

Josué Corujo Rodríguez

Contact Information

Institut de Recherche Mathématique Avancée, UMR 7501
Université de Strasbourg et CNRS
7 rue René-Descartes, 67000 Strasbourg, France

@ josue.corujorodriguez@math.unistra.fr

🌐 <https://josuecorujo.github.io>

ORCID  0000-0002-3997-7391.

ArXiv arxiv.org/a/corujo_j_2.html

📖 scholar scholar.google.com/citations?user=3QdTmnoAAAAJ

Research Interests

Stochastic Processes: Markov processes, interacting particle systems, branching processes, long time convergence and mean-field limit, cutoff phenomenon

Quasi-stationary distributions : Moran (or Fleming – Viot) particle systems, convergence to the quasi-stationary distribution (QSD)

Population genetics : coalescent processes, structured populations

Random graphs : random graphs, multiplicative coalescent, random forests

Reliability theory : stochastic orders, aging classes, maintenance processes

Education

- 2018-2021 **Ph.D. in Mathematics.**
CEREMADE, Université Paris Dauphine, Paris, France
Title: *Multi-allelic Moran models and quasi stationary distributions*
Advisors: Djalil Chafaï (CEREMADE) and Simona Grusea (INSA-T)
- 2015-2017 **MSc in Mathematics – Probability and Statistics.**
Universidad de La Habana, Havana, Cuba
MSc Thesis: *Stochastic Comparisons between Two-Units Repairable Systems*
Advisor: José E. Valdés
- 2011-2015 **BSc in Mathematics.**
Universidad de La Habana, Havana, Cuba
BSc Thesis: *Analysis of Repairable Systems using Stochastic Orders and Aging Classes*
Advisor: José E. Valdés

Academic Appointments

- 2021– **Postdoc with Vlada Limic**
IRMA, Université de Strasbourg, Strasbourg, France

2018–2021	Graduate Teaching Assistant Génie Mathématique et Modélisation, INSA-T, Toulouse, France
2017–2018	Assistant Professor Universidad de La Habana, Havana, Cuba
2015–2017	Junior Professor Universidad de La Habana, Havana, Cuba

Articles and preprints

Preprints

- 2023 A. Arredondo, J. Corujo, C. Noûs, S. Boitard, L. Chikhi, O. Mazet, *Exact calculation of the expected SFS in structured populations*
[biorXiv: 10.1101/2023.05.10.540112](#)
- J. Corujo and V. Limic, *A dynamical approach to spanning and surplus edges of random graphs*
[arXiv: 2305.04716](#) | [HAL-04092273](#)
- J. Corujo and V. Limic, *The standard augmented multiplicative coalescent revisited*
[arXiv: 2304.07545](#) | [HAL-04074235](#)

Publications in peer reviewed journals

- 2023 J. Corujo, *On the spectrum and ergodicity of a neutral multi-allelic Moran model*
ALEA **20** (2023), 505–546
[arXiv: 2010.08809](#) | [HAL-02969874](#) | DOI: 10.30757/ALEA.v20-18
- J. Corujo, D. Flores-Peñaloza, C. Huemer, P. Pérez-Lantero, and C. Seara, *Matching random colored points with rectangles*, **J. Comb. Optim.** 45:81, (2023). ¹
DOI: 10.1007/s10878-023-01010-z
- 2022 B. Cloez and **J. Corujo**
Uniform in time propagation of chaos for a Moran model
Stochastic Process. Appl. **154** (2022) 251–285.
[arXiv: 2107.10794](#) | [HAL-03345583](#) | DOI: 10.1016/j.spa.2022.09.006
- 2021 **J. Corujo**
Dynamics of a Fleming – Viot type particle system on the cycle graph
Stochastic Process. Appl. **136** (2021), 57–91.
[arXiv: 2001.08000](#) | [HAL-02447747](#) | DOI: 10.1016/j.spa.2021.02.001
- J. Corujo** and J. E. Valdés
Further results on stochastic orderings and aging classes in systems with age replacement
Probab. Eng. Inf. Sci. (2021), 1–30.
[HAL](#) | DOI: 10.1017/S0269964821000036

¹A preliminary version of this work appeared in WALCOM 2020, 14th International Conference and Workshop on Algorithms and Computation, Singapore.

- 2018 **J. M. Corujo**, J. E. Valdés and J. C. Laria
Stochastic Comparisons of Two-Units Markovian Repairable Systems
 Commun. Stat. - Theory Methods **48** (2019), no. 23, 5820–5838.
[arXiv: 1804.03098](#) | DOI: [10.1080/03610926.2018.1522349](#)
- W. Rodríguez, O. Mazet, S. Grusea, A. Arredondo, **J. M. Corujo**, S. Boitard and L. Chikhi
The IICR and the non-stationary structured coalescent: towards demographic inference with arbitrary changes in population structure
 Heredity **116** (2016), 362–371.
[HAL-02347366](#) | DOI: [10.1038/s41437-018-0148-0](#)

