

# Curriculum Vitae – Carlo R. Laing

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## 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 (awarded Pushkin Society Special Prize).
- 1984–1988 Pakuranga College, Auckland, New Zealand. Dux of the College and Junior University Scholarship (1988).

## Employment

- January 2007–present 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

- 2008: JH Michell Medal (ANZIAM<sup>1</sup>, 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).

## Grants

- 2002: \$600 from New Zealand Mathematical Society for travel to ICIAM 2003, Sydney, Australia.
- 2003: Fast Start award from the Marsden Fund (NZ Government). \$100,000 over 2004–2005.
- 2004: \$3,500 from Massey University Research Fund (summer student support).
- 2008: Marsden Fund (NZ Government) \$454,000 over 2009–2011.

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<sup>1</sup>Australia and New Zealand Industrial and Applied Mathematics

## Student Supervision

- Summer students:
  - Graeme Mak, 2007–8
  - Ben Smith, 2010–11
- PGDipSci project students:
  - Uros Abaz, 2004
  - Amanda Elvin, 2004
- PhD students:
  - Amanda Elvin, 2005–8. (Recipient of Vice-Chancellor’s Doctoral Scholarship (2005); Aitkin Prize (2005); Highly commended, ANZIAM meeting (2006). Co-supervised with Mick Roberts)
  - Maarten Jordens, 2007–2010. (Co-supervised with Gaven Martin)
  - Samuel Dillon, 2008–present. (Co-supervised with Gaven Martin)
  - Steffen Klatt, 2009–2010. (Co-supervised with Alona Ben-Tal)

## Publications

### Refereed Papers

47. C. R. Laing, K. Rajendran and I. G. Kevrekidis. Chimeras in sparse networks of phase oscillators. submitted.
46. C. R. Laing, Y. Zou, B. Smith and I. G. Kevrekidis. Managing heterogeneity in the study of neural oscillator dynamics. Submitted.
45. C. R. Laing. Fronts and bumps in spatially extended Kuramoto networks. *Physica D*, **240**, pp. 1960-1971, 2011.
44. S. Coombes, H. Schmidt, C. R. Laing, N. Svanstedt and J. A. Wyller. Waves in random neural media. To appear in *Discrete and Continuous Dynamical Systems — Series A*.
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**, 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** No. 5. pp. 1155–1168, 1993.

## Book chapters

1. C. R. Laing and B. Doiron. Ghostbursting: the role of active dendrites in electrosensory processing, in *Bursting: The Genesis of Rhythm in the Nervous System*. Edited by S. Coombes and P. Bressloff. World Scientific. Hackensack, NJ. 2005.
2. A. Longtin, C. R. Laing and M. J. Chacron. Correlations and memory in neurodynamical systems, in *Processes with Long Range Correlations*. Edited by G. Rangarajan and M. Ding. Springer-Verlag, Berlin. 2003.

## 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. *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 NZ Math Society Newsletter, no. 93 (2005).
2. *Mathematical Biology. II: spatial models and biomedical applications* by J. D. Murray. Reviewed for NZ Math Society Newsletter, no. 90 (2004).
3. *Mathematical Biology. I: an introduction* by J. D. Murray. Reviewed for NZ Math Society Newsletter, no. 87 (2003).

## Unrefereed Papers

1. A. Elvin and C. Laing. *Evaluation of numerical integration schemes for a partial integro-differential equation*. Res. Lett. Inf. Math. Sci., **7**, pp. 171-186, 2005.

## Lecturing Experience

### Institute of Information and Mathematical Sciences, Massey University, Auckland, New Zealand

	2003	2004	2005	2006	2007	2008	2009	2010	2011
Mathematics for Business (1st year). Four hrs/week. 130–185 students.	x	x		x					
Calculus (1st year). Four hrs/week. 80 students.					x				
Technological Maths (2nd year). Four hrs/week. 40–45 students.	x		x	x	x				
Differential Equations 2 (3rd year). Four hrs/week. 4–16 students.						x		x	x
Methods in Applied Mathematics (graduate). Three hrs/week. 2–3 students.		x			x	x	x		x
Studies in Applied Differential Equations (graduate). Three hrs/week. 2 students.			x						

