

Brieuc FRÉNAIS

Curriculum Vitae

Mines Nancy (ENSMN)
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Education

- Sep. 2021 – **PhD in Mathematics**, IRMA (Strasbourg, France).
- Dec. 2024 *Stochastic branching processes with selection*, under supervision of Jean Bérard and Lionel Lenôtre, defended on December 20, 2024 (HAL).
- 2020–2021 **Master of Mathematics (Probability theory)**, Université de Strasbourg.
- 2017–2021 **Magistère de Mathématiques**, École Normale Supérieure de Rennes, Université de Rennes I.
Bachelor's degree in 2018, Master's degree in 2020. Agrégation de Mathématiques in 2020.
- 2015–2017 **CPGE MPSI-MP***, Lycée Clemenceau (Nantes, France).
- 2015 **Baccalauréat Scientifique**, Lycée Clemenceau (Nantes, France).

Research & Teaching Experience

Ecole des Mines, Nancy (ENSMN) & IECL, Université de Lorraine

- Sep. 2024 – **ATER (non-tenured teaching and research position)**.
present Continuation of my PhD, as well as teaching to engineer-students on various topics.
IRMA, Université de Strasbourg
- Sep. 2021 – **PhD in Mathematics**, *Stochastic branching processes with selection*.
Dec. 2024 Under supervision of Jean Bérard and Lionel Lenôtre.
- Sep. 2021 – **Teaching assignment**.
June 2024 Teaching classes from Bachelor's to Master's degree students (mainly on Probability).
- Sep. 2022 – **Co-organizer of PhD students' seminar**.
Sep. 2023
- Summer 2022 **Summer School CEMRACS 2022**, CIRM (Marseille, France).
One week summer school, five weeks working on a research project about a mean field control problem.
Oral interrogations in CPGE
- 2020–2021 **Mathematics colles in MPSI & PCSI**, Lycée Kléber (Strasbourg, France).
- 2018 **Mathematics colles in MPSI**, Lycée Clemenceau (Nantes, France).
- Other experiences
- April 2021 – **Research internship**, IRMA (Strasbourg, France).
- August 2021 Working on the hydrodynamic limit of the N-branching Brownian motion, under supervision of Jean Bérard and Lionel Lenôtre.
- Summer 2019 **Research internship**, Laboratoire Jean Leray (Nantes, France).
Working on the connective constant of the hexagonal lattice, under supervision of Nicolas Pétrélis.
- Summer 2018 **Research internship**, Laboratoire Jean Leray (Nantes, France).
Working on resonance and periodicity phenomena for some dynamic systems, under supervision of Benoît Grébert.
- 2015–2017 **Private teacher for highschool students**.

Computer & linguistic skills

- Programming LaTeX, Python, Keras, Tensorflow, R, HTML/CSS
- Languages French (mother tongue), English (written, read, spoken), German (basic notions)

Publications

Conference proceedings

- Nov. 2024 **Deep Learning for Mean Field Optimal Transport**, *S. Baudelet, B. Frénais, M. Laurière, A. Machtalay and Y. Zhu*, In **ESAIM: ProcS, Vol. 77** (HAL)(DOI).

Submitted papers & pre-prints

- Nov. 2023 **The comonotone flow of a stochastically monotone Feller process on the real line**, *J. Bérard and B. Frénais*, (HAL).
- Nov. 2023 **Hydrodynamic limit of N-branching Markov processes**, *J. Bérard and B. Frénais*, (HAL).

Talks

- June 2025 **Limite hydrodynamique de processus de branchement avec sélection**, *Probability&Statistics seminar (IECL, Nancy)*.
- May 2025 **Limites hydrodynamiques, problèmes à frontière libre et temps de passage**, *PhD students' seminar (IECL, Nancy)*.
- July 2024 **Problème inverse du premier temps de passage et problème à frontière libre**, *MAThEOR Days 2024 (Sainte-Marie-aux-Mines)*.
- June 2024 **Limite hydrodynamique d'un processus de branchement avec sélection**, *Journées de Probabilités 2024 (Bordeaux)*.
- June 2024 **Limite hydrodynamique d'un processus de branchement avec sélection**, *Probability seminar (IRMAR, Rennes)*.
- March 2024 **Limite hydrodynamique de processus de Markov branchants avec sélection**, *Mathematics seminar (IRIMAS, Mulhouse)*.
- Nov. 2023 **Limite hydrodynamique de processus de Markov branchants avec sélection**, *Stochastic calculus seminar (IRMA, Strasbourg)*.
- Nov. 2023 **Limite hydrodynamique d'un processus de branchement-sélection**, *PhD students' seminar (IRMA, Strasbourg)*.
- October 2023 **Méthodes de machine learning pour le problème de transport optimal en champ moyen**, *Workshop on Optimal Transport (IRIMAS, Mulhouse)*.
- Feb. 2023 **Méthodes de machine learning pour le problème de transport optimal en champ moyen**, *PhD students' seminar (IRMA, Strasbourg)*.
- Aug. 2022 **Numerical methods for mean field optimal transport**, *CEMRACS project presentation (Marseille)*.
- Nov. 2021 **Vitesse de croissance exponentielle des chemins auto-évitant sur le réseau hexagonal**, *PhD students' seminar (IRMA, Strasbourg)*.

Scientific mediation

- April 2023 **Rendez-vous des Jeunes Mathématiciennes et Informatiennes**, *IRMA, Université de Strasbourg*, Supervision of a mathematical activity.
- April 2023 **Tournoi Français des Jeunes Mathématiciennes et Mathématiciens**, *UFR de mathématique et d'informatique, Strasbourg*, Jury for the regional tournament.
- Feb. 2022 **Rendez-vous des Jeunes Mathématiciennes et Informatiennes**, *IRMA, Université de Strasbourg*, Supervision of a research workshop and a mathematical activity.