

Jinqiao Duan, Professor

Illinois Institute of Technology
Department of Applied Mathematics
Chicago, IL 60616
duan@iit.edu www.iit.edu/~duan

Education

Ph.D. in Applied Mathematics, Cornell University, 1993
M.S. in Mathematics, University of Massachusetts at Amherst
B.S. in Computational Mathematics, Wuhan University, China

Employment

Illinois Institute of Technology, Laboratory for Stochastic Dynamics & Computation:
[Professor & Director \(2003–Present\)](#)

Institute for Pure and Applied Mathematics (IPAM), UCLA, Los Angeles:
[Professor & Associate Director \(2011–2013\)](#)

Illinois Institute of Technology: Associate Professor (2000-2002)
Argonne National Laboratory: Guest Faculty Fellow (2000—Present)
Clemson University: Associate/Assistant Professor(1999-2000/1995-99)
California Institute of Technology: Instructor/Postdoc (1993–95) – working with Steve Wiggins

Research Areas

Applied Math: Nonlinear & Stochastic Dynamical Systems:

Awards, Fellowships and Recent Visiting Positions

The Young Scientists' Publication Award, European Geophysical Society, 1999
Sigma Xi Award for Excellence in Research (Senior Faculty Category), IIT, 2011
Dean's Excellence Award for Research, Illinois Institute of Technology, 2005
K. C. Wong Education Foundation Fellowship (Hong Kong), 2007
Visiting Professor, University of Gottingen, Germany, September 2006 and Oct 2016
Visiting Professor, Humboldt University of Berlin, Germany, October 2006, Feb 2011, July 2016
Invited Professor, Universite Paris-Sud, July 2017
Univ of Wales - Swansea, Oct 2009

Loughborough University, Sept 2009
Invited Professor, Universite Paris 1, France, June 2007
Visiting Professor, University of Pisa, Italy, July 2006

NSF Grants:

1. Theoretical and numerical studies of nonlocal equations derived from stochastic differential equations with Lévy noises (with Xiaofan Li), NSF DMS-1620449, \$ 210000, 2016–2019.
2. NSF-CBMS Conference: Nonlocal Dynamics – Theory, Computation and Applications (with Xiaofan Li). DMS-1642545, \$35000, 2016–2017.
3. Collaborative Research: Mathematical Modeling by Bridging Primitive and Boussinesq Equations. Lead PI, NSF DMS-1025422, 2010-2015, \$ 850000.
4. Recent Advances in the Numerical Approximation of Stochastic Partial Differential Equations, NSF-CBMS Regional Conference in the Mathematical Sciences August 2010, Chicago, NSF-0938235, PI, \$34975.
5. Stochastic Agent-based Modeling of Angiogenesis and Tissue Growth, Co-PI, NSF-0731201, \$270000, 2007-2010.
6. Collaborative Research: A New Modeling Framework for Nonhydrostatic Simulations of Small-Scale Oceanic Processes – Stochastic Approaches, NSF-0620539, Lead PI, \$500000, 2006-2010.
7. Collaborative Research: Stochastic Dynamics of Three-Dimensional Density Currents, NSF, DMS-0209326, Lead PI, \$380000, 2002-2006.
8. Deterministic and Stochastic Dynamics of Some Geophysical Systems, NSF, DMS-9973204 and DMS-0139073, PI, \$75000 & \$45000, 1999-2002.
9. Dynamical Systems Methods for Nonlocal, Nonautonomous and Nondissipative Systems, NSF, DMS-9704345, PI, \$75000, 1997-1999.
10. Stochastic Partial Differential Equations and Their Applications, NSF-CBMS Regional Conference in the Mathematical Sciences May 19–23, 2003, Chicago, NSF-0225738, PI, \$32000.
11. Random Real Processes Corresponding to 3D Navier-Stokes Equations: Their Formulation and Stabilization, NSF-NRC (Collaboration with Russia), \$12850, 2002–2004.
12. Asymptotic Behavior of Nonautonomous Dynamical Systems with Applications in Hydrodynamics, Meteorology and Oceanology, NSF Moldova-U.S. Program, \$35000, 2001-2003.
13. Mathematical Sciences Scientific Computing Research Environments: Numerical Simulation of Stochastic Partial Differential Equations, Co-PI, NSF, DMS-0112351, \$60000, and 2001-2004; DMS-0923111, 2009-2010; \$60000.

Editorial Services

Managing Editor for the journal: *Stochastics and Dynamics*, 2001–Present
www.worldscientific.com/worldscinet/sd

Editorial Board Member, *Nonlinear Processes in Geophysics*, 2010–Present

Editor-in-Chief for the book series: *Interdisciplinary Mathematical Sciences*, 2004–Present
www.worldscientific.com/series/ims

Professional Activities

NSF panels, CBMS-NSF panels, DoE panels, Science Foundation Ireland panel, Univ of Notre Dame development fund review, Portugal Foundation for Science and Technology (FCT), The Netherlands Organisation for Scientific Research (NWO) grants reviews, The National Research Council (NRC) grants reviews.

Co-organizer, NSF-CBMS Conference: Nonlocal Dynamics – Theory, Computation and Applications. Chicago, June 5–9, 2017.

Co-organizer, Third International Conference on Random Dynamical Systems, at S S Chern Institute of Mathematics, July 2013, Tianjin, China

Co-organizer, Second International Conference on Random Dynamical Systems, June 2011, Nanjing, China

Co-organizer, NSF-CBMS Regional Conference on Recent Advances in the Numerical Approximation of Stochastic Partial Differential Equations, Chicago, August 9–13, 2010.

