

# François Bienvenu

Born on 13 April 1991 in Rouen (France)

Institute for Theoretical Studies

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## Education and professional experience

- Sep. 2021 – **Junior Fellow**,  
*Institute for Theoretical Studies, ETH, Switzerland.*
- Mar. 2021 **Young Transilvania Fellow**,  
Aug. 2021 *Transilvania University of Brasov, Romania.*
- Oct. 2020 **Postdoc in Christina Goldschmidt's group at the University of Oxford**,  
Jan. 2021 *Department of Statistics, University of Oxford, United Kingdom.*
- Jan. 2020 **Postdoc with Céline Scornavacca at ISEM**,  
Oct. 2020 *Institut des Sciences de l'Évolution Montpellierain, Université de Montpellier, France.*
- 2016 – 2019 **PhD in Mathematics, "Random Graphs in Evolution"**,  
*Sorbonne Université, Paris, France.*
- 2014 – 2015 **Second year of Master in Mathematics, "Mathématiques de la Modélisation"**,  
*Sorbonne Université, Paris, France.*
- 2013 – 2014 **First year of Master in Life Science, "Écologie, Biodiversité, Évolution"**,  
*École Normale Supérieure, Paris, France.*
- 2012 – 2013 **Bachelor of Science in Biology, École Normale Supérieure, Paris, France.**  
2012 **Admission to École Normale Supérieure, Paris, in the biology department.**  
Ranked first at the national entrance examination (concours BCPST).

## Publications and preprints

- 2022 Bienvenu F, Lambert A. and Steel M. Combinatorial and stochastic properties of ranked tree-child networks. *Random Structures & Algorithms* (in press).
- 2021 Coste C, Bienvenu F, Ronget V, Cubaynes S. and Pavard S. The kinship matrix: inferring the kinship structure of a population from its demography *Ecology Letters*, 24(12):2750–2762.
- 2021 Bienvenu F, Cardona G. and Scornavacca C. Revisiting Shao and Sokal's  $B_2$  index of phylogenetic balance. *Journal of Mathematical Biology*, 83:52.
- 2021 Bienvenu F, Duchamps J-J. and Foutel-Rodier F. The Moran forest. *Random Structures & Algorithms*, 59(2), pp.155-188
- 2019 Bienvenu F. Positive association of the oriented percolation cluster in randomly oriented graphs. *Combinatorics, Probability and Computing*, 28(6), pp.811–815.
- 2019 Bienvenu F. The equivocal mean age of parents in a cohort. *The American Naturalist*, 194(2), pp.276–284.
- 2019 Bienvenu F, Débarre F. and Lambert A. The split-and-drift random graph, a null model for speciation, *Stochastic Processes and their Applications*, 129(6), pp.2010–2048.
- 2017 Bienvenu F, Akçay E, Legendre S. and McCandlish D. M. The genealogical decomposition of a matrix population model with applications to the aggregation of stages, *Theoretical Population Biology*, 115, pp.69–80.
- 2015 Bienvenu F. and Legendre S. A new approach to the generation time in matrix population models, *The American Naturalist*, 185(6), pp.834–843.

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## Integration to the scientific community

- Selected talks**
- One World Symposium.  
*Revisiting Shao and Sokal's  $B_2$  index of phylogenetic balance*. Online. 2020.
  - GRAAL summer school short talks.  
*The Moran forest*. CIRM, Luminy, France. 2019.
  - Seminar of the Department of Statistics of the University of Auckland.  
*The split-and-drift random graph*. Auckland, New Zealand. 2018
  - Annual meeting of the GDR TheoMoDive.  
*The split-and-drift random graph*. Paris, France. 2017.
  - European Conference on Mathematical and Theoretical Biology (ECMTB).  
*The split-and-drift random graph*. Nottingham, United Kingdom. 2016.
  - Seminar of the Department of Biology of the University of Pennsylvania.  
*The generation time in matrix population models*. Philadelphia, United-States. 2014.

- Peer-review** I have reviewed papers for the following journals:
- Biology: *The American Naturalist*, *Theoretical Population Biology*, *PLOS One*.
  - Mathematics: *Electronic Communications in Probability*, *Random Structures & Algorithms*, *Scientific Reports*.

- Visit** From October to December 2018 I was a visiting scholar at the University of Canterbury (Christchurch, New Zealand), where I was invited by Prof. Mike Steel.

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## Teaching

2016 – 2019 **Teaching assistant at Sorbonne Université (192 hours)**

- Complex analysis, 3<sup>rd</sup> year of bachelor.
- Probability theory, 3<sup>rd</sup> year of bachelor.
- Measure theory and integration, 3<sup>rd</sup> year of bachelor.
- Power series, integrals depending on a parameter, 2<sup>nd</sup> year of bachelor.
- Series and Riemann integrals, 2<sup>nd</sup> year of bachelor.

2013 – 2016 **Organizer of the GT maths-bio at École Normale Supérieure**

In 2013 I started a workgroup in mathematical biology aimed at bachelor students of École Normale Supérieure. The workgroup lasted for four years and totaled 48 two-hour sessions on a variety of topics. More information: <http://www.gt-mathsbio.biologie.ens.fr>

**Interns I have supervised two research interns:**

- Tristan Lazard (second-year master student in mathematics). Tristan did his master thesis on a random graph model under my supervision and that of Amaury Lambert from March to July 2017.
- Mélanie Hennart (third-year bachelor student in biology). Mélanie did a voluntary research internship on matrix population models under my supervision in March 2016.

- Tutoring** During my undergraduates studies I have tutored students at various levels, from junior high-school to college, both in mathematics and in biology.

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## Programming

I do a bit of computer programming, both for my research and as a hobby. I program mostly in Python, but I have used several other languages, in particular OCaml, R and Pascal. OCaml is my clear favorite.

I am the main author of the Python library MatPopMod:  
<https://bienvenu.gitlab.io/matpopmod>.

In 2016, I have worked on porting the Unified Life Models software from Delphi to Free Pascal and making it open-source:  
<https://www.biologie.ens.fr/~legendre/ulm/ulm.html>