

# PHILIP S. L. ANDERSON

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Biology Department  
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## ACADEMIC APPOINTMENTS

- 2013-present Post Doctoral Researcher, Dept. of Biology, Duke University, Durham, NC  
2012-2013 Senior Research Fellow, Dept. of Biology, University of Massachusetts, Amherst  
2011-2012 Lecturer, Department of Earth Sciences, University of Bristol, UK  
2009-2011 Marie Curie Postdoctoral Fellow, University of Bristol, UK.  
2007-2009 Royal Society Postdoctoral Fellow, University of Bristol, UK.

## EDUCATION

- 2001-2007 Ph.D. (Geophysical Sciences) University of Chicago, Chicago, IL.  
1997-2001 B.A. (Geology) *Magna cum laude*, Carleton College, Northfield, MN.

## GRANTS

- 2009 Marie Curie International Incoming Fellowship (~\$265,000)  
2007 Royal Society International Incoming Fellowship (~\$235,000)  
2005 Sigma Xi, Grants in Aid of Research.  
2004 Ross Research Award, Geological Society of America  
2004 Stephen J. Gould Grant, Paleontological Society.  
2004 Hinds Fund Grant, Committee of Evolutionary Biology, University of Chicago.  
2004 Doolittle/Harrison Fellowship, University of Chicago

## PUBLICATIONS

22. **Anderson, P. S. L.** and Patek, S. N., (in press). Mechanical sensitivity reveals evolutionary dynamics of mechanical systems. *Proceedings of the Royal Society B: Biological Sciences*.  
21. **Anderson, P. S. L.**, Claverie, T. and Patek, S. N., **2014**. Levers and linkages: mechanical trade-offs in a power-amplified system. *Evolution* 68(7): 1919-33. doi:10.1111/evo.12407.  
20. **Anderson, P. S. L.**, Renaud, S. and Rayfield, E. J., **2014**. Adaptive plasticity in the mouse mandible. *BMC Evolutionary Biology*. 14: 85-93. doi:10.1186/1471-2148-14-85  
19. **Anderson, P. S. L.**, Friedman, M, and Ruta, M., **2013**. Late to the Table: Diversification of tetrapod mandibular biomechanics lagged behind the evolution of terrestriality. *Integrative and Comparative Biology* 53(2): 197-208. doi:10.1093/icb/ict006

18. Stubbs\*, T. L., Pierce, S. E., Rayfield, E. J., & **Anderson, P. S.**, 2013. Morphological and biomechanical disparity of crocodile-line archosaurs following the end-Triassic extinction. *Proceedings of the Royal Society B: Biological Sciences*, 280(1770).  
\*(Master's student)
17. **Anderson, P. S. L.** and Friedman, M., 2012. Using cladistic characters to predict functional variety: experiments using early gnathostomes. *Journal of Vertebrate Paleontology* 32(6): 1254-1270.
16. **Anderson, P. S. L.** and Rayfield, E. J., 2012. Virtual experiments, physical validation: dental morphology at the intersection of experiment and theory. *Royal Society Interface* 9: 1846-1855.
15. Ragazzola, F., Foster, L. C., Form, A., **Anderson, P. S. L.**, Hansteen, T. H., and Fietzke, J., 2012. Ocean acidification weakens the structural integrity of coralline algae. *Global Change Biology* 18: 2804-2812.
14. **Anderson, P. S. L.**, Bright, J. A., Gill, P. G., Palmer, C., and Rayfield, E. J., 2012. Models in palaeontological functional analysis. *Biology Letters* 8(1): 119-122.
13. **Anderson, P. S. L.**, Friedman, M., Brazeau, M. D., and Rayfield, E. J., 2011. Initial radiation of jaws demonstrated stability despite faunal and environmental change. *Nature* 476: 206-209.  
\*(featured in *The New York Times* and *Scientific American*)
12. **Anderson, P. S. L.**, Gill, P. G., and Rayfield, E. J., 2011. Modeling the effects of cingula structure on strain patterns and potential fracture in tooth enamel. *Journal of Morphology* 272(1): 50-65.
11. Snively, E., **Anderson, P. S. L.**, and Ryan, M. J., 2010. Functional and ontogenetic implications of bite stress in arthrodire placoderms. *Kirