

Curriculum Vitae

Luca Reggio

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Contact

Professional address: Dipartimento di Matematica *Federigo Enriques*
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Personal information

Name and surname: Luca Reggio

Nationality: Italian

Date of birth: July 31, 1989

Place of birth: Monza, Italy

Current position

09/2024 – ongoing **Tenure-track Researcher (RTD-B)**
Dipartimento di Matematica *Federigo Enriques*,
Università degli Studi di Milano Statale

01/2025 – ongoing **Honorary Research Fellow**
Department of Computer Science, University College London (UCL)

Previous positions

02/2022 – 08/2024 **Senior Research Fellow**
Department of Computer Science, University College London (UCL)

02/2020 – 01/2022 **Marie Skłodowska-Curie Research Fellow**
Department of Computer Science, University of Oxford
Project: “Duality for finite models: relating structure to power”
Supervisor: Samson Abramsky

08/2019 – 01/2020 **Postdoctoral researcher**
Mathematical Institute, University of Bern
Supervisor: George Metcalfe

10/2018 – 07/2019 **Postdoctoral researcher**
Institute of Computer Science of the Czech Academy of Sciences, Prague
Supervisor: Petr Cintula

Education

09/2015 – 09/2018

Doctorat de Mathématiques, *mention très honorable*

Institut de Recherche en Informatique Fondamentale (IRIF), Paris-Diderot, Université de Paris

Title: “Quantifiers and duality”

Defence: September 10, 2018 in Paris

PhD supervisor: Mai Gehrke

09/2012 – 04/2015

Masters of Mathematics, *cum laude*

Department of Mathematics, Università degli Studi di Milano Statale

MSc thesis: “Stone duality above dimension zero”

MSc thesis supervisor: Vincenzo Marra

09/2008 – 02/2012

Bachelor of Mathematics, *with full marks*

Department of Mathematics, Università di Trento

List of publications

Copies of all articles and manuscripts listed below are available at the following address:

<https://lucareggio.github.io/publications/>

1. C. Borlido, P. Karazeris, **L. Reggio**, K. Tsamis (2024). Filtral pretoposes and compact Hausdorff locales, *Theory and Applications of Categories* **41**, 1439–1475.
URL: <http://www.tac.mta.ca/tac/volumes/41/41/41-41abs.html>
2. S. Abramsky, **L. Reggio** (2024). An invitation to game comonads, *ACM SIGLOG News* **11**, issue 3, 5–48. DOI: 10.1145/3687256.3687260.
3. S. Abramsky, **L. Reggio** (2024). Arboreal categories and equi-resource homomorphism preservation theorems, *Annals of Pure and Applied Logic* **175**, issue 6, 103423. DOI: 10.1016/j.apal.2024.103423.
4. S. Abramsky, **L. Reggio** (2023). Arboreal categories: an axiomatic theory of resources. Extended version of the ICALP’21 paper, *Logical Methods in Computer Science* **19**, issue 3, 14:1–14:36. DOI: 10.46298/lmcs-19(3:14)2023.
5. M. Abbadini, **L. Reggio** (2023). Barr-exact categories and soft sheaf representations. *Journal of Pure and Applied Algebra* **227**, issue 12, 107413. DOI: 10.1016/j.jpaa.2023.107413.
6. G. Metcalfe, **L. Reggio** (2023). Model completions for universal classes of algebras: necessary and sufficient conditions, *Journal of Symbolic Logic* **88**, issue 1, 381–417. DOI: 10.1017/jsl.2022.1.
7. M. Gehrke, T. Jakl, **L. Reggio** (2023). A Cook’s tour of duality in logic: From quantifiers, through Vietoris, to measures, In: *Samson Abramsky on Logic and Structure in Computer Science and Beyond, Outstanding Contributions to Logic* **25**, Springer. DOI: 10.1007/978-3-031-24117-8_4.

