

Curriculum Vitae

Luis E. Silvestre

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Personal Information

Citizenship: Argentinian.
US permanent resident.

Education

Ph.D. Mathematics May 2005
University of Texas, Austin, TX
Advisor: Prof. Luis Caffarelli

Licenciado en Matematica December 2000
Universidad Nacional de La Plata, Argentina.

Positions

Assistant Professor September 2008 - present
University of Chicago. Chicago, IL.

Courant Instructor Fall 2005 - August 31st 2008
Courant Institute. New York University. New York, NY.

Fellowships and Grants

- Bernardo A. Houssay scholarship for high school students 1994 and 1995
- FOMEC scholarship at Universidad Nacional de La Plata 1997, 1998 and 1999
- David Bruton jr. Fellowship at UT Austin Fall 2001, Spring 2002 and Fall 2003
- Sid Richardson Foundation Regents Fellowship at UT Austin Summer 2002
- Edward and Alice Dodd Fellowship at UT Austin Spring 2004
- Graduate Continuing Fellowship at UT Austin Fall 2004 and Spring 2005
- Liftoff Fellowship from the Clay Mathematics Institute. Summer 2005
- NSF Research grant DMS-0701016 June 2007 - May 2010
- Sloan Research Fellowship 2009 - 2011
- NSF Research grant DMS-1001629 June 2010 - May 2013
- NSF FRG Project DMS-1065971 - with Luis Caffarelli, Yanyan Li, Fanghua Lin and Henri Berestycki 2011 - 2014

Awards

- Silver Medal, International Mathematical Olympiad 1993 and 1994
- National Champion, Argentinian Mathematical Olympiad 1993 and 1994
- First Prize in the Paenza Mathematical Contest 1995, 1997, 1998 and 1999

Publications

1. $C^{1,\alpha}$ regularity of solutions of degenerate fully non-linear elliptic equations. C. Imbert and L. Silvestre. Preprint.
2. Holder continuity to Hamilton-Jacobi equations with superquadratic growth in the gradient and unbounded right-hand side. P. Cardaliaguet and L. Silvestre. Communications in Partial Differential Equations. To appear.
3. Partial regularity of solutions of fully nonlinear uniformly elliptic equations. S. Armstrong, L. Silvestre and C. Smart. Communications on Pure and Applied Mathematics. To appear.
4. Holder continuity for a drift-diffusion equation with pressure V. Vicol and L. Silvestre. Submitted.
5. Unique continuation for fully nonlinear elliptic equations S. Armstrong and L. Silvestre. Mathematical Research Letters. To appear.
6. On the differentiability of the solution to an equation with drift and fractional diffusion. L. Silvestre. Indiana University Mathematical Journal. To appear.
7. On divergence free drifts. G. Seregin, L. Silvestre, V. Sverak and A. Zlatoš. Journal of Differential Equations. To appear.
8. Holder estimates for advection fractional-diffusion equations. L. Silvestre. Annali della Scuola Normale Superiore di Pisa. Classe di Scienze. To appear.
9. Full regularity of a free boundary problem with two phases. H. Jiang, C. Larsen and L. Silvestre. Calculus of Variations and PDE. To appear.
10. Holder continuity for integro-differential parabolic equations with polynomial growth respect to the gradient. L. Silvestre. Discrete and Continuous Dynamical Systems Volume: 28, Number: 3, November 2010. A special issue Dedicated to Louis Nirenberg on the Occasion of his 85th Birthday Part II
11. Eventual regularization of the slightly supercritical fractional Burgers equation. C. H. Chan, M. Czubak and L. Silvestre. Discrete and Continuous Dynamical Systems Volume: 27, Number: 2, June 2010. A special issue Trends and Developments in DE/Dynamics Part I.
12. On the differentiability of the solution to the Hamilton-Jacobi equation with critical fractional diffusion. L. Silvestre. Advances in Mathematics. 226 (2011), no. 2, 2020-2039
13. Smooth approximations to solutions of nonconvex fully nonlinear elliptic equations. L. Caffarelli and L. Silvestre. American Mathematical Society Translations–Series 2 Advances in the Mathematical Sciences 2010; Volume: 229. Nonlinear Partial Differential Equations and Related Topics: Dedicated to Nina N. Uraltseva.
14. On the Evans-Krylov theorem. L. Caffarelli and L. Silvestre. Proceedings of the AMS. 138 (2010), 263-265.
15. The Evans-Krylov theorem for non local fully non linear equations. L. Caffarelli and L. Silvestre. Annals of Mathematics. To appear.
16. Regularity results for nonlocal equations by approximation L. Caffarelli and L. Silvestre. Archive of Rational Mechanics and Analysis. Volume 200, Issue 1 (2011), Page 59.
17. Eventual regularization in the slightly supercritical quasi-geostrophic equation. L. Silvestre. Annales de l'Institut Henri Poincaré (C) Non Linear Analysis 27 (2010), Issue 2, Pages 693-704.
18. The Dirichlet Problem for the Convex Envelope A. Oberman and L. Silvestre. Transactions of the AMS. To Appear.
19. Regularity theory for fully nonlinear integro-differential equations. L. Caffarelli and L. Silvestre. Communications on Pure and Applied Mathematics. 62 (2009) Issue 5, 597–638.
20. A characterization of optimal two-phase multifunctional composite designs. L. Silvestre. Proc. of the Royal Soc. of London A 463, Number 2086 (2007).

