



BRUCE IAN HENRY

Associate Professor
Department of Applied Mathematics

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Contact information

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Administration Duties

Coordinator, UNSW School Maths Competition

Editor, [Parabola](#)

Brief History

BSc, Hons 1, University Medal, Theoretical Physics, University of New South Wales, 1981

PhD, Theoretical Condensed Matter Physics, University of New South Wales, (1985).

Postdoctoral Fellow, School of Physics, University of Waterloo, 1984,1985.

Visiting Assistant Professor, University of Waterloo, 1986.

School Postdoctoral Fellow, Institute for Advanced Studies, Australian National University, 1987.

Queen Elizabeth II Fellow, Institute for Advanced Studies, ANU, 1988, 1989, 1990

Australian Research Fellow, School of Mathematics, University of New South Wales, 1991.

Lecturer, Applied Mathematics, University of New South Wales, 1991.

Senior Lecturer, Applied Mathematics, University of New South Wales, 1994.

Associate Profesor, Applied Mathematics, University of New South Wales, 2004.

Research Interests

Publications cover a range of areas including plasma physics, wind energy, lattice dynamics, statistical mechanics, nonlinear dynamics, pattern formation.

Current research interests include:

- **Fractional Cable Equations**
- **Anomalous Diffusion**
- **Fractal Pattern Formation**
- **Nonlinear Lattice Dynamics**
- **Statistical Mechanics of Systems with Few Degrees of Freedom**

ARC Discovery Grant: "Mathematical Measurement and modelling of Neuronal Degeneration "

ARC Discovery Grant: "Pattern Formation and Signalling in Spatially Complex Media "

ARC Large Grant: "Fractal Pattern Formation with Competing Unstable Phases"

Recent Teaching

MATH5185 - Modern Topics in Applied Mathematics - Nonlinear and Statistical Dynamics

MATH3041 - Mathematical Modelling for Real World Systems

MATH3201 - Dynamical Systems and Chaos

MATH2281 - Dynamical Systems and Chaos

MATH1241 - Calculus

Selected Publications

[Fractional Cable Models for Spiny Neuronal Dendrites](#) Physical Review Letters 100 (2008) 128103.

[Anomalous subdiffusion with multispecies linear reaction dynamics](#) Physical Review E 77 (2008) 021111.

[Anomalous diffusion with linear reaction dynamics: From continuous time random walks to frational reaction-diffusion equations](#) Physical Review E 74 (2006) 031116.

[Statistical physics and stromatolite growth: new perspectives on an ancient dilemma](#) Physica A 350 (2005) 6.

[Turing pattern formation in fractional activator-inhibitor systems](#) Physical Review E 72 (2005) 026101.

- [Gene Stanley, the n-vector model and random walks with absorbing boundaries](#) Physica A 314 (2002) 77.
- [Random walks on finite lattice tubes](#) Physical Review E **68** (2003) 016112.
- [Deterministic KPZ model for stromatolite laminae](#) Physica A 282 (2000) 123.
- [Fractional Reaction-Diffusion](#) Physica A 276 (2000) 448.
- [Differentiating the non-differentiable - Fractional calculus](#) Parabola 35(2) (1999) 9-19.
- [Surfing Brachistochrones](#) Parabola 34(3) (1998) 13-21.
- [Resonance energy transfers in the induction phenomenon in quartic Fermi-Pasta-Ulam chains](#) Phys Rev E 58 (1998) 3045-3054.
- [Surface width scaling in noise reduced Eden clusters](#) Phys Rev E 58 (1998) 4023-4026.
- [Continuum model for radial interface growth](#) Physica A 260 (1998) 11-21.
- [Mean field analysis of Williams-Bjerknes type growth](#) Physica A 256 (1998) 295-311.
- [From dynamics to statistical mechanics in the Henon-Heiles model: Statistical Mechanics](#) Canadian J. Phys. 75 (1997) 517.
- [Statistical surface distributions for constant energy ensembles](#) Canadian J. Phys. 75 (1997) 539.
- [Pattern Formation in an Etched Radial Hele Shaw Cell](#) Fractals 4 (1996) 149-159.
- [Growth and form of zero-noise Diffusion-Limited-Aggregation on the cubic lattice](#) Physica A 233 (1996) 905-918.
- [New Equipartition Results for Normal Mode Energies of Anharmonic Chains](#) J.Stat.Phys. 78 (1995) 1039-1053.
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Recommended Links

[The CIA World Factbook](#)

[History of Mathematics Archive](#)

[UNSW School of Mathematics and Statistics](#)

Last Update by Bruce Henry September 2008