

Olivier DRUET

October, 2011

Born : November 30, 1976

Citizenship : French

Married, two children (2004, 2009).

CURRICULUM VITAE

Address :

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Phd :

Title : "Asymptotiques géométriques, phénomènes de concentration et inégalités optimales".

Date of defence : November, 27th, 2001.

Advisor : Emmanuel Hebey.

Committee : Pierre Bérard, Patrick Gérard (referee), Etienne Ghys (chair), Emmanuel Hebey, Michel Ledoux (referee), Cédric Villani, Claude Viterbo.

"Habilitation à diriger des recherches" (Accreditation to supervise researches) :

Title : "Stabilité et instabilité pour des EDPs elliptiques issues de la géométrie".

Date of defence : April, 1, 2010.

Referees : Tobias Colding, Nassif Ghoussoub, Michael Struwe.

Committee : Ivar Ekeland (chair), Nassif Ghoussoub (referee), Etienne Ghys, Emmanuel Hebey, Michael Struwe (referee), Cédric Villani.

Positions held :

1995-1999 : Ecole Normale Supérieure, rue d'Ulm, Paris.

1999-2002 : Allocataire Moniteur Normalien, Université de Cergy-Pontoise.

2002-2007 : C.R. at CNRS, ENS Lyon.

2007-2008 : C.R. at CNRS, PIMS, Vancouver.

2008- : C.R. at CNRS, ENS Lyon.

Publications :

- (1) Optimal Sobolev inequalities of arbitrary order on compact Riemannian manifolds,
Journal of Functional Analysis, vol. 159, 217-242, 1998.
- (2) Best constants in Sobolev inequalities for compact manifolds of nonpositive curvature,
Comptes Rendus de l'Académie des Sciences de Paris, with T. Aubin and E. Hebey, vol. 326, 1998, 1117-1121.
- (3) The best constants problem in Sobolev inequalities,
Mathematische Annalen, vol. 314, 1999, 327-346.
- (4) Optimal Nash's inequalities on Riemannian manifolds: the influence of geometry,
International Mathematics Research Notices, with E. Hebey and M. Vaugon, vol. 14, 1999, 735-779.
- (5) Generalized scalar curvature type equations on compact Riemannian manifolds,
Proceedings of the Royal Society of Edinburgh, vol. 130A, 2000, 767-788.
- (6) Sharp Sobolev inequalities with lower order remainder terms,
Transactions of the American Mathematical Society, with E. Hebey and M. Vaugon, vol. 353, 269-289, 2001.
- (7) Extremal functions for optimal Sobolev inequalities on compact manifolds,
Calculus of Variations and PDE's, with Z. Djadli, 12, 2001, 59-84.
- (8) Asymptotic profile for the sub-extremals of the sharp Sobolev inequality on the sphere,
Communications in Partial Differential Equations, with F. Robert, 25, 5-6, 2001, 743-778.
- (9) The AB program in geometric analysis. Sharp Sobolev inequalities and related problems,
Memoirs of the American Mathematical Society, with E. Hebey, MEMO/160/761, 2002.
- (10) Isoperimetric inequalities on compact manifolds,
Geometriae Dedicata, 90, 2002, 217-236.
- (11) Pohozaev type obstructions and solutions of bounded energy for quasilinear elliptic equations with critical Sobolev growth, The conformally flat case,
Nonlinear Analysis, Theory, Methods and Applications, with E. Hebey and M. Vaugon, 51, 2002, 79-94.
- (12) Sharp local isoperimetric inequalities involving the scalar curvature,
Proceedings of the American Mathematical Society, 130, 8, 2002, 2351-2361.
- (13) Optimal Sobolev inequalities and extremal functions. The three-dimensional case,
Indiana University Mathematics Journal, 51, 1, 2002, 69-88.
- (14) Elliptic equations with critical Sobolev exponent in dimension 3,

