JASON BERTRAM

Department of Biology, Indiana University, Bloomington, IN 47405
jxb@iu.edu ● https://jasonbertram.github.io/ ● +1 (520) 268 0775

Education

2015 **PhD** School of Biology, Australian National University
Advisors: Roderick Dewar, Graham Farquhar, Michael Roderick

2011 **MPhil** School of Physics, Australian National University

2008 **BSc (Hons)** Pure & Applied Mathematics, Statistics.
University of Cape Town (South Africa)

Professional Experience

2018-present **Theoretical Biology Fellow**, Environmental Resilience Institute
Adjunct Research Scientist, Department of Biology
Indiana University

2015-2018 **Postdoctoral Researcher**
Masel Lab, Department of Ecology and Evolutionary Biology
University of Arizona

Publications

*advised graduate student

2019

[13] **J Bertram**, J Masel. Different mechanisms drive the maintenance of polymorphism at loci subject to strong versus weak fluctuating selection. *Evolution* **73** 883-896 doi:10.1111/evo.13719

[12] **J Bertram**, J Masel. Density-dependent selection and the limits of relative fitness. *Theoretical Population Biology* (In Press) doi: 10.1016/j.tpb.2018.11.006

[11] S Foy, B Wilson, **J Bertram**, M Cordes, J Masel. A shift in aggregation avoidance strategy marks a long-term direction to protein evolution. *Genetics* **211**(4) 1345-1355 doi:10.1534/genetics.118.301719

[10] K Gomez*, **J Bertram,** J Masel. In rapidly adapting asexuals, the orientation of G can reflect selection rather than functional constraints. *Genetics* **211**(2) 715-729 doi:10.1534/genetics.118.301685

[9] **J Bertram**, E Newman, R Dewar. Maximum entropy models elucidate the contribution of metabolic traits to patterns of community assembly. *Ecological Modelling* **407** 108720 doi:10.1016/j.ecolmodel.2019.108720

2016

[8] **J Bertram**, K Gomez*, J Masel. Predicting patterns of long-term adaptation and extinction with population genetics. *Evolution* **71** 204-214 doi:10.1111/evo.13116

2015

[7] **J Bertram** and R C Dewar. Combining mechanism and drift in community ecology: a novel statistical mechanics approach *Theoretical Ecology* **8**(4) 419-435 doi:10.1007/s12080-015-0259-7

[6] **J Bertram.** Maximum kinetic energy dissipation and the stability of turbulent Poiseuille flow. *Journal of Fluid Mechanics* **767** 342-363 doi:10.1017/jfm.2015.65

[5] S Haskey, B D Blackwell, C Nuehrenberg, A Koenies, **J Bertram**, C Michael, M Hole, J Howard. Experiment-theory comparison for low frequency BAE modes in the strongly shaped H-1NF stellarator. *Plasma Phys. Control. Fusion* doi:10.1088/0741-3335/57/9/095011

2014

[4] **J Bertram.** Maximum entropy models of ecosystem functioning. *AIP Proceedings MaxEnt 2013* **1636** *131* doi:10.1063/1.4903722

2013

[3] **J Bertram** and R C Dewar. Statistical patterns in tropical tree cover explained by the different water demand of individual trees and grasses. *Ecology* **94** 2138-2144 doi:10.1890/13-0379.1

Pre-2013

[2] **J Bertram**, B D Blackwell and M J Hole (2012) Ideal-magnetohydrodynamic theory of low-frequency Alfvén waves in the H-1 Heliac. *Plasma Phys. Control. Fusion* doi:10.1088/0741-3335/54/5/055009

[1] **J Bertram**, M J Hole, D G Pretty, B D Blackwell and R L Dewar (2011) A reduced global Alfvén eigenmodes model for Mirnov array data on the H-1 NF Heliac. *Plasma Phys. Control. Fusion* doi:10.1088/0741-3335/53/8/085023

Manuscripts in review

J Bertram, J Masel. Evolution rapidly optimizes stability and aggregation in lattice proteins despite pervasive landscape valleys and mazes. *Submitted to Genetics.* Preprint: https://www.biorxiv.org/content/10.1101/776450v1.

