

Manon Costa

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Birth : 07 July 1987 – Clermont-Ferrand, France.
French citizen
2 children

Education and positions

Since 2016, **Maîtresse de conférence** (\sim tenured assistant professor) at the Institut de Mathématiques de Toulouse, University Toulouse 3 - Paul Sabatier, France.

CRNS Delegation at the Institut de Mathématiques de Toulouse 01/02/2023 au 31/08/2023 (CRCT du 01/02/2020 au 31/08/2020 (obtenu au CNU 26)

2015 - 2016, **Postdoc**, Institut of Mathématiques de Toulouse, University Toulouse 3 - Paul Sabatier, France.

Collaboration with S. Gadat (TSE Toulouse) and the INSERM team of S. Valitutti. (Projet TOXIMATH (Fondation RITC))

2012 - 2015, **Ph.D., Applied Math.**, CMAP, Ecole Polytechnique, France.

Advisor : Sylvie Méléard. Ph.D. thesis : “*Modélisation probabiliste et eco-évolutionnaire des communautés proies-prédateurs*” Ph.D. committee : V. Bansaye (Examinateur), F. Bonnans (Examinateur), S. Gadat (Examinateur), N. Loeuille (Examinateur), S. Méléard (Directrice de Thèse), E. Pardoux (Rapporteur) et M. Thieullen (Présidente du Jury). (Second Rapporteur : L. Popovic).

2008 - 2012, **École Normale Supérieure de Paris**,

Master 2 Probabilités et Statistiques à Université Paris sud, mention bien.

Agrégation de Mathématiques, 2010 (rang 72).

Master 1 à l'ENS de Paris et l'Université Paris-sud.

License à l'ENS de Paris et l'Université Paris-sud

Publications and preprints

Publications

1. M. Costa, N. Loeuille, C. Hauzy, S. Méléard : *Stochastic eco-evolutionary model of a prey-predator community*. Journal of Mathematical Biology, 72(3), pp 573-622 (2015).
2. M. Costa : *A piecewise deterministic model for a prey-predator community*. The Annals of Applied Probability, 26(9), pp 3491-3530 (2016).
3. C. Coron, M. Costa, H. Leman, C. Smadi, *Speciation by mating preference : a stochastic individual based model*, Journal of Mathematical Biology (2018) doi/10.1007/s00285-017-1175-9.
4. P. Gonnord, M. Costa, A. Abreu, M. Peres, L. Yseabert, S. Gadat, S. Valitutti, *Multiparametric*

analysis of CD8+ T cell compartment phenotype in chronic lymphocytic leukemia reveals a signature associated with progression towards therapy, OncoImmunology 2019, doi/10.1080/2162402X.2019.15

5. M. Costa, S. Gadat, P. Gonnord, L. Risser *An adaptive deconvolution estimation for atomic distributions. Application to data issued from flow-cytometry*, Journal of Nonparametric Statistics , 2019, Vol. 31, No. 2, pp506-547.
6. M. Costa, C. Graham, L. Marsalle, V.C. Tran, *Renewal in Hawkes processes with self-excitation and inhibition*; A paraitre dans Advances in Applied Probability, 52.3, 2020.
7. C. Coron, M. Costa, F. Laroche, H. Leman, C. Smadi *Emergence of homogamy in a two lous stochastic population model*, ALEA, (Volume 18, 2021).
8. B. Bercu, M. Costa, S. Gadat *Stochastic approximation algorithms for superquantile estimation*, Electron. J. Probab., 26 :1-29 (2021)
9. M. Costa, C. Etchegaray and S. Mirrahimi *Survival criterion for a population subject to selection and mutations; Application to temporally piecewise constant environments*, Nonlinear Analysis : Real Worls Applications (Volume 59, June 2021)
10. Manon Costa, S. Gadat. *Non asymptotic controls on a recursive superquantile approximation*, Electronic Journal of Statistics, Vol. 15, No. 2, 4718-4769 (2021).
11. P. Cattiaux, L. Colombani, Manon Costa, *Limit Theorems for Hawkes processes including inhibition* , Stochastic Processes and their Applications 149 :404-426 (2022).
12. P. Cordelier, M. Costa, J. Fehrenbach, *Slow-fast model and therapy optimization for oncolytic treatment of tumors*, Bulletin of Mathematical Biology 2022 May 10 ;84(6) :64.
13. C. Coron, M. Costa, H. Leman, V.Llaurens, C. Smadi. *Origin and persistence of polymorphism in loci targeted by dissassortative preference : a general model* To appear in Journal of mathematical Biology

