Peter Ashcroft

Curriculum Vitæ

Institute for Integrative Biology
ETH Zürich
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Personal details

Nationality British

Date of birth 13th October 1989

Research experience

Sept 2015 – Present **Postdoctoral researcher** ETH Zürich, Switzerland
Supervisor: Prof. Sebastian Bonhoeffer.
Group: Theoretical Biology, Institute for Integrative Biology.

Research interests

Population dynamics, stochastic processes, mathematical modelling of cancer, evolutionary game theory, first-passage problems, quantitative biology, hematopoiesis, epidemiological modelling.

Education

Sept 2012 – Sept 2015 **PhD in Theoretical Physics** The University of Manchester, UK
Supervisor: Dr. Tobias Galla.
Group: Complex Systems and Statistical Physics, School of Physics and Astronomy.
Thesis: *The statistical physics of fixation and equilibration in individual-based models.*

2008 – 2012 **Undergraduate degree: Maths and Physics** The University of Manchester, UK.
Degree: First Class M.Math and Phys (hons).
Overall grade: 84%.

2006 – 2008 **A-levels** Carmel College, St Helens, UK
A-levels: Maths(A), Further Maths(A), Physics(A), Geography(A);
AS-levels: Computing(A).

Awards

- Springer Thesis Award (2016).
- Humboldt Research Fellowship for Postdoctoral Researchers (2016) (Gratefully declined).
- Nuffield Foundation funding for summer research project (2011).

Publications

- *Effects of population growth on the success of invading mutants.*
  P. Ashcroft, C.E.R. Smith, M. Garrod and T. Galla, arXiv preprint 1609.06742 (2016).
- *The statistical physics of fixation and equilibration in individual-based models.*
  P. Ashcroft, Springer International Publishing, Switzerland (2016).
- *When the mean is not enough: Calculating fixation time distributions in birth-death processes.*
  P. Ashcroft, A. Traulsen, and T. Galla, Phys. Rev. E **92**, 042154 (2015).

- *Stochastic tunneling and metastable states during the somatic evolution of cancer.* P. Ashcroft, F. Michor, and T. Galla, Genetics **199**, 1213 (2015).
- *Fixation in finite populations evolving in fluctuating environments.* P. Ashcroft, P.M. Altrock, and T. Galla, J. R. Soc. Interface **11**, 20140663 (2014).
- *Pattern formation in individual-based systems with time-varying parameters.* P. Ashcroft and T. Galla, Phys. Rev. E **88**, 062104 (2013).

Talks

- Hematology seminar series, UniversitätsSpital Zürich, June 2016.
- DPG Spring meeting, Universität Regensburg, March 2016.
- Modelling Biological Evolution 2015, University of Leicester, April 2015.
- Cancer Research UK Society Workshop (Outreach event), The University of Manchester, December 2014.
- Michor Laboratory group meeting, Dana-Farber Cancer Institute, Harvard School of Public Health, August 2014.
- W.E. Heraeus seminar: The versatile action of noise: applications from genetic to neural circuits, Jacobs University, Bremen, June 2014.
- DPG Spring meeting, TU Dresden, April 2014.
- Michor Laboratory group meeting, Dana-Farber Cancer Institute, Harvard School of Public Health, January 2014.

Teaching and supervision

March 2016 – April 2016 **MSc lab rotation supervision** ETH Zürich, Switzerland
I supervised an MSc student from the Computation Biology and Bioinformatics masters program for a 90-hour lab rotation. Together we investigated efficient simulation and analytical methods for calculating distributions of numbers of mutants generated in a branching process.

Feb 2016 – June 2016 **Lecturing and tutorials** ETH Zürich, Switzerland
I gave a lecture on the spread of epidemics on networks as part of the Infectious Disease Dynamics course. I also provided assistance during tutorials and oral examinations.

Sept 2014 – May 2015 **Undergraduate tutorials** The University of Manchester, UK
I tutored two groups of first year undergraduate physics students in Maths 1 & 2, Introduction to Astrophysics & Cosmology, and Properties of Matter.

Sept 2013 – May 2014 **M.Phys project supervision** The University of Manchester, UK
I joint-supervised groups of fourth year MPhys students in projects based on the emergence of cancer.

Administrative duties

- Regular reviewer for journals covering quantitative biology, including: Journal of Theoretical Biology, PLoS Biology, PLoS Computational Biology, and Scientific Reports.

Skills and interests

- Mathematical and graphing packages including Mathematica and Matlab.
- Linux OS, including scripting and high-throughput computing.
- Programming in C++.
- LaTeX typesetting.
- Statistical analysis in R.
- Version control using Git.
- Scientific writing.
- Beginner in German (A2.1).
- Machine learning including regression, classification, and neural networks.