Publications in peer reviewed conferences

- 2020 **J. Corujo**, D. Flores-Peñaloza, C. Huemer, P. Pérez-Lantero and C. Seara
Matching Random Colored Points with Rectangles, In: Rahman M., Sadakane K., Sung WK. (eds) WALCOM: Algorithms and Computation. WALCOM 2020. Lecture Notes in Computer Science, vol 12049. Springer, Cham.
[DOI:10/gzm6](#)

Scientific Communications

- June 2023 Invited speaker for the session *Quasi-stationary distributions in numerical stochastic methods and statistics* in the **21st INFORMS Applied Probability Society Conference, IECL**, Nancy, France
 Talk: *Convergence of the empirical measure induced by a Moran type particle system*
- April 2023 Seminar **Mathématiques pour la Biologie**, Institut de Mathématiques de Toulouse, France.
 Talk: *Large population limits for a mutation-selection Moran model*
- Oct. 2022 **Séminaire de Probabilités y Statistique, IECL**, Nancy, France
 Talk: *A dynamical approach to spanning and surplus edges of random graphs*
- Oct. 2022 **ITI IRMIA++ Day**, Strasbourg, France
 Talk: *Some recent advances in the multiplicative coalescent and near-critical random graphs*
- Oct. 2022 **Journées Math Bio Santé 2022**, Besançon, France
 Poster: *IICR of structured populations with size change: strong and weak migration*
- May 2022 **Summer School Mathematics of Large Networks**, Budapest, Hungary
- April 2022 **Recent progress in probabilistic modelling of population genetics**
 Royal Statistical Society, UK
 Talk: *Spectrum and ergodicity of a neutral multi-allelic Moran model*
- April 2022 **Séminaire (de calcul) stochastique de Strasbourg**, Strasbourg
 Présentation orale : *A neutral multi-allelic Moran model: spectral elements and cutoff*
- Mar. 2022 **Worskshop ANR QuAMProcs**, Inria Paris, France

	Talk: <i>Speed of convergence to the mean-field limit for a mutation-selection particle system</i>
Dec. 2021	GDR MAMОВI 2021, École polytechnique, France Talk: <i>Propagation of chaos for a multi-allelic Moran model</i>
Jun. 2021	Seminario de Probabilità, Analisi Stocastica e Statistica, Università di Pisa, Italy Talk: <i>Spectrum and ergodicity of a neutral Moran model</i>
Feb. 2021	Journée de doctorants en Probabilités, Institut de Mathématiques de Toulouse, France Talk: <i>Spectrum of the neutral Moran model and its long time behaviour</i>
Dec. 2020	Séminaire de Probabilité, Institut de Mathématiques de Toulouse, France Talk: <i>On the spectrum of a neutral multi-allelic Moran model.</i>
Nov. 2020	Séminaire de Probabilité et Statistique, Montpellier, France Talk: <i>Spectral properties of a neutral multi-allelic Moran model</i>
Mar. 2020	14th International Conference on Operations Research, Havana, Cuba Talk: <i>Convergence of a Fleming–Viot type particle system on the cycle graph.</i>
Feb. 2020	Séminaire “Mathématiques pour la Biologie”, Institut de Mathématiques de Toulouse, France Talk: <i>On a multi-allelic Moran type model with mutation matrix corresponding to a cycle graph</i>
Feb. 2020	Research school “EDP et probabilité pour la biologie” CIRM, Marseille, France Poster: <i>Quantitative results on a multi-allelic Moran type model with mutation</i>
Dec. 2019	Workshop on Models and Inference in Population Genetics, Warwick, UK. Poster: <i>Quantitative results on a multi-allelic Moran type model with mutation</i>
Nov. 2019	Journée des doctorant.e.s et post-doc, Institut de Mathématiques de Toulouse, France Talk: <i>Quantitative results on a multi-allelic Moran type model with mutation</i>
Sep. 2019	GDR MAMОВI 2019, Université de Tours, France Talk: <i>Quantitative results for a Moran type particle process in the cycle graph</i>
Sep. 2019	Journée de rentrée, INSA de Toulouse, France Talk: <i>Quantitative results for a Fleming-Viot type particle process in the cycle graph</i>
Jul. 2019	Summer school “Data and Models in Ecology and Evolution”, Institut Pascal, Université Paris-Saclay, France Talk: <i>Quantitative results for a Moran type particle process in the cycle graph</i>
Feb. 2019	Master Course from Cooperation project in Mathematics France – Cuba (lectures by Miraine Dávila Felipe) Universidad de La Habana, Cuba Title : “Stochastic processes applied to Biology”
Jul. 2017	10th International Conference on Mathematical Methods in Reliability, Grenoble, France

Talk: *Stochastic Comparisons of Two-Units Markovian Repairable Systems*

Honor and Awards

2022	<i><u>Prix solennels de thèse</u></i> , from <i>La Chancellerie des Universités de Paris</i>
2021	<i>Postdoctoral Fellowship</i> funded the Labex IRMIA, Strasbourg, France
2015	<i>Scientific Merit Award</i> from the Rector of the Universidad de La Habana
2015	<i>Graduated Summa Cum Laude in Mathematics</i> from Universidad de La Habana

Computational Skills

MATLAB, , Python , Wolfram Mathematica, Maple , \LaTeX , **git**

Languages

Spanish	Native Language
English	Professional Proficiency
French	Professional Proficiency