

# Gabriele Lobbia

Research Fellow

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## Professional Experience

- Apr 2025 – **Research Fellow (RTDA)**, *Università degli Studi di Milano (Department of Mathematics “Federigo Enriques”)*, Milan, Italy
- Mar 2024 – **Postdoctoral Researcher (Assegnista di Ricerca)**, *Università di Bologna (Department of Computer Science)*, Bologna, Italy, working with Fabio Zanasi on the project *Resource Awareness in Programming*.
- 2022 – 2024 **Postdoctoral Researcher**, *Masaryk University (Department of Mathematics)*, Brno, Czech Republic
- Aug-Dec 2021 **Part-Time Researcher**, *Masaryk University*, Brno, Czech Republic, working with John Bourke on skew monoidal categories, multicategories and connections with higher dimensional categories.
- 2019–2021 **Teaching Assistant**, *University of Leeds*, UK.
- Feb 2017 **Substitute Teacher**, *Liceo Falcone Borsellino*, Arese (MI), Italy

## Education

- 2018–2022 **PhD in Mathematics**, *School of Mathematics*, University of Leeds, UK  
Funded by an EPSRC Scholarship, Oct 2018 – Feb 2022,  
Supervisors: Dr. N. Gambino and Prof. P. Martin  
Thesis: Pseudomonads, Relative Monads and Strongly Finitary Notions of Multicategory  
Examiners: Prof. M. Fiore and Dr. J. Faria Martins
- 2016–2018 **ALGANT Master Program Degree (M.S.)**  
*Università degli studi di Milano* 110/110 cum laude, *Universität Regensburg* 1.0/1.0  
Advisor: Prof. Dr. Denis-Charles Cisinski  
Thesis Title: Kan Complexes as a Univalent Model of Type Theory
- 2013–2016 **Laurea Triennale in Matematica (B.S.)**, *Università degli studi di Milano*, 110/110

## Research Interests

Category theory, higher category theory, categorical logic, universal algebra, multicategories, monoidal categories, skew structures, sketches, categorical algebra, theoretical computer science.

## Publications and Preprints

- 2024\* **Sketches and Classifying Logoi**, with Ivan Di Liberti  
preprint, available at [arXiv:2403.09264](https://arxiv.org/abs/2403.09264).
- 2023\* **A finite approach to representable multicategories and related structures**  
preprint, available at [arXiv:2312.06237](https://arxiv.org/abs/2312.06237).
- 2023\* **Some Remarks on the Interchange in Gray-categories**, with Nicola Di Vittorio  
preprint, available at [arXiv:2310.03503](https://arxiv.org/abs/2310.03503).
- 2025 **Quantitative Monoidal Algebra**, with Wojciech Różowski, Ralph Sarkis and Fabio Zanasi  
*50th International Symposium on Mathematical Foundations of Computer Science (MFCS)*,  
preprint available at [arXiv:2410.09229](https://arxiv.org/abs/2410.09229).
- 2024 **KZ-pseudomonads and Kan Injectivity**, with Ivan Di Liberti and Lurdes Sousa  
*Theory and Applications of Categories (Bunge Festschrift)*, 40 (16), pp 430-478.
- 2023 **A skew approach to enrichment for Gray-categories**, with John Bourke  
*Advances in Mathematics*, vol. 434:109327, preprint available at [arXiv:2212.12358](https://arxiv.org/abs/2212.12358).

- 2023 **Distributive laws for relative monads**  
*Applied Categorical Structures*, 37 (19), preprint available at arXiv:2007.12982.
- 2021 **On the formal theory of pseudomonads and pseudodistributive laws**, with Nicola Gambino  
*Theory and Applications of Categories*, 37 (2), pp. 14-56.

## Scholarships, Awards and Grants

- 2025 **PNRR Young Researcher 2024 - SoE Grant**.
- 2024 **Seal of Excellence** for the project proposal 3DALG (3-Dimensional Algebra) submitted under the *Horizon Europe Marie Skłodowska-Curie Actions* call HORIZON-MSCA-2023-PF-01-01.
- 2018 – 2022 **EPSRC PhD Scholarship**
- 2017 – 2018 **Erasmus Grant** to study in Regensburg, Germany

## Research Visits

- 2025 **Masaryk University** (Brno, Czech Republic), 7-20 July.
- University of Manchester** (UK), 1-4 July.
- 2024 **University of Manchester** (UK), 22-26 April.
- 2020 **University of Cambridge** (UK), 20-22 January.

## Conference Talks

- 2024 **Sketches and Classifying Logoi**, CT2024, Santiago de Compostela, contributed (plenary), June.
- 2023 **2-dimensional Aspects of the Theory of Sketches**, 4<sup>th</sup> ItaCa Workshop, Turin, contributed, December.
- A Skew Approach to Enrichment for Gray-categories**, PSSL 107, Athens, contributed, April.
- 2022 **Kan Injectivity and KZ-monads**, SYCO 9, Como, contributed, September.
- 2021 **Finitary Definitions of Multicategory**, CT20→21, Genova, contributed, September.
- 2019 **The Formal Theory of Pseudomonads**, 1st ItaCa Workshop, Milano, contributed, December.
- The Formal Theory of Pseudomonads**, Postgraduate Conference in Category Theory and its Applications, Leicester, invited, November.

