

# Benjamin James Lansdell

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Nationality: Australian

## Current position

Senior Fellow  
Department of Physiology and Biophysics  
University of Washington, Seattle

## Areas of specialization

Computational neuroscience • Stochastic processes • Dynamical systems

## Education

- 2017 **PhD in Applied Mathematics** (GPA: 3.84/4.0)  
University of Washington, Seattle  
Advisor: Adrienne Fairhall
- 2012 **MPhil in Mathematics** (GPA: 84/100)  
University of Melbourne, Australia  
Advisors: Terence Speed, Kerry Landman
- 2008 **BSc (Hons) major in Mathematics** (GPA: 89/100)  
University of Melbourne, Australia  
Advisors: Anthony Papenfuss, Terence Speed

### SUMMER SCHOOLS & WORKSHOPS

- 2016 **Graduate Summer School – The Mathematics of Data**  
Park City Mathematics Institute/Institute for Advanced Study, Utah
- 2015 **Summer Institute in Statistics and Modeling in Infectious Diseases**  
Department of Biostatistics, University of Washington, Seattle
- 2014 **OIST Computational neuroscience course**  
Okinawa Institute of Science and Technology, Okinawa, Japan

## Positions held

- 2017 - University of Washington, Seattle, USA  
Senior Fellow  
*Fairhall lab, Department of Physiology and Biophysics*
- 2009 Walter and Eliza Hall Institute for Medical Research, Australia  
Research Technician

*Speed lab, Bioinformatics division*

2007 Walter and Eliza Hall Institute for Medical Research, Australia  
Undergraduate Research Opportunities Program Student  
*Speed lab, Bioinformatics division*

## Honors & awards

### MAJOR

2008 Dwight's Prize in Mathematical Statistics, University of Melbourne  
2008 Alan W. Harris Scholarship, Walter and Eliza Hall Institute  
2003 Australian Students Prize, Australian government

### SELECTED SMALLER

2016 Travel grant to attend Graduate Summer School, Park City Mathematics Institute  
2014 Travel grant to attend Okinawa Computational neuroscience course, OIST  
2010 Top Scholar Award, University of Washington, Department of Applied Mathematics  
2006 Melbourne Abroad Scholarship (University of Nottingham)  
2006 MacFarland Scholarship, Ormond College  
2004-2006 Ormond College Scholar, Ormond College

## Publications & talks

### JOURNAL ARTICLES

**Lansdell B**, Kluck R, Hockings C, Fairlie D, Lee E, Landman K, Frascoli F, Speed T, "Computational model of Bcl-2 family pro-apoptotic Bak activation through BH3-only stimulation: activation efficiencies and dynamic regulation mechanisms", *in preparation*

2017 **Lansdell B**, Milovanovic I, Mellema C, Fetz E, Fairhall A, Moritz C, "Reconfiguring motor circuits for a joint manual and BCI task", *arXiv arXiv:1702.07368*

2016 Aljadeff Y, **Lansdell B**, Fairhall A, Kleinfeld D, "Analysis of neuronal spike trains, deconstructed," *Neuron* 2016, 91(2), <http://dx.doi.org/10.1016/j.neuron.2016.05.039>

Pang R, **Lansdell B**, Fairhall A, "Dimensionality Reduction in Neuroscience", *Current Biology* 2016, 26: R1-R5

2014 **Lansdell B**, Ford K, Kutz J N, "A reaction-diffusion model of cholinergic retinal waves", *PLoS Computational Biology* 2014, 10(12): e1003953. doi:10.1371/journal.pcbi.1003953

Garsed DW, Marshall OJ, Corbin VDA, Hsu A, Stefano LD, Schröder J, Li J, Feng Z, Kim BW, Kowarsky M, **Lansdell B**, Brookwell R, Myklebost O, Meza-Zepeda L, Holloway AJ, Pedetour F, Choo KH, Damore MA, Deans AJ, Papenfuss AT, Thomas DM, "The Architecture and Evolution of Cancer Neochromosomes," *Cancer Cell* 2014, 26:653-667

