Gabriele Lobbia

Postdoctoral Researcher

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Professional Experience

Mar 2024 – **Postdoctoral Researcher (Assegnista di Ricerca)**, *Universitá 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

Publications and Preprints

2024* **Quantitative Monoidal Algebra**, with Wojciech Różowski, Ralph Sarkis and Fabio Zanasi
preprint, available at arXiv:2410.09229.

2024* **Sketches and Classifying Logoi**, with Ivan Di Liberti
preprint, available at arXiv:2403.09264.

2023* **A finite approach to representable multicategories and related structures**
preprint, available at arXiv:2312.06237.

2023* **Some Remarks on the Interchange in Gray-categories**, with Nicola Di Vittorio
preprint, available at arXiv:2310.03503.

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.

2023 **Ditributive 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.

Research Interests

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

Scholarships, Awards and Grants

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

Conference Talks

2024 **Sketches and Classifying Logoi**, CT2024, Santiago de Compostela, contributed (plenary), June.

2023 **2-dimensional Aspects of the Theory of Sketches**, 4th 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

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

2024   **CT 2024**, Santiago de Compostela, 23-29 June (contributed talk).

2023   **4th 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   **3rd 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   **2nd 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   **1st 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

2019–2021   **Teaching assistant**, Universitá di Bologna, for the course *Informatica Teorica*.

2019–2021   **Teaching assistant**, University of Leeds

- MATH1400 Modelling with Differential Equations, tutorials (≈ 10 students), Spring 2020;
- MATH1060 Introductory Linear Algebra, tutorials (≈ 10 students), Spring 2020;
- MATH2022 Groups and Vector Spaces, workshops (≈ 40 students) Autumn 2019, marking/drop-in sessions Autumn 2020;
- MATH1225 Introduction to Geometry, tutorials (≈ 10 students), Autumn 2019;
- MATH3044 Number Theory, marking, Spring 2019;
- MATH1026 Sets, Sequences and Series, tutorials (≈ 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

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

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   LaTeX, C

Platforms   Windows

Languages

Italian   Native

English   Fluent