8. **L. Reggio** (2022). Polyadic sets and homomorphism counting, *Advances in Mathematics* **410**, Part A, 108712. DOI: 10.1016/j.aim.2022.108712.
9. M. Gehrke, T. Jakl, **L. Reggio** (2022). A duality theoretic view on limits of finite structures: Extended version, *Logical Methods in Computer Science* **18**, issue 1, 16:1–16:38. DOI: 10.46298/lmcs-18(1:16)2022.
10. S. Abramsky, **L. Reggio** (2021). Arboreal categories and resources, *International Colloquium on Automata, Languages, and Programming (ICALP), LIPIcs* **198**, 115:1–115:20. DOI: 10.4230/LIPIcs.ICALP.2021.115.
11. A. Dawar, T. Jakl, **L. Reggio** (2021). Lovász-type theorems and game comonads, *Proceedings of the 36th Annual ACM/IEEE Symposium on Logic in Computer Science (LiCS)*, 1–13. DOI: 10.1109/LICS52264.2021.9470609.
12. **L. Reggio** (2021). Beth definability and the Stone-Weierstrass Theorem, *Annals of Pure and Applied Logic* **172**, issue 8, 102990. DOI: 10.1016/j.apal.2021.102990.
13. M. Gehrke, D. Petrişan, **L. Reggio** (2020). Quantifiers on languages and codensity monads, *Mathematical Structures in Computer Science* **30**(10), issue 10, 1054–1088. Extended version of the LiCS’17 paper. DOI: 10.1017/s0960129521000074.
14. V. Marra, **L. Reggio** (2020). A characterisation of the category of compact Hausdorff spaces, *Theory and Applications of Categories* **35**, 1871–1906. URL: <http://www.tac.mta.ca/tac/volumes/35/51/35-51abs.html>
15. M. Abbadini, **L. Reggio** (2020). On the axiomatisability of the dual of compact ordered spaces, *Applied Categorical Structures* **28**, 921–934. DOI: 10.1007/s10485-020-09604-y.
16. M. Gehrke, T. Jakl, **L. Reggio** (2020). A duality theoretic view on limits of finite structures, *International conference on Foundations of Software Science and Computation Structures (FoSSaCS)*, 299–318. DOI: 10.1007/978-3-030-45231-5_16.
17. **L. Reggio** (2020). Codensity, profiniteness and algebras of semiring-valued measures, *Journal of Pure and Applied Algebra* **224**, 181–205. DOI: 10.1016/j.jpaa.2019.05.002.
18. S. J. van Gool, **L. Reggio** (2018). An open mapping theorem for finitely copresented Esakia spaces, *Topology and its Applications* **240**, 69–77. DOI: 10.1016/j.topol.2018.03.006.
19. M. Gehrke, D. Petrişan, **L. Reggio** (2017). Quantifiers on languages and codensity monads, *Proceedings of the 32nd Annual ACM/IEEE Symposium on Logic in Computer Science (LiCS)*, 1–12. DOI: 10.1109/LICS.2017.8005140.
20. V. Marra, **L. Reggio** (2017). Stone duality above dimension zero: the algebraic theory of $C(X)$, *Advances in Mathematics* **307**, 253–287. DOI: 10.1016/j.aim.2016.11.012.
21. M. Gehrke, D. Petrişan, **L. Reggio** (2016). The Schützenberger product for syntactic spaces, *International Colloquium on Automata, Languages, and Programming (ICALP), LIPIcs* **55**: 112:1–112:14. DOI: 10.4230/LIPIcs.ICALP.2016.112.

Preprints

- **L. Reggio**, C. Riba. Finitely accessible arboreal adjunctions and Hintikka formulae.
DOI: 10.48550/arXiv.2304.12709.
- **L. Reggio**. A model category for modal logic. DOI: 10.48550/arXiv.2310.12068.
- S. Abramsky, T. Laure, **L. Reggio**. Existential and positive games: a comonadic and axiomatic view.
DOI: 10.48550/arXiv.2503.01247.

Theses

- **L. Reggio**, *Quantifiers and duality*, Ph.D. thesis, Université Sorbonne Paris Cité, 2018.
Available at <https://luca Reggio.github.io/publications>.
- **L. Reggio**, *Stone duality above dimension zero*, Master's thesis, University of Milano, 2015.
Available at <https://luca Reggio.github.io/publications>.

Invited presentations at international conferences (selection)

1. *Game comonads: logical and homotopical aspects*, at *38th Summer Conference on Topology and its Applications*, Coimbra, July 2024.
2. *Game comonads and resource-sensitive model theory*, at *Topology, Algebra, and Categories in Logic (TACL)*, Barcelona, July 2024.
3. *Polyadic spaces, homomorphism counting and ω -categorical theories*, at *XXII Congresso dell'Unione Matematica Italiana, sezione Logica Matematica*, Pisa, September 2023.
4. *Resource-sensitive model theory: a categorical view*, at *Category Theory 2023*, Louvain-la-Neuve, July 2023.
5. *The algebraic theory of $C(X)$ and its logic*, at *XXVII Incontro di Logica*, Caserta, September 2022.
Triennial conference of the Italian Association for Logic and its Applications (AILA).
6. *Lovász-type theorems and polyadic spaces*, at *BLAST 2021 (Special session on Stone and Priestley dualities)*, New Mexico University and online, June 2021.
7. *Dualities in logic: old and new results*, at *XXI Congresso dell'Unione Matematica Italiana, sezione Logica Matematica*, Pavia, September 2019.
8. *Dualities in logic*, tutorial in two parts at *PhDs in Logic XI*, Bern, April 2019.
9. *Pretoposes and topological representations*, at *ToLo VI: Topological Methods in Logic*, Tbilisi State University, July 2018.
10. *Towards a general Stone-Gelfand duality*, at *ToLo V: Topological Methods in Logic*, Tbilisi State University, June 2016.

