

Contact Information

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Education

2021 - **PostDoc in Mathematics**, *Cluster of Excellence Hausdorff Center for Mathematics (HCM)*, University of Bonn. Mentors: Karl-Theodor Sturm, Franca Hoffmann

2017 - 2021 **Phd Student in Mathematics**, *Institute of Science and Technology Austria (IST Austria)*, *Klosterneuburg, Austria*. Supervisor: Jan Maas. Committee members: Nicola Gigli (SISSA, Trieste), Julian Fischer (IST Austria)

I am also member of the Doctoral Program "Dissipation and Dispersion in Nonlinear PDEs" funded by the Austrian Science Fund FWF (project number: W1245).

Thesis title: "Discrete-to-Continuum Limits of Transport Problems and Gradient Flows in the Space of Measures", DOI=10.15479/at:ista:10030.

2015/16 - **Ordinary Student of Scuola Normale Superiore (SNS)**, Pisa, Master Diploma
2016-17 in Mathematics

2015/16 - **Graduate Student in Pure Mathematics**, *Università di Pisa*, Pisa, Master Degree
2016-17 in Mathematics, September 2017. Grade: 110/110 cum laude

Master thesis title: "Metric measure spaces, Cheeger's energies and upper regularity for Dirichlet forms".

Supervisor: Luigi Ambrosio.

2011/12 - **Bachelor Student in Pure Mathematics**, *Università di Torino*, Torino, Bachelor
2014/15 Degree in Mathematics, September 2015. Grade: 110/110 cum laude

Bachelor thesis title: "Introduction on Optimal Control Theory".

Supervisor: Susanna Terracini.

Achievements

September 2021 **Winner of a Hausdorff Postdoc position in the Cluster of Excellence Hausdorff Center for Mathematics, Bonn**

September 2017 **Member of the Doctoral Program *Dissipation and Dispersion in Nonlinear PDEs* funded by the Austrian Science Fund FWF**

- 01/09/2015 **Ordinary competition Scuola Normale Superiore, Pisa**
Grading in list: 3 (out of 6 available positions)
- 01/09/2015 **Competition for SISSA collaboration with Trieste University**
Grading in list: 5 (out of 6 available positions)

Publications and Preprints

- Submitted L. PORTINALE, S. RADEMACHER, AND D. VIROSZTEK, *Limit theorems for empirical measures of interacting quantum systems in Wasserstein space*, arxiv:2312.00541 (2023).
- Submitted L. PORTINALE AND F. QUATTROCCHI, *Discrete-to-continuum limits of optimal transport with linear growth on periodic graphs*, arxiv:2311.17284 (2023).
- Accepted L. PORTINALE, *Entropic regularised optimal transport in a noncommutative setting*, arxiv:2310.10142 (2023). To appear in the book "*Optimal Transport on Quantum Structures*" <https://link.springer.com/book/9783031504655>.
- Accepted M. MAGNABOSCO, L. PORTINALE, AND T. ROSSI, *The strong Brunn–Minkowski inequality and its equivalence with the CD condition*, arxiv:2210.01494 (2022). Accepted on *Communications in Contemporary Mathematics*
- Published S. DI MARINO, L. PORTINALE, AND E. RADICI, *Optimal transport with nonlinear mobilities: a deterministic particle approximation result*, *Advances in Calculus of Variations* (2024), <https://doi.org/10.1515/acv-2022-0076>.
- Published L. DELLO SCHIAVO, L. PORTINALE, AND F. SAU, *Scaling Limits of Random Walks, Harmonic Profiles, and Stationary Non-Equilibrium States in Lipschitz Domains*, *Ann. Appl. Probab.* 34 (2024), no. 2, 1789–1845.
- Published M. MAGNABOSCO, L. PORTINALE, AND T. ROSSI, *The Brunn–Minkowski inequality implies the CD condition in weighted Riemannian manifolds*, *Nonlinear Analysis* (2024) | DOI: <https://doi.org/10.1016/j.na.2024.113502> .
- Published P. GLADBACH, E. KOPFER, J. MAAS, AND L. PORTINALE, *Homogenisation of dynamical optimal transport on periodic graphs*, *Calc. Var. Partial Differential Equations*, 62(5), Paper No. 143, 75, 2023.
- Published D. FELICIANGELI, A. GEROLIN, AND L. PORTINALE, *A Non-Commutative Entropic Optimal Transport Approach to Quantum Composite Systems at Positive Temperature*, *J. Funct. Anal.*, 285(4):Paper No. 109963, 39, 2023.
- Published D. FORKERT, J. MAAS, AND L. PORTINALE, *Evolutionary Γ -convergence of entropic gradient flow structures for Fokker–Planck equations in multiple dimensions*, *SIAM Journal on Mathematical Analysis* (2022) | DOI: 10.1137/21M1410968 .
- Published P. GLADBACH, E. KOPFER, J. MAAS, AND L. PORTINALE, *Homogenisation of one-dimensional discrete optimal transport*, *J. Math. Pures Appl.* (9), 139 (2020), pp. 204–234.
- Published L. PORTINALE AND U. STEFANELLI, *Penalization via global functionals of optimal-control problems for dissipative evolution*, *Adv. Math. Sci. Appl.*, 28 (2019), 425–447.

