



Cristina Urbani

Education

2016–2019 **PhD in Mathematics in Natural, Social and Life Sciences**
Gran Sasso Science Institute, Italy and Sorbonne Université, France

Thesis: *"Bilinear control of evolution equations"*

Evaluated cum laude

2014 – 2016 **Master's degree in Pure and Applied Mathematics**
University of Rome "Tor Vergata"

Thesis: *"Bilinear control of partial differential equations of evolution"*

110/110 summa cum laude

2009 – 2014 **Bachelor's degree in Mathematics**
University of Rome "Tor Vergata"

Thesis: *"Hamilton - Jacobi equations"*

Current Position

2023 - curr. RTT at Universitas Mercatorum

Previous Positions

2022 – 2023 Postdoc fellow at Accademia Nazionale dei Lincei, Italy

2020 – 2022 Postdoc fellow at University of Rome Tor Vergata, Italy.

Qualifications

2023-2027 Maître de conférences, section 25: Mathématiques

2023-2027 Maître de conférences, section 26: Mathématiques appliquées et applications des mathématiques

Preprints

2022 P. Cannarsa, V. Lucarini, P. Martinez, C. Urbani, J. Vancostenoble *"Analysis of a two-layer energy balance model: long time behaviour and greenhouse effect"*, preprint available on arXiv:2211.15430

Publications

- 2023 F. Alabau-Boussouira, P. Cannarsa, C. Urbani "*Bilinear control of evolution equations with unbounded lower order terms. Application to the Fokker-Planck equation*", accepted for publication in Comptes Rendus Mathématiques, preprint available on arXiv:2303.04465
- 2023 P. Cannarsa, P. Martinez, C. Urbani "*Bilinear control of a degenerate hyperbolic equation*", accepted for publication in SIAM J. of Mathematical Analysis, preprint available on arXiv:2112.00636
- 2022 P. Cannarsa, A. Duca, C. Urbani "*Exact controllability to eigensolutions of the bilinear heat equation on compact networks*", Discrete and Continuous Dynamical Systems - Series S, vol. 15, No. 6, pages 1377-1401 (2022), doi:10.3934/dcdss.2022011
- 2022 F. Alabau-Boussouira, P. Cannarsa, C. Urbani "*Exact controllability to eigensolutions for evolution equations of parabolic type via bilinear control*", Nonlinear Differ. Equ. Appl. 29, 38 (2022). <https://doi.org/10.1007/s00030-022-00770-7>
- 2021 F. Alabau-Boussouira, P. Cannarsa, C. Urbani "*Superexponential stabilizability of evolution equations of parabolic type via bilinear control*", Journal of Evolution Equations, vol. 20, pages 941–967 Springer (2021)
- 2020 P. Cannarsa, C. Urbani "*Superexponential stabilizability of degenerate parabolic equations via bilinear control*", Inverse Problems and Related Topics, vol. 310, pages 31–45, Springer Singapore (2020)
- 2020 C. Urbani, Bilinear control of evolution equations, PhD Thesis, <http://hdl.handle.net/20.500.12571/10061>

Ongoing works

- 2019 F. Alabau-Boussouira, C. Urbani "*A constructive mathematical algorithm for building mixing coupling real valued potentials with time control. Applications to exact controllability and stabilization in bilinear control*"
- 2022 A. Duca, E. Pozzoli, C. Urbani "*Approximate bilinear null controllability in small time of a nonlinear heat equation on compact manifolds*"

Research activities

- 2023 **Invited speaker** at ICIAM 23, Tokyo (Japan). Minisymposium: Interplay between controllability and qualitative aspects of stochastic dynamical systems
- 2023 **Invited speaker** at SIAM CT23, Philadelphia (USA). Minisymposium: Control, Stability and its applications
- 2022 **Invited speaker** at Analysis and Control of (bi)linear PDEs, Rome (Italy)
- 2022 **Invited speaker** at ACIPDif22, Bari (Italy)
- 2022 **Poster** at Theoretical and numerical trends in inverse problems and control for PDE's, and Hamilton-Jacobi equation: French-Italian-Japanese conference, Marseille (France)
- 2022 **Contributed speaker** at 100 UMI - 800 UniPd, Padua (Italy)
- 2021 **Poster** at SIAM Annual Meeting 2021, Spokane, Washington (USA), online

