

Alexis Guérin

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Educational background

- 2024-... 📖 **PhD thesis** Clermont-Ferrand (France)
- 2023-2024 📖 **Master's in Research** Strasbourg (France)
- 2020-2024 📖 **École Normale Supérieure (ENS)** Rennes (France)
- 2017-2020 📖 **CPGE (Preparatory Classes for Grandes Écoles)** Lille (France)

Degrees

- 2024 📖 **Degree from ENS Rennes**
ENS of Rennes (France)
- 📖 **Master's in Fundamental Mathematics**
Strasbourg University (France), grade: 15.242/20
- 2023 📖 **Agrégation of mathematics**
Rank: 74th
- 📖 **Master's in mathematics for teaching**
Rennes University (France), grade: 15.685/20
- 2021 📖 **Bachelor's degree in mathematics**
Rennes University (France), grade: 17.408/20
- 2017 📖 **Baccalauréat scientifique**
Grade: 19.42/20
- 2015 📖 **Cervantes certification** (Spanish).

Publications

- 2025 📖 **An action of the Witt algebra on Khovanov-Rozansky homology (submitted)**
with Felix Roz
<https://arxiv.org/abs/2501.19096>

Skills

- Languages 📖 French (native), English (reading, writing, speaking), Spanish (B1).
- Programming languages 📖 $\text{\LaTeX}$, Python, Ocaml, SQL.

Invited talks

- Mar 2026 📖 **Xlim PhD Seminar (Limoges, France).**
Unknotting number and connected sum of knots.
- Nov 2025 📖 **Kauffman Seminar (online).**
Symmetries of Khovanov-Rozansky homology.
- Oct 2025 📖 **Kauffman Seminar (online).**
Rasmussen invariant and slice genus.

Invited talks (continued)

- Apr 2025  **Edinburgh Algebra Seminar (Edinburgh, Scotland).**
Symmetries of Khovanov–Rozansky homology.

Other talks

- May 2026  **Matemale Summer School (Matemale, France).**
Homotopy groups of spheres.
- Jun 2026  **Topology Between the Waves (Fréjus, France).**
The universal construction.
- Jan 2026  **Scottish Talbot on Algebra and Topology (Crianlarich, Scotland).**
The functoriality of Khovanov homology in S^3 .
- Nov 2025  **LMBP Algebra Seminar (Clermont-Ferrand, France).**
Symmetries of Khovanov–Rozansky homology.
- Oct 2025  **PhD Students' Seminar at Clermont Auvergne University (Clermont-Ferrand, France).**
Unknotting number and connected sum of knots.
- May 2025  **Matemale Summer School (Matemale, France).**
Rasmussen invariant and slice genus.
- Apr 2025  **RTop Network PhD Students' Days (Amiens, France).**
Symmetries of Khovanov–Rozansky homology.
- Mar 2025  **Topology Between the Waves (Besse, France).**
Existence of open book decompositions via branched coverings.
- Dec 2024  **PhD Students' Seminar at Clermont Auvergne University (Clermont-Ferrand, France).**
The Burau representation.
- Jun 2022  **Interns' Seminar at UQAM (Université du Québec à Montréal).**
An Introduction to Knot Theory: The Jones Polynomial.
Minkowski Space in Geometry and Physics.

Teaching

- 2026  **Teaching assistant in Numerical analysis**, 14 hours (Clermont-Ferrand)
Outils maths 2, 48 hours (Clermont-Ferrand)
- 2025  **Outils maths 2**, 48 hours (Clermont-Ferrand)
- 2024  **Outils maths 1**, 12 hours (Clermont-Ferrand)

Academic Responsibilities

- 2022  **Organizer of the Intern's Seminar at UQAM**
- 2025-2026  **Organizer of the Scientific Days (web site)**
Two-day conference gathering all PhD students from the Doctoral School of Fundamental Sciences of Clermont-Ferrand.
- 2025-2027  **Alternate PhD Student Representative on the Doctoral School Council of Fundamental sciences**

Mathematical outreach

- June 2026  **API hours 72 by Clermont'ech**
Public outreach talk on the unknotting number.
- April 2026  **Math mouth conference**
Public outreach talk on the unknotting number.
- 2024-2025  **Les cordées de la réussite**
Organization of outreach days for high school students.
- 2020-2021  **RJMI** (Rencontre des jeunes mathématiciennes et informaticiennes).
Mathematical outreach for high school girls.

Internship

- 2024  **Master's thesis (M2)** in knot theory.
Study of symmetries of equivariant Khovanov–Rozansky homology.
Under the supervision of Emmanuel Wagner (IMJ-PRG) and Louis-Hadrien Robert (UCA).
- 2022  **Master's internship (M1)** in geometry.
Study of Minkowski space and its connections with various geometries.
Under the supervision of Frédéric Rochon (CIRGET Montréal).
- 2021  **Bachelor's internship (L3)** in knot theory.
Study of the Jones polynomial and Khovanov homology.
Under the supervision of Alexis Virelizier at Paul Painlevé Laboratory (Lille).

Other

- 2025- ...  Member of Écran Libre, film club at Clermont-Ferrand.
- 2021-2022  Secretary of the Arts Office at ENS Rennes.
- 2017  Driver license.