

## Jimmy Garnier

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### Current position

Since 2013 CNRS junior researcher at LAMA, Université Savoie Mont-Blanc, Chambéry

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### Education

- 2025 **HDR, Mathematics** University Grenobles Alpes  
*Reaction-dispersion models in ecology and evolution*  
Jury : M Alfaro (Rev.), L-M Chevin, M Doumic, F Hamel, F Lutscher (Rev.), C Prieur, J M Roquejoffre (Rev.), L Roques and E Schertzer
- 2012 **Ph.D., Mathematics** INRAE and Aix-Marseille University  
*Mathematical analysis of population dynamics models*  
Advisors : F Hamel (LATP Marseille) and L Roques (INRAE Avignon)  
Jury : H Berestycki, O Diekmann (Ref.), B Perthame (Ref.), A Rapaport and J M Roquejoffre
- 2009 **Agrégation de Mathématiques**
- 2008 **Master's degree in PDE and Numerical Analysis**, Aix-Marseille University
- 2006-2010 **École Normale Supérieure de Cachan**, interdisciplinary program in mathematics and biology.

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### Research interests – *Mathematical modeling applied to ecology*

Nonlinear Analysis of PDEs, Reaction–dispersion equations and propagation phenomena;

Mathematical modeling in ecology and evolution, biological invasion, biodiversity and adaptation to climate change;

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### Significant publications

#### **Mathematics journals:** (12 articles)

- V Calvez, **J Garnier** and F Patout. [A quantitative genetics model with sexual mode of reproduction in the regime of small variance](#), *J École polytech — Math.*, 6, 537–579, (2019), doi:[10.5802/jep.100](https://doi.org/10.5802/jep.100), hal-01910655;
- **J Garnier**, T Giletti, F Hamel, L Roques. [Inside dynamics of pulled and pushed fronts](#), *J. Math. Pures Appl.*, 11:173–188, (2012), doi:[10.1016/j.matpur.2012.02.005](https://doi.org/10.1016/j.matpur.2012.02.005), hal-00630298;

#### **Applied mathematics and theoretical ecology journals:** (12 articles)

- M Martignoni, M M Hart, R Tyson and **J Garnier**, [Diversity within mutualist guilds promotes coexistence and reduces the risk of invasion from an alien mutualist](#), *Proc. R. Soc. B*, 2312, (2020), doi:[10.1098/rspb.2019.2312](https://doi.org/10.1098/rspb.2019.2312), hal-03006649;
- **J Garnier**, O Cotto, E Bouin, T Bourgeron, T Lepoutre, O Ronce et V Calvez, [Adaptation of a quantitative trait to a changing environment: New analytical insights on the asexual and infinitesimal sexual models](#), *Theor. Popul. Biol.*, 152, (2023), 1-22, doi:[10.1016/j.tpb.2023.04.002](https://doi.org/10.1016/j.tpb.2023.04.002)

#### **General scientific journals:** (7 articles, PNAS, Scientific Reports, Global Change Biology, Peer Community)

- L Ledru, **J Garnier**, M Rhor, C Noûs and S Ibanez , [Mutualists construct the ecological conditions that trigger the transition from parasitism](#), *Peer Community Journal*, 2 (2022), e41 doi:[10.24072/pcjournal.139](https://doi.org/10.24072/pcjournal.139) hal-03333564 ;
- L Roques, **J Garnier**, F Hamel and E Klein. [Allee effect promotes diversity in traveling waves of colonization](#), *Proc. Natl. Acad. Sci. USA*, 109(23): 8828–8833, (2012), doi: [10.1016/j.matpur.2012.02.005](https://doi.org/10.1016/j.matpur.2012.02.005), hal-00630298;

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### International visibility

- MOPGA fellowship of R Tyson (1 year visit in my lab);

- International invitation (PIMS Distinguished Visitor award 1 month, NCAR 2 weeks, WHOI 1 month);
- Invited speaker at international conferences (AIMS Taiwan, CIMPA, CIRM, BESM, Univ Boulder)
- (since 2019) Committee member of SMCAI (Société Canadienne de Maths Appliquées et Industrielles);

## Main collaborators

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### Mathematics:

