Apolline LOUVET

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I develop and study stochastic population dynamics and population genetics models for populations out of equilibrium, such as expanding populations or populations affected by frequent extinction events. These models cover a wide variety of stochastic processes (space-continuous measure-valued population genetics processes, variants of the Wright-Fisher model with a seed bank component, branching processes...) and have applications in population genetics, plant ecology and urban ecology.

SEPT.2022 - …	Research associate (postdoc) in probability at the University of Bath *Under the supervision of Matt Roberts*
2019 - 2022	PhD in Mathematics, CMAP (Ecole Polytechnique) and MAP5 (Université Paris Cité) *Under the supervision of Amandine Véber (mathematician at CNRS)* *and Nathalie Machon (ecologist at National Museum of Natural History)* Title: **"Probabilistic population genetics models for expanding populations"** Thesis defended on June 7th 2022. The manuscript can be found here.
2015-2019	Ecole Normale Supérieure (ENS) Diploma in Mathematics *Department of Mathematics and Applications (DMA)*, ENS Paris
2017-2018	M2 MATHEMATICS FOR LIFE SCIENCES (MSV) *Université Paris-Sud*, Orsay (France)

TEACHING AND POPULARIZATION OF SCIENCE

TEACHING

YEAR 2022-2023	**Probability with Martingales**, University of Bath *TEACHER*: Cécile Mailler In charge of 4 weeks of classes (12h) **Selected Topics in Probability**, Indiana University *TEACHER*: Wai-Tong (Louis) Fan Mini-course (2h) on spatial Λ-Fleming Viot processes
YEAR 2021-2022	**Discrete Mathematics**, Bachelor 1A, Ecole Polytechnique *TEACHER*: François Alouges
YEAR 2020-2021	**Discrete Mathematics**, Bachelor 1A, Ecole Polytechnique *TEACHER*: François Alouges **Probability: Stochastic Processes**, Bachelor 3A, Ecole Polytechnique *TEACHER*: Thibaut Mastrolia
YEAR 2019-2020	**Discrete Mathematics**, Bachelor 1A, Ecole Polytechnique *TEACHER*: Igor Kortchemsky

SCIENCE POPULARIZATION

Each year from 2019 to 2021, I participated to the "Fête de la Science" (Science Festival) at Ecole Polytechnique. In 2019, I helped animating a stand on "Mathematics and Ecology". In 2020, I created a video introducing Conway's "Game of life". The video is available here (in French, English subtitles). In 2021, I helped animating a stand on mathematical puzzles.

PUBLICATIONS

PREPRINTS

- "*Growth properties of the infinite-parent spatial Lambda-Fleming Viot process*", A.L. and A. Véber (2022). Preprint available on ArXiv and HAL.

Published articles

- "*Stochastic measure-valued models for populations expanding in a continuum*", A.L., *ESAIM - Probability and Statistics* (2023). The article is available online here. Preprint available on ArXiv and HAL.

- "*Extinction threshold and large population limit of a plant metapopulation model with recurrent extinction events and a seed bank component*, A.L., *Theoretical Population Biology* (2022). The article is available online here. Preprint available on ArXiv and HAL.

- "*Detecting seed bank influence on plant metapopulation dynamics*", A.L., N. Machon, J. B. Mihoub and A. Robert, *Methods in Ecology and Evolution*, 12(4), 655-664 (2021).
The article is available online here. The submitted version can be found on HAL. A blog article presenting the article can be found here.

Talks

The slides for all the talks can be found online here.

