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**Education and Academic Positions**

2018-present **Theoretical Biology Fellow** Environmental Resilience Institute  
**Adjunct Research Scientist** Department of Biology  
 Indiana University  
 2015-2018 **Postdoctoral Researcher** Department of Ecology and Evolutionary Biology  
 University of Arizona (Advisor: Joanna Masel)  
 2012-2015 **PhD** Population ecology, statistical mechanics  
 Australian National University (Advisors: Roderick Dewar, Graham Farquhar, Michael Roderick)  
 2009-2011 **MPhil** Theoretical plasma physics, Australian National University  
 2008 **BSc (Hons)** Applied Mathematics, University of Cape Town  
 2005-2007 **BSc** Pure Mathematics, Applied Mathematics, Statistics, University of Cape Town (South Africa)

**Peer-reviewed Publications**

\*advised student

1. **J Bertram**, Erica Newman, Roderick Dewar (2019) Maximum entropy models elucidate the contribution of metabolic traits to patterns of community assembly (*Ecological Modelling*) <https://doi.org/10.1101/526764>
2. **J Bertram**, J Masel (2019) Different mechanisms drive the maintenance of polymorphism at loci subject to strong versus weak fluctuating selection. *Evolution* <https://doi.org/10.1111/evo.13719>
3. **J Bertram**, J Masel (2019) Density-dependent selection and the limits of relative fitness. *Theoretical Population Biology* <https://doi.org/10.1016/j.tpb.2018.11.006>
4. S Foy, B Wilson, **J Bertram**, M Cordes, J Masel (2019) A shift in aggregation avoidance strategy marks a long-term direction to protein evolution. *Genetics* <https://doi.org/10.1534/genetics.118.301719>
5. K Gomez\*, **J Bertram**, J Masel (2019) In rapidly adapting asexuals, the orientation of G can reflect selection rather than functional constraints. *Genetics* <https://doi.org/10.1534/genetics.118.301685>
6. **J Bertram**, K Gomez\*, J Masel (2016) Predicting patterns of long-term adaptation and extinction with population genetics. *Evolution* **71** 204 <https://doi.org/10.1111/evo.13116>
7. **J Bertram** and R C Dewar (2015) Combining mechanism and drift in community ecology: a novel statistical mechanics approach *Theoretical Ecology* **8** 419 <https://doi.org/10.1007/s12080-015-0259-7>
8. **J Bertram** (2015) Maximum kinetic energy dissipation and the stability of turbulent Poiseuille flow. *J. Fluid Mech.* **767** 342 <https://doi.org/10.1017/jfm.2015.65>
9. **J Bertram** (2014) Maximum entropy models of ecosystem functioning. *AIP Proceedings MaxEnt 2013* <https://doi.org/10.1063/1.4903722>
10. **J Bertram** and R C Dewar (2013) Statistical patterns in tropical tree cover explained by the different water demand of individual trees and grasses. *Ecology* **94** 2138. <https://doi.org/10.1890/13-0379.1>
11. S Haskey, B D Blackwell, C Nuehrenberg, A Koenies, **J Bertram**, C Michael, M Hole, J Howard (2015)

Experiment-theory comparison for low frequency BAE modes in the strongly shaped H-1NF stellarator. *Plasma Phys. Control. Fusion* **57** 095011

12. **J Bertram**, B D Blackwell and M J Hole (2012) Ideal-magnetohydrodynamic theory of low-frequency Alfvén waves in the H-1 Helic. *Plasma Phys. Control. Fusion* **54** 055009  
<https://doi.org/10.1088/0741-3335/54/5/055009>
13. **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 Helic. *Plasma Phys. Control. Fusion* **53** 085023 <https://doi.org/10.1088/0741-3335/53/8/085023>
14. M J Hole, G von Nessi, **J Bertram**, J. Svensson, L. C. Appel, B. D. Blackwell, R. L. Dewar and J. Howard (2010) Model Data Fusion: developing Bayesian inversion to constrain equilibrium and mode structure. *J. Plasma Fusion Res.* **9** 479

## Presentations

1. “Can fluctuating selection stabilize polymorphism concurrently at many loci?” (Invited Talk) Evolution (Providence, 2019)
2. “Density-dependent selection and limits of relative fitness” (Talk) Evolution (Montpellier, 2018)
3. “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* (Madison, 2018)
4. “Density-dependent selection and limits of relative fitness” (Talk) *Arizona Population Genetic Group Workshop* (Tucson, 2018)
5. “Feedbacks can drive large fluctuations in adaptation rates when sex is optional” (Talk) *Mathematical Modeling and Analysis of Populations in Biological Systems* (Tucson, 2017)
6. “Contrast between selection on fecundity versus interference” (Talk) *Evolution 2016* (Austin, 2016)
7. “Modelling long-term adaptation and extinction” *Microbial Population Biology Gordon Conference* (2015)
8. “A population-genetic model of long-term adaptation and extinction” (Talk) *Mathematical Models in Ecology and Evolution 2015* (Paris, 2015)
9. “Statistical stability arguments for maximum kinetic energy dissipation” (Talk) *Mathematics of the Fluid Earth* (Newton Institute, Cambridge, UK, November 2013)
10. “Maximum Entropy Models of Ecosystem Functioning” *MaxEnt 2013* (Canberra, December 2013) *Frontiers in Macroecology Workshop* (UC, Berkeley, January 2013)
11. “A reduced global Alfvén eigenmodes model for Mirnov array data on the H-1 NF Helic.” *EPS Plasma Physics* (Dublin 2010)

## Mentoring

PhD students:

Kevin Gomez (Co-advisor, Fall 2015 – present)

Undergraduate research students:

Austin Fritzke (Primary supervisor, Spring 2015)

Jasmin Templin (Primary supervisor, Spring 2015 – Spring 2017)

Madison Delmoe (Primary supervisor, Fall 2017 – Spring 2018)

## Awards

Cambridge Philosophical Society Bursary to visit the Newton Institute, Cambridge University (2013)

Australian National University Graduate Scholarship (Australian National University 2009-2014)

Crompton Travel Scholarship Award (Australian National University, 2010)

**Teaching**

- 2016 Co-developer and instructor of an ecology and evolution modelling course, University of Arizona
- 2012 Teaching assistant, introductory physics, Australian National University
- 2010 Teaching assistant, introductory mathematics, Australian National University

**Service**

1. Regular editor of scientific Wikipedia pages to add content and improve scientific accuracy  
<https://en.wikipedia.org/wiki/Special:Contributions/Jasonbertram>.
2. Organizer of annual Wikipedia Edit-a-thons in the Department of Ecology and Evolution at the University of Arizona.
3. Contributing author to University of Arizona Postdoctoral Guide
4. Reviewer for *Evolution*, *Genetics*, *BioScience*, *Phil. Trans. B*