

# Alessio Figalli

## Curriculum Vitae

Department of Mathematics  
ETH Zürich  
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*Professor & Chair in Mathematics*  
*Phd, SNS Pisa and ENS Lyon, 2007*

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### Personal information

Place and date of birth Rome (Italy), April 2, 1984  
Language skills Italian (native), English and French (fluent),  
Spanish (intermediate), German (basic)  
Citizenship Italian citizen, Swiss permanent resident  
Civil status married

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### Position held

Sep 2016 – present *Full Professor and Chair*, ETH Zürich (Zurich, Switzerland)  
Sep 2013 – Aug 2016 *Full Professor and R. L. Moore Chair*,  
The University of Texas at Austin (Austin, TX, USA)  
Sep 2011 – Aug 2013 *Full Professor*, The University of Texas at Austin (Austin, TX, USA)  
Sep 2010 – Aug 2011 *Associate Professor*, The University of Texas at Austin (Austin, TX, USA)  
Sep 2009 – Aug 2010 *Associate Professor and Harrington Faculty Fellow*,  
The University of Texas at Austin (Austin, TX, USA)  
Oct 2008 – Aug 2009 *Professor (Professeur Hadamard)*, École Polytechnique (Palaiseau, France)  
Oct 2007 – Sep 2008 *Researcher (Chargé de recherche CNRS)*, University of Nice (Nice, France)

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### Formation

Feb 17, 2009 Habilitation à Diriger de Recherche (French habilitation)  
Mémoire HDR (in english): *Optimal transport, Euler equations, Mather and DiPerna-Lions theories*  
Nov 2006 – Sep 2007 PhD student at the Scuola Normale Superiore of Pisa (Italy) and at the École Normale Supérieure of Lyon (France).  
Advisors: Luigi Ambrosio and Cédric Villani.  
PhD degree obtained Oct. 24, 2007 (italian grade: 70/70 cum laude; french grade: mention très honorable).  
Phd thesis (in english): *Optimal transportation and action-minimizing measures*  
Oct 2002 – Oct 2006 Student of mathematics at the Scuola Normale Superiore of Pisa (Italy)  
Master degree obtained the Jun 23, 2006 (grade: 110/110 cum laude).  
Master thesis (in english): *Trasporto ottimale su varietà non compatte*  
Bachelor degree obtained Nov 29, 2004 (grade: 110/110 cum laude).  
Degree thesis (in italian): *Il problema di Bernstein e una congettura di De Giorgi*

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## Honors, Prizes and Awards

### Prizes and Awards

- 2017 – present Fellow of the European Academy of Sciences  
2017 *Feltrinelli Prize* of “Accademia Nazionale dei Lincei”  
2016 *O'Donnell Award in Science* of “The Academy for Medicine, Engineering, & Science of Texas (TAMEST)”  
2015 *Stampacchia Gold Medal* of the Italian Mathematical Union  
2012 *European Mathematical Society (EMS) Prize*  
2011 – 2012 *Peccot-Vimont Prize* and *Cours Peccot* of the “Collège de France”  
2010 *Gioacchino Iapichino Prize* of the “Accademia Nazionale dei Lincei”  
2010 *Anile Prize* of the “Associazione Angelo Marcello Anile” and the “Consorzio Catania Ricerche”  
2009 – 2010 *Harrington Faculty Fellowship*  
2008 *Carlo Miranda Prize* of the “Accademia di Scienze Fisiche e Matematiche” of Naples  
2008 *Giuseppe Borgia Prize* of the “Accademia Nazionale dei Lincei”  
2006 – 2007 *Benedetto Sciarra Prize* of the “Scuola Normale Superiore” of Pisa

### Grants

- 2017 – 2022 *ERC Grant*, “Regularity and Stability in Partial Differential Equations (RS)”  
2014 – 2017 *NSF Grant DMS-1361122*, “FRG: Collaborative Research: Vectorial and geometric problems in the calculus of variations”  
2013 – 2018 *NSF Grant DMS-1262411*, “Regularity and stability results in variational problems”  
2010 – 2013 *NSF Grant DMS-0969962*, “Analytical and geometrical problems in calculus of variations and partial differential equations”

### Selected Invited Talks

- Jun 2018 *Bourbaki seminar* at IHP  
May 2018 *Rouse Ball Lecture* at the University of Cambridge  
Feb 2018 *Harold J. Gay Lecture*  
Jun 2017 *23rd Rolf Nevanlinna Colloquium* at ETH Zürich  
Nov 2016 *Leonardo Da Vinci Lectures*  
Sep 2015 *XX Congress of the Italian Mathematical Union*, Plenary Speaker  
Mar 2015 *Thomas Wolff Memorial Lectures in Mathematics* at Caltech  
Fall 2014 *Nachdiplom-Vorlesungen* at ETH Zürich  
Aug 2014 *International Congress of Mathematicians (ICM)*, Invited Speaker  
Jul 2014 *XV International Conference on Hyperbolic Problems*, Plenary Speaker  
May 2014 *1st Nirenberg Lectures in Geometric Analysis* at CRM  
Apr 2014 *AMS Spring Central Regional Meeting* at Texas Tech University, Plenary Speaker  
Dec 2013 *SIAM Conference on Analysis of Partial Differential Equations*, Plenary Speaker  
Jun 2013 *INdAM Day*, Invited speaker  
Jul 2012 *European Congress of Mathematics (ECM)*, Invited speaker  
Apr 2010 *2009-2010 Salomon Bockner Lectures in Mathematics*  
Jun 2009 *Bourbaki seminar* at IHP

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## Mentoring

### Postdocs

- 2016 – present *Joaquim Serra*, ETH Zürich  
2016 – present *Connor Mooney*, UT Austin - ETH Zürich

- 2015 – 2016 *Brian Krummel*, UT Austin (coadvised with Francesco Maggi)
- 2014 – 2015 *Begoña Barrios*, UT Austin
- 2014 – 2016 *Xavier Ros-Oton*, UT Austin
- 2013 *Shibing Chen*, MSRI.
- 2012 *Filippo Cagnetti*, UT Austin (coadvised with Luis Caffarelli)
- 2010 – 2011 *Clayton Bjorland*, UT Austin (coadvised with Luis Caffarelli)

#### PhD Students

- 2015 – present *Xavier Fernández-Real*, UT Austin - ETH Zürich
- 2014 – present *Yash Jhaveri*, UT Austin - ETH Zürich
- 2013 – 2017 *Javier Morales*, UT Austin
- 2013 – 2017 *Robin Neumayer*, UT Austin (coadvised with Francesco Maggi)
- 2012 – 2015 *Maria Colombo*, UT Austin - SNS Pisa (coadvised with Luigi Ambrosio)
- 2011 – 2016 *Rohit Jain*, UT Austin (coadvised with Luis Caffarelli)
- 2011 – 2012 *Levon Nurbekyan*, UT Austin - IST Lisbon (coadvised with Diogo Gomes)
- 2010 – 2013 *Diego Marcon Farias*, UT Austin - IST Lisbon (coadvised with Diogo Gomes)
- 2009 – 2013 *Emanuel Indrei*, UT Austin
- 2009 – 2012 *Eric Baer*, UT Austin

#### Master Students

- 2008 – 2009 *Vito Mandorino*, University of Padua - University of Paris VII

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## Scientific and administrative responsibilities

#### Editorial work

- 2016 – present Editor of *Arch. Ration. Mech. Anal.*
- 2016 – present Editor of *Commun. Contemp. Math.*
- 2015 – present Editor of *Probab. Theory Related Fields*
- 2015 – 2017 Editor of *Appl. Math. Res. Express. AMRX*
- 2014 – present Editor of *Duke Math. J.*
- 2013 – present Editor of *Anal. Theory Appl.*
- 2013 – present Editor of *Anal. PDE*
- 2013 – present Editor of *J. Ecole Polytechnique*
- 2013 – present Advisory Board Member for *in Math.*
- 2013 – 2017 Associate Editor of *ESAIM: Control Optim. Calc. Var.*
- 2012 – 2016 Managing Editor of *Discrete Contin. Dyn. Syst. - Series A*
- 2011 – present Editor of *Discrete Contin. Dyn. Syst. - Series A*
- 2011 – present Editor of *AIMS Series on Applied Mathematics*
- 2010 – present Corresponding Editor of *Acta Appl. Math.*

#### Conference organization

- Apr 2019 – Jun 2019 Co-organizer of the thematic program on “Optimal transport” at the Erwin Schrödinger Institute (Vienna, Austria)
- Aug 2018 Co-organizer of the workshop on “Calculus of Variations” at the MFO (Oberwolfach, Germany)
- Jul 2016 Co-organizer of the workshop on “Calculus of Variations” at the MFO (Oberwolfach, Germany)
- Jul 2016 Co-organizer of the session on “Quantitative geometric and functional inequalities and new trends in nonlinear PDEs” at the 11th AIMS Conference (Orlando, FL, USA)
- Oct 2015 Co-organizer of the workshop “Analysis in Lyon” (Lyon, France)

