Clémentine Lemarié−−Rieusset

(Female) French citizen; birth date: 2 August 1996

Postdoc

2023 - today **Postdoc in mathematics**, in Marc Levine's research group at the ESAGA (Essener Seminar für Algebraische Geometrie und Arithmetik) in the Fakultät für Mathematik of the Universität Duisburg-Essen (Essen, Germany); my postdoc is funded by the DFG (Deutsche Forschungsgemeinschaft, i.e. German Research Foundation) Research Training Group 2553 *Symmetries and classifying spaces: analytic, arithmetic and derived*

Higher education

2020-2023 **Ph.D. in mathematics**, at Université Bourgogne-Franche-Comté (more specifically, IMB (Institut de Mathématiques de Bourgogne), Université de Bourgogne, Dijon, France), under the supervision of Frédéric Déglise and Adrien Dubouloz, title of the thesis : *Motivic knot theory*; my PhD was funded by a CDSN from École Normale Supérieure de Rennes; Ph.D.

2019-2020 **Fourth year in mathematics** at École Normale Supérieure de Rennes (Bruz, France) and **M2 in fundamental mathematics**, at Sorbonne Université (Paris, France); Master's degree (research) and degree of the ENS Rennes

2018-2019 **Third year in mathematics** at École Normale Supérieure de Rennes (Bruz, France) and **M2 to prepare the Agrégation**, at Université de Rennes 1 (Rennes, France); success at the competitive exam of the Agrégation externe de mathématiques (rank : 34) and Master's degree (agrégation)

Agrégation externe In France, this is a national competitive examination of high level which allows one to teach in high schools or in preparatory schools (see below).

2017-2018 **Second year in mathematics** at École Normale Supérieure de Rennes (Bruz, France) and **M1 in mathematics** at Université de Rennes 1 (Rennes, France)

2016-2017 **First year in mathematics** at École Normale Supérieure de Rennes (Bruz, France) and **L3 in mathematics** at Université de Rennes 1 (Rennes, France); Bachelor's degree

Écoles Normales Supérieures The Écoles Normales Supérieures are four higher learning institutions (Grandes Écoles) in France which provide research-oriented training over four years for students who typically come out of post-secondary preparatory schools.

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2013-2016 **MPSI-MP*** at Louis-le-Grand (Paris, France) with the Computer Science option, post-secondary preparatory school

Post-secondary preparatory school

In France, these are classes preparing for entrance examinations to the Grandes Écoles. MPSI stands for mathematics, physics, and engineering science, and MP stands for mathematics and physics (the * denotes a class which is particularly focused on preparing the entrance examinations to the Écoles Normales Supérieures).

Research internships

Internship of Master 2

2020 **K-théorie invariante par homotopie**
Université Paris-Saclay (Orsay, France) with Joël Riou as supervisor.
The title translates as *Homotopy invariant K-theory*. We studied Denis-Charles Cisinski's article *Descente par éclatements en K-théorie invariante par homotopie* and focused mainly on the $\mathbb{A}^1$-localization functor and the Bass-Thomason-Trobaugh construction.

Internship of Master 1

2018 **An introduction to toric varieties**
University of Edinburgh (Edinburgh, United Kingdom) with Milena Hering as supervisor.
We studied the proof that any fan can be transformed into a regular fan by stellar subdivisions (which gives an algorithm to find a resolution of singularities of any toric variety).

Internship of Licence 3 (Bachelor)

2017 **Liberté et rigidité systoliques**
Laboratoire IMJ-PRG (Paris, France) with Nicolas Bergeron as supervisor.
The title translates as *Systolic freedom and systolic constraint*. We proved that the differentiable manifold $\mathbb{S}^3 \times \mathbb{S}^1$ is $(1, 3)$-systolically free.

Article

2024 *The quadratic linking degree*: arXiv:2210.11048 [math.AG]; MSC 2020: Primary 14F42, 57K10; Secondary 11E81, 14C25, 19E15; Keywords: Motivic homotopy theory, Knot theory, Links, Witt groups, Milnor-Witt K-theory, Rost-Schmid complex. This paper has been accepted by the *Annales de l'Institut Fourier*.

Teaching

Jan.-June 2022 — 34h of Integration, Sequences and series of functions, and Normed vector spaces exercise sessions for students in their second year of bachelor studies in science (L2 Sciences et techniques, Université de Bourgogne, Dijon). All of the exercise sessions were face-to-face. I devised and corrected several examinations for these students.

Sept.-Dec. 2021 — 30h of Logic and Algebra exercise sessions for students in their first year of bachelor studies in science (L1 Sciences et techniques, Université de Bourgogne, Dijon). More precisely, the exercises were on naïve logic, naïve set theory and the complex numbers (definition, equations, the fundamental theorem of algebra, trigonometry and geometry). All of the exercise sessions were face-to-face. I devised and corrected several examinations for these students.

