JASON BERTRAM

Department of Biology, Indiana University, Bloomington, IN 47405
jxb@iu.edu ● jasonbertram.github.io ● +1 (520) 268 0775
scholar.google.com/citations?user=cgOBCWgAAAAJ

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

2020

[15] **K Gomez***, J Bertram, J Masel. Mutation bias can shape adaptation in large asexual populations experiencing clonal interference. *Accepted at Proc. Roy. Soc. B.* Preprint: https://doi.org/10.1101/2020.02.17.953265.

[14] **J Bertram**, J Masel. Evolution rapidly optimizes stability and aggregation in lattice proteins despite pervasive landscape valleys and mazes. *Genetics (Highlighted Investigation). https://doi.org/10.1534/genetics.120.302815*.

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* **129** 81-92 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 Under Review

[1] **J Bertram** (2021) Allele frequency divergence reveals ubiquitous influence of positive selection in *Drosophila* (In review at *PNAS*). Preprint: doi.org/10.1101/2021.03.15.435474

Awards

ASN Travel Award ($1500). Evolution 2019, Providence, RI.

SSE Travel Award ($500). Evolution 2018, Montpellier, France.

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

2020

J Bertram Adaptive Evolution in the Sequencing Era: The Population Genetics of Rapid Adaptation, Extinction and Evolutionary Mazes. *Departmental Seminar, Department of Biology, Texas A&M University.*

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 – Spring 2020)

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

Reviewer for *The American Naturalist, PNAS, Evolution*, *Genetics*, *Phil. Trans. B, BioScience*.

Lead organizer, Environmental Resilience Institute Fall Symposium 2019.

Environmental Resilience Institute Seminar Series Committee Member (Spring 2019-present).

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.