Curriculum Vitae – Carlo R. Laing

School of Mathematical and Computational Sciences, Massey University, Auckland, New Zealand
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Country of birth: New Zealand. Citizenship: New Zealand

Education

1994–1997	Ph.D., Department of Applied Mathematics and Theoretical Physics, University of Cambridge, United Kingdom. Supervisor: Professor Paul Glendinning.
1992–1994	M.Sc. (Physics), First Class Honours, University of Auckland, New Zealand. Masters' thesis completed. Supervisors: Vivien Kirk and Peter Wills.
1989–1991	B.Sc., University of Auckland, New Zealand. Subjects studied: Mathematics, Physics, Chemistry, Russian.
1984–1988	Pakuranga College, Auckland, New Zealand. Dux of the College and Junior University Scholarship (1988).

Employment

January 2017–	Professor of Mathematics, Massey University, New Zealand. (Albany campus).
January 2013–December 2016	Associate Professor of Mathematics, Massey University, New Zealand. (Albany campus).
January 2007–December 2012	Senior Lecturer in Mathematics (Range 2 from January 2011), Massey University, New Zealand (Albany campus).
October 2002–December 2006	Lecturer in Mathematics, Massey University, New Zealand (Albany campus).
August 2000–August 2002	Research Associate, Department of Physics, University of Ottawa, Canada.
August 1998–August 2000	Visiting Research Assistant Professor, Department of Mathematics, University of Pittsburgh, USA.
April 1998–August 1998	Research Fellow, Department of Mathematics and Statistics, University of Surrey, UK.
November 1997–April 1998	Research Fellow, Centre for Nonlinear Dynamics and its Applications, University College London and Department of Engineering, University of Cambridge, UK.

Awards

2021:	Nominated for Lecturer of the Year (Massey University, Albany Campus).
2018:	New Zealand Mathematical Society Research Award.
2016:	Awarded Fellowship of New Zealand Mathematical Society.
2013:	Nominated for Lecturer of the Year (Massey University, Albany Campus).
2008:	J.H. Michell Medal (ANZIAM[1], outstanding young researcher).
2006:	Distinguished Teaching Award, Massey University, Auckland, New Zealand.
1994–1997:	Cambridge Commonwealth Trust Prince of Wales Scholarship and Overseas Research Student Award.
1994:	Elected Fellow of Cambridge Commonwealth Society.
1993:	Sagar Geophysics Prize, University of Auckland.
1992–1994:	University of Auckland Graduate Scholarship.
1991:	Senior Prize in Physics, University of Auckland.
1990:	Annual Prize in Physics, University of Auckland.
1989:	Auckland Pushkin Society Special Prize (for Russian).

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[1]Australia and New Zealand Industrial and Applied Mathematics

Grants

Student Supervision

- PhD students:

  - Amanda Elvin, 2005–08. (Recipient of Vice-Chancellor's Doctoral Scholarship (2005); Aitkin Prize (2005); Highly commended, ANZIAM meeting (2006). Co-supervised with Mick Roberts)
  - Maarten Jordens, 2007–10. (Co-supervised with Gaven Martin)
  - Samuel Dillon, 2008–12. (Co-supervised with Gaven Martin)
  - Steffen Klatt, 2009–10. (Co-supervised with Alona Ben-Tal)
  - Karen McCulloch, 2012-16. (Co-supervised with Mick Roberts)
  - Sidra Zafar, 2017-20 (Co-supervised with Mick Roberts)
  - Christian Bläsche, 2017-20 (Co-supervised with Gaven Martin)
  - Jian Song, Oct 2022-Feb 2024 (Visiting from South China University of Technology)
  - Na Zhao, May 2024-May 2025 (Visiting from South China University of Technology)

- PGDipSci project students:

  - Uros Abaz, 2004
  - Amanda Elvin, 2004

- Summer students:

  - Graeme Mak, 2007–8
  - Ben Smith, 2010–11

Postdoctoral Supervision

- Shawn Means (2018-2021)

- Jingjing Liao (2024-)

Publications

Refereed Papers

95. N. Zhao, **C. R. Laing**, J. Song and S. Liu. Coupling–excitability correlation shapes complex dynamics in theta neurons network: macroscopic states, inhibition-induced clustering, and chaotic regimes. Submitted, 2025.

94. **C. R. Laing** and B. Krauskopf. Periodic solutions for a pair of delay-coupled excitable theta neurons. *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences*, **481** (20240897),2025.

93. N. Zhao, **C. R. Laing**, J. Song and S. Liu. Subsystem resetting of a heterogeneous network of theta neurons. *Physica A*, **662**, 130416, 2025.

92. **C. R. Laing**. Periodic solutions for a pair of delay-coupled active theta neurons. *The ANZIAM Journal*, **67**, e11, 2025.

91. J. Song, **C. R. Laing** and S. Liu. A dynamical analysis of collective behaviour in a multi-population network with infinite theta neurons. *Physica D*, **472**, 134468, 2025.

90. O. Omel'chenko and **C. R. Laing**. Activity patterns in ring networks of quadratic integrate-and-fire neurons with synaptic and gap junction coupling. *Physical Review E*, **110**, 034411, 2024.

89. J. Song, **C. R. Laing** and S. Liu. Ion channels and the diversity of spontaneous firing in anterior pituitary corticotrophs: A dynamical analysis. *Communications in Nonlinear Science and Numerical Simulation*, **131**, 107789, 2024.

88. **C. R. Laing**. Chimeras in phase oscillator networks locally coupled through an auxiliary field: stability and bifurcations. *Chaos*, **33**, 083141, 2023.

87. **C. R. Laing**. and O. Omel'chenko. Periodic solutions in next generation neural field models. *Biological Cybernetics*, **117**, pp. 259–274, 2023.