- Sep 2015 – Dec 2015 Co-organizer of the program “Fall Semester 2015 in Analysis” (Lyon, France)
- May 2015 Co-organizer of the program “Calculus of Variations and Nonlinear Partial Differential Equations” (Austin, TX, USA)
- Nov 2014 Co-organizer of the Fields Medal Symposium “The many facets of entropy: Kinetic Theory, Optimal Transport, Geometry” in honor of Cédric Villani at the Fields Institute (Toronto, Canada)
- Oct 2014 Co-organizer of the Thematic day on “Optimal transport and sub-Riemannian manifolds” at IHP (Paris, France)
- Apr 2014 – May 2014 Co-organizer of the “UT Austin Workshop: Kinetics, non-standard diffusion and multiscale phenomena: emerging challenges in the sciences” (Austin, TX, USA)
- Aug 2013 – Dec 2013 Co-organizer of the MSRI program on “Optimal Transport: Geometry and Dynamics” (Berkeley, CA, USA)
- Aug 2013 Co-organizer of the “Introductory Workshop on Optimal Transport: Geometry and Dynamics” (Berkeley, CA, USA)
- May 2012 Co-organizer of the Workshop “Optimal transportation and differential geometry” at BIRS (Banff, Canada)
- Jun 2011 Co-organizer of the CoLab Mathematics Summer School and Workshop “Aubry Mather Theory and Optimal Transport (Summer School) - Nonlinear PDEs (Workshop)” (Lisbon, Portugal)
- Jan 2011 Co-organizer of the conference “Kinetic theory, optimal transport, probability, geometry: old and new” in the honor of Cédric Villani, Fields medalist 2010 (ENS Paris, France)
- Jul 2010 Organizer of the minisymposium “Geometric Measure Theory and Calculus of Variations” at IHES Asian-French Summer school on “Singularities in PDE” (IHES, France)
- Apr 2010 Co-organizer of Workshop “Optimal transportation and applications” at BIRS (Banff, Canada)
- Apr 2010 Organizer of the Workshop “Nonlinear Analysis and PDEs” at the University of Texas at Austin (Austin, TX, USA), sponsored by the Harrington Foundation
- May 2009 Organizer of the minisymposium “Transport optimal et applications” at the SMAI Conference (La Colle sur Loup, France)

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## Research

### Published/Accepted papers

- 1) The Monge problem on non-compact manifolds, *Rend. Sem. Mat. Univ. Padova* 117 (2007), 147-166.
- 2) Existence, uniqueness and regularity of optimal transport maps, *SIAM J. Math. Anal.* 39 (2007), no. 1, 126-137.
- 3) High action orbits for Tonelli Lagrangians and superlinear Hamiltonians on compact configuration spaces” (with A. Abbondandolo), *J. Differential Equations* 234 (2007), no. 2, 626-653.
- 4) Strong displacement convexity on Riemannian manifolds (with C. Villani), *Math. Z.* 257 (2007), no. 2, 251-259.
- 5) On the regularity of the pressure field of Brenier’s weak solutions to incompressible Euler equations” (with L. Ambrosio), *Calc. Var. Partial Differential Equations* 31 (2007), no. 4, 497-509.
- 6) Existence and uniqueness of martingale solutions for SDE with rough or degenerate coefficients, *J. Funct. Anal.* 254 (2008), no. 1, 109-153.
- 7) A simple proof of the Morse-Sard theorem in Sobolev spaces, *Proc. Amer. Math. Soc.* 136 (2008), no. 10, 3675-3681.
- 8) Synchronized traffic plans and stability of optima (with M. Bernot), *ESAIM Control Optim. Calc. Var.* 14 (2008), 864-878.

- 9) Invariant measures of Hamiltonian systems with prescribed asymptotic Maslov index (with A. Abbondandolo), *J. Fixed Point Theory Appl.* 3 (2008), no. 1, 95-120.
- 10) Absolute continuity of Wasserstein geodesics in the Heisenberg group (with N. Juillet), *J. Funct. Anal.* 255 (2008), no. 1, 133-141.
- 11) An approximation lemma about the cut locus, with applications in optimal transport theory (with C. Villani), *Methods Appl. Anal.* 15 (2008), no. 2, 149-154.
- 12) Convergence to the viscous porous medium equation and propagation of chaos (with R. Philipowski), *ALEA Lat. Am. J. Probab. Math. Stat.* 4 (2008), 185-203.
- 13) Generalized solutions for the Euler equations in one and two dimensions (with M. Bernot and F. Santambrogio), *J. Math. Pures Appl.* 91 (2008), no. 2, 137-155.
- 14) Geodesics in the space of measure-preserving maps and plans (with L. Ambrosio), *Arch. Ration. Mech. Anal.* 194 (2009), no. 2, 421-462.
- 15) A geometric lower bound on Grad's number, *ESAIM Control Optim. Calc. Var.* 15 (2009), no. 3, 569-575.
- 16) On the Hausdorff Dimension of the Mather quotient (with A. Fathi and L. Rifford), *Comm. Pure Appl. Math.* 62 (2009), no. 4, 445-500.
- 17) On flows associated to Sobolev vector fields in Wiener spaces: an approach à la DiPerna-Lions (with L. Ambrosio), *J. Funct. Anal.* 256 (2009), no. 1, 179-214.
- 18) A note on Cheeger sets (with F. Maggi and A. Pratelli), *Proc. Amer. Math. Soc.* 137 (2009), no. 6, 2057-2062.
- 19)  $C^1$  regularity in 2 dimension for potentials of the optimal transport problem (with G. Loeper), *Calc. Var. Partial Differential Equations* 35 (2009), no. 4, 537-550.
- 20) A note on the regularity of the free boundaries in the optimal partial transport problem, *Rend. Circ. Mat. Palermo* 58 (2009), no. 2, 283-286.
- 21) Continuity of optimal transport maps and convexity of injectivity domains on small deformations of  $\mathbb{S}^2$  (with L. Rifford), *Comm. Pure Appl. Math.* 62 (2009), no. 12, 1670-1706.
- 22) A refined Brunn-Minkowski inequality for convex sets (with F. Maggi and A. Pratelli), *Ann. Inst. H. Poincaré Anal. Non Linéaire* 26 (2009), no. 6, 2511-2519.
- 23) Some new well-posedness results for continuity and transport equations, and applications to the chromatography system (with L. Ambrosio, G. Crippa and L. V. Spinolo), *SIAM J. Math. Anal.* 41 (2009), no. 5, 1890-1920.
- 24) Optimal transportation on non-compact manifolds (with A. Fathi), *Israel J. Math.* 175 (2010), no. 1, 1-59.
- 25) The optimal partial transport problem *Arch. Ration. Mech. Anal.* 195 (2010), no. 2, 533-560.
- 26) Mass Transportation on Sub-Riemannian Manifolds (with L. Rifford), *Geom. Funct. Anal.* 20 (2010), no. 1, 124-159.
- 27) On flows of  $H^{3/2}$ -vector fields on the circle, *Math. Ann.* 347 (2010), no. 1, 43-57.
- 28) Regularity properties of optimal maps between nonconvex domains in the plane, *Comm. Partial Differential Equations* 35 (2010), no. 3, 465-479.
- 29) A new transportation distance between non-negative measures, with applications to gradient flows with Dirichlet boundary conditions (with N. Gigli), *J. Math. Pures Appl.* 94 (2010), no. 2, 107-130.
- 30) On the Ma-Trudinger-Wang curvature on surfaces (with L. Rifford and C. Villani), *Calc. Var. Partial Differential Equations* 39 (2010), no. 3-4, 307-332.
- 31) Almost everywhere well-posedness of continuity equations with measure initial data (with L. Ambrosio), *C. R. Acad. Sci. Paris* 348 (2010), no. 5-6, 249-252.
- 32) Partial regularity of Brenier solutions of the Monge-Ampère equation (with Y.-H. Kim), *Discrete Contin. Dyn. Syst.* 28 (2010), no. 2, 559-565.

- 33) A mass transportation approach to quantitative isoperimetric inequalities (with F. Maggi and A. Pratelli), *Invent. Math.* 182 (2010), no. 1, 167-211.
- 34) Local semiconvexity of Kantorovich potentials on non-compact manifolds (with N. Gigli), *ESAIM Control Optim. Calc. Var.* 17 (2011), no. 3, 648-653.
- 35) A variational method for a class of parabolic PDEs (with W. Gangbo and T. Yolcu), *Ann. Scuola Norm. Sup. Pisa Cl. Sci.* (5) 10 (2011), no. 1, 207-252.
- 36) Global-in-time weak measure solutions and finite-time aggregation for nonlocal interaction equations (with J. A. Carrillo, M. Di Francesco, T. Laurent and D. Slepčev), *Duke Math. J.* 156 (2011), no. 2, 229-271.
- 37) Fine properties of minimizers of mechanical Lagrangians with Sobolev potentials (with V. Mandorino), *Discrete Contin. Dyn. Syst.* 31 (2011), no. 4, 1325-1346.
- 38) On the shape of liquid drops and crystals in the small mass regime (with F. Maggi), *Arch. Ration. Mech. Anal.* 201 (2011), no. 1, 143-207.
- 39) Surface measures and convergence of the Ornstein-Uhlenbeck semigroup in Wiener spaces (with L. Ambrosio), *Ann. Fac. Sci. Toulouse Math.* (6) 20 (2011), no. 2, 407-438.
- 40) When is multidimensional screening a convex program? (with Y.-H. Kim and R. J. McCann), *J. Econom. Theory* 146 (2011), no. 2, 454-478.
- 41) Tangent cut loci on surfaces (with L. Rifford and C. Villani), *Differential Geom. Appl.* 29 (2011), no. 2, 154-159.
- 42) Semiclassical limit of quantum dynamics with rough potentials and well posedness of transport equations with measure initial data (with L. Ambrosio, G. Friesecke, J. Giannoulis and T. Paul), *Comm. Pure Appl. Math.* 64 (2011), no. 9, 1199-1242.
- 43) Necessary and sufficient conditions for continuity of optimal transport maps on Riemannian manifolds (with L. Rifford and C. Villani), *Tohoku Math. J.* (2) 63 (2011), no. 4, 855-876.
- 44) Nearly round spheres look convex (with L. Rifford and C. Villani), *Amer. J. Math.* 134 (2012), no. 1, 109-139.
- 45) Non-Local Tug-of-War and the Infinity Fractional Laplacian (with C. Bjorland and L. Caffarelli), *Comm. Pure Appl. Math.* 65 (2012), no. 3, 337-380.
- 46) Isoperimetric-type inequalities on constant curvature manifolds (with Y. Ge), *Adv. Calc. Var.* 5 (2012), no. 3, 251-284.
- 47) Confinement in nonlocal interaction equations (with J. A. Carrillo, M. Di Francesco, T. Laurent, and D. Slepčev), *Nonlinear Anal.* 75 (2012), no. 2, 550-558.
- 48) Semiclassical limit for mixed states with singular and rough potentials (with M. Ligabò and T. Paul), *Indiana Univ. Math. J.* 61 (2012), no. 1, 193-222.
- 49) Total Variation Flow and Signed Fast Diffusion in one dimension (with M. Bonforte), *J. Differential Equations* 252 (2012), no. 8, 4455-4480.
- 50) Existence of Eulerian solutions to the semigeostrophic equations in physical space: the 2-dimensional periodic case (with L. Ambrosio, M. Colombo, and G. De Philippis), *Comm. Partial Differential Equations* 37 (2012), no. 12, 2209-2227.
- 51) Non-Local Gradient Dependent Operators (with C. Bjorland and L. Caffarelli), *Adv. Math.* 230 (2012), no. 4-6, 1859-1894.
- 52) Regularity of optimal transport maps on multiple products of spheres (with Y.-H. Kim and R. J. McCann), *J. Eur. Math. Soc. (JEMS)* 15 (2013), no. 4, 1131-1166.
- 53) A stability result for the relative isoperimetric inequality inside convex cones (with E. Indrei), *J. Geom. Anal.* 23 (2013), no. 2, 938-969.
- 54) Regularity of solutions to the parabolic fractional obstacle problem (with L. Caffarelli), *J. Reine Angew. Math.* 680 (2013), 191-233.
- 55)  $W^{2,1}$  regularity for solutions of the Monge-Ampère equation (with G. De Philippis), *Invent. Math.* 192 (2013), no. 1, 55-69.

