Nathan Glatt-Holtz

Associate Professor of Applied Mathematics, Tulane University

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Research Interests

Nonlinear and Stochastic Partial Differential Equations, Inverse Problems, Computational Statistics

Appointments

Tulane University (Fall 2016 - Present)
Associate Professor (with tenure).

Mathematical Sciences Research Institute (MSRI), Berkeley, CA (Fall 2015)
Research Membership.

Virginia Tech (Fall 2013 - Summer 2016)
Assistant Professor (tenure track).

University of Minnesota, Twin Cities (Fall 2012- Spring 2013)
IMA Postdoctoral Fellow.
Thematic program: Infinite Dimensional and Stochastic Dynamical Systems and their Applications.

Indiana University
Max Zorn Postdoctoral Fellow (Fall 2008- Spring 2011).
NSF Postdoctoral Fellow (Fall 2010 - Summer 2012).
Postdoctoral Mentor: Roger Temam.

Education

University of Southern California
Ph.D, Applied Mathematics, August 2008
Thesis Advisor: Mohammed Ziane

University of California, Berkeley
B.A., Mathematics, May 2003

External Funding

6. 2021-2024 NSF-DMS-**2108790** ($141,000).
5. 2018-2022 NSF-DMS-**1816551** ($120,000).
4. 2017-2019 NSF-DMS-**1700124** ($30,000).
3. 2017-2019 Simons Foundation **515990** ($42,000).
2. 2013-2017 NSF-DMS-**1313272** ($121,170).
1. 2010-2012 NSF-DMS-**1004638** ($135,000).

Publications and Preprints

Submitted

S6. "Long-term accuracy of numerical approximations of SPDEs with the stochastic Navier-Stokes equations as a paradigm" (with C. Mondaini).

S5. "The short memory limit for long time statistics in a stochastic Coleman-Gurtin model of heat conduction." (with V. Martinez, and H. Nguyen).

S4. "Unique Ergodicity in Stochastic Electroconvection" (with E. Abdo, and M. Ignatova).

S3. "Parallel MCMC Algorithms: Theoretical Foundations, Algorithm Design, Case Studies" (with C. Mondaini, A. Holbrook and J. Krometis).

S2. "On the long-time statistical behavior of smooth solutions of the weakly damped, stochastically-driven KdV equation" (with V. Martinez and G. Richards).

S1. "Embracing Uncertainty in 'Small Data' Problems: Estimating Earthquakes from Historical Anecdotes" (with J. Krometis, R. Harris, H. Ringer and J. Whitehead).

In Press

P2. "A Statistical Framework for Domain Shape Estimation in Stokes Flows" (with J.Borggaard and J. Krometis).
Inverse Problems.

P1. "On the accept-reject mechanism for Metropolis-Hastings algorithms" (with C. Mondaini and J. Krometis).
The Annals of Applied Probability.

Journal Articles

34. "Mixing Rates for Hamiltonian Monte Carlo Algorithms in Finite and Infinite Dimensions" (with C. Mondaini).
Stochastics and Partial Differential Equations: Analysis and Computations, (2021): 1-74.

33. "Sensitivity of steady states in a degenerately-damped stochastic Lorenz system" (with J. Földes, D. Herzog).
Stochastics and Dynamics, Vol. 21, No. 08, 2150055 (2021).

32. "Methodological reconstruction of historical seismic events from anecdotal accounts of destructive tsunamis: a case study for the great 1852 Banda arc mega-thrust earthquake and tsunami" (with H. Ringer, J. Whitehead, J. Krometis, R. Harris, S. Giddens, C. Ashcraft, G. Carver, A. Robertson, M. Harward, J. Fullwood, K. Lightheart, R. Hilton, A. Avery, C. Kesler, M. Morrise, M. Klein).
JGR: Solid Earth, Volume 126, Issue 4, April 2021.

31. "A Bayesian Approach to Estimating Background Flows from a Passive Scalar" (with J. Borggaard and J. Krometis)
SIAM/ASA Journal on Uncertainty Quantification, 8(3):1036 1060, 2020.

30. "On Bayesian Consistency for Flows Observed Through a Passive Scalar" (with J.Borggaard and J. Krometis).
The Annals of Applied Probability, 30(4) (2020): 1762-1783.

29. "The Generalized Langevin Equation with power-law memory in a non-linear potential well" (with D. Herzog, S. McKinley, H. Nguyen).
Nonlinearity, (2020) Volume 33, Number 6.