Awards

Cambridge Philosophical Society Bursary to visit the Newton Institute ($1000). Cambridge University, UK, 2013.

Australian National University Graduate Scholarship ($25k/year). 2009-2014.

Crompton Travel Scholarship Award ($2500). Australian National University, 2010.

Invited Presentations

2019

J Bertram, J Masel. Can fluctuating selection stabilize polymorphism concurrently at many loci? *Special Symposium: Causes & consequences of temporally fluctuating selection in the wild. Evolution 2019, Providence.*

J Bertram. Evolution in a Changing World: Rapid Adaptation, Extinction and the Importance of Incorporating Ecology into Evolutionary Models. *Departmental Seminar, Department of Biological Sciences, Florida State University, Tallahassee.*

2018

J Bertram, J Masel. Density-dependent selection and limits of relative fitness. *Arizona Population Genetics Group Workshop, Tucson.*

2017

J Bertram. Feedbacks can drive large fluctuations in adaptation rates when sex is optional. *Mathematical Modeling and Analysis of Populations in Biological Systems 2017, Tucson.*

2013

J Bertram, R Dewar. Maximum entropy models of ecosystem functioning. *Frontiers in Macroecology Workshop, Berkeley, 2013*.

J Bertram. Statistical stability arguments for maximum kinetic energy dissipation. *Mathematics of the Fluid Earth, Newton Institute Cambridge UK, 2013*.

Selected Presentations

2018

J Bertram, J Masel. Density-dependent selection and limits of relative fitness. *Evolution 2018, Montpellier, France.*

J Bertram, J Masel. Reversal of dominance is a powerful stabilizer of polymorphism in fluctuating environments, but boom-bust cycles and storage are more likely to stabilize many loci of large effect. *Population, Evolutionary and Quantitative Genetics 2018.*

2016

J Bertram, J Masel. Contrast between selection on fecundity versus interference. *Evolution 2016, Austin, TX.*

2015

J Bertram, J Masel. Modelling long-term adaptation and extinction. *Microbial Population Biology Gordon Conference 2015, Andover, NH.*

J Bertram, J Masel. A population-genetic model of long-term adaptation and extinction. *Mathematical Models in Ecology and Evolution 2015, Paris, France.*

2013

J Bertram, R Dewar. Maximum Entropy Models of Ecosystem Functioning. *MaxEnt 2013*, *Canberra, Australia.*

Mentoring

Graduate students:

Kevin Gomez (Co-advisor and thesis committee member, Fall 2015 – present)

Undergraduate research students:

Madison Delmoe (Primary advisor, Fall 2017 – Spring 2018)
Jasmin Templin (Primary advisor, Spring 2015 – Spring 2017)
Austin Fritzke (Primary advisor, Spring 2015)

Teaching

Co-developer and co-instructor of departmental ecology/evolution modelling course, University of Arizona (2016)

Teaching assistant, Introductory Physics. Australian National University (2012)

Teaching assistant, Introductory Mathematics. Australian National University (2010)

Service

Lead organizer, Environmental Resilience Institute Fall Symposium 2019 (Indiana University).

Environmental Resilience Institute Seminar Series Committee Member.

Judge for W. D. Hamilton Graduate Student Award at Evolution 2018.

Regular editor of scientific Wikipedia pages to add content and improve scientific accuracy https://en.wikipedia.org/wiki/Special:Contributions/Jasonbertram.

Organizer of annual Wikipedia Edit-a-thons in the Department of Ecology and Evolution at the University of Arizona (2015, 2016, 2017).

Contributing author to University of Arizona Postdoctoral Guide.

Reviewer for *Evolution*, *Genetics*, *BioScience, Phil. Trans. B*.