Brieuc FRÉNAIS

Curriculum Vitae

Mines Nancy (ENSMN)
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Education

Sep. 2021 – Dec. 2024	**PhD in Mathematics**, *IRMA (Strasbourg, France)*. *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. 2025 – present	**PRAG (Teaching professor)**. Full teaching position in engineer school. Responsible for the Mathematical Engineering option. Involved in student recruitment and academic advising.
Sep. 2024 – Aug. 2025	**ATER (non-tenured teaching and research position)**. Continuation of my PhD, as well as teaching to engineer-students on various topics.

IRMA, Université de Strasbourg

Sep. 2021 – Dec. 2024	**PhD in Mathematics**, *Stochastic branching processes with selection*. Under supervision of Jean Bérard and Lionel Lenôtre, defended on December 20, 2024.
Sep. 2021 – June 2024	**Teaching assignement**. Teaching classes from Bachelor's to Master's degree students (mainly on Probability).
Sep. 2022 – Sep. 2023	**Co-oragnizer of PhD students' seminar**.
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 – August 2021	**Research internship**, *IRMA (Strasbourg, France)*. 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-évitants sur le réseau hexagonal**, *PhD students' seminar (IRMA, Strasbourg)*.

Scientific mediation

April 2023 **Rendez-vous des Jeunes Mathématiciennes et Informaticiennes**, *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 Informaticiennes**, *IRMA, Université de Strasbourg*, Supervision of a research workshop and a mathematical activity.