- 56) Sharp stability theorems for the anisotropic Sobolev and log-Sobolev inequalities on functions of bounded variation (with F. Maggi and A. Pratelli), *Adv. Math.* 242 (2013), 80-101.
- 57) Stability for a GNS inequality and the Log-HLS inequality, with application to the critical mass Keller-Segel equation (with E. Carlen), *Duke Math. J.* 162 (2013), no. 3, 579-625.
- 58) On the isoperimetric problem for radial log-convex densities (with F. Maggi), *Calc. Var. Partial Differential Equations* 48 (2013), no. 3-4, 447-489.
- 59) Asymptotics of the  $s$ -perimeter as  $s \searrow 0$  (with S. Dipierro, G. Palatucci and E. Valdinoci), *Discrete Contin. Dyn. Syst.* 33 (2013), no. 7, 2777-2790.
- 60) A note on interior  $W^{2,1+\varepsilon}$  estimates for the Monge-Ampère equation (with G. De Philippis and O. Savin), *Math. Ann.* 357 (2013), no. 1, 11-22.
- 61) Second order stability for the Monge-Ampère equation and strong Sobolev convergence of optimal transport maps (with G. De Philippis), *Anal. PDE* 6 (2013), no. 4, 993-1000.
- 62) On sets of finite perimeter in Wiener spaces: reduced boundary and convergence to half-spaces (with L. Ambrosio and E. Runa), *Atti Accad. Naz. Lincei Cl. Sci. Fis. Mat. Natur. Rend. Lincei (9) Mat. Appl.* 24 (2013), no. 1, 111-122.
- 63) Hölder continuity and injectivity of optimal maps (with Y.-H. Kim and R. J. McCann), *Arch. Ration. Mech. Anal.* 209 (2013), no. 3, 747-795.
- 64) Sobolev regularity for Monge-Ampère type equations (with G. De Philippis), *SIAM J. Math. Anal.* 45 (2013), no. 3, 1812-1824.
- 65) On supporting hyperplanes to convex bodies (with Y.-H. Kim and R. J. McCann), *Methods Appl. Anal.* 20 (2013), no. 3, 261-271.
- 66) A geometric approach to correlation inequalities in the plane (with F. Maggi and A. Pratelli), *Ann. Inst. Henri Poincaré Probab. Stat.* 50 (2014), no. 1, 1-14.
- 67) Bootstrap regularity for integro-differential operators, and its application to nonlocal minimal surfaces (with B. Barrios and E. Valdinoci), *Ann. Sc. Norm. Super. Pisa Cl. Sci. (5)* 13 (2014), no. 3, 609-639.
- 68) A global existence result for the semigeostrophic equations in three dimensional convex domains (with L. Ambrosio, M. Colombo, and G. De Philippis), *Discrete Contin. Dyn. Syst.* 34 (2014), no. 4, 1251-1268.
- 69) WKB analysis of Bohmian dynamics (with C. Klein, P. Markowich, and C. Sparber), *Comm. Pure Appl. Math.* 67 (2014), no. 4, 581-620.
- 70) Regularity results for very degenerate elliptic equations (with M. Colombo), *J. Math. Pures Appl. (9)* 101 (2014), no. 1, 94-117.
- 71) How to recognize convexity of a set from its marginals (with D. Jerison), *J. Funct. Anal.* 266 (2014), no. 3, 1685-1701.
- 72) An excess-decay result for a class of degenerate elliptic equations (with M. Colombo) *Discrete Contin. Dyn. Syst. Ser. S* 7 (2014), no. 4, 631-652.
- 73) Higher integrability for minimizers of the Mumford-Shah functional (with G. De Philippis), *Arch. Ration. Mech. Anal.* 213 (2014), no. 2, 491-502.
- 74) A general class of free boundary problems for fully nonlinear elliptic equations (with H. Shahgholian), *Arch. Ration. Mech. Anal.* 213 (2014), no. 1, 269-286.
- 75) Strongly nonlocal dislocation dynamics in crystals (with S. Dipierro and E. Valdinoci), *Comm. Partial Differential Equations* 39 (2014), no. 12, 2351-2387.
- 76) Closing Aubry sets I (with L. Rifford), *Comm. Pure Appl. Math.* 68 (2015), no. 2, 210-285.
- 77) Closing Aubry sets II (with L. Rifford), *Comm. Pure Appl. Math.* 68 (2015), no. 3, 345-412.
- 78) Optimal regularity of the convex envelope (with G. De Philippis), *Trans. Amer. Math. Soc.* 367 (2015), no. 6, 4407-4422.

- 79) A general class of free boundary problems for fully nonlinear parabolic equations (with H. Shahgholian), *Ann. Mat. Pura Appl.* (4) 194 (2015), no. 4, 1123-1134.
- 80) Quantitative stability for sumsets in  $\mathbb{R}^n$  (with D. Jerison), *J. Eur. Math. Soc. (JEMS)* 17 (2015), no. 5, 1079-1106.
- 81) Generic hyperbolicity of Aubry sets on surfaces (with G. Contreras and L. Rifford), *Invent. Math.* 200 (2015), no. 1, 201-261.
- 82) Isoperimetry and stability properties of balls with respect to nonlocal energies (with N. Fusco, F. Maggi, V. Millot, and M. Morini), *Comm. Math. Phys.* 336 (2015), no. 1, 441-507.
- 83) Partial regularity for optimal transport maps (with G. De Philippis), *Publ. Math. Inst. Hautes Études Sci.* 121 (2015), 81-112.
- 84) On the convexity of injectivity domains on nonfocal manifolds (with T. Gallouët and L. Rifford), *SIAM J. Math. Anal.* 47 (2015), no. 2, 969-1000.
- 85) Boundary  $\varepsilon$ -regularity in optimal transportation (with S. Chen), *Adv. Math.* 273 (2015), 540-567.
- 86) A note on the dimension of the singular set in free interface problems (with G. De Philippis), *Differential Integral Equations* 28 (2015), 523-536.
- 87) Transport maps for  $\beta$ -matrix models and universality (with F. Bekerman and A. Guionnet), *Comm. Math. Phys.* 338 (2015), no. 2, 589-619.
- 88) Existence and uniqueness of maximal regular flows for non-smooth vector fields (with L. Ambrosio and M. Colombo), *Arch. Ration. Mech. Anal.* 218 (2015), no. 2, 1043-1081.
- 89) *BMO*-type norms related to the perimeter of sets (with L. Ambrosio, J. Bourgain, and H. Brezis), *Comm. Pure Appl. Math.* 69 (2016), no. 6, 1062-1086.
- 90) On the density function on moduli spaces of toric 4-manifolds (with Á. Pelayo), *Adv. Geom.* 16 (2016), no. 3, 291-300.
- 91) Nonlinear bounds in Hölder spaces for the Monge-Ampère equation (with Y. Jhaveri and C. Mooney), *J. Funct. Anal.* 270 (2016), no. 10, 3808-3827.
- 92) Stability results on the smoothness of optimal transport maps with general costs (with S. Chen), *J. Math. Pures Appl.* (9) 106 (2016), no. 2, 280-295.
- 93) Weak KAM Theory for a Weakly Coupled System of Hamilton-Jacobi Equations (with D. Gomes and D. Marcon), *Calc. Var. Partial Differential Equations* 55 (2016), no. 4, 55-79.
- 94) Characterization of isoperimetric sets inside almost-convex cones (with E. Baer), *Discrete Contin. Dyn. Syst.* 37 (2017), no. 1, 1-14.
- 95) Quantitative stability of the Brunn-Minkowski inequality for sets of equal volume (with D. Jerison), *Chin. Ann. Math. Ser. B* 38 (2017), no. 2, 393-412.
- 96) Rigidity and stability of Caffarelli's log-concave perturbation theorem (with G. De Philippis), *Nonlinear Anal.* 154 (2017), 59-70.
- 97) Partial  $W^{2,p}$  regularity for optimal transport maps (with S. Chen), *J. Funct. Anal.*, 272 (2017), no. 11, 4588-4605.
- 98) On the regularity of the free boundary in the  $p$ -Laplacian obstacle problem (with B. Krummel and X. Ros-Oton), *J. Differential Equations*, 263 (2017), no. 3, 1931-1945.
- 99) Quantitative stability for the Brunn-Minkowski inequality (with D. Jerison), *Adv. Math.*, 314 (2017), 1-47.
- 100) Universality in several-matrix models via approximate transport maps (with A. Guionnet), *Acta Math.*, 217 (2016), no. 1, 81-176.
- 101) Regularity and Bernstein-type results for nonlocal minimal surfaces (with E. Valdinoci), *J. Reine Angew. Math.*, 729 (2017), 263-273.
- 102) Infinite speed of propagation and regularity of solutions to the fractional porous medium equation in general domains (with M. Bonforte and X. Ros-Oton), *Comm. Pure Appl. Math.*, 70 (2017), no. 8, 1472-1508.



