

# Curriculum Vitae

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French Nationality

Born 05/03/1985 in Paris.

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## Education and Positions

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- 2014–** : Junior researcher for the CNRS in the Laboratoire Jacques-Louis Lions, Université Paris 7.
- 2012–2014** : Von Humboldt Post-Doc fellow at the Max Planck Institute in Leipzig (Germany) in the group of F. Otto.
- Spring 2012** : Post-Doc stay at the University of Carnegie Mellon (USA) under the supervision of I. Fonseca and G. Leoni.
- 2009–2011** : PhD at the Ecole Polytechnique (France) under the supervision of A. Chambolle.

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## Papers

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Preprints:

1. **A gradient flow approach to relaxation rates for the multi-dimensional Cahn-Hilliard equation**, with L. De Luca et M. Strani, submitted.
2. **Quantitative estimates for bending energies and applications to non-local variational problems**, with M. Novaga and M. Röger, submitted.
3. **A Ginzburg-Landau model with topologically induced free discontinuities**, with B. Merlet and V. Millot, submitted.
4. **Self-similar minimizers of a branched transport functional**, submitted.
5. **A variational proof of partial regularity for optimal transportation maps**, with F. Otto, submitted.

6. **On the optimality of stripes in a variational model with non-local interactions**, with E. Runa, submitted.

Published Journal Papers:

1. **A branched transport limit of the Ginzburg-Landau functional**, with S. Conti, F. Otto and S. Serfaty, accepted in *J. École Polytechnique*.
2. **On minimizers of an isoperimetric problem with long-range interactions and convexity constraint**, with M. Novaga and B. Ruffini, accepted in *Analysis and PDEs*.
3. **Phase segregation for binary mixtures of Bose-Einstein Condensates**, with B. Merlet, accepted in *SIAM J. Math. Analysis*.
4. **New bounds for the inhomogenous Burgers and the Kuramoto-Sivashinsky equations**, with M. Josien and F. Otto, accepted in *CPDE*.
5. **Study of island formation in epitaxially strained films on unbounded domains**, with P. Bella and B. Zwicknagl, *ARMA*, 218, (2015), no. 1, 163–217.
6. **Sharp interface limit for two components Bose-Einstein condensates**, with J. Royo-Letelier, *ESAIM COCV* (2015), no.3 603-624.
7. **Nucleation barriers at corners for a cubic-to-tetragonal phase transformation**, with P. Bella, *Proc. Roy. Soc. Edimburgh*, 145 A (2015), 715-724.
8. **Existence and stability for a non-local isoperimetric model of charged liquid drops**, with M. Novaga and B. Ruffini, *ARMA*, 217 (2015), no. 1, 1–36.
9. **Fine properties of the subdifferential for a class of one-homogeneous functionals**, with A. Chambolle and M. Novaga, *Adv. Calc. Var*, vol. 8 n. 1 (2015), 31-42.
10. **Scaling law and reduced models for epitaxially strained films**, with B. Zwicknagl, *SIAM J. Math. Analysis*, 46 (2014), no. 1, 1–24.
11. **The  $\Gamma$ -limit for singularly perturbed functionals of Perona-Malik type in arbitrary dimension**, with G. Bellettini and A. Chambolle, *M3AS*, vol. 24, Issue 6 (2014).
12. **Plane-like minimizers and differentiability of the stable norm**, with A. Chambolle and M. Novaga, *J. Geometric Analysis*, vol. 24, Issue 3 (2014).
13. **Representation, relaxation and convexity for variational problems in Wiener spaces**, with A. Chambolle and M. Novaga, *J. Math. Pures Appl*, vol. 99 (2013), 419-435.
14. **A geometric approach for convexity in some variational problem in the Gauss space**, *Rend. Sem. Mat. Padova*, vol. 129 (2013).
15. **Approximation and relaxation of perimeter in the Wiener space**, with M. Novaga, *Annales IHP - Analyse Non linéaire*, vol. 29, (2012), 525-544.

16. **Volume-constrained minimizers for the prescribed curvature problem in periodic media**, with M. Novaga, Calc. Var. and PDE, vol. 44, Issue 3 (2012), 297-318.
17. **Continuous Primal-Dual Methods for Image Processing**, SIAM Journal of Imaging Science vol. 4, no. 1, (2011).

Conference Proceedings and Review Papers:

1. **Equilibrium shapes of charged droplets and related problems: (mostly) a review**, with B. Ruffini, accepted in Geometric flows.
2. **Existence and qualitative properties of isoperimetric sets in periodic media**, with A. Chambolle and M. Novaga, "Geometric Partial Differential Equations", Edizioni della Normale, CRM Series, vol. 15, (2013).

