CURRICULUM VITAE

October 2010

Didier SMETS

Born November 8th 1975 in Montignies sur Sambre (Belgium).
Double nationality belgian and french, married, two children.
Address : 17 rue Vauvenargues, 75018 Paris, France.

Professional Address

Université Pierre & Marie Curie (Paris 6) Laboratoire Jacques-Louis Lions
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Position

Professor, Université Pierre & Marie Curie (Paris 6), since September 1st 2005.

Diplomas and Degrees

Habilitation, Université Pierre & Marie Curie (2004) Jury : *F. Béthuel, Y. Brenier, P. Gérard, M. Soner, M. Struwe, M. Willem.*

Ph.D, Université de Louvain-la-Neuve (2000).
Advisor : *M. Willem.*

Master in Mathematics, Université de Louvain-la-Neuve (1998).

Graduate studies in Mathematics, Université de Louvain-la-Neuve (1995-1997).

Civil engineer, 1st year, Université de Louvain-la-Neuve (1994).

Prizes and Grants

Part-time professor at École Normale Supérieure de Paris 2009-.
ANR Jeunes chercheurs, 2005-2008 and 2009-2013.
Prize Maurice Audin 2005, co-laureate with Brahim Mezerdi.
Prize Eugène Catalan of the Académie Royale des Sciences, des Lettres & des Beaux-Arts de Belgique, for the period 2000-2004 (2005).
Annual prize of the classe des Sciences de l'Académie Royale des Sciences, des Lettres & des Beaux-Arts de Belgique, Section Mathematics (2001).

Career

Professor, Université Pierre & Marie Curie, since September 1st 2005.
Visiting Professor at Scuola Normale Superiore di Pisa (09/2004 - 08/2005).
Assistant Professor, Université Pierre & Marie Curie (02/2002 - 09/2005).
Research Fellow FNRS, Belgium (10/2001 - 01/2002).
Research Fellow FNRS, Belgique (10/1997 - 09/2001).
Postdocs : Paris 6 (01/2000 - 07/2000), Rome 1 (01/2001 - 07/2001).

Ph.D Students

- Haidar MOHAMMAD, since September 2009.
- Evelyne MIOT, Ph.D from Université Pierre & Marie Curie defended in December 2009. Evelyne is now Chargée de Recherche at Université Paris-Sud Orsay.

Invited talks

- ICM Satellite Conference on PDE and Related Topics, TIFR-CAM Bangalore, India, August 2010.
- NODE 2008, Meeting in honor of Jean Mawhin and Patrick Habets, Académie royale de Belgique, September 2008.
- European Congress of Mathematicians, Parallel session, Amsterdam, July 2008.
- Second congress Canada-France, Parallel session, June 2008.
- Des Equations aux dérivées partielles au calcul scientifique, Congresss in honor of Luc Tartar, on the occasion of his 60th birthday, Paris, July 2007.
- Limit problems in Analysis, Leiden, Netherlands, May 2006.
- Equations aux Dérivées Partielles Non Linéaires et Applications, conference in honor of Jim Serrin, Tours, France, June 2005.
- Equations aux Dérivées Partielles Non Linéaires, Tipaza, Algeria, May 2005.
- Variational Methods in Nonlinear Analysis, 80th birthday of L. Nirenberg and G. Prodi, Erice, Sicily, April 2005.
- Recent Advances in Calculus of Variations and PDE's, Pisa, Italy, March 2005.
- Régularité et singularités en optimisation de forme et frontières libres, Antenne de Bretagne de l'ENS Cachan, France, Octobre 2004.
- Analyse des Equations aux Dérivées Partielles, Forges-les-Eaux, France, June 2004.
- Variational Methods and the Nonlinear Schrödinger Equation, EPFL Lausanne, Switzerland, February 2004.
- Intensive Research Period on Geometric Analysis, Scuola Normale Superiore di Pisa, Italty, October 2003.
- Calculus of Variations and Microstructures, Fields Institute of Toronto, Canada, August 2003.
- Calculus of Variations and Geometric Measure Theory, University of Trento, Italy, April 2003.
- Journées à la mémoire de Guido Stampacchia, Paris, France, March 2003.
- Fronts and singularities, Meeting RTN, Heraklion, Crete, September 2002.
- Conference in honor of Jean Mawhin, Institut Henri Poincaré, Paris, France, March 2002.
- Singularities and Concentration Phenomena in Nonlinear Elliptic and Parabolic PDE's, Oberwolfach, Germany, January 2002.
- Workshop in Nonlinear Differental Equations, Bergamo, Italy, July 2001.
- Joint Meeting of the Belgian and German Academies of Sciences, Liège, Belgium, June 2001.
- Weekend in nonlinear analysis, University of Roma 2, Italy, March 2001.
- Fronts and singularities, Meeting TMR, Tel Aviv, Israel, June 2000.

