Scott N. Armstrong   Curriculum Vitae

CONTACT INFORMATION	Courant Institute of Mathematical Sciences New York University 251 Mercer St. New York, NY 10012 webpage: `http://cims.nyu.edu/~scotta/` email: `scotta@cims.nyu.edu`

EDUCATION

University of California, Berkeley
Ph.D. in Mathematics, 2009.

CURRENT POSITION

Courant Institute of Mathematical Sciences, NYU
Professor of Mathematics, 2019–present

PREVIOUS POSITIONS

Courant Institute of Mathematical Sciences, NYU
Associate Professor of Mathematics, 2016–2019

Université Paris-Dauphine/CEREMADE
CNRS Chargé de recherche (1re classe), 2012–2016

University of Wisconsin–Madison
Assistant Professor (tenure track), 2011–2012

The University of Chicago
Dickson Instructor/NSF Postdoctoral Fellow, 2010–2011

Louisiana State University
VIGRE Postdoctoral Fellow, 2009–2010

VISITING POSITIONS

Fondation Sciences Mathématiques de Paris
Chaire Junior, 2012 (six months)

Université Paris-Dauphine
Professeur Invité, June 2011

Centre d'analyse et de mathématiques sociales (CAMS), Paris
Postdoctoral Fellow, Summer 2010

RESEARCH INTERESTS

Partial differential equations, Probability theory, Mathematical Physics, Homogenization, Statistical Mechanics

GRANTS

1. PI, NSF Grant DMS-1700329 (2017–2020), $180k

2. Co-PI (with J.-C. Mourrat), grant of NYU-PSL Global Alliance (2018), $20k

EDITORIAL BOARDS

Nonlinear Analysis, Associate Editor since 2019.

Stochastics and Partial Differential Equations: Analysis and Computations, Associate Editor since 2016.

Advances in Calculus of Variations, Associate Editor since 2015

STUDENTS

Paul Dario, PhD co-advisor with J.-C. Mourrat, defense expected 6/2019

Samuel Ferguson, PhD advisor, defended 5/2019

Alexandre Bordas, PhD co-advisor with J.-C. Mourrat, defended 9/2018

Jean-Paul Daniel, PhD co-advisor with S. Serfaty, defended 12/2014

PRIZES

1. 2017 SIAM Activity Group on Analysis of Partial Differential Equations Prize (shared with C. Smart) for the most outstanding paper on a topic in partial differential equations published in the four calendar years preceding the award year.

BOOK

1. S. Armstrong, T. Kuusi & J.-C. Mourrat, *Quantitative Stochastic Homogenization and Large-Scale Regularity.* Grundlehren der mathematischen Wissenschaften, Vol. 352 (2019), Springer, xxxviii+518p.

PAPERS

46. Local laws and rigidity for Coulomb gases at any temperature (with S. Serfaty), submitted.

45. Variational methods for the kinetic Fokker-Planck equation (with J.-C. Mourrat), submitted.

44. Homogenization, linearization and large-scale regularity for nonlinear elliptic equations (with S. Ferguson and T. Kuusi), submitted.

43. An iterative method for elliptic problems with rapidly oscillating coefficients (with A. Hannukainen, T. Kuusi and J.-C. Mourrat), submitted.

42. Quantitative stochastic homogenization and regularity theory of parabolic equations (with A. Bordas and J.-C. Mourrat), *Anal. & PDE*, 11 (2018), 1945–2014.

41. S. Armstrong and P. Dario. Elliptic regularity and quantitative homogenization on percolation clusters. *Comm. Pure Appl. Math.*, 71 (2018), 1717–1849.

40. Quantitative analysis of boundary layers in periodic homogenization (with T. Kuusi, J.-C. Mourrat and C. Prange), *Arch. Ration. Mech. Anal.*,

226 (2017), 695–741.

39. Optimal quantitative estimates in stochastic homogenization for elliptic equations in nondivergence form (with J. Lin), *Arch. Ration. Mech. Anal.*, 225 (2017), 937–991.

38. The additive structure of elliptic homogenization (with T. Kuusi and J.-C. Mourrat), *Invent. Math.*, 208 (2017), 999–1154.

37. Bounded correctors in almost periodic homogenization (with T. Kuusi and A. Gloria), *Arch. Ration. Mech. Anal.*, 222 (2016), 393–426.

36. Mesoscopic higher regularity and subadditivity in elliptic homogenization (with T. Kuusi and J.-C. Mourrat), *Comm. Math. Phys.*, 347 (2016), 315–361.

35. Calderón-Zygmund estimates for stochastic homogenization (with J.-P. Daniel), *J. Functional Anal.*, 270 (2016), 312–329.