- In preparation L. DELLO SCHIAVO, S. FLOREANI, L. PORTINALE, AND F. SAU, *Homogenization of discrete boundary-value problems and scaling limits of boundary-driven interacting particle systems* (2024+).
- In preparation P. GLADBACH, J. MAAS, AND L. PORTINALE, *Stochastic homogenisation of transport problems on stationary graphs* (2024+).
- In preparation E. CAPUTO, A. GEROLIN, N. MONINA, AND L. PORTINALE, *Quantum optimal transport with convex regularizations* (2024+).

Talks at Conferences and Workshops

- March 31 - April 4, 2025 Workshop I: Optimal Transport for Density Operators: Theory and Numerics, Institute for Pure and Applied Mathematics (IPAM), UCLA (**Invited talk**).
- September 09-13, 2024 Gradient flows 4 face to face, München (**Invited talk**).
- September 02-06, 2024 Quantum Optimal Transport and Applications (QOTTA), Cortona (**Invited talk**).
- June 10-14, 2024 Italian meeting on Probability and Mathematical Statistics, Rome. Speaker at the Symposium "Hydrodynamic limits " organised by Simone Floreani (**Invited talk**).
- May 19-25, 2024 SIAM Conference on Mathematical Aspects of Materials Science, Pittsburgh, USA (**Invited Talk** – Minysimposium "Analysis and Modeling of Gradient Flows with Multiscale Effects", organised by Yuan Gao, and Aaron Nung Kwan Yip)
- September 10-15, 2023 Gradient Flows face-to-face 3, Université Claude Bernard Lyon I, Lyon (**Invited talk**)
- August 18-27, 2023 ICIAM 2023, Waseda University, Tokyo (**Invited Talk** – Minysimposium, organised by Yuan Gao, Matthias Liero, and Artur Stephan)
- November 14-18, 2022 Workshop on Aspects of Ricci Curvature Bounds, Fields Institute, Toronto (**Invited talk**)
- October 16-22, 2022 Oberwolfach Arbeitsgemeinschaft on Stochastic Homogenisation, organised by A. Gloria and F. Otto (**Lecture talk**)
- September 26-30, 2022 Workshop "Optimal Transport on Quantum Structures", Rényi Institute and Erdős Center, Budapest (**Invited talk**)
- September 12-15, 2022 Workshop "[Gradient Flows Face-To-Face]²", Università degli studi dell'Aquila (**Invited talk**)
- May 04, 2022 Budapest Graduate Seminar, Rényi Institute (**Invited talk**)
- March 14, 2022 SIAM Conference on Analysis of Partial Differential Equations (**Organizer (with G. Favre and B.T. Quoc) and Speaker - Minysimposium**)
- December 07, 2021 WEMM (Wien, Erlangen, München, Münster) Seminars (online) (**Invited talk**)
- October 18-29, 2021 Workshop "Dynamics and Discretization: PDEs, Sampling, and Optimization", Simons Institute in Berkeley, CA. (**Invited talk**)
- December 22, 2020 Welcome Home 2020, Dipartimento di Matematica "G. Peano", Università di Torino (online) (**Invited talk**)

- October 16, 2020 Student compact course of the Thematic Einstein Semester on Energy-Based Mathematical Methods for Reactive Multiphase Flows, Berlin (online) (**Contributed talk**).
- April 14 - June 14, 2019 Thematic program in Optimal Transport, E. Schrödinger institute, Wien (**Contributed talk**).
- February 18-22, 2019 GAMM 2019: 90th Annual Meeting of the International Association of Applied Mathematics and Mechanics 2019, Wien (**Contributed talk**).
- October 14-20, 2018 Oberwolfach Seminar: Optimal Transport Theory and Hydrodynamics (from Euler to Monge and vice versa) (**Contributed talk**).

Organisation of academic events

- September 16-20, 2024 Workshop "Calculus of Variations: a New Generation", Bonn. Organised in collaboration with S. Di Marino and E. Radici.
- July 13-16, 2021 Recent advances in Gradient Flows, Kinetic Theory, and Reaction-Diffusion Equations, Online event. Organised in collaboration with G. Favre and B.T. Quoc.
- March 14, 2022 SIAM Conference on Analysis of Partial Differential Equations. Minisymposium organised in collaboration with G. Favre and B.T. Quoc.

