

# Mattia Galeotti

## Curriculum Vitæ

Dipartimento di Matematica  
Università di Bologna  
Piazza di Porta San Donato 5, 40126 Bologna  
✉ galeotti.mattia.work@gmail.com  
🌐 [www.dm.unibo.it/~mattia.galeotti4/](http://www.dm.unibo.it/~mattia.galeotti4/)

### 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

Sub-Riemannian geometry, contact structures, jet bundles, models of the Visual Cortex, PDEs on cortical models, deformation theory

### Papers

8. **The cortical V1 transform as a heterogeneous Poisson problem**, joint work with Alessandro Sarti and Giovanna Citti, arXiv:2206.06895, to appear on the SIAM Journal on Imaging Science
7. **A framework for stereo vision via optimal transport**, joint work with Giovanna Citti and Alessandro Sarti, arXiv:2207.00333, Under review
6. **Cortically based optimal transport**, joint work with Giovanna Citti and Alessandro Sarti, Journal of Mathematical Imaging and Vision (2022)

5. **Birational geometry of moduli of curves with an  $S_3$ -cover**, *Advances in Mathematics*. Vol. 389, 2021
4. **Moduli of  $G$ -covers of curves: geometry and singularities**, *Annales de l'Institut Fourier*, Tome 72 (2022) no. 6, pp. 2191-2240
3. **Moduli spaces of abstract and embedded Kummer varieties**, *joint work with Sara Perna*, *International Journal of Mathematics*. Vol. 32, No. 08, 2150054 (2021)
2. **Discrimination and algorithms. Encounters and confrontations between different definitions of fairness (in italian)**, *The Lab's Quarterly*, 2018, XX, 4
1. **Singularities of moduli of curves with a universal root**, *Documenta Mathematica*, n.22 (2017)

## Students

- 2021 **Francesco Paltrinieri**, *student at Università di Bologna*, master thesis “Approximation theorems through neural networks and applications to measure error mapping” (in italian), I was co-supervisor; supervisor: Giovanna Citti
- 2021 **Giulia Lupi**, *student at Università di Bologna*, master thesis “Kernel approximations in Lie groups and application to group-invariant CNN”, I was co-supervisor; supervisor: Giovanna Citti
- 2019 **Valeria Tomasi**, *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), I was co-supervisor, supervisor: Claudio Fontanari

## Talks and Posters

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

- 3-5/7/2023 **Sub-Riemannian Geometry Harmonic Analysis, PDEs and Applications**, *Dipartimento di Matematica, Università di Bologna* organizing committee

## Attended Conferences and Seminars

- 1-5/8/2022 **Local cohomology and related topics**, *Stockholms Matematikcentrum*, Stockholms
- 20-25/6/2021 **Entropic Regularization of Optimal Transport and Applications**, *Banff International Research Station for Mathematical Innovation and Discovery*, Banff
- 15-19/7/2019 **ACT 2019 - Applied Category Theory Conference**, *Oxford University*, Oxford
- 11/2018-05/2019 **Seminar “Dynamiques post-structurelles : devenir hétérogène, intensif, singulier”**, *EHESS*, Paris
- 11-15/7/2018 **Topological Data Analysis and Persistent Homology**, *CIRM - Università di Trento - Università di Milano*, Levico Terme
- 27-30/3/2017 **Cycles and Moduli**, *ETH*, Zürich
- 11-13/7/2017 **Conference on Complex networks: from theory to interdisciplinary applications**, Marseille
- 22-24/3/2016 **CIMPA-CIMAT-ICTP School on Moduli of Curves**, *Cimat*, Guanajuato
- 22/6-10/7/2015 **Pragmatic 2015 - Moduli of Curves and Line Bundles**, *Università di Catania*, Catania

## Teaching

- 2023/2024 **Teaching professor for the course “Analysis 1”**, *Università di Bologna*, Faculty of informatics
- 10/2021 **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
- 1-3/2020 **Teaching assistant for the course “Analysis”**, *Università di Bologna*, Faculty of engineering
- 2014-2016 **Teaching assistant for various courses of undergraduate level**, *UPMC*, Paris