**France:** L Roques, V Calvez, F Patout, E Bouin, F Hamel, T Giletti, G Nadin,

**Canada/USA:** M A Lewis, R Lui, R Tyson, C Henderson.

### Interactions with ecologists:

**France:** C Gallet, S Ibanez, L Ledru, G Martin, W Thuillier,

**Canada/USA:** S Jenouvrier, M Hart.

## Fellowships, projects and awards

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2025-2028	AAP project Univ Savoie Mont Blanc – <a href="#">VertiCya</a>
2024-2029	Associated researcher to the <b>ANR project</b> – <a href="#">ReaCh</a>
2021-2022	AAP exploratory project Univ Savoie Mont-Blanc – <a href="#">ModEcoEvo</a>
2020	Award PIMS Distinguished Visitor at Univ British Columbia, Canada (postponed to 2022)
2017-now	PI Biotherm and Mission Blue grant – <a href="#">Emperor penguins</a>
2017-2021	Associated researcher to the <b>ANR project</b> – <a href="#">GlobNets</a>
2015-2020	Secondary investigator (15%) of the <b>ERC</b> starting grant – <a href="#">MESOPROBIO</a>
2015-2018	Associated researcher to the <b>ANR project</b> – <a href="#">NONLOCAL</a>
2014	AAP project junior researcher Univ Savoie Mont-Blanc
Since 2014	Researcher in the French <b>INRAE network</b> – <a href="#">MEDIA</a> ;
2011-2014	Associated researcher to the <b>INRAE meta-project</b> – <a href="#">AACC</a> ;
2013	CIMI <b>postdoctoral fellowship</b> , Toulouse University (declined for the CNRS position);
2013	<b>Thesis award</b> from Aix-Marseille University.
2012 - 2013	<b>Post-doctoral fellowship</b> University of Alberta, Canada;

## Institutional responsibilities

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Since 2022	correspondant in the RT <a href="#">Math Bio Santé</a> and member of scientific committee of GDR workshop
Since 2021	member of consultative committee 25-26, Univ Savoie Mont-Blanc
2015-2020	member of the laboratory council at Laboratoire MATHématique (LAMA)
Referee	<i>Mathematics:</i> DCDS-Serie A, J Dyn Diff Equ, Nonlinearity, SIAM J Math Anal <i>Mathematical biology:</i> J Math Biol, Math Med Biol, Bull Math Biol, <i>Ecology and general science:</i> PNAS, Ecology Letters, Proc R Soc Interfaces;

## Supervision and mentoring

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phd student	P Lafargeas (2023-2026) co-supervision with D Bresch (LAMA, Univ Savoie),
	L Ledru (2018-2021) with S Ibanez and C Gallet (LECA, Univ Savoie), [post-doc Univ Savoie]
	P Lafontaine (2017-2020), co-supervision with D Bucur (Univ Savoie), [retired associate researcher LAMA]
	M Martignoni (2018-2020) co-supervision with R Tyson (Canada) [post-doc Georgia Tech]
	F Patout (2017-2019) co-supervision with V Calvez (ICJ, Univ. Lyon) [CR INRAE Avignon],
post doc	M Ohlmann (2020-2021) co-supervision with L Vuillon (LAMA)
	T Bourgeron (2015-2017) co-supervision with V Calvez,
stud visitor	N Marculis PhD student at Univ. Alberta, Canada, (1 month invitation)
	Y Youssouf (2015-2016), PhD student at Saint-Louis Univ, Senegal, (1 month invitation)
master stud	J P Elise (2024), A Chibani (2023);
	M Ferre, L Zuccali (2020)
	L Ledru (2018) co-supervision with S Ibanez;
	F Patout (2015-2016) co-supervision S Jenouvrier, L Desvillettes, V Calvez.

## Teaching activities

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2018-2024 **Master course** in Martingales and Markov Chain, Univ Savoie–Mont Blanc;  
2017-2020 **Master course** in Mathematical modeling and scientific computing, Univ Savoie–Mont Blanc;  
2015-2016 **Doctoral and Master course** in Mathematical modeling in life science, Univ Grenoble-Alpes;  
2015 **Lecture group** on Reaction-diffusion equations in ecology, ENS Lyon