- 103) Regularity of codimension-1 minimizing currents under minimal assumptions on the integrand, *J. Diff. Geom.*, 106 (2017), no. 3, 371-391.
- 104) Rigidity and sharp stability estimates for hypersurfaces with constant and almost-constant nonlocal mean curvature (with G. Ciraolo, F. Maggi, and M. Novaga), *J. Reine Angew. Math.*, to appear.
- 105) Gradient stability for the Sobolev inequality: the case  $p \geq 2$  (with R. Neumayer), *J. Eur. Math. Soc. (JEMS)*, to appear.
- 106) Symplectic  $G$ -capacities and integrable systems (with J. Palmer and Á. Pelayo), *Ann. Sc. Norm. Super. Pisa Cl. Sci. (5)* 18 (2018), no. 1, 65-103.
- 107) Lipschitz changes of variables between perturbations of log-concave measures (with M. Colombo and Y. Jhaveri), *Ann. Sc. Norm. Super. Pisa Cl. Sci., (5)* 17 (2017), no. 4, 1491-1519.
- 108) Geometry of minimizers for the interaction energy with mildly repulsive potentials (with J. A. Carrillo and F. S. Patacchini), *Ann. Inst. H. Poincaré Anal. Non Linéaire*, 34 (2017), no. 5, 1299-1308.
- 109) A quantitative analysis of metrics on  $\mathbb{R}^n$  with almost constant positive scalar curvature, with applications to fast diffusion flows (with G. Ciraolo and F. Maggi), *Int. Math. Res. Not. IMRN*, to appear.
- 110) Global regularity for the free boundary in the obstacle problem for the fractional Laplacian (with B. Barrios and X. Ros-Oton), *Amer. J. Math.*, to appear.
- 111) On the Lagrangian structure of transport equations: the Vlasov-Poisson system (with L. Ambrosio and M. Colombo), *Duke Math. J.*, 116 (2017), no. 18, 3505-3568.
- 112) Free boundary regularity in the parabolic fractional obstacle problem (with B. Barrios and X. Ros-Oton), *Comm. Pure Appl. Math.*, to appear.
- 113) Global well-posedness of the spatially homogeneous Kolmogorov-Vicsek model as a gradient flow (with M.-J. Kang and J. Morales), *Arch. Ration. Mech. Anal.*, 227 (2018), no. 3, 869-896.
- 114) An obstacle problem for conical deformations of thin elastic sheets (with C. Mooney), *Arch. Ration. Mech. Anal.*, 228 (2018), no. 2, 401-429.
- 115) Sharp global estimates for local and nonlocal porous medium-type equations in bounded domains (with M. Bonforte and J. L. Vazquez), *Anal. PDE*, 11 (2018), no. 4, 945-982.
- 116) The sharp quantitative Euclidean concentration inequality (with F. Maggi and C. Mooney), *Camb. J. Math.* 6 (2018), no. 1, 59-87.
- 117) Sharp boundary behaviour of solutions to semilinear nonlocal elliptic equations (with M. Bonforte and J. Vázquez), *Calc. Var. Partial Differential Equations*, 17 (2017), no. 4, 1491-1519.
- 118) A rigorous derivation from the kinetic cucker-smale model to the pressureless euler system with nonlocal alignment (with M.-J. Kang), *Anal. PDE*, to appear.

#### Submitted papers

- 1) A sharp Freiman type estimate for semisums in  $\mathbb{R}^n$  (with D. Jerison)
- 2) Optimal regularity for the convex envelope and semiconvex functions related to supersolutions of fully nonlinear elliptic equations (with J. E. M. Braga and D. Moreira)
- 3) On stable solutions for boundary reactions: a De Giorgi type result in dimension  $4+1$  (with J. Serra)
- 4) On the fine structure of the free boundary for the classical obstacle problem (with J. Serra)
- 5) Optimal regularity and structure of the free boundary for minimizers in cohesive zone models (with L. Caffarelli and F. Cagnetti)
- 6) On the Continuity of Center-Outward Distribution and Quantile Functions

## Lecture notes and reviews

- 1) Cédric Villani reçoit un prix de la Société Mathématiques Européenne. (French) [Cédric Villani, 2008 European Mathematical Society Prize] (with L. Desvillettes), *Gaz. Math.* No. 120 (2009), 76-81
- 2) Regularity of optimal transport maps [after Ma-Trudinger-Wang and Loeper], *Séminaire Bourbaki. Vol. 2008/2009. Exposés 997-1011. Astérisque* No. 332 (2010), Exp. No. 1009, ix, 341-368.
- 3) Optimal Transport. Old and New. [book review], *Bull. Amer. Math. Soc. (N.S.)* 47 (2010), no. 4, 723-727.
- 4) Almost everywhere well-posedness of continuity equations with measure initial data (with L. Ambrosio), *C. R. Math. Acad. Sci. Paris* 348 (2010), no. 5-6, 249-252.
- 5) Optimal Transport and Curvature (with C. Villani), *Nonlinear PDE's and applications, 171-217, Lecture Notes in Math.* 2028, Springer, Heidelberg, 2011.
- 6) Quantitative isoperimetric inequalities, with applications to the stability of liquid drops and crystals, *Concentration, functional inequalities and isoperimetry, 77-87, Contemp. Math.* 545, Amer. Math. Soc. Providence, RI, 2011.
- 7) Existence and uniqueness results for the continuity equation and applications to the chromatography system (with L. Ambrosio, G. Crippa, and L. V. Spinolo), *Nonlinear conservation laws and applications, 195-204, IMA Vol. Math. Appl.* 153, Springer, New York, 2011.
- 8) Stability in geometric and functional inequalities, *Proceedings of the 6th European Congress of Mathematics*, 2012
- 9) Variational models for the incompressible Euler equations (with S. Daneri), *HCDTE lecture notes. Part II. Nonlinear hyperbolic PDEs, dispersive and transport equations, 51 pp., AIMS Ser. Appl. Math., 7, Am. Inst. Math. Sci. (AIMS)*, Springfield, MO, 2013.
- 10) Aubry sets, Hamilton-Jacobi equations, and Mañé Conjecture (with L. Rifford), *Geometric analysis, mathematical relativity, and nonlinear partial differential equations, 83-104, Contemp. Math.* 599, Amer. Math. Soc., Providence, RI, 2013.
- 11) Lecture notes on variational models for incompressible Euler equations (with L. Ambrosio), *Optimal transportation, 58-71, London Math. Soc. Lecture Note Ser.* 413, Cambridge Univ. Press, Cambridge, 2014.
- 12) Sobolev regularity for the Monge-Ampère equation, with application to the semi-geostrophic equations, *Zap. Nauchn. Sem. S.-Peterburg. Otdel. Mat. Inst. Steklov. (POMI) 411 (2013), Teoriya Predstavlenii Dinamicheskie Sistemy, Kombinatornye Metody. XXII, 103-118, 242; translation in J. Math. Sci. (N. Y.)* 196 (2014), no. 2, 175-183.
- 13) The Monge-Ampère equation and its link to optimal transportation (with G. De Philippis), *Bull. Amer. Math. Soc. (N.S.)* 51 (2014), no. 4, 527-580
- 14) Partial regularity results in optimal transportation (with G. De Philippis), *Trends in Contemporary Mathematics*, Springer INdAM Series, Volume 8, (2014), 293-307
- 15) Quantitative stability results for the Brunn-Minkowski inequality, *Proceedings of the ICM 2014*.
- 16) Stability results for the Brunn-Minkowski inequality, *Colloquium De Giorgi 2013 and 2014, 119-127, Colloquia* 5, Ed. Norm., Pisa, 2014.
- 17) Perimeter of sets and *BMO*-type norms (with L. Ambrosio, J. Bourgain, and H. Brezis), *C. R. Math. Acad. Sci. Paris* 352 (2014), no. 9, 697-698.
- 18) An overview of unconstrained free boundary problems (with H. Shahgholian), *Philos. Trans. A* 373 (2015), no. 2050, 20140281, 11 pp.
- 19) A transportation approach to universality in random matrix theory, *Boll. Unione Mat. Ital.* 10 (2017), no. 1, 55-74.
- 20) Global existence for the semigeostrophic equations via Sobolev estimates for Monge-Ampère, *CIME Lecture Notes*, Springer, to appear.

- 21) Regularity theory for local and nonlocal minimal surfaces: an overview (with M. Cozzi), *CIME Lecture Notes*, Springer, to appear.
- 22) Free boundary regularity in obstacle problems, *Journées EDP 2018*, to appear

### Books

- 1) Optimal transportation and action-minimizing measures. *Thesis, Scuola Normale Superiore, Pisa, 2007. Tesi. Scuola Normale Superiore di Pisa (Nuova Series) [Theses of Scuola Normale Superiore di Pisa (New Series)], 8. Edizioni della Normale, Pisa, 2008. xx+254 pp.*
- 2) Autour des inégalités isopérimétriques. (French) [On isoperimetric inequalities] (with W. Bench, C. de Franchis, L. Deproix, S. Gilles, B. Oh, A. Tenne, K. Webster), *Edited and with a preface by Figalli. Éditions de l'École Polytechnique, Palaiseau, 2011. 124 pp.*
- 3) The Monge-Ampère Equation and its Applications. *Zürich Lectures in Advanced Mathematics. European Mathematical Society (EMS), Zurich, 2017.*

