

Magalie Bénéfice

Curriculum Vitae

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Education

- Since 2021 **Ph.D. degree in Pure Mathematics, EDMI**, Université de Bordeaux
- 2020–2021 **M2 (2nd year of Master degree)-Mathematics**, *Analysis-PDE-Probability*, Université de Bordeaux
With highest honour, rank 1/7
- 2017–2018 **M2-Teaching, MEEF 2nd 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

Ph.D. Thesis (current)

- 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.

Preprint and Publications

[Preprint \(Available on arXiv and HAL\)](#)

[1] Magalie Bénéfice. Couplings of Brownian motions on $SU(2)$ and $SL(2, \mathbb{R})$, 2023. <https://arxiv.org/abs/2305.10017>.

[2] Magalie Bénéfice. Non co-adapted couplings of Brownian motions on subRiemannian manifolds, 2023. <https://arxiv.org/abs/2312.14512>.

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.

Work experience

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 **"Moi Informaticienne, Moi mathématicienne"**, 15h, Creation and animation of mathematical activities for high school students.

Since 2022 **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>

Research

Spring 2021 **Master 2 Intership**, *Institut de Mathématiques de Bordeaux*, Study of couplings of stochastic processes in subRiemannian geometry, Under the supervision of Michel Bonnefont

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

Conferences and Workshops

With given talk

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*

Other contribution

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

Languages

French Mother Tongue

Anglais Working knowledge

German Basis

Computer skills

Programming languages MATLAB, SCILAB, Python

Software Latex