

# Apolline LOUVET

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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)*

2016-2017 M1 MATHEMATICS  
*Université Paris-Sud, Orsay (France)*

2015-2016 L3 MATHEMATICS  
*Université Paris-Sud, Orsay (France)*

## RESEARCH INTERNSHIPS

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OCTOBER 2018 - MARCH 2019	<i>CESCO, Muséum National d’Histoire Naturelle, Paris (France)</i> Study of invasive plant species in an urban environment. Under the supervision of <i>Nathalie Machon</i> .
APRIL 2018 - SEPTEMBER 2018	<i>CMAP, Ecole Polytechnique, Palaiseau (France)</i> Spatial population genetics models and mathematical modeling of expanding populations. Under the supervision of <i>Amandine Véber</i> .
MAY 2017 - JULY 2017	<i>CMAP, Ecole Polytechnique, Palaiseau (France)</i> Study of a coalescent model with a seed-bank component. Under the supervision of <i>Amandine Véber</i> .
FEVRIER 2017 - AVRIL 2017	<i>Chennai Mathematical Institute (CMI), Chennai (India)</i> Young tableaux and their applications. Under the supervision of <i>Vijay Ravikumar</i> . As part of an exchange program between ENS and CMI.

## PUBLICATIONS

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### PREPRINTS

- “*Growth properties of the infinite-parent spatial Lambda-Fleming Viot process*”, with A. Véber (2022). Preprint available on [ArXiv](#) and HAL.
- “*Stochastic measure-valued models for populations expanding in a continuum*” (2022). Preprint available on [ArXiv](#) and HAL.

### PUBLISHED ARTICLES

- “*Extinction threshold and large population limit of a plant metapopulation model with recurrent extinction events and a seed bank component*, *Theoretical Population Biology* (2022). The article is available online [here](#). Preprint available on [ArXiv](#) and HAL.
- “*Detecting seed bank influence on plant metapopulation dynamics*”, with 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](#).

# TEACHING AND POPULARIZATION OF SCIENCE

## TEACHING

From 2019 to 2022, I was a teaching assistant at the Department of Applied Mathematics of Ecole Polytechnique.

YEAR 2021-2022	<b>Discrete Mathematics</b> , Bachelor 1A <i>TEACHER</i> : François Alouges
YEAR 2020-2021	<b>Discrete Mathematics</b> , Bachelor 1A <i>TEACHER</i> : François Alouges <b>Probability: Stochastic Processes</b> , Bachelor 3A <i>TEACHER</i> : Thibaut Mastrolia
YEAR 2019-2020	<b>Discrete Mathematics</b> , Bachelor 1A <i>TEACHER</i> : 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.

## TALKS

The slides for all the talks can be found online [here](#).

### CONFERENCES AND SUMMER SCHOOLS

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

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 $\Lambda$ -Fleming Viot process: Construction and limit $k \rightarrow +\infty$ ” 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.

## POSTERS

WORKSHOP “BRANCHING SYSTEMS, REACTION-DIFFUSION EQUATIONS AND POPULATION MODELS” CRM (Montréal), May 2022	“The $\infty$ -parent SLFV: Definition and growth properties”
MEETING OF THE CHAIRE MMB Aubervilliers, April 2022	“Seed banks and urban tree bases”

## OTHERS

June 2022	“Stochastic population genetics models for expanding populations” PhD defense.
March 2022	“Variations on the spatial $\Lambda$ -Fleming Viot process” Formidable Journée du CESCO Presentation in 5 minutes of the spatial $\Lambda$ -Fleming Viot process and several of its variants.
August 2021	“Pieds d’arbre et plantes fantômes” (Tree bases and ghost plants) Formidable Journée du CESCO Presentation in 5 minutes of one question I am interested in as part of my PhD work.
CMAP, June 2021	“Diversité génétique dans une population en expansion” (Genetic diversity in an expanding population) Talks made by the 2nd year PhD students of the CMAP laboratory.
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.
March 2020	“Genetic diversity in an expanding population” Journées du Rocheton (CESCO) Presentation of my PhD subject in 5 minutes.

## RESPONSIBILITIES

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- 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

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ENGLISH, SPANISH    Advanced

JAPANESE:    Intermediate

PROGRAMMATION:    Python, LaTeX, basics of R and HTML/CSS

MARCH 2019 - AUGUST 2019	<i>Keio University, Tokyo (Japan)</i> Was enrolled in the Japanese Language Program. As part of an exchange program between ENS and Keio University.
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