

Aline Marguet

Researcher

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Research interests : branching processes, structured populations, growth-fragmentation equations, statistical inference for tree-structured data, inheritance, noise in gene expression, bacterial communities.

Employment status

- Since 2019 **Researcher**, *project-team MICROCOSME, Inria Grenoble – Rhône-Alpes, Montbonnot*
- 2018–2019 **Postdoctoral student**, *team IBIS, Inria Grenoble – Rhône-Alpes, Montbonnot*
Mixed-effects modelling and identification of the growth and the gene expression dynamics of bacterial population from single-cell measurements.
- 2014–2017 **PhD student**, *CMAP, École Polytechnique, Palaiseau*
"Branching processes for structured populations and estimators for cell division" under the supervision of Vincent Bansaye and Marc Hoffmann.

Training

- 2017 **Doctorat de l'Université Paris-Saclay**, *École Polytechnique, Palaiseau*
- 2013–2014 **Master 2 Mathématiques pour les sciences du vivant**, *Université Paris Saclay*
- 2013 **Reçue à l'agrégation de Mathématiques**
- 2011–2012 **Master 1 de Mathématiques**, *ENS Rennes - Université de Rennes 1*
- 2010–2011 **Licence de Mathématiques**, *ENS Rennes - Université de Rennes 1*
- 2010–2014 **Magistère de Mathématiques**, *ENS Rennes - Université de Rennes 1*
- 2008–2010 **Classes préparatoires MPSI/MP**, *Lycée Kléber, Strasbourg*
- 2008 **Baccalauréat série S**, *Lycée Marguerite Yourcenar, Erstein (67)*

Publications

- A. Marguet, C. Smadi, Parasite infection in a cell population : role of the partitioning kernel, *Journal of Mathematical Biology*, 89 , 14, 2024.
- E. Reginato, A. Marguet, E. Cinquemani, Inference of tree-structured auto-regressive models of gene expression parameters from generation-snapshot data, *Proceedings of the 22nd European Control Conference, (ECC, Stockholm, Sweden, June 25-28, 2024)*.
- A. Marguet, C. Smadi, Spread of parasites affecting death and division rates in a cell population, *Stochastic Processes and their Applications*, 168, pp.104262, 2024.
- V. Bansaye, B. Cloez, P. Gabriel, A. Marguet, A non-conservative Harris ergodic theorem, *Journal of the London Mathematical Society*, 106, 2459-2510, 2022.
- A. Marguet, C. Smadi, Long time behaviour of continuous-state nonlinear branching processes with catastrophes, *Electronic Journal of Probability*, 26, no. 95, 1-32, 2021.
- A. Marguet, E. Cinquemani. Identification of stochastic gene expression models over lineage trees, *Proceedings of the 19th IFAC symposium on System Identification*, Padova, July 13-16, 2021.

- A. Marguet, M. Lavielle, E. Cinquemani, Inheritance and variability of kinetic gene expression parameters in microbial cells : Modelling and inference from lineage tree data, *Bioinformatics*, 35(14), i586–i595, 2019.
- A. Marguet, Uniform sampling in a structured branching population, *Bernoulli*, 25, 4A, 2649-2695, 2019.
- M. Hoffmann, A. Marguet, Statistical estimation in a randomly structured branching population, *Stochastic Processes and their Applications*, 129, 12, 5236-5277, 2019.
- A. Marguet, A law of large numbers for branching Markov processes by the ergodicity of ancestral lineages, *ESAIM : Probability and Statistics*, 23, 638–661, 2019.
- B. Cloez, R. Dessalles, A. Genadot, F. Malrieu, A. Marguet, R. Yvinec, Probabilistic and Piecewise Deterministic models in Biology, *ESAIM : Proceedings and Surveys*, 60, 225-245, 2017.

Student Supervision

- 2025 **Amelio Schiavone**, *M2 student*, Co-supervision with E. Cinquemani and H. de Jong
Mathematical modelling and simulation of the emergence of growth variability in bacterial population
- Since 2024 **Eugène Ferragu**, *PhD student*, co-supervision with C. Smadi
Modeling and analysis of phages proliferation in growing cell populations
- 2021-2024 **Charles Medous**, *PhD student*, co-supervision with L. Coquille and C. Smadi
Interacting population, spine construction and stochastic simulations.
- Since 2020 **Emrys Reginato**, *PhD student*, co-supervision with E. Cinquemani
Heterogeneity of microbial populations from stochasticity across cell divisions : individual-based modelling and inference on case studies
- 2020 **Alan Flatrès**, *M2 student*, co-supervision with E. Cinquemani
Modelling and inference from lineage tree data and stochastic gene expression dynamics

Projects

- 2024-2029 **ARBOREAL**, *Branching resource allocation processes for the analysis and inference of phenotypic growth variability*
ANR JCJC
- 2024-2029 **IMOCEP**, *Innovations en modélisation de la croissance*
Projet ciblé PEPR Maths-Vives
- 2021-2024 **AnaComBa**, *Analysis of bacterial communities : stochastic modelling*
Équipe-Action PERSYVAL-lab
- 2020-2022 **MOSTIC**, *Stochastic modelling and inference for cell communities in interaction*
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Talks (since 01/2020)

- 07/2025 **Workshop single-cell modeling**, Montpellier
- 01/2024 **GT BLOSS seminar**, Online
- 12/2023 **EverEvol**, Grenoble
- 09/2023 **Biology meets math**, Montpellier
- 06/2023 **Inform Applied Probability Society Conference 2023, Invited session "Stochastic models for ecology and evolution"**, Nancy
- 05/2023 **Cérémonie de remise des prix des Olympiades de Mathématiques 2023**, Grenoble
- 03/2022 **Séminaire de Probabilités de l'ICJ et l'UMPA**, Lyon
- 01/2022 **Séminaire de Probabilités de l'IRMAR**, Rennes

08/2021 **Journées MAS 2021**, online
 07/2021 **19th IFAC symposium on System Identification**, Padova (videoconference)
 06/2021 **Séminaire de Modélisation aléatoire du vivant**, Paris (videoconference)
 02/2021 **Séminaire de Probabilités et Statistiques**, Montpellier (videoconference)
 08/2020 **Bernoulli-IMS One World Symposium 2020**, Pre-recorded talk
 05/2020 **Séminaire de Statistique d'AgroParisTech**, Paris (videoconference)
 02/2020 **Séminaire du LMAC**, Compiègne
 01/2020 **Séminaire de probabilités et statistique**, Lille

Teaching

2019–2024 **Biostatistics, TP**, *M2 Biologie*, Université Grenoble Alpes, Grenoble
 2015–2017 **Écologie et statistiques, TP de R**, *L2 Biologie*, Université Paris-Sud, Orsay
 2014–2017 **Calculus, TD**, *L1 MPI*, Université Paris-Sud, Orsay

Administrative functions

Since 2023 Co-organizer of the "*Séminaire de modélisation du vivant*".
 Since 2023 Member of the scientific committee of *GDR branchement*.
 2023 Co-organizer of the first conference of GDR branchement, Toulouse, <https://indico.math.cnrs.fr/event/9437/>.
 2021 Co-organizer of Biohasard 2021, Grenoble, <https://biohasard2020.sciencesconf.org/>.
 2021-2023 Representative of researchers at "Comité de centre", Inria centre at the University Grenoble Alpes.
 Since 2021 Member of "Comité des études doctorales", Inria centre at the University Grenoble Alpes.

Programming languages

Julia, R, MATLAB