28. "Data Assimilation in Large-Prandtl Rayleigh-Bnard Convection from Thermal Measurements" (with A. Farhat, N. Glatt-Holtz, V. Martinez, S. McQuarrie, J. Whitehead).
SIAM Journal on Applied Dynamical Systems, (2019) (1), 510540.

27. "On the convergence of stationary solutions in the Smoluchowski-Kramers approximation of infinite dimensional systems" (with S. Cerrai).
Journal of Functional Analysis, (2019) 108421.

26. "GPU-Accelerated Particle Methods for Evaluation of Sparse Observations for PDE-Constrained Inverse Problems" (with J.Borggaard and J. Krometis).
Journal of Computational Physics, 391 (2019): 142-154.

25. "Invariant measures for the stochastic one-dimensional compressible Navier-Stokes equations" (with M. Coti Zelati, N. Glatt-Holtz, and K. Trivisa).
Applied Mathematics & Optimization, 83, pages 14871522 (2021).

24. "Large Prandtl Number Asymptotics in Randomly Forced Turbulent Convection" (with J. Földes and G. Richards).
Nonlinear Differential Equations and Applications NoDEA, (2019) 26: 43.

23. "Scaling and Saturation in Infinite-Dimensional Control Problems with Applications to Stochastic Partial Differential Equations" (with D. Herzog, J. C. Mattingly).
Annals of PDE, (2018) 4: 16.

22. "Asymptotic Analysis for Randomly Forced MHD" (with J. Földes, S. Friedlander, G. Richards).
SIAM Journal on Mathematical Analysis (SIMA), 49(6), 4440–4469, 2017.

21. "On Unique Ergodicity in Nonlinear Stochastic Partial Differential Equations" (with J. C. Mattingly, G. Richards).
Journal of Statistical Physics, 1–32, 2016.

20. "Ergodicity in Randomly Forced Rayleigh-Bénard Convection" (with J. Földes, G. Richards, J.P. Whitehead).
Nonlinearity, Nov 2016, Volume 29, Number 11.

19. "Invariant measures for passive scalars in the small noise inviscid limit" (with J. Bedrossian and M. Coti Zelati).
Communications in Mathematical Physics, Nov 2016, Volume 348, Issue 1, pp 101–127.

18. "Time Discrete Approximation of Weak Solutions for Stochastic Equations of Geophysical Fluid Dynamics and Applications", (with R. Temam and C. Wang).
Chinese Annals of Mathematics, Ser. B 38 2017, no.2, 425–472.

17. "Inviscid Limits for a Stochastically Forced Shell Model of Turbulent Flow" (with S. Friedlander, V. Vicol).
Annales de l'Institut Henri Poincaré, Probabilités et Statistiques, Volume 52, Number 3 (2016).

16. "Ergodic and Mixing Properties of The Boussinesq Equations with a Degenerate Random Forcing" (with J. Földes, G. Richards and E Thomann).
Journal of Functional Analysis, Volume 269, Issue 8, 15 October 2015, Pages 2427-2504.

15. "Martingale and Pathwise Solutions to the Stochastic Zakharov-Kuznetsov Equation with Multiplicative Noise" (with R. Temam and C. Wang).
Discrete and Continuous Dynamical Systems - Series B, 19 (2014), no. 4, 1047-1085.

14. "Existence and Regularity of Invariant Measures for the Three Dimensional Stochastic Primitive Equations" (with I. Kukavica, V. Vicol and M. Ziane).
Journal of Mathematical Physics, 55, 051504 (2014).

13. "Unique Ergodicity for Fractionally Dissipated, Stochastically Forced 2D Euler Equations" (with P. Constantin and V. Vicol).
Communications in Mathematical Physics, September 2014, Volume 330, Issue 2, pp 819-857.

12. "On Inviscid Limits for the Stochastic Navier-Stokes Equations and Related Models" (with V. Šverák, V. Vicol).
Archive for Rational Mechanics and Analysis, Volume 217, Issue 2 (2015), pp 619-649.

11. "Local and global existence of smooth solutions for the stochastic Euler equations with multiplicative noise." (with V. Vicol).
Annals of Probability, Volume 42, Number 1 (2014), 1-430.

10. "Invariant Measures for Dissipative Dynamical Systems: Abstract Results and Applications" (with M.D. Chekroun).
Communications in Mathematical Physics, vol 316, 723-761 (2012).