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## Talks

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Workshops and conferences:

- Meeting on Applied Mathematics and Calculus of Variations in Rome, Sapienza, Italy (2018).
- Workshop on New trends in the variational modeling of failure phenomena, ESI Vienna, Austria (2018).
- Workshop on kinetic and fluid Partial Differential Equations, Université Paris Diderot, France (2018).
- Workshop on Curves and Networks in Geometric Analysis, Centro De Giorgi, Pisa, Italy (2017).
- Workshop Transport problems in Zurich, University of Zurich, Switzerland (2017).
- Workshop on Geometric Measure Theory, Shape Optimisation and Free Boundaries, SISSA, Trieste, Italy (2016).
- Mini-Symposium, 9th European Conference on Elliptic and Parabolic Problems, Gaeta, Italy (2016).
- Mini-Symposium, British Applied Maths Colloquium, Oxford, UK (2016).
- Journée ANR GEOMETRYA, Nice, France (2014).
- Workshop on Trends in Non-Linear Analysis, IST Lisbon, Portugal (2014).
- Workshop on Isoperimetric Problems between Analysis and Geometry, Centro De Giorgi, Pisa, Italy (2014).
- Workshop on Geometric PDEs, Centro De Giorgi, Pisa, Italy (2012).
- Mini-Symposium, ISMP International Conference, Berlin, Germany (2012).

- Contributed talk, The 5th Symposium on Analysis & PDEs, Purdue University, USA (2012).
- Contributed talk, PICO International Conference, École Polytechnique, France (2012).
- Joint day of GdR Isis and MSPC, IHP, France (2010).

Seminar talks:

- Erlangen (2014), Würzburg (2014), Leipzig (2012, 2015, 2017), Bonn (2013, 2016), LJLL Paris VI (2015), CalVa X/Orsay/Paris VI/Paris Dauphine (2010, 2012, 2013), AN-EDP Paris 6/Paris 7/ENS (2015), Orsay (2013, 2018×2), Creteil (2017), EHES (2016), Physique Mathématique IHP (2016), Grenoble (2012, 2016), Lyon (2012), Marseille (2012), Toulon (2013), Carnegie Mellon (2012), Padova (2011), Pisa (2011, 2016, 2017), SISSA (2018).

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### Stays

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- 5 months in the Scuola Normale Superiore di Pisa (2011).
- 1 week or less: Uni. Bonn (2013, 2014, 2016), Max Planck Leipzig (2014, 2015, 2016, 2017, 2018), TU Berlin (2018), Institut J. Fourier Grenoble (2014), Uni. Montpellier (2015, 2016), Uni. Pisa (2013, 2014, 2016, 2017), Uni. Padova (2011), Sapienza Roma (2017), SISSA (2017, 2018), Inst. of Thermomechanics of the Academy of Sciences of Czech Republic (2013).

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### Fundings and awards

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- Thesis Prize from the Ecole Polytechnique.
- PI of a CNRS project PEPS Jeunes Chercheur-e-s (2016). Co-PI of two CNRS project PEPS Jeunes Chercheur-e-s (2017 and 2018).
- Member of the project “Connexions Optimales, Calcul et Approximations” funded by the PGMO program.

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### Responsibilities

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- Organizer of the “Journées internes du LJLL”, 2015–.

- Organizer of the calculus of variations workgroup first in Polytechnique, 2010–2011 and then joint Orsay/Dauphine/LJLL 2015–.
- Co-Organizer of the CNA-PIRE Working Group on Variational methods for phase transitions and copolymers, Carnegie Mellon University, Pittsburgh, Spring 2012.
- Co-Organizer of a minisymposium on Variational models in elasticity and plasticity at the GAMM meeting 2014.
- Reviewer for: ARMA, SIAM J. Math. Anal., Inverse Problems and Imaging, Appl. Math. Optim., ESAIM COCV, J. Convex Analysis, Manuscripta Math., Com. Contemp. Math., Lecture Notes SNS, Mathscinet.
- 2017: Member of a Hiring committee for a Maitre de Conference position in the Université Paris Diderot.

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### Teaching Experience and Mentoring

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- 2014–2017 : TA for the undergraduate courses Advanced Algebra and Analysis, Optimisation, P7.
- Spring 2014 : Co-advisor together with F. Otto of the M1 thesis of M. Josien (École Polytechnique).
- Winter 2013 : Advanced class on 'Introduction to Weak KAM theory and Hamilton-Jacobi equations' at MPI Leipzig (25h).
- Summer 2012 : Project Director for the Summer Undergraduate Applied Mathematics Institute of the University of Carnegie Mellon (mentoring 4 students).
- 2009–2012 : One course of Probability and one of Statistics to first year students in the IUT de Sceaux (64h per year).