David J.W. Simpson

School of Mathematical and Computational Sciences
Massey University
Palmerston North, 4442, New Zealand
d.j.w.simpson@massey.ac.nz
http://www.massey.ac.nz/∼djwsimps

Education

- **Ph.D.** Applied Mathematics, University of Colorado at Boulder, December 2008
- **M.Sc.** Applied Mathematics, University of Auckland, May 2004
- **B.Sc.** Mathematics and Statistics, University of Auckland, May 2002

Employment

- **Associate Professor of Mathematics** January 2024 – present
  Senior Lecturer of Mathematics January 2017 – December 2023
  Lecturer of Mathematics August 2012 – December 2016
  School of Mathematical and Computational Sciences,
  Massey University, Palmerston North, New Zealand
- **Post-Doctoral Fellow** August 2009 – August 2012
  Department of Mathematics and Institute of Applied Mathematics,
  University of British Columbia, Vancouver, Canada
- **Lecturer and Research Associate** January – August 2009
  Department of Applied Mathematics,
  University of Colorado, Boulder, Colorado, USA

Awards and Invitations

- Marsden Grant (25-MAU-044) November 2025
  - Principal Investigator for NZ$673,000 project: *Empowering research analysts with better mathematical tools for analysing physical phenomena.*
- Marsden Grant (25-UOA-026) November 2025
  - Associate Investigator for NZ$683,000 project: *Understanding complex cycles of competition.*
- ICDEA Keynote Speaker July 2023
  - Awarded travel, accommodation, and conference registration costs for the 28th International Conference on Difference Equations and Applications in Phitsanulok, Thailand.
- Marsden Grant (MAU2209) November 2022
  - Principal Investigator for NZ$602,000 project: *Minimal mathematical models for dynamical systems with abrupt events.*
- NZMS Research Award December 2019
  - Given to (usually) one NZ mathematician per year for excellence in research.
- Marsden Grant (MAU1809) November 2018
  - Principal Investigator for NZ$500,000 project: *Organised chaos: Using geometry to explain robust chaotic dynamics in switched dynamical systems.*
- ICTS Invited Lecturer June 2018
  - Awarded travel, accommodation, and living costs to give a series of lectures and tutorials in the *Summer Program on Dynamics of Complex Systems* held at ICTS (International Centre for Theoretical Sciences), Bangalore, India.
- Massey University International Visitors Research Fund May 2017

  - Awarded NZ$2976 to host Prof. Paul Glendinning (University of Manchester) for collaborative research.

- Simons Visiting Researcher February–March 2016
  - Awarded travel, accommodation, and living costs for five weeks by the Simon's Foundation to participate in the research program *Advances in Nonsmooth Dynamics* held at the *Centre de Recerca Matematica*, Barcelona, Spain.
- NZMS Early Career Award December 2014
  - Given to one NZ early career mathematician per year for excellence in research.
- Massey University Early Career Researcher Award March 2013
  - Awarded NZ$5000 to visit the University of Bristol to establish an on-going collaborative research project.

Books

- D.J.W. Simpson. Bifurcations in Piecewise-Smooth, Continuous Systems. Volume 70 of *Nonlinear Science*. World Scientific, Singapore, 2010.