9. "Global Existence and Regularity for the 3D Stochastic Primitive Equations of the Ocean and Atmosphere with Multiplicative White Noise" (with A. Debussche, R. Temam and M. Ziane).
Nonlinearity, vol 25 (2012) 2093-2118.

8. "Local Martingale and Pathwise Solutions for an Abstract Fluids Model" (with A. Debussche and R. Temam).
Physica D, vol 240, Issues 14-15, 15 July 2011, pp. 1123-1144.

7. "Parameter Estimation for the Stochastically Perturbed Navier-Stokes Equations" (with I. Cialenco).
Stochastic Processes and their Applications, vol 121, pp. 701-724, 2011.

6. "Pathwise Solutions of the 2-D Stochastic Primitive Equations" (with R. Temam).
Applied Mathematics and Optimization, Vol 63, No 3, 401-433

5. "Cauchy Convergence Schemes for Some Nonlinear Partial Differential Equations" (with R. Temam).
Applicable Analysis, Special Issue in honor of V. Solonnikov, Vol 90, No 1, 2011, 85 - 102.

4. "Asymptotics of the Coleman-Gurtin model" (with M.D. Chekroun, F. Di Plinio, and V. Pata).
Discrete and Continuous Dynamical Systems-Series S, (Vol. 4, No. 2) April 2011.

3. "Singular Perturbation Systems with Stochastic Forcing and the Renormalization Group Method" (with M. Ziane).
Discrete and Continuous Dynamical Systems-Series A (2010), Vol 26, No 4.

2. "Strong Pathwise Solutions of the Stochastic Navier-Stokes System" (with M. Ziane).
Advances in Differential Equations, 14 (2009), no. 5-6, 567-600.

1. "The Stochastic Primitive Equations in Two Space Dimensions with Multiplicative Noise" (with M. Ziane).
Discrete and Continuous Dynamical Systems-Series B, (2008), no. 4, 801822.

Miscellaneous/Expository

M2. "Hydrodynamic stability in the presence of a stochastic forcing: a case study in convection" (with J. Földes, G. Richards, and J. Whitehead)

M1. "Notes on Statistically Invariant States in Stochastically Driven Fluid Flows"

Professional Service and Activities

Scholars Mentored

Postdoctoral:

Cecilia Mondaini (2017-2019, Currently Tenure Track at Drexel University).

Vincent Martinez (2016-2018, Currently Tenure Track at Hunter College, CUNY).

Geordie Richards (2012-2015, Currently Tenure Track at Utah State).

Ph.D Students:

Christian Frederiksen (2020-present, Ph.D Expected, Spring 2024, Tulane)

Justin Krometis (joint with J. Borggaard, 2015-2018, Ph.D Spring 2018, Virginia Tech, Currently Computational Scientist, Advanced Research Computing, Virginia Tech).

Chuntian Wang (joint with R. Temam, 2011-2015, Ph.D Spring 2015, Indiana University, Postdocs at MSRI and UCLA, Currently Tenture Track at University of Alabama, Tuscaloosa).

Masters Students: Anping Pan (2019), Shane McQuarrie (2018), Vitalij Schwarzmann (2014).

Undergraduate Honors Thesis: Jacob Broussard (2020)

Workshop Organization

6. "Conference on New Developments in Probability", Tulane University, May 2021.
5. "Clifford Lecture Series in Honor of Laure Saint-Raymond– Rotating fluids : effects of topography and viscosity", Tulane University, October 2019.
4. "Recent Advances in Pure and Applied Stochastics", Tulane University, March 2019.
3. "Stochastic Perturbations of Dynamical Systems: A conference in honor of Alexander Wentzell and his work", Tulane University, October 2017 (with M. Kalka, S. McKinley).
2. "Probabilistic Perspectives in Nonlinear PDEs" at the International Centre for Mathematical Sciences, June 2017 (with S. Friedlander, T. Oh, G. Richards, O. Pocovnicu).
1. "AIM Workshop: Stochastics in Geophysical Fluid Dynamics" at the American Institute of Mathematics, February 2013 (with B. Rozovsky, R. Temam, J. Tribbia).

