Dr. Laura Caravenna

http://www.lauracaravenna.altervista.org/

c/o OxPDE, Mathematical Institute, 24-29 St Giles', Oxford OX1 3LB, U.K.

Experience

Post-doctoral researcher
Oxford Centre for Nonlinear PDE, University of Oxford   Appointment: 09/2011-08/2014

Research Associate at Keble college (nominated by Prof. G.-Q. Chen)   10/2011-08/2014

Research grant
Centro di Ricerca Matematica 'De Giorgi', Scuola Normale Superiore di Pisa   11/2010-10/2011

Junior Visitor (Post-Doctoral position)
Centro di Ricerca Matematica 'De Giorgi', Scuola Normale Superiore di Pisa   11/2009-10/2010

Member of INdAM, National Group for Mathematical Analysis, Probability and Applications

Education

PhD in Mathematics   October 23rd, 2009—SISSA, Trieste (Italy)
'The Disintegration Theorem and Applications to Optimal Mass Transport' with Prof. S. Bianchini

Master's Degree in Mathematics   2006—SISSA & University of Trieste (Italy)
'On the Entropy Dissipation for Scalar Conservation Laws' with Prof. S. Bianchini

Bachelor in Mathematics   2004— University of Milan (Italy)
'Numerical Observation on a Fermi-Pasta-Ulam-type Model' with Prof. D. Bambusi

Awarded by scholarships from the National Institute of High Mathematics and SISSA for the 8 years of the above studies, selected with entrance examination. Full grade degrees.

Personal Information

Birth: 1st March 1982, Treviglio (BG), Italy   **Citizenship:** Italian
Residence: Oxford, U.K.   **E-mail:** Laura.Caravenna@maths.ox.ac.uk
Telephone: *Office*: +44 (1865) 615104. *Mobile*: +39 3287638494
Hobbies: Preparing cakes and pastries. Amateur gardening. Walking. Knitting.

Main Research Interests

Nonlinear Hyperbolic PDEs, Measure Theory, Optimal Mass Transport

Published Journal Articles

1. *An entropy based Glimm-type functional, J. Hyperbolic Differ. Equ.*, 5(3):643–662, 2008
2. *On the extremality, uniqueness and optimality of transference plans*, joint work with S. Bian-

chini, *Bull. Inst. Math. Acad. Sin. (N.S.)*, 4(4):353–455, 2009

3. *On optimality of c-cyclically monotone transference plans*, joint work with S. Bianchini, *C. R. Math. Acad. Sci. Paris, Ser. I*, 348:613–618, 2010

4. *A disintegration of the Lebesgue measure on the faces of a convex function*, joint work with S. Daneri *J. Funct. Anal.*, 258:3604–3661, 2010

5. *A proof of Sudakov theorem with strictly convex norms,Math. Z.*, 268:371–407, 2011

6. *A proof of Monge problem in $\mathbb{R}^n$ by stability,Rend. Istit. Mat. Univ. Trieste*, 43:31-52, 2011

7. SBV *regularity for genuinely nonlinear, strictly hyperbolic systems of conservation laws in one space dimension*, joint work with S. Bianchini, *Comm. Math. Phys.*, 313:1–33, 2012

Other Articles

8. *Intrinsic Lipschitz graphs in Heisenberg groups and continuous solutions of a balance equation*, joint work with F. Bigolin and F. Serra Cassano, `http://arxiv.org/abs/1202.3083`

9. *A regularity result for 1D-hyperbolic conservation laws* (Proceedings)

10. *Continuous solution to balance laws* (in preparation with G. Alberti and S. Bianchini)

Teaching

2009 Tutorial activity: Mathematics and Statistics (I year, Biology, University of Trieste)

2011 Examiner for the course of Nonlinear PDEs (I year, PhD, Oxford University)

2012 Tutorial activity: Multivariable Calculus (II year, Mathematics, University of Oxford)

2012 Supervisor for an undergraduate summer research project (OxPDE, University of Oxford)

Forthcoming- Reading course in the internal seminars of the group on hyperbolic PDEs

Computer Skills

Usage of Linux, Mac, Windows. *Programming*: C, Java, Pascal, Matlab. Rudiments of R

Grants and Organisational Roles

2009: Awarded by FIRB by INdAM, main investigator Gianluca Crippa

2006-2010: Part of the PRIN with main investigator Stefano Bianchini

2010-2011: Grant for traveling and invitations awarded with the visiting position at CRM

2012: Co-organisation of the conference 'Stochastic Methods & Nonlinear PdEs', Cardiff School of Mathematics, granted by the London Mathemaical Society, OxPDE and University of Cardiff

2012: Co-organisation of a mini-symposia in the 'International Conference on Nonlinear PDEs' at Oxford University

2012: Co-organiser of the weekly Lunchime Seminar Series at OxPDE

Reviewer for MathSciNet. *Referee* for four international Journals

Short Visits (chronological order)

Dr. Laura Spinolo, at the time at Northwestern University (U.S.A.)

Prof. Luigi Ambrosio, Scuola Normale Superiore di Pisa (Italy)

Dr. Gianluca Crippa, at the time at Università di Parma (Italy), now Professor in Basel
Prof. Stefano Bianchini, SISSA (Italy)
Prof. Francesco Serra Cassano and Dr. Francesco Bigolin, Università di Trento (Italy)
Dr. Federica Dragoni, Cardiff University (U.K.)
Dr. Laura Spinolo, CNR in Pavia (Italy)

Selected Talks

-*Continuous solutions to a balance law*, *14th International Conference on Hyperbolic Problems: Theory, Numerics, Applications*, University of Padua 2012
-*Intrinsic Lipshcitz graphs in the Heisenberg groups and continuous solutions to balance equations*, *XXII Conv. Naz. di Calcolo delle Variazioni*, 2012, Levico Terme.
-*Reduction on characteristics for continuous solutions to a 1D-balance law*, 2012, 'South West PDE Winter School' (Warwick University, U.K.).
-*SBV regularity of Entropy Solutions to genuinely non-linear strictly hyperbolic systems of conservation laws*, 2011, Royal Society Meeting (Kavli Centre, London, U.K.).
-*Sets of Uniqueness for Transference Plans*, June 10-12, 2010, in the *Meeting on Applied Math. & Calculus of Variations (Roma, Italy)*.
-*Sets of Uniqueness for Optimal Transport Plans*, Feb. 25th, 2010, in the *Intensive Research Month on Hyperbolic Conservation Laws & Fluid Dynamics (Parma, Italy)*.
-*Some problems in Optimal Mass Transport studied by Disintegration of Measures*
Sept. 1st, 2009, in the *VII meeting on Hyperbolic Conservation Laws (Trieste, Italy)*.
-*Optimal transport maps for the Monge problem in* $\mathbb{R}^N$
June 19, 2009, at *Optimal transport: theory and applications, Grenoble (France)*
-*Un funzionale di interazione basato sull'entropia (An entropy-based interaction functional)*
Feb. 12nd, 2009, at the *XIII Incontro Nazionale Problemi di Tipo Iperbolico (Bari, Italy)*
-*A proof of Sudakov theorem with strictly convex norms*
Jan. 27th, 2009, at the *First Winter School at IMDEA on PDE's and Inequalities (Madrid, Spain)*
-*A proof of Sudakov theorem with strictly convex norms*
Nov. 5th, 2008, in the conference *Optimal transportation and applications (Pisa, Italy)*
-*Sufficient conditions for optimality of c-cyclically monotone transference plans*
2008, at Northwestern University, Evanston (IL, USA)