

# IGNACIO QUINTERO MÄCHLER, PH.D.

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École Normale Supérieure, 46 Rue d'Ulm, 75005 Paris

Biodiversity • Biogeography • Diversification • Phylogenetics • Bayesian Inference

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## EDUCATION

2019

**Ph.D., Department of Ecology and Evolutionary Biology, Yale University, New Haven, CT, USA.**

*Advisor:* Dr. Walter Jetz [Lab web-page](#)

*Committee:* Dr. Forrest W. Crawford, Dr. Michael Donoghue, Dr. Robert E. Ricklefs

2016

**M.S., Department of Ecology and Evolutionary Biology, Yale University, New Haven, CT, USA.**

*Advisor:* Dr. Walter Jetz [Lab web-page](#)

2011

**B.Sc. Biology, Universidad de los Andes, Bogotá, Colombia.**

*Thesis Advisor:* Dr. Carlos D. Cadena [Lab web-page](#)

## PROFESSIONAL APPOINTMENTS

2022 - Present

**CNRS postdoctoral fellow, Institut de Biologie de l'École Normale Supérieure (IBENS), École Normale Supérieure, Paris, France.**

*Lab:* Dr. Hélène Morlon [Lab web-page](#)

2020 - 2022

**Marie Skłodowska-Curie postdoctoral fellow, Institut de Biologie de l'École Normale Supérieure (IBENS), École Normale Supérieure, Paris, France.**

*Lab:* Dr. Hélène Morlon [Lab web-page](#)

2019 - 2020

**CNRS postdoctoral fellow, Institut de Biologie de l'École Normale Supérieure (IBENS), École Normale Supérieure, Paris, France.**

*Lab:* Dr. Hélène Morlon [Lab web-page](#)

2017 - 2018

**Statistics Consultant, Yale University Library, Yale University, New Haven, CT, USA.**

2012 - 2013

**Research Assistant, Department of Ecology and Evolutionary Biology at Yale University, New Haven, CT, USA**

*Lab:* Dr. Walter Jetz [Lab web-page](#)

2012

**Internship fellowship, Smithsonian Tropical Research Institute, Barro Colorado Island/Gamboa, Panamá**  
Linking chemical, physical, and symbiotic traits to understand seed defense syndromes

*PIs:* James Dalling, A. Elizabeth Arnold and Adam Davis, Post-doc: P. Camilo Zalamea [Project web-page](#)

2011

**Visiting Researcher, Department of Ecology and Evolution at Stony Brook University, Stony Brook, NY, USA**

*Lab:* John J. Wiens [Lab web-page](#)

## PEER-REVIEWED PUBLICATIONS

Guarnizo, C. E., Montoya, P., **Quintero, I.**, Cadena, C. D. (2022) Allochronic Divergence Driven by Spatial Asynchrony in Precipitation in Neotropical Frogs? *Journal of Biogeography* | [link](#)

**Quintero, I.**, Suchard, M. A., Jetz, W. (2022) Macroevolutionary dynamics of climatic niche space. *Proceedings of the Royal Society B* 289: 20220091 | [link](#)

Landis, M. J., **Quintero, I.**, Muñoz, M. M., Zapata, F., Donoghue, M. J. (2022) Phylogenetic inference of where species spread or split across barriers. *Proceedings of the National Academy of Sciences* 119 (13): e2116948119 | [link](#)

Medina, I., Perez, D., Silva, A., Cally, J., Leon, C., Maliet, O., **Quintero, I.** (2022) Nest architecture is linked with ecological success in songbirds. *Ecology Letters* 25 (6): 1365-1375 | [link](#)

- Media Coverage: The New York Times ([link](#)),

**Quintero, I.**, Landis, M. J. (2020) Interdependent trait and biogeographic evolution driven by biotic interactions. *Systematic Biology*, 69 (4): 739-755 | [link](#)

Jarzyna, M., **Quintero, I.**, Jetz, W. (2020) Global functional and phylogenetic structure of avian assemblages across elevation and latitude. *Ecology letters* | [link](#)

**Quintero, I.**, Jetz, W. (2018) Global elevational diversity and diversification of birds. *Nature* Vol. 555, 246-250. | [link](#)