Research Publications

1) H. Tang, A. Champneys, and D.J.W. Simpson. Boundary Equilibrium Bifurcations Creating Multiple Limit Cycles in Impacting Hybrid Systems. *SIAM J. Appl. Dyn. Syst.*, 24(4):2734–2766, 2025.
2) P.A. Glendinning and D.J.W. Simpson. Extended Normal Forms for One-Dimensional Border-Collision Bifurcations. *Nonlinearity*, 38(10):105012, 2025.
3) I. Ghosh and D.J.W. Simpson. Robust chaos in $\mathbb{R}^n$. *Nonlinearity*, 38(9):095013, 2025.
4) D.J.W. Simpson. A Piecewise-Linear Fixed Point Theorem. *Amer. Math. Month.*, 132(7):695–699, 2025.
5) D.J.W. Simpson. Three Forms of Dimension Reduction for Border-Collision Bifurcations. *Phys. Lett. A*, 550:130603, 2025.
6) D.J.W. Simpson. The Two-Dimensional Border-Collision Normal Form with a Zero Determinant. *SIAM J. Appl. Dyn. Syst.*, 24(3):2205–2245, 2025.
7) D.J.W. Simpson. Nonsmooth Folds as Tipping Points. *Chaos*, 35(2):023125, 2025.
8) I. Ghosh, R.I. McLachlan and D.J.W. Simpson. Robust Chaos in Orientation-Reversing and Non-Invertible Two-Dimensional Piecewise-Linear Maps. *J. Nonlin. Sci.*, 35:16, 2025.
9) I. Ghosh, R.I. McLachlan and D.J.W. Simpson. The Bifurcation Structure within Robust Chaos for Two-Dimensional Piecewise-Linear Maps. *Commun. Nonlin. Sci. Numer. Simul.*, 134:108025, 2024.
10) D.J.W. Simpson. The Necessity of the Sausage-String Structure for Mode-Locking Regions of Piecewise-Linear Maps. *Phys. D*, 462:134142, 2024.
11) D.J.W. Simpson and P.A. Glendinning. Inclusion of Higher-Order Terms in the Border-Collision Normal Form: Persistence of Chaos and Applications to Power Converters. *Phys. D*, 462:134131, 2024.
12) D.J.W. Simpson. Border-Collision Bifurcations from Stable Fixed Points to Any Number of Coexisting Chaotic Attractors. *J. Difference Eq. Appl.*, 30:90–110, 2024.
13) D.J.W. Simpson. Detecting Invariant Expanding Cones for Generating Word Sets to Identify Chaos in Piecewise-Linear Maps. *J. Difference Eq. Appl.*, 29:1094–1126, 2023.
14) P.A. Glendinning and D.J.W. Simpson. Unstable Dimension Variability and Heterodimensional Cycles in the Border-Collision Normal Form. *Phys. Rev. E*, 108(2):L022202, 2023.
15) H.O. Fatoyinbo and D.J.W. Simpson. A Synopsis of the Non-Invertible, Two-Dimensional, Border-Collision Normal Form with Applications to Power Converters. *Int. J. Bifurcation Chaos*, 33(8):2330019, 2023.
16) P.A. Glendinning and D.J.W. Simpson. Normal Forms, Differentiable Conjugacies and Elementary Bifurcations of Maps. *SIAM J. Appl. Math.*, 83(2):816–836, 2023.