21. *Regularity estimates for the solution and the free boundary to the obstacle problem for the fractional Laplacian.* L. Caffarelli, S. Salsa and L. Silvestre. *Inventiones Mathematicae*. 171, Number 2 (2008).
22. *Regularity for the nonlinear Signorini problem.* E. Milakis and L. E. Silvestre. *Advances in Mathematics*. 217, Issue 3 (2008).
23. *An extension problem related to the fractional laplacian.* L. A. Caffarelli and L. E. Silvestre. *Communications in Partial Differential Equations*, 32 (2007) 8, 1245.
24. *Regularity of the obstacle problem for a fractional power of the laplace operator.* L. E. Silvestre. *Communications on Pure and Applied Mathematics*. 60 (2007), no. 1, 67–112.
25. *Issues in homogenization for problems with nondivergence structure.* L. A. Caffarelli and L. E. Silvestre. *Calculus of variations and nonlinear partial differential equations*, 43–74, *Lecture Notes in Math.*, 1927, Springer, Berlin, 2008.
26. *Hölder estimates for solutions of integro differential equations like the fractional laplace.* L. E. Silvestre. *Indiana University Mathematical Journal* 55 (2006), 1155–1174.
27. *Regularity for fully nonlinear elliptic equations with Neumann boundary data.* E. Milakis and L. E. Silvestre. *Communications in Partial Differential Equations* 31 (2006), No. 8
28. *The two membranes problem.* L. E. Silvestre. *Communications in Partial Differential Equations* 30 (2005), no. 1-3, 245–257
29. *Weak Matrix Majorization.* F. D. Martínez Pería, P. Massey and L. E. Silvestre. *Linear Algebra Appl.* 403 (2005), 343–368.

Talks in conferences

- Free Boundary Problems. Theory and Applications. Focus session on obstacle type problems. June 2005, Coimbra, Portugal.
- 2006 AMS Spring Southeastern Meeting. Special Session on Singular Integrals, Geometric Analysis, and Free Boundary Problems. April 1, 2006. Miami, FL.
- 2006 AMS Fall Eastern Section Meeting. Storrs, CT, October, 2006.
- International Conference on Partial Differential Equations and Applications. Beijing Normal University. June 2007, Beijing, China.
- Prairie Analysis Seminar. November 2nd, 2007. Manhattan, KS.
- Recent Trends in Nonlocal Operators and Applications. April 2008. Banff, Canada.
- Free Boundary Problems. Theory and Applications. Focus session on Regularity of free boundaries. June 2008. Stockholm, Sweden.
- Workshop on Geometric PDEs. Institute for Advance Studies. February 2009. Princeton, NJ.
- IV International Symposium on Nonlinear Equations and Free Boundary Problems. Mar del Plata, Argentina, March 2009.
- The 3D Euler and 2D Surface Quasi-geostrophic Equations Meeting. American Institute of Mathematics in Palo Alto, CA. April 2009.
- Minicourse at INdAM Intensive Period. Pavia, Italy, June 2009.
- Workshop on Nonlocal equations. Leganes, Spain. July 2009.
- Minicourse at Universidad Autonoma de Madrid. Madrid. July 2009.
- SIAM Conference on Analysis of Partial Differential Equations. Miami. December 2009.
- Conference on Nonlocal operators and partial differential equations. Bedlweo, Poland. June 2010.
- Past Themes and Current developments. A Special Workshop on Nonlinear Partial Differential Equations. Beijing, China, July 2010.
- Nonlinear PDEs. Valparaiso, Chile. January 2011.

- Free Boundary Problems, Theory and Applications. MSRI. Berkeley, CA. March 2011.
- Fronts and Nonlinear PDEs. A conference in honor of Henri Berestycki. Ecole normale suprieure. Paris. June 2011.
- Partial Differential Equations workshop. Oberwolfach. August 2011.

Talks in university seminars.

- Analysis seminar. Massachusetts Institute of Technology. November 2004.
- Analysis seminar. Royal Institute of Technology (KTH). March 2005. Stockholm, Sweden.
- Seminario di calcolo delle variazioni ed equazioni differenziali. Politecnico di Milano. June 2005. Milan, Italy.
- Geometric Analysis seminar. Princeton University. October 2005.
- PDE seminar. Purdue University. October 2005.
- PDE seminar. Brown University. October 2005.
- Geometry/Analysis Seminar. Columbia University. February 23, 2006.
- PDE Seminar. University of Texas at Austin. August 2006.
- PDE seminar. East China Normal University. June 2007, Shanghai, China.
- Rutgers University. September 18, 2007.
- Geometric Analysis seminar. Princeton University. October 5th, 2007.
- Colloquium. Kansas State University. November 1st, 2007.
- Analysis Seminar. Massachusetts Institute of Technology. February 2008.
- PDE seminar. Universidad de Buenos Aires. July 2008. Argentina.
- Differential Geometry/PDE Seminar. University of Washington. Seattle. January 2009.
- PDE seminar. Carnegie Mellon. March 2010.
- PDE seminar. UT Austin. April 2010.
- PDE seminar. Univerisity of Bonn. July 2010. Germany.
- PDE seminar. Georgia Tech. November 2010.
- Seminar at the departamento de aeronáutica, UNLP. La Plata, Argentina, August 2010.
- Geometric Analysis seminar. Princeton University. February 2011.
- Calderon-Zygmund seminar. University of Chicago. March 2011.
- Analysis seminar. University of Wisconsin, Madison. September 2011.
- Analysis seminar. Northwestern Univerisity. November 2011.
- PDE seminar. Universit Paris-Est Crteil. November 2011.
- Applied Analysis and Computation Seminar. UMass., Amherst. November 2011.

Other

- Refereed articles for several journals.