

# Alexandre Bailleul

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## Positions

- Since 2021 **Agrégé préparateur (three year lecturer position, renewable)**, *ENS Paris-Saclay*
- 2020-2021 **ATER (one year lecturer position)**, *ENS de Lyon*
- 2017-2020 **PhD candidate**, *Université de Bordeaux*
- 2015-2017 **Élève normalien**, *ENS Rennes*

## Prizes

- 2022 **Kevin Henriot thesis prize**, *Fondation Sciences Mathématiques de Paris*

## Education

- 2017-2020 **PhD in Pure Mathematics**, *Université de Bordeaux*, Bordeaux, "On the distribution of Frobenius automorphisms in Galois groups"  
Under the supervision of Florent Jouve.
- 2016-2017 **Master 2 in Mathematics - Algebra, Geometry and Number Theory**, *Université de Bordeaux*, Bordeaux  
With highest honours.
- 2015-2016 **Agrégation externe de mathématiques (national teaching competitive exam)**, *ENS Rennes & Université de Rennes 1*, Rennes  
Rank : 14th nationwide.
- 2014-2015 **Master 1 in Mathematics**, *ENS Rennes & Université de Rennes 1*, Rennes  
With honours.
- 2013-2014 **Bachelor's degree in Mathematics**, *ENS Rennes & Université de Rennes 1*, Rennes  
With highest honours.
- 2011-2013 **Classes préparatoires aux Grandes Écoles**, *Lycée Lafayette*, Clermont-Ferrand
- 2010-2011 **Baccalauréat Scientifique (end of high school degree), specialty in Mathematics**, *Lycée Saint-Pierre*, Cusset  
With honours.

## Research

- 2024 **Work in progress**, "Chebyshev's bias in families of function field extensions"

- 2024 **Publication**, with *L. Devin, D. Keliher and W. Li*, "Exceptional biases in counting primes over function fields", *Journal of the London Mathematical Society*, Vol 109, No. 3  
<https://arxiv.org/abs/2302.13665>
- 2022 **Publication**, "Explicit Kronecker-Weyl theorems and applications to prime number races", *Research in Number Theory* 8, 43 (2022)  
<https://arxiv.org/abs/2007.05763>
- 2021 **Publication**, "Chebyshev's bias in dihedral and generalized quaternion Galois groups", *Algebra & Number Theory*, Vol 15 (2021), No. 4, 999-1041  
<https://arxiv.org/abs/2001.06671>
- 2017 **Research memoir**, *Institut de Mathématiques de Bordeaux*, Under the supervision of Florent Jouve, 5 months  
 "Effective versions of Chebotarev's density theorem" (in french)
- 2015 **Research internship**, *Institut Élie Cartan, Nancy*, Under the supervision of Gérald Tenenbaum, 6 weeks  
 "Multiplicative functions in short intervals" (in french)
- 2014 **Research internship**, *Laboratoire de mathématiques de Clermont-Ferrand*, Under the supervision of Éric Gaudron, 6 weeks  
 "Transcendental numbers" (in french)

## Talks

- March 2023 **Exceptional Chebyshev's bias over finite fields**, *CRG L-functions Weekly Seminar (Online)*
- January 2023 **Exceptional Chebyshev's bias in finite fields**, *Analytic and elementary number theory meetings*, Institut Henri Poincaré, Paris
- November 2022 **Exceptional Chebyshev's bias in finite fields**, *Number Theory Seminar*, Institut Fourier, Grenoble
- January 2022 **Some aspects of prime number races**, *ADA Seminar*, LMAP, Calais
- November 2021 **Some aspects of prime number races**, *ADA Seminar*, Number Theory Seminar, LMBP  
 Clermont-Ferrand
- March 2021 **Real zeros of Artin L-functions and Chebyshev's bias in number fields**, *Bordeaux number theory seminar*, (Online)
- January 2021 **Real zeros of Artin L-functions and Chebyshev's bias in number fields**, *Nancy-Metz number theory seminar*, (Online)
- December 2020 **Real zeros of Artin L-functions and Chebyshev's bias in number fields**, *LFANT seminar (IMB)*, (Online)
- March 2020 **L-functions and prime number races**, *Lambda Seminar*, Bordeaux
- December 2019 **Real zeros of Artin L-functions and Chebyshev's bias in number fields**, *Analytic and elementary number theory meetings*, Institut Henri Poincaré, Paris
- March 2019 **Chebotarev's density theorem**, *Working group "Équirépartition en théorie des nombres"*, Bordeaux

- March 2019 **Chebyshev's bias in quaternionic extensions of  $\mathbb{Q}$** , *Pampers Seminar*, Rennes
- October 2018  **$L$ -functions and prime number races**, *Rencontres doctorales Lebesgue 2018*, Brest
- October 2018 **On the prime number theorem**, *Lambda Seminar*, Bordeaux
- February 2017 **Dirichlet's theorem and Chebotarev's density theorem**, *Meeting of 4th year students of ENS Rennes*, Rennes

