

# Magalie Bénéfice

*Curriculum Vitae*

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## Education

- 2021–2024 **Ph.D. degree in Pure Mathematics**, *EDMI*, Université de Bordeaux
- 2020–2021 **M2 (2<sup>nd</sup> year of Master degree)-Mathematics**, *Analysis-PDE-Probability*, Université de Bordeaux  
With highest honour, rank 1/7
- 2017–2018 **M2-Teaching**, *MEEF 2<sup>nd</sup> degré/ Mathématiques*, ESPE d'Aquitaine, Université de Bordeaux
- 2017 **Agrégation competitive exam (higher education teacher in Mathematics)**,  
*Specialisation: probability and statistics*  
rank 72/304
- 2016–2017 **M2-Mathematics**, *Preparation for the Agrégation*, Université de Bordeaux  
rank 1/6
- 2015–2016 **M1 Mathematics**, *Spécialité mathématiques approfondies*, Université de Bordeaux  
With high honour
- 2012–2015 **Bachelor in Mathematics**, *Université de Bordeaux*  
With highest honour
- 2012 **High school diploma**  
With highest honour

## Preprint and Publications

### Publication

- [1] Magalie Bénéfice. Couplings of Brownian motions on  $SU(2)$  and  $SL(2, \mathbb{R})$ . *Stochastic Process. Appl.*, 176:Paper No. 104434, 20, 2024.  
[Submitted preprint \(Available on arXiv and HAL\)](#)
- [1] Magalie Bénéfice. Non co-adapted couplings of Brownian motions on subRiemannian manifolds. <https://arxiv.org/abs/2312.14512>, 2023.
- [2] Marc Arnaudon, Magalie Bénéfice, Michel Bonnefont, and Delphine Féral. A coupling strategy for Brownian motions at fixed time on Carnot groups using Legendre expansion. <https://arxiv.org/abs/2407.04321>, 2024.
- [3] Magalie Bénéfice. Non co-adapted successful couplings of Brownian motions on

the free, step 2 carnot groups. <https://arxiv.org/abs/2407.06593>, 2024.

### Conference publication

- [1] Magalie Bénéfice, Marc Arnaudon, and Michel Bonnefont. Couplings of Brownian motions on  $SU(2, \mathbb{C})$ . In *Geometric science of information. Part I*, volume 14071 of *Lecture Notes in Comput. Sci.*, pages 592–600. Springer, Cham, [2023] ©2023.

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## Ph.D. Thesis (defended in July 2024)

Title *Coupling of stochastic processes in sub-Riemannian geometry*  
Ph.D. supervisors Michel Bonnefont, Marc Arnaudon  
Description The goal of this thesis is to continue the study of the coupling of stochastic processes in sub-Riemannian geometry. Couplings have a lot of applications in Geometry, Optimal Transport as well as in Analysis. In particular, one of the aim of this thesis is to use this approach to obtain new results or new proofs in sub-Riemannian geometry such as gradient inequalities for the heat semi-group or properties for harmonic functions.

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## Work experience

### Research

Since October 2024 **Post-doc position**, *INSMI, IECL Nancy*, Université de Lorraine  
September 2024 **Research engineer**, *ADERA, IMB Bordeaux*, Estimations on Lie groups  
2021-2024 **Ph.D.**, *IMB*, Université de Bordeaux  
Spring 2021 **Master 2 Internship**, *Institut de Mathématiques de Bordeaux*, Study of couplings of stochastic processes in subRiemannian geometry, Under the supervision of Michel Bonnefont

### University teaching

2022–2023 **Mathematical Tools**, 36h, Tutorial, 1st year  
2022–2023 **Fourier Series for "CPBX MP" (preparatory class for engineering schools program, speciality Mathematics and Physics)**, 13h, Lesson and exercises, 2nd year  
2021–2022 **Probability and statistics for biologists (preparatory class for engineering schools program, speciality Biology)**, 24h, Lesson and exercises, 2nd year

### Outreach

2023, 2024 **"Moi Informaticienne, Moi mathématicienne"**, 15h/year, Creation and animation of mathematical activities for high school students.  
2022-2024 **Part of the workshop "CultureMath"**, *Writing and reviewing of popular science articles for High School Math teachers for*  
<https://culturemath.ens.fr/thematiques/probabilites/mouvements-browniens-et-couplages>

### Mathematic high school teaching (Professeur agrégé de mathématiques)

2018–2020 **Lycée général et technologique Thibaut de Champagne**, *Provins, FRANCE*

2017–2018 **Lycée Polyvalent les Iris**, *Lormont, FRANCE*, Internship

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## Conferences and Workshops

### With given talk

- October 2024 **Probability and statistics team seminar**, *IECL, Nancy, FRANCE*  
June 2024 **EMA team seminar**, *LMPA, Calais, FRANCE*  
January 2023 **QuAMProcs (Quantitative Analysis of Metastable Processes) Workshop**,  
*Nantes, FRANCE*  
October 2023 **Colloques des Jeunes Probabilistes et statisticiens**, *Oléron, FRANCE*  
September 2023 **GSI'23 – Geometric Science of Information**, *Saint-Malo, FRANCE*  
July 2023 **Saint-Flour summer school**, *Saint-Flour, FRANCE*  
June 2023 **Journées de Probabilité**, *Anger, FRANCE*  
December 2022 **Image, Optimisation and Probability Team seminar**, *Bordeaux, FRANCE*  
May 2022 **Journées de Probabilité**, *Orbey, FRANCE*  
December 2021 **Bordeaux Ph.D. student Seminar/ Lambda Seminar**, *Bordeaux, FRANCE*

### Without talk

- April 2023 **Journées de Probabilités et Statistiques en Nouvelle Aquitaine**, *Bordeaux, FRANCE*  
January 2023 **RAGE (Real Analysis and Geometry) Workshop**, *Bordeaux, FRANCE*  
January 2022 **RAGE (Real Analysis and Geometry) Workshop**, *Nantes (Online), FRANCE*

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## Other contribution

- Since 2022 **Organisation of the Ph.D. students seminar**, *part of the Lambda Association*

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## Languages

French Mother Tongue  
Anglais Working knowledge  
German Basis

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## Computer skills

Programming languages MATLAB, SCILAB, Python  
Software Latex