

Guilhem Doulcier | Student

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Education

M2 Mathématiques et applications **2015–Ongoing**
Université Pierre et Marie Curie *Paris, France*

Second year of a master degree in applied mathematics. I am following the Biology Modeling curriculum

Diplôme de l'École normale supérieure **2012–Ongoing**
École normale supérieure *Paris, France*

Major in Biology, Minor in environmental sciences.

M1 Écologie-Biodiversité-Évolution **2013–2014**
École normale supérieure *Paris, France*

First year of a master degree in Ecology, Biodiversity and Evolution.

Licence de Biologie **2012–2013**
École normale supérieure *Paris, France*

Bachelor Degree in Life Science

Classe préparatoire aux grandes écoles **2010–2012**
Lycée Joffre *Montpellier, France*

Section Biologie Chimie Physique et Sciences de la Terre.

A 2-year intensive program in biology, physics, chemistry and earth science preparing for the national competitive exam for entry to engineering schools.

Baccalauréat scientifique, spécialité physique chimie **2007–2010**
Lycée André Chamson *Le Vigan, France*

High-school national diploma in science, physics and chemistry specialization.

Summer schools.....

Dresden Summer School in Systems Biology **2014**
Dresden, Germany

Summer school on spatiotemporal modeling and simulation of biological systems. Organized by the Center of Systems Biology Dresden (CSBD) and the International Max Planck Research School for Cell, Developmental and Systems Biology (IMPRS-CellDevoSys). Bronze Medal.

Work Experience

Studying collective heredity: theoretical foundations and practical solutions **2016**
ESPCI Paris - Université Paris Sciences et Lettres *Paris, France*

A six month research project involving the modeling of the emergence of Darwinian characteristic at the collective level and the development of a signal processing and visualization pipeline for the high throughput phenotype analyzer developed by the Millidrop start-up. Project supervised by Paul B Rainey (ESPCI Paris), Silvia De Monte (ENS) and Amaury Lambert (Collège de France).

Structure of natural bipartite networks **2015**
Stouffer Lab - University of Canterbury *Christchurch, New-Zealand*

A six month research project combining theoretical tools development, implementation, and application about the structure of plant-pollinator networks and their consequences. Project supervised by Daniel Stouffer.

Impact of climate change and land use on meta-communities **2014-2015**
Équipe Biodicée - Institut des Sciences de l'Évolution de Montpellier *Montpellier, France*

A five month research project combining spatiotemporal modeling and data analysis, supervised by Sonia Kéfi and Vincent Devictor, about the impact of environmental and climatic variation on metacommunity composition.

Automatic taxonomic affiliation in viral metagenomic data **2014**
Tucson Marine Phage Lab - University of Arizona *Tucson, United-States*

A five month research project supervised by Matthew Sullivan, about the automatic classification of the vast amount of viral sequence data gathered by the TARA expedition.

Adaptive Evolution of Cell Adhesion in Microbes **2013**
Éco-Évolution mathématique, Institut de Biologie de l'École normale supérieure *Paris, France*

Supervised by Silvia De Monte, two month research project on the evolution of multicellularity using adaptive dynamics.

Short lab internship.....

- **2012** : *Institut de Biologie de l'École normale supérieure, Paris (France)*, Two weeks internship on the secondary structure of the non-coding snRNA 7sk supervised by Anne-Catherine Dock-Bregeon in the "Cell biology of transcription" team of Olivier Bensaude.
- **2011** : *Centre d'Écologie Fonctionnelle et Évolutive, Montpellier (France)*, Ten days in the team of Claude Grison on phytotechnology and green chemistry in the Natural Substances and Chemical Mediations team, Interaction, Ecology and Society Department.
- **2006** : *Institut de Radioprotection et de Sécurité Nucléaire, Cadarache (France)*, One week with Yann Monerie in the combustible study laboratory.

Teaching.....

- **2013-Ongoing** : *Groupe de travail mathématiques et biologie - École normale supérieure (Paris)*, I gave the presentation about unsupervised classification in the "Mathematics and Biology" (2013) student work-group, I co-organized the "Game theory" workshop (2014). I also gave a lecture about the mathematics behind ecological niches (2015).

Fundings.....

- **2016** : *Origines et conditions d'apparition de la vie program - Paris Sciences et Lettres Research University*, I obtained a three years PhD funding.

- **2016** : *Concours de l'École doctorale Science du Végétal - Université Paris-Saclay*. I obtained a three years PhD funding which I turned down.

Publications

Patterns and ecological drivers of ocean viral communities

Jennifer R. Brum*, J. Cesar Ignacio-Espinoza*, Simon Roux*, **Guilhem Doulcier**, Silvia G. Acinas, Adriana Alberti, Samuel Chaffron, Corinne Cruaud, Colomban de Vargas, Josep M. Gasol, Gabriel Gorsky, Ann C. Gregory, Lionel Guidi, Pascal Hingamp, Daniele Iudicone, Fabrice Not, Hiroyuki Ogata, Stéphane Pesant, Bonnie T. Poulos, Sarah M. Schwenck, Sabrina Speich, Celine Dimier, Stefanie Kandels-Lewis, Marc Picheral, Sarah Searson, Tara Oceans Coordinators, Peer Bork, Chris Bowler, Shinichi Sunagawa, Patrick Wincker, Eric Karsenti, Matthew B. Sullivan, *Science*, May 2015. (* These authors contributed equally to this work)

The evolution of adhesiveness as a social adaptation Thomas Garcia*, **Guilhem Doulcier***, Silvia De Monte, *eLife* 2015;10.7554/eLife.08595 (* These authors contributed equally to this work).

A General framework to assess species contribution to community changes **Guilhem Doulcier**, Pierre Gausere, Vincent Devictor, Sonia Kefi, (in prep.).

Aridity leads to shifts in microbial communities and severe implications under a changing climate Manuel Delgado-Baquerizo, **Guilhem Doulcier**, David J. Eldridge, Daniel Stouffer, Fernando T. Maestre, Noah Fierer, Jeff. R. Powell, Thomas C. Jeffries, Brajesh K. Singh. (submitted).

Rnetcarto: Fast Network Modularity and Roles Computation by Simulated Annealing. **Guilhem Doulcier**, Daniel Stouffer, R package version 0.2.4. (Hosted on CRAN, application note in prep.).

Skills

- **Languages** : French (mother tongue), English (fluent).
- **Computer programming** : C (HPC with OpenMP), Python (Numpy, Matplotlib, Pandas).
- **Computer software** : R, Parallel computing with grid engines, Unix tools, GNU/Linux system administration.
- **Web developpment** : HTML/CSS, SQL, Javascript (Data visualisation with D3js).
- Driver's licence

Community involvement

- **We Are Ready Now**: Developer on the project to follow the ratification of the 2016 Paris Agreement on climate change.
- **Association Écocampus ENS** : (*President for the year 2013*), Environmental association of ENS students.
- **Club CPN en pays vignais** : (*President from 2011 to 2012*), Naturalist and DIY straw bale house building association.