

# Perrine Jouteur

PhD student

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## Education

### Overview

- 2023– (expected end in 2026) **PhD thesis**, *Université de Reims Champagne-Ardenne*, advisor : Sophie Morier-Genoud  
Title :  $q$ -analogues of real numbers : geometric, combinatorial and analytical aspects.
- 2019–2023 **École Normale Supérieure**, *Rennes*
- 2022–2023 **Master degree (second year)**, *Sorbonne Université, Paris*  
Lie theory by David Hernandez, Homology theory by Baptiste Rognerud, Algebraic topology by Julien Marché and Ilia Itenberg, Character varieties by Adrien Brochier and Emmanuel Letellier.
- 2021–2022 **Agrégation**, *Université de Rennes 1*  
National most competitive and highest teaching qualification. Rank : 25 (out of 2 888 candidates).
- 2020–2021 **Master degree (first year)**, *Université de Rennes 1*  
Mention Très bien.
- 2019–2020 **Bachelor's degree with a double major**, *Université de Rennes 1*  
Mathematics and Computer science.
- 2017–2019 **Preparatory classes**, *Lycée Camille Guérin, Poitiers*

### Research internships

- 2023 **Master 2 internship**, *Université de Reims Champagne-Ardenne*, supervisor : Sophie Morier-Genoud  
Title : Cyclic sieving phenomenon and application to the Grassmanian.
- 2021 **Master 1 internship**, *Oslo University*, supervisor : Paul Arne Østvær  
Title :  $A_1$ -homotopy theory and contractible varieties.
- 2020 **Undergraduate thesis**, *Université Paris Cité*, supervisor : Daniel Juteau  
Title : Linear representations of finite groups.

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## Research

### Research overview

My main interests are in algebraic combinatorics, representation theory and knot theory. For my PhD, I am focusing on quantum deformations of real numbers, which are combinatorial objects defined recently by Morier-Genoud and Ovsienko. They connect many different mathematical fields such as cluster algebras, hyperbolic geometry, braid groups representations, friezes patterns and Diophantine approximation via Markov numbers. The aim of my current research is to combine tools of these various fields to answer questions about  $q$ -real numbers, and conversely to use the efficient combinatorics of  $q$ -real numbers to understand better these fields.

### Papers

- 2025 **On  $q$ -deformed Markov numbers. Cohn matrices and perfect matchings with weighted edges**, *arXiv:2507.19080*  
Joint work with Sam Evans, Sophie Morier-Genoud and Valentin Ovsienko
- 2025 **Symmetries of the  $q$ -deformed real projective line**, *arXiv:2503.02122*
- 2024 **Bureau representation of  $B_4$  and quantization of the rational projective plane**, *Comptes Rendus. Mathématique, Volume 363 (2025), pp.89-107*, *arXiv:2407.20645*