- Nature Research Highlight ([link](#))
- News and Views ([link](#))
- Youtube interview for “Ciencia Café Pa’ Sumercé” in Spanish with English subtitles ([link](#))
- Select Media Coverage: Yale News ([link](#)), Nature Middle East ([link](#)), Phys.org ([link](#)), Yale Daily News ([link](#))

**Quintero, I.**, Keil, P., Jetz, W., Crawford, F. W (2015) Historical Biogeography Using Species Geographical Ranges. *Systematic Biology*, 64 (6): 1059-1073. | [link](#)

**Quintero, I.**, González-Caro, S., Zalamea, P.C., Cadena, C.D. (2014) Asynchrony of seasons: genetic differentiation associated with geographic variation in climatic seasonality and reproductive phenology. *The American Naturalist*, Vol. 184, No. 3, 352-363. | [link](#)

**Quintero, I.**, Wiens, J.J. (2013) Rates of projected climate change dramatically exceed past rates of climatic niche evolution among vertebrate species. *Ecology Letters* 16 (8), 1095-1103. | [link](#)

- Research Highlight in Nature Climate Change [link](#)
- Select Media Coverage: RollingStone ([link](#)), The Guardian ([link](#)), Nature News, Science News ([link](#)), Discovery News ([link](#)), ScienceDaily ([link](#)), Huffington Post ([link](#)), Weather Underground ([link](#)), The Molecular Ecologist ([link](#)), among more than 100 other blog posts.

**Quintero, I.**, Wiens, J.J. (2013) What determines the climatic niche width of species? The role of spatial and temporal climatic variation in three vertebrate clades. *Global Ecology and Biogeography* 22 (4), 422-432. | [link](#)

**Quintero, I.**, Jácome, A. (2011) Black Hawk-Eagle (*Spizaetus tyrannus*), Neotropical Birds Online, Cornell Lab of Ornithology. | [Web-page](#)

## IN REVIEW, PREPRINTS AND WORKING PAPERS

**Quintero, I.**, Landis, M.J., Jetz, W., Morlon, H. (*in review in Science*) The build-up of the present-day latitudinal gradient in tetrapods.

**Quintero, I.**, Lartillot, N., Morlon, H. (*Pre-print, for review in Nature*) The birth-death diffusion leading to present-day Mammal diversity. | [Pre-print](#)

**Quintero, I.**, Andreoletti, J., Silvestro, D., Morlon, H. (*in prep*) The Red Queen subverts the Lindy effect across taxa.

## SOFTWARE

**Quintero, I.** Tapestry.jl Julia package v0.1.4 | [Github link](#)

**Quintero, I.** Introduction to Julia. | [Github link](#)

**Quintero, I.**, Keil, P., Crawford, F. W. (2015) *rasc*: Range Ancestral State Estimation for Phylogeography and Comparative Analyses. R package version 0.3-2. | [Github link](#) | [CRAN link](#)

## GRANTS, AWARDS & ACADEMIC DISTINCTIONS

**2020 Awardee** of The Australia and Pacific Science Foundation grant for “Are open nests a key evolutionary innovation in birds?” project with Iliana Medina [AUD 29,878].

**2020 Awardee** of the Marie Skłodowska-Curie Action (MSCA-IF-2019) for the “INSANE Joint Species And Niche Evolution” project [€184,707.84].

**2019 Awardee** of Yale’s John Spangler Nicolas prize for the best PhD Dissertation by an Ecology and Evolutionary Biology student [US \$500].

**2019** Phylogenetic analysis of diversification across the tree of Life (PANDA). European Research Council (ERC 616419), Consolidator Grant awarded to Hélène Morlon. **Participation as postdoctoral researcher** [€1,857,856].

**2019** VertLife Terrestrial: A complete, global assembly of phylogenetic, trait, spatial and environment characteristics for a model clade. Standard Grant from the National Science Foundation (NSF) (DEB 1441737) awarded to Walter Jetz. **Participation as PhD student** [US \$1,130,504].

**2018** Advancing Map of Life’s Impact and Capacity for Sharing, Integrating, and Using Global Spatial Biodiversity Knowledge. Continuing Grant from the National Science Foundation (NSF) (DBI 1262600) awarded to Walter Jetz. **Participation as PhD student** [US \$997,627].

**2014 Awardee** of the Graduate Research Fellowship Program (GRFP) from the National Science Foundation (NSF) for “The Evolutionary Tapestry: Insights on the Processes Behind the Origin and Maintenance of Biodiversity” [US \$138,000].