Co-Organizer, US-Asian Workshop on Random Dynamical Systems, S. S. Chern Institute of Math., China, June 2009.

Co-Organizer, SIAM Conference on Applications of Dynamical Systems, May 28–June 1, 2007, Snowbird, Utah, USA

Co-Organizer, Workshop on Mathematical Issues in Stochastic Approaches for Multiscale Modeling, May 21–25, 2007, MSRI, Berkeley, California, USA

Co-Organizer, Workshop on Stochastic Dynamical Systems and Climate Modeling, April 15–20, 2007, Banff International Research Station, Canada

Co-Organizer, US-Asian Workshop on Nonlinear Dynamics and Stochastic Partial Differential Equations, May 27–31, 2004, Beijing, China.

Organizer, NSF-CBMS Regional Conference on Stochastic Partial Differential Equations and Their Applications, Chicago, May 19–23, 2003.

Co-Organizer, Summer Program on Probability and Partial Differential Equations in Modern Applied Mathematics, at IMA, Minnesota, July 21–August 1, 2003.

Co-Organizer, Workshop on Dynamics and Numerics of Stochastic Partial Differential Equations, March 3–8, 2002, Oberwolfach, Germany.

Research in Pairs Program on Random Dynamics of Geophysical Flows, July 15–30, 2000, Oberwolfach, Germany.

Teaching and Education Accomplishments

1. Help developed our Applied Math PhD curriculum (2000–2005)
2. Taught courses in statistics, probability, stochastic dynamics, stochastic modeling, stochastic PDEs, stochastic processes, nonlinear dynamics, PDEs, ODEs, calculus, analysis, functional analysis, among others.
3. Faculty of the Month, 2006, IIT Tech News
4. Supervised 17 PhD students and a dozen Master’s students
5. Supervised 8 postdocs & over 10 long-term (one year or longer) visitors
6. Undergraduate students supervised (with research theses):
Diana Harold, Angeliki Ermogenous, Mike McCourt, Hee Seo, Jaekwan Lee, and Kun Huang
7. PhD committees served for PhD students in engineering & science: Georgia Papavasiliou (Biomedical Eng); Yufeng Han (ECE); Chih-Wei Yi (CS); Jui-Kun Peng (Chem-Biological Eng); Vincent Nguyen (CS); Thidaporn Kitkailard (Chem-Biological Eng); Yu Wang (CS); Andrey Sokolov (Biophysics); Haolu Xie (ECE); Yue Yu (CS); Sukanya Balasubramanian (Chem-Biological Eng); Yuval Merhav (CS); Michael Boghosian (Mechanical and Aerospace Eng).

References

Russ Caffisch, Inst for Pure and Applied Math (IPAM), UCLA	rcaffisch@ipam.ucla.edu
Philip Holmes, Princeton University	pholmes@math.Princeton.edu
Yannis Kevrekidis, Johns Hopkins University	yannis@princeton.edu
Stanley Osher, Inst for Pure and Applied Math (IPAM), UCLA	sjo@math.ucla.edu
Stephen Wiggins, University of Bristol, U.K.	S.Wiggins@Bristol.ac.uk

Jinqiao Duan's Selected Publication

• Books & Edited Books:

- *An Introduction to Stochastic Dynamics*, Cambridge University Press, 2015. (ISBN: 9781107428201)
- *Effective Dynamics of Stochastic Partial Differential Equations* (with Wei Wang), Elsevier, 2014. (ISBN: 978-0-12-800882-9)
- *Probability and Partial Differential Equations in Modern Applied Mathematics* (with E. Waymire, Eds.), Springer-Verlag, 2005.
- *Recent Development in Stochastic Dynamics and Stochastic Analysis*. J. Duan, S. Luo and C. Wang (Eds.), World Scientific, New Jersey, 2010.

• Papers under review

1. Q. Huang, J. Duan and R. Song, Homogenization of Periodic Linear Nonlocal Partial Differential Equations. 2018.
2. L. Lin, M. Yang and J. Duan, Homogenization of a nonlocal stochastic partial differential equation. 2017.
3. Most probable evolution trajectories in a genetic regulatory system excited by stable Lévy noise. 2017.

• 2018

4. Q. Huang, J. Duan and J. L. Wu, Maximum principles for nonlocal parabolic Waldenfels operators. *Bulletin of Mathematical Sciences*, 2018. <https://doi.org/10.1007/s13373-018-0126-0>
5. Wei Yan, Yongsheng Li, Jianhua Huang and Jinqiao Duan, The Cauchy problem for the Ostrovsky equation with positive dispersion. *Nonlinear Diff. Eqns. Appl. (NoDEA)*, 2018. <https://doi.org/10.1007/s00030-018-0514-x>
6. Guangying Lv, Huyuan Chen and Jinqiao Duan, Boundary blow-up solutions to nonlocal elliptic systems of cooperative type. *Annales Henri Poincaré*, 2018.
7. H. Wang, X. Chen and J. Duan, A stochastic pitchfork bifurcation in most probable phase portraits. *Int. J. of Bifurcation and Chaos*, Vol. 28, No. 1 (2018) 1850017.
8. Hui Wang, Xiujun Cheng, Jinqiao Duan, Jurgen Kurths and Xiaofan Li, Likelihood for transcriptions in a genetic regulatory system under asymmetric stable Lévy noise. *Chaos*, 28, 013121 (2018).