17) P.A. Glendinning and D.J.W. Simpson. Normal Forms for Saddle-Node Bifurcations: Takens' Coefficient and Applications in Climate Models. *Proc. R. Soc. A*, 478:20220548, 2022.
18) P.A. Glendinning and D.J.W. Simpson. Chaos in the Border-Collision Normal Form: A Computer-Assisted Proof Using Induced Maps and Invariant Expanding Cones. *Appl. Math. Comput.*, 434:127357, 2022.
19) I. Ghosh and D.J.W. Simpson. Renormalisation of the Two-Dimensional Border-Collision Normal Form. *Int. J. Bifurcation Chaos*, 32(12):2250181, 2022.
20) H.O. Fatoyinbo, R.G. Brown, D.J.W. Simpson and B. van Brunt. Pattern Formation in a Spatially-Extended Model of Pacemaker Dynamics in Smooth Muscle Cells. *Bull. Math. Biol.*, 84(8):86, 2022.
21) D.J.W. Simpson. Dimension Reduction for Slow-Fast, Piecewise-Linear ODEs and Obstacles to a General Theory. *Phys. D*, 439:133368, 2022.
22) S.S. Muni and R.I. McLachlan and D.J.W. Simpson. Unfolding Globally Resonant Homoclinic Tangencies. *Discrete Contin. Dyn. Syst.*, 42(8):4013-4030, 2022.
23) D.J.W. Simpson. Twenty Hopf-Like Bifurcations in Piecewise-Smooth Dynamical Systems. *Phys. Rep.*, 970:1–80, 2022.
24) I. Ghosh and D.J.W. Simpson. Robust Devaney Chaos in the Two-Dimensional Border-Collision Normal Form. *Chaos*, 32:043120, 2022.
25) D.J.W. Simpson. On the Stability of Boundary Equilibria in Filippov Systems. *Commun. Pure Appl. Anal.*, 20(9):3093–3111, 2021.
26) S.S. Muni, R.I. McLachlan and D.J.W. Simpson. Homoclinic Tangencies with Infinitely Many Asymptotically Stable Single-Round Periodic Solutions. *Discrete Contin. Dyn. Syst.*, 41(8):3629–3650, 2021.
27) P.A. Glendinning and D.J.W. Simpson. A Constructive Approach to Robust Chaos using Invariant Manifolds and Expanding Cones. *Discrete Contin. Dyn. Syst.*, 41(7):3367–3387, 2021.
28) P.A. Glendinning and D.J.W. Simpson. Robust Chaos and the Continuity of Attractors. *Trans. Math. Appl.*, 4(1):tnaa002, 2020.
29) D.J.W. Simpson. Chaotic Attractors from Border-Collision Bifurcations: Stable Border Fixed Points and Determinant-Based Lyapunov Exponent Bounds. *NZJM*, 50:71–91, 2020.
30) D.J.W. Simpson, V. Avrutin and S. Banerjee. The Nordmark Map and the Problem of Large-Amplitude Chaos in Impact Oscillators. *Phys. Rev. E*, 102:022211, 2020.
31) D.J.W. Simpson. The Stability of Fixed Points on Switching Manifolds of Piecewise-Smooth Continuous Maps. *J. Dyn. Diff. Equat.*, 32(3):1527–1552, 2020.
32) H.O. Fatoyinbo, R.G. Brown, D.J.W. Simpson and B. van Brunt. Numerical Bifurcation Analysis of Pacemaker Dynamics in a Model of Smooth Muscle Cells. *Bull. Math. Biol.*, 82(7):95, 2020.
33) D.J.W. Simpson. Unfolding Codimension-Two Subsumed Homoclinic Connections in Two-Dimensional Piecewise-Linear Maps. *Int. J. Bifurcation Chaos*, 30(3):2030006, 2020.
34) D.J.W. Simpson. Hopf-Like Boundary Equilibrium Bifurcations involving Two Foci in Filippov Systems. *J. Diff. Eq.*, 267(11):6133–6151, 2019.
35) H.A. Al Fran, D.J.W. Simpson and C.P. Tuffley. Characterisation and Classification of Signatures of Spanning Trees of the n-Cube. *Australas. J. Combin.*, 75(3):259–295, 2019.
36) D.J.W. Simpson. A General Framework for Boundary Equilibrium Bifurcations of Filippov Systems. *Chaos*, 28(10):103114, 2018.
37) D.J.W. Simpson. A Compendium of Hopf-Like Bifurcations in Piecewise-Smooth Dynamical Systems. *Phys. Lett. A.*, 382(35):2439–2444, 2018.
38) M.R. Jeffrey, G. Kafanas and D.J.W. Simpson. Jitter in Dynamical Systems with Intersecting Discontinuity Surfaces. *Int. J. Bifurcation Chaos*, 28(6):1830020, 2018.
39) D.J.W. Simpson. The Structure of Mode-Locking Regions of Piecewise-Linear Continuous Maps: II. Skew Sawtooth Maps. *Nonlinearity*, 31(5):1905–1939, 2018.