**2014** Validating and Advancing Continent-Wide Projections of Species’ Geographic Distributions in the Face of Global Change. Standard Grant from the National Science Foundation (NSF) (DEB 1026764) awarded to Walter Jetz. **Participation as PhD student** [US \$997,627].

**2014 Awardee** of the Graduate Student Research Award from the Society of Systematic Biologists (SSB) [US \$2,000].

**2012** Linking chemical, physical, and symbiotic traits to understand seed defense syndromes. Standard Grant from the National Science Foundation (NSF) awarded to James Dalling, A. Elizabeth Arnold and Adam Davis. **Participation as intern.**

**2010 4th absolute place** in Biological Sciences of 2010 nationally in Colombia’s Graduate State Exam (Examen de Estado de calidad de la Educación Superior SABER PRO (antes ECAES), Colombia).

**2007 Rated in the 1st group nationally** at Colombia’s State Exam (Examen de Estado Para Ingreso a la Educación Superior, ICFES, Colombia).

## SKILLS

**Software:** Julia, R, Git, bash, GDAL, GEOS, L<sup>A</sup>T<sub>E</sub>X, JAGS, Stan

**Languages:** Spanish - native, English - fluent, French - elementary

## SERVICE AS REVIEWER

*Nature, PNAS, Ecology Letters, Proceedings of the Royal Society B, Nature Ecology and Evolution, Nature Communications, Systematic Biology, Evolution, Journal of Animal Ecology, Evolutionary Ecology, PLoS One, NSF research grants*

[Publons link](#)

## PRESENTATIONS & ACADEMIC MEETINGS

### 2021 MCEB: Mathematical and Computational Evolutionary Biology

**Quintero, I.,** Morlon, H. Incorporating latent stochasticity into environmental, state dependent and general birth-death models.  
Porquerolles, France.

### 2020 Guest lecturer at Sebastian Höhna's lab seminar

**Quintero, I.,** Morlon, H., Landis, M.J. Interdependent trait evolution with diversification and with biogeography.  
Ludwig-Maximilians-Universität, Munich, Germany (Virtual given the covid-19 pandemic).

### 2019 AEEB : Evolutionary Biology Meeting at Marseilles

**Quintero, I.,** Morlon, H. Effect of fluctuating environment on spatial diversification.  
Marseilles, France.

### 2019 Invited lecturer at the seminar series on Biodiversity

**Quintero, I.,** Insights on the processes behind the origin and maintenance of Biodiversity.  
Swiss Federal Research Institute, WLS, Birmensdorf, Switzerland

### 2019 International Society of Biogeography Biannual Meeting 2019 (Oral Presentation):

**Quintero, I.,** Landis, M.J. Interdependent trait and biogeographic evolution driven by biotic interactions.  
Málaga, España

### 2016 Evolution 2016 (Oral Presentation):

**Quintero, I.,** Jetz, W. Global altitudinal biodiversity of birds.  
Austin, TX, USA

### 2014 99th Ecological Society of America Annual Meeting (Oral Presentation):

**Quintero, I.,** Jetz, W. Identifying the evolutionary and geographical underpinnings of global avian mountain biodiversity.  
Sacramento, CA, USA

### 2013 Phylotastic Hackathon #2 (Participant)

www.phylotastic.org  
Tucson, AZ, USA

### 2013 International Society of Biogeography Biannual Meeting, (Poster):

**Quintero, I.,** Jetz, W. Variation in avian diversification rate, species richness and elevation across mountain systems.  
Miami, FL, USA

- 2012 Smithsonian Tropical Research Institute BCI Talk (Oral Presentation):**  
**Quintero, I.,** Gonzáles-Caro, S., Zalamea, P.C., Cadena, C.D. Asynchrony of Seasons: population differentiation resulting from spatial heterogeneity in climatic regimes?  
 BCI Island, Panamá
- 2011 III Symposium of Evolutionary Biology (Oral Presentation):**  
**Quintero, I.,** Gonzáles-Caro, S., Zalamea, P.C., Cadena, C.D. Asynchrony of Seasons: Population Differentiation Resulting From Geographic Variation in Climate and Avian Reproductive Phenology?  
 Medellín, Colombia