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## Teaching

### Undergraduate and graduate classes

- 2017 – 2018 (fall) *Analysis III*, undergraduate class (ETH Zürich)
- 2016 – 2017 (spring) *Topics in the calculus of variations*, graduate class (ETH Zürich)
- 2016 – 2017 (fall) *Free Boundary Problems*, graduate class (ETH Zürich)
- 2015 – 2016 (spring) *Hamilton-Jacobi equations and dynamics*, graduate class (UT Austin)
- 2015 – 2016 (spring) *PDE II*, graduate class (UT Austin)
- 2014 – 2015 (spring) *PDE II*, graduate class (UT Austin)
- 2014 – 2015 (fall) *The Monge-Ampère equation and its applications*, Nachdiplom Lectures (ETH Zürich)
- 2013 – 2014 (spring) *Topics in nonlinear analysis*, graduate class (UT Austin)
- 2012 – 2013 (spring) *Optimal transport*, graduate class (UT Austin)
- 2012 – 2013 (fall) *Topics in Differential Equations*, graduate class (MIT)
- 2011 – 2012 (spring) *Calculus of Variations*, graduate class (UT Austin)
- 2011 – 2012 (spring) *PDE II*, graduate class (UT Austin)
- 2010 – 2011 (spring) *Geometric Measure Theory*, graduate class (UT Austin)
- 2010 – 2011 (spring) *PDE II*, graduate class (UT Austin)
- 2008 – 2009 (spring) *Transport optimal et applications* (in french), graduate class (Université Paris-Sud)
- 2008 – 2009 (fall) *Equations différentielles et systèmes dynamiques* (in french), undergraduate class (Ecole Polytechnique)

### Invited graduate or research-level courses

- Jun 2018 *Free boundary regularity in obstacle problems*, Journées EDP 2018 (Obernai, France)
- Nov 2017 *The obstacle problem*, Conference on Particle Systems and PDE's (Nice, France)
- Sep 2017 *The obstacle problem*, “Summer School” at OxPDE (Oxford, UK)
- Jul 2016 *Regularity results for local and non-local energy interactions*, CIME Summer School on “Nonlocal and nonlinear diffusions and interactions: new methods and directions” (Cetraro, Italy)
- Feb 2016 *Flow of nonsmooth vector fields and applications*, “The 6th Korea PDE school” at NIMS (Daejeon, Korea)
- Jul 2015 *Flow of nonsmooth vector fields and applications*, “International Workshop on Elliptic and Kinetic Partial Differential Equations” at IMPA (Rio de Janeiro, Brazil)

- Mar 2015 *The Monge-Ampère equation*, “Thomas Wolff Memorial Lectures in Mathematics” at Caltech (Pasadena, CA, USA)
- Dec 2014 *Nonlocal minimal surfaces*, School-Workshop “Nonlocal days in Basel” (Basel, Switzerland)
- Jun 2014 *Regularity results in free boundary problems*, EMS Summer School on “Interactions between Dynamical Systems and Partial Differential Equations” (Barcelona, Spain)
- Jun 2014 *Trasporto ottimale ed equazioni di tipo Monge-Ampère*, 1° Corso Intensivo di Calcolo delle Variazioni (Catania, Italy)
- Jun 2014 *Monge-Ampère type equations and applications*, CIME Summer School on “Partial Differential Equations and Geometric Measure Theory” (Cetraro, Italy)
- May 2014 *Stability results for geometric and functional inequalities*, “Nirenberg Lectures in Geometric Analysis” at the CRM (Montreal, Canada)
- May 2014 *Regularity for the Monge-Ampère equation, with applications to the semigeostrophic equations*, School-Workshop on “Kinetics, non standard diffusions and stochastics: emerging challenges in the sciences” (Austin, TX, USA)
- Jul 2013 *Stability results for geometric inequalities*, Summer School on “Geometric Measure Theory and Optimal Transport” at ICTP (Trieste, Italy)
- Jan 2012 *Stabilité dans les inégalités fonctionnelles, transport optimal et EDP*, Cours Peccot at the Collège de France (Paris, France)
- Jun 2011 *Optimal transport, functional inequalities and Riemannian geometry*, Summer School on “Aubry Mather Theory and Optimal Transport” (Lisbon, Portugal)
- Jun 2011 *Free boundaries in variational problems*, ERC-Summer School on “Calculus of Variations, Continuum Mechanics and Geometric Inequalities” (Ischia, Italy)
- May 2011 *Variational models for the incompressible Euler equations*, Summer School during the Trimester Program on “Nonlinear Hyperbolic PDEs, Dispersive and Transport Equation: Analysis and Control” (Trieste, Italy)
- Sep 2010 *Applications of optimal transport to isoperimetric inequalities and Riemannian geometry*, Summer School on “Optimal mass transport and geometric inequalities” (Haus Bergkranz, Austria)
- Apr 2010 *Optimal transport and applications*, 2009-2010 Salomon Bockner Lectures in Mathematics (Houston, TX, USA)
- Jun 2009 *Variational models for the incompressible Euler equations*, Summer School on “Optimal Transportation: Theory and Applications” (Grenoble, France)
- Sep 2007 *Variational models for the incompressible Euler equations*, Summer School on “Optimal transportation structures, gradient flows and entropy methods for applied PDE’s” (Vienna, Austria)

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## Invitations and communications

### Invitations

- Sep 2015 – Dec 2015 Ecole Normale Supérieure of Lyon, (Lyon, France), four months
- Sep 2014 – Dec 2014 ETH Zürich (Zurich, Switzerland), four months
- Jun 2014 – Jul 2014 Scuola Normale Superiore (Pisa, Italy), one month
- Sep 2013 – Nov 2013 MSRI (Berkeley, CA, USA), three months
- Sep 2012 – Jan 2013 MIT (Cambridge, MA, USA), five months
- Jun 2012 – Jul 2012 University of Nice (Nice, France), one month
- May 2011 – Jun 2011 University of Nice (Nice, France), one month
- Oct 2010 – Nov 2010 University of Nice (Nice, France), one month
- Sep 2009 Centro Ennio de Giorgi (Pisa, Italy), two weeks
- Mar 2009 Institute for Advanced Study (Princeton, NJ, USA), two weeks
- Jan 2009 Universidad Autónoma de Madrid (Madrid, Spain), two weeks
- Nov 2008 – Dec 2008 University of Texas at Austin (Austin, TX, USA), one month

Oct 2008 – Nov 2008 Centro Ennio de Giorgi (Pisa, Italy), three weeks  
 Mar 2008 – Jun 2008 UCLA (Los Angeles, California, USA), three months  
 Nov 2007 – Dec 2007 University of Toronto (Toronto, Canada), five weeks  
 Sep 2007 Wolfgang Pauli Institute (Vienna, Austria), two weeks  
 May 2007 – Jul 2007 University of Bonn, (Bonn, Germany), three months  
 Sep 2005 – Feb 2006 Ecole Normale Supérieure of Lyon, (Lyon, France), six months

#### Invited lectures

Jul 2018 Conference on “Calculus of Variations and Geometric Measure Theory” at University of Sussex (Brighton, United Kingdom)  
 Apr 2018 “The 4th Duke Mathematical Journal Conference” at Duke University (Durham, NC, USA)  
 Apr 2018 Workshop on “Entropies, the Geometry of Nonlinear Flows, and their Applications” at BIRS (Banff, Canada)  
 Mar 2018 Yorkshire and Durham Geometry Days (Durham, United Kingdom)  
 Jan 2018 Conference on “Recent trends in PDE” at King’s College London (London, United Kingdom)  
 Nov 2017 Symposium at the University of Amsterdam (Amsterdam, Netherlands)  
 Jul 2017 Oberwolfach Workshop “Partial Differential Equations” (Oberwolfach, Germany)  
 Jul 2017 Workshop on “Aggregation-Diffusion PDEs: Variational Principles, Nonlocality and Systems” (Anacapri, Italy)  
 Jul 2017 Conference on “Recent Advances in PDEs and the Calculus of Variations” (Venice, Italy)  
 Jun 2017 “Orienta Cento” at Scuola Normale Superiore of Pisa (Pisa, Italy)  
 Jun 2017 Workshop on “PDEs: Modelling, Analysis and Numerical Simulation” at the University of Granada (Granada, Spain)  
 Jun 2017 “23rd Rolf Nevanlinna Colloquium” at ETH Zürich (Zurich, Switzerland)  
 May/June 2017 Conference on “Nonlocal Partial Differential Equations and Applications to Geometry, Physics and Probability” at ICTP (Trieste, Italy)  
 May 2017 Conference on “Nonlinear diffusion and free boundary problems” at Universidad Autónoma de Madrid (Madrid, Spain)  
 Apr 2017 Workshop on “Transport problems in Zürich” at University Zürich (Zurich, Switzerland)  
 Apr 2017 Conference on “Generated Jacobian Equations: from Geometric Optics to Economics” at BIRS (Banff, Canada)  
 Feb 2017 “Maxwell Symposium in PDEs” (Edinburgh, Scotland)  
 Jan 2017 Conference on “Calculus of Variations and Optimal Transportation” in the honor of Yann Brenier for his 60th birthday (Paris, France)  
 Nov 2016 Leonardo Da Vinci Lectures (Milan, Italy)  
 Oct 2016 INdAM Workshop “Analytic Aspects of Convexity 2016” at INdAM (Rome, Italy)  
 Sep 2016 Conference “A mathematical tribute to Ennio De Giorgi” (Pisa, Italy)  
 Sep 2016 Workshop on “Interactions between Partial Differential Equations & Functional Inequalities” at Mittag-Leffler (Stockholm, Sweden)  
 May 2016 Conference on “Calculus of Variations and Nonlinear Partial Differential Equations” at Columbia University (New York, NY, USA)  
 Feb 2016 Workshop on “Advances in Kinetic and Fluid Dynamics Transport: Analysis and Approximations” (Austin, TX, USA)  
 Jan 2016 Workshop on “Probability and asymptotic analysis in strongly coupled systems” (Bonn, Germany)  
 Nov 2015 ANR Weak KAM beyond Hamilton-Jacobi (Lyon, France)  
 Sep 2015 XX Congress of the Italian Mathematical Union (Siena, Italy)