- 2021 **Invited speaker** at INdAM Workshop: Analysis and Numerics of Design, Control and Inverse Problem, Rome (Italy)
 - 2021 **Invited speaker** at LSSC 2021, Sozopol (Bulgaria), online seminar
 - 2020 **Invited speaker** at Control in Time of Crisis, online seminar
 - 2020 **Invited speaker** at Controllability of PDEs in Physics Models and Applied Sciences, University of Rome Tor Vergata (Italy)
 - 2019 **Invited speaker** at VIII Partial differential equation, optimal design and numerics, Benasque (Spain). Minisymposium: Theoretical results on parabolic control theory
 - 2019 **Contributed speaker** at INDAM intensive period: Shape optimization, control and inverse problems for PDEs, Naples (Italy)
 - 2019 **Invited speaker** at Control Theory and Applications, L'Aquila (Italy)
 - 2018 **Invited speaker** at LIA COPDESC workshop: Analysis, Control and Inverse Problems for PDEs, Naples (Italy)
 - 2018 **Contributed speaker** at BIT Circus 2018, Helsinki (Finland)
 - 2018 **Invited speaker** at SIMAI2018, Rome (Italy).
Minisymposium: Control and Inverse Problems for Evolution Equations
 - 2017 **Contributed speaker** at VII Partial differential equation, optima design and numerics, Benasque (Spain). Minisymposium: Bilinear and fractional control of partial differential equations
- Reviewer** for IEEE, Journal of Mathematical Modeling and Mathematical Methods in the Applied Sciences, Acta Mathematica Sinica, Journal of Control and Decision

Organization activities

- 2023 Minisymposium: Analysis and Control of Climatological and Biological Models, organized in collaboration with Genni Fragnelli. SIAM CT23, Philadelphia (USA)

Visiting positions

- October 2022 Laboratoire Jacques-Louis Lions, Sorbonne Université, Paris (3 weeks)

Experience

- 2021 – cur. Teaching. Course: Analisi Matematica e Geometria, Bachelor's degree in Statistica & Big data, Universitas Mercatorum
- 2021 – cur. Teaching. Course: Analisi Matematica I e Fondamenti di Geometria, Bachelor's degree in Ingegneria delle infrastrutture e della mobilità, Universitas Mercatorum
- 2020 – 2021 Cultrice della Materia di Istituzioni di Matematica – Mat/05, Università Mediterranea Reggio Calabria
- 2019 – 2020 Teaching assistant. Course: Analisi Matematica 1, Bachelor's degree in Chimica, Università di Roma Tor Vergata

Thesis supervision

- 2021 – 2022 D. Busseni - "Studio introduttivo della teoria dei giochi: un modello matematico del gioco degli scacchi", Bachelor's degree in Statistica & Big Data, Universitas Mercatorum

Awards

- 2023 GNAMPA travel grant for ICIAM 2023, Tokyo (Japan)
2023 INdAM abroad visiting scholarship
2023 Financial support FS1, ICIAM support program for ICIAM23, Tokyo (Japan)
2022-2023 Postdoctoral fellowship "Beniamino Segre", funded by Centro Linceo Interdisciplinare
2021 Kovalevskaya Grant of the ICM Local Organizing Committee, to participate to ICM 2022, St. Petersburg (Russia)
2021 European Kovalevskaya Travel Grant, funded by EMS, to participate to ICM 2022, St. Petersburg (Russia)
2021 Travel award funded by AWM, supported by the NSF grants DMS 1953892 and DMS 1821955, to participate to the AWM Workshop at SIAM Annual Meeting 2021, Spokane, Washington (USA)
2020-2022 Postdoctoral fellowship, funded by MUR "Dipartimenti universitari di eccellenza" CUP: E83C18000100006
2018 Bando Vinci, Mobility allowance for cotutelle thesis, Università Italo Francese/Université Franco Italienne (UIF/UFI)

Scientific societies membership

- 2019 - cur. Unione Matematica Italiana - UMI
2018 - cur. Gruppo Nazionale per l'Analisi Matematica, la Probabilità e le loro applicazioni - GNAMPA
2018-2022 Società Italiana di Matematica Applicata e Industriale - SIMAI
2021 - cur. European Women in Mathematics - EWM
2023 SIAM

Research projects

- 2018 participation to GNAMPA project "Analisi e controllo di modelli differenziali non lineari", coordinator Prof. C. Pignotti
2019 participation to GNAMPA project "Controllabilità di PDE in modelli fisici e scienze della vita", coordinator Prof. G. Fragnelli
2020 participation to GNAMPA project "Problemi inversi e di controllo per equazioni di evoluzione e loro applicazioni", coordinator Prof. G. Floridia
2023 participation to GNAMPA project "Modelli differenziali per l'evoluzione del clima e i suoi impatti", coordinator Prof. Piermarco Cannarsa

Skills

- Languages
- Italian, mother tongue
 - English, C1 level, New British Centre certificate

Programming Languages C, MATLAB[®], L^AT_EX