## MENTORING

- 2020** Master student Jérémy Andréoletti, Master student at the Ecole Normale Supérieure, Masters IMaLiS at the ENS and Mathematics for Life Sciences at the Université Paris-Saclay, on incorporating fossil information in birth-death diffusion.
- 2020** Master student Thomas Merrien, M2-BEE of the Université Paris-Saclay, Sorbonne Université, the Museum National d'Histoire Naturel de Paris and AgroParisTech, on expanding data augmentation methods to multivariate trait evolution.
- 2019** Master student Clio Dalmaz, Master en Sciences de la Vie au Centre de Recherches Interdisciplinaires (CRI), on using GIS tools and clustering algorithms to biologically define biomes.
- 2015** Undergraduate students Benjamin Klempay and Adam Houston, at Yale University, on collating and vetting species distribution data.

## TEACHING

- 2022 Basic Introduction to Julia**  
 Workshop for the 10th Biennial conference of the International Biogeography Society  
 Vancouver, Canada (Virtual given the covid-19 pandemic)
- 2021 Introduction to Historical Biogeography**  
 Part of Master course "Biology of Ecological Systems (Biologie des Systèmes Écologiques)"  
 École Normale Supérieure, Paris, France (Virtual given the covid-19 pandemic)
- 2021 Julia practical**  
 Part of Master course "Computational Biology"  
 École Normale Supérieure, Paris, France
- 2020 Introduction to Historical Biogeography**  
 Graduate level course "EcoSum: Ecological Models and Beyond"  
 Laboratoire d'Ecologie Alpine (LECA), Grenoble, France (Virtual given the covid-19 pandemic).
- 2020 Introduction to Historical Biogeography**  
 Part of Master course "Biology of Ecological Systems (Biologie des Systèmes Écologiques)"  
 École Normale Supérieure, Paris, France (Virtual given the covid-19 pandemic)
- 2017 Introduction to Julia**  
 YCRC Bootcamp: Introduction to Julia, [link](#)  
 Yale Center for Research Computing  
 Yale University, CT, USA
- 2015 Teaching Fellow for Evolutionary Biology**  
 Professor: Jeff Powell, Ph.D. and Steve Stearns, Ph.D.  
 Yale University, CT, USA

- 2014 Guest Lecturer for Introductory Statistics: Life Sciences**  
*Introduction to Likelihood and Bayesian Inference*  
Professor: Walter Jetz, Ph.D.  
Yale University, CT, USA
- 2014 Teaching Fellow for Introductory Statistics: Life Sciences**  
Professor: Walter Jetz, Ph.D.  
Yale University, CT, USA
- 2013 Teaching Fellow for General Ecology**  
Professor: David Post, Ph.D. and David Vasseur, Ph.D.  
Yale University, CT, USA
- 2011 Teaching Assistant for Vertebrates Theory Class**  
Professor: Carlos Daniel Cadena, Ph.D.  
Universidad de los Andes, Bogotá, Colombia
- 2010 Teaching Assistant for Animal Physiology Laboratory Class**  
Professor: Adolfo Amézquita, Ph.D.  
Universidad de los Andes, Bogotá, Colombia

## REFERENCE CONTACTS

- Hélène Morlon** [helene.morlon@bio.ens.psl.eu](mailto:helene.morlon@bio.ens.psl.eu) tel: +33 (0)1 44 32 35 35  
CNRS research director, IBENS, École Normale Supérieure, UMR 8197 CNRS  
46 rue d'Ulm, 75005 Paris, France
- Walter Jetz** [walter.jetz@yale.edu](mailto:walter.jetz@yale.edu) tel: +1 (203) 432 7540  
Associate Professor, Department of Ecology and Evolutionary Biology, Yale University  
165 Prospect St., 06511 New Haven, CT, USA
- Michael Landis** [michael.landis@wustl.edu](mailto:michael.landis@wustl.edu) tel: +1 (314) 935 8082  
Associate Professor, Department of Biology, Washington University in St. Louis  
One Brookings Dr., 63130 St. Louis, MO, USA
- Carlos Daniel Cadena** [ccadena@uniandes.edu.co](mailto:ccadena@uniandes.edu.co) tel: +57 (1) 339 4949 ext. 2072  
Professor, Departamento de Ciencias Biológicas, Universidad de los Andes  
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