

Thomas GILETTI

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Laboratoire de Mathématiques Blaise Pascal and UFR Mathématiques

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1 Professional experience

- Since 2023** **Full professor**, PDE team at Laboratoire de Mathématiques Blaise Pascal, Univ. Clermont Auvergne.
- 2013-2023** Associate professor, PDE team at Univ. Lorraine.
- 2012-2013** JSPS fellow at University of Tokyo.
- 2009-2012** Doctoral student at University Aix-Marseille III.

2 Education

- 2022** **Habilitation to conduct research**, University of Lorraine.
Title : *Propagation of solutions of reaction-diffusion equations and systems.*
Defended on december 16th, 2022.
Jury : E. Crooks (reviewer), L. Desvillettes (president), Y. Du (reviewer), F. Hamel, E. Logak (reviewer), H. Matano , F.Robert, P. Souplet.
[Link to the manuscript on HAL.](#)
- 2011** **Doctorate**, University Aix-Marseille III, under supervision of François Hamel.
Title : *Phénomènes de propagation dans des milieux diffusifs excitables : vitesses d'expansion et systèmes avec pertes.*
Defended on december 13th, 2011.
Jury : J. Coville, E. Grenier (reviewer), F. Hamel, M. Langlais, F. Merle, L. Ryzhik (reviewer).
- 2007-2008** French "Agrégation" in Mathematics.
- 2005-2008** Student at Ecole Normale Supérieure de Cachan.

3 Research activities

- Projects (PI)** Coordination since 2019 of **IRN (ex-GDRI) ReaDiNet** which gathers researchers in mathematics and its applications in biology in France, Japan, South Korea and Taiwan.

Coordination of a France-South Korea **PHC Star** from 2019 to 2022.

Projects (participant) Member of the following projects :

- ANR ReaCh (since 2023) ;
- ANR JCJC Indyana (since 2021) ;
- Tohoku-Lorraine project on “Deterministic and stochastic PDEs” (2020 to 2024) ;
- PRMO project on “Optimisation et interaction de structures” (2020 to 2021) ;
- ANR Nonlocal (2014 to 2019) ;
- LIA ReaDiLab (2013 to 2014) then GDRI ReaDiNet (2015 to 2018).

Reviewing Reviewer for Mathematical Reviews and zbMATH.

Reviewer for international peer-reviewed journals, including : Annales de l’IHP, ARMA, JMPA, JDE, JEMS, SIMA, Math. Ann., Nonlinearity, J. of Biological Dynamics, J. of Theoretical Biology, Math. Biosciences, etc.

Member of 2 **thesis juries** as reviewer, one **thesis follow-up committee** in 2020-2022. 1 **review** for the attribution of a graduate fellowship.

4 Participation in scientific events

Organizer **Conferences of IRN ReaDiNet** :

- “International conference on parabolic and stochastic models in mathematical biology” in Orsay, 2023.
- “An online conference on recent topics in reaction-diffusion systems, biology, medicine and chemistry”, 2021.
- “An online conference on mathematical biology”, 2020.
- “Mathematical analysis for biology and ecology” in Nancy, 2019.

Organization committees :

- for “Parabolic and kinetic models in population dynamics” in Toulouse (2022),
- for le Forum FCH-Entreprises (workshop day involving research labs of University of Lorraine and regional industrial competitive hubs) in Nancy (2022),
- for ICMMA conference in Tokyo (2015).

Seminar days on reaction-diffusion systems in Nancy in 2022, 2017, 2015.

In charge of the **weekly PDE seminar** of Nancy (from 2015 to 2017).

Invitations **Frequent invitations in France and abroad** (Germany, China, Japan, South Korea, Portugal, Taiwan) :
— several 2/3 weeks stays at **Univ. of Tokyo** and **Meiji Univ.** ; 1 week at **Shanghai Normal Univ.** (2017) ; 1 week at **Univ. Lisbon** (2017) ; 2 weeks at **Univ. Tamkang** in Taiwan (2019) ; 2 weeks at **Korea Univ.** and **KAIST** (2019).