Conference Session Organization

17. "Recent Advances in Infinite-Dimensional Stochastic Analysis", AMS 2023 Spring Eastern Section Meeting (with V. Martinez, and H. Nguyen).
16. "Mathematical Advances in Bayesian Statistical Inversion and Markov Chain Monte Carlo Sampling Algorithms", AMS Spring Western Sectional Meeting, May 14-15, 2022 (with J. Krometis, C. Mondaini).
15. "New developments in mathematical fluid dynamics", Mathematical Congress of the Americas Buenos Aires, Argentina July 19-24, 2021 (with A. Bronzi, J. Gomez-Serrano, C. Mondaini).
14. "Special Session on Advances in High and Infinite Dimensional Stochastic Analysis", AMS Spring Southeastern Sectional Meeting, March 2020, University of Virginia, Charlottesville, VA (with J. Foldes, M. Sy).
13. "Recent Advances in Infinite Dimensional Stochastic Analysis ", 9th International Congress on Industrial and Applied Mathematics, July 2019 (with C. Mondaini).
12. "Intersections in Probability and Nonlinear PDEs", 12th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Taipei, Taiwan on July 5-9, 2018. (with Y.M. Chung, V. Martinez, C. Mondaini).
11. "Nonlinear and Stochastic Partial Differential Equations and Applications", AMS Eastern Sectional meeting at Northeastern University, Boston, April 2018 (with V. Martinez, C. Mondaini).
10. "Special Session on Nonlinear and Stochastic Partial Differential Equations" at the Mathematical Congress of the Americas, June 2017 (with J. Colliander, J. Földes, G. Richards).
9. "Special Session on Nonlinear and Stochastic Partial Differential Equations: Theory and Applications in Turbulence and Geophysical Flows" AMS Eastern Sectional meeting at Hunter College, NYC, May 2017 (with G. Richards and X. Wang).
8. "Special Session on Nonlinear and Stochastic Partial Differential Equations" at the AMS sectional meeting in Denver, CO, October 2016 (with G. Richards and M. Coti-Zelati).
7. "Special Session on Nonlinear Partial Differential Equations" at the AMS sectional meeting in San Francisco, CA October 2014 (with G. Richards and V. Vicol).

6. "Special Session on Stochastics and PDEs" at the AMS sectional meeting in Albuquerque, NM April 2014 (with J. Foldes, G. Richards).
5. "Mathematical fluid dynamics and its application in geosciences" at the AMS sectional meeting at the University of Arizona, October 2012 (with B. Cheng).
4. "Special Session on Climate modeling and geophysical fluid dynamics" at the JMM in Boston, January 2012 (with M.D. Chekroun & Q. Chen).
3. "Special Session on Recent Developments in Stochastic Partial Differential Equations" at the AMS sectional meeting in Las Vegas, April 2011 (with I. Cialenco).
2. "Interdisciplinary Session on Deterministic and Stochastic Partial Differential Equations" Special Session at the AMS sectional meeting in Notre Dame, IN, November 2010 (with V. Vicol).
1. "Interdisciplinary Session on Deterministic and Stochastic Partial Differential Equations" Special Session at the AMS sectional meeting at Baylor University, October 2009 (with M.D. Chekroun & S. Wang).

Invited Talks and Conference Presentations

96. Invited speaker, "Data-driven and physics-informed techniques in Data Assimilation" International Council for Industrial and Applied Mathematics (ICIAM), Tokyo, Japan, August 2023
95. Invited speaker, One World Stochastic Numerics and Inverse Problems Seminar, June 2023.
94. Invited speaker, "Recent Advances in Mathematical Fluid Dynamics", Duke University, May 2023.
93. Applied Math Seminar, Florida International University, December 2022.
92. Probability Seminar, Duke University, October 2022.
91. Colloquium Speaker, Center for Applied Mathematical Sciences, University of Southern California, September 2022
90. Invited speaker, "Unifying concepts in PDEs with randomness", Centre de Recherches Mathématiques, Montrael, Canada, May 2022
89. Department of Mathematical Sciences Colloquium Worcester Polytechnic Institute, March 2022
88. Colloquium Speaker, Center for Applied Mathematical Sciences, University of Southern California, November 2021
87. Invited Speaker, "Statistical Aspects of Non-Linear Inverse Problems", Banff International Research Station Workshop, Banff Alberta Canada, November 2021
86. Bielefeld Stochastic Afternoon Seminar, Bielefeld University Germany, May 2021
85. Probability, Analysis, and Data Science, Iowa State University, May 2021
84. Probability Seminar, Carnegie Mellon University, April 2021
83. Analysis and Applied Mathematics Seminar, University of Illinois Chicago, April 2021
82. Probability seminar, Department of Mathematics, Penn State University, December 2020.
81. AMS Special Session Meeting, Fall Western Sectional Meeting, October 2020.
80. Hausdorff School on MCMC: Recent developments and new connections, September 2020.
79. Seminar Speaker, "Probability Seminar Series", University of California, Los Angeles, May 2020. (canceled due to COVID 19)
78. Seminar Speaker, "Analysis of Fluids and Related Topics", Princeton. University, April 2020. (canceled due to COVID 19)
77. AMS Special Session Meeting, Tufts University, Boston, MA, March 2020. (canceled due to COVID 19)
76. Invited speaker, "12th Americas Conference on Differential Equations and Nonlinear Analysis", Guanajuato, Mexico, December 2019.
75. Colloquium speaker, Department of Mathematics, Lousiana State University, November 2019.
74. Applied Math Colloquium speaker, Department of Mathematics, New Jersey Institute of Technology, October 2019.
73. Probability Seminar, Department of Mathematics, University of Virginia, May 2019.
72. AMS Special Session Meeting, University of Michigan, Ann Arbor, Ann Arbor, MI, October 2018.
71. Invited Speaker, CliMathNet Conference 2018, University of Reading, UK, September 2018.
70. Invited Speaker, "Regularity and Blow-up of Navier-Stokes Type PDEs using Harmonic and Stochastic Analysis", Banff International Research Station (BIRS), Canada, August 2018.

