AURÉLIEN VELLERET

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RESEARCH Keywords

Scaling limits of Agent-Based Models, Large deviation theory, Quasi-stationary distributions (QSD), Q-process, Survival capacity, Adaptation, Selection, Epidemic transmission, Structures of interactions

ACADEMIC CAREER

01/2023 -...	**Postdoctoral Fellow** "How to take into account the population's heterogeneity for the assessment of vaccine strategies?" MaIAGE, Inrae Jouy-en-Josas, France Advisor: Elisabeta Vergu
01/2022 -12/2022	**Postdoctoral Fellow** "Individual-based SIS epidemics on (not so) dense large random networks" LAMA Université Gustave Eiffel Marne-la-Vallée, France Advisors: Chi Tran, Pierre-André Zitt (Université Gustave Eiffel, LAMA), Jean-François Delmas (Ecole des Ponts ParisTech, CERMICS), Paolo Frasca (CNRS, GIPSA-lab) and Federica Garin (INRIA, GIPSA-lab)
09/2020 -12/2021	**Postdoctoral Fellow** Institut für Mathematik, Goethe Universität, Frankfurt Advisor: Cornelia Pokalyuk
09/2016 -08/2020	**PhD**-studies on "Quasi-stationarity of Markov processes facing extinction : application to models of population adaptation" Aix-Marseille University, France Institut de Mathématiques de Marseille, Advisors: Prof. E. Pardoux, Prof. M. Kopp
12/06/2019 -21/08/2019	Japan Society for the Promotion of Science **Summer Program** -research project on Large Deviation estimates on the empirical measure of jumps of a process facing extinction Kumamoto University, Japan, Advisors: Prof. D. Kim

EDUCATION

09/2015 -09/2016	**Master M2** in Mathematics for the life sciences Paris-Sud University, France
09/2014 -09/2015	**Master M1** in Mathematics Ecole Normale Supérieure (rue d'Ulm), Paris , France
09/2013 -09/2014	**Licence L3** in Mathematics and Biology Ecole Normale Supérieure, Paris, France

RESEARCH SCHOOLS

Feb' 2020	in Marseille : PDE and Probability for Biology
Aug' 2018	The Helsinki Summer School on Mathematical Ecology and Evolution
June 2018	Summer school in Güntzburg : Probabilistic Structures in Evolution
between 2016-19, every year around the end of May	"Ecole de recherche" at Aussois : organized by the Consortium "Modélisation Mathématique et Biodiversité" `www.cmap.polytechnique.fr/chaire-mmb/ecole.html`

PUBLICATIONS

- **A. Velleret**: Individual-based models under various time-scales; ESAIM:Proceedings and Surveys, V.68, 123-152 (2020)

  (overview of the four lectures given at the session Stochastic Processes and Biology at the conference Journées MAS 2018)

- A. Velleret: Unique Quasi-Stationary Distribution, with a stabilizing extinction,
  Stochastic Processes and Applications, V.148, pp.98-138 (June 2022)
  on ArXiv: `arxiv.org/abs/1802.02409`.

Preprints under revision :

- A. Velleret: Exponential quasi-ergodicity for processes with discontinuous trajectories,
  New submission to ESAIM: Probability and Statistics,
  on ArXiv: `arxiv.org/abs/1902.01441`.

- A. Velleret: Adaptation of a population to a changing environment under the light of quasi-stationarity,
  Major revision (sent) for Advances in Applied Probability,
  on ArXiv: `arxiv.org/abs/1903.10165`.

- A. Velleret: Two level natural selection with a quasi-stationarity approach,
  Minor revision in progress for Discrete and Continuous Dynamical Systems
  Seties B, on ArXiv: `arxiv.org/abs/1903.10161`.

- M. Mariani, E. Pardoux, A. Velleret: Metastability between the clicks of the Muller ratchet,
planned for submission to Probability Theory and Fields,
on ArXiv: `arxiv.org/abs/2007.14715`.

I also did reviews of submissions for Stoch. Proc. Appl., Ann.Inst. Henri Poincaré, Probab. Stat. and Math. Modell. Nat. Phenom.

DISTINCTION
Thesis award from Aix-Marseille University

TALKS AND POSTERS

Invited talks

Nov' 22	Talk at the LPSM: Interactions inter-villes et prise en compte de leurs tailles très hétérogènes dans les stratégies de confinement
July 19	Probability seminar at Kansai University in Osaka
May 19	Seminar in INRA Avignon

Contributed talks

Sept' 22	ModCovGre (half-day on modeling in epidemiology):
Sept' 21	Madeira COVID-19 Modellers Encounter 2021, talk on certain models of local lockdown strategies
Sept' 21	German Probability & Statistics Days Mannheim, Prerecorded talk on the study of Müller's ratchet
Aug' 19	Stochastic Models for Biology in Rennes, talk on the notion of QSD in the context of a population adapting to a changing environment
Aug' 18	Journées Modélisations Aléatoires et Stochastiques in Dijon, talk on the model with two-level selection
July 18	ALEA Day in Marseilles gathering researchers in probability from Marseilles and Lyon
May 17	Ecole de recherche in Aussois in the theme : Climatic change and species' range
April 17	Modelling Biological Evolution : Developing Novel Approaches in Leicester

Posters

Feb' 20	Mathematical Models in Evolutionary Biology, in Marseille CIRM
Sept' 19	23rd Evolutionary Biology Meeting at Marseilles, short oral presentation and poster
Aug' 19	12th Seasonal Institute of the Mathematical Society of Japan in Fukuoka on Stochastic Analysis, Random Fields and Integrable Probability
Sept' 17	21st Evolutionary Biology Meeting at Marseilles

Leisure activities

Theater	2022-23	Second male role in the original play "Gambetta", dramatic and historical comedy presented at the ENS
Yoga	2019-23	Iyengar Yoga center of Marseille, of Rödelheim (near Francfort), MJC de Sceaux; Interests: Relaxation, body awareness and body maintenance
Japanese	2014-23	ENS, Centre Culturel Franco-japonais (Marseille), 2-months trip in Japan, MJC de Sceaux Interests: Cultural discovery, different logic of thoughts
Chorus	2015-21	COGE (Paris), CHORAMU (Marseille); Interests: Musical harmony, teamwork