Preprints

14. P. Cattiaux, L. Colombani, M. Costa, *Large deviation principles for cumulative processes and applications* , Submitted (2022)/
15. P. Linh Nguyen, M. Costa, N. Loeuille, *Implication of drift and rapid evolution on negative niche construction* , Submitted (2021).
16. M.C., S. Gadat, L. Huang. *Portfolio optimization under CV@R constraint with stochastic mirror descent*, Submitted (2022)

Students

Ph.D. Students

2019-2022 : Laetitia Colombani (co-encadrement avec P. Cattiaux)

2021-... : Anthony Muraro (co-encadrement avec P. Maillard)

Postdoc

2019-2020 : P. Linh Nguyen, in collaboration with F. Débarre and N. Loeuille (founded by the Chaire MMB).

2017-2018 : C. Etchegaray in collaboration with S. Mirrahimi (founded by Labex CIMI).

Master students

2022 : Livio Leto (M1 MAPI3) financed by ANR JANUS.

2022 : Maxime Boutin (M2 in Ecology) in collaboration with V. Llaurens (MNHN), A. Perrard (IEES) et C. Fontaine (MNHN).

2021 : Luisa Walsch (M1 MAPI3), in collaboration with A. Mazoyer.
2021 and 2019 : Bastien Camillo (L2 BIOMIP and L3 BIOMIP)..
2017 : Quentin Chiche (L3 TSE).

Grants and awards

2020-2024 : **Member of the DEEV JCJC ANR project** (159 321,60€) with 5 collaborators.
2019-2023 : **Member of the JANUS ANR project** (487 500) with 19 collaborators.
2019-2023 : PEDR (Prime d'Encadrement doctorale et de recherche)
2018 : **CNRS "PEPS Jeunes Chercheurs et Jeunes Chercheuses" grant** (2500 €) for the project
2017 : **CNRS "PEPS Jeunes Chercheurs et Jeunes Chercheuses" grant** (2500 €) for the project

Teaching

Université Toulouse 3

2022-2023

Exercice sessions, *Master introduction* (M1, MAPI3) (24h)

Lectures, exercice and practical sessions, *Stimulation stochastique* (M1, MAPI3) (80h)

2021-2022 Lectures, exercice and practical sessions, *Modélisation mathématique en Biologie* (L2, Maths), (33h)

Lectures, *Mathématiques* (L1, SdV-SdT) (27 h)

Lectures, exercice and practical sessions, *Stimulation stochastique* (M1, MAPI3) (60h)

Lectures and exercice sessions, *Probabilités* (L2, PS) (38 HTD)

Lectures and exercice sessions, *Méthématiques* (L2, BIOMIP) (30 HTD)

Project advisor for various student groups (L3)

2020-2021 Lectures, exercice and practical sessions, *Modélisation mathématique en Biologie* (L2, Maths), (33h)

Lectures and exercice session, *Mathématiques* (L1, SdV-SdT) (86 h)

Lectures, exercice and practical sessions, *Stimulation stochastique* (M1, MAPI3) (60h)

Oral exam for the preparation course to the french national examination of "Agrégation externe" (18h).

