP2022), University of Malaga, Spain
Speaker of the seminar:	Uncertainty quantification in hierarchical vehicular flow models.
11/04/2022 – 15/04/2022	*SIAM Conference on Uncertainty Quantification (SIAM UQ22),* Atlanta, USA
Speaker of the seminar:	"Uncertainty quantification in hierarchical vehicular flow models".
30/08/2021 – 03/09/2021	*SIMAI 2020+21, XV biannual Congress of SIMAI (Italian Society of Applied and Industrial Mathematics)*, University of Parma, Italy
Invited speaker at MS of the seminar:	"Stop and Go waves in traffic flow: how to reduce them?" (Minisymposium *Optimal control, differential games and applications*).
16/08/2021 – 20/08/2021	13^{th} *International Conference on Monte Carlo Methods and Application (MCM21)*, University of Mannheim, Germany
Invited speaker at MS of the seminar:	"Uncertainty quantification for traffic flow models via a stochastic Galerkin approach" (Minisymposium *UQ for hyperbolic partial differential equations*).
06/02/2020 – 07/02/2020	Workshop GNCS 2019 *Numerical approximation of hyperbolic problems and applications (Original language: Approssimazione numerica di problemi di natura iperbolica ed applicazioni),* Rome, Italy

Speaker of the seminar: "Mathematical models for traffic flow and Stop-and-Go waves"

25/11/2019 – 29/11/2019 *RICAM Workshop on Feedback Control,* Johann Radon Institute for Computational and Applied Mathematics, Linz, Austria

Poster session: "Stop & Go waves: how to reduce them?"

15/07/2019 – 19/07/2019 9^{th} *International Congress on Industrial and Applied Mathematics (ICIAM 2019),* Valencia, Spain

Invited speaker at MS of the seminar: "Multiscale models for traffic flow" (Minisymposium *Mathematical descriptions of traffic flow: micro, macro and kinetic models*).

16/04/2018 – 20/04/2018 *Numerical Aspects of Hyperbolic Balance Laws and Related Problems*, University of Ferrara, Italy

Poster session: *Sensitivity analysis of the LWR model for traffic forecast on large networks using Wasserstein distance*

SCIENTIFIC RESPONSIBILITY FOR RESEARCH FUNDS AND PROJECTS

Competitive calls for proposals

2024–2026 "Bando anno 2024 per progetti di ricerca finanziati con il contributo 5x1000", University of Ferrara

Title of the project: *Numerical methods and Machine Learning techniques for collective dynamics affected by uncertainty* (original language: *Metodi numerici e tecniche di Machine Learning per dinamiche collettive affette da incertezza*)

Total funded: 1.824,50 €

Role: Principal Investigator and scientific responsible for funding

2024–2026 "Fondo di Ateneo per la Ricerca" (FAR) year 2024, University of Ferrara

Title of the project: *High Performance Computing (HPC) and Big Data: mathematical insights*

Total funded: 4.695,00 €

Role: Principal Investigator and scientific responsible for funding

2024–2025 "Bando per Progetti di Ricerca GNCS 2024" of the National Group for Scientific Computing (INdAM–GNCS)

Title of the project: *Numerical methods for uncertain dynamics* (original language: *Metodi numerici per le dinamiche incerte*)

Total funded: 3.350,00 €

Research units involved: University of Ferrara, Sapienza University of Roma, University of Verona, University of Catania

Role: Principal Investigator and scientific responsible for funding

2023–2025 "Fondo per l'Incentivazione alla Ricerca Dipartimentale" (FIRD) year 2023, University of Ferrara

Title of the project: *Opinion dynamics and Machine Learning*

Total funded: 4.623,00 €

Role: Principal Investigator and scientific responsible for funding

2023–2025 "Fondo di Ateneo per la Ricerca" (FAR) year 2023, University of Ferrara

Title of the project: *Benchmark problems in the world of High Performance Computing (HPC)*

Total funded: 2.670,00 €

Role: Principal Investigator and scientific responsible for funding

2019 "Bando Ricerca Scientifica: Progetti Avvio alla ricerca, Sapienza University of Rome
Title of the project: *PREVENT: accurate PREdictions for VEhicular Traffic on Networks in urban society.*
Total funded: 1.000,00 €
Role: Principal Investigator and scientific responsible for funding