86. **C. R. Laing**. Chimeras on a ring of oscillator populations. *Chaos*, **33**, 013121, 2023.

85. **C. R. Laing**. Chimeras on annuli. *Chaos*, **32**, 083105, 2022.

84. B. Krauskopf and **C. R. Laing**. Theta neuron subject to delayed feedback: a prototypical model for self-sustained pulsing. *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences*, **478**(2266), 2022.

83. S. Means and **C. R. Laing**. Explosive behaviour in networks of Winfree oscillators. *Chaos, Solitons and Fractals*, **160**, 112254, 2022.

82. F. P. Kemeth, T. Bertalan, T. Thiem, F. Dietrich, S. J. Moon, **C. R. Laing** and I. G. Kevrekidis. Learning emergent PDEs in a learned emergent space. *Nature Communications*, **13**, 3318, 2022.

81. O. Omel'chenko and **C. R. Laing**. Collective states in a ring network of theta neurons. *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences*, **478**(2259), 2022.

80. **C. R. Laing**. Chimeras with uniformly distributed heterogeneity: Two coupled populations. *Physical Review E*, **105**, 024306, 2022.

79. **C. R. Laing**. Interpolating between bumps and chimeras. *Chaos*, **31**, 113116, 2021.

78. T. N. Thiem, F. P. Kemeth, T. Bertalan, **C. R. Laing**, and I. G. Kevrekidis. Global and local reduced models for interacting, heterogeneous agents. *Chaos*. **31**, 073139, 2021.

77. **C. R. Laing**. Effects of degree distributions in random networks of Type-I neurons. *Physical Review E*, **103**, 052305, 2021.

76. **C. R. Laing**, C. Blasche and S. Means. Dynamics of structured networks of Winfree oscillators. Frontiers in Systems Neuroscience, Vol. 15, art. 631377, 2021.

75. S. Means, C. Blasche, and **C. R. Laing**. A permutation method for network assembly. *PLoS ONE*, 15(10): e0240888, 2020.

74. T. N. Thiem, M. Kooshkbaghi, T. Bertalan, **C. R. Laing**, and I. G. Kevrekidis. Emergent spaces for coupled oscillators. *Frontiers in Computational Neuroscience*. Vol. 14, Art. 36, 2020.

73. C. Bick, M. Goodfellow, **C. R. Laing** and E. A. Martens. Understanding the dynamics of biological and neural oscillator networks through mean-field reductions: a review. *Journal of Mathematical Neuroscience*, **10**, 9, 2020.

72. **C. R. Laing** and O. Omel'chenko. Moving bumps in theta neuron networks. *Chaos.* **30**, 043117, 2020.

71. **C. R. Laing** and C. Bläsche. The effects of within-neuron degree correlations in networks of spiking neurons. *Biological Cybernetics.* **114**(3), pp. 337-347, 2020.

70. C. Bläsche, S. Means, and **C. R. Laing**. Degree assortativity in networks of spiking neurons. *Journal of Computational Dynamics.* **7**(2), pp. 401-423, 2020.

69. **C. R. Laing**. Dynamics and stability of chimera states in two coupled populations of oscillators. *Physical Review E*, **100**, 042211, 2019.

68. K. McCulloch, M. G. Roberts and **C. R. Laing**. Generalised probability mass function for the final epidemic size of an SIR model on a line of triangles network. *Mathematical Biosciences.* **311**, 49-61, 2019.

67. **C. R. Laing**. Chaos in small networks of theta neurons. *Chaos.* **28**, 073101, 2018.

66. **C. R. Laing**. The dynamics of networks of identical theta neurons. *Journal of Mathematical Neuroscience,* **8**, 4, 2018.

65. T. Bertalan, Y. Wu, **C. Laing**, C. W. Gear and I. G.Kevrekidis. Coarse-grained descriptions of dynamics for networks with both intrinsic and structural heterogeneities. *Frontiers in Computational Neuroscience*, **11**, 43, 2017.

64. **C. R. Laing**. Chimeras in two-dimensional domains: heterogeneity and the continuum limit. *SIAM Journal on Applied Dynamical Systems.* **16**(2), pp. 974-1014, 2017.

63. **C. R. Laing**. Travelling waves in arrays of delay-coupled phase oscillators. *Chaos.* **26**, 094802, 2016.

62. K. Rajendran, A. C. Tsoumanis, C. I. Siettos, **C. R. Laing** and I. G. Kevrekidis. Modeling heterogeneity in networks using polynomial chaos. *International Journal for Multiscale Computational Engineering*, **14**(3), pp. 291-302 2016.

61. M. Choi, T. Bertalan, **C. R. Laing** and I. G. Kevrekidis. Dimension reduction in heterogeneous neural networks: generalized Polynomial Chaos (gPC) and ANalysis-Of-VAriance (ANOVA). *The European Physical Journal Special Topics*, **225**, pp. 1165-1180, 2016.

60. K. McCulloch, M. G. Roberts and **C. R. Laing**. Exact analytical expressions for the final epidemic size of an SIR model on small networks. *The ANZIAM Journal*, **57**, pp. 429-444, 2016.

59. **C. R. Laing**. Bumps in small-world networks. *Frontiers in Computational Neuroscience*, **10**, 53, 2016.

58. R. Thul, S. Coombes and **C. Laing**. Neural field models with threshold noise. *Journal of Mathematical Neuroscience,* **6**, 3, 2016.

57. M. J. Panaggio, D. M. Abrams, P. Ashwin and **C. R. Laing**. Chimera states in networks of phase oscillators: the case of two small populations. *Physical Review E,* **93**, 012218, 2016.