Around **70 talks in seminars and conferences** before 2023.

5 Teaching activities

Since 2023 Professor at UFR Mathématiques of University Clermont-Auvergne.

Before 2023 Associate professor at IUT Charlemagne of University of Lorraine.

Master **Teaching at M2 level :**

- Master 2 MFA (Fundamental and Applied Mathematics) at University of Lorraine in 2015-2016 and 2016-2017, titled : “PDEs for population dynamics”.
- Master 2 at ESSTHS (Ecole supérieure des sciences et de la technologie de Hammam Sousse in Tunisia) in 2018-2019 and 2019-2020.

Supervision **Supervision of research projects** at M1 level :

- Thomas Gauchery, “Modélisation de densités de populations en compétition”, 2020-2021.
- Mohamed Moubdi, “Influence d’une ligne de diffusion rapide sur la propagation dans une bande”, 2018-2019.
- Luca Gorini, “Modèles diffusifs de dynamique des populations avec changement climatique”, 2017-2018.

Supervision of internships at M2 level :

- Wail Souici (Univ. Lorraine), “Vitesse de propagation dans une bande avec diffusion rapide sur un bord”, 2020.
- Mohammed Azoua (ENS Casablanca), “Comportement asymptotique des solutions des équations paraboliques non-linéaires”, 2019.

Publication list

Please check [HAL](#) for an updated list.

- Preprints**
1. *Stability of propagating terraces in spatially periodic multistable equations in \mathbb{R}^N* , (with L. Rossi).
 2. *Convergence to a terrace solution for discontinuous multistable nonlinearities*, (with H.-Y. Kim), 2022.
 3. *Spreading properties of the Fisher-KPP equation in presence of a nonlocally pulling patch*, (with L. Girardin and H. Matano), 2023.
- Published**
4. *Terrace solutions for non-Lipschitz multistable nonlinearities*, (with H.-Y. Kim and Y.-J. Kim).
SIAM J. Math. Anal. 54, No. 4, 4785-4805 (2022).
 5. *On the modelling of spatially heterogeneous nonlocal diffusion : deciding factors and preferential position of individuals*, (with M. Alfaro, Y.-J. Kim, G. Pel-tier and H. Seo).
Journal of Mathematical Biology 84, No. 5, Paper No. 38, 35 p. (2022).
 6. *Monostable pulled fronts and logarithmic drifts*.
NoDEA, Nonlinear Differ. Equ. Appl. 29, No. 4, Paper No. 35, 42 p. (2022).
 7. *A reaction-diffusion equation with heterogeneous shifting diffusion*, (with G. Faye and M. Holzer).
Discrete Contin. Dyn. Syst., Ser. S 15, No. 9, 2467-2496 (2022).
 8. *Persistence of species in a predator-prey system with climate change and either nonlocal or local dispersal*, (with W. Choi and J.-S. Guo).
Journal of Differential Equations 302, 807-853 (2021).
 9. *Propagation for KPP bulk-surface systems in a general cylindrical domain*, (with B. Bogosel and A. Tellini).
Nonlinear Analysis 213 (2021), Paper No. 112528, 42 pp.
 10. *Admissible speeds in spatially periodic bistable reaction-diffusion equations*, (with W. Ding).
Advances in Mathematics 389 (2021), 107889.
 11. *Interplay of nonlinear diffusion, initial tails and Allee effect on the speed of invasions*, (with M. Alfaro).
Annali Della Scuola Normale Superiore Di Pisa - Classe Di Scienze. (5) 21, Spec. Iss., 1223-1255 (2020).
 12. *Asymptotic spreading speeds for a predator-prey system with two predators and one prey*, (with A. Ducrot, J.-S. Guo and M. Shimojo).
Nonlinearity 34 (2021), no. 2, 669–704.
 13. *Persistence of preys in a diffusive three species predator-prey system with a pair of strong-weak competing preys*, (with Y.-S. Chen and J.-S. Guo).
Journal of Differential Equations 281 (2021), 341–378.