34. Stochastic homogenization of quasilinear Hamilton-Jacobi equations and geometric motions (with P. Cardaliaguet), *J. Eur. Math. Soc.*, 20 (2018), 797–864.

33. Stochastic homogenization of nonconvex Hamilton-Jacobi equations in one space dimension (with H. V. Tran and Y. Yu), *J. Differential Equations*, 261 (2016), 2702–2737.

32. Lipschitz regularity for elliptic equations with random coefficients (with J.-C. Mourrat), *Arch. Ration. Mech. Anal.*, 219 (2016), 255–348.

31. Lipschitz estimates in almost-periodic homogenization (with Z. Shen), *Comm. Pure Appl. Math.* 69 (2016), 1882–1923

30. Quantitative stochastic homogenization of convex integral functionals (with C. K. Smart), *Ann. Sci. Éc. Norm. Supér.*, 48 (2016), 423–481.

29. Local asymptotics for controlled martingales (with O. Zeitouni), *Ann. Appl. Probab.*, 26 (2016), 1467–1494.

28. Quantitative stochastic homogenization of viscous Hamilton-Jacobi equations (with P. Cardaliaguet), *Comm. PDE*, 40 (2015), 540–600.

27. Stochastic homogenization of a nonconvex Hamilton-Jacobi equation (with H. V. Tran and Y. Yu), *Calc. Var. Partial Differential Equations*, 54 (2015), 1507–1524.

26. Stochastic homogenization of viscous Hamilton-Jacobi equations and applications (with H. V. Tran), *Anal. PDE*, 7-8 (2014), 1969–2007..

25. Viscosity solutions of general viscous Hamilton-Jacobi equations (with H. V. Tran), *Math. Ann.*, 361 (2015), 647–687.

24. Quantitative stochastic homogenization of elliptic equations in nondiver-

gence form (with C.K. Smart), *Arch. Ration. Mech. Anal.*, 214 (2014), 867–911.

23. Remarks on a constrained optimization problem for the Ginibre ensemble (with S. Serfaty and O. Zeitouni), *Potential Anal.*, 41 (2014), 945–958.

22. Stochastic homogenization of fully nonlinear uniformly elliptic equations revisited (with C. K. Smart), *Calc. Var. Partial Differential Equations* 50 (2014), 967–980.

21. Regularity and stochastic homogenization of fully nonlinear equations without uniform ellipticity (with C. K. Smart), *Ann. Probab.*, 42 (2014), 2558–2594.

20. Error estimates and convergence rates for the stochastic homogenization of Hamilton-Jacobi equations (with P. Cardaliaguet and P. E. Souganidis), *J. Amer. Math. Soc.*, 27 (2014), 479–540.

19. Stochastic homogenization of level-set convex Hamilton-Jacobi equations (with P. E. Souganidis), *Int. Math. Res. Not.*, 2013 (2013), 3420–3449.

18. Concentration phenomena for neutronic multigroup diffusion in random environments (with P. E. Souganidis), *Ann. Inst. H. Poincaré Anal. Non Linéaire*, 30 (2013), 419–439.

17. Stochastic homogenization of L^∞ variational problems (with P. E. Souganidis), *Adv. Math.*, 229 (2012), no. 6, 3508–3535.

16. Singular solutions of fully nonlinear elliptic equations and applications (with B. Sirakov and C. K. Smart), *Arch. Ration. Mech. Anal.*, 205 (2012), no. 2, 345–394

15. Partial regularity of solutions of fully nonlinear uniformly elliptic equations (with L. Silvestre and C. K. Smart), *Comm. Pure. Appl. Math.*, 65 (2012), no. 8, 1169–1184.

14. Stochastic homogenization of Hamilton-Jacobi and degenerate Bellman equations in unbounded environments (with P. E. Souganidis), *J. Math. Pures Appl.*, 97 (2012), no. 5, 460–504.

13. Unique continuation for fully nonlinear elliptic equations (with L. Silvestre), *Math. Res. Lett.*, 18 (2011), no. 5, 921–926.

12. Nonexistence of positive supersolutions of elliptic equations via the maximum principle (with B. Sirakov), *Comm. Partial Differential Equations*, 36 (2011), no. 11, 2011–2047.

11. Convexity criteria and uniqueness of absolutely minimizing functions (with M. G. Crandall, V. Julin, and C. K. Smart), *Arch. Ration. Mech. Anal.*, 200 (2011), no. 2, 405–443.

10. Sharp Liouville results for fully nonlinear equations with power-growth

nonlinearities (with B. Sirakov), *Ann. Sc. Norm. Super. Pisa Cl. Sci.*, 10 (2011), no.3, 711–728.