56. **C. R. Laing**. Chimeras in networks with purely local coupling. *Physical Review E,* **92**, 050904(R), 2015.

55. **C. R. Laing** and I. G. Kevrekidis. Equation-free analysis of spike timing dependent plasticity. *Biological Cybernetics,* **109**:6, pp. 701-714, 2015.

54. **C. R. Laing**. Exact neural fields incorporating gap junctions. *SIAM Journal on Applied Dynamical Systems*, **14**(4), pp. 1899-1929, 2015.

53. S. J. Moon, K. A. Cook, K. Rajendran, I. G. Kevrekidis, J. Cisternas and **C. R. Laing**. Coarse-grained clustering dynamics of synaptically coupled heterogeneous neurons. *Journal of Mathematical Neuroscience,* **5**, 2, 2015.

52. **C. R. Laing**. Derivation of a neural field model from a network of theta neurons. *Physical Review E,* **90**, 010901(R), 2014.

51. **C. R. Laing**. Numerical bifurcation theory for high-dimensional neural models. (Invited review article.) *Journal of Mathematical Neuroscience,* **4**, 13, 2014.

50. O. Omel'chenko, M. Wolfrum and **C. R. Laing**. Partially coherent twisted states in arrays of coupled phase oscillators. *Chaos,* **24**, 023102, 2014.

49. L. Shiau and **C. R. Laing**. Periodically forced piecewise linear adaptive exponential integrate-and-fire neuron. *International Journal of Bifurcation and Chaos* **23**, 1350171, 2013.

48. **C. R. Laing**. Disorder-induced dynamics in a pair of coupled heterogeneous phase oscillator networks. *Chaos* **22**, 043104, 2012.

47. **C. R. Laing**, K. Rajendran and I. G. Kevrekidis. Chimeras in random non-complete networks of phase oscillators. *Chaos,* **22**, 013132, 2012.

46. **C. R. Laing**, Y. Zou, B. Smith and I. G. Kevrekidis. Managing heterogeneity in the study of neural oscillator dynamics. *Journal of Mathematical Neuroscience,* **2**, 5, 2012.

45. S. Coombes, H. Schmidt, **C. R. Laing**, N. Svanstedt and J. A. Wyller. Waves in random neural media. *Discrete and Continuous Dynamical Systems – Series A,* **32**, pp. 2951-2970, 2012.

44. **C. R. Laing**. Fronts and bumps in spatially extended Kuramoto networks. *Physica D,* **240**, pp. 1960-1971, 2011.

43. S. Coombes and **C. R. Laing**. Pulsating fronts in periodically modulated neural field models. *Physical Review E,* **83**, 011912, 2011.

42. T. M. Wasylenko, J. E. Cisternas, **C. R. Laing** and I. G. Kevrekidis. Bifurcations of smooth and lurching waves in a one-dimensional thalamic neuronal network. *Biological Cybernetics,* **103**:6, pp. 447–462, 2010.

41. **C. R. Laing**. Chimeras in networks of planar oscillators. *Physical Review E,* **81**, 066221, 2010.

40. **C. R. Laing**, T. Frewen and I. G. Kevrekidis. Reduced models for binocular rivalry. *Journal of Computational Neuroscience,* **28**, 459-476, 2010.

39. A. J. Elvin, **C. R. Laing**, R. I. McLachlan and M. G. Roberts. Exploiting the Hamiltonian structure of a neural field model. Invited article, *Physica D,* **239**, pp. 537–546, 2010.

38. E. A. Martens, **C. R. Laing** and S. H. Strogatz. Solvable model of spiral wave chimeras. *Physical Review Letters,* **104**, 044101, 2010. (Discussed in News and Views, *Nature Physics,* **6**, pp. 164-165, 2010.)

37. **C. R. Laing**. The dynamics of chimera states in heterogeneous Kuramoto networks. *Physica D,* **238**, pp. 1569–1588. 2009.

36. **C. R. Laing**. Chimera states in heterogeneous networks. *Chaos,* **19**, 013113, 2009.

35. S. Coombes and **C. R. Laing**. Instabilities in threshold-diffusion equations with delay. *Physica D,* **238**, pp. 264–272, 2009.

34. A. J. Elvin, **C. R. Laing** and M. G. Roberts. Transient Turing patterns in a neural field model. *Physical Review E,* **79**, 011911, 2009.

33. S. Coombes and **C. R. Laing**. Delays in activity based neural networks. Invited article, *Philosophical Transactions of the Royal Society A,* **367**, pp. 1117–1129, 2009.

32. **C. R. Laing** and I. G. Kevrekidis. Periodically-forced finite networks of heterogeneous coupled oscillators: a low-dimensional approach. *Physica D,* **237**, pp. 207–215, 2008.

31. S. Coombes, N. A. Venkov, L. Shiau, I. Bojak, D. T. J. Liley and **C. R. Laing**. Modeling electrocortical activity through improved local approximations of integral neural field equations. *Physical Review E,* **76**, 051901, 2007. (Selected to appear in *Virtual Journal of Biological Physics Research,* Vol. 14, 2007.)

30. M. R. Owen, **C. R. Laing** and S. Coombes. Bumps, rings, and spots in a two-dimensional neural field: splitting and rotational instabilities. *New Journal of Physics,* **9**, 378, 2007.

29. **C. R. Laing**, T. A. Frewen and I. G. Kevrekidis. Coarse-grained dynamics of an activity bump in a neural field model. *Nonlinearity,* **20**, pp. 2127–2146, 2007.

28. **C. R. Laing** and S. Coombes. The importance of different timings of excitatory and inhibitory pathways in neural field models. *Network: Computation in Neural Systems,* **17(2)**, pp. 151–172, 2006.