## Seminar Talks

- 2025 **Quantitative Monoidal Algebra**, Category Theory Seminar, Manchester, invited, July.
- 2024 **Sketches and Classifying Logoi**, LAC (Logic, Algebra, and Categories) Seminar, Milan, invited, December.
- Sketches and Classifying Logoi**, Category Theory Seminar, Manchester, invited, April.
- 2023 **Some Remarks on the Interchange in Gray-categories**, Masaryk University Algebra Seminar, contributed, November.
- A skew approach to enrichment for Gray-categories**, *ItaCa Fest 2023*, online, invited, October.
- A skew approach to enrichment for Gray-categories Part 2**, Masaryk University Algebra Seminar, contributed, April.
- 2022 **KZ-monads and Kan injectivity**, Masaryk University Algebra Seminar, contributed, May.
- 2021 **A nice picture of 2-cats**, Se Mi Narri, Pavia online, invited, March.
- 2020 **Distributive laws for relative monads**, Masaryk University Algebra Seminar, Brno online, invited, December.
- Monoidal Categories vs Multicategories**, Postgraduate Logic seminar, Leeds online, contributed, November.

- Distributive laws for relative monads**, Virtual Logic Seminar, Leeds online, contributed, June.
- Everything is connected, everything is Yoneda**, Pure Postgraduate seminar, Leeds, contributed, February.
- A Formal Approach to Generalisations of Monads**, Category Theory Seminar, Cambridge, invited, January.
- 2019 **The Formal Theory of Pseudomonads**, Proofs, computations and constructions, Leeds, contributed, November.
- A nice picture of 2-cats**, Pure Postgraduate Seminar, Leeds, contributed, March.
- 2018 **Kan Complexes as a Univalent Model of Type Theory**, Postgraduate Logic seminar, Leeds, contributed, October.

## Conferences, Workshops and Summer/Winter Schools

- 2025 **CT 2025**, Brno, 13-19 July.
- 2024 **CT 2024**, Santiago de Compostela, 23-29 June (contributed talk).
- 2023 **4<sup>th</sup> ItaCa Workshop**, Turin, 18-19 December (contributed talk).
- CT 2023**, Louvain-la-Neuve, 2-8 July.
- PSSL 107** (Peripatetic Seminar on Sheaves and Logic), Athens, 2-3 April (contributed talk).
- 2022 **3<sup>rd</sup> ItaCa Workshop**, Pisa, 21-22 December.
- SYCO 9** (Symposium on Compositional Structures), Como, 8-9 September (contributed talk).
- Bicategories, Categorification and Quantum Theory** (Summer School), Leeds, 11-15 July.
- TACL 2022** (Topology, Algebra and Categories in Logic), Coimbra, 20-24 June.
- PSSL 106** (Peripatetic Seminar on Sheaves and Logic), Brno, 14-15 May.
- ItaCa Fest 2022**, online, April-November.
- 2021 **2<sup>nd</sup> ItaCa Workshop**, Genova, 20-21 December.
- CT20→21**, Genova, 30 August-4 September.
- ItaCa Fest 2021**, online, April-June.
- 2020 **ItaCa Fest 2020**, online, June-December.
- 2019 **1<sup>st</sup> ItaCa Workshop**, Milano, 19-20 December (contributed talk).
- SYCO 6** (Symposium on Compositional Structures), Leicester, 16-17 December.
- Postgraduate Conference in Category Theory and its Applications**, Leicester, 18-19 November (invited talk).
- CT 2019**, Edinburgh, 7-13 July.
- Higher Topos Theory and Univalent Foundations** (Summer School), Leeds, 24-28 June.
- PSSL 105** (Peripatetic Seminar on Sheaves and Logic), Palermo, 18-19 May.

## Teaching Experience

- 2024–2025 **Teaching assistant (tutoraggio)**, Università degli Studi di Milano (corso di Viticoltura ed Enologia), for the course *Matematica*.
- 2024 **Teaching assistant**, Università di Bologna, for the course *Informatica Teorica*.
- 2019–2021 **Teaching assistant**, University of Leeds
- MATH1400 Modelling with Differential Equations, tutorials ( $\approx 10$  students), Spring 2020;
  - MATH1060 Introductory Linear Algebra, tutorials ( $\approx 10$  students), Spring 2020;
  - MATH2022 Groups and Vector Spaces, workshops ( $\approx 40$  students) Autumn 2019, marking/drop-in sessions Autumn 2020;

- MATH1225 Introduction to Geometry, tutorials ( $\approx 10$  students), Autumn 2019;
- MATH3044 Number Theory, marking, Spring 2019;
- MATH1026 Sets, Sequences and Series, tutorials ( $\approx 10$  students), Spring 2019, 2021.

Feb 2017 **Substitute Teacher** for a first year and a second year Scientifico classes and a first year Linguistico class, Liceo Scientifico e Linguistico “G. Falcone – P. Borsellino” (Arese, MI, Italy)

## Other Professional Experience

2025 **Program and Organising Committee** for 6<sup>th</sup> ItaCa Workshop.

**Programme Committee** for ACT (Applied Category Theory) 2025.

2023 – **Reviewer** for *Higher Structures*, *Applied Categorical Structures*, *Theory and Applications of Categories*, *ACT 2024* and *Mathematical Structures in Computer Science*.

May 2022 **Organising Committee**, PSSL 106 (Peripatetic Seminar on Sheaves and Logic), Brno.

2020 – **Social media manager** of ItaCa, the Italian community of category theory.

2019 – 2021 **Co-organiser** of the Pure Postgraduate Seminar, Leeds.

June 2019 **Organising Committee**, Higher Topos Theory and Univalent Foundations School, Leeds.

## Professional Memberships

2018 – 2021 Student member of the Association for Symbolic Logic

## Computer Skills

Languages  $\text{\LaTeX}$ , C

Platforms Windows

## Languages

Italian Native

English Fluent