- Annales de l'IHP, Analyse non-linéaire*, 19, 2, 2002, 125-142.
- (15) Asymptotics for sharp Sobolev-Poincaré inequalities on compact Riemannian manifolds,
Advances in Differential Equations, with E. Hebey, 7, 12, 2002, 1409-1478.
- (16) From one bubble to several bubbles : the low-dimensional case,
Journal of Differential Geometry, 63, 2003, 399-473.
- (17) Blow up analysis in dimension 2 and a sharp form of Trudinger-Moser inequality,
Communications in Partial Differential Equations, with Adimurthi, 29, 1-2, 2004, 295-322.
- (18) Blow-up theory for elliptic PDEs in Riemannian geometry,
Mathematical Notes, Princeton University Press, with E. Hebey and F. Robert, 45, 2004.
- (19) Compactness for the Yamabe equation in low dimensions,
International Mathematics Research Notices, 23, 2004, 1143-1191.
- (20) Blow-up examples for second order elliptic PDEs of critical Sobolev growth,
Transactions of the American Mathematical Society, with E. Hebey, 357, 5, 2005, 1915-1929.
- (21) Elliptic equations of Yamabe type,
I.M.R.S., with E. Hebey, 1, 2005.
- (22) Bubbling phenomena for fourth-order four-dimensional PDEs with exponential growth,
Proc. A.M.S., with F. Robert, 134, 3, 2005, 897-908.
- (23) Multibumps analysis in dimension 2 - Quantification of blow up levels,
Duke Math. Journal, 132, 2, 2006, 217-269.
- (24) Sharp asymptotics and compactness for local low energy solutions of critical elliptic systems in potential form,
Calculus of Variations and PDE's, with E. Hebey, 31, 2, 2008, 205-230.
- (25) The critical Lazer-McKenna conjecture in low dimensions,
Journal of Differential Equations, 245, 8, 2008, 2199-2242.
- (26) Asymptotic expansion of the Faber-Krahn profile of a compact Riemannian manifold,
Compte-rendus mathématiques, 346, 21-22, 2008, 1163-1167.
- (27) Stability and instability for Einstein-scalar field Lichnerowicz equations on compact Riemannian manifolds,
Math. Zeitschrift, with E. Hebey, 263, 2009, 33-67.
- (28) Stability for strongly coupled critical elliptic systems in a fully inhomogeneous medium,
Analysis and PDE, with E. Hebey, 2, 2009, 305-359.
- (29) Stability of the Pohozaev obstruction in dimension 3,
Journal of the E.M.S., with P. Laurain, 12, 5, 2010, 117-1149.

- (30) Bounded stability for strongly coupled critical elliptic systems in a fully inhomogeneous medium,
Journal of Functional Analysis, with E. Hebey and J. Vétois, 258, 2010, 999-1059.
- (31) La notion de stabilité pour des équations aux dérivées partielles elliptiques,
ENSAIOS Matematicos, vol. 19, 2010, 1-100.
- (32) Existence and a priori bounds for Schrödinger-Maxwell systems in fully inhomogeneous spaces,
Communications in Contemporary Mathematics, with E. Hebey, to appear, 34 pages.
- (33) The Lin-Ni's problem for mean convex domains,
Memoirs of the American Mathematical Society, with F. Robert and J. Wei, to appear.

PhD students :

Yaxin Peng (co-supervision with Chunli Shen, ECNU, Shanghai) : 2005-2008 (defence : 2008 at Shanghai).

Yaxin Peng is now assistant professor at Shanghai University.

Paul Laurain : 2006-2010 (defence : 2010 at ENS Lyon).

Paul Laurain is now assistant professor (MCF) at University Paris 7.

Bruno Premoselli (co-supervision with Emmanuel Hebey, Univ. Cergy-Pontoise) : 2011-

Romain Petrides : 2012-

Invited talks :