PARTICIPATION IN RESEARCH PROJECTS

Competitive calls for proposals

2023–2025 Industrial research and innovation project (original language: Progetto di ricerca industriale e innovazione) (PNRR)
Title of the project: *"National Centre for HPC, Big Data and Quantum Computing"*
Spoke 1 - Future HPC & Big Data, WorkPackage 5: HW-SW co-design, benchmarking, patterns and microkernels
Research units involved: University of Catania, University of Bologna, University of Torino, University of Pisa, University of Padova, University of Rome Tor Vergata, University of Naples, Politecnico di Milano, University of Calabria, National Institute of Astrophysics, CINECA, ENEA, Italian Institute of Technology, University of Ferrara
Project code: F77G22000120006

2023–2024 "Bando per Progetti di Ricerca GNCS 2023" of the National Group for Scientific Computing (INdAM–GNCS)
Title of the project: *Numerical methods for multiscale differential problems: high order schemes, optimization, control*
Project code: E53C22001930001
Research units involved: University of Ferrara, Sapienza University of Roma, University of Trento, University of Catania, University of Cologne, King Abdullah University of Science and Technology (KAUST)

2023–2024 "Bando Giovani anno 2023 per progetti di ricerca finanziati con il contributo 5x1000 anno 2021", University of Ferrara
Title of the project: *Epidemics and equitable and sustainable well-being: statistical analysis, modeling, and computational simulations* (original language:*Epidemie e benessere equo e sostenibile: analisi statistiche, modellistica e simulazioni computazionali*)
Project code: E53C22001930001

2023–2025 Horizon Europe Call "HORIZON-MSCA-2021-DN-01"
Title of the project: *DATAHYKING - Data-driven simulation, uncertainty quantification and optimization for hyperbolic and kinetic models*
Research units involved: Katholieke Universiteit (KU) Leuven, University of Ferrara, Sapienza University of Rome, Technical University of Kaiserslautern (TUK), Rheinisch-Westfälische Technische Hochschule (RWTH) Aachen University, Institut National de Recherche en Informatique et en Automatique (Inria)
Project code: Grant Agreement n.101072546

2021– present "Facebook and Social Science One"
Title of the project: *Democracy in the Age of Data: a Facebook study* (Data-grant)
Research units involved: Sapienza University of Rome, University of Roma Tre, University of Ferrara

2020– 2022 DFG Cluster of Excellence at RWTH Aachen University

Title of the project: Cluster of Excellence “Internet of Production” (IoP)
Role: Participant and responsible for collaborations with other institutes

2017 – 2021 MIUR – PRIN 2017 (DD 3728/2017)
Title of the project: *Innovative numerical methods for evolutionary partial differential equations and applications*
project code: 2017KKJP4X
Research units involved: University of Catania, University of Ferrara, University of Trento, University of Verona, Sapienza University of Rome, Institute for Applications of Computing “Mauro Picone” - National Research Council (IAC-CNR)

2019–2020 “Bando per Progetti di Ricerca GNCS 2019” of the National Group for Scientific Computing (INdAM–GNCS)
Title of the project: *Numerical approximation of hyperbolic problems and applications*

AWARDS AND HONORS

July 2024 Shortlisted for a position as researcher with tenure track (RTT) in Numerical analysis (MAT/08) at the Department of Environmental Science and Prevention, University of Ferrara, D.R. N. 284/2024 Prot. n. 103040 of 02/04/2024.

November 2023 Shortlisted for a position as researcher with tenure track (RTT) in Numerical analysis (MAT/08) at the Mathematics Department, Sapienza University of Rome, D.R. N. 1328/2023 of 25/05/2023 (application code 2023RTTA035).

March 2023 Awarded financial support (covering the registration fee) for participation at the 10^{th} *International Congress on Industrial and Applied Mathematics (ICIAM 2023)*, at Waseda University, Tokyo, Japan. Funding granted by the Congress Committee.

March 2019 Awarded financial support (covering the registration fee) for participation at the 9^{th} *International Congress on Industrial and Applied Mathematics (ICIAM 2019)*, Valencia, Spain. Funding granted by the Congress Committee.

September 2018 Awarded of a fellowship *“International doctorates in Germany for all (Ipid4all)*” granted by the German Federal Ministry of Education and Research.

BIBLIOMETRIC INDICATORS

Scopus 14 documents – 75 citations – h-index 5
Google Scholar 20 documents – 144 citations – h-index 8
MathSciNet 11 documents – 21 citations

ORGANIZER OF CONFERENCES AND MINISYMPOSIA

Conferences and Workshops

8 Dec - 13 Dec 2024 **Oberwolfach mini-workshop**
Title: *High-Dimensional Control Problems and Mean-Field Equations with Applications in Machine Learning*, (https://www.mfo.de/occasion/2450b/www_view).
Co-organizers: Dr. Giacomo Borghi (Heriot-Watt University), Dr. Chiara Segala (RWTH Aachen), Dr. Mathias Oster (RWTH Aachen).

