

Antoine Pauthier

Curriculum Vitae

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Position

2013– **Ph.D student**, *Toulouse University*, Toulouse (France).

Education

2009–2013 **Student at ENS Cachan**, Cachan.

2012–2013 **Master in Applied Mathematics**, *Toulouse University*, Toulouse.

Major : applied analysis, modelisation, scientific computing.

2011–2012 **Agrégation de Mathématiques**, rank 57th/308.

A competitive exam for undergraduate teaching tenure.

Specialization : scientific computing.

2009–2011 **BSc and MSc (1st year) in Mathematics**, *ENS Cachan & Paris Diderot University*, Cachan, Paris.

Ph.D thesis

Title *Integral reaction-diffusion models in inhomogeneous media.*

Advisors Henri Berestycki & Jean-Michel Roquejoffre

Defense expected July, 2016

short summary My thesis focuses on spreading phenomena and travelling fronts in inhomogeneous reaction-diffusion equations. In a first work, I studied nonlocal interactions between an homogeneous media and a road of fast diffusion for a Fisher-KPP equation. The initial model was introduced in 2013 by Berestycki, Roquejoffre and Rossi. I am currently trying to extend the works of Berestycki, Bouhours and Chapuisat concerning "cylinder-like" domains, where they devised the existence of travelling fronts for a bistable equation, to more general domains.

Research internships

2013 **Master II**, INSTITUT DE MATHÉMATIQUES DE TOULOUSE, 5 months.

"The influence of a line with fast diffusion on Fisher-KPP propagation : integral models " advised by J.M. Roquejoffre. I adapted the work of H. Berestycki, J.-M. Roquejoffre and L. Rossi on a road-field system with nonlocal boundary conditions. This was the starting point of my Ph.D thesis.

2011 **Master I**, COMMISSARIAT À L'ÉNERGIE ATOMIQUE, Ile-de-France, 5 months.

"Stationary solutions for 1D radiative Euler equations" advised by P. Hoch, B. Rebourcet and G. Samba.

2010 **BSc**, CENTRE DE MATHÉMATIQUES DE LEURS APPLICATIONS, Cachan, 5 month.

"Stabilisation of a 1D wave equation with bilinear control" advised by K. Beauchard.

Publications

- *The influence of a line with fast diffusion and nonlocal exchange terms on Fisher-KPP propagation*, Comm. Math. Sciences, 2015 2 (2016) 535-570.
- *Uniform dynamics for Fisher-KPP propagation driven by a line of fast diffusion under a singular limit*, Nonlinearity 28 (2015) 3891-3920.
- *Road-field reaction-diffusion system: a new threshold for long range exchanges*, a short note about infimum for the spreading speed for the systems considered above, 2015 arXiv:1504.05437 [math.AP].

Teaching experience

- 2013–2016 **Teaching duty as a Ph.D student**, TOULOUSE UNIVERSITY.
- 2013–2014 Undergrad (2nd year) in preparatory cycle for ingeneering school. Tutorial (64h).
Topics: parametric curves, topology in finite dimension, differential calculus, multiple integral.
 - 2014–2015 Undergrad (2nd year) in preparatory cycle for ingeneering school. Tutorial (72h).
Topics: sequences and series, improper integrals, sequences and series of functions, power series, matrices and linear transformations.
 - 2015–2016
 - Undergrad (2nd year) in preparatory cycle for ingeneering school. Tutorial (44h).
Topics: sequences and series, improper integrals, sequences and series of functions, power series.
 - Undergrad (2nd year), students majoring in mathematics, physics and chemistry. Tutorial (12h).
Topics: same as above, Fourier series.
- 2014–2015 **2 Hippocampe Tutoring**, TOULOUSE UNIVERSITY.
A 3 days experience with high school students where they discover research. It consists in studying a completely new field for them, with as little knowledge as possible in the beginning. In the end, they should present their results in a talk to the other students, and during a poster session to the researchers of the laboratory.
Topics : Optimal transport.
- 2011–2012 **Oral examinations in Preparatory classes for Grandes Écoles**, Paris.
2011–2012 MPSI (students majoring in mathematics and physics) – Lycée Saint-Louis

Invited talks

- March 2014 **5th workshop of the ReaDi ERC project**, EHESS - Paris.
Jan. 2015 **BioSP seminar at INRA**, Avignon.
April 2015 **1st workshop of the ANR NONLOCAL project**, Paris.

Scientific events attended

- May 2013 **Mini-courses and Conference on Nonlinear Elliptic Equations and Applications**, Rutgers University & Courant Institute.
July 2013 **JISD 2013**, UPC - Barcelona.
2014 **PDE-Probability quarter of the Labex CIMI**, Toulouse University.
May 2014 **Kinetics, non standard diffusions and stochastics: emerging challenges in the sciences**, The University of Texas at Austin.
June 2014 **JISD 2014**, UPC - Barcelona.
Oct. 2014 **Reaction-Diffusion Equations in Montpellier**, Montpellier.
June 2015 **JISD 2015**, UPC - Barcelona.

Responsibilities

- 2014–2016 **Co-organizer of the PhD seminar**.
Fortnightly seminar covering all topics present at the Institut de Mathématiques de Toulouse.
- 2014–2015 **Co-organizer of a working group**.
Monthly working group covering stochastic ODEs, fluid mechanism, and reaction-diffusion equations.
- 2015–2016 **Elected member of the board of the Institut de Mathématiques de Toulouse**.
Representative of the PhD students.

Languages, other skills

French **Mothertongue**

English **Advanced**

TOEIC: 920

○ Driving licence.

○ Software : Matlab, Scilab, Maple