69. Invited speaker, "Classical & Geophysical Fluid Dynamics: Modeling, Analysis & Reduction", AIMS Conference on Dynamical Systems, Differential Equations & Applications, Taipei, Taiwan, July 2018.
68. SIAM Conference on Uncertainty Quantification, Anaheim CA, April 2018
67. Colloquium Speaker, Department of Statistics and Probability, Michigan State University, March 2018.
66. SIAM Conference on Analysis of Partial Differential Equations, December 2017.
65. PDE Seminar, University of Minnesota, October 2017.
64. Colloquium Seminar, Centra International de Rencontres Mathématiques (CIRM), University of Trento, Trento, Italy, June 2017
63. "Incompressible Fluid Dynamics", Mathematical Congress of the Americas, Montreal, Canada June 2017
62. Invited Speaker, "Essence of $u\nabla u$: Reflections on Mathematical Fluid Dynamics, Workshop at University of Virginia, May 2017.
61. Applied Math Seminar, Brigham Young University, March 2017
60. Stochastic Analysis Seminar, University of Utah, March 2017
59. Invited Speaker, "Current Developments in Mathematical Fluid Dynamics: Regularity, Instabilities, and Turbulence" Workshop at ICERM, Brown University, Providence RI, January 2017
58. Invited Lectures, Gene Golub SIAM Summer School, Drexel University, Philadelphia, August 2016
57. PDE seminar, CUNY Graduate Center, New York, NY February 2016
56. Probability Seminar, University of Maryland, College Park, February 2016
55. Colloquium Speaker, Tulane University, January 2016
54. Probability Seminar, Tulane University, November 2015
53. Colloquium Speaker, University of California, Santa Cruz, October 2015
52. Mathematics of Geophysical Flows and Turbulence, Fudan University, China, August 2015
51. Conference on Mathematical Aspects of Hydrodynamics, Mathematisches Forschungsinstitut Oberwolfach, Germany, August 2015
50. University of Virginia, Probability Seminar, April 2015
49. AMS Spring Eastern Sectional Meeting, Georgetown University, Washington, DC, March 2015
48. PDE seminar, Department of Mathematics, University of Maryland, College Park, February 2015
47. Colloquium speaker, Department of Mathematics, Indiana University, January 2015
46. Informal Workshop on Mathematical Fluid Dynamics, Texas A&M, College Station, Texas, January 2015
45. Probability Seminar, Department of Mathematics, University of Rochester, October 2014
44. Conference on the Mathematical Analysis of Turbulence, Institute for Pure and Applied Mathematics (IPAM), UCLA, October 2014
43. Workshop on Fluids and PDE, Instituto Nacional de Matemtica Pura e Aplicada (IMPA), Rio de Janeiro, Brazil, May 2014
42. Seminar on Analysis of Fluids and Related Topics, Department of Mathematics, Princeton University, April 2014
41. Colloquium Speaker, Center for Applied Mathematical Sciences, University of Southern California, February 2014
40. Mathematical Finance and Stochastic Analysis Seminar, Department of Mathematics, University of York, November 2013
39. Dynamics and PDEs Seminar, Department of Mathematics, University of Surrey, November 2013
38. Midlands Probability Seminar, University of Warwick, November 2013
37. Newton Institute for Mathematical Sciences, University of Cambridge, November 2013
36. Conference on Non-equilibrium Statistical Mechanics and the Theory of Extreme Events in Earth Science, Newton Institute for Mathematical Sciences, University of Cambridge, October 2013
35. AMS Special Session Meeting, University of Washington, St. Louis, October 2013
34. Colloquium Speaker, Department of Mathematics, Virginia Tech, October 2013
33. Applied Math And Analysis Seminar, Department of Mathematics, Duke University, September 2013