• 2017

9. J. Wei, J. Duan and G. Lv, Kinetic solutions for nonlocal scalar conservation laws. *SIAM J. Math. Anal.* 50(2), 1521 - 1543.
10. Yanjie Zhang, Zhuan Cheng, Xinyong Zhang, Xiaoli Chen, Jinqiao Duan, Xiaofan Li. Data assimilation and parameter estimation for a multiscale stochastic system with alpha-stable Lévy noise. *J. Statistical Mech*, 17 November 2017.
11. Lu Bai, Xiujun Cheng, Jinqiao Duan and Meihua Yang, Slow manifold for a nonlocal stochastic evolutionary system with fast and slow components. *J. Differential Equations* 263(2017)4870 - 4893.
12. Rui Cai, Xiaoli Chen, Jinqiao Duan, J. Kurths and Xiaofan Li, Lévy noise-induced escape in an excitable system. *J. Stat. Mech.*, June 8, 2017. Online at [stacks.iop.org/JSTAT/2017/063503](https://doi.org/10.1088/1742-5468/aa727c). <https://doi.org/10.1088/1742-5468/aa727c>
13. Metastable phenomena in a dynamical system with discontinuous vector field. (with L. Serdukova, Y. Zheng, and J. Kurths), *Nature - Scientific Reports* (2017) 7: 9336.
14. Mengfeng Sun, Yijun Lou, Jinqiao Duan and Xinchu Fu, Behavioral synchronization induced by epidemic spread in complex networks. *Chaos* 27, 063101 (2017).
15. Jiang, Tao; Liu, Xianming; Duan, Jinqiao A Wong-Zakai approximation for random invariant manifolds. *J. Math. Phys.* 58 (2017), no. 12, 122701
16. Xu Sun, Jinqiao Duan, Xiaofan Li, Hua Liu, Xiangjun Wang and Yayun Zheng, Derivation of Fokker-Planck equations for stochastic systems under excitation of multiplicative non-Gaussian white noise. *J. Math. Anal. Appl.* 446, 786-800 (2017).
17. Wang, Ming; Duan, Jinqiao Existence and regularity of a linear nonlocal Fokker-Planck equation with growing drift. *J. Math. Anal. Appl.* 449 (2017), no. 1, 228243
18. Lv, Guangying; Duan, Jinqiao Martingale and weak solutions for a stochastic nonlocal Burgers equation on finite intervals. *J. Math. Anal. Appl.* 449 (2017), no. 1, 176194.

● **2016**

19. L. Serdukova, Y. Zheng, J. Duan and J. Kurths, Stochastic Basins of Attraction for Metastable States. *Chaos* 26, 073117 (2016).
20. Guangying Lv, Jinqiao Duan, Hongjun Gao and Jiang-Lun Wu, On a stochastic nonlocal conservation law in a bounded domain. *Bull. Sci. Math.* 140 (2016) 718 -746.
21. Y. Zheng, J. Duan, L. Serdukova and J. Kurths, Transitions in a genetic transcriptional regulatory system under Lévy motion. *Nature - Scientific Reports* (Nature Publishing Group) 6, Article number: 29274 (2016).
22. Tao Wang, Jinqiao Duan and Tong Liu, Competition promotes the persistence of populations in ecosystems. *Nature - Scientific Reports* (Nature Publishing Group) 6, Article number: 30477 (2016).

23. H. Qiao and J. Duan, Lyapunov exponents of stochastic differential equations driven by Lévy processes. *Dynamical Systems* Volume 31, 2016 - Issue 2, 136-150.
24. Yancai Liu, Wei Zou, Meng Zhan, Jinqiao Duan and Jurgen Kurths, Enhancing dynamical robustness in aging networks of coupled nonlinear oscillators. *European Phys. Lett.*, 114(2016) 40004.
25. X. Sun, J. Duan, and X. Li. Modeling nonlinear oscillators under excitation of combined Gaussian and Poisson white noise: a viewpoint based on energy conservation law. *Nonlinear Dynamics*, 2016, 84:13111325.
26. T. Gao, J. Duan, X. Kan and Z. Cheng, Dynamical Inference for Transitions in Stochastic Systems with α -stable Lévy Noise. *J. Phys. A: Math. Theoret.* 49 (2016) 294002 (12pp).
27. M. Wang and J. Duan, Smooth solution of a nonlocal FokkerPlanck equation associated with stochastic systems with Lévy noise. *Applied Mathematics Letters*. Volume 58, August 2016, Pages 172-177.
28. T. Gao and J. Duan, Quantifying model uncertainty in dynamical systems driven by non-Gaussian Lévy stable noise with observations on mean exit time or escape probability. *Commun Nonlinear Sci Numer Simulat* 39 (2016)1-6.
29. J. Wang, D. Li and J. Duan, On the shape Conley index theory of semiflows on complete metric space. *Discrete and Continuous Dyn. Systems* 36 (2016), 1629-1647.
30. H. Qiao & J. Duan, Stationary Measures for Stochastic Differential Equations with Jumps. *Stochastics*, Volume 88, 2016 - Issue 6, p. 864-883.
31. Guo, Yanfeng; Duan, Jinqiao Approximation representation of parameterizing manifold and non-Markovian reduced systems for a stochastic Swift-Hohenberg equation. *APPLIED MATHEMATICS LETTERS* Volume: 52 Pages: 112-117 Published: FEB 2016.
32. T. Gao and J. Duan, Quantifying model uncertainty in dynamical systems driven by non-Gaussian Lévy noise with observations on mean exit time or escape probability. *Commun. Nonlinear. Sci. Numer. Simulat.* 39 (2016), 16.
33. T. Gao, X. Li and J. Duan, Fokker-Planck Equations for Stochastic Dynamical Systems with Symmetric Lévy Motions. *Appl. Math. Comput.* 278 (2016) 1-20.
34. Z. Cheng, J. Duan and L. Wang, Most probable dynamics of some nonlinear systems under noisy fluctuations, *Commun. Nonlinear. Sci. Numer. Simulat.*, 30(2016)108114.