Seminars

University of Cergy-Pontoise, December 2010. University of Paris-Sud Orsay, December 2010. Wolfgang Pauli Institue, Vienna, September 2010. Institut Henri Poincaré, Paris, April 2009. Ecole Polytechnique, X-EDP, October 2008. Max Planck Institute, Leipzig, May 2007. University of Paris 6, March 2007. University of Paris 7, March 2006. Collège de France, December 2005. EPFL Lausanne, November 2005. ENS Lyon, October 2005. University Paris-Sud Orsay, March 2005. University of Louvain-la-Neuve, March 2005. University of Rome 1, March 2005. University of Pisa, March 2005. Courant Institute, New-York, November 2004. University of Nice, March 2004. University of Paris-Sud Orsay, November 2003. ENS Lyon, October 2003. Institut Fourier, Grenoble, October 2003. University of Amiens, April 2003. University of Rennes, February 2003. Ecole Polytechnique, X-EDP, January 2003. University of Paris 6,

October 2002. Sissa, Trieste, May 2002. Academica Sinica, Beijing, September 2001. University of Besançon, April 2001. University of Roma 1, September 2000. University de Paris 6, February 2000. University of Paris-Sud Orsay, November 1998.

Summer schools

Sharp interfaces and geometric flows, 5h teaching, CIMPA-UNESCO-EGYPTE School, Alexandria, Egypt, January 2009.

Dynamique des vortex dans l'équation de Ginzburg-Landau, 5h teaching, Summer school "Dynamique des Equations aux dérivées partielles non linéaires", Institut Fourier, Grenoble, June 2005.

Concentration Phenomena for Variational Problems, 6h teaching, Summer school MURST - University of Roma 1, September 2003.

Nonlinear Analysis and Differential Equations, Mini-course, University of Milana-Bicocca, October 2002.

Topological degree and applications in differential equations, one week, Summer school in Brasov, Romania, July 2001.

Administration

Member of the hiring committee (26th section) of the University Pierre & Marie Curie, since 2007.

Member of the editorial board of Potential Analysis, since January 2007.

Co-organizer of 4 international conferences since June 2000.

Publications

Papers in international peer reviewed journals

-(with F. Béthuel and G. Orlandi) Slow motion for gradient systems with equal depth multiple-well potentials, Journal of Differential Equations, to appear.
- (with J. Van Schaftingen) Desingularization of vortices for the Euler equation, Arch. Ration. Mech. Anal., to appear.
- (with F. Béthuel and R. Danchin) On the linear wave regime of the Gross-Pitaevskii equation, Journal d'Analyse Mathématique **110** *(2010), 297–338.*
- (with F. Béthuel, P. Gravejat and J.-C. Saut) On the Korteweg-de Vries long-wave approximation of the Gross-Pitaevskii equation II, Comm. Partial Differential Equations **35** *(2010), 113–164.*
- (with F. Béthuel, P. Gravejat and J.-C. Saut) On the Korteweg-de Vries long-wave approximation of the Gross-Pitaevskii equation I, Int. Math. Res. Not. IMRN **14** *(2009), 2700–2748.*
- (with F. Béthuel, P. Gravejat and J.-C. Saut) Orbital stability of the black soliton for the Gross-Pitaevskii equation, Indiana Univ. Math. Journal **57** *(2008), 2611–2642.*
- (with F. Béthuel and R.L. Jerrard) On the NLS dynamics for infinite energy vortex configurations on the plane, Rev. Math. Iberoamericana **24** *(2008), 671–702.*
- (with F. Béthuel) A remark on the cauchy problem for the 2D Gross-Pitaevskii equation with nonzero degree at infinity, Differential Integral Equations **20** *(2007), 325–338.*

