

Curriculum Vitae

Nestor Guillen

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Personal information

Born: September 25, 1984.
Venezuelan citizen.
United States Permanent Resident.

Education

Ph.D. Mathematics University of Texas at Austin. Advisor: Luis Caffarelli.	December 2010
Licenciado en Matemáticas Universidad Simón Bolívar. Sartenejas, Venezuela. Tutor: Lázaro Recht.	July 2006

Positions

Associate Professor. Texas State University.	2022 - present.
Assistant Professor. Texas State University.	2019 - 2022.
Associate Professor (on leave). University of Massachusetts at Amherst.	2019 - 2020.
Assistant Professor. University of Massachusetts at Amherst.	2014 - 2019.
Visiting Associate Research Scientist. Columbia University.	Fall 2018-Spring 2019.
E.R. Hedrick Assistant Adjunct Professor. University of California at Los Angeles.	2011 - 2014.
Postdoctoral Fellow. Mathematical Sciences Research Institute, Berkeley.	Spring 2011.
Visiting Scholar. Institute for Advanced Study, Princeton.	Winter 2009.
Graduate Research Assistant. University of Texas at Austin.	Spring 2007-Fall 2010.

Fellowships, grants and awards

NSF CAREER Grant DMS-2144232. Award: \$498,969.00	2022-2027.
NSF Research Grant DMS-1700307. Award: \$135,000.00	2017-2020.
NSF Research Grant DMS-1201413. Award: \$102,000.00	2012-2016.
Visiting Researcher at the <i>Fields Institute</i> in Toronto, Canada.	Fall 2014.
Graduate School Continuing Fellowship.	2009-2010.
Lefevre Fellowship.	Spring 2009.
Wall Memorial Fellowship.	Spring 2009.
Frank Sid Richardson Foundation Regents Fellowship.	Spring 2007.
Frank Gerth III Graduate Excellence Award.	2007.

Ph.D. Students mentored

- René Cabrera (UMass Amherst, PhD 2022).

Research articles

Note: *Links to preprints and journal articles can be found in my personal homepage www.ndguillen.com.*

1. *Hardy's inequality and the isotropic Landau equation.* M. Gualdani and N. Guillen. Journal of Functional Analysis, accepted for publication.
2. *A Hele-Shaw limit without monotonicity.* N. Guillen, I. Kim, and A. Mellet. Archive for Rational Mechanics and Analysis (2022).
3. *Optimal transport and the Gauss curvature equation.* N. Guillen and J. Kitagawa, Methods and Applications of Analysis (2020).
4. *Geometry of graph partitions via optimal transport.* T. Abrishami, N. Guillen, P. Rule, Z. Schutzman, J. Solomon, T. Weighill, and S. Wu. SIAM Journal on Scientific Computing (2020).
5. *A primer on Generated Jacobian Equations: Geometry, optics, economics.* N. Guillen. Notices of the American Mathematical Society 66.9 (2019).
6. *Some free boundary problems recast as nonlocal parabolic equations.* H. Chang-Lara, N. Guillen, and R. Schwab. Journal of Nonlinear Analysis (2019).
7. *Coupling Levy measures and comparison principles for viscosity solutions.* N. Guillen, C. Mou, and A. Swiech. Transactions of the American Mathematical Society (2019).
8. *Estimates for Dirichlet-to-Neumann maps as integro-differential operators.* N. Guillen, J. Kitagawa, and R. Schwab. Potential Analysis. Potential Analysis (2019).
9. *On A_p weights and the Landau equation.* M. Gualdani and N. Guillen. Calculus of Variations and Partial Differential Equations (2019).
10. *Min-max formulas for nonlocal elliptic operators on Euclidean space.* N. Guillen and R. Schwab, Journal of Analysis (2019).
11. *Min-max formulas for nonlocal elliptic operators.* N. Guillen and R. Schwab. Calculus of Variations and Partial Differential Equations (2019).
12. *From the free boundary condition for Hele-Shaw to a fractional parabolic equation.* H. Chang-Lara and N. Guillen. Preprint.
13. *Neumann Homogenization via Integro-Differential Operators, Part 2: singular gradient dependence.* N. Guillen and R. Schwab. SIAM Journal on Mathematical Analysis (2018).