- **2015**

35. H. Qiao and J. Duan, Nonlinear filtering of stochastic dynamical systems with Lévy noises. *Adv. in Appl. Probab.* Volume 47, Number 3 (2015), 902-918.
36. X. Sun, J. Duan, X. Li and X. Wang, State estimation under non-Gaussian Levy noise: A modified Kalman filtering method. *Banach Center Publications*, Vol. 105, 2015, pp. 239-246. arXiv:1303.2395

37. J. Ren, J. Duan and X. Wang, A parameter estimation method based on random slow manifolds. *Applied Math. Modelling* **39** (2015), 3721-3732.
38. J. Ren, J. Duan and C. K. R. T. Jones, Approximation of random slow manifolds and settling of inertial particles under uncertainty. *J. Dyn. Diff. Eqns* December 2015, Volume 27, Issue 3, pp 961-979. DOI 10.1007/s10884-015-9452-z
39. X. Chen, A. J. Roberts and J. Duan, Centre manifolds for stochastic evolution equations. *Journal of Difference Equations and Applications*, Volume: 21 Issue: 7 Pages: 606-632 Published: 2015. DOI: 10.1080/10236198.2015.1045889
40. Lv, Guangying; Duan, Jinqiao; He, Jinchun, Nonlocal elliptic equations involving measures. *J. Math. Anal. Appl.* Volume: 432 Issue: 2 Pages: 1106 - 1118 Published: DEC 15, 2015
41. Lv, Guangying; Duan, Jinqiao Impacts of noise on a class of partial differential equations. *J. Diff. Eqns.* Volume: 258 Issue: 6 Pages: 2196 - 2220 Published: MAR 15, 2015
42. J. He, J. Duan and H. Gao, A nonlocal Fokker-Plank equation for non-Gaussian stochastic dynamical systems. *Applied Math. Lett.*, Volume 49, November 2015, Pages 1 - 6. doi:10.1016/j.aml.2015.03.013
43. H. Qiao and J. Duan, Asymptotic methods for stochastic dynamical systems with small non-Gaussian Lévy noise. *Stochastics and Dynamics* **15** (2015), no. 1, 1550004.
44. X. Wang, J. Duan, X. Li and Y. Luan, Numerical methods for the mean exit time and escape probability of two-dimensional stochastic dynamical systems with non-Gaussian noises. *Appl. Math. Comput.* Volume 258, 1 May 2015, Pages 282 - 295.
45. Wei Zou, D. V. Senthilkumar, Raphael Nagao, Istvan Z. Kiss, Yang Tang, Aneta Koseska, Jinqiao Duan and Jurgen Kurths, Restoration of rhythmicity in diffusively coupled dynamical networks. *Nature – Communications* July 15, 2015. DOI: 10.1038/ncomms8709

● **2014**

46. Wei Zou, D. V. Senthilkumar, Jinqiao Duan and Jurgen Kurths, Emergence of amplitude and oscillation death in identical coupled oscillators. *Phys. Review E* 90, 032906 (2014).
47. T. Gao, J. Duan, X. Li and R. Song, Mean exit time and escape probability for dynamical systems driven by Lévy noise. *SIAM J. Sci. Computing* Vol. 36, No. 3, pp. A887-A906, 2014.
48. Xu, Yong; Guo, Rong; Liu, Di; et al. STOCHASTIC AVERAGING PRINCIPLE FOR DYNAMICAL SYSTEMS WITH FRACTIONAL BROWNIAN MOTION. DISCRETE AND CONTINUOUS DYNAMICAL SYSTEMS-SERIES B Volume: 19 Issue: 4 Pages: 1197-1212 Published: JUN 2014
49. W. Wang, J. Ren, J. Duan & G. He, Ensemble Averaging for Dynamical Systems Under Fast Oscillating Random Boundary Conditions, *Stochastic Analysis and Applications*, 2014(32):6, 944-961.

50. G. Chen, J. Duan and J. Zhang, Slow foliation of a slow-fast stochastic evolutionary system. *J. Functional Anal.* **267**(2014)2663-2697.
51. M. Hao, J. Duan, R. Song and W. Xu, Asymmetric non-Gaussian effects in a tumor growth model with immunization. *Applied Mathematical Modelling* **38** (2014) 4428-4444.
52. H. Qiao and J. Duan, Topological equivalence for discontinuous random dynamical systems and applications. *Stochastics and Dynamics* Vol. **14**(2014), No. 01, 1350007.

• **2013**

53. H. Qiao, X. Kan and J. Duan, Escape probability for stochastic dynamical systems with jumps. *Springer Proceedings in Mathematics & Statistics*, Vol. **34**, p.195-216, 2013.
54. X. Kan, J. Duan, I. G. Kevrekidis and A. J. Roberts, Simulating Stochastic Inertial Manifolds by a Backward-Forward Approach. *SIAM J. Applied. Dyn. Sys.*, Vol. **12**, No. 1, pp. 487-514, 2013.
55. X. Sun, J. Duan and X. Li, An alternative expression for stochastic dynamical systems with parametric Poisson white noise. *Probabilistic Engineering Mechanics* **32** (2013) 1-4.
56. M. Hao, T. Gao, J. Duan and W. Xu, Non-Gaussian dynamics of a tumor growth system with immunization. *Inverse Problems and Imaging* Volume 7, No. 3, 2013, 697-716.
57. G. Chen, J. Duan and J. Zhang, Approximating dynamics of a singularly perturbed stochastic wave equation with a random dynamical boundary condition. *SIAM J. Math. Anal.* Vol. 45, No. 5, 2013, pp. 2790-2814.
58. H. Fu, X. Liu and J. Duan, Slow manifolds for multi-time-scale stochastic evolutionary systems. *Comm. Math. Sci.*, 2013, Vol. **11**, No. 1, pp. 141-162.
59. Y Xu, J Li, J Feng, H Zhang, W Xu and J Duan, Lévy noise-induced stochastic resonance in a bistable system. *European Physical Journal B* **86** (2013), 1-7.

