Peter Ashcroft

Curriculum Vitæ

Institute for Integrative Biology
ETH Zürich
Universitätstrasse 16, Zürich, 8092
+41 (0)44 633 60 34
peter.ashcroft@env.ethz.ch
ashcroftp.github.io

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.
Interests: Population dynamics, stochastic processes, mathematical modelling of cancer, evolutionary game theory, first-passage problems, quantitative biology, hematopoiesis, epidemiological modelling, mathematical immunology, multi-scale 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%.

Awards

- Travel award to attend workshop at the Moffitt Cancer Centre, FL, USA (2017).
- Springer Thesis Award (2016).
- Humboldt Research Fellowship for Postdoctoral Researchers (2016) (Gratefully declined).
- Nuffield Foundation funding for summer research project (2011).

Publications

- *Clonal dominance and transplantation dynamics in hematopoietic stem cell compartments.*
  P. Ashcroft, M.G. Manz, and S. Bonhoeffer, PLoS Comput. Biol. **13**, e1005803 (2017).
- *Effects of population growth on the success of invading mutants.*
  P. Ashcroft, C.E.R. Smith, M. Garrod, and T. Galla, J. Theor. Biol. **420**, 232 (2017).
- *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

- Division of Theoretical Systems Biology (Höfer), Universität Heidelberg, July 2017.
- Society for Mathematical Biology Annual meeting, July 2017.
- Department Evolutionary Theory (Traulsen), MPI for Evolutionary Biology, April 2017.
- 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.
- Dana-Farber Cancer Institute (Michor), 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.
- Dana-Farber Cancer Institute (Michor), Harvard School of Public Health, January 2014.

Teaching and supervision

Oct 2017 – Present **MSc term paper supervision** ETH Zürich, Switzerland
I supervised an MSc student from the Ecology and Evolution masters program. We wrote a review about the role that climate change will have on plant community composition in an alpine ecosystem, and constructed a game-theoretic framework to investigate this further.

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 – Present **Lecturing and tutorials** ETH Zürich, Switzerland
I gave lectures 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).
- Machine learning including regression, classification, and neural networks.

References

Prof. Sebastian Bonhoeffer
Institute for Integrative Biology, ETH Zürich, Switzerland
✉ sebastian.bonhoeffer@env.ethz.ch ☎ +41 (0)44 632 71 06

Dr. Tobias Galla
School of Physics and Astronomy, The University of Manchester, UK
✉ tobias.galla@manchester.ac.uk ☎ +44 (0)161 275 4264

Prof. Arne Traulsen
Max-Planck-Institute for Evolutionary Biology, Germany
✉ traulsen@evolbio.mpg.de