Contributed presentations at international conferences (selection)

1. *Regular categories and soft sheaf representations*, at *Topology, Algebra, and Categories in Logic (TACL)*, Coimbra, June 2022.
2. *Game comonads and homomorphism counting in finite model theory*, at *Logic Colloquium*, Poznań and online, July 2021.
3. *Arboreal categories and resources*, at the *48th International Colloquium on Automata, Languages, and Programming (ICALP)*, Glasgow and online, July 2021.
4. *Lovász-type theorems and game comonads*, at the *36th Annual Symposium on Logic in Computer Science (LiCS)*, Rome and online, June 2021.
5. *A pretopos theoretic characterisation of compact Hausdorff spaces*, at *Journées niçoises: Logique catégorique, topos et dualités*, Nice, January 2018.
6. *Axiomatising the dual of compact Hausdorff spaces*, at *Topology, Algebra, and Categories in Logic (TACL)*, Ischia, June 2015.

Between 2015 and 2024, I gave ~ 60 presentations at local seminars and international workshops. For a complete list, see: <https://lucareggio.github.io/talks>

Funding

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| 10/2024 – 09/2027 | Rita Levi-Montalcini Fellowship , MUR (Italian Ministry of University and Research). Project <i>Syntactic spaces: Topological and geometric methods for first-order logics</i> , hosted by the Department of Mathematics of Università degli Studi di Milano Statale. |
| 02/2020 – 01/2022 | Marie Skłodowska-Curie Individual Fellowship , Horizon 2020. Project <i>Duality for finite models (D-FINED)</i> , hosted by the Department of Computer Science of Oxford University and supervised by Samson Abramsky. |
| 01/2019 – 12/2020 | CAS-ICS postdoctoral position , jointly funded by the Czech Academy of Sciences and the Institute of Computer Science, two years of full funding for the applicant's postdoctoral research. |
| 10/2018 – 09/2020 | Fellowship for Junior Researchers of the Institute of Computer Science of the Czech Academy of Sciences. In January 2019 I renounced to this fellowship to take up the previous one. |
| 10/2015 – 09/2018 | Sorbonne Paris Cité Volant International PhD scholarship , three years of full funding for the applicant's PhD research project, awarded by Sorbonne Paris Cité. |

Participation in research projects

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| 02/2022 – 08/2024 | Resources in computation , funded by the Engineering and Physical Sciences Research Council (EPSRC). P.I.: Samson Abramsky. |
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| 02/2020 – 06/2023 | Resources and co-resources: a junction between semantics and descriptive complexity , funded by the Engineering and Physical Sciences Research Council (EPSRC). P.I.: Samson Abramsky and Anuj Dawar. |
| 08/2019 – 01/2020 | Hidden quantifiers , funded by the Swiss National Science Foundation (SNSF). P.I.: George Metcalfe. |
| 01/2019 – 07/2019 | Predicate graded logics and their applications to computer science , funded by the Czech Science Foundation (GACR). P.I.: Carles Noguera. |
| 09/2015 – 09/2018 | DuaLL: Duality in formal languages and logic , funded by the European Research Council (ERC), Advanced Grant. P.I.: Mai Gehrke. |

Teaching

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| Fall 2024 | Lecturer of Logica Matematica 1 for the MSc in Mathematics, Università degli Studi di Milano Statale. |
| Fall 2024 | Lecturer of Matematica Generale for the BSc in Biological Sciences, Università degli Studi di Milano Statale. |
| Spring 2023 | Teaching assistant. Undergraduate course Discrete Mathematics , UCL. |
| Summer 2022 | Lecturer, with Tomáš Jakl, for the advanced course An Invitation to Game Comonads at the <i>33rd ESSLLI Summer School</i> , Galway. |
| Fall 2021 | Lecturer. Master course Categories, Proofs and Processes , University of Oxford. |
| Spring 2021 | Class tutor. Undergraduate course Logic and Proof , University of Oxford. |
| Fall 2020 | Guest lecturer and class tutor. Master course Categories, Proofs and Processes , University of Oxford. |
| Spring 2020 | Assessor for two Part C and Oxford Masters in Mathematical Sciences dissertations. |
| Fall 2019 | Teaching assistant. Master course Model theory , University of Bern. |
| Fall 2019 | Co-organiser of the seminar Duality Theory for Master's students, University of Bern. |