Sept. 2020 - June 2021 — 64h of Analysis (numerical sequences and series, real functions, integration, ordinary differential equations, parametric curves, probabilities) exercise sessions for students in their first year of preparatory school for the Esirem (a Grande École). Part of the exercise sessions were face-to-face (as is usual), part were online (using Microsoft Teams and sometimes Overleaf), and part were hybrid (some of the students face-to-face and some of the students online at the same time). I devised an examination and corrected several examinations for these students.

Feb. 1-5 2021 — I supervised the internship of a 3e student (3e is the last year of middle school in France; it is customary for 3e students to do a week-long internship to discover a job). I presented to him the job of a researcher in mathematics and made him work on a combinatorial argument which is at the heart of Zeev Dvir's proof of the algebraic geometry version of the Kakeya conjecture.

Responsibilities

2021 - 2023 — I was a member of the Conseil de la Fédération de Bourgogne Franche-Comté Mathématiques (which has 16 members, 8 from Dijon and 8 from Besançon); we met on November 29, 2021 in Besançon and on 30 November 2022 in Dijon.

ANR Project

2021 - today — I am a member of the ANR-21-CE40-0015 HQDIAG project *Motivic homotopy, quadratic invariants and diagonal classes* which is funded by the ANR (Agence Nationale de la Recherche, i.e. the French National Research Agency). This project currently has 17 members and has Frédéric Déglise as coordinator and Adrien Dubouloz as scientific leader.

Talks at Seminars, Workshops, ...

Talks presenting my research to algebraic geometers / topologists

Nov. 8 2024 — *Motivic homotopy in interaction* conference at the CIRM (Marseille, France)

June 27 2024 — Joint Symposium of the RTG 2440 of Düsseldorf and Wuppertal and the RTG 2553 of Essen (Essen, Germany)

June 12 2024 — Algebraic and Arithmetic Geometry Seminar (Bielefeld, Germany)

Dec. 15 2023 — Seminar on Arithmetic Geometry (Darmstadt, Germany)

Sept. 15 2023 — PhD Defence (Dijon, France)

Aug. 11 2023 — *K-theory, algebraic cycles and mathematical physics* workshop (Columbus, Ohio, USA); talk online (using Zoom)

April 27 2023 — RTG 2553 seminar (Essen, Germany)

April 26 2023 — Oberseminar Algebra und Topologie (Wuppertal, Germany)

Mar. 23 2023 — Basel-Dijon-EPFL joint seminar (Lausanne, Switzerland)

Oct. 26 2022 — Réunion annuelle du GDR Topologie algébrique (Annual meeting of the French national research group Algebraic topology; Nantes, France)

Sept. 5 2022 — ANR HQDIAG workshop (Lyon, France)

Talks presenting my research to mathematicians in general

Nov. 18 2022 — Journée de la Fédération Bourgogne Franche-Comté Mathématiques (Day of the Bourgogne Franche-Comté Mathematics Federation; Besançon, France); introductory talk in French to present my research on motivic knot theory

April 15 2022 — Septième Journée des Jeunes Chercheuses et des Jeunes Chercheurs en Mathématiques de l'Université Bourgogne-Franche-Comté (Seventh Young Researchers in Mathematics in UBFC's Day; Besançon, France); introductory talk in French to present my research on motivic knot theory

Dec. 1 2021 — Dijon Ph.D. students' seminar (Dijon, France); introductory talk to present my research on motivic knot theory

June 23 2021 — Dijon Ph.D. students' seminar (Dijon, France); introductory talk to present $\mathbb{A}^1$-homotopy theory (a.k.a. motivic homotopy theory)

Talks in semester-long seminars

Nov. 12 2024 — Motives research seminar *Motivic and real étale stable homotopy theory* (Essen, Germany); I gave a talk about duality transfers and homotopy modules

May 21 2024 — Motives research seminar *The motivic Freudenthal suspension theorem* (Essen, Germany); I gave a talk about the unstable and stable motivic homotopy theories (in an ∞-categorical setting)

May 8 2024 — PhD seminar *Periods and Nori motives* (Essen, Germany); I gave a talk about Nori's diagram category

Jan. 30 2024	Motives research seminar *The arithmetic Yau-Zaslow formula* (Essen, Germany); I gave a talk about the arithmetic Yau-Zaslow formula
Nov. 7 2023	Motives research seminar *The arithmetic Yau-Zaslow formula* (Essen, Germany); I gave a talk about Göttsche's formula
Oct. 26 2023	Algebraic Geometry research seminar *Variation of GIT quotients* (Essen, Germany); I gave a talk about divisors on toric varieties
April 8 2022	*Real geometry, motives and $\mathbb{A}^1$-homotopy* workshop (online, using Zoom; this workshop was funded by the ANR HQDIAG); I gave a talk in French about Milnor-Witt K-theory, homotopy modules and localization (in an ∞-categorical setting)
Feb. 12 and 26 2021	*Variations on a theme by Rost* workshop (online, using BigBlueButton); I gave two talks to present Rost cycle modules and give an example (de Rham cohomology)

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