## Workshops and Seminars

- Since 2017 **Analytic and elementary number theory meetings**, *Institut Henri Poincaré*, Paris  
6 meetings per year
- Since 2023 **Fouvry workshop**, *Laboratoire de Mathématiques d'Orsay*, Orsay
- December 2022 **"Arithmétique en plat pays"**, *Laboratoire Paul Painlevé*, Lille
- June 2021 **Summer school in analytic number theory**, *Université de Paris*, Paris
- June 2021 **Summer School "Polynomial Methods"**, *Hausdorff Research Institute for Mathematics*, (Online)
- May 2021 **Hausdorff School "The Circle Method"**, *Hausdorff Research Institute for Mathematics*, (Online)
- December 2019 **"Zeta functions" conference**, *Centre International de Rencontres Mathématiques*, Marseille Luminy
- November 2019 **Journée en l'honneur de Jacques Martinet**, *Institut de Mathématiques de Bordeaux*, Bordeaux
- July 2019 **Second Symposium on Analytic Number Theory**, Cetraro (Italy)
- May 2019 **Colloquium "Inter'Actions en Mathématiques 2019"**, *Institut de Mathématiques de Bordeaux*  
Organizing comity
- April 2019 **Une petite journée GANDA**, *Institut de Mathématiques de Bordeaux*, Bordeaux
- November 2018 **London-Paris Number Theory Seminar**, *Institut de mathématiques de Jussieu*, Paris
- October 2018 **PhD students meeting "Rencontres doctorales Lebesgue 2018"**, *Université de Bretagne Occidentale*, Brest
- June 2018 **Summer School " $L$ -functions : Open problems and current methods"**, *Hausdorff Center for Mathematics*, Bonn (Germany)
- May 2018 **Colloquium "Inter'Actions en Mathématiques 2018"**, *Université Claude Bernard Lyon*, Lyon
- November 2017 **Journée Arithmétique FraZA 2017**, *Institut de Mathématiques de Bordeaux*, Bordeaux

## Teaching

- 2023-2024 **Supervision of research internships for 3rd year students**, *ENS Paris-Saclay*
- 2023-2024 **Reading groups for 3rd year students**, *ENS Paris-Saclay*
- 2022-2024 **Oral examinations in preparatory classes**, *Lycée Lakanal, Sceaux*
- 2021-2024 **Supervision of formal algebra texts for french "agrégation"**, *Université Paris-Saclay*
- 2021-2024 **Supervision of "leçons d'agrégation"**, *ENS Paris-Saclay*
- 2021-2024 **Complex Analysis lectures**, *M2 FESUP, ENS Paris-Saclay*
- 2021-2024 **Integration and Probability Theory lectures**, *M2 FESUP, ENS Paris-Saclay*
- 2021 **Exercise sessions in Number Theory for 4th year students**, *ENS de Lyon*
- 2020 **Exercise sessions in Advanced Algebra for 4th year students**, *ENS de Lyon*
- 2020 **Exercise sessions in Algebra for 3rd year students**, *ENS de Lyon*
- 2020 **Supervision of "leçons d'agrégation"**, *ENS de Lyon*
- 2019 **Exercise sessions in Lebesgue Integration Theory for 3rd year students**, *Université de Bordeaux*
- 2019 **Supervision of two research internships for a 1st and 2nd year students**, *Université de Bordeaux*
- 2018 **Supervision of talks « Maths, Sciences et Société »**, *Université de Bordeaux*
- 2018 & 2019 **Lecturer in Mathematics for Biology**, *Université de Bordeaux*
- 2017 & 2018 **Exercise sessions in Linear Algebra for 2nd year students**, *Université de Bordeaux*
- 2016-2017 **Oral examinations in preparatory classes**, *Lycées Montaigne et Gustave Eiffel, Bordeaux*
- Since 2013 **Private lessons in mathematics for 1st, 2nd and 3rd year students**

## Other mathematical activities

- Since 2022 **Writing a book for french "agrégation"**
- 2019-2021 **President of the association Lambda of PhD students in mathematics of Bordeaux**
- 2018-2019 **Organization comity of the colloquium "Inter'Actions en Mathématiques 2019"**, *Institut de Mathématiques de Bordeaux*
- 2019 **Author of a short paper for the website Culture Maths**
- 2017-2019 **Attended Master 2 courses during PhD**, *Analytic Number Theory, Heights and Diophantine Problems, Diophantine Approximation*, *Institut de Mathématiques de Bordeaux*
- Since 2017 **Administrator of the online forum les-mathematiques.net**
- 2015 & 2016 **Jury member at TFJM<sup>2</sup> (french championship for young mathematicians)**, *Rennes*

## Languages

French

English TOEIC : 975/990

*Native tongue*

*Fluent*