32. IGK Workshop on Stochastic and Real World Models, Bielefeld University, Bielefeld Germany, July 2013
31. SIAM Conference on Mathematical & Computational Issues in the Geosciences, Padua, Italy, June 2013
30. Colloquium Speaker, UNC/Duke Probability Seminar, April 2013
29. AIM Workshop: Stochastics in Geophysical Fluid Dynamics, American Institute of Mathematics, Palo Alto CA, February 2013
28. Postdoctoral Seminar, Institute for Mathematics and its Applications, University of Minnesota, January 2013
27. AIMS conference on Dynamical Systems, Differential Equations and Applications, Orlando FL, July 2012
26. 8th International Purdue Symposium on Statistics, June 2012
25. ICMS (Edinburgh) Workshop on Dynamics in Infinite-Dimensions: Ergodic Theory and PDEs, May 2012
24. SIAM Conference on Uncertainty Quantification, Raleigh NC, April 2012
23. AMS Meeting, University of Kansas, April 2012
22. Colloquium Speaker, Center for Applied Mathematical Sciences, University of Southern California, November 2011
21. SIAM Conference on Analysis of Partial Differential Equation, San Diego, November 2011
20. CAMP/Nonlinear PDEs Seminar, University of Chicago, November 2011
19. National Center for Atmospheric Research, April 2011
18. PDE Seminar, Indiana University, Department of Mathematics, November 2010
17. Conference on Recent Advances in the Numerical Approximation of Stochastic Partial Differential Equations, Illinois Institute of Technology, August 2010
16. PDE Seminar, Universite de Poitiers, Department of Mathematics, June 2010
15. Plenary Lecture at the International Congress in Mathematical Fluid Dynamics and Its Applications, Rennes France, June 2010
14. International Conference on Advances in Partial Differential Equations and Their Applications, Shanghai China, June 2010
13. Applied Mathematics Seminar, Purdue University, January 2010
12. PDE Seminar, Indiana University, Department of Mathematics, February 2010
11. Applied Mathematics Seminar, Illinois Institute of Technology, November 2009
10. SIAM Conference on Applications of Dynamical Systems, Snowbird Utah, May 2009 (Supported by an NSF Postdoctoral Travel Award)
9. AMS Meeting, San Francisco State University, April 2009
8. AMS Meeting, University of Illinois at Urbana-Champaign, March 2009
7. Applied Mathematics Seminar, Indiana University, Institute for Scientific Computing and Applied Mathematics, November 2008
6. PDE Seminar, Indiana University, Department of Mathematics, October 2008
5. SIAM Annual Meeting, San Diego, California, July 2008
4. PDE/Analysis Seminar, UC Irvine, Department of Mathematics, February 2008
3. SIAM Conference on Analysis of Partial Differential Equations, Mesa, Arizona, December 2007
2. PDE/Applied Math Seminar, Indiana University, Department of Mathematics, October 2007
1. Analysis Seminar, University of Southern California, Department of Mathematics, October 2007

Short-Term Research Visits

École normale suprieure Paris (Summer 2009), École normale suprieure de Cachan (Summer 2010), University of California, Los Angeles (Summer 2011), Princeton University (Fall 2012), Henri Poincaré Institute, Paris (Summer 2013), University of Pisa (Summer 2013). Newton Institute for Mathematical Science, University of Cambridge (Fall 2013) Instituto Nacional de Matemtica Pura e Aplicada (IMPA), Rio de Janeiro (May 2014)

Research in Pairs Followships:

Centra International de Rencontres Mathématiques (CIRM), Marseille, France (January 2018)

Centro Internazionale per la Ricerca Matematica (CIRM), Trento, Italy (June 2017)

Banff International Research Station for Mathematical Innovation and Discovery, Canada (October 2016)

Oberwolfach Research Institute for Mathematics, Germany (Summer 2015)

Institut Mittag-Leffler, Sweeden (Summer 2014)

Henri Poincaré Institute, Paris (Summer 2013)