27. **C. R. Laing**. On the application of "equation-free" modelling to neural systems. *Journal of Computational Neuroscience,* **20**, pp. 5–23, 2006.

26. **C. R. Laing**. Spiral waves in nonlocal equations. *SIAM Journal on Applied Dynamical Systems,* **4**(3), pp. 588–606, 2005.

25. **C. R. Laing** and S. Coombes. Mode locking in a periodically forced "ghostbursting" neuron model. *International Journal on Bifurcation and Chaos,* **15**(4), pp. 1433–1444, 2005.

24. X. Huang, W. C. Troy, S. J. Schiff, Q. Yang, H. Ma, **C. R. Laing** and J.-Y. Wu. Spiral waves in disinhibited mammalian neocortex. *Journal of Neuroscience,* **24**(44), pp. 9897–9902, 2004.

23. **C. R. Laing**. Ghostbursting in sensory cells of electric fish. Invited article, *Nonlinear Studies,* **11**(3), pp. 469–480, 2004.

22. **C. R. Laing** and W. C. Troy. PDE methods for nonlocal models. *SIAM Journal on Applied Dynamical Systems,* **2**(3), pp. 487–516, 2003.

21. **C. R. Laing** and A. Longtin. Periodic forcing of a model sensory neuron. *Physical Review E,* **67** 051928, 2003.

20. **C. R. Laing** and A. Longtin. Dynamics of deterministic and stochastic paired excitatory–inhibitory delayed feedback. *Neural Computation,* **15**, pp. 2779–2822, 2003.

19. L. Noonan, B. Doiron, **C. R. Laing**, A. Longtin and R. W. Turner. A dynamic dendritic refractory period regulates burst discharge in the electrosensory lobe of weakly electric fish. *Journal of Neuroscience,* **23**(4), pp. 1524–1534, 2003.

18. **C. R. Laing**, B. Doiron, A. Longtin, L. Noonan, R. W. Turner and L. Maler. Type I burst excitability. *Journal of Computational Neuroscience,* **14**(3), pp. 329–342, 2003.

17. **C. R. Laing** and W. C. Troy. Two–bump solutions of Amari–type models of neuronal pattern formation. *Physica D,* **178**, pp. 190–218, 2003.

16. **C. R. Laing** and A. Longtin. A two–variable model of somatic–dendritic interactions in a bursting neuron. *Bulletin of Mathematical Biology,* **64**(5), pp. 829–860, 2002.

15. **C. R. Laing**, B. Doiron, A. Longtin and L. Maler. Ghostbursting: the effects of dendrites on spike patterns. *Neurocomputing,* **44–46**, pp. 127–132, 2002.

14. **C. R. Laing**, W. C. Troy, B. S. Gutkin and G. B. Ermentrout. Multiple bumps in a neuronal model of working memory. *SIAM Journal on Applied Mathematics,* **63**(1), pp. 62–97, 2002.

13. **C. R. Laing** and C. C. Chow. A spiking neuron model for binocular rivalry. *Journal of Computational Neuroscience,* **12**(1), pp. 39–53, 2002.

12. B. Doiron, **C. Laing**, A. Longtin and L. Maler. Ghostbursting: a novel neuronal burst mechanism. *Journal of Computational Neuroscience,* **12**(1), pp. 5–25, 2002.

11. **C. R. Laing** and A. Longtin. Noise–induced stabilization of bumps in systems with long–range spatial coupling. *Physica D*, **160**(3–4), pp. 149–172, 2001.

10. B. S. Gutkin, **C. R. Laing**, C. L. Colby, C. C. Chow and G. B. Ermentrout. Turning on and off with excitation: the role of spike–timing asynchrony and synchrony in sustained neural activity. *Journal of Computational Neuroscience,* **11**(2), pp. 121–134, 2001.

9. **C. R. Laing** and C. C. Chow. Stationary bumps in networks of spiking neurons. *Neural Computation,* **13**(7), pp. 1473–1494, 2001.

8. P. Aston and **C. R. Laing**. Symmetry and chaos in the complex Ginzburg–Landau equation. II: Translational Symmetries. *Physica D,* **135**, pp. 79–97, 2000.

7. P. Aston and **C. R. Laing**. Symmetry and chaos in the complex Ginzburg–Landau equation. I: Reflectional Symmetries. *Dynamics and Stability of Systems,* **14**(3), pp. 233–253, 1999.

6. **C. R. Laing**, A. McRobie and J. M. T. Thompson. The postprocessed Galerkin method applied to nonlinear shell vibrations. *Dynamics and Stability of Systems,* **14**(2), pp. 163–181, 1999.

5. **C. R. Laing**. Rotating waves in rings of coupled oscillators. *Dynamics and Stability of Systems,* **13**(4), pp. 305–318, 1998.

4. **C. R. Laing** and P. Glendinning. Bifocal homoclinic bifurcations. *Physica D*, **102**, pp. 1–14, 1997.

3. P. Glendinning and **C. R. Laing**. A homoclinic hierarchy. *Physics Letters A,* **211**, pp. 155–160, 1996.

2. P. Hirschberg and **C. R. Laing**. Successive homoclinic tangencies to a limit cycle. *Physica D,* **89**, pp. 1–14, 1995.

1. M. Persson and **C. Laing**. Low–dimensional behaviour of nonlinear tearing mode dynamics in a rotating plasma. *International Journal on Bifurcation and Chaos,* **3**(5), pp. 1155–1168, 1993.

Book chapters

1. **C. R. Laing**. Phase oscillator network models of brain dynamics, pp. 505-517 in *Computational Models of Brain and Behavior.* Edited by Ahmed Moustafa. (Wiley-Blackwell). 2017.