14. *Estimates for radial solutions of the homogeneous Landau equation with Coulomb potential.* M. Gualdani and N. Guillen. *Analysis and PDE* (2016).
15. *Pointwise estimates and regularity in geometric optics and other Generated Jacobian Equations.* N. Guillen and J. Kitagawa. *Communications on Pure and Applied Mathematics.* (2017).
16. *Neumann Homogenization via Integro-Differential Operators.* N. Guillen and R. Schwab. *Discrete and Continuous Dynamical Systems* (2016).
17. *Mean curvature, diffusion generated motion, and phase field theory on finite graphs.* A. Bertozzi, Y. van Gennip, N. Guillen and Braxton Osting. *Milan Journal of Mathematics* (2014).
18. *Quasistatic droplets in randomly perforated domains.* N. Guillen and Inwon Kim. *Archive for Rational Mechanics and Analysis* (2015).
19. *On the local geometry of maps with c -convex potentials.* N. Guillen and J. Kitagawa. *Calculus of Variations and Partial Differential Equations* (2015).
20. *Aleksandrov-Bakelman-Pucci Type Estimates For Integro-Differential Equations.* N. Guillen and R. Schwab. *Archive for Rational Mechanics and Analysis* (2012).
21. *Five lectures on optimal transportation: geometry, regularity and applications.* N. Guillen and R. McCann. *In Analysis and Geometry of Metric Measure Spaces: Lecture Notes of the Seminaire de Mathematiques Superieure* (2011).
22. *Regularity for non-local almost minimal boundaries and applications.* N. Guillen and C. Caputo. Preprint.
23. *Optimal regularity for the Signorini problem.* N. Guillen. *Calculus of Variations and Partial Differential Equations* (2009).

Selected seminar talks

- Online Analysis and PDE Seminar¹. Universidad de Sevilla. March 2021, Sevilla.
- DEAM Seminar. Texas State University. February 2021, San Marcos.
- Applied Mathematics Seminar. Brown University. February 2019, Providence.
- Colloquium. Texas State University. January 2019, San Marcos.
- Colloquium. Tulane University, April 2018, New Orleans.
- Metric Geometry Group Seminar. Tufts University, May 2017, Boston.
- Analysis seminar. Massachusetts Institute of Technology, March 2017, Boston.
- Analysis Seminar. University of Chicago. October 2016, Chicago.
- Applied Mathematics Seminar. Michigan State University. March 2016, Lansing.
- Geometric PDE. University of Wisconsin. March 2016, Madison.
- PDE Seminar. Georgia Inst. of Technology, October 2015, Atlanta.
- UCLA-Caltech Analysis Seminar. California Inst. of Technology, May 2015, Pasadena.
- Analysis Seminar. Columbia University, September 2014, New York.
- Colloquium. Drexel University, January 2014, Philadelphia.
- Colloquium. George Washington University. January 2014, Washington, D.C.

¹<https://sites.google.com/view/analysis-pde-seminar/main-page>

- Colloquium. University of Maryland. December 2013, College Park.
- Colloquium. University of Massachusetts. December 2013, Amherst.
- Colloquium. Purdue University. December 2013, West Lafayette.
- Geometric PDE seminar. Princeton University. September 2013. Princeton.

Minicourses taught

- Minicourse on Stochastic Homogenization. 2016 Gene Golub Summer School, Philadelphia, July 2016.

Selected conference talks

- *Midwest Geometry Conference*. Plenary speaker. Wichita State University. March 2022.
- *Congreso Latinoamericano de Matemáticos*. (Análisis Funcional y Geometría). September 2021.
- *Gerrymandering workshop*. Duke University, October 2018.
- *BIRS Workshop: Advanced Developments for Surface and Interface Dynamics - Analysis and Computation*. Banff International Research Station. June 2018.
- *Mathematical Congress of the Americas*. Session on Nonlocal variational problems. Montreal. July 2017.
- *BIRS Workshop: Generated Jacobian Equations: from geometric optics to economics*. Banff International Research Station. April 2017.
- *SIAM Conference on Nonlinear Waves and Coherent Structures*. Session on Nonlocal dynamics in mechanics, transport, and electromagnetics. Philadelphia. August 2016.
- *3rd Conference on Nonlocal Operators and Partial Differential Equations*. Stefan Banach International Mathematical Center, Bedlewo. June 2016.
- *Conference on Recent Trends on Elliptic Nonlocal Equations*. Fields Institute, Toronto. June 2016
- *Nonlocal PDEs Workshop*. IPAM, Los Angeles. February 2012.

Organization of scientific meetings

- [Recent Progress in Kinetic and Integro-Differential Equations](#), November 2022, Banff International Research Station. Co-organized with Maria Gualdani, Russell Schwab, and Maja Taskovic.
- [Workshop on Free Boundary Problems](#), May 2019, Columbia University. Co-organized with Daniela De Silva, Ovidiu Savin, and Hui Yu.
- [Workshop on Nonlinear PDEs](#), December 2018, Columbia University. Co-organized with Daniela De Silva, Ovidiu Savin, and Hui Yu.
- [Generated Jacobian Equations: from Geometric Optics to Economics](#), April 2017, Banff International Research Station. Co-organized with Jun Kitagawa and Robert McCann.
- [Optimal Transport School, Lake Arrowhead \(October 2013\)](#). Co-organized with Dima Shlyakhtenko and Christoph Thiele.
- SIAM Conference on Analysis of PDE 2011. *Non-local equations: perspectives from Probability and PDEs*. Co-organized with Russell Schwab.
- SIAM Conference on Analysis of PDE 2009. *Topics in fractional and geometric PDE*. Co-organized with Luis Caffarelli.