40) D.J.W. Simpson and R. Kuske. The Influence of Localised Randomness on Regular Grazing Bifurcations with Applications to Impacting Dynamics. *J. Vib. Contr.*, 24(2):407–426, 2018.
41) D.J.W. Simpson. Grazing-Sliding Bifurcations Creating Infinitely Many Attractors. *Int. J. Bifurcation Chaos*, 27(12):1730042, 2017.
42) D.J.W. Simpson and C.P. Tuffley. Subsumed Homoclinic Connections and Infinitely Many Coexisting Attractors in Piecewise-Linear Maps. *Int. J. Bifurcation Chaos*, 27(2):1730010, 2017.
43) D.J.W. Simpson. The Structure of Mode-Locking Regions of Piecewise-Linear Continuous Maps: I. Nearby Mode-Locking Regions and Shrinking Points. *Nonlinearity*, 30(1):382–444, 2017.
44) D.J.W. Simpson. The Instantaneous Local Transition of a Stable Equilibrium to a Chaotic Attractor in Piecewise-Smooth Systems of Differential Equations. *Phys. Lett. A*, 380(38):3067–3072, 2016.
45) D.J.W. Simpson. Unfolding Homoclinic Connections formed by Corner Intersections in Piecewise-Smooth Maps. *Chaos*, 26:073105, 2016.
46) D.J.W. Simpson. Border-Collision Bifurcations in $\mathbb{R}^N$. *SIAM Rev.*, 58(2):177–226, 2016.
47) D.J.W. Simpson and M.R. Jeffrey. Fast Phase Randomisation via Two-Folds. *Proc. R. Soc. A*, 472(2186):20150782, 2016.
48) D.J.W. Simpson and R. Kuske. Stochastic Perturbations of Periodic Orbits with Sliding. *J. Nonlin. Sci.*, 25(4):967–1014, 2015.
49) D.J.W. Simpson and R. Kuske. The Positive Occupation Time of Brownian Motion with Two-Valued Drift and Asymptotic Dynamics of Sliding Motion with Noise. *Stoch. Dyn.*, 14(4):1450010, 2014.
50) D.J.W. Simpson and R. Kuske. Stochastically Perturbed Sliding Motion in Piecewise-Smooth Systems. *Discrete Contin. Dyn. Syst. Ser. B*, 19(9):2889–2913, 2014.
51) D.J.W. Simpson. On the Relative Coexistence of Fixed Points and Period-Two Solutions near Border-Collision Bifurcations. *Appl. Math. Lett.*, 38:162–167, 2014.
52) D.J.W. Simpson. Scaling Laws for Large Numbers of Coexisting Attracting Periodic Solutions in the Border-Collision Normal Form. *Int. J. Bifurcation Chaos*, 24(9):1450118, 2014.
53) D.J.W. Simpson. Sequences of Periodic Solutions and Infinitely Many Coexisting Attractors in the Border-Collision Normal Form. *Int. J. Bifurcation Chaos*, 24(6):1430018, 2014.
54) M.R. Jeffrey and D.J.W. Simpson. Non-Filippov Dynamics Arising from the Smoothing of Nonsmooth Systems, and its Robustness to Noise. *Nonlinear Dyn.*, 76(2):1395–1410, 2014.
55) D.J.W. Simpson. On Resolving Singularities of Piecewise-Smooth Discontinuous Vector Fields via Small Perturbations. *Discrete Contin. Dyn. Syst.*, 34(9):3803–3830, 2014.
56) D.J.W. Simpson, J. Hogan and R. Kuske. Stochastic Regular Grazing Bifurcations. *SIAM J. Appl. Dyn. Sys.*, 12(2):533–559, 2013.
57) D.J.W. Simpson and J.D. Meiss. Aspects of Bifurcation Theory for Piecewise-Smooth, Continuous Systems. *Phys. D*, 241(22):1861–1868, 2012.
58) D.J.W. Simpson, R. Kuske and Y.-X. Li. Dynamics of Simple Balancing Models with State Dependent Switching Control. *J. Nonlin. Sci.*, 22(2):135–167, 2012.
59) D.J.W. Simpson and R. Kuske. Mixed-Mode Oscillations in a Stochastic Piecewise-Linear System. *Phys. D*, 240:1189–1198, 2011.
60) D.J.W. Simpson and J.D. Meiss. Resonance near Border-Collision Bifurcations in Piecewise-Smooth, Continuous Maps. *Nonlinearity*, 23(12):3091–3118, 2010.
61) D.J.W. Simpson and J.D. Meiss. Simultaneous Border-Collision and Period-Doubling Bifurcations. *Chaos*, 19(3):033146, 2009.
62) D.J.W. Simpson and J.D. Meiss. Shrinking Point Bifurcations of Resonance Tongues for Piecewise-Smooth, Continuous Maps. *Nonlinearity*, 22(5):1123–1144, 2009.
63) D.J.W. Simpson, D.S. Kompala and J.D. Meiss. Discontinuity Induced Bifurcations in a Model of *Saccharomyces cerevisiae*. *Math. Biosci.*, 218(1):40–49, 2009.
64) D.J.W. Simpson and J.D. Meiss. Unfolding a Codimension-Two Discontinuous Andronov-Hopf Bifurcation. *Chaos*, 18(3):033125, 2008.