2. **C. R. Laing**. Waves in spatially-disordered neural fields: a case study in uncertainty quantification, pp. 367-391 in *Uncertainty in Biology: A Computational Modeling Approach.* Edited by David Gomez and Liesbet Geris. (Springer-Verlag). 2016.

3. **C. R. Laing**. PDE methods for two-dimensional neural fields, pp. 153-173 in *Neural Fields: Theory and Applications.* Edited by Stephen Coombes, Peter beim Graben, Roland Potthast, and James J. Wright. (Springer). 2014.

4. **C. R. Laing** and B. Doiron. Ghostbursting: the role of active dendrites in electrosensory processing, pp. 145-172 in *Bursting: The Genesis of Rhythm in the Nervous System.* Edited by S. Coombes and P. Bressloff. (World Scientific). Hackensack, NJ. 2005.

5. A. Longtin, **C. R. Laing** and M. J. Chacron. Correlations and memory in neurodynamical systems, pp. 286-308 in *Processes with Long Range Correlations.* Edited by G. Rangarajan and M. Ding. (Springer–Verlag, Berlin). 2003.

Volumes Edited

1. Special issue of Journal of Computational Dynamics on "Novel computational approaches and their applications". Vol. 7, no. 2, 2020. (14 papers, jointly edited with Bernd Krauskopf).

Books edited

- *Stochastic Methods in Neuroscience.* Edited by **C. Laing** and G. J. Lord. Oxford University Press, New York. 2009. ISBN 978-0199235070.

Popular

1. **C. R. Laing**. Taking the Pulse. *Physics.* **7**, p. 10, 2014.

2. **C. R. Laing**. Not so shocking: the electric fish of South America. *South American Explorer.* **69** pp. 32–36, 2002.

Theses

- Ph.D. thesis (1997): Coupled oscillator networks.

- M.Sc. thesis (1994): Merging of resonance tongues near the saddle–node/Hopf bifurcation.

Book Reviews

1. *Mathematics Handbook for Science and Engineering* by Lennart Råde and Bertil Westergren. Reviewed for the NZ Mathematical Society Newsletter, no. 93 (2005).

2. *Mathematical Biology. II: Spatial Models and Biomedical Applications* by J. D. Murray. Reviewed for NZ the Mathematical Society Newsletter, no. 90 (2004).

3. *Mathematical Biology. I: An Introduction* by J. D. Murray. Reviewed for the NZ Mathematical Society Newsletter, no. 87 (2003).

Unrefereed Papers

1. A. Elvin and **C. Laing**. Evaluation of numerical integration schemes for a partial integro-differential equation. *Research Letters in Information and Mathematical Sciences*, **7**, pp. 171-186, 2005.

Teaching Experience

Massey University, Auckland, New Zealand.

Courses taught 2002-present. Details on class sizes, number of times taught etc. available on request.

- Mathematics for Business (1st year)

- Calculus (1st year)

- Processes in Mathematics (1st year)

- Engineering Mathematics 1B (1st year)

- Mathematics 1B (1st year)

- Differential Equations 1 (2nd year)

- Technological Maths (2nd year)

- Engineering Maths (2nd year)

- Calculus 2 (2nd year)

- Differential Equations 2 (3rd year)

- Methods in Applied Mathematics (graduate)

- Studies in Applied Differential Equations (graduate)

Department of Mathematics, University of Pittsburgh, PA, USA

Courses taught 1998-1999. Details on class sizes, number of times taught etc. available on request.

- Analytical Geometry and Calculus I (undergraduate)

- Analytical Geometry and Calculus II (undergraduate)

- Analytical Geometry and Calculus III (undergraduate)

- Methods in Applied Mathematics (graduate)

- Mathematical Neuroscience (graduate)

Editorial

- 2010–2020: Editorial Board, *Journal of Mathematical Neuroscience* (Springer).

- 2013–present: International Subject Editor, *Applied Mathematical Modelling* (Elsevier).

- 2015–2019: Editorial Board, *Frontiers in Computational Neuroscience.*

- 2020–present: Editorial Board, *Mathematical Neuroscience and Applications*

- 2022–present: Associate Editor, *Communications in Nonlinear Science and Numerical Simulation.* (Elsevier).

Administration (selected, national and university)

- 2024: Organized NZMRI summer meeting on Mathematical Neuroscience, Paihia.

- 2011-13: Michell medal (ANZIAM) selection panel (chair in 2012).

- Dec 2004-Dec 2008: Chair, New Zealand branch of ANZIAM.

- Dec 2008-Dec 2009: Committee member, New Zealand branch of ANZIAM.

- July 2003–present: Seminar organiser, SNCS, Massey University.

Refereeing

Papers refereed for:

Advances in Difference Equations (1)
Annals of Physics (1)
ANZIAM Journal (3)
Applied Numerical Mathematics (1)
Applied Sciences (1)
BioEssays (1)
Biological Cybernetics (9)
Brain Topography (1)
Bulletin of Mathematical Biology (4)
Bulletin of the Malaysian Mathematical Sciences Society (1)
Chaos (36)
Chaos, Solitons and Fractals (1)
Cogent Mathematics (1)
Communications Biology (1)
Communications in Nonlinear Science and Numerical Simulation (1)
Comptes rendus Mathématique (1)
Discrete and Continuous Dynamical Systems – Series A (1)
Discrete and Continuous Dynamical Systems – Series B (2)
Discrete Dynamics in Nature and Society (1)
Dynamical Systems: An International Journal (3)
Dynamics and Stability of Systems (2)