2011 Renfree MB, Papenfuss AT, Deakin JE, Lindsay J, Heider T, Belov K, Rens W, Waters PD, Pharo EA, Shaw G, Wong ES, Lefèvre CM, Nicholas KR, Kuroki Y, Wakefield MJ, Zenger KR, Wang C, Ferguson-Smith M, Nicholas FW, Hickford D, Yu H, Short KR, Siddle HV, Frankenberg SR, Chew KY, Menzies BR, Stringer JM, Suzuki S, Hore TA, Delbridge ML, Mohammadi A, Schneider NY, Hu Y, O'Hara W, Al Nadaf S, Wu C, Feng ZP, Cocks BG, Wang J, Flicek P, Searle SM, Fairley S, Beal K, Herrero J, Carone DM, Suzuki Y, Sugano S, Toyoda A, Sakaki Y, Kondo S, Nishida Y, Tsumoto S, Mandiou I, Hsu A, McColl KA, **Lansdell B**, Weinstock G, Kuczek E, McGrath A, Wilson

P, Men A, Hazar-Rethinam M, Hall A, Davis J, Wood D, Williams S, Sundaravadanam Y, Muzny DM, Jhangiani SN, Lewis LR, Morgan MB, Okwuonu GO, Ruiz SJ, Santibanez J, Nazareth L, Cree A, Fowler G, Kovar CL, Dinh HH, Joshi V, Jing C, Lara F, Thornton R, Chen L, Deng J, Liu Y, Shen JY, Song XZ, Edson J, Troon C, Thomas D, Stephens A, Yapa L, Levchenko T, Gibbs RA, Cooper DW, Speed TP, Fujiyama A, Graves JA, O'Neill RJ, Pask AJ, Forrest SM, Worley KC, "Genome sequence of an Australian kangaroo, *Macropus eugenii*, provides insight into the evolution of mammalian reproduction and development.", *Genome Biology* 2011, 12:R81.

#### CONFERENCE PROCEEDINGS

- 2016 **Lansdell B**, Milovanovic I, Fairhall A, Fetz E, Moritz C, "Neural activity in a simultaneous BCI and manual task", BCI Society Meeting 2016, CA, USA. doi:10.3217/978-3-85125-467-9-118

#### CONFERENCE POSTERS

- 2016 **Lansdell B**, Milovanovic I, Fairhall A, Fetz E, Moritz C, "Neural activity in a simultaneous BCI and manual task", Neurofutures Meeting 2016, Allen Institute for Brain Science, WA, USA.
- 2013 **Lansdell B**, Kutz JN (September, 2013), "The spatio-temporal dynamics of spontaneous activity in the developing retina", *BMES 2013*, Seattle, USA.
- Lansdell B**, Kutz JN (September, 2013), "A computational model of Bcl-2 regulated apoptosis: bistability revisited", *BMES 2013*, Seattle, USA.
- Lansdell B**, Kutz JN (September, 2013), "The spatio-temporal dynamics of spontaneous activity in the developing retina", *University of Washington Computational Neuroscience connection 2013*, Seattle, USA.
- Lansdell B**, Kutz JN (July, 2013), "Cholinergic Retinal Waves and Self-Organized Criticality", *CNS 2013*, Paris, France.
- 2012 **Lansdell B**, Kutz JN, Ford K (September, 2012), "Modeling Retinal Waves in Starburst Amacrine Cells", *Neuroinformatics 2012*, Munich, Germany.
- 2008 **Lansdell B**, Papenfuss AT, Speed TP, (December 2008) "Incorporating Tiling Array Expression Data into a Gene Predictor", *Genome Informatics Workshop*, Gold Coast, Australia.

#### TALKS

- 2017 **Lansdell B** (June 5, 2017), "Neural population dynamics in motor control and development", Geffen lab talk, University of Pennsylvania. (Invited)
- Lansdell B** (May 30, 2017), "Neural population dynamics in motor control and development", Shirley Ryan Ability lab, Chicago. (Invited)
- Lansdell B** (March 24, 2017), "Moving models of motor control forward, in theory and application", *Special seminar*, Flatiron Institute, Simons Foundation, New York. (Invited)
- Lansdell B** (January 24, 2017), "Unraveling principles of motor control: from nerve nets to neural prosthetics", *Neurotheory group talk*, Columbia University, New York. (Invited)
- Lansdell B** (January 23, 2017), "Unraveling principles of motor control: from nerve nets to neural prosthetics", *Special seminar*, Janelia Research Campus, Ashburn VA. (Invited)
- 2012 **Lansdell B** (June 12, 2012), "Modeling Retinal Waves in Starburst Amacrine Cells", *SIAM Conference on Non-linear Waves and Coherent Structures*, University of Washington, Seattle. (Invited)
- 2012 **Lansdell B** (February 11, 2012), "Continuum Model of Retinal Waves in Starburst Amacrine Cells", *Frontiers in Biophysics*, Simon Fraser University, Vancouver. (Contributed)