Project advisor for various student groups (niveau L3)

2019-2020 Lectures, exercice and practical sessions, *Modélisation mathématique en Biologie* (L2, Maths), (6h+12h+12h)

Lectures, *Mathématiques* (niveau L1, SdV-SdT) (16 h)

Practical sessions, *Statistique* (niveau M1, MAPI3) (12h)

2018-2019 Lectures, exercice and practical sessions, *Modélisation mathématique en Biologie* (L2, Maths), (6h+12h+12h)

Exercice sessions, *Mathématiques* (niveau L2, CUPGE) (36h)

Project advisor for various student groups L2 Biologie

2017-2018 Lectures, exercice and practical sessions, *Modélisation mathématique en Biologie* (L2, Maths), (4h+10h+16h)

Exercice sessions, *Mathématiques* (niveau L2, CUPGE) (36h)

Lectures and exercice sessions, *Simulations stochastiques* (L3), (18h+24h)

Lectures, *Stochastic models for Biology* (M2), (12h)

2016-2017 Lectures and exercice sessions, *Introduction aux statistiques* (L2, Biochimie), (25h)

Lectures and exercice sessions, *Simulations stochastiques* (Niveau L3), (18h+24h)

Python practical session Analyse (Niveau L1), (8h).

Numerous project supervisions at different level (L3 BIOMIP, L3 MAPI3, M1 MAPI3).

Duties, responsibilities and work for the mathematics community

Opération Postes Since 2018 I am a member of the team that supervises the website.

Local duties

2020- ··· : Elected member of the lab counsel (depuis jan 2020).

2020- ··· : Member of the Scientific prospective counsel at IMT (depuis jan. 2020).

2018 - ··· : Elected member of the scientific counsel of the university (Informatics and Mathematics)

2018 - ··· : Equality and parity referee in the lab.

Selection committee

Member of the selection committee for an MCF position at University Gustave Eiffel (2020)

Peer-review for *Stochastics, Electronic Journal of Statistics, Stochastic Processes and Applications, Applied Mathematical Modelling, Journal of Machine learning research, ESAIM :P&S.*

Conference and seminar organization

2021 : Member of the organizing committee of the SMAI 2021 conference (La grande Motte, France).

2020-2021 : Organizer of the lecture group "Stochastic processes" at the Institut de Mathématiques de Toulouse.

2019 : Organizer of a symposium at MMEE " Mathematical Modeling in Ecology and Evolution" (Lyon, France).

2018-2020 : Co-organizer of the probability seminar at the Institut de Mathématiques de Toulouse.

2017 : Co-organizer of international conference "Ecology and evolutionary biology, deterministic and stochastic models " (Toulouse, France).

Talks

National and international conferences

sept. 2021 Bath-Beijing-Paris branching structures meeting (Bath - Online meeting).

juil. 2021 5th Workshop Probability and Evolution (CIRM - Marseille).

juil. 2019 Mathematical Models in Ecology and Evolution (MMEE) (Lyon)

mars. 2019 Stochastic processes and statistical machine learning II. (Toulouse).

fev. 2018 Stochastic processes and statistical machine learning I. (Potsdam).

sept. 2017 Opening conference of the semester "Mathematics computer science and Biology (Toulouse).

sept. 2017 Journées d'ouvertures du GDR MAMOVI (Lyon).

jan. 2017 ANR PIECE "PDMPs, Theory and Applications" (Chambond sur Loire).

juin 2016 Barcelona-Toulouse Probability days (Toulouse).

Other talks

mai 2022 Séminaire Math-Bio (Marseille)
oct. 2020 Séminaire MADSTAT (Toulouse).
sept. 2019 Séminaire de Probabilités, Nice.
fev. 2019 Séminaire Math-Bio, Tours-Orléans.
oct. 2018 Séminaire de probabilités, Clermont-Ferrand.
dec. 2017 Séminaire du laboratoire INRA Toulouse.
nov. 2017 Séminaire du laboratoire Ecologie et diversité Biologique (Toulouse).
jan. 2017 Journées des nouveaux entrants de l'IMT (Toulouse).
juin 2016 Journées LPT-IMT (Toulouse).

Additional information

Maternity leaves : 26/06/2016-28/10/2016 and 20/05/2018-10/09/2018.

Partial time 80% (from September 2018 to August 2020).