• **2012**

60. X. Sun and J. Duan, Fokker-Planck equations for nonlinear dynamical systems driven by non-Gaussian Lévy processes. *J. Math. Phys.* **53**, 072701 (2012).
61. H. Chen, J. Duan and C. Zhang, Elementary bifurcations for a simple dynamical system under non-Gaussian Lévy noises. *Acta Mathematica Scientia* 2012,32B(4):1391-398.
62. J. Ren, C. Li, T. Gao, X. Kan and J. Duan, Mean Exit Time and Escape Probability for a Tumor Growth System under Non-Gaussian noise. *International J. Bifurcation and Chaos*, Vol. 22, No. 4 (2012), 1250090.
63. W. Wang, A. J. Roberts and J. Duan, Large deviations and approximations for slow-fast stochastic reaction-diffusion equations. *J. Diff. Eqns.* **253** (2012) 3501-3522.

- 64. X. Sun, X. Kan and J. Duan, Approximation of invariant foliations for stochastic dynamical systems. *Stochastics and Dynamics* **12**, No. 1, (2012), 1150011.
- 65. J. Duan, T. Gao and G. He, Quantifying Missing Mechanisms in the Space of Probability Measures. *Interdisciplinary Mathematical Sciences*, Volume 13, p.99-110, 2012.
- 66. J. Duan, A. Roberts and W. Wang, Averaging, homogenization and slow manifolds for stochastic partial differential equations. In *New Trends in Stochastic Analysis and Related Topics* (H. Zhao and A. Truman eds.), World Scientific, p. 89-126, 2012.

- **2011**

- 67. Y. Xu, J. Duan and W. Xu, An Averaging Principle for Stochastic Dynamical Systems with Lévy Noise. *Phys. D* **240** (2011), 1395-1401.
- 68. H. Chen, J. Duan, X. Li and C. Zhang, A computational analysis for mean exit time under non-Gaussian Levy noises. *Appl. Math. Comput.*, volume 218, issue 5, 2011, pp. 1845 - 1856.
- 69. X. Chen, A. J. Roberts and J. Duan, Center manifolds for infinite dimensional random dynamical systems. Submitted to *J. of London Math Soc.*, arXiv:1210.5924
- 70. S. Xu and J. Duan, A Taylor expansion approach for solving partial differential equations with random Neumann boundary conditions. *Applied Mathematics and Computation* **217** (2011), 9532-9542.
- 71. J. Yang and J. Duan, Quantifying Model Uncertainties in Complex Systems. *Progress in Prob.*, Vol. 65, 49-80, 2011. arxiv: 0912.0280
- 72. G. Chen, J. Duan and J. Zhang, Geometric shape of invariant manifolds for a class of stochastic partial differential equations. *J. Math. Phys.*, **52**, 072702, 2011.
- 73. C. Sun, L. Yang and J. Duan, Asymptotic behavior for a semilinear second order evolution equation. *Trans. Amer. Math. Soc.* Volume 363, Number 11, November 2011, Pages 6085-6109.
- 74. X. Chen, J. Duan and M. Scheutzow, Evolution systems of measures for stochastic flows. *Dynamical Systems*, Vol. 26, No. 3, September 2011, 323-34.
- 75. X. Chen and J. Duan, State space decomposition for non-autonomous dynamical systems. *Proceedings of the Royal Society of Edinburgh: Section A Mathematics* October 2011, 141 : pp 957-974.
- 76. Y. Xu, R. Gu, H. Zhang, W. Xu and J. Duan, Stochastic bifurcations in a bistable Duffing-Vander Pol oscillator with colored noise. *Phys. Rev. E.* **83**, 056215 (2011).

- **2010**

- 77. X. Sun, J. Duan and X. Li, An impact of noise on invariant manifolds in nonlinear dynamical systems, *J. Math. Phys.* **51**, 042702 (2010).

78. J. Ren, H. Fu, D. Cao and J. Duan, Effective dynamics of a coupled microscopic-macroscopic stochastic system. *Acta Mathematica Scientia* **30** (2010), 2064-2076.
79. X. Chen, J. Duan and X. Fu, A sufficient condition for bifurcation in random dynamical systems. *Proc. American Math. Soc.* **138** (2010) 965-973. DOI: 10.1090/S0002-9939-09-10093-X.
80. C. Sun, H. Gao, J. Duan and B. Schmalfuss, Rare Events in the Boussinesq System with Fluctuating Dynamical Boundary Conditions. *J. Diff. Eqns.* **248** (2010), 1269-1296.
81. X. Liu, J. Duan, J. Liu and P. E. Kloeden, Synchronization of Dissipative Dynamical Systems Driven by Non-Gaussian Lévy Noises. *International J. Stochastic Analysis*, Volume 2010 (2010), Article ID 502803, 13 pages. doi:10.1155/2010/502803
82. X. Liu, J. Duan, J. Liu and P. E. Kloeden, Synchronization of systems of Marcus canonical equations driven by α -stable noises. *Nonlinear Analysis* **11** (2010), 3437-3445. doi:10.1016/j.nonrwa.2009.1
83. J. Duan, P. Fischer, T. Iliescu and T. Ozgokmen, Bridging the Boussinesq and primitive equations through spatio-temporal filtering. *Appl. Math. Lett.* **23** (2010), 453-456.

