Curriculum vitæ

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sodini.giacomo@gmail.com
giacomo.sodini@univie.ac.at

Giacomo Enrico Sodini
live:sodini.giacomo

Research Interests

Mathematical Analysis. In particular

- Optimal Transport,
- Calculus of Variations,
- Non-smooth analysis.

Current Position

1 | **University assistant** — Since October 2022
Universität Wien | Österreich

Education

1 | **Ph.D. in Mathematics** — Nov 2019 | Sept 2022
TUM-IAS | Munich
Thesis: *Optimal transport: unbalanced positive measures, dissipative evolutions and Sobolev spaces*
Supervisors: *Prof. M. Fornasier and Prof. G. Savaré*
Grade: *summa cum laude*

2 | **M.Sc. in Mathematical Engineering** — Oct 2017 | Oct 2019
Politecnico di Milano
Thesis: *Fine estimates on the matching problem via PDE techniques*
Advisors: *Prof. L. Ambrosio and Prof. S.Salsa*
Grade: *110/110 cum laude*

3 | **B.Sc. in Mathematical Engineering** — Oct 2014 | Jul 2017
Politecnico di Milano
Thesis: *Probability Measures on Trajectories Spaces and the Kolmogorov Existence Theorem*
Advisor: *Prof. M. Gregoratti*
Grade: *110/110 cum laude*

4 | **High School Degree** — Sept 2009 | Jun 2014
Liceo Scientifico Statale Lorenzo Respighi | Piacenza
Grade: *100/100*

Publications

1 | **A relaxation viewpoint to Unbalanced Optimal Transport: duality, optimality and Monge formulation** w/G. Savaré |
Journal de Mathématiques Pures et Appliquées | 188 (2024)

2 | **Extension of monotone operators and Lipschitz maps invariant for a group of isometries** w/G. Cavagnari and G. Savaré |
Canadian Journal of Mathematics | Published online (2023) pp. 1-38

3 | **Density of subalgebras of Lipschitz functions in metric Sobolev spaces and applications to Wasserstein Sobolev spaces** w/M. Fornasier and G. Savaré |
Journal of Functional Analysis | 285.11 (2023)

4 | **The general class of Wasserstein Sobolev spaces: density of cylinder functions, reflexivity, uniform convexity and Clarkson's inequalities** |
Calculus of Variations and Partial Differential Equations | 62.7 (2023)

5 | **Dissipative PVFs and generation of evolution semigroups in Wasserstein spaces** w/G. Cavagnari and G. Savaré |
Probability Theory and Related Fields | 185.3-4 (2023), pp. 1087-1182

6 | **A simple relaxation approach to duality for OT problems in completely regular spaces** w/G. Savaré |
Journal of Convex Analysis 29.1 (2022), pp.1-12

7 | **Mathematical Analysis - Module 1 Exercises** w/M. D'Amico, J. De Tullio and G. Osimo |
Egea - Le dispense del Pellicano (2021)

8 | **Numerical methods for a system of coupled Cahn-Hilliard equations** w/M.Martini |
Communications in Applied and Industrial Mathematics, 12, (2021), Issue 1, pp. 1-12

Preprints

1 | **Approximation Theory, Computing, and Deep Learning on the Wasserstein Space** w/M. Fornasier and P. Heid |
Preprint | October 2023

2 | **A Lagrangian approach to dissipative evolutions in Wasserstein spaces** w/G. Cavagnari and G. Savaré |
Preprint | May 2023

Conferences

1 | **Lions-Magenes days 2024** Pavia, 21-22 May 2024

2 | **Variational Analysis, Models and Methods in Measure Spaces** CIRM Marseille, 29 April-3 May 2024

3 | **Austrian Calculus of Variations day** Vienna, 23-24 November 2023

4 | **The Mathematics of Subjective Probability** Milano, 11-13 September 2023

5 | **Calculus of Variations and Geometric Measure Theory** Pisa, 11-15 June 2023

6 | **XXXII Convegno Nazionale di Calcolo delle Variazioni** Levico T., 7-12 May 2023

7 | **Workshop on Optimal Transport, Mean-Field Models, and Machine Learning** Munich, 24-28 April 2023

8 | **Geometric Analysis and PDEs at PoliMi** Milano, 5 December 2022

9 | **Smooth Functions on Rough Spaces and Fractals with Connections to Curvature Functional Inequalities** Banff, 20-25 November 2022

10 | **2nd Austrian Calculus of Variations Day** — Salzburg, 17-18 November 2022

11 | **Optimal Transportation and Applications** — Pisa, 24-28 October 2022

12 | **PIMS - IFDS - NSF Summer School in Optimal Transport** — Seattle, 20 June - 2 July 2022