- Aug 2015 63rd Workshop “Variational Analysis and Applications” (Erice, Italy)
- Aug 2015 Oberwolfach workshop “Partial Differential Equations” (Oberwolfach, Germany)
- Jun 2015 Conference on “Geometric Analysis, Free Boundary Problems and Measure Theory” (Leipzig, Germany)
- Jun 2015 Symposium: 50 Years of Mathematics at the FIM (Zurich, Switzerland)
- May 2015 Conference on “Calculus of Variations and Nonlinear Partial Differential Equations” at UT Austin (Austin, TX, USA)
- Apr 2015 18th Rivière-Fabes Symposium on Analysis and PDE & Spring 2015 Midwest PDE Conference (Minneapolis, MN, USA)
- Feb 2015 22nd Southern California Geometric Analysis Seminar (San Diego, CA, USA)
- Nov 2014 Conference of “Calculus of Variations: Geometry, Inequalities, and Design” at the Fields Institute (Toronto, Canada)
- Aug 2014 International Congress of Mathematicians (Seoul, Korea)
- Aug 2014 Workshop on “Nonlinear Analysis and Nonlinear Elliptic PDEs”, ICM 2014 Satellite Conference at KAIST (Daejeon, Korea)
- Aug 2014 Workshop on “Variational Method for Nonlinear Elliptic Problems”, ICM 2014 Satellite Conference at KAIST (Daejeon, Korea)
- Jul 2014 “XV International Conference on Hyperbolic Problems” at IMPA (Rio de Janeiro, Brazil)
- Jul 2014 Oberwolfach workshop “Calculus of Variations” (Oberwolfach, Germany)
- Jul 2014 Workshop on “Existence and Regularity for Nonlinear Systems of Partial Differential Equations” (Pisa, Italy)
- Apr 2014 Conference “Beyond Hamilton-Jacobi” (Avignon, France)
- Apr 2014 AMS Spring Central Regional Meeting (Lubbock, TX, USA)
- Dec 2013 SIAM Conference on “Analysis of PDEs” (Orlando, FL, USA)
- Nov 2013 “New Trends in Calculus of Variations and Partial Differential Equations” in the honour of the 65th birthday of Carlo Sbordone (Naples, Italy)
- Nov 2013 “Midwest PDE seminar” at Purdue University (West Lafayette, IN, USA)
- Sep 2013 Conference on “Qualitative and geometric Aspects of Elliptic PDE’s” (Barcelona, Spain)
- Aug 2013 Oberwolfach workshop “Partial Differential Equations” (Oberwolfach, Germany)
- Jul 2013 Conference on “Analysis and Partial Differential Equations” in the honour of the 60th birthday of Nassif Goussoub (Vancouver, Canada)
- Jun 2013 Workshop on “Nonlinear Elliptic and Parabolic Partial Differential Equations” (Milan, Italy)
- Jun 2013 “INdAM Day” (Palermo, Italy)
- May 2013 Conference on “Recent Advances in Nonlinear PDE” (New York, NY, USA)
- Apr 2013 “Graduate Student Topology and Geometry Conference” (South Bend, IN, USA)
- Nov 2012 “Madison Autumn Analysis and PDE Workshop” (Madison, WI, USA)
- Nov 2012 Workshop on “Optimal Transportation and Applications” (Pisa, Italy)
- Jul 2012 Oberwolfach workshop “Calculus of Variations” (Oberwolfach, Germany)
- Jul 2012 Workshop “Geometric inequalities in Calculus of variations” (Pisa, Italy)
- Jul 2012 Workshop “Recent Trends in Nonlinear Diffusion” (Pisa, Italy)
- Jul 2012 “6th European Congress of Mathematics” (Krakow, Poland)
- Jun 2012 “Geometric and Nonlinear Partial Differential Equations” on the occasion of Neil Trudinger’s 70th birthday (Xi’An, China)
- Jun 2012 “Monge-Kantorovich optimal transportation problem, transport metrics and their applications” dedicated to the centenary of L. V. Kantorovich (St. Petersburg, Russia)
- May 2012 Concentration month on “Nonlinear elliptic PDEs” (Chicago, IL, USA)

- Jan 2012 Meeting on “Functional Inequalities and PDE in the Life Sciences” (Paris, France)
- Dec 2011 Workshop “Dynamical Optimization in PDE and Geometry” (Bordeaux, France)
- Oct 2011 33rd Midwest Probability Colloquium (Evanston, IL, USA)
- Sep 2011 Workshop “Geometry meets transport” (Nice, France)
- Sep 2011 4th MSJ-SI conference on “Nonlinear Dynamics in Partial Differential” (Fukuoka, Japan)
- Aug 2011 MSRI Program on Quantitative Geometry, “Introductory Workshop on Quantitative Geometry” (Berkeley, CA, USA)
- Aug 2011 Summer Course UIMP 2011 “Frontiers of Mathematics and Applications” (Santander, Spain)
- Aug 2011 Oberwolfach workshop “Partial Differential Equations” (Oberwolfach, Germany)
- Jun 2011 OPTPDE-BCAM Summer School on “Challenges in Applied Control and Optimal Design” (Bilbao, Spain)
- Jan 2011 International Conference on “Nonlinear Evolutionary Partial Differential Equations” (Shanghai, China)
- Dec 2010 Southeast Geometry Seminar XVII (Knoxville, TN, USA)
- Dec 2010 PRIMA-PARC-PIMS meeting in PDE (Vancouver, Canada)
- Nov 2010 Colloque en l’honneur de Cédric Villani (Lyon, France)
- Nov 2010 Workshop on “Geometric Probability and Optimal Transportation” (Toronto, Canada)
- Oct 2010 ERC Workshop on “Optimal Transportation and Applications” (Pisa, Italy)
- Sep 2010 Opening Conference of the Center for Mathematics and Theoretical Physics on “Seminal Interactions between Mathematics and Physics” (Rome, Italy)
- Sep 2010 4th Symposium on “Analysis of Geometric Evolution” (Austin, TX, USA)
- Jul 2010 IHES Asian-French Summer school on “Singularities in PDE”, minisymposium on “Geometric Measure Theory and Calculus of Variations” (IHES, France)
- Jul 2010 Oberwolfach workshop “Calculus of Variations” (Oberwolfach, Germany)
- Jul 2010 SIAM 2010 Annual Meeting, Session on “Recent Advances in Calculus of Variations and Partial Differential Equations” (Pittsburgh, PA, USA)
- Jun 2010 Meeting on “Applied Mathematics and Calculus of Variations” (Rome, Italy)
- Jun 2010 SIAM conference “Emerging Topics in Dynamical Systems and Partial Differential Equations”, Session on “Entropy methods in evolution PDEs” (Barcelona, Spain)
- May 2010 BIRS Workshop “Nonlinear Diffusions and Entropy Dissipation: From Geometry to Biology” (Banff, Canada)
- Mar 2010 Workshop “New Trends in Sub-Riemannian Geometry” (Nice, France)
- Feb 2010 IMA Workshop “Analysis and Computation of Incompressible Fluid Flow” (Minneapolis, MN, USA)
- Oct 2009 AMS 2009 Fall Southeastern Meeting, Session on “Concentration, Functional Inequalities and Isoperimetry” (Boca Raton, FL, USA)
- Oct 2009 AMS 2009 Fall Central Section Meeting, Session on “Formations of Singularities in Geometric Flows” (Waco, TX, USA)
- Sep 2009 Regularity for non-linear PDEs (Pisa, Italy)
- Aug 2009 Oberwolfach Workshop “Partielle Differentialgleichungen ” (Oberwolfach, Germany)
- Jul 2009 Workshop “Optimization, Transport and Equilibrium in Economics” (Paris, France)
- Jun 2009 “Nonlinear PDE and Free Boundary Problems” (Warwick, United Kingdom)
- Jun 2009 Colloque du GDR “Analyse des équations aux dérivées partielles” (Evian, France)
- May 2009 51st Workshop “Variational Analysis and Applications” (Erice, Italy)
- Jan 2009 First winter school at IMDEA on “PDE’s and inequalities” (Madrid, Spain)
- Nov 2008 Workshop “Optimal Transportation and Applications” (Pisa, Italy)
- Jul 2008 Oberwolfach workshop “Calculus of Variations” (Oberwolfach, Germany)

- Jun 2008 Culminating workshop on “Optimal Transport” (Lake Arrowhead, CA, USA)
- Apr 2008 Workshop “Numerics and Dynamics for Optimal Transport” (Los Angeles, CA, USA)
- Mar 2008 “Séminaire commun Analyse-Geometrie” (Luminy, France)
- Feb 2008 XVIII Convegno nazionale di “Calcolo delle Variazioni” (Levico Terme, Italy)
- Dec 2007 Canadian Mathematical Society Meeting, Session on “Calculus of Variations in Physics Geometry and Economics” (London, Canada)
- Oct 2007 Workshop “Regularity in optimal transportation” (Nice, France)
- Sep 2007 Workshop “Optimal transportation structures, gradient flows and entropy methods for applied PDE’s” (Vienna, Austria)
- Sep 2007 Workshop “Non-linear hyperbolic equations and related topics” (Pisa, Italy)
- Jun 2007 Fifth meeting on “Hyperbolic Conservation Laws: Recent results and Research perspectives” (Trieste, Italy)
- Feb 2007 XVII Convegno nazionale di “Calcolo delle Variazioni” (Levico Terme, Italy)
- Dec 2006 Workshop “Geometric evolutions and applications” (Pisa, Italy)
- Nov 2006 Workshop “Optimal transport: theory and applications” (Pisa, Italy)
- Jul 2006 Joint French-Italian Mathematical Meeting, Session on “Qualitative Methods for Hamilton-Jacobi Equations and Applications” (Turin, Italy)