### Working groups

- 2024- **Women in Noncommutative Algebras and Representation Theory IV (WINART) workshop**, led by Léa Bittmann and Emine Yıldırım, with Melody Molander and Ezgi Kantarcı Oğuz  
Research working group on  $q$ -deformed Markov numbers
- 2024-2026 **PhD students working group**, *Université de Reims Champagne-Ardenne*, with Hugo Mathevet, Yoann Demesmay and Valentin Massicot  
Reading the book *Enveloping Algebras*, by Dixmier
- 2023-2024 **GT Clusters, quivers and geometry**, *IMJ-PRG (Paris)*, organized by Pierre-Guy Plamondon and Bernhard Keller  
Reading group on the paper *The positive Grassmannian, the Amplituhedron, and Cluster Algebras*, by Lauren K. Williams
- Talks**
- 2025, August **Quantized symmetries of the real projective line**, *Short talk, 20min*  
Summer School on Markov Numbers and the Combinatorics of Cluster Algebras (Istanbul), Turkey
- 2025, June **Une déformation des nombres de Markov**, *PhD seminar, 20min*  
LMR (Reims), France
- 2025, June **Déformations quantiques de rationnels et au-delà**, *Team seminar, 1h*  
IMAG (Montpellier), France
- 2025, May **Quantized rational numbers, from every angles**, *Team seminar, 1h*  
ICJ (Lyon), France
- 2025, April **Analogues quantiques de nombres, un tour d'horizon**, *PhD seminar, 1h*  
IRMAR (Rennes), France
- 2025, March **Analogues quantiques de nombres via la représentation de Bureau**, *Team seminar, 1h*  
LAMFA (Amiens), France
- 2025, March **Mirror deformation of Markov numbers**, *Workshop report, 20min*  
WINART Workshop at BIRS (Banff), Canada
- 2025, March **Analogues quantiques de nombres via la représentation de Bureau**, *Team seminar, 1h*  
LAMFA (Amiens), France
- 2025, February **Analogues quantiques des nombres rationnels**, *Team seminar, 1h*  
LIB (Dijon), France
- 2025, February **Bureau representation of  $B_4$  and  $q$ -deformed rational projective plane**, *Short talk, 30min*  
Winterbraids XIV, Institut de Mathématiques de Bordeaux, France
- 2024 **Quantum analogues of rational numbers**, *PhD seminars, 1h*  
LAMFA (Amiens), LMBP (Clermont-Ferrand), LPP (Lille) and LMR (Reims), France
- Summer and Winter schools**
- 2025, August **Markov Numbers and the Combinatorics of Cluster Algebras**, *Istanbul, Turkey*
- 2025, February **Winterbraids XIV**, *Bordeaux, France*
- 2024, May **CHARMS Summer School**, *Versailles, France*
- 2023, July **Workshop on Kac-Moody geometry**, *Kiel, Germany*
- Attended conferences**
- 2025, May **Frieze patterns in Algebra, Combinatorics and Geometry**, *CIRM, France*  
With presentation of a poster : Symmetries of the  $q$ -deformed real projective line
- 2025, March **WINART IV**, *Banff, Canada*
- 2025, March **Colloque Tournant du RT Algèbre**, *Clermont-Ferrand, France*
- 2024, October **New Trends in Geometry, Combinatorics and Mathematical Physics**, *Oléron, France*  
With presentation of a poster : Bureau representation of  $B_4$  and  $q$ -deformed rational projective plane
- 2024, May **Cluster categories and mirror symmetry (ANR CHARMS)**, *Strasbourg, France*
- 2024, March **Continued fractions and  $SL_2$ -tilings**, *Durham, England*
- 2024, March **Réseau Thématique Algèbre**, *CIRM, France*

2023, November **Journées SL2R**, Metz, France

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## Experience

### Teaching

- 2025-2026 **Research referent for MathEnJeans**, *Lycée Franklin Roosevelt, Reims*  
Supervising a workshop for high school students, yearly.
- 2025 **Lecturer in Calculus**, *Université de Reims Champagne-Ardenne*  
Calculus for undergraduate students, 28h.
- 2024 **Lecturer in Calculus**, *Université de Reims Champagne-Ardenne*  
Calculus for undergraduate students, 64h.
- 2023 **Teaching assistant in Linear Algebra**, *Université de Reims Champagne-Ardenne*  
Main teacher : Loïc Poulain d'Andecy. Travaux dirigés for undergraduate students, 58h.
- 2019-2021 **Tutoring**, *Lycée Bréquigny, Rennes*  
Helping high school students with their homework.

### Administrative

- 2025-2026 **Leader of LMR PhD students**, *Université de Reims Champagne-Ardenne*  
Organizer of PhD seminars, manager of the website, representative of PhD students.

### Popularization

- 2025 **Exposition Femmes de science de l'URCA**, Library university of Reims  
Podcast and poster about research in mathematics and women, organized by Claire Levêque
- 2019 **Mathematical workshop in Fête de la science**, Université Paris Diderot  
Workshop for general audience with puzzles and games

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## Computer skills

- Programming Python, OCaml, Sage
- Word Office suite, L<sup>A</sup>T<sub>E</sub>X, Wikipedia articles
- processing
- Other Geogebra

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## Language

- French Native speaker
- English Fluent, 920 at TOEIC 2021

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## Hobbies

- Walking In town or in nature
- Aïkido Two years of practice
- Climbing Sporadic activity
- Reading Novels, short stories, poetry. These days I am fond of science-fiction.