

Corentin Lunel

Postdoctoral Researcher

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Born on December 24th, 1996
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Research Interests

I am motivated by topics at the interface of mathematics and theoretical computer science. My main interest is computational topology, which is a field in between low-dimensional topology and algorithms. My goal is to investigate the rich relationships between manifolds, knots, and graphs from a computational perspective.

Employment and Education

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| 2024-2025 | <i>INRIA UCA</i> : Post-doc in collaboration with Clément Maria within the Datashape team. |
| 2021-2024 | <i>LIGM, Université Gustave Eiffel</i> : PhD thesis: "Trees, Decompositions, and Knot Theory" under the supervision of Arnaud de Mesmay and Pierre Dehornoy. PHD defended on the 23rd of September 2024. <ul style="list-style-type: none">• Reviewers:<ul style="list-style-type: none">- David Eppstein, University of California- Stephan Tillmann, University of Sydney• Examiners:<ul style="list-style-type: none">- Dominique Attali, Gipsa-lab- Livio Liechti, Université de Fribourg- Delphine Moussard, Aix-Marseille Université- Lionel Pournin, Université Sorbonne Paris Nord |
| 2017-2021 | <i>École Normale Supérieure de Lyon</i> , scholarship at ENSL: |
| 2020-2021 | ENSL M2 of theoretical computer science.
Internship with Arnaud de Mesmay at <i>LIGM</i> : "From decomposing graphs to sweeping knots". |
| 2019-2020 | ENSL M1 of Mathematics.
Internship with Olga Kravchenko at <i>Université Lyon 1</i> : "Le polynôme d'Alexander vu par les graphes bipartis". |
| 2018-2019 | ENSL M1 of theoretical computer science.
Internship with Uli Wagner at <i>Institute of Science and Technology Austria</i> : "Expander graphs and high dimensional Expanders". |
| 2017-2018 | ENSL L3 of theoretical computer science.
Internship with Arnaud de Mesmay at <i>Gipsa-lab</i> : "Réduction monotone de noeuds". |
| 2014-2017 | <i>Toulouse</i> , Higher school preparatory classes at Lycée Pierre de Fermat |

Awards

- 2022** Best PhD student talk at ED MSTIC day.
2017 Junior Fermat prize for mathematical research.

Publications

Articles in conferences

1. *Hard Diagrams of Split Links*, with Arnaud de Mesmay and Jonathan Spreer, accepted in the 41th Symposium on Computational Geometry (SoCG 2025, invited to DCG and JoCG special issues on SoCG 2025)
<https://arxiv.org/abs/2412.03372>.
2. *Hopf Arborescent Links, Minor Theory, and Decidability of the Genus Defect*, with Pierre Dehornoy and Arnaud de Mesmay, Proceedings of the 40th Symposium on Computational Geometry (SoCG 2024, invited to a DCG special issue on SoCG 2024).
<https://arxiv.org/abs/2312.09094>.
3. *A Structural Approach to Tree Decompositions of Knots and Spatial Graphs*, with Arnaud de Mesmay, Proceedings of the 39th Symposium on Computational Geometry (SoCG 2023).
<https://arxiv.org/abs/2303.07982>.

Articles in journals

4. *Etude d'un invariant des noeuds alternés et mise en oeuvre informatique*, in French, with Hugo Fages and Quentin Rembert, *Quadrature* 112 (2019) p23-31.

Presentations

- Séminaire Rauzy, Marseille, France, 2025.
- Séminaire MC2, Lyon, France, 2025.
- Séminaire AlGCo, Montpellier, France, 2024.
- AATRN Seminar (online), November 2024.
- Geometry & Computing (poster), Marseille, France, 2024.
- International symposium of Computational Geometry, Athens, Greece, 2024.
- Journées du GdR IFM (poster), Grenoble, France, 2024.
- Journées Graphes et Algorithmes, Lyon, France, 2023.
- International symposium of Computational Geometry, Dallas, Texas, USA, 2023.
- SOS Workshop, Dagstuhl, Germany, 2023.
- ED MSTIC PhD Student day, best presentation, Paris, 2022.
- Journée de Géométrie Algorithmique (online), 2022.
- AMS-EMS-SMF Joint Congress of Mathematics, Grenoble, France, 2022.

Teaching

2022-2024	Algorithms course, exercise and practical sessions, 48 hours, ESIPE, first year.
2021-2023	Algorithms and tree data structures, exercise sessions, 22 hours, L2 course at Université Gustave Eiffel.
2021-2022	Lab math-info, exercise and practical sessions, 40 hours, L2 course at Université Gustave Eiffel.

Reviews

- I reviewed a paper for SoCG 2023.

Skills

Spoken languages

- French, native speaker.
- English, fluent (Certificate in Advanced English, C1).
- German, school level (B1).

Programming languages

- C
- Python
- OCaml
- LaTeX