13 | **XXXI Convegno Nazionale di Calcolo delle Variazioni** — Levico T., 8-13 May 2022

14 | **Schrödinger Problem and Mean-field PDE Systems** — CIRM Marseille, 15-19 November 2021

15 | **XXX Convegno Nazionale di Calcolo delle Variazioni** — Levico T., 3-7 February 2020

Talks

1 | **Wasserstein Sobolev spaces and applications to the computation of the Wasserstein distance** — May 2024
Invited speaker | Mathematics Department University of Pavia

2 | **Dissipative evolutions in Wasserstein spaces: the explicit Euler scheme** — April 2024
Invited speaker | CIRM Marseille

3 | **Monotone evolutions in the space of probability measures and the extension problem** — November 2023
Speaker | TU Wien

4 | **Dissipative evolutions in the space of probability measures** — November 2023
Speaker | Department of Mathematics University Nice

5 | **Unbalanced Optimal Transport: a relaxation viewpoint** — November 2023
Speaker | Mathematics Department University of Vienna

6 | **A relaxation approach to Optimal Transport with applications to the unbalanced case** — September 2023
Invited speaker | Mathematics Department Bicocca University

7 | **Density of subalgebras of Lipschitz functions in metric Sobolev spaces and applications to Sobolev-Wasserstein spaces** — May 2023
Speaker | Mathematics Department UniVie

8 | **Density of subalgebras of Lipschitz functions in metric Sobolev spaces and applications to Sobolev-Wasserstein spaces** — April 2023
Invited speaker | IAS-TUM Munich

9 | **Density of subalgebras of Lipschitz functions in metric Sobolev spaces and applications to Sobolev-Wasserstein spaces** — January 2023
Speaker | ISTA Vienna

10 | **Density of subalgebras of Lipschitz functions in metric Sobolev spaces and applications to Sobolev-Wasserstein spaces** — November 2022
Invited speaker | Mathematics Department PoliMi

11 | **Dissipative evolutions in Wasserstein spaces** — November 2022
Contributed speaker | Mathematics Department of University of Salzburg

12 | **Density of subalgebras of Lipschitz functions in metric Sobolev spaces and applications to Sobolev-Wasserstein spaces** — November 2022
Contributed speaker | BIRS Banff

13 | **A relaxation approach to Optimal Transport with applications to the unbalanced case** — October 2022
Speaker | Mathematics Department UniVie

14 | **A relaxation approach to Optimal Transport with applications to the unbalanced case** October 2022
Invited Speaker | SNS Pisa

15 | **Density of subalgebras of Lipschitz functions in metric Sobolev spaces and applications to Sobolev-Wasserstein spaces** July 2022
Speaker | KU-LMU-TUM Joint Seminar

16 | **A relaxation approach to optimal transport with applications to the unbalanced case** June 2022
Contributed speaker | University of Washington, Seattle

17 | **Unbalanced optimal transport** May 2022
Speaker | TUM Department of Mathematics

18 | **A relaxation approach to optimal transport** November 2021
Invited speaker | Mathematics Department of Politecnico di Milano

19 | **A brief introduction to optimal transport** April 2020
Speaker | Mathematics Department of University of Pavia

Teaching

1 | **Exercise classes for Analysis 2. Lecturer: Nathanael Berestycki** Summer semester 2024

2 | **Exercise classes for Topologie und Funktionalanalysis. Lecturer: Gerald Teschl** First semester 2023/2024

3 | **Exercise classes for Mathematical Analysis - Module 1. Lecturer: Giuseppe Savaré** First semester 2023/2024

4 | **Exercise classes for Mathematical Analysis - Module 1. Lecturer: Giuseppe Savaré** First semester 2022/2023

5 | **Exercise classes for Foundations in Data Analysis. Lecturer: Felix Kramer** Summer semester 2022

6 | **Exercise classes for Mathematical Analysis II. Lecturer: Giulia Cavagnari** Second semester 2021/2022

7 | **Exercise classes for Mathematical Analysis - Module 1. Lecturer: Giuseppe Savaré** First semester 2021/2022

8 | **Exercise classes for Foundations in Data Analysis. Lecturer: Massimo Fornasier** Summer semester 2021

9 | **Exercise classes for Mathematical Analysis II. Lecturer: Giulia Cavagnari** Second semester 2020/2021

10 | **Exercise classes for Mathematical Analysis - Module 1. Lecturer: Giuseppe Savaré** First semester 2020/2021

11 | **Exercise classes for Foundations in Data Analysis. Lecturer: Massimo Fornasier** Summer semester 2020