European Journal of Physics (2)
Europhysics Letters (5)
Frontiers in Applied Mathematics and Statistics (1)
Frontiers in Computational Neuroscience (3)
Frontiers in Human Neuroscience (1)
Frontiers in Physiology (1)
Frontiers of Physics (3)
Geosciences (1)
IEEE Transactions on Circuits and Systems I: Regular Papers (1)
IEEE Transactions on Neural Networks (3)
IMA Journal of Applied Mathematics (1)
International Journal of Bifurcation and Chaos (1)
International Journal of Non-Linear Mechanics (1)
Journal of Biological Dynamics (1)
Journal of Biological Systems (1)
Journal of Computational Dynamics (13)
Journal of Computational Neuroscience (15)
Journal of Mathematical Analysis and Applications (1)
Journal of Mathematical Biology (5)
Journal of Mathematical Neuroscience (11)
Journal of Neurophysiology (1)
Journal of Nonlinear Science (5)
Journal of Physics A (10)
Journal of Physics Communications (1)
Journal of Statistical Physics (1)
Journal of Theoretical Biology (5)
Mathematical Biosciences (3)
Mathematical Biosciences and Engineering (1)
Mathematical Medicine and Biology (1)
Mathematical Modelling and Analysis (1)
Mathematical Neuroscience and Applications (1)
Mathematical Problems in Engineering (1)
Multiscale Modeling and Simulation (1)
Nature Communications (2)
Nature Physics (1)
Network: Computation in Neural Systems (1)
Neural Computation (5)
Neural Networks (3)
Neural Processing Letters (1)
Neurocomputing (3)
New Journal of Physics (4)
New Zealand Journal of Mathematics (1)
Nonlinear Analysis: Real World Applications (3)
Nonlinear Differential Equations and Applications NoDEA (1)
Nonlinearity (12)
Partial Differential Equations in Applied Mathematics (1)
Philosophical Transactions of the Royal Society A (1)
Physica A (1)
Physica D (22)
Physical Review Applied (1)
Physical Review E (55)
Physical Review Letters (23)
Physical Review Research (3)
Physical Review X (4)
Physics Letters A (7)
PLoS Computational Biology (4)
PLoS One (6)

Proceedings of the Royal Society, Series A (5)
Regular and Chaotic Dynamics (1)
Science (1)
Science Advances (1)
Scientific Reports (6)
SIAM Journal on Applied Dynamical Systems (25)
SIAM Journal on Applied Mathematics (2)
SIAM Journal on Mathematical Analysis (1)
SIAM Journal on Scientific Computing (1)
SIAM Review (1)

Theses examined:

M.Sc. (4)
Ph.D.: Auckland (3), Massey (4), UNSW (1), University of Queensland (1), University of Sydney (1), University of the Balearic Islands (1)

Reviewer:

Reviewer for Zentralblatt MATH since 2012.
Reviewer for Mathematical Reviews since 2005.
Grant reviewer for the Dutch National Science Foundation (2007, 2012, 2013).
Grant reviewer for the Dutch Research Council (2021, 2024).
Grant reviewer for the Georgia National Science Foundation (2009, 2015).
Grant reviewer for the Romanian National Council for Scientific Research (2012).
Grant reviewer for the Canada Research Chair Programme (2014).
Grant reviewer for the Katholieke Universiteit Leuven (2014).
Grant reviewer for the Austrian Science Fund (2015, 2016).
Grant reviewer for the Deutsche Forschungsgemeinschaft (2015, 2017(x2), 2024).
Grant reviewer for the European Research Council (2017).
Reviewer for ICNAAM (2008, 2009, 2011, 2013, 2017).
Book reviewer for Springer (2012).
Reviewer for University Research Fellowship (Royal Society, UK) (2017).
Programme Committee, International Conference on Mathematical Neuroscience (2016, 2017, 2018, 2019).
Grant reviewer for Serrapilheira (Brazil) (2017).

Talks, Conferences

2025: • Invited presentation, Society for Mathematical Biology MathNeuro Mini-Conference (via zoom).

2024: • Invited minisymposium presentation, Dynamics Days Europe, Bremen, Germany.
 • Seminar at Potsdam University (Germany).
 • Oral presentation, Mathematical Modelling and Analytics Symposium, AUT University, Auckland, New Zealand.
 • Oral presentation, NZ Mathematical Society Colloquium, Auckland.

2023: • Oral presentation, Mathematical Modelling and Analytics Symposium, AUT University, Auckland, New Zealand.
 • Oral presentation, NZ Mathematical Society Colloquium, Victoria University, Wellington.

2022: • Invited plenary, Chimera States: From Theory and Experiments to Technology and Living Systems, Max Planck Institute for the Physics of Complex Systems, Dresden, Germany (via Zoom).
 • Oral presentation, New Zealand Mathematical Society Colloquium, Christchurch.
 • Seminar at Potsdam University (Germany).
 • Invited presentation, Dynamical Systems in NZ, Karioitahi, New Zealand.
 • Invited presentation, Interdisciplinary meeting of Mathematics and Neuroscience, China (online).

2021: • Contributed presentation, Dynamics Days Europe (via Zoom).
 • Invited special session presentation, Australian Mathematical Society Annual Meeting (via

Zoom).
- Contributed presentation, Nonlinear Dynamics of Oscillatory Systems (Nizhny Novgorod, via Zoom).
- Oral presentation, Manawatu-Wellington Applied Maths Day (via Zoom).

2020: • Oral presentation, ANZIAM Meeting, Hunter Valley, Australia.
- Invited special session presentation, Australian Mathematical Society Annual Meeting (via Zoom).
- Invited presentation, Conference on Complex Systems 2020, Satellite Event (via Zoom).
- Seminar at Universities of Auckland and Canterbury, New Zealand.
- Seminar for Sydney Dynamics Group (via Zoom).
- Minisymposium presentation, Dynamics Days Digital (via Zoom).