9. Fundamental solutions of homogeneous fully nonlinear elliptic equations (with B. Sirakov and C. K. Smart), *Comm. Pure Appl. Math.* 64 (2011), no. 6, 737-777.

8. An infinity Laplace equation with gradient term and mixed boundary conditions (with C. K. Smart and S. J. Somersille), *Proc. Amer. Math. Soc.* 139 (2011), no. 5, 1763–1776.

7. An easy proof of Jensen's theorem on the uniqueness of infinity harmonic functions (with C. K. Smart), *Calc. Var. Partial Differential Equations* 37 (2010), 381–384.

6. A finite difference approach to the infinity Laplace equation and tug-of-war games (with C. K. Smart), *Trans. Amer. Math. Soc.* 364 (2012), no. 2, 595–636.

5. Long-time asymptotics for fully nonlinear homogeneous parabolic equations (with M. Trokhimtchouk), *Calc. Var. Partial Differential Equations* 38 (2010), 521–540.

4. The Dirichlet problem for the Bellman equation at resonance, *J. Differential Equations* 247 (2009), 931–955.

3. Principal eigenvalues and an anti-maximum principle for homogeneous fully nonlinear elliptic equations, *J. Differential Equations* 246 (2009), 2958–2987.

2. Solvability of symmetric word equations in positive definite letters (with C. J. Hillar), *J. Lond. Math. Soc.* (2) 76 (2007), no. 3, 777–796.

1. On embeddings of full amalgamated free product C^*-algebras (with K. Dykema, R. Exel and H. Li), *Proc. Amer. Math. Soc.* 132 (2004), no. 7, 2019–2030.

TALKS

96. École Polytechnique, minicourse, Paris (June 2019)

95. Journées EDP 2019, minicourse lecturer, Obernai (France) (June 2019)

94. Institute for Advanced Study, Analysis seminar (March 2019)

93. Université de Lyon and ENS Lyon, Hypatie seminar (joint minicourse with J.-C. Mourrat) (January 2019)

92. University of Maryland, Mathematics colloquium (November 2018)

91. Midwest PDE seminar, Purdue University (November 2018)

90. University of Texas at Austin, Analysis seminar (September 2018)

89. International Congress of Mathematical Physics, PDE Session, invited speaker, Montreal (July 2018)

88. Transport and localization in random media: theory and applications, Columbia University (April 2018)

87. MIT, Probability seminar (April 2018)

86. The SIAG/APDE Prize Lecture, SIAM Conference on Analysis of Partial Differential Equations, Baltimore (December 2017)

85. Princeton University, Analysis seminar (November 2017)

84. Recent Advances in PDEs and the Calculus of Variations, Venice (July 2017)

83. PDE & Calculus of Variations Conference, Berkeley (May 2017)

82. Temple University, Analysis seminar (January 2017)

81. Columbia University, Probability seminar (November 2016)

80. Rutgers University, Nonlinear Analysis Seminar (October 2016)

79. Madison Workshop in Analysis and PDE (October 2016)

78. University of Chicago, Calderón-Zygmund seminar (September 2016)

77. Multiscale phenomena in electrochemical and porous systems, Warwick (June 2016)

76. New trends in nonlinear PDEs: from theory to applications, Cardiff (June 2016)

75. École des hautes études en sciences sociales, analysis seminar (May 2016)

74. L'Institut de Mathématiques de Bordeaux, seminar (April 2016)

73. L'université de Cergy-Pontoise, analysis seminar (March 2016)

72. 6th Ohio River Analysis Meeting, invited plenary lecture, Lexington, Kentucky (March 2016)

71. Invited minicourse at Winter school on stochastic homogenization, University of Augsburg (February 2016)

70. University of California, Berkeley, Mathematics colloquium (February 2016)

69. University of California, Berkeley, Mathematics colloquium (February 2016)

68. Courant Institute, Mathematics colloquium (February 2016)

67. Probability seminar, University of Warwick (December 2015)

66. Analysis seminar, University of Helsinki (November 2015)

65. Probability seminar, Paris 7 (October 2015)

64. BIRS workshop on homogenization, Banff research station (July 2015)

63. Joint AMS/EMS/SPM Meeting, Porto (June 2015)

62. Invited minicourse in 13th Workshop on interactions between dynamical systems and partial differential equations, UPC Barcelona (June 2015)