- (with F. Béthuel and G. Orlandi) Dynamics of multiple degree Ginzburg-Landau vortices, Comm. Math. Phys. **272** *(2007), 229–261.*
- (with F. Béthuel and G. Orlandi) Quantization and motion law for Ginzburg-Landau vortices, Arch. Ration. Mech. Anal. **183** *(2007), 315–370.*
- (with F. Béthuel and G. Orlandi) Convergence of the parabolic Ginzburg-Landau equation to motion by mean curvature, Annals of Mathematics **163** *(2006), 37–163.*
- (with F. Béthuel and G. Orlandi) Collisions and phase-vortex interactions in dissipative Ginzburg-Landau dynamics, Duke Mathematical Journal **130** *(2005), 523–614.*
- (with F. Béthuel and G. Orlandi) Improved estimates for the Ginzburg-Landau equation : the elliptic case, Annali Scuola Normale Sup. Pisa Cl. Sci. **5** *(2005), 319–355.*
- Nonlinear Schrodinger equation with Hardy potential and critical nonlinearity, Transactions of the AMS **357** *(2005), 2909–2938.*
- (with F. Béthuel and B. Després) Symmetrization of Dissipative-Dispersive Traveling Waves for Systems of Conservation Laws, Physica D **200** *(2005), 105–123.*
- (with F. Béthuel and G. Orlandi) Approximations with vorticity bounds for the Ginzburg-Landau functional, Comm. Contemp. Math. **6** *(2004), no. 5, 1–30.*
- (with F. Béthuel and G. Orlandi) Motion of concentration sets in Ginzburg-Landau equations, Ann. Fac. Sci. Toulouse Math. **13** *(2004), no. 1, 3–43.*
- (with F. Béthuel and G. Orlandi) Vortex rings for the Gross-Pitaevskii equation, Jour. Europ. Math. Soc. **6** *(2004), 17–94.*
- (with M. Willem) Partial symmetry and asymptotic behavior for some elliptic variational problems, Calc. Var. and PDE **18** *(2003), 57–75.*
- (with V. Rădulescu) Critical singular problems on infinite cones, Nonlinear analysis, TMA **54** *(2003), no. 6, 1153–1164.*
- (with A. Tesei) On a class of singular elliptic problems with first order terms, Adv. Differential Equations **8** *(2003), no. 3, 257–278.*
- (with J. Su and M. Willem) Non radial ground states for Henon like equations, Commun. Contemp. Math. **4** *(2002), 467–480.*
- (with J.B. van den Berg) Homoclinic solutions for Swift-Hohenberg and suspension bridges type equations, J. Differential Equations **184** *(2002), no. 1, 78–96.*
- (with V. Rădulescu and M. Willem) Hardy-Sobolev inequalities with remainder terms, Topol. Methods Nonlinear Anal. **20** *(2002), 145–149.*
- (with D. Bonheure and C. Fabry) Periodic solutions of forced isochronous oscillators at resonance, Discr. & Cont. Dyn. Syst. **8** *(2002), no. 4, 907–930.*
- (with A.K. Ben Naoum and C. Fabry) Resonance with respect to the Fučík spectrum, Electr. Journal of Differential Equations **37** *(2000), 1–21.*
- (with A.K. Ben Naoum and C. Fabry) Structure of the Fučík spectrum and existence of solutions for equations with asymmetric nonlinearities, Proc. Royal. Soc. Edinb. A. **131A** *(2001), 241–265.*
- A concentration-compactness lemma with applications to singular eigenvalue problems, Journal of Functional Analysis **167** *(1999), 463–480.*
- (with Th. De Pauw) On explicit solutions for the problem of Mumford and Shah, Communications in Contemporary Mathematics **1** *(1999), 201–212.*
- Travelling waves for an infinite lattice : Multibump type solutions, Topological Methods in Nonlinear Analysis **12** *(1998), 79–90.*
- (with M.Willem) Solitary waves with prescribed speed on infinite lattices, Journal of Functional Analysis **149** *(1997), 266–275.*