14. *Pulsating fronts for multidimensional bistable and multistable equations*, (with L. Rossi).
Mathematische Annalen 378 (2020), no. 3-4, 1555-1611.
15. *Existence and uniqueness of propagating terraces*, (with H. Matano).
Communications in Contemporary Mathematics 22 (2020), no. 6, 1950055.
16. *When fast diffusion and reactive growth both induce accelerating invasions*, (with M. Alfaro).
Communications on Pure and Applied Analysis 18 (2019), no. 6, 3011-3034.
17. *Spreading speeds for multidimensional reaction-diffusion systems of the prey-predator type*, (with A. Ducrot and H. Matano).
Calculus of Variations and PDEs 58 (2019), no. 4, Paper No. 137.
18. *Spreading and vanishing for a monostable reaction-diffusion equation with forced speed*, (with J. Bouhours).
Journal of Dynamics and Differential Equations 31 (2019), no. 1, 247-286.
19. *Travelling waves for a non-monotone bistable equation with delay : existence and oscillations*, (with M. Alfaro and A. Ducrot).
Proceedings of the London Mathematical Society 116 (2018), 729-759.
20. *Sharp thresholds between finite spread and uniform convergence for a reaction-diffusion equation with oscillating initial data*, (with F. Hamel).
Journal of Differential Equations 262 (2017), no. 3, 1461-1498.
21. *Varying the direction of propagation in reaction-diffusion equations in periodic media*, (with M. Alfaro).
Networks and Heterogeneous media 11 (2016), 369-393.
22. *Asymptotic analysis of a monostable equation in periodic media*, (with M. Alfaro).
Tamkang Journal of Mathematics 47 (2016), 1-26.
23. *Long time behavior of solutions of a reaction-diffusion equation on unbounded intervals with Robin boundary conditions*, (with X. Chen, B. Lou and M. Zhou).
Annales de l'Institut Henri Poincaré (C) Analyse Non Linéaire 33 (2016), 67-92.
24. *A KPP road-field system with spatially periodic exchange terms*, (with L. Monsaingeon and M. Zhou).
Nonlinear Analysis 128 (2015), 273-302.
25. *Convergence to a pulsating travelling wave for an epidemic reaction-diffusion system with non-diffusive susceptible population*, (with A. Ducrot).
Journal of Mathematical Biology 69 (2014), no. 3, 533-552.
26. *Convergence to pulsating traveling waves with minimal speed in some KPP heterogeneous problems*.
Calculus of Variations and PDEs 51 (2014), no. 1-2, 265-289.
27. *Existence and convergence to a propagating terrace in one-dimensional reaction-diffusion equations*, (with A. Ducrot and H. Matano).
Trans. of the American Mathematical Society. 366 (2014), no. 10, 5541-5566.
28. *Inside dynamics of pulled and pushed fronts*, (with J. Garnier, F. Hamel and L. Roques).
Journal de Mathématiques Pures et Appliquées 98 (2012), no. 4, p. 428-449.
29. *Maximal and minimal spreading speeds for reaction-diffusion equations in nonperiodic slowly varying media*, (with J. Garnier and G. Nadin).
Journal of Dynamics and Differential Equations 24 (2012), no. 3, p. 521-538.

30. *KPP reaction-diffusion systems with loss inside a cylinder : convergence toward the problem with Robin boundary conditions.*
Communications in Mathematical Sciences 9 (2011), no. 4, p. 1177-1201.
31. *Traveling waves for a reaction-diffusion-advection system with interior or boundary losses.*
Comptes Rendus de l'Académie des Sciences Série I 349 (2011), no. 9, p. 535-539.
32. *KPP reaction-diffusion equations with a non-linear loss inside a cylinder.*
Nonlinearity 23 (2010), p. 2307-2332.