65) D.J.W. Simpson and J.D. Meiss. Neimark-Sacker Bifurcations in Planar, Piecewise-Smooth, Continuous Maps. *SIAM J. Appl. Dyn. Sys.*, 7(3):795–824, 2008.
66) B. Marts, D.J.W. Simpson, A. Hagberg and A.L. Lin. Period Doubling in a Periodically Forced Belousov-Zhabotinsky Reaction. *Phys. Rev. E*, 76(2):026213, 2007.
67) D.J.W. Simpson and J.D. Meiss. Andronov-Hopf Bifurcations in Planar, Piecewise-Smooth, Continuous Flows. *Phys. Lett. A*, 371(3):213–220, 2007.
68) D.J.W. Simpson, V. Kirk and J. Sneyd. Complex Oscillations and Waves of Calcium in Pancreatic Acinar Cells. *Phys. D*, 200:303–324, 2005.

Conference Proceedings, Theses, and Other Research Outputs

1) D.J.W. Simpson How to Compute Multi-Dimensional Stable and Unstable Manifolds of Piecewise-Linear Maps. *Springer Proceedings in Mathematics & Statistics*, 485:1–14, 2025.
2) P.A. Glendinning and D.J.W. Simpson. Differentiable Conjugacies for One-Dimensional Maps. *Springer Proceedings in Mathematics & Statistics*, 444:115-130, 2024.
3) I. Belykh, R. Kuske, M. Porfini and D.J.W. Simpson. Beyond the Bristol Book: Advances and Perspectives in Non-Smooth Dynamics and Applications. *Chaos*, 33(1):010402, 2023.
4) M.E. Roberts, C. Kueh, E. Greenbank, D. Clarke, S. van Hove, D.J.W. Simpson, A. Williams and J. Williams. Modelling the Mechanical Action of a Front Loading Washing Machine. *ANZIAM J.*, 59: M30–M62, 2019.
5) D.J.W. Simpson. Open Problems on Border-Collision Bifurcations. In: A. Colombo, M. Jeffrey, J. Lázaro, J. Olm (eds). Extended Abstracts Spring 2016. 8:163–166, 2017.
6) D.J.W. Simpson. Piecewise-Linear Maps: Intricate Dynamics with Explicit Solvability. *NZMS Newsletter*, 125:8–10, 2015.
7) D.J.W. Simpson. DSWeb Media Gallery. 2014. *http://www.dynamicalsystems.org/pi/fr/detail?item=140*
8) D.J.W. Simpson and D.S. Kompala. Mathematica Demonstrations. 2008-2009. *http://demonstrations.wolfram.com/author.html?author=David+J.+W.+Simpson*
9) D.J.W. Simpson. Bifurcations in Piecewise-Smooth, Continuous Systems. PhD thesis, University of Colorado. 2008.
10) D.J.W. Simpson. A Bifurcation Analysis of a Mathematical Model of Intracellular Calcium Waves. Master's thesis, University of Auckland. 2004.

Supervisory Experience

- Primary supervisor of PhD students

  Indranil Ghosh, January 2021 – December 2023
  Sishu Muni, November 2018 – November 2021

- Cosupervisor of PhD students

  Sidra Zafar, January 2022 – present
  Hammed Fatoyinbo, January 2017 – March 2021
  Christian Offen, November 2016 – July 2020
  Howida al Fran, May 2013 – 2017

- Host of post-doctoral fellows

  Indranil Ghosh, February 2024 – September 2025
  Hammed Fatoyinbo, May 2021 – May 2022

- Supervised summer students on projects involving original research on dynamical systems

  Isaac Abbott, November 2025 – present
  Olivia Goodman, November 2025 – present
  Beth Brauchli, November 2023 – February 2024
  Jack Sandford, November 2021 – February 2022
  Edward Chen, November 2017 – February 2018

Liam Bignell, November 2016 – February 2017
Sam Irvine, November 2015 – February 2016
Harjinder Pal, December 2014 – February 2015

- Supervised graduate students for honours-level projects

Lydia Price, February 2024 – June 2024
Edward Chen, February 2018 – June 2018
Alex Gibbs, July 2017 – October 2017
Sangeetha Basnayake, March 2013 – November 2013