### Department of Mathematics, University of Pittsburgh, PA, USA

	1998	1999
Analytical Geometry and Calculus I (undergraduate). Three hrs/week. 50 students.	x (×2)	
Analytical Geometry and Calculus II (undergraduate). Three hrs/week. 50 students.		x
Analytical Geometry and Calculus III (undergraduate). Three hrs/week. 50 students.		x
Methods in Applied Mathematics (graduate). Three hrs/week. 10 students.		x
Mathematical Neuroscience (graduate). Two hrs/week. 15 students. Shared course load with two other faculty members.		x

## Editorial

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

## Administration

- 2012: Michell medal (ANZIAM) chair of selection panel.
- 2011: Michell medal (ANZIAM) selection panel.
- 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, IIMS, Massey University.
- 2003: Organised First Annual Auckland/Waikato Region Applied Maths Day.

## Refereeing

### Papers refereed for:

- Annals of Physics (1)
- BioEssays (1)
- Biological Cybernetics (3)
- Bulletin of Mathematical Biology (3)
- Bulletin of the Malaysian Mathematical Sciences Society (1)
- Chaos (1)
- Discrete Dynamics in Nature and Society (1)
- Dynamical Systems: an International Journal (1)
- Dynamics and Stability of Systems (2)
- European Journal of Physics (2)
- Frontiers in Human Neuroscience (1)
- IEEE Transactions on Neural Networks (3)
- International Journal of Non-Linear Mechanics (1)
- Journal of Computational Neuroscience (6)
- Journal of Mathematical Biology (2)
- Journal of Mathematical Neuroscience (2)
- Journal of Neurophysiology (1)
- Journal of Nonlinear Science (1)
- Journal of Physics A (4)
- Journal of Theoretical Biology (2)
- Mathematical Biosciences (1)
- Mathematical Medicine and Biology (1)
- Mathematical Modelling and Analysis (1)
- Network: Computation in Neural Systems (1)
- Neural Computation (5)
- Neural Networks (1)
- Neurocomputing (2)
- New Journal of Physics (2)
- Nonlinear Analysis Series B: Real World Applications (1)
- Nonlinearity (2)
- Philosophical Transactions of the Royal Society A (1)
- Physica D (9)
- Physical Review E (9)
- Physical Review Letters (8)
- Physics Letters A (3)
- PLoS Computational Biology (1)
- PLoS One (1)
- Proceedings of the Royal Society, Series A (1)
- SIAM Journal on Applied Dynamical Systems (9)
- SIAM Journal on Applied Mathematics (1)
- SIAM Journal on Mathematical Analysis (1)

**Theses examined:**

M.Sc. [2]  
Ph.D. [Auckland (1), Massey (1)]

**Reviewer:**

Reviewer for Mathematical Reviews since 2005.  
Grant reviewer for Dutch National Science Foundation (2007).  
Grant reviewer for Georgia National Science Foundation (2009).  
Reviewer for ICNAAM (2008, 2009, 2011).

## Talks, Conferences

- 2011: • Invited participant and speaker, 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 University of Auckland, 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 Math 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, Canterbury University, 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, NZ 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, NZ 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, NZ 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, NZ Mathematical Society Colloquium, Otago University, Dunedin.  
 • Oral presentation, Manawatu-Wellington Applied Maths Day, Palmerston North, New Zealand.  
 • Oral presentation, Nonlinear Dynamics and Numerical Analysis meeting, Raglan, New Zealand.  
 • Oral presentation, SIAM Conference on Life Sciences, Portland, OR, USA.  
 • Seminars at Massey University (Albany), Universities of Houston, Auckland.  
 • Participant, Maths in Industry Study Group, Auckland, New Zealand.  
 • Oral presentation, ANZIAM Meeting, Hobart, Australia.
- 2003: • Talk, Maths Teachers' Evening, Massey University (Albany).  
 • Invited speaker, Modelling Cellular Function meeting, Waiheke Island, New Zealand  
 • Invited minisymposium organiser and speaker, International Congress on Industrial and Applied Mathematics, Sydney, Australia.  
 • Seminars at Massey University (Albany, Palmerston North), Universities 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.  
 • 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 Institute, Toronto, Canada.

- 2000: • Seminars at Universities of Loughborough (UK) and Pittsburgh.  
 • Poster presentation and session moderation at 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. CRM, Université de Montréal, Quebec, 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

- 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.