17 Dec - 19 Dec 2024 **NumAsp Young**
Title: *Numerical aspects of hyperbolic balance laws and related problems – Young Researcher Conference*

Co-organizers: Prof. Giacomo Albi (University of Verona), Dr. Giulia Bertaglia (University of Ferrara).

Minisymposia

UNCECOMP25 MS *"Monte Carlo Sampling for Stochastic Solvers: Advances in Uncertainty Quantification"* at the 6th International Conference on Uncertainty Quantification in Computational Science and Engineering, Rhodes (15/06/2025 - 18/06/2025).

GIMC SIMAI YOUNG 2024 MS *"Particles in Numerical Simulations: trends and applications"* at the second edition of GIMC SIMAI YOUNG 2024, Naples (10/07/2024–12/07/2024).

SIAMUQ24 MS *"Quantifying Uncertainty in Kinetic and Hyperbolic PDEs: Numerical Insights"* at SIAM Conference on Uncertainty Quantification (UQ24), Trieste (27/02/2024 – 01/03/2024).

SIMAI23 MS *"Kinetic equations: numerical methods and applications"* at 2023 edition of the bi-annual Congress of the Italian Society of Applied and Industrial Mathematics, Matera (28/08/2023 – 01/09/2023).

AFFILIATIONS AND OTHER SCIENTIFIC ACTIVITIES

Member of Scientific Associations

- National Institute of Advanced Mathematics, National Group for Scientific Computing (original language: Istituto Nazionale di Alta Matematica "Francesco Severi" (INdAM), Gruppo Nazionale per il Calcolo Scientifico (GNCS))
- Italian Society of Applied and Industrial Mathematics (Original language: Società Italiana di Matematica Applicata e Industriale) (SIMAI)

Participation in committees

- **Member of the Committee for a Postdoc position** at the University of Ferrara *(original language 'Procedura selettiva pubblica per il conferimento di assegni per lo svolgimento di attività di ricerca presso strutture dell'Università degli Studi di Ferrara')* (N. 1335, Prot. 200227 of 09/07/2024)
  Research topic: Innovative numerical approaches for hyperbolic and kinetic multiscale equations with uncertainty (MAT/08: Numerical Analysis)
- **Member of the Committee for a Postdoc position** at the University of Ferrara *(original language 'Procedura selettiva pubblica per il conferimento di assegni per lo svolgimento di attività di ricerca presso strutture dell'Università degli Studi di Ferrara')* (N. 1957, Prot. 274951 of 12/12/2023)
  Research topic: Innovative numerical approaches for hyperbolic and kinetic multiscale equations with uncertainty (MAT/08: Numerical Analysis)
- **Member of the Committee for a Postdoc position** at the University of Ferrara (original language 'Procedura selettiva pubblica per il conferimento di assegni per lo svolgimento di attività di ricerca presso strutture dell'Università degli Studi di Ferrara') (N.779, Prot. 115752, of 29/05/2023)
  Research topic: Numerical models and methods for consensus-based global optimization and applications (MAT/08: Numerical Analysis)

Collaboration with companies and research institutes

- 2018–2020: **Autovie Venete** (Italian company of highways in the north-east)
  PROJECT: *Vehicular traffic forecast from fixed and moving sensors and data analysis.*
  In collaboration with IAC-CNR.

- 2017–2019: *Affiliation at the Institute for the Application of Scientific calculus "Mauro Picone", (IAC-CNR)*
  Responsible: Dr. Emiliano Cristiani

Reviewer activities for international journals

SIAM Journal on Applied Dynamical Systems (SIADS) – Physica A – Networks and Heterogeneous Media (NHM) – Mathematics and Computers in Simulation (Elsevier) – Zeitschrift für angewandte Mathematik und Physik – Journal of Computational Physics (JCP) – Kinetic and Related Models (KRM) – PlosOne – Heliyon.

Public Engagement

09/2023-2024 – *Participation at the Night of the researchers Presentation of my research work at the night of the researchers to an audiences of all ages in the main square of Ferrara.(Detailed info: https://www.unife.it/it/notte-ricercatori/passate/notte-dei-ricercatori-2023/programma*)

Ferrara, September 10, 2024