

Antonin MONTEIL

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Born in Limoges, France, October 30th, 1988

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Education

- 2019 - now: Postdoc at University of Bristol, United Kingdom.
- 2016 - 2019: Postdoc FNRS at Université catholique de Louvain, Belgium.
- 2015 - 2016: ATER at Université Paris-Sud, France.
- 2012 - 2015: PhD student at Université Paris-Sud. Supervisors: Radu Ignat and Filippo Santambrogio. Title: *Approximations elliptiques d'énergies singulières sous contrainte de divergence* (Elliptic approximations of singular energies under divergence constraint).
Thesis defended on December 7th, 2015. Referees: Fabrice Bethuel and Robert L. Jerrard.
Committee: Fabrice Bethuel, Radu Ignat, Petru Mironescu, Édouard Oudet, Étienne Sandier (president), Filippo Santambrogio.
- 2011 - 2012: *Master 2* (Master's degree) at ENS Cachan and Université Paris-Sud, specialization: Partial differential equations. Master thesis on Aviles-Giga functional at Université Paris-Sud, supervisors: Radu Ignat and Filippo Santambrogio.
- 2010 - 2011: Preparation for a national teaching competitive exam (*Concours de l'agrégation externe de mathématiques*) at ENS Cachan, successful candidate (6th place).
- 2010: Successful candidate to the national examination for the admission in third year at ENS Cachan.
- 2008 - 2010: Student at Université Paris-Sud: *Licence 3* and *Master 1* (3rd and 4th year), specialization: fundamental and applied mathematics. Thesis on the Ax-Grothendieck theorem, supervisor: Franck Benoist, Orsay.
- 2006 - 2008: *Classes préparatoires aux grandes écoles* (University equivalence: 1st and 2nd year) at Lycée Gay Lussac, Limoges.

Publications

- [1] Antonin Monteil. Uniform estimates for a Modica-Mortola type approximation of branched transportation. *ESAIM Control Optim. and Calc. of Var.* **23** (2017), 309–335.
- [2] Pierre Bochart and Antonin Monteil. A necessary condition for lower semicontinuity of line energies. *Calc. Var. and Partial Differential Equations* **56** (2017), no. 1, 8.
- [3] Antonin Monteil and Filippo Santambrogio. Metric methods for heteroclinic connections. *Mathematical Methods in the Applied Sciences* **41** (2018), no. 3, 1019–1024.
- [4] Antonin Monteil and Jean Van Schaftingen. Uniform boundedness principles for Sobolev maps into manifolds. *Ann. Inst. Henri Poincaré, Anal. Non Lin* **36** (2019), no. 2, 417–449.

- [5] Antonin Monteil and Filippo Santambrogio. Metric methods for heteroclinic connections in infinite dimensional spaces. *Indiana Univ. Math. J.* **69** (2020), no. 4, 1445–1503.
- [6] Radu Ignat and Antonin Monteil. A De Giorgi type conjecture for divergence-free maps. *Comm. Pure Appl. Math.* **73** (2020), no. 4, 771–854.
- [7] Radu Ignat and Antonin Monteil. A necessary condition in a De Giorgi type conjecture for elliptic systems in infinite strips. *Pure Appl. Funct. Anal.* **5** (2020), no. 4, 981–998.

Submitted papers (ArXiv preprints):

- [8] Antonin Monteil, Rémy Rodiac and Jean Van Schaftingen. Renormalised energies and renormalisable singular harmonic maps into a compact manifold on planar domains.
- [9] Antonin Monteil, Rémy Rodiac and Jean Van Schaftingen. Ginzburg-Landau relaxation for harmonic maps on planar domains into a general compact vacuum manifold.

Participation on workshops, conferences, schools

- *New trends in the variational modeling and simulation of liquid crystals*, ESI, Vienna, Austria, December 2–6, 2019.
- *1st Joint Meeting Brazil-France in Mathematics*, IMPA, Rio de Janeiro, Brazil, July 14–19, 2019.
- *Calculus of variations and probability*, Toulouse, France, May 20–24, 2019.
- *Optimal Transportation and Applications*, Pisa, Italy, November 12–16, 2018.
- *One day conference on Calculus of variations - 2nd edition*, Lille, France, October 12, 2018.
- *Calculus of Variations at Paris-Diderot*, Paris 7, France, June 25–27, 2018.
- *Geometric Measure Theory in Verona*, Verona, Italy, June 11–15, 2018.
- FNRS meeting, ULB, Brussels, Belgium, December 18, 2017.
- *First Belgium-Chile-Italy Conference in PDE's*, ULB, Brussels, Belgium, November 13–17, 2017.
- *Curves and Networks in Geometric Analysis*, SNS, Pisa, Italy, June 26-30, 2017.
- ERC Workshop on Optimal Transport and Applications, SNS, Pisa, Italy, November 7–11, 2016.
- *Topological Patterns and Dynamics in Magnetic Elements and in Condensed Matter*, MPIPKS, Dresden, Germany, June 27 – July 1, 2016.
- *Journées Jeunes EDPistes français 2016*, IMB, Bordeaux, France, March 21 – 23, 2016.
- Winter school *Nonlinear Function Spaces in Mathematics and Physical Sciences*, Lyon, France, December 14 – 18, 2015.
- Modern Mathematical Methods in Science and Technology (M3ST), Kalamata, Greece, August 30 - September 1, 2015.
- Special Semester on New Trends in Calculus of Variations, RICAM, Linz, Austria, December 2–12, 2014.