2019: • Oral presentation, ANZIAM Meeting, Nelson, New Zealand.
- Oral presentation, New Zealand Mathematical Society Colloquium, Palmerston North.
- Seminars at Massey University, Potsdam University (Germany).
- Lecturer at School and Workshop on Patterns of Synchrony: Chimera States and Beyond. International Centre for Theoretical Physics, Trieste, Italy.
- Invited presentation, Sydney Dynamics Group meeting, Margaret River, Western Australia.

2018: • Oral presentation, ANZIAM Meeting, Hobart, Australia.
- Minisymposium presentation, Society for Mathematical Biology Meeting, Sydney, Australia.
- Seminar at Massey University.
- Plenary speaker, Dynamics Days Asia-Pacific, Huaqiao University, China.
- Oral presentation, New Zealand Mathematical Society Colloquium, Dunedin.

2017: • Oral presentation, ANZIAM Meeting, Hahndorf, Australia.
- Seminars at Massey University, Universities of Sydney and Nottingham, Max Planck Institute for the Physics of Complex Systems (Dresden, Germany).
- Oral presentation, 7th Workshop on High-Dimensional Approximation, Sydney, Australia.
- Invited presentation, SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, USA.
- Oral presentation, International Conference on Mathematical Neuroscience, Boulder, Colorado.
- Invited presentation, annual meeting of the Japanese Society for Mathematical Biology, Sapporo, Japan.
- Invited presentation, Satellite workshop of Japanese Society for Mathematical Biology, "Patterns and dynamics with nonlocal effect", Jozankei, Japan.

2016: • Oral presentation, ANZIAM Meeting, Canberra, Australia.
- Invited oral presentation, NeuroEng 2016, Brisbane, Australia.
- Oral presentation, New Zealand Mathematical Society Colloquium, Wellington.
- Seminar at Massey University.

2015: • Oral presentation, ANZIAM Meeting, Gold Coast, Australia.
- Seminars at Universities of Nottingham, Exeter, Technical University of Munich.
- Invited plenary, workshop on Dynamics of Coupled Oscillators: 40 years of the Kuramoto Model, Max Planck Institute for the Physics of Complex Systems, Dresden, Germany.
- Invited presentation, Equadiff 2015, Lyon, France.
- Invited presentation, SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, USA.

2014: • Oral presentation, ANZIAM Meeting, Rotorua, New Zealand.
- Invited plenary, Mathematical Sciences Symposium, AUT University, Auckland, New Zealand.
- Seminars at Massey University, Northwestern University (Chicago), Universities of Leeds, Nottingham.
- Invited presentation, International Workshop on Neurodynamics, Castro Urdiales, Spain.
- Invited presentation, workshop on Rhythms in Complex Networks: From Theory to Experiment, Copenhagen, Denmark.
- Invited presentation, Dynamics Days Europe, Bayreuth, Germany.

2013: • Talk, Orewa College, Auckland.
      • Oral presentation, New Zealand Mathematical Society Colloquium, Tauranga.
      • Two invited presentations, Workshop on Progress of Mathematical Studies in Neuroscience, National Tsing-Hua University, Taiwan.
      • Invited presentation, SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, USA.
      • Oral presentation, ANZIAM Meeting, Newcastle, Australia.
      • Seminar at Massey University.

2012: • Seminars at Massey University; Weierstrass Institute, Berlin, Germany.
      • Oral presentation, ANZIAM Meeting, Warrnambool, Australia.
      • Invited plenary, BrainModes 2012, Brisbane, Australia.
      • Invited presentation, workshop on Mathematical Challenges in Neural Network Dynamics, Mathematical Biosciences Institute, Columbus, OH, USA.
      • Invited presentation, SIAM Conference on Life Sciences, San Diego, CA, USA.
      • Invited presentation, Dynamics Days Europe, Gothenburg, Sweden.
      • Talk, Orewa College, Auckland.

2011: • Invited presentation, Conference on Spatio-temporal Evolution Equations and Neural Fields, Centre International de Rencontres Mathématiques, Marseille, France.
      • Oral presentation, ANZIAM Meeting, Adelaide, Australia.
      • Seminars at the Universities of Auckland and Maryland, Princeton, Massey and Drexel Universities, New Jersey Institute of Technology, Weierstrass Institute (Berlin, Germany).
      • Invited presentation, SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, USA.
      • Talk, Whangaparaoa College, Auckland.

2010: • Oral presentation, New Zealand Mathematical Society Colloquium, Otago University, Dunedin.
      • Invited presentation, Conference on Progress in Neural Field Theory, University of Reading, UK.
      • Poster presentation, OCCAM Computational Neuroscience Workshop, Oxford, UK.
      • Talk, Albany Senior High School, Auckland.
      • Invited presentation, International Workshop on Nonlinear Dynamics on Networks, Kiev, Ukraine.
      • Seminars at Princeton University, University of Manchester.
      • Poster presentation, SIAM Conference on Life Sciences, Pittsburgh, PA, USA.
      • Invited presentation, 8th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Dresden, Germany.
      • Invited plenary, ANZIAM Meeting, Queenstown, New Zealand.

2009: • Seminars at Massey University (Albany), Heriot-Watt, Warwick, Leeds, Manchester, Surrey, Nottingham, Exeter and Pompeu Fabra (Barcelona) Universities.
      • Invited presentation, Mathematical Neuroscience Workshop, Edinburgh, UK.
      • Oral presentation, Noise in Life, Cambridge, UK.
      • Oral presentation, Conference on Dynamics in Systems Biology, Aberdeen, UK.
      • Invited presentation, EPSRC Capstone Conference, Warwick University, UK.
      • Invited presentation, Workshop on Mathematical Medicine and Biology, University of Nottingham, UK.