#### Research seminars

- Jun 2018 *Regularity of interfaces in phase transition via obstacle problems*, Mathematics Colloquium at the University of Warwick (Coventry, United Kingdom)
- Apr 2018 *Regularity of interfaces in phase transition via obstacle problems*, Analysis seminar at University of Texas at Austin (Austin, TX, USA)
- Mar 2018 *Regularity of interfaces in phase transition via obstacle problems*, Colloquia Patavina at Padua University (Padua, Italy)
- Feb 2018 *Regularity of interfaces in phase transition via obstacle problems*, Harold J. Gay Lecture at Worcester Polytechnic Institute (Worcester, MA, USA)
- Feb 2018 *Sharp free boundary regularity in obstacle problems*, Analysis Seminar at Princeton University (Princeton, NJ, USA)
- Feb 2018 *Regularity of interfaces in phase transition via obstacle problems*, Rutgers Mathematics Department Colloquium (New Brunswick, NJ, USA)
- Feb 2018 *Sharp free boundary regularity in obstacle problems*, Applied Mathematics Seminar at Durham University (Durham, United Kingdom)
- Jun 2017 *Transportation techniques for beta-ensembles*, PDE/Probability colloquium at SISSA (Trieste, Italy)
- May 2017 *The De Giorgi conjecture for the half-Laplacian in dimension 4*, Geometric Analysis & PDE seminar at the University of Cambridge (Cambridge, United Kingdom)
- Mar 2017 *Quantitative stability: isoperimetric vs Brunn-Minkowski inequalities*, Colloquium at University of Bern (Bern, Switzerland)
- Mar 2017 *Global estimates for local and nonlocal porous medium type equations on bounded domains*, Analysis seminar at EPFL (Lausanne, Switzerland)
- Mar 2017 *Transportation techniques for beta-ensembles*, PDE/Probability seminar at IHP (Paris, France)
- Mar 2017 *Free boundary regularity in the parabolic fractional obstacle problem*, Analysis seminar at the University of Warwick (Coventry, United Kingdom)
- Oct 2016 *Recent applications of quantitative stability to convergence to equilibrium*, Geometric Analysis & PDE seminar at the University of Cambridge (Cambridge, United Kingdom)
- Mar 2016 *Transport theory: from isoperimetry to random matrices*, Brandeis-Harvard-MIT-Northeastern Colloquium (Cambridge, MA, USA)



- Dec 2015 *Global free-boundary regularity for the Signorini problem*, Geometric Analysis & PDE seminar at the University of Cambridge (Cambridge, United Kingdom)
- Nov 2015 *Local and non-local minimal surfaces*, Seminar of Analysis and Geometry at the University of Nice (Nice, France)
- Nov 2015 *Flow of non-smooth vector fields and applications*, Seminar on Nonlinear analysis and PDEs of Paris 6, ENS Paris, and Paris 7 (Paris, France)
- Oct 2015 *Local and non-local minimal surfaces*, Seminar of Geometry and Dynamics at the ENS Lyon (Lyon, France)
- Oct 2015 *Transport theory: from functional inequalities to random matrices*, Colloquium at Université Lyon 1 (Lyon, France)
- May 2015 *Transport theory: from isoperimetry to random matrices*, Colloquium at UCLA (Los Angeles, CA, USA)
- May 2015 *Local and non-local minimal surfaces*, Colloquium at Stanford University (Palo Alto, CA, USA)
- Apr 2015 *Recent applications of transport theory*, Geometry-Analysis seminar at Rice University (Houston, TX, USA)
- Mar 2015 *Recent applications of transport theory*, Colloquium the Hausdorff Center (Bonn, Germany)
- Jan 2015 *Recent applications of transport theory*, Seminar at ETH Zürich (Zurich, Switzerland)
- Dec 2014 *A transportation approach to random matrices*, Mathematics Colloquium at the University of Geneva (Geneva, Switzerland)
- Dec 2014 *Recent applications of the DiPerna-Lions theory to PDEs*, Video Seminar on PDE and Mathematical Physics at the University of Zürich (Zurich, Switzerland)
- Nov 2014 *Recent applications of the DiPerna-Lions theory*, Seminar of Calculus of Variations at Paris VI (Paris, France)
- Oct 2014 *Quantitative stability estimates for the Brunn-Minkowski inequality*, Seminar of Sub-Riemannian geometry at IHP (Paris, France)
- Oct 2014 *Recent applications of the DiPerna-Lions theory*, Colloquium at the University of Cambridge (Cambridge, United Kingdom)
- Sep 2014 *A transportation approach to random matrices*, Analysis Seminar at IST Austria (Vienna, Austria)
- May 2014 *A transportation approach to random matrices*, Seminar of Differential Equations at the University of Roma Tor Vergata (Rome, Italy)
- May 2014 *A transportation approach to random matrices*, Seminar at the Newton Institute (Cambridge, United Kingdom)
- May 2014 *Stability results for the semisum of sets in  $\mathbb{R}^n$* , Geometric Analysis & PDE seminar at the University of Cambridge (Cambridge, United Kingdom)
- Apr 2014 *Stability results for the Brunn-Minkowski inequality*, Mathematics Colloquium at the University of North Carolina (Chapel Hill, NC, USA)
- Mar 2014 *Stability results for the semisum of sets in  $\mathbb{R}^n$* , Analysis seminar at ETH Zürich (Zurich, Switzerland)
- Mar 2014 *A transportation approach to random matrices*, Analysis seminar at the University of Zürich (Zurich, Switzerland)
- Feb 2014 *A transportation approach to random matrices*, Séminaire d'Analyse Fonctionnelle at the University of Paris 6 (Paris, France)
- Feb 2014 *Stability results for functional inequalities and applications*, Computational and Applied Mathematics Colloquium at Penn State (State College, PA, USA)
- Feb 2014 *Optimal transport theory and applications*, Center for Computational Mathematics and Applications's Luncheon Seminar (State College, PA, USA)
- Oct 2013 *Stability results for the semisum of sets in  $\mathbb{R}^n$* , Colloquio De Giorgi (Pisa, Italy)

- Nov 2013 *Partial regularity for Monge-Ampère type equations*, Seminar at Mittag-Leffler (Stockholm, Sweden)
- Oct 2013 *Stability results for the semisum of sets in  $\mathbb{R}^n$* , Mathematics Colloquium at the University of California at Santa Cruz (Santa Cruz, CA, USA)
- Sep 2013 *Stability results for sumsets in  $\mathbb{R}^n$* , Mathematics Colloquium at the University of Texas at Austin (Austin, TX, USA)
- Jun 2013 *Stability results for sum of sets in  $\mathbb{R}^n$* , Analysis seminar at the WIAS Institute (Berlin, Germany)
- Jun 2013 *Regularity results for very degenerate elliptic equations*, Analysis seminar at the Universidad Autónoma de Madrid (Madrid, Spain)
- Jun 2013 *Stability result for geometric and functional inequalities*, Mathematics Colloquium at the University of Roma La Sapienza (Rome, Italy)
- May 2013 *Optimal transport and the principal-agent problem*, De Finetti Risk Seminar at Bocconi University (Milan, Italy)
- May 2013 *Stability result for sumsets in  $\mathbb{R}^n$* , Mathematics Colloquium at the Instituto Superior Técnico (Lisbon, Portugal)
- May 2013 *Stability result for sum of sets in  $\mathbb{R}^n$* , Mathematics Colloquium at the University of Maryland (College Park, MD, USA)
- Apr 2013 *Stability results for geometric and functional inequalities*, Mathematics Colloquium at the University of Notre Dame (South Bend, IN, USA)
- Apr 2013 *A stability result for the semisum of sets in  $\mathbb{R}^n$* , Mathematics Colloquium at Northwestern University (Evanston, IL, USA)
- Mar 2013 *Stability results for functional inequalities and applications*, Applied Mathematics and Computational Sciences Seminar (KAUST, Saudi Arabia)
- Feb 2013 *A stability result for the semisum of sets in  $\mathbb{R}^n$* , Calderon-Zygmund Analysis seminar at the University of Chicago (Chicago, IL, USA)
- Dec 2013 *When is a set almost convex?*, Séminaire de Géométrie et Analyse at the University of Nice (Nice, France)
- Nov 2012 *Closing Aubry sets*, Geometric Analysis Seminar at MIT (Cambridge, MA, USA)
- Oct 2012 *On the regularity of optimal transport maps*, PDE Seminar at Brown University (Providence, RI, USA)
- Oct 2012 *Stability results for geometric and functional inequalities*, Harvard Analysis/Probability seminar (Cambridge, MA, USA)
- Sep 2012 *Stability results for functional inequalities and applications*, Mathematics Colloquium at the University of Illinois at Urbana-Champaign (Urbana, IL, USA)
- Sep 2012 *On the regularity of optimal transport maps*, PDE/Analysis Seminar at MIT (Cambridge, MA, USA)
- Sep 2012 *Regularity results for optimal transport maps*, Joint Princeton-Rutgers Seminar on Geometric PDE's (New Brunswick, NJ, USA)
- Jun 2012 *Régularité Sobolev pour les équations de type Monge-Ampère*, Séminaire de Géométrie et Analyse at the University of Nice (Nice, France)
- May 2012 *Stability in functional inequalities and applications*, Courant Institute Analysis Seminar (New York, NY, USA)
- Feb 2012 *On the Ma-Trudinger-Wang condition*, Mathematics Colloquium at the University of Houston (Houston, TX, USA)
- Feb 2012  *$W^{2,1}$  regularity for the Monge-Ampère equation*, Geometry and Analysis seminar at Columbia University (New York, NY, USA)
- Feb 2012 *Di Perna-Lions' theory, with application to semiclassical limits for the Schrodinger equation*, Courant Institute Analysis Seminar (New York, NY, USA)
- Feb 2012  *$W^{2,1}$  regularity for the Monge-Ampère equation*, CAMP/Nonlinear PDE seminar at the University of Chicago (Chicago, IL, USA)