Teaching Experience

- **Instructor**

Linear Mathematics, 160.102, Massey University	Semester 1, 2016 – 2019
Methods of Mathematics, 160.103, Massey University	Semester 1, 2013 – 2015
Discrete Mathematics, 160.212, Massey University	Semester 1, 2023 – 2025
Differential Equations II, 160.318, Massey University	Semester 1, 2013 – 2019, 2021 – 2025
Studies in Applied Differential Equations, 160.734, Massey University	Semester 1 or 2, 2013 – 2019
Differential Equations I, 160.204, Massey University	Semester 2, 2021, 2025
Linear Algebra, 160.211, Massey University	Semester 2, 2013 – 2025
Classical Fields, 124.332, Massey University	Semester 2, 2013 – 2021
Methods of Mathematical Physics, 160.317, Massey University	Semester 2, 2012, 2013
Linear Differential Equations, University of British Columbia	Fall 2011
Partial Differential Equations, University of British Columbia	Fall 2009, 2010
Complex Variables and Applications, University of Colorado at Boulder	Spring 2009
Differential Equations and Linear Algebra, University of Colorado at Boulder	Summer 2008

  - Responsible for class instruction, lecture planning, course structure, writing and grading exams, writing homework assignments, maintaining a course webpage, holding office hours, coordinating with other instructors and supervising teaching assistants.

Selected Presentations

- **SIAM Conference on Applications of Dynamical Systems** May 14, 2025
  Denver, CO, USA
  Geometric constructions and computer-assisted proofs of chaotic attractors in piecewise-smooth maps.
- **NZMS, AMS, AustMS Joint Meeting** Dec. 11, 2024
  University of Auckland
  Explicit constructions for chaotic attractors of piecewise-linear maps.
- **Engineering Mathematics Seminar** Apr. 23, 2024
  University of Bristol, UK
  How the dynamics of piecewise-linear maps differs from those of smooth maps.
- **Dynamics and Piecewise-Smooth Systems Workshop** (Keynote speaker) Apr. 15, 2024
  University of Manchester, UK
  The next big thing in piecewise-smooth dynamics.
- **British Applied Mathematics Colloquium** Apr. 9, 2024
  Newcastle, UK
  Explicit constructions for chaotic attractors of piecewise-linear maps.
- **4th Antipodeal Dynamics Workshop** (Keynote speaker) Dec 12, 2023
  (virtual)
  Patterns of bifurcations in piecewise-smooth dynamical systems.
- **ICDEA** (Keynote speaker) July 17, 2023
  Phitsanulok, Thailand
  Piecewise-linear maps: where do they come from and what do they do?

- **SIAM Conference on Applications of Dynamical Systems** May 17, 2023
  Portland, OR, USA
  The Unexpected Helpfulness of Adding Noise to Nonsmooth ODEs.
- **Department of Electrical Engineering and Information Technology Seminar** Oct. 27, 2021
  University of Naples (virtual)
  Stability of Piecewise-Linear Systems.
- **SIAM Conference on Applications of Dynamical Systems** May 21, 2021
  (virtual)
  Constructing Robust Chaos: Power Converters Revisited.
- **NZMS Colloquium** (Plenary speaker) Dec. 5, 2019
  Massey University, Palmerston North, NZ
  Border-Collision Bifurcations of Switched Dynamical Systems: From Fixed Points to Robust Chaos
- **SIAM Conference on Applications of Dynamical Systems** May 22, 2019
  Snowbird, UT, USA
  Towards a General Bifurcation Theory for Equilibria of Piecewise-Smooth ODEs
- **Mathematics Department Seminar** May 13, 2019
  University of Manchester, UK
  New Developments in the Dynamics of Multi-Dimensional Piecewise-Linear Maps
- **ANZIAM** Feb. 4, 2019
  Nelson, NZ
  Stability in Piecewise-Smooth Maps: Fixed Points, Fractals, and Friction
- **Workshop on Complex Networks** June 26, 2018
  ICTS, Bangalore, India
  Fractal Structures in Multi-Dimensional Piecewise-Linear Maps
- **ANZIAM** Feb. 8, 2018
  Hobart, Australia
  The Sausage-String Structure of Mode-Locking Regions of Piecewise-Linear Maps
- **Dynamics Days** Jan. 6, 2018
  Denver, CO, USA
  The Sausage-String Structure of Mode-Locking Regions of Piecewise-Linear Maps
- **SIAM Conference on Applications of Dynamical Systems** May 22, 2017
  Snowbird, UT, USA
  Desynchronising Collections of Oscillators by using Two-Fold Singularities
- **School/Workshop on Applicable Theory of Switched Systems** June 10, 2016
  The University of Texas at Dallas, TX, USA
  Using Two-Fold Singularities to Desynchronise Collections of Oscillators
- **CRM Research Program on Advances in Nonsmooth Dynamics** Feb. 11, 2016
  Autonomous University of Barcelona, Spain
  Noisy Sliding Motion and a Probabilistic Notion of Forward Evolution through a Two-Fold
- **Conference on Open Problems in Nonsmooth Dynamics** Feb. 1, 2016
  Autonomous University of Barcelona, Spain
  Border-Collision Bifurcations: Myths, Facts and Open Problems
- **Applied Mathematics Department Seminar** May 28, 2015
  University of Colorado at Boulder, CO, USA
  Noisy Sliding Motion
- **SIAM Conference on Applications of Dynamical Systems** May 20, 2015
  Snowbird, UT, USA
  Infinitely Many Coexisting Attractors in the Border-Collision Normal Form
- **ANZIAM** Feb. 5, 2014
  Rotorua, NZ
  Effects of Noise on Nonsmooth Dynamical Systems