● **2000–2009**

84. P. Brune, J. Duan and B. Schmalfuss, Random dynamics of the Boussinesq system with dynamical boundary conditions. *Stochastic Analysis and Appl.* **27** (2009), 1096-1116.
85. J. Duan and A. Millet, Large deviations for the Boussinesq equations under random influences. *Stochastic Processes & Applications* **119** (2009), 2052-2081.
86. X. Chen and J. Duan, Random chain recurrent sets for random dynamical systems. *Dynamical Systems* **24**(2009), 537 - 546.
87. T. Caraballo, J. Duan, K. Lu and B. Schmalfuss, Invariant manifolds for random and stochastic partial differential equations. *Advanced Nonlinear Studies* 10 (2009), 23-52. arXiv:0901.0382v1 [math.DS]
88. W. Wang and J. Duan, Reductions and deviations for stochastic partial differential equations under fast dynamical boundary conditions. *Stochastic Anal. Appl.* **27** (2009), 431-459.
89. M. Denker, J. Duan and M. McCourt, Pseudorandom Numbers for Conformal Measures. *Dynamical Systems* **24** (2009), 439-457.
90. A. Du and J. Duan. A stochastic approach for parameterizing unresolved scales in a system with memory. *Journal of Algorithms & Computational Technology* **3**(2009), 393-405. arXiv:0901.3312
91. D. Li and J. Duan, Structure of the set of bounded solutions for a class of nonautonomous second-order differential equations. *J. Differential Equations* **246** (2009), no. 5, 1754–1773.
92. X. Fu and J. Duan, On global attractors for a class of nonhyperbolic piecewise affine maps. *Physica D* **237** (2008), 3369-3376.

93. Z. Yang, and J. Duan, An intermediate regime for exit phenomena driven by non-Gaussian Lévy noises. *Stochastics and Dynamics* **8**(2008), 583-591.
94. D. Yang and J. Duan, An impact of stochastic dynamic boundary conditions on the evolution of the Cahn-Hilliard system. *Stochastic Analysis and Applications* **25**(2007), 613-639.
95. W. Wang and J. Duan, Homogenized dynamics of stochastic partial differential equations with dynamical boundary conditions. *Comm. Math. Phys.* **275** (2007), 163-186.
96. X. Fu and J. Duan, Global attractors and invariant measures for non-invertible planar piecewise isometric maps. *Phys. Lett. A* **371** (2007), 285-290.
97. W. Wang and J. Duan, A dynamical approximation for stochastic partial differential equations. *J. Math. Phys.* **48**(2007), No. 10, 102701.
98. J. Duan, C. Pötzsche and S. Siegmund, Slow integral manifolds for Lagrangian fluid dynamics in unsteady geophysical flows. *Physica D* **233**(2007), 73-82.
99. P. Bongolan-Walsh, J. Duan, P. F. Fischer, T.M. Ozgokmen and T. Iliescu. Impact of Boundary Conditions on Entrainment and Transport in Gravity Currents. *Applied Mathematical Modelling* **31** (2007), 1338-1350.
100. J. Duan and B. Nadiga. Stochastic parameterization for large eddy simulation of geophysical flows. *Proc. Amer. Math. Soc.* **135** (2007), 1187-1196.
101. T. Ozgokmen, T. Iliescu, P. Fischer, A. Srinivasan and J. Duan. Large eddy simulation of stratified mixing in two-dimensional dam-break problem in a rectangular enclosed domain. *Ocean Modelling* **16** (2007), 106-140.
102. W. Wang, D. Cao and J. Duan, Effective macroscopic dynamics of stochastic partial differential equations in perforated domains. *SIAM J. Math. Anal.* **38** (2007), 1508-1527.
103. C. Sun, D. Cao and J. Duan, Uniform attractors for non-autonomous wave equations with nonlinear damping, *SIAM J. Applied Dynamical Systems* **6** (2007), 293-318.
104. C. Sun, D. Cao and J. Duan, Non-autonomous dynamics of wave equations with nonlinear damping and critical nonlinearity. *Nonlinearity* **19** (2006)2645-2665.
105. J. Duan and A. V. Fursikov, Feedback stabilization for Oseen fluid equations: A stochastic approach. *J. Math. Fluid Mech.* **7** (2005), 574 - 610.
106. H. Gao and J. Duan. Averaging principle for quasi-geostrophic motion under rapidly oscillating forcing. *Appl. Math. Mech.* (English Series) **26** (2005), no. 1, 108–120
107. D. Cheban and J. Duan, Almost Periodic Motions and Global Attractors of the Nonautonomous Navier-Stokes Equations, *J. Dynamics and Diff. Eqns.* **16** (2004), 1–34.
108. D. Cheban and J. Duan, Recurrent motions and global attractors of nonautonomous Lorenz systems, *Dynamical Systems* **19**, No. 1, 2004, 41-59.

