Mattia Galeotti

Curriculum Vitæ

Dipartimento di Matematica
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Personal profile

Born	April 27, 1989
Birthplace	Barga (LU) – ITALY

Work experience

2023-current	**Postdoctoral researcher (Ricercatore di Tipo A)**, *Università di Bologna*
2019-2023	**Postdoctoral researcher (assegnista di ricerca)**, *Università di Bologna*
2018-2019	**Postdoctoral researcher (assegnista di ricerca)**, *Università degli Studi di Trento*

Education

November 30, 2017	**Thesis defense. Thesis title: Moduli of curves with principal and spin bundles: singularities and global geometry** Supervisor: Alessandro Chiodo
2014-2017	**PhD student in mathematics**, *Université Pierre et Marie Curie, Paris, Institut de Mathématiques de Jussieu*
9/2013	**Master Degree in mathematics**, *Université Pierre et Marie Curie, Paris, Mention "Très Bien" (Very Good)* Supervisor: Alessandro Chiodo
2011-2014	**Student in mathematics**, *Ecole Normale Supérieure, Paris*
7/2011	**Laurea Triennale - Bachelor equivalent**, *Università di Pisa, 110/110 cum laude* Supervisor: Angelo Vistoli
2008-2011	**Student in mathematics**, *Scuola Normale Superiore, Pisa*
2008-2011	**Student in mathematics**, *Università di Pisa*

Research interests

Partial Differential Equations, Sub-Riemannian geometry, contact structures, models of the Visual Cortex, optimal transport, deformation theory

Papers

1. **Critical singular problems in Carnot groups**, arXiv:2506.07521
   under review
2. **An extension to non-nilpotent groups of Rothschild-Stein lifting method**, arXiv:2403.19619
   under review
3. **The cortical V1 transform as a heterogeneous Poisson problem**, *joint work with Alessandro Sarti and Giovanna Citti*
   SIAM Journal on Imaging Sciences 17 (1) (2024)

4. **Differential Operators Heterogenous in Orientation and Scale in the V1 Cortex**, *joint conference paper with Giovanna Citti and Alessandro Sarti*
   International Conference on Geometric Science of Information. Cham: Springer Nature Switzerland, 2023

5. **Cortically based optimal transport**, *joint work with Giovanna Citti and Alessandro Sarti*
   Journal of Mathematical Imaging and Vision (2022)

6. **Birational geometry of moduli of curves with an S_3-cover**
   Advances in Mathematics. Vol. 389, 2021

7. **Moduli of G-covers of curves: geometry and singularities**
   Annales de l'Institut Fourier, Tome 72 (2022) no. 6, pp. 2191-2240

8. **Moduli spaces of abstract and embedded Kummer varieties**, *joint work with Sara Perna*
   International Journal of Mathematics. Vol. 32, No. 08, 2150054 (2021)

9. **Discrimination and algorithms. Encounters and confrontations between different definitions of fairness (in italian)**
   The Lab's Quarterly, 2018, XX, 4

10. **Singularities of moduli of curves with a universal root**
    Documenta Mathematica, n.22 (2017)

Supervision activity

2021 **Francesco Paltrinieri**, *master student at Università di Bologna*, master thesis *Approximation theorems through neural networks and applications to measure error mapping* (in italian)
co-advised with Giovanna Citti

2021 **Giulia Lupi**, *master student at Università di Bologna*, master thesis *Kernel approximations in Lie groups and application to group-invariant CNN*
co-advised with Giovanna Citti

2019 **Valeria Tomasi**, *master student at Università degli Studi di Trento*, master thesis *From Geometry to the theory of categories: the concept of topos as generalized space* (in italian), co-advised with Claudio Fontanari

Invited talks in conferences

upcoming **GSI'25, Geometric Science of Information**, *Saint-Malo*, talk presentation "A heterogeneous model of boundary and figure completion in V1"

1/09/2023 **GSI'23, Geometric Science of Information**, *Saint-Malo*, presented talk "Differential operators heterogeneous in orientation and scale in the V_1 cortex"

Talks and Posters

25/06/2025 **Sub-Riemannian Geometry and Beyond, IV**, *Schwarzsee, Fribourg (Switzerland)*, presented poster "A Sub-Riemannian version of the Benamou-Brenier Theorem"

8/10/2024 **Periodic Seminar of the Mathematics Department**, *Trento*, Presented talk "A lifting and saturation method for non-nilpotent lie groups"

21/03/2024 **Pini Seminar**, *Bologna*, presented talk "Global fundamental solutions for Hörmander operators via a saturation method"

28/02/2024 **Bio-PDE Days 2024**, *Wien*, presented poster "The visual V1 cortex action as a heterogeneous differential operator"

19/02/2023 **VISAPP2023, at the 18th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications**, *Lisbon*, presented poster "Poisson's equation with heterogeneous differential operators"

2/02/2023 **Mathematics and Image Analysis, MIA conference 2023**, *Humboldt Universität, Berlin*, presented poster "Poisson's equation with heterogeneous differential operators"

17/05/2021 **Post structural dynamic seminar (online)**, *EHESS, Paris*, presented talk jointly with Luca Cabassa: "Between virtuality and formal gesture: thinking about the rare event" (in French)

30/04/2021 **Conference "Giornate di geometria algebrica e argomenti correlati XV" (online)**, *Mathematics Department, Università di Milano*, presented talk "Birational geometry and singularities of moduli of curves with a spin bundle or a principal bundle"

26/03/2019 **Geometry Seminar**, *Università degli Studi di Trento*, presented talk "The Kodaira dimension of moduli of curves with spin and principal bundles"

26/04/2018 **Pure Mathematics Seminar**, *University of Liverpool*, presented talk "Singularities and global geometry of moduli of curves with spin and principal bundles"

Organized Conferences and Seminars

16-18/06/2025 **Three days in Sub-Riemannian geometry**, *Math Department*, University of Bologna
organizing committee

24-28/06/2024 **Noncommutativity at the Interface of Topology, Geometry and Analysis**, *Bologna*, JHU-Unibo conference
organizing committee

3-5/07/2023 **Sub-Riemannian Geometry Harmonic Analysis, PDEs and Applications**, *Math Department*, University of Bologna
organizing committee

Teaching

2024/2025 **Teaching professor for the course "Analysis TA"**, *Università di Bologna*, Faculty of Energetic Engineering

2023/2024 **Teaching professor for the course "Analysis 1"**, *Università di Bologna*, Faculty of Informatics

2021/2022 **Teaching assistant for the course "Tutorials in mathematics"**, *Università di Bologna*, Faculty of Economics and Finance

2020/2021 **Teaching professor for the course "Analysis 1"**, *Università di Bologna*, Faculty of Informatics

2019/2020 **Teaching assistant for the course "Analysis"**, *Università di Bologna*, Faculty of Engineering

2016/2017 **Teaching assistant for the course "Elements of mathematics"**, *bachelor's degree at UPMC*, Paris

2015/2016 **Teaching assistant for the courses "Elements of mathematics" and "Elementary probabilities"**, *bachelor's degree at UPMC*, Paris

2014/2014 **Teaching assistant for the courses "Elements of mathematics" and "Series, integrals and linear algebra"**, *bachelor's degree at UPMC*, Paris