Jérémy ANDRÉOLETTI
23rd February, 1998

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Curriculum vitae

EDUCATION

2020-2021 **Master 2 of Mathematics for the Life Sciences,** *Université Paris-Saclay & École Polytechnique, Palaiseau, France*
Relevant courses: Latent variable models, Stochastic Processes, ODE/PDE, Optimisation, Branching processes for structured populations, Population Genetics, Machine Learning.

2019 – 2020 **Master 1 of Life Sciences,** *École Normale Supérieure (ENS), Paris, France*
Relevant courses: Evolution, Evolutionary Ecology, Genetics, Mathematics II, Computational Biology, Data analysis.

2018 – 2019 **Bachelor of Life Sciences,** *École Normale Supérieure (ENS), Biology Department, Paris, France*
Relevant courses: Evolution, Ecology, Functional Genomics, Genetics, Mathematics I, Modelling, Bioinformatics.

2016 – 2018 **BCPST preparatory school,** *Lycée Champollion, Grenoble, France*
Main courses: Biology, Mathematics, Physics, Chemistry, Geology.

2016 **French Baccalaureat with high honours,** *Lycée du Grésivaudan, Meylan, France*

RESEARCH EXPERIENCE

September 2021 – February 2022 *24 weeks*
Laboratory internship: *Fast combined-evidence inference of diversification histories using data augmentation*
ENS Paris, Institute of Biology, Modeling Biodiversity team, I. Quintero & H. Morlon
Implementing the Fossilized and Occurrence birth-death processes in the Tapestree Julia package, optimization of the inference by a data augmentation procedure, incorporation of Brownian evolution of parameters and traits

April 2021 – July 2021 *18 weeks*
Laboratory internship: *Integrating trophic interaction networks in species distribution models*
Grenoble-Alpes University, Laboratoire d'Écologie Alpine, G. Poggiato & Wilfried Thuiller
Combining species distributions models and structured equations models, penalized inference methods with uncertainty propagation and predictive performances evaluation in a virtual ecologist framework.

October 2020 – Mars 2021 *1 day per week*
Math-Bio Research project: *Inferring the Distribution of Fitness Effects (DFE) of mutations on E. coli growth*
INRIA Paris, Institut Polytechnique, M. Doumic & L. Robert
Estimating the DFE from noisy growth rate trajectories, analytic results with PDEs and Python/R implementation.

February 2020 – June 2020 *18 weeks*
Laboratory internship: *The Occurrence Birth-Death Process for combined-evidence analysis in macroevolution*
ETH Zurich (D-BSSE Basel), Computational Evolution team, M. Manceau, R. Warnock & T. Stadler
Implementing a new birth-death process in the RevBayes software (C++). Bayesian inference by Markov Chain Monte Carlo in a graphical models framework, application to past and extant Cetacean data.

October 2019 – January 2020 *1 day per week*
Research project: *Fitting an evolutionary model to phylogenetic data by Approximate Bayesian Computation*
ENS Paris, Institute of Biology, Modeling Biodiversity team, L. Aristide & H. Morlon
Applying Bayesian inference tools to the model of phenotypic and species diversification developed by the team.

June – July 2019 *8 weeks*
Laboratory internship: *Morphology of fossil rhyncholites and comparison with present Nautiluses*
National Museum of Natural History Paris, Metazoan phylogeny and diversification, L. Souquet & I. Rouget
Geometric morphometrics methods, including photogrammetry, 3D segmentation, (semi-)landmarks placement, Procrust analysis, PCAs and topographic metrics in order to infer morphological and functional evolution.

October 2018 – May 2019 *4-6 h per week*
Laboratory internship: *Reconstructing haplotypes from populations' genotypes with Neural Networks*
ENS Paris, Institute of Biology, Experimental Evolutionary Genetics team, L. Noble & H. Teotónio
Analysis of C. elegans experimental results, prediction of meiotic recombination from genetic markers using neural networks (CNN, LSTM) implemented in Python. Poster

July 2016 *4 weeks*
Summer job: *Virtual extraction of an unidentified fossilized animal embryo in its egg*
European Synchrotron Radiation Facility Grenoble, Microtomography beamline, V. Fernandez & P. Tafforeau

PAPER

2020 **Preprint:** *The Occurrence Birth-Death Process for combined-evidence analysis in macroevolution and epidemiology*
Jérémy Andréoletti, Antoine Zwaans, Rachel C. M. Warnock, Gabriel Aguirre-Fernández, Joëlle Barido-Sottani, Ankit Gupta, Tanja Stadler, Marc Manceau, 2020, bioRxiv, https://doi.org/10.1101/2020.10.27.356758

SEMINAR PRESENTATIONS

May 2020 **2nd Palaeontological Virtual Congress - Early career session:** *Total-evidence Bayesian inference of past diversity: the occurrence birth-death process*

October 2020 **Geological Society of America, Connects Online 2020 - Linking Biological Questions to Paleontological Session:** *Total-evidence Bayesian inference of past diversity: the occurrence birth-death process*

ADDITIONAL SKILLS

Informatics

- Advanced Python programming / R for data analysis / Julia / C++ basics
- Unix / Mac / Windows environments
- Jupyter and Rstudio notebooks

Languages

- French: mother tongue
- English: fluent, C1

MOOCs

- *Reproducible research: methodological principles for a transparent science*, INRIA
- *The molecular origins of life*, Univ. Paris Diderot
- *Bioinformatics: Genomes and Algorithms*, INRIA

Webinars

- *One World ABC Seminar*, University of Warwick
- *Paleobiology Database webinar*, PBDB

FIELDS OF INTEREST

Natural sciences, Epistemology, Effective Altruism

(Macro-)Evolution, Ecology, Palaeobiology, Environmental crisis

Mathematical and computational biology, Bayesian inference

Cinema, Literature