Upcoming talks

- Probability seminar, University of Bristol, February 2023
- One World Probability Seminar, March 2023
- Workshop "Random discrete structures", Münster, Marcj 2023

Conferences and summer schools

BUC Probability meeting CIMAT, Guanajuato, January 2023	"A toy model for studying the consequences of the microscopic reproduction dynamics at the edge of an expanding population"
Conference "Mathematical models in ecology and evolution" University of Reading, July 2022	"A new plant metapopulation model with recurrent extinction events and a seed bank component"
Workshop "Mathematical models in ecology and evolution" IHP, March 2022	"A family of stochastic measure-valued population genetics processes for expanding populations"
Probabilités de Demain IHP, February 2022	"Modélisation stochastique de populations en expansion" (Stochastic modeling of expanding populations)
Journée YSP IHP, February 2022	"Limite d'un modèle de Wright-Fisher avec fantômes et événements d'extinction" (Limit of a Wright-Fisher model with ghosts and extinction events)
Journées MAMOVI Ecole Polytechnique, December 2021	"Extinction threshold and large population limit of a plant metapopulation model with recurrent extinction events and a seed bank component"
Journées de Probabilités Guidel, June 2021	"Modélisation stochastique de populations en expansion" (Stochastic modeling of expanding populations)
Ecole d'été de la chaire MMB Aussois, September 2020	"Détection de l'influence de la banque de graines sur la dynamique d'une métapopulation de plantes" (Detecting seed bank influence on plant metapopulation dynamics)

Seminars and reading groups

Indiana University, January 2023	"The ∞-parent SLFV - Definition and growth properties" Seminar "Probability and Related Fields".
University of Bath, November 2022	"Some growth properties of the ∞-parent spatial Λ-Fleming Viot process" Internal seminar of the Prob-L@b.
University of Bath, October 2022	"Stochastic Patch Occupancy Models for plant dynamics in urban tree bases" Seminar of the Centre for Mathematical Biology, University of Bath.
MAP5, June 2022	"Modèles probabilistes de génétique des populations pour des populations en expansion" (Stochastic population genetics models for expanding populations) PhD students seminar, MAP5.
CMAP, April 2022	"Modeling plant dynamics in urban tree bases" PhD students seminar, CMAP.
LPSM (Paris), April 2022	"Limit of a Wright-Fisher model with ghosts" Doctoral seminar.

IMT (Toulouse), March 2022	"Stochastic population genetics models for expanding populations" Doctoral seminar.
INRIA Paris, December 2021	"The k-parent spatial Λ -Fleming Viot process: Construction and limit $k \to +\infty$" NEMO Network Theory reading group.
Munich (Zoom), December 2021	"Impact of seed banks on plant dynamics in urban tree bases"
MAP5, June 2021	"Quelques modèles probabilistes de génétique des populations en espace continu" (Some probabilistic models of population genetic in continuous space) PhD students seminar, MAP5.
Berlin (Zoom), May 2021	"A plant metapopulation model with recurrent extinction events and a seed bank component"
CMAP, March 2021	"Quelques modèles probabilistes de génétique des populations en espace continu" (Some probabilistic models of population genetic in continuous space) PhD students seminar, CMAP.

OTHERS

February 2021	"Modèles mathématiques pour l'étude de la diversité génétique dans une population en expansion" (Mathematical models for the study of genetic diversity in an expanding population) Presentation of my research interests made at the Ecole de l'Inserm Liliane Bettencourt for 2nd year students in medical studies.

RESPONSIBILITIES

- Co-organisation of the upcoming workshop "Probability meets Biology" (June 2023, University of Bath)

- Co-organisation of the first edition of the "Congrès des Jeunes Chercheuses et Chercheurs en Mathématiques Appliquées" (CJC-MA 2021), a conference aimed at PhD students in applied mathematics which gathered more than 100 researchers during three days. The website of the conference can be found here.

- From 2020 to 2022, representative of the teaching assistants at the Department committee.

LANGUAGES

ENGLISH, SPANISH	Advanced
JAPANESE:	Intermediate
PROGRAMMATION:	Python, LaTeX, basics of R and HTML/CSS
MARCH 2019 - AUGUST 2019	*Keio University, Tokyo (Japan)* Was enrolled in the Japanese Language Program. As part of an exchange program between ENS and Keio University.