## PRESENTATIONS

- 2010 **Lansdell B** (December 9, 2010), “The Hirota Method in Soliton Theory”, *Master’s completion seminar*, University of Washington, Seattle.
- Lansdell B** (July 13, 2010), “Understanding the Bcl2 family through computational modelling”, *Bioinformatics seminar*, Walter and Eliza Hall Institute, Melbourne, Australia.
- 2009 **Lansdell B** (May 26, 2009), “Improving the Mosquito Genome Annotation”, *Bioinformatics seminar*, Walter and Eliza Hall Institute, Melbourne, Australia.

## UNPUBLISHED WORKS

- 2012 **Lansdell B**, *Understanding the Bcl-2 family through computational modelling*, Masters thesis, Department of Mathematics and Statistics, University of Melbourne, 2012.
- 2008 **Lansdell B**, *Computational gene prediction using generalised hidden Markov models and tiling arrays*, Honours thesis, Department of Mathematics and Statistics, University of Melbourne, December 2008.

## Teaching

- 2013,2015 University of Washington  
Department of Applied Mathematics  
Guest Lecturer:
- Winter 2015– AMATH 402/502, Introduction to Nonlinear Dynamics and Chaos
  - Fall 2013 – AMATH 532, Mathematics of genome analysis and molecular modeling
- 2012 University of Washington  
Department of Applied Mathematics  
Teaching Assistant:
- Spring 2012 – AMATH 353, Fourier Analysis and Partial Differential Equations
  - Winter 2012 – AMATH 402/502, Introduction to Nonlinear Dynamics and Chaos
- 2010-2011 University of Washington  
Department of Mathematics  
Teaching Assistant:
- Fall 2011 – MATH 111, Algebra in Business and Economics
  - Winter 2011 – Assistant in first year Math Study Center
  - Fall 2010 – MATH 125, Calculus with Analytic Geometry II
- 2006-2007 University of Melbourne  
Queen’s College  
Non-resident physics tutor
- 2006 University of Melbourne  
Ormond College  
Resident student tutor:
- Semester 1 2006: 620-232 – Vector Calculus

## Affiliations & responsibilities

### AFFILIATIONS

2013 - present OCNS member  
2013 - present BMES member  
2011 - present SIAM member  
2011 - present AMS member

### SERVICE & RESPONSIBILITIES

Refereed for: Nature Communications, Neuron  
2015 - 2017 UAW Student Union Steward, Department of Applied Mathematics representative, University of Washington  
2012 - 2016 Computer Systems Administrator, Department of Applied Mathematics, University of Washington  
2011 - 2013 Graduate student representative for computing, Department of Applied Mathematics, University of Washington

## Volunteer & outreach

2014 Fossil technician, Burke Museum of Natural History and Culture, University of Washington  
2013-2014 Co-organizer of SIAM UW chapter sponsored math fair at Lockwood Elementary School  
2013 Volunteer for UW STEM Bridge program for incoming engineering and science students

## Professional skills

### COMPUTING

Proficient in Python, MATLAB, Maple,  $\text{\LaTeX}$ , AUTO, git version control, WordPress CMS, MySQL  
Working knowledge of C, C++, R, HTML, shell script, PHP, OpenGL, OpenCV, CUDA

## References

Adrienne Fairhall	J. Nathan Kutz	Chet Moritz
Associate Professor	Professor	Associate Professor
Physiology and Biophysics	Applied Mathematics	Rehabilitation Medicine
University of Washington	University of Washington	University of Washington
Seattle	Seattle	Seattle
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fairhall@uw.edu	kutz@uw.edu	ctmoritz@uw.edu