

# 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

- 2024-2025** *INRIA UCA*: Post-doc in collaboration with Clément Maria within the Datashape team.
- 2021-2024** *LIGM, Université Gustave Eiffel*: 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.
- Reviewers:
    - David Eppstein, University of California
    - Stephan Tillmann, University of Sydney
  - Examiners:
    - Dominique Attali, Gipsa-lab
    - Livio Liechti, Université de Fribourg
    - Delphine Moussard, Aix-Marseille Université
    - Lionel Pournin, Université Sorbonne Paris Nord
- 2017-2021** *École Normale Supérieure de Lyon*, scholarship at ENSL:
- 2020-2021 ENSL M2 of theoretical computer science.  
Internship with Arnaud de Mesmay at *LIGM*: "From decomposing graphs to sweeping knots".
- 2019-2020 ENSL M1 of Mathematics.  
Internship with Olga Kravchenko at *Université Lyon 1*: "Le polynôme d'Alexander vu par les graphes bipartis".
- 2018-2019 ENSL M1 of theoretical computer science.  
Internship with Uli Wagner at *Institute of Science and Technology Austria*: "Expander graphs and high dimensional Expanders".
- 2017-2018 ENSL L3 of theoretical computer science.  
Internship with Arnaud de Mesmay at *Gipsa-lab*: "Réduction monotone de noeuds".
- 2014-2017** *Toulouse*, 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), 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), 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), 2023.  
<https://arxiv.org/abs/2303.07982>.  
A journal version has been accepted in Algebraic & Geometric Topology.

### 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

<b>2022-2024</b>	Algorithms course, exercise and practical sessions, 48 hours, ESIPE, first year.
<b>2021-2023</b>	Algorithms and tree data structures, exercise sessions, 22 hours, L2 course at Université Gustave Eiffel.
<b>2021-2022</b>	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