Lorenzo Liverani

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Google Scholar Profile
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Employment

2025 – Today ◇ **Akademischer Rat** @FAU Erlangen-Nürnberg, Chair for Dynamics, Control, Machine Learning and Numerics.

2024 – 2025 ◇ **Humboldt Fellow** @FAU Erlangen-Nürnberg, Chair for Dynamics, Control, Machine Learning and Numerics.
Supervisor: Prof. Enrique Zuazua.

2023 – 2024 ◇ **Postdoctoral Researcher** @University of Milano-Bicocca.
Supervisor: Prof. Veronica Felli

Education

May 2022 ◇ **Visiting PhD Student** @Universitat Politècnica de Catalunya

2019 – 2023 ◇ **PhD, Mathematical Models and Methods in Engineering** @Politecnico di Milano.
Thesis title: *Stability of Differential Systems of Moore-Gibson-Thompson Type*
Ph.D. Supervisor: Vittorino Pata

2017 – 2019 ◇ **Master, Mathematics (joint curriculum with SISSA)** @University of Trieste.
Supervisor: Stefano Bianchini
Final grade: 110/110 cum laude

2014 – 2017 ◇ **Bachelor, Mathematical Engineering** @Politecnico di Milano
Final grade: 110/110 cum laude

Teaching

2024 – Today ◇ **FAU Erlangen-Nürnberg,** Supervision of three Master's theses at FAU Erlangen-Nürnberg. One thesis is expected to be completed by May 2025; the others are ongoing.

2024 – 2025 ◇ **FAU Erlangen-Nürnberg,** Lecturer for *Mathematics for Engineers III*

2019 – 2024 ◇ **Politecnico di Milano,** Teaching Assistant for the course *Analisi 1* (B.Sc. Civil Engineering) and *Analisi 1* (B.Sc. Mathematical Engineering).

November 2022 ◇ **Politecnico di Milano,** Intensive course "Introduction to MATLAB and Simulink".

Research Publications

Journal Articles

1. Crin-Barat, T., **Liverani, L.**, Shou, L.-Y., & Zuazua, E. (2025). Large-time asymptotics for hyperbolic systems with non-symmetric relaxation: An algorithmic approach. *Journal de Mathématiques Pures et Appliquées*. (To appear).

2. Dell'Oro, F., **Liverani**, **L.**, Pata, V., & Quintanilla, R. (2025). On the double Moore–Gibson–Thompson system of thermoviscoelasticity. *Studies in Applied Mathematics*, *154*(1), e12784. doi:https://doi.org/10.1111/sapm.12784

3. Felli, V., **Liverani**, **L.**, & Ognibene, R. (2025). Quantitative spectral stability for the Neumann Laplacian in domains with small holes. *J. Funct. Anal.*, *288*(6), Paper No. 110817. doi:10.1016/j.jfa.2024.110817

4. Bazarra, N., Fernández, J. R., **Liverani, L.**, & Quintanilla, R. (2024). Analysis of a thermoelastic problem with the Moore-Gibson-Thompson microtemperatures. *J. Comput. Appl. Math.*, *438*, Paper No. 115571, 20. doi:10.1016/j.cam.2023.115571

5. Dell'Oro, F., **Liverani, L.**, Pata, V., & Quintanilla, R. (2024). Global attractors for Moore-Gibson-Thompson thermoelastic extensible beams and Berger plates. *Nonlinear Analysis Real World Applications*. (In press).

6. Antonietti, P. F., **Liverani, L.**, & Pata, V. (2023). Lack of superstable trajectories in linear viscoelasticity: A numerical approach. *Numer. Math.*, *153*(4), 611–633. doi:10.1007/s00211-023-01351-1

7. Conti, M., **Liverani, L.**, & Pata, V. (2023). On the Moore-Gibson-Thompson equation with memory with nonconvex kernels. *Indiana Univ. Math. J.*, *72*, 1–27. doi:10.1512/iumj.2023.72.9330

8. Dell'Oro, F., **Liverani, L.**, & Pata, V. (2023). On the regularized Moore-Gibson-Thompson equation. *Discrete Contin. Dyn. Syst. Ser. S.* doi:10.3934/dcdss.2023025

9. **Liverani, L.**, Mammeri, Y., Pata, V., & Quintanilla, R. (2023). On the linearized Whitham–Broer–Kaup system on bounded domains. *Proceedings of the Royal Society of Edinburgh: Section A Mathematics*, 1–20. doi:10.1017/prm.2023.85