- Conference on Nonlinearity, Transport, Physics, and Patterns, Fields Institute, Toronto, Canada, October 6–10, 2014.
- Conferences of the ANR project Geometrya: Lyon (October 11–12, 2012), Marseille (November 28–29, 2013), Orsay (March 20–21, 2014), Nice (November 20–21, 2014).
- *Journée SMAI-MODE*, INSA, Rennes, France, March 26–28, 2014.
- ERC Workshop on Optimal Transportation and Applications, SNS, Pisa, Italy, November 5–9, 2012.

Presentations

- Analysis seminar, University of Bath, United Kingdom, March 12, 2020.
- EDP-Analysis seminar, University of Durham, United Kingdom, November 28th, 2019.
- *1st Joint Meeting Brazil-France in Mathematics*, IMPA, Rio de Janeiro, July 18, 2019.
- PDE team analysis seminar, USP, Ribeirao Preto, Brazil, July 10, 2019.
- Applied analysis team research seminar, I2M, Université Aix-Marseille, March 5, 2019.
- EDP-CVGI team research seminar, LJK, Université de Grenoble, February 21, 2019.
- *One day conference on Calculus of variations - 2nd edition*, Lille, France, October 12, 2018.
- ANEDP team research seminar, LPP, Lille 1 University, France, April 5, 2018.
- FNRS meeting, ULB, Brussels, Belgium, December 18, 2017.
- Research group on *Analysis of singularities in PDE's and Calculus of Variations*, IMT, Toulouse, France, October 6, 2017.
- Analysis research seminar, IRMP, Louvain-la-Neuve, Belgium, October 25, 2016.
- *Topological Patterns and Dynamics in Magnetic Elements and in Condensed Matter*, MPIPKS, Dresden, Germany, June 29, 2016.
- Working group on Calculus of Variations and PDE's (joint seminar between Marseille and Toulon), Marseille, March 31, 2016.
- *Journées Jeunes EDPistes français 2016*, IMB, Bordeaux, France, March 21 - 23, 2016.
- Applied analysis research seminar, LAMFA, Amiens, France, February 1, 2016.
- Analysis research seminar, IRMA, Strasbourg, France, February 4, 2016.
- GT CalVa, LJLL, University of Paris 6, France, October 5, 2015.
- *Journée de rentrée*, EDP team, LMO, University of Paris-Sud, France, September 24, 2015.
- Modern Mathematical Methods in Science and Technology (M3ST), Kalamata, Greece, August 30 - September 1, 2015.
- *Journée Geometrya*, Nice, France, November 20–21, 2014.
- *Journées SMAI-MODE*, INSA, Rennes, France, March 26–28, 2014.
- EDP team research seminar, LMO, University of Paris-Sud, France, March 6, 2014.

Teaching experience

- Since 2019, I give tutorial classes in Analysis for undergraduate students at University of Bristol (16h/year).
- Between 2016 and 2019, I have been giving a course on *Calculus of Variations and convex duality* (26h/year) for Master students at UCLouvain.
- Between 2012 and 2016, I have been teaching assistant at Université Paris-Sud (64h/year during the PhD contract, 192h during the academic year 2015-2016 as “Attaché temporaire d’enseignement et de recherche”). I have conducted tutorial classes in:
 - 2015-2016: Scilab for L2 students in Physics.
 - 2015-2016: *Linear and non-linear elliptic equations*, M2 AMS and AAG.
 - 2015-2016: Topology and differential calculus for L2 students in mathematics.
 - 2014-2015: *Elliptic Equations and Calculus of variations*, M2 EDPCS (Partial Differential Equations and Scientific Computing) and AAG (Analysis, Arithmetic and Geometry).
 - 2012-2016: Linear algebra and calculus for L1 students.
 - 2012-2013: Matlab, L3 MFA (Fundamental and Applied Mathematics).

Organization of scientific events, Activities

- 2018: Implementation of a working group on *homogenization* with post-docs and PhD students at UCLouvain and ULB.
- Co-organizer of a working day on Branched Transport, University of Paris-Sud, April 5, 2016. Financed by the project MACRO and the ANR project GEOMETRYA (Geometric measure theory and its applications).
- 2014-2016: Member of the PGMO research project MACRO, “Méthodes d’Approximation Continue de Réseaux Optimaux” (Continuous Approximation Methods for Optimal Networks).
- 2013-2016: Co-organizer of the working group on Calculus of Variation *GT CalVa*, joint seminar of *Université Paris-Sud* (LMO), *Paris 7* (LJLL), *Paris-Dauphine* (CEREMADE) and *Paris 6* (LJLL).