109. J. Duan, K. Lu and B. Schmalfuss, Smooth stable and unstable manifolds for stochastic evolutionary equations. *J. Dynamics and Diff. Eqns.* **16** (2004), 949-972.
110. T. Ozgokmen, P. Fischer, J. Duan and T. Iliescu, Entrainment in Bottom Gravity Currents Over Complex Topography from Three-Dimensional Non-hydrostatic Simulations. *Geophysical Research Letters* **31** (2004), L13212.
111. C. Gugg and J. Duan, A Markov jump process approximation of the stochastic Burgers equation. *Stochastics and Dynamics*, **4** (2004), No. 2, 245-264.
112. T. Ozgokmen, P. Fischer, J. Duan and T. Iliescu, Three-Dimensional Turbulent Bottom Density Currents From a High-Order Non-hydrostatic Spectral Element Model, *J. Physical Oceanography* **34** (2004), 2006-2026.
113. J. Brannan, J. Duan and V. Ervin, A Wiener-Hopf Approximation Technique for a Multiple Plate Diffraction Problem, *Mathematical Methods in the Applied Sciences* **47** (2004),19-34.
114. J. Duan, K. Lu and B. Schmalfuss, Invariant manifolds for stochastic partial differential equations. *Annals of Probability* **31**(2003), 2109-2135.
115. I. Chueshov, J. Duan and B. Schmalfuss, Determining functionals for random partial differential equations. *Nonlinear Diff. Eqns. Appl. (NoDEA)*, **10** (2003), 431-454.
116. J. Duan, H. Gao and B. Schmalfuss, Stochastic Dynamics of a Coupled Atmosphere-Ocean Model. *Stochastics and Dynamics* **2** (2002),357-380.
117. D. Blomker, J. Duan and T. Wanner, Enstrophy Dynamics of Stochastically Forced Large-Scale Geophysical Flows, *J. Math. Phys.* **43** (2002), 2616-2626.
118. V. P. Bongolan-Walsh, D. Cheban and J. Duan, Recurrent Motions in the Nonautonomous Navier-Stokes System, *Discrete and Continuous Dyn. Sys. B*, **3** (2002) 255-262.
119. J. Duan and B. Goldys, Ergodicity of Stochastically Forced Large Scale Geophysical Flows, *International J. Math. Math. Sci.* **28** (2001), 313-320.
120. D. Schertzer, M. Larcheveque, J. Duan, V. Yanovsky and S. Lovejoy, Fractional Fokker-Planck Equation for Nonlinear Stochastic Differential Equations Driven by Non-Gaussian Levy Stable Noises. *J. Math. Phys.* **42** (2001), 200-212.
121. J. Duan, P. E. Kloeden and B. Schmalfuss, Exponential Stability of the Quasigeostrophic Flows under Random Perturbation, *Progress in Probability* **49** (2001), 241-256.
122. X. Fu, W. Lu, P. Ashwin and J. Duan, Symbolic Representations of Iterated Maps, *Topological Methods in Nonlinear Analysis* **18** (2001), 119-147.
123. I. Chueshov, J. Duan and B. Schmalfuss, Probabilistic Dynamics of Two-Layer Geophysical Flows, *Stochastics and Dynamics*, **1** (2001), 451-475.
124. G. Lin, H. Gao, J. Duan and V. Ervin, Asymptotic Dynamical Difference between the Non-local and Local Swift-Hohenberg Models, *J. Math. Phys.* **41**(2000), 2077-2089.

125. X. Fu, Y. Fu and J. Duan and R. S. MacKay, Chaotic Properties of Subshifts Generated by a Non-periodic Recurrent Orbit, *Inter. J. Bifurcation and Chaos* **10**(2000), 1067-1073.

● **1993–1999**

126. X. Fu and J. Duan, Infinite-dimensional linear dynamical systems with chaoticity, *J. Nonlinear Sci.*, **9** (1999), 197-211.

127. J. Duan, X. Fu, P. Liu and A. Manning, On a Linear Chaotic Quantum Harmonic Oscillator, *Applied Math. Lett.*, **12** (1999), 15-19.

128. J. Duan, D. D. Holm and K. Li, Variational Methods and Nonlinear Quasigeostrophic Waves, *Phys. Fluids* **11** (1999), 875-879.

129. J. Duan and P. E. Kloeden, Dissipative Quasigeostrophic Motion under Temporally Almost Periodic Forcing, *J. Math. Anal. Appl.* **236** (1999), 74-85.

130. J. Brannan, J. Duan and V. Ervin, Escape Probability, Mean Residence Time and Geophysical Fluid Particle Dynamics, *Physica D* **133** (1999), 23-33.

131. J. Brannan, J. Duan and V. Ervin, Escape Probability and Mean Residence Time in Random Flows with Unsteady Drift, *Math Problems in Engineering* **7** (2001), 55-65.

132. J. Duan and V. J. Ervin, Dynamics of a Nonlocal Kuramoto-Sivashinsky Equation, *J. Diff. Eqns.* **143** (1998), 243-266.

133. J. Duan and J. Nee, Limit Set of Trajectories of the Coupled Viscous Burgers' Equations, *Applied Math. Lett.*, **11** (1998), 57-61.

134. J. Duan and S. Wiggins, Lagrangian transport and chaos in the near wake of the flow around an obstacle: a numerical implementation of lobe dynamics, *Nonlinear Processes in Geophysics* **4** (1997), 125-136.

135. J. Duan, H. V. Ly and E. S. Titi, The effect of nonlocal interaction on the dynamics of the Ginzburg-Landau equation, *Z. Angew. Math. Phys.* **47** (1996), 433-455.

136. J. Duan and S. Wiggins, Fluid exchange across a meandering jet with quasiperiodic variability, *J. Phys. Oceanography* **26** (1996), 1176-1188.

137. J. Duan and S. Wiggins, Nonlinear stability of one-layer geostrophic fronts, *Physica D* **98** (1996), 335-342.

138. J. Duan and P. Holmes, Fronts, domain walls and pulses for a generalized Ginzburg-Landau equation, *Proc. Edinburgh Math. Soc.* **38**(1995), 77-97.