10. Conti, M., Dell'Oro, F., **Liverani, L.**, & Pata, V. (2022). Spectral analysis and stability of the Moore-Gibson-Thompson-Fourier model. *J. Dynam. Differential Equations*. doi:10.1007/s10884-022-10164-z

11. Conti, M., **Liverani, L.**, & Pata, V. (2022a). Correction to "Thermoelasticity with antidissipation" (volume 15, number 8, 2022, 2173–2188). *Discrete Contin. Dyn. Syst. Ser. S*, *15*, 2429–2431. doi:10.3934/dcdss.2022125

12. Conti, M., **Liverani, L.**, & Pata, V. (2022b). On the optimal decay rate of the weakly damped wave equation. *Commun. Pure Appl. Anal.*, *21*, 3421–3424. doi:10.3934/cpaa.2022107

13. Conti, M., **Liverani, L.**, & Pata, V. (2022c). Thermoelasticity with antidissipation. *Discrete Contin. Dyn. Syst. Ser. S*, *15*, 2173–2188. doi:10.3934/dcdss.2022040

14. **Liverani, L.**, & Quintanilla, R. (2022). Thermoelasticity with temperature and microtemperatures with fading memory. *Math. Mech. Solids*, *28*, 1255–1273. doi:10.1177/10812865221115359

15. Conti, M., **Liverani, L.**, & Pata, V. (2021a). A note on the energy transfer in coupled differential systems. *Commun. Pure Appl. Anal.*, *20*, 1821–1831. doi:10.3934/cpaa.2021042

16. Conti, M., **Liverani, L.**, & Pata, V. (2021b). The MGT-Fourier model in the supercritical case. *J. Differential Equations*, *301*, 543–567. doi:10.1016/j.jde.2021.08.030

Submitted and in preparation

1. Fantuzzi, G., & **Liverani, L.** (2025). *Discovering distributions of random dynamical systems*. (In preparation).
2. **Liverani, L.**, Steynberg, M., & Zuazua, E. (2025). *HYCO: The hybrid-collapse strategy for PDE learning*. (In preparation).
3. Dell'Oro, F., **Liverani**, **L.**, & Pata, V. (2024). *Abstract damped wave equations: The optimal decay rate*. (Submitted for review). arXiv: 2304.05816
4. Li, Z., Liu, K., **Liverani**, **L.**, & Zuazua, E. (2024). *Universal approximation of dynamical systems by semi-autonomous neural odes and applications*. (Submitted for review). arXiv: 2407.17092

Grants and awards

2025 ◇ **AFOSR Grant.** Grant from the Air Force Office for Scientific Research (USA), for the organization of the workshop "Machine Learning and PDEs", held @FAU Erlangen in April 2025.

2024 ◇ **Alexander von Humboldt Fellowship for Postdocs.** Two-year fully funded fellowship awarded by the Alexander von Humboldt foundation to support young researchers in Germany.

2017 ◇ **SISSA Scholarship.** Competitive fellowship for joint program with University of Trieste. The main selection procedure consists in an entrance examination, written and oral.

2014 ◇ **Best Freshman Award.** Merit based award for the most talented freshmen enrolled in Politecnico di Milano in 2014-15. **Main criteria**: GPA.

2014-2017 ◇ **Full scholarship.** Merit based scholarship for the most talented students enrolled in Politecnico di Milano and residing out of town. **Main criteria**: GPA.

Conferences and seminar talks

April 2025 ◇ Machine Learning and PDEs (Erlangen, Germany)
Main organizer of the event MLPDES25

February 2025 ◇ AICOMAS (Paris, France)
SA-NODEs and Universal Approximation of Dynamical Systems

September 2024 ◇ Young Researchers Meeting on PDEs (Milan, Italy)
Spectral stability for the Neumann Laplacian in domains with small holes

August 2024 ◇ X Partial differential equations, optimal design and numerics (Benasque, Spain)
SA-NODEs and the Universal Approximation of Dynamical Systems

December 2021 ◇ Recent Advances in Analysis, PDEs and Applications (Milan, Italy)
Stability of coupled dissipative/antidissipative systems

◇ XMaths (Bari, Italy)
Decay properties of the supercritical MGT-Fourier model

September 2021 ◇ 3 Days on evolution PDEs (Urbino, Italy)
On the Moore-Gibson-Thompson equation with memory with nonconvex kernels

Conferences and seminar talks (continued)

◇ Partial differential equations of mathematical physics and applications (Como, Italy)
Longterm behavior of an hyperbolic PDE with finite memory

July 2021 ◇ PDEs and continuum mechanics (Varese, Italy)
Stability of coupled dissipative-antidissipative systems