Josué Corujo Rodríguez

Contact Information

	Université Paris Est Creteil UFR des Sciences et Technologie Laboratoire d'Analyse et de Mathématiques Appliquées 61 Avenue du General de Gaulle, 94010 Créteil, France
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ArXiv	arxiv.org/a/corujo_j_2.html
G 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 Reparable Systems*
Advisor: José E. Valdés

2011-2015 **BSc in Mathematics**.
Universidad de La Habana, Havana, Cuba
BSc Thesis: *Analysis of Reparable Systems using Stochastic Orders and Aging Classes*
Advisor: José E. Valdés

Academic Appointments

2023– **Assistant Professor (Maître de Conférences)**
LAMA, Université Paris Est Créteil, Créteil, France

2021–2023	**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

2024

J. Corujo, S. Lemaire, V. Limic *A novel approach to the giant component fluctuations* arXiv: 2412.06995 | HAL-04834626

L. Chikhi, W. Rodríguez, C. Paris, M. Ha-Shan, A. Jouniaux, A. Arredondo, C. Noûs, S. Grusea, J. Corujo, I. Lourenço, S. Boitard, O. Mazet, *Extending the IICR to multiple genomes and identification of limitations of some demographic inferential methods* biorXiv: 10.1101/2024.08.16.608273

J. Corujo, *The number of connected components in sub-critical random graph processes* arXiv: 2406.06380 | HAL-04608655

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

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

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

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

Jan. 2025 Séminaire de probabilités, Institut Fourier, Grénoble
Talk: *Combien de composantes connexes il y a dans un graphe aléatoire d'Erdős-Rényi sous-critique ?*

Nov. 2024 EMALCA research school, Havana, Cuba.

Oct. 2024 Conference Non-local branching processes Marseille, France
Short talk: *The number of connected components is sub-critical random graphs*

Aug. 2024 Journées MAS, Poitiers, France

March 2024 Evolution in structured populations: recent progress and new challenges (Conference in honour of Alison Etheridge), University of Oxford, UK

Dec. 2023 EverEvol – Population dynamics: from rare events to evolution, Grenoble, France

Nov. 2023 Séminaire du LMAC, Compiègne, France
Talk: *Encoding the size of the connected components and number of surplus edges of*

random graphs

Oct. 2023 — Groupe de travail Probabilités, Créteil, France.
Talk: *Random graphs and the augmented multiplicative coalescent*

Sept. 2023 — Journée d'accueil du LAMA, Marne la Vallée, France
Talk: *Random graphs and the augmented multiplicative coalescent*

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*
Poster: *The standard augmented multiplicative coalescent revisited*
(Best Poster Awards)

June 2023 — Journées de Probabilité 2023, Angers, France.
Talk: The standard augmented multiplicative coalescent revisited

June 2023 — *Chalk Talk*, Instituto Gulbenkian de Ciência, Lisbon, Portugal.

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: Speed of convergence to the mean-field limit for a mutation-selection particle system

Dec. 2021 — GDR MAMOVI 2021, École polytechnique, France
Talk: *Propagation of chaos for a multi-allelic Moran model*

Jun. 2021 — Seminario de Probabilità, Analisi Stocastica e Statistica, Università di Pisa, Italy
Talk: Spectrum and ergodicity of a neutral Moran model

Feb. 2021	Journée de doctorants en Probabilités, Institut de Mathématiques de Toulouse, France Talk: *Spectrum of the neutral Moran model and its long time behaviour*
Dec. 2020	Séminaire de Probabilité, Institut de Mathématiques de Toulouse, France Talk: *On the spectrum of a neutral multi-allelic Moran model.*
Nov. 2020	Séminaire de Probabilité et Statistique, Montpellier, France Talk: *Spectral properties of a neutral multi-allelic Moran model*
Mar. 2020	14th International Conference on Operations Research, Havana, Cuba Talk: *Convergence of a Fleming–Viot type particle system on the cycle graph.*
Feb. 2020	Séminaire "Mathématiques pour la Biologie", Institut de Mathématiques de Toulouse, France Talk: *On a multi-allelic Moran type model with mutation matrix corresponding to a cycle graph*
Feb. 2020	Research school "EDP et probabilité pour la biologie" CIRM, Marseille, France Poster: *Quantitative results on a multi-allelic Moran type model with mutation*
Dec. 2019	Workshop on Models and Inference in Population Genetics, Warwick, UK. Poster: *Quantitative results on a multi-allelic Moran type model with mutation*
Nov. 2019	Journée des doctorant.e.s et post-doc, Institut de Mathématiques de Toulouse, France Talk: *Quantitative results on a multi-allelic Moran type model with mutation*
Sep. 2019	GDR MAMOVI 2019, Université de Tours, France Talk: *Quantitative results for a Moran type particle process in the cycle graph*
Sep. 2019	Journée de rentré, INSA de Toulouse, France Talk: *Quantitative results for a Fleming-Viot type particle process in the cycle graph*
Jul. 2019	Summer school "Data and Models in Ecology and Evolution", Institut Pascal, Université Paris-Saclay, France Talk: *Quantitative results for a Moran type particle process in the cycle graph*
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 Reparable Systems*

Honor and Awards

2023	Best Poster Award, in the Informs APS-23 conference.
2022	***Prix solennels de thèse***, from *La Chancellerie des Universités de Paris*
2021	*Postdoctoral Fellowship* funded the Labex IRMIA, Strasbourg, France

2015 *Scientific Merit Award* from the Rector of the Universidad de La Habana

2015 *Graduated Summa Cum Laude in Mathematics* from Universidad de La Habana

Computational Skills

MATLAB, R, Python, Wolfram Mathematica, Maple, LaTeX, git

Languages

Spanish	Native Language
English	Professional Proficiency
French	Professional Proficiency