61. ENS Lyon, Probability seminar (February 2015)

60. Séminaire au Laboratoire de Jacques-Louis Lions, Paris (January 2015)

59. Weizmann Institute, Probability seminar (December 2014)

58. Laurent Schwartz seminar, IHES/Polytechnique (October 2014)

57. Mittag-Leffler Institute seminar, Workshop on Homogenization and Random Phenomenon (September 2014)

56. Colloquium, Linköping University (September 2014)

55. Oberwolfach seminar, Workshop on Calculus of Variations (June 2014)

54. Workshop on interactions between dynamical systems and partial differential equations, Barcelona (June 2014)

53. Analyse des Equations aux Dérivées Partielles, Roscoff, France (June 2014)

52. Probability seminar, Stanford University (June 2014)

51. Center for Nonlinear Analysis seminar, Carnegie Mellon University (May 2014)

50. Probability seminar, Courant Institute (May 2014)

49. Analysis Seminar, University of Pennsylvania (March 2014)

48. Analysis seminar, Courant Institute (March 2014)

47. Applied math seminar, Columbia University (March 2014)

46. Seminar of Felix Otto's Research Group, Leipzig (February 2014)

45. PDE seminar, La Sapienza University, Rome (February 2014)

44. Quasilinear PDEs and Game Theory (conference), Uppsala University (December 2013)

43. ETH minicourse (April 2013)

42. Analysis seminar, University of Basel (March 2013)

41. OxPDE Seminar, University of Oxford, UK (February 2013)

40. Weizmann Institute, Geometric Functional Analysis & Probability Seminar, Rehovot, Israel (December 2012)

39. PDE Seminar, University Paris-Est-Créteil (November 2012)

38. Seminar of Felix Otto's Research Group, Leipzig (October 2012)

37. Séminaire ÉDP, Modélisation et Calcul scientifique de Lyon, l'Institut Camille Jordan and ENS Lyon (October 2012)

36. Nonlinear analysis & PDE seminar, ENS, Paris 6 and Paris 7 (October 2012)

35. ERC Workshop on Geometric Partial Differential Equations, Pisa (September 2012)

34. University of Jyväskylä, PDE Seminar, Jyväskylä, Finland (August 2012)

33. EDP Seminar, Aix-Marseille Université, Marseilles (May 2012)

32. Université Paris-Sud, Séminaire ANEDP d'Orsay, (May 2012)

31. University of Wisconsin-Madison, Probability Seminar (February 2012)

30. University of Illinois, Urbana-Champaign, Probability Seminar (February 2012)

29. University of California, Berkeley, PDE Seminar (February 2012)

28. Université Paris-Dauphine, CEREMADE Analysis and Probability seminar (January 2012)

27. SIAM Conference on Analysis of Partial Differential Equations, San Diego (November 2011)

26. Columbia University, Geometry and Analysis seminar, New York (October 2011)

25. University of Wisconsin-Madison, PDE/Geometric Analysis seminar (October 2011)

24. University of Wisconsin-Madison, Mathematics Department Colloquium (September 2011)

23. Ginzburg-Landau equations, Dislocations and Homogenization, Ile de Ré, France (May 2011)

22. ETH, Analysis seminar, Zurich (May 2011)

21. Collège de France, Applied Mathematics Seminar, Paris (April 2011)

20. Nonlinear PDEs in Valparaíso (conference), Valparaíso, Chile (January 2011)

19. Southern California Analysis and PDE conference, UCLA (November

2010)

18. Fields Institute (invited minicourse), Toronto (October 2010)

17. Georgia Tech University, PDE Seminar, Atlanta (September 2010)

16. Symposium on Viscosity methods and nonlinear PDE, Sapporo, Japan (July 2010)

15. University of Jyväskylä, PDE Seminar, Jyväskylä, Finland (June 2010)

14. Positivity: A key to fully nonlinear equations (conference), Salerno, Italy (May 2010)

13. 8th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Dresden, Germany (May 2010)

12. AMS Special Session on Partial Differential Equations in Geometry and Variational Problems, Lexington, KY (March 2010)

11. Louisiana State University, Math Department Colloquium (February 2010)

10. University of Wisconsin-Madison, Mathematics Department Colloquium (January 2010)

9. AMS Special Session on Degenerate and Singular Elliptic Partial Differential Equations, San Francisco (January 2010)

8. SIAM Conference on Analysis of Partial Differential Equations, Miami (December 2009)

7. University of Chicago, CAMP/Nonlinear PDE seminar (November 2009)

6. Loyola University, Math Department Colloquium, Chicago (November 2009)

5. University of Houston, PDE seminar (October 2009)

4. Louisiana State University, Analysis seminar (September 2009)

3. Workshop on New Connections Between Differential and Random Turn Games, PIMS/University of British Columbia, Vancouver (July 2009).

2. Lehigh University, Mathematics and Statistics Colloquium, Bethlehem, PA (January 2009)

1. Santa Clara University, Mathematics and Computer Science Colloquium, Santa Clara, CA (February 2008)