139. J. Duan, E. S. Titi and P. Holmes, Regularity, approximation and asymptotic dynamics for a generalized Ginzburg-Landau equation, *Nonlinearity* **6** (1993), 915-933.

Jinqiao Duan's Recent Invited Presentations

- June 11, 2018, The Joint US-China Math conference
- July 5–9, 2018, AIMS conference, Taipei
- July 11–14, 2018, Beijing, Stochastic Analysis, Geometry
- May 2017, Deterministic methods for stochastic dynamics. SIAM Conference on Applications of Dynamical Systems, Utah
- August 5, 2017, Weihai, China Geometric methods for stochastic dynamics. Conference on stochastic analysis and related fields.
- Oct 10-14, 2016, Stochastic dynamics under homogenization. Bielefeld University, Germany, Conference on Stochastic Partial Differential Equations and Related Fields.
- July 28–30, 2016, Deterministic methods for stochastic dynamics. In Crossroads: Workshop on Stochastic Analysis and Related Fields. Berlin, Germany.
- July 12–16, 2016, Beijing Institute of Technology, China. Conference on Stochastic Analysis and Related Fields
- June 24–26, 2016, Organizer for the First Symposium on Stochastic PDEs, Wuhan, China
- April 9–10, 2016, Salt Lake City, AMS Spring Western Section meeting Nonlocal PDEs with connection to Levy driven dynamical systems
- Jan 7, 2016, Nanjing Normal University, China Nonlocal PDEs and non-Gaussian dynamics
- Oct 4, 2015, AMS Fall Central Section Meeting, Loyola Univ Chicago, Nonlocal PDEs and non-Gaussian Stochastic Dynamical Systems
- August 2015, ICIAM Beijing : two talks SD and SPDEs
- May 2015, SIAM dynamical systems conference
- Sept 2014, IPAM, Local vs. Nonlocal Diffusions–A Tale of Two Laplacians
- Chern Inst of Math, July 2014, Nonlocal operators and non-Gaussian dynamics
- July 2014, SIAM annual conference in Chicago, Perspectives in non-Gaussian stochastic dynamics
- Nonlocal PDEs and non-Gaussian dynamics, Jan 10, 2013, AMS joint meetings, San Diego, CA.
- What do we know about non-Gaussian dynamics? Symposium on “Critical Challenges at the Interface of Mathematics and Engineering” at the University of Illinois at Urbana-Champaign, Sept 17, 2012.
- Plenary Talk “Non-Gaussian Dynamics, Nonlocal Operators and Applications” in The Workshop on Applications of Fractal Geometry & Dynamical Systems Theory to Biology & Physics, UC-Riverside, June 19-22, 2012.

A Glimpse of Stochastic Dynamics, U. of New South Wales, May 3, 2012.

Effective Dynamics of SPDEs, Third Australia-China Conference on Nonlinear PDEs and Related Fields, Sydney, May 1–5, 2012.

Topics in Stochastic PDEs, U. of Washington, April 16, 2012.

Perspectives on Quantifying Uncertain Mechanisms in Dynamical Systems, SIAM Conference on Uncertainty Quantification, Raleigh, NC, April 4, 2012.

Nonlocal PDEs and non-Gaussian Dynamics, Workshop on Nonlocal PDEs and Variational Problems and Applications, Inst for Pure and Applied Math (IPAM), Los Angeles, March 1, 2012.

Effective dynamics of SPDEs, U of California-Irvine, Probability Seminar, Feb 14, 2012.

A glimpse of nonlinear and stochastic dynamics, U of California-Riverside, Colloquium, Feb 8, 2012.

Random dynamical systems with non-Gaussian noises. Invited talk at the Southern California Probability Symposium, December 3, 2011.

Effective dynamics of stochastic partial differential equations, University of California-Los Angeles, Nov 9, 2011.

Non-Gaussian dynamical systems, 2nd International Conference on random Dynamical Systems, Nanjing, China, June 2011.

Some impact of noise on invariant manifolds for stochastic partial differential equations. Newton Institute for Mathematical Sciences, Cambridge, UK, March 29–April 1, 2010.

A series of presentations on random dynamical systems in UK, supported by a grant from the London Mathematical Society, October 2009.

Data-Driven Quantification of Uncertainty in Water Vapor Dynamics. Invited session speaker at the *Pacific Rim Mathematical Association Congress*, July 6-10, 2009, Sydney, Australia.

Random Dynamical Systems with Non-Gaussian Noises. *Workshop on Stochastic Analysis and Finance*, June 29–July 3, 2009, Hong Kong.

Quantifying model uncertainty by colored noises. *Infinite Dimensional Random Dynamical Systems and their Applications*, November 2–8, 2008, Oberwolfach, Germany

Invariant manifolds in stochastic dynamical systems. April 7-11, 2008, *International Conference on Stochastic Analysis and Related Fields*, Wuhan, China.

Transport via Exit under Non-Gaussian Noise. May 5-9, 2008: *Workshop on Transport Systems in Geography, Geosciences, and Networks*, Institute for Pure and Applied Mathematics (IPAM), USA.

Small probability events in some geophysical flows under uncertainty. May 15-16, 2008, *Rocky Mountain Dynamical Systems Conference*, Park City, Utah, USA.

Dynamics under random boundary conditions. June 11, 2007, *Conference on Stochastic Dynamics*, Paris, France.

Stochastic parameterization for large eddy simulation of geophysical flows. *Conference on Computational Methods in Energy and Environmental Research*, July 11, 2007, Peking University, China.

Lecture Series on Random Dynamical Systems, May 14–18, 2007, Workshop on Dynamical Systems, National Center for Theoretical Sciences, Taiwan.