- 04/1998 : Analysis Seminar, *Courant Institute of Mathematical Sciences, New York (US)*.
- 04/1998 : PDE/Geometry seminar, *Johns Hopkins university (US)*.
- 11/1998 : Analysis seminar, *Rutgers university (US)*.
- 03/1999 : Séminaire de Théorie Spectrale et Géométrie, *Université de Grenoble (France)*.
- 06/1999 : Conference on Integral Inequalities and Applications, *Cortona (Italy)*.
- 03/2000 : Analysis seminar, *Tata Institute, Bangalore (India)*.
- 03/2000 : Short courses, *Tata Institute, Bangalore (India)*.
- 03/2000 : Analysis seminar, *Indian Statistical Institute, Bangalore (India)*.
- 04/2000 : Analysis seminar, *Rutgers university (US)*.
- 04/2000 : Geometric Analysis seminar, *Princeton university (US)*.
- 05/2000 : Analysis and Topology seminar, *University of Pennsylvania (US)*.
- 05/2000 : Journée d'analyse de l'*Université de Marne-la-Vallée (France)*.
- 05/2000 : Séminaire de Théorie Spectrale et Géométrie, *Université de Grenoble (France)*.
- 12/2000 : Short courses, *University of Roma 3 (Italy)*.
- 03/2001 : Short courses, *Ecole Normale Supérieure de Lyon (France)*.
- 11/2001 : Short courses, *Université de Grenoble (France)*.
- 02/2002 : Colloquium, *Tata Institute, Bangalore (India)*.
- 02/2002 : Analysis Seminar, *Tata Institute, Bangalore (India)*.
- 03/2002 : Journées "Inégalités de Sobolev logarithmique", *Université d'Orléans (France)*.
- 03/2002 : Séminaire de géométrie et analyse globale, *Université de Nantes (France)*.
- 05/2002 : Conference "Heat kernels and analysis on manifolds", *I.H.P., Paris (France)*.
- 06/2002 : Séminaire Analyse, *Paris VI (France)*.
- 11/2002 : Geometric Analysis seminar, *Princeton university (US)*.
- 11/2002 : PDE, Geometry and Complex analysis Seminar, *University of Notre-Dame, Indiana (US)*.
- 05/2003 : Conference "Recent Trends in Nonlinear Variational Problems", *ICTP, Trieste (Italy)*.
- 11/2003 : Intensive Period of Research "Geometric Analysis", *SNS, Pisa (Italy)*.
- 02/2004 : Séminaire de géométrie et d'analyse, *Université de Nice (France)*.
- 03/2004 : Séminaire de Théorie Spectrale et Géométrie, *Université de Grenoble (France)*.
- 04/2004 : Three-city Seminar, *ETH Zurich (Switzerland)*.
- 05/2004 : Conference "Geometric Partial Differential Equations", *IMS, NUS (Singapore)*.
- 09/2004 : Conference "Geometric and nonlinear Analysis", *Notre-Dame, Indiana (US)*.
- 11/2004 : Differential Geometry Seminar, *I.M.P.A., Rio de Janeiro (Brazil)*.
- 02/2005 : Séminaire EDP, *Univ. Lyon I (France)*.

03/2005 : Conference "Recent advances in calculus of variations and PDEs", *SNS Pisa (Italy)*.

03/2005 : PDE Seminar, *University Roma II (Italy)*.

03/2005 : PDE Seminar, *University of Pisa (Italy)*.

04/2005 : Conference "Differential Geometry", *Yangzhou (China)*.

04/2005 : PDE Seminar, *ECNU, Shanghai (China)*.

11/2005 : Workshop "Recent Results in Nonlinear Elliptic Equations and their Interactions with Geometry", *MSRI, Berkeley (US)*.

01/2006 : Séminaire de géométrie, *Université de Nancy (France)*.

06/2006 : DG-MP-PDE Seminar, *UBC, Vancouver (Canada)*.

07/2006 : Workshop "Calculus of Variations and PDEs", *Oberwolfach (Germany)*.

08/2006 : Workshop "Geometric and Nonlinear Analysis", *Banff (Canada)*.

09/2006 : Workshop "Nonlinear evolution problems", *Centro de Giorgi, Pisa (Italy)*.

03/2007 : Séminaire "Géométrie et Algèbre", *Université de Brest (France)*.

03/2007 : Séminaire d'Analyse Appliquée, *Université d'Amiens (France)*.

06/2007 : Workshop "Géométrie et EDP", *CIRM, Luminy (France)*.