Comptes rendus notes presenting an original result

- (with F. Béthuel and G. Orlandi) On an open problem for Jacobians raised by Bourgain, Brezis and Mironescu, C. R. Math. Acad. Sci. Paris **337** *(2003), no. 6, 381–385.*
- (with S. Secchi and M. Willem) Remarks on a Hardy-Sobolev inequality, C. R. Acad. Sci. Paris Sér. I Math., **336** *(2003), no. 10, 811–815.*
- On infinite sums of integer valued Dirac's masses, C. R. Acad. Sci. Paris Sér. I Math. **334** *(2002), no. 5, 371–374.*

Comptes rendus notes announcements and proceedings

- (with F. Béthuel and G. Orlandi) On the Cauchy problem for phase and vortices in the parabolic Ginzburg-Landau equation, Singularities in PDE and the calculus of variations, 11–31, CRM Proc. Lecture Notes, 44, Amer. Math. Soc., Providence, RI, 2008.
- (with F. Béthuel and G. Orlandi) Dynamique des tourbillons de vorticité pour l'équation de Ginzburg-Landau parabolique, Séminaire: Équations aux Dérivées Partielles. 2006-2007, Exp. No. XVIII, 18 pp., Sémin. Équ. Dériv. Partielles, École Polytech., Palaiseau, 2007.
- PDE analysis of concentrating energies for the Ginzburg-Landau equation, Topics on concentration phenomena and problems with multiple scales, 293–314, Lect. Notes Unione Mat. Ital., 2, Springer, Berlin, 2006.
- (with F. Béthuel and G. Orlandi) Dynamics of multiple degree Ginzburg-Landau vortices, C. R. Math. Acad. Sci. Paris **342** *(2006), no. 11, 837–842.*
- Vortex motion and phase-vortex interaction in dissipative Ginzburg-Landau dynamics, Journées : Equations aux dérivées partielles, Forge-les-Eaux, 7-11 juin 2004, Imprimé à l'Ecole Polytechnique, Palaiseau, 2004.
- (with F. Béthuel and G. Orlandi) Convergence of the parabolic Ginzburg-Landau equation to motion by mean curvature, C. R. Acad. Sci. Paris Sér. I Math., **336** *(2003), no. 10, 719–723.*
- Problèmes d'évolution liés à l'énergie de Ginzburg-Landau, Séminaire: Equations aux Dérivées Partielles, 2002-2003, Exp. No. XII, 15 p., Ecole Polytechnique, Palaiseau, 2003.

Citations : 391 by 302 authors.

Five most representative publications

- (with F. Béthuel and G. Orlandi) Dynamics of multiple degree Ginzburg-Landau vortices, Comm. Math. Phys. **272** *(2007), 229-261.*
- (with F. Béthuel and G. Orlandi) Convergence of the parabolic Ginzburg-Landau equation to motion by mean curvature, Annals of Mathematics **163** *(2006), 37-163.*
- Nonlinear Schrodinger equation with Hardy potential and critical nonlinearity, Transactions of the AMS **357** *(2005), 2909-2938.*
- (with F. Béthuel and G. Orlandi) Vortex rings for the Gross-Pitaevskii equation, Jour. Europ. Math. Soc. **6** *(2004), 17-94.*
- (with M. Willem) Partial symmetry and asymptotic behavior for some elliptic variational problems, Calc. Var. and PDE **18** *(2003), 57-75.*

Teaching

From September 1997 to January 2000, 4h/week exercise lectures as research fellow FNRS at the university of Louvain-la-Neuve. From February 2002 to September 2004, normal load of an assistant professor at university Pierre & Marie Curie. One year without teaching spent at Scuola Normale Superiore di Pisa from Septembre 2004 to June 2005. Normal load as a professor from September 2005 at university Pierre & Marie Curie (part time at École Normale Supérieure de Paris from 2008).