Madeleine KUBASCH

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Education

2021 -   **PhD in Applied Mathematics — École polytechnique, INRAE (France)**
Thesis supervisors: Vincent Bansaye (CMAP, École polytechnique, Palaiseau, France), Elisabeta Vergu (MaIAGE, INRAE, Jouy-en-Josas, France).
Topic: Multi-level contact models for epidemic dynamics.
Keywords: Household-workplace models, two layers of mixing, measure-valued process, large population limit, model reduction, epidemic growth rate, teleworking strategies.

2019-2021   **Master in Applied Mathematics — Sorbonne Université (France)**
Specialisation in mathematical modelling, major in Mathematics for Life Sciences. Highest Honours.

2018-2019   **Bachelor in Life Sciences — Magistère Européen de Génétique, Université de Paris (France)**
Highest Honours. Price of the *Association de Promotion du Magistère Européen de Génétique*, distinguishing top-rank students.

2017-2018   **Bachelor in Mathematics — Sorbonne Université (Paris)**
Highest Honours.

2015-2017   **Undergraduate studies — Sorbonne Université (France)**
Double major in Mathematics and Life Sciences, taking place at the *Station Biologique de Roscoff*, France.

2015   ***Baccalauréat* (France)**
Scientific option. Highest Honours.

Research internships

2021   **Evaluating epidemiological vulnerability on contact networks**
Supervisors: Vincent Bansaye (CMAP, École polytechnique, Palaiseau, France), Elisabeta Vergu (MaIAGE, INRAE, Jouy-en-Josas, France). Four month Master Thesis research internship.
Keywords: Epidemiology, metapopulation models, branching processes, spinal constructions, random graphs, numerical exploration through simulations.

2020   **Epidemic model for Cercospora leaf spot disease**
Supervisors: Renaud Dessalles and Simon Moulieras (Greenshield Technology, Paris, France), Luis Almeida (LJLL, Sorbonne Université), Nicolas Vauchelet (LAGA, Université Sorbonne Paris Nord). Two month summer internship at Greenshield Technology.
Keywords: Epidemiology, PDEs, stochastic optimisation.

2019   **Targeted oxidation of 5-methylcytosine (5mC) in RNA**
Supervisor: Dylan Mooijman (Ephrussi Group, EMBL, Heidelberg, Germany). Four month Bachelor Thesis internship.
Keywords: Molecular biology (lab work), bioinformatics.

2017/2018 ***De novo* detection of enriched RNA-motifs**
Supervisor: Julia Morales (TCCD, CNRS, Roscoff, France). Summer internships (twice two months, in 2017 and 2018).
Keywords: Bioinformatics.

Publications

[1]   <u>Madeleine Kubasch</u> (2023+). **« Large population limit for a multilayer SIR model including households and workplaces »**. Preprint available at ⟨hal-04106800v3⟩.

[2]   Vincent Bansaye, François Deslandes, <u>Madeleine Kubasch</u>, Elisabeta Vergu (2023+). **« The epidemiological footprint of contact structures in models with two levels of mixing »**. Preprint available at ⟨hal-04012906⟩.

Invited talks

Oct 2023	Colloquium *Jeunes Probabilistes et Statisticiens*, Oléron, France.
Sep 2023	CMAP Welcome Day, École polytechnique, Palaiseau, France.
Jun 2023	*Rencontres Mathématiques de Rouen*, Université Rouen Normandie, Rouen, France.
Jun 2023	Research School of the Chair Modélisation Mathématique et Biodiversité (MMB), École polytechnique and Veolia, Aussois, France.
Dec 2022	Probability and Statistics Seminar, Université de Montpellier and INRAE, Montpellier, France.
Nov 2022	Annual meeting of the Coordinated Action (CA) Modelling of Infectious Diseases, University of Bordeaux, Bordeaux, France.
Jun 2022	Dynenvie team seminar, INRAE, Jouy-en-Josas, France.

Attended workshops, conferences and summer schools

Oct 2023	Colloquium *Jeunes Probabilistes et Statisticiens*, Oléron, France.
Sep 2023	Workshop « The scales of epidemic modelling » organised by the CA Modelling of Infectious Diseases, ISC, Paris, France.
Jun 2023	*Rencontres Mathématiques de Rouen*, Université Rouen Normandie, Rouen, France.
Jun 2023	Research School, Chair MMB, École polytechnique and Veolia, Aussois, France.
Nov 2022	Workshop on « Spatial propagation and organisation in biology », Université Paris Dauphine, Paris, France.
Nov 2022	Annual meeting of the CA Modelling of Infectious Diseases, University of Bordeaux, Bordeaux, France.
Jul 2022	Saint-Flour Summer School, Saint-Flour, France.
Jun 2022	Research School, Chair MMB, École polytechnique and Veolia, Aussois, France.
Oct 2021	Annual meeting of the CA for modelling of infectious diseases, Institut Pasteur, Paris, France.
Jun 2021	Research School, Chair MMB, École polytechnique and Veolia, Aussois, France.

Teaching

2023-	Teaching assistant: <u>Probability and Statistics</u>, 2nd year Bachelor Program, École polytechnique
2022-	<u>Bachelor Thesis</u>: conception of one (2022) or two (2023) 8-week internship proposals, supervision and evaluation of the student(s). 3rd year Bachelor Program, École polytechnique.
2021-2022	Teaching assistant: <u>Introduction to Probability</u>, 2nd year Bachelor Program, École polytechnique.
2021-2022	Teaching assistant: <u>Refresher Course in Applied Mathematics</u> for foreign students joining the Engineering Program, École polytechnique.

Technical skills

Code	Python (intermediate), C++ (beginner), R (beginner), Git (beginner).
Languages	German (mother tongue), French (fluent), English (TOEFL iBT 2016: 112/120), Italian (beginner).

Miscellaneous

2022	*Mathématiques: nom féminin ?* — Presentation of my thesis to middle school students, discussion about women in mathematics. Organised by LAPS/Équipe du Matin.
2021-2022	PhD representative at CMAP laboratory council.