- Jan 2012 *Régularité pour le transport optimal et applications*, Groupe de travail Calcul de Variations at the Ecole Polytechnique (Palaiseau, France)
- Jan 2012 *Régularité  $W^{2,1}$  pour l'équation de Monge-Ampère*, Seminar of the Laboratoire J.-L. Lions (Paris, France)
- Dec 2011 *On the Ma-Trudinger-Wang condition*, Mathematics Colloquium at the Hausdorff Center (Bonn, Germany)
- Nov 2011  *$W^{2,1}$  regularity for the Monge-Ampère equation*, Differential Geometry and Geometric Analysis Seminar at Princeton University (Princeton, NJ, USA)
- Nov 2011 *Di Perna-Lions' theory, with application to semiclassical limits for the Schrodinger equation*, Mathematics Colloquium at Princeton University (Princeton, NJ, USA)
- Apr 2011 *A new transportation distance between non-negative measures*, Differential Geometry/PDE seminar at the University of Washington (Seattle, WA, USA)
- Apr 2011 *Regularity for the parabolic obstacle problem with fractional Laplacian*, Diff. Geom./Math. Phys./PDE seminar at the University of British Columbia (Vancouver, Canada)
- Feb 2011 *The geometry of the Ma-Trudinger-Wang condition*, Mathematics Colloquium at the University of Minnesota (Minneapolis, MN, USA)
- Feb 2011 *Regularity for the parabolic obstacle problem with fractional Laplacian*, Differential Geometry and Geometric Analysis seminar at Princeton University (Princeton, NJ, USA)
- Feb 2011 *A stochastic version of the Ambrosio-DiPerna-Lions' theory*, Rutgers Mathematical Finance and Probability Seminar (New Brunswick, NJ, USA)
- Nov 2010 *A Gradient Flow Approach to Non-Local Interaction Equations*, Séminaire de Géométrie et Analyse at the University of Nice (Nice, France)
- Nov 2010 *On the work of Cédric Villani*, Geometry seminar at the University of Texas at Austin (Austin, TX, USA)
- Oct 2010 *Il problema del trasporto ottimale*, Seminario di divulgazione scientifica at the University of Perugia (Perugia, Italy)
- Mar 2010 *Closing Aubry sets*, Dynamical systems seminar at the University of Austin (Austin, TX, USA)
- Mar 2010 *The optimal partial transport problem*, Analysis seminar at the University of Austin (Austin, TX, USA)
- Dec 2009 *Trasporto ottimale, regolarità e geometria Riemanniana*, Mathematics Colloquium at the University of Roma Tor Vergata (Rome, Italy)
- Nov 2009 *Optimal transport, synthetic Ricci curvature, and the MTW tensor. Part I and II*, GADGET Seminar at the University of Texas at Austin
- Jul 2009 *Trasporto ottimale: da  $\mathbb{R}^n$  alle varietà sub-Riemanniane*, Seminar of Differential equations and Applications at the University of Padova (Padova, Italy)
- May 2009 *Transport optimal et inégalités isopérimétriques*, Séminaire de Probabilités et Statistiques (Nancy, France)
- May 2009 *Il problema del trasporto ottimo parziale*, Seminario di Equazioni Differenziali at the University of Roma La Sapienza (Rome, Italy)
- May 2009 *Le problème du transport partiel de masse*, Séminaire du Ceremade d'Analyse-Probabilités at the University Paris-Dauphine (Paris, France)
- Apr 2009 *Stability problems for crystals*, Oberseminar analysis at the Max-Planck-Institut für Mathematik (Leipzig, Germany)
- Mar 2009 *Stability problems for crystals. Part I and II*, Mathematical Physics Seminar at the IAS (Princeton, NJ USA)
- Mar 2009 *Le problème du transport partiel de masse*, Séminaire du CMAP at the Ecole Polytechnique (Palaiseau, France)
- Jan 2009 *Il problema del trasporto parziale ottimale*, University of Naples (Naples)
- Dec 2008 *Régularité du transport optimal sur les variétés riemanniennes*, Séminaire d'Analyse non linéaire at the Ecole Normale Supérieure (Paris, France)

- Dec 2008 *Regularity results for optimal transport maps on Riemannian manifolds*, Analysis seminar at the University of Austin (Austin, TX, USA)
- Dec 2008 *Regularity results for optimal transport maps on Riemannian manifolds*, Analysis seminar at Princeton University (Princeton, NJ, USA)
- Nov 2008 *A mass transportation approach to quantitative isoperimetric inequalities*, Analysis seminar at ETH Zürich (Zurich, Switzerland)
- Oct 2008 *A mass transportation approach to quantitative isoperimetric inequalities*, Analysis seminar at the Warwick Mathematics Institute (Warwick, United Kingdom)
- Oct 2008 *Equations de type Monge-Ampère et régularité du transport optimal sur les variétés*, Séminaire d'Analyse Numérique et Equations aux Dérivées Partielles d'Orsay (Orsay, France)
- Jun 2008 *Le problème du transport partiel de masse*, Séminaire de Géométrie et Analyse at the University of Nice (Nice, France)
- Jun 2008 *The optimal partial transport problem*, Analysis and PDE Seminar at UCLA (Los Angeles, CA, USA)
- Apr 2008 *Quantitative isoperimetric inequalities and optimal transportation*, PDE/Analysis seminar at MIT (Cambridge, MA USA)
- Apr 2008 *Mass transportation and the isoperimetric inequality*, OT2008 Seminars Series (Los Angeles, CA, USA)
- Jan 2008 *Une approche par transport optimal à des inégalités isopérimétriques quantitatives*, Séminaire EDP-Analyse Numérique at the University of Nice (Nice, France)
- Jan 2008 *A mass transportation approach to quantitative isoperimetric inequalities*, Analysis seminar at the University of Bonn (Bonn, Germany)
- Jan 2008 *Metodi variazionali per l'equazione d'Eulero incompressibile*, Analysis seminar at the University of Roma Tor Vergata (Rome, Italy)
- Jan 2008 *Trasporto ottimale su varietà non compatte*, Analysis seminar at the University of Roma Tor Vergata (Rome, Italy)
- Dec 2007 *Caffarelli's Holder regularity theory of Monge-Ampère equations. Part I and II*, Fields Institute Analysis Working Group (Toronto, Canada)
- Nov 2007 *A mass transportation approach to quantitative isoperimetric inequalities*, Fields Institute Analysis Working Group (Toronto, Canada)
- Nov 2007 *Une approche par transport optimal pour des inégalités isopérimétriques quantitatives*, Séminaire d'Analyse at the Institut Fourier (Grenoble, France)
- Jul 2007 *Flussi generalizzati per equazioni differenziali ordinarie e stocastiche a coefficienti non regolari*, Analysis seminar at the University of Florence (Florence, Italy)
- Jun 2007 *Generalized flows for non-smooth ordinary and stochastic differential equations*, Probability seminar at the University of Bonn (Bonn, Germany)
- May 2007 *Variational models for the incompressible Euler equations*, Analysis seminar at the University of Bonn (Bonn, Germany)
- May 2007 *Modèles variationnels pour l'équation d'Euler incompressible*, Séminaire d'équations aux dérivées partielles et applications at the ENS Lyon (Lyon, France)
- Apr 2007 *Le théorème de Sard*, Seminar at the ENS Lyon (Lyon, France)
- Feb 2007 *Optimal transport on non-compact manifolds*, Colloquia of Control Theory and Partial Differential Equations at the University of Roma La Sapienza (Rome, Italy)
- Jan 2006 *Existence du transport optimal pour les variétés non-compactes*, Séminaire du Ceremade d'Analyse-Probabilités at the University Paris-Dauphine (Paris, France)

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## Participation to Workshops, Schools and Courses

- Jun 2010 Gnampa-ERC Summer School on “Analytic Techniques for Geometric and Functional Inequalities” (Ischia, Italy)
- Apr 2010 BIRS Workshop “Optimal transportation and applications” (Banff, Canada)

- Apr 2010 Workshop “Nonlinear Analysis and PDEs” (Austin, TX, USA)
- Oct 2009 Workshop “Analytical and numerical issues on quantum, kinetic and statistical evolution” (Austin, TX, USA)
- Jun 2009 Workshop “Optimal Transportation: Theory and Applications” (Grenoble, France)
- Feb 2009 XIX Convegno nazionale di “Calcolo delle Variazioni” (Levico Terme, Italy)
- Feb 2009 “Trends in Nonlinear Analysis and PDE’s” on the occasion of Luis Caffarelli’s 60th birthday (Milan, Italy)
- Feb 2009 “Nice Weak KAM Methods in Nice” (Nice, France)
- Dec 2008 “Future Directions in Nonlinear PDE” in honor of Luis A. Caffarelli on the occasion of his 60th birthday (Austin, TX USA)
- Oct 2008 School on “Optimal transportation, geometry and functional inequalities” (Pisa, Italy)
- Jun 2008 CIME Summer Course on “Nonlinear PDE’s and Applications” (Cetraro, Italy)
- May 2008 Workshop “Transport Systems in Geography, Geosciences, and Networks” (Los Angeles, CA, USA)
- Apr 2008 Workshop “Optimal Transport” (Los Angeles, CA, USA)
- Oct 2007 Workshop “Schrodinger equations and Carleman estimates” (St. Raphael, France)
- Sep 2007 “Seminaire commun Analyse-Geometrie” (Luminy, France)
- Jul 2007 “Optimal Transportation, and Applications to Geophysics and Geometry” (Edinburgh, Scotland)
- Nov 2006 “Regularity in Hyperbolic Problems” (Bertinoro, Italy)
- Nov 2006 “Microlocal Analysis and Applications to PDEs” (Pisa, Italy)
- Oct 2006 “Variational methods in Material Science” (Pisa, Italy)
- Sep 2006 “Lectures on Geometric Analysis” (Pisa, Italy)
- Sep 2006 “Nonlinear evolution problems” (Pisa, Italy)
- Sep 2006 “Four mini courses on fine properties of solutions of Partial Differential Equations” (Pisa, Italy)
- Jul 2006 “Eleventh International Conference on Hyperbolic Problems, Theory, Numerics, Applications” (Lyon, France)
- Jun 2006 “Optimal Transport and Geometric PDE’s” (Nice, France)
- Mar 2006 “Cours Frédéric Poupaud : ODEs avec rough coefficients et hyperbolic conservation laws” (Nice, France)
- Feb 2006 XVI Convegno nazionale di “Calcolo delle Variazioni” (Levico Terme, Italy)
- Dec 2005 Workshop “Geometric evolutions and applications” (Pisa, Italy)
- Dec 2005 Autumn School et Workshop “Moving boundaries” (Lyon, France)
- Nov 2005 Workshop “Optimal Mass Transport and its Applications” (Berkeley, CA, USA)
- Jun 2005 CIME Summer Course on “Calculus of Variations and Non-linear Partial Differential Equations” (Cetraro, Italy)
- May 2005 Workshop “Gradient flow equations of non convex functionals” (Pisa, Italy)
- Apr 2005 Spring School on “Geometric Measure Theory: Old et New” (Les Diablerets, Switzerland)
- Sep 2004 First Summer School in “Analysis et Applied Mathematics” (Rome, Italy)

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Zurich, July 5, 2018