08/2007 : Workshop "Loss of compactness in nonlinear PDE : Recent trends", *Banff (Canada)*.

09/2007 : DG-MP-PDE seminar, *UBC, Vancouver (Canada)*.

05/2008 : PGNS seminar, *Univ. of Washington, Seattle (US)*.

06/2008 : "Geometric and Nonlinear Analysis", France-Canada Congress, *Montréal (Canada)*.

09/2008 : Rencontres d'analyse géométrique, *CIRM, Luminy (France)*.

11/2008 : Séminaire "Géométries", *Université de Lyon I (France)*.

11/2008 : Séminaire "Analyse", *Université de Nantes (France)*.

01/2009 : Journées Nancéiennes de Géométrie, *Université de Nancy (France)*.

05/2009 : Colloquium, *University of Freiburg (Germany)*.

05/2009 : SFB "Geometrische Partielle Differentialgleichungen" seminar (2 talks), *University of Freiburg (Germany)*.

06/2009 : Journée "Géométries", *Université de Cergy-Pontoise (France)*.

10/2009 : Rencontre "Problèmes non linéaires avec perte de compacité : perspectives et applications", *CIRM, Luminy (France)*.

11/2009 : Journée EDP Rhône Alpes Auvergne, *Univ. Grenoble 1 (France)*.

05/2010 : Queen Dido conference, *Carthage (Tunisia)*.

10/2010 : Ecole thématique "Analyse géométrique", *Roscoff (France)*.

12/2010 : Colloquium, *Univ. Rennes 1 (France)*.

12/2010 : Analysis seminar, *Univ. Rome 3 (Italy)*.

01/2011 : Differential Geometry seminar, *Univ. Magdeburg (Germany)*.

10/2011 : Rencontres d'analyse géométrique, *CIRM, Luminy (France)*.

10/2011 : Colloquium IMJ, *Univ. Paris 6-7 (France)*.

11/2011 : SIAM conference "Analysis of partial differential equations, *San Diego (USA)*.

Invitations in foreign universities :

- 04/1998 : Courant Institute, New York, US (one week).
- 11/1998 : Rutgers University, New Brunswick, US (one week).
- 03/2000 : Tata Institute, Bangalore, India (three weeks).
- 04/2000 : Rutgers University, New Brunswick, US (one week).
- 04/2000 : Princeton University, US (10 days).
- 05/2000 : University of Pennsylvania, Philadelphie, US (one week).
- 12/2000 : University of Roma 3, Italy (one week).
- 02/2002 : Tata Institute, Bangalore, India (two weeks).
- 11/2002 : Princeton University, US (one week).
- 11/2002 : University of Notre-Dame, Indiana, US (one week).
- 11/2003 : SNS Pisa, Italy (one week).
- 04/2004 : ETH Zurich, Switzerland (3 days).
- 05/2004 : IMS, National University of Singapore, Singapore (10 days).
- 09/2004 : University of Notre-Dame, Indiana, US (one week).
- 11/2004 : I.M.P.A, Rio de Janeiro, Brazil (two weeks).
- 03/2005 : Pisa, Italy (one week).
- 04/2005 : ECNU, Shanghai, China (three weeks).
- 11/2005 : MSRI, Berkeley (three weeks).
- 06/2006 : P.I.M.S., Vancouver (one month).
- 10/2006 : Centro de Giorgi, Pisa, Italy (one month).
- 09/2008 : ECNU, Shanghai, China (three days).
- 05/2009 : Freiburg Universität, Germany (10 days).
- 07/2009 : P.I.M.S., Vancouver, Canada (one week).
- 12/2010 : University Roma 3, Italy (one week).
- 01/2011 : University of Magdeburg, Germany (3 days).

Organisation of conferences

Workshop "Asymptotic analysis in the calculus of variations and PDEs", PIMS, Vancouver, july 2009.

Symposium "Analyse asymptotique des EDP elliptiques" lors de l'Ecole d'Eté franco-asiatique "Singularités dans les EDP", I.H.E.S., Paris, july 2010.

"Journées d'Analyse Géométrique de Lyon", ENS Lyon, october 2011.