Teaching

- June 2024 Summer school "Optimal transport: discrete and continuous", Budapest. Hold a minicourse (4.5hrs) on "Gradient flows and Optimal Transport".
- Spring 2023 Teacher for the course "Stochastic Processes" at the University of Bonn.
- Fall 2020 Teaching assistant for the course "Optimal Transport", IST Austria.

Supervision of students

- Spring 2024 Supervision for the Internship of PhD student Nataliia Monina, from Ottawa university.
- Fall 2023+ Supervision for Master thesis of Alexander Becker. Title: Large deviations of stochastic processes on Riemannian manifolds (on-going).
- Spring 2023 Supervision of Meugang Toukam Kevine as part of the YAM Program at the University of Bonn.

Seminar Talks

- February 14, 2024 Mathematical Physics Seminar, University of Genova.
- November 08, 2023 Analysis Seminar, Bielefeld (invited by Matthias Erbar).
- November 06, 2020 AJS (Analysis Junior Seminars) in SISSA, Trieste (online).
- December 18, 2019 EPFL, Lausanne (invited by Emanuela Radici).

- September 18, 2019 Analysis Colloquium Vrije Universiteit, Amsterdam (invited by Augusto Gerolin).
- September 2017-now Pde Afternoon: Seminars cycle at University of Vienna (six talks given).

Short term visits

- March 2024 Institute of Science and Technology Austria, Klosterneuburg. Visting Prof. Jan Maas and Lorenzo Dello Schiavo.
- February, 2024 University of Genova, visiting Prof. Augusto Gerolin.
- September 2023 University of l'Aquila, working with Prof. Marco di Francesco and Prof. Emanuela Radici.
- May 2023 University of Leipzig, working together with Simone Rademacher and Daniel Virosztek.
- July 2023 Università degli Studi di Trieste, visiting Federico Sau.
- February 2023 Institute of Science and Technology Austria, Klosterneuburg. Visiting Prof. Jan Maas and Lorenzo Dello Schiavo.
- November 2022 Fields Institute, Toronto + University of Ottawa, Canada; visiting Prof. Augusto Gerolin.
- July 2022 TUM Technical Unviersity of Munich, visiting Prof. Daniel Matthes and Prof. Marco Cicalese.
- June 2022 TUE Technical University of Eindhoven, visiting Prof. Oliver Tse.
- October 2021 Simons Institute in Berkeley, CA. In occasion of the Workshop "Dynamics and Discretization: PDEs, Sampling, and Optimization".

First-Year (PhD) Rotation Projects

- J.Maas Random matching problem and optimal transport.
- U.Stefanelli Approximation of evolutive PDE optimal control problem through Legendre penalization (external rotation, Uniwien).
- C.Lampert Optimal transport and Machine learning: WGAN.

Attended Events

- March 11-14, 2024 Workshop on Optimal Transport: From Theory to Applications, Humboldt-Universität, Berlin.
- February 12-14, 2024 XXXII Convegno Nazionale del Calcolo delle Variazioni, Riccione.
- May 09-13, 2022 XXXI Convegno Nazionale del Calcolo delle Variazioni, Levico Terme, Trento.
- February 03-07, 2020 XXX Convegno Nazionale del Calcolo delle Variazioni, Levico Terme, Trento.

September 02-05, 2019 ICMS conference "Optimal Transport and Optimal Patterns", Edinburgh.

June 24-28, 2019 POTA (People in Optimal Transportation and Applications) workshop, Cortona.

February 04-08, 2019 XXIX Convegno Nazionale di Calcolo delle Variazioni, Levico Terme, Trento.

November 12-16, 2018 Optimal Transport and Applications, Pisa.

September 03-06, 2018 Meeting in Applied Mathematics and Calculus of Variations, Roma.

May 7-11, 2018 Lake Como school of advanced studies, Como.

February 05-10, 2017 XXVII Convegno Nazionale di Calcolo delle Variazioni, Levico Terme, Trento.

September 19-23, 2016 A Mathematical Tribute to Ennio De Giorgi, Centro di Ricerca Matematica E. De Giorgi.

September 19-23, 2016 Optimal Transport and Applications, Pisa.

Aug. 30 - Sep. 13, 2016 Pisa-Hokkaido Summer School, Centro di Ricerca Matematica E. De Giorgi.

Language skills

Italian Mother tongue
 English Fluent
 German Basic (B2)

Place: Bonn.

Date: 18.07.24