2008: • Oral presentation, NZ Mathematical Society Colloquium, University of Canterbury, Christchurch.
      • Seminars at Massey (Albany) and Heriot-Watt Universities, University of Leeds.
      • Invited presentations (2), Workshop on Mathematical Medicine and Biology, University of Nottingham, UK.
      • Oral presentation, ANZIAM Meeting, Katoomba, Australia.
      • Poster presentation, Workshop on Multi-scale Modelling of the Respiratory System, Auckland.

2007: • Invited presentation, Mathematical and Computational Nanoscience Meeting, Victoria University, Wellington, New Zealand.
      • Oral presentation, New Zealand Mathematical Society Colloquium, Victoria University, Wellington, New Zealand.
      • Oral presentation, ANZIAM Meeting, Fremantle, Australia.

• Seminar at University of Canterbury, Christchurch, New Zealand.
• Invited presentations (2), SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, USA.

2006: • Oral presentation, New Zealand Mathematical Society Colloquium, Waikato University, Hamilton.
• Invited presentation, opening of Centre for Mathematical Biology, Massey University, Auckland.
• Oral presentation, Manawatu-Wellington Applied Maths Day, Palmerston North, New Zealand.
• Poster presentation, Workshop on Mathematical and Computational Neuroscience, Brisbane, Australia.
• Oral and poster presentation, SIAM Conference on Life Sciences, Raleigh, NC, USA.
• Oral presentation, Nonlinear Dynamics and Numerical Analysis meeting, Victoria University, Wellington, New Zealand.
• Oral presentation, ANZIAM Meeting, Mansfield, Australia.

2005: • Oral presentation, Workshop on Bio-mathematics and Numerical Analysis, Auckland.
• Oral presentation, New Zealand Mathematical Society Colloquium, Palmerston North.
• Career seminar, Massey University (Albany) Open Day.
• Invited presentations (2), SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, USA.
• Seminars at Massey University, Universities of Ottawa, Manchester, Bristol, Nottingham, Auckland.
• Invited oral presentation, Mathematical Neuroscience Workshop, Edinburgh, UK.
• Oral presentation, ANZIAM Meeting, Napier, New Zealand.

2004: • Oral presentation, New Zealand Mathematical Society Colloquium, Otago University, Dunedin.
• Oral presentation, Manawatu-Wellington Applied Maths Day, Palmerston North.
• Oral presentation, Nonlinear Dynamics and Numerical Analysis meeting, Raglan.
• Oral presentation, SIAM Conference on Life Sciences, Portland, OR, USA.
• Seminars at Massey University (Albany), Universities of Houston, Auckland.
• Oral presentation, ANZIAM Meeting, Hobart, Australia.

2003: • Talk, Maths Teachers' Evening, Massey University (Albany).
• Invited speaker, Modelling Cellular Function meeting, Waiheke Island.
• Invited minisymposium organiser and speaker, International Congress on Industrial and Applied Mathematics, Sydney, Australia.
• Seminars at Massey University (Albany, Palmerston North), Universities of Waikato, Auckland (Mathematics, Bioengineering).
• Poster and oral (2) presentations, SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, USA.
• Invited participant and speaker, Symmetry and Bifurcation in Biology Meeting, Banff International Research Station, Canada.

2002: • Seminars at Instituto de Investigaciones Biológicas "Clemente Estable" (Uruguay), Boston and McGill Universities, University of Pittsburgh.
• Poster presentation, First SIAM Conference on Life Sciences, Boston, MA, USA.
• Invited talk, Fourth International Conference on Dynamical Systems and Differential Equations, Wilmington, NC, USA.
• Poster presentation, Computational Neuroscience '02, Chicago, IL, USA.
• Oral presentation, New Zealand Mathematics Colloquium, Auckland.

2001: • Oral and poster presentation, Sixth SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, USA.
• Invited talk, Annual Canadian Applied and Industrial Math Society Meeting, Victoria, BC, Canada.
• Oral presentation, Computational Neuroscience '01, Monterey, CA, USA.
• Seminars at Universities of Ottawa and Auckland.
• Invited talk, Ontario Medical Students' Weekend Meeting, Ottawa, Canada.
• Invited participant, Workshop on Computational Biology, Fields Insitute, Toronto, Canada.

2000: • Seminars at Universities of Loughborough (UK) and Pittsburgh.
• Poster presentation, Nonlinear Analysis 2000 → Conference, Courant Institute, New York, NY, USA.
• Poster presentation, Computational Neuroscience '00, Brugge, Belgium.
• Invited presentation, Workshop on Memory, Delays and Multistability. Centre de recherches mathématiques, Université de Montréal, Quebéc, Canada.

1999: • Invited presentation, SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, USA.
• Seminars at Universities of Pittsburgh and Victoria (Canada).
• Oral presentation, Computational Neuroscience '99, Pittsburgh, PA, USA.

1998: • Seminars at Universities of Bristol, Surrey, Pittsburgh and University College London.
• Oral presentation, UK Dynamics Days, Edinburgh, UK.

1997: • Seminars at Universities of Surrey, Auckland and Cambridge.
• Poster presentation, SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, USA.

1996: • Seminar at University of Cambridge.

1994: • Seminar at University of Auckland.

Long-term Visits

• June-December 2009: Department of Mathematics, University of Nottingham, UK.
• July-December 2011: Department of Chemical and Biological Engineering, Princeton University, USA.

Summer Schools Attended

• August 1999: Methods in Computational Neuroscience, Marine Biological Laboratory, Woods Hole, MA, USA.
• June 1994: Fifth Annual Complex Systems Summer School, Santa Fe Institute, NM, USA.
• Summer 1991–92: Vacation Scholar, Department of Theoretical Physics, Australian National University, Canberra, Australia.