Supervision

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| Fall 2024 – ongoing | Co-supervisor for a PhD thesis in Mathematics (Caterina Sioli, Università degli Studi di Milano Statale). |
| Spring 2022 | Co-supervisor for a research internship (<i>stage de M1</i>) at UCL (Thomas Laure, ENS Paris). |
| Spring 2020 | Co-supervisor for a <i>mémoire de M2</i> in Mathematics (Jérémy Marquès, Univ. de Nice). |

Qualifications

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| 05/2022 | <i>Abilitazione scientifica nazionale, settore concorsuale 01/A1: Logica matematica e matematiche complementari.</i> Ministero dell'Università e della Ricerca. |
| 02/2021 | <i>Qualification aux fonctions de maître de conférences en Mathématiques.</i> Ministère de l'Enseignement Supérieur français, n° de qualification 21225342956. |

Prizes and awards

- 08/2022** **EACSL sponsorship** for the course *An Invitation to Game Comonads* at the 33rd ESSLLI Summer School. Awarded by the European Association for Computer Science Logic.
- 06/2020** **Premio Speciale Paolo Gentilini** for PhD theses in mathematical logic and its applications to theoretical computer science. Awarded by the Italian Association for Logic and its Applications (AILA).
- 11/2019** **Premio Ada Lettieri** for the paper *Stone duality above dimension zero* (Adv. Math. **307**, 2017), written jointly with Vincenzo Marra. Awarded by AILA.
- 05/2015** **AILA Prize 2015** for the best Master's theses in Logic.

Organisation of scientific meetings

- 10/2024 – ongoing** **Seminario di Logica, Algebra e Categorie (LAC)**, weekly seminar at Università degli Studi di Milano Statale. Organiser.
- 09/2023** **Workshop on Springer Volume “Samson Abramsky on Logic and Structure in Computer Science and Beyond”**, international workshop at University College London. Member of the organising and scientific committees.
- 09/2022** **Resources in Computation**, international workshop at University College London. Member of the organising and scientific committees.
- 06/2019** **Topology, Algebra, and Categories in Logic (TACL)**, international conference at Université Côte d’Azur. Member of the organising committee.
- 09/2018** **Quantifiers and Duality**, international workshop at Université Paris-Diderot. Member of the organising and programme committees.
- 09/2017 – 07/2018** **Dualité de Stone, langages formels et logique**, weekly seminar at Université Côte d’Azur. Organiser.

Committees

- 09/2025** Member of the **program committee** of the conference *TbiLLC 2025* (Tbilisi).
- 07/2025** Member of the **program committee** of the summer school *ESSLLI 2025* (Bochum).
- 10/2024** Member of the **Commissione Trasferimenti e Riconoscimento Titoli Esteri**, Dipartimento di Matematica, Università degli Studi di Milano Statale.
- 07/2024** Member of the **program committee** of the workshop *Structure Meets Power 2024* (Tallinn).
- 06/2024** Member of the **program committee** of the conference *WoLLIC 2024* (Bern).
- 09/2023** Member of the **PhD defence committee** for the PhD thesis of Jérémie Marquès (Nice).
- 09/2023** Member of the **PhD defence committee** for the PhD thesis of Aliaume Lopez (Paris).
- 06/2022** Member of the **programme committee** of the conference *TACL 2022* (Coimbra).
- 02/2021** Member of the **admissions committee** for the Oxford MSc in Advanced Computer Science (Oxford).
- 04/2020** Member of the **scientific committee** of the conference *PhDs in Logic XII* (Berlin).

Reviewing activities

1. **Scientific expert:** remote evaluation of scientific proposals for the Marie Skłodowska-Curie Fellowship program, calls HORIZON-MSCA-2023-PF-01 (Fall 2023) and HORIZON-MSCA-2024-PF-01 (Fall 2024).
2. **Assessor** for two Part C and Oxford Masters in Mathematical Sciences dissertations, University of Oxford, Spring 2020.
3. **Reviewer** for ~ 30 articles submitted to international journals, including *Journal of Symbolic Logic*, *Annals of Pure and Applied Logic*, *Journal of Logic and Analysis*, *Journal of Pure and Applied Algebra*, *Journal of Algebra*, *Topology and its Applications*, *Theory and Applications of Categories*, *Applied Categorical Structures*, *Cahiers de Topologie et Géométrie Différentielle Catégoriques*, *Mathematical Structures in Computer Science*, and international conferences, including *LiCS*, *CSL*, *ICALP*, *CALCO*, *RAMiCS*.

Language skills

Italian (native speaker), **French** (fluent), **English** (fluent).