- **Engineering Mathematics Department Colloquium** July 5, 2013
  University of Bristol, Bristol, England
  Stochastic Perturbations of Sliding Motion and Periodic Orbits with Sliding Segments
- **SIAM Conference on Applications of Dynamical Systems** May 19, 2013
  Snowbird, UT, USA
  Stochastic Grazing Bifurcations
- **The 9th AIMS Conference on Dynamical Systems, Differential Equations and Applications** July 1, 2012
  Orlando, FL, USA
  The Effects of Noise on Sliding Motion
- **Engineering Mathematics Department Colloquium** Jan. 27, 2012
  University of Bristol, Bristol, England
  Resonance in Piecewise-Smooth Continuous Maps
- **Maps, Gaps and Noise Workshop** (Keynote speaker) Jan. 17 & 18, 2012
  University of Bath, Bath, England
  Noisy Sliding Motion
- **7th European Nonlinear Dynamics Conference** July 26, 2011
  Sapienza - Università di Roma, Rome, Italy
  Dynamics of a Prototypical Balancing Model with Switching Control
- **International Council for Industrial and Applied Mathematics** July 21, 2011
  Vancouver, Canada
  Noise-Induced Mixed-Mode Oscillations via Canards in a PWL FitzHugh-Nagumo Model
- **International Workshop on Resonance, Oscillations and Stability of Nonsmooth Systems** June 19, 2009
  London Imperial College, London, England
  Shrinking Point Bifurcations of Resonance Tongues for PWS, Continuous Maps

Academic Service

- Guest Editor for *Chaos* and *Physica D* for special issues on Nonsmooth Dynamics, 2022
- Associate Editor for the Book Review section of *SIAM Review*, January 2018 – December 2023
- Webmaster for the NZMS, December 2018 – December 2022
- Minisymposium organiser for the SIAM Conferences on Applications of Dynamical Systems, Snowbird, Utah, USA, May 2013, 2015, 2017, 2019, and 2025
- Co-organiser of the NZMS Colloquium, Massey University, Palmerston North, December 2–5, 2019
- Co-organiser of the 17th Manawatu-Wellington Applied Maths Conference (MWAM-15), Massey University, Palmerston North, July 9, 2015
- Massey University Misconduct Appeals Committee Member, since Sept. 2024
- SMCS Research Committee member, since March 2022
- College of Sciences Emerging Researcher Committee member, since March 2022
- Postgraduate Advisor for the Mathematics Group, Massey University, Manawatu Campus, Aug. 2020 -– Dec. 2021
- Question Composer for the Massey University Mathematics and Statistics Quiz (M3S) for Year 12 students since 2014.
- Member of NZMS, ANZIAM, & SIAM

Computer Language Capabilities

- AUTO, HTML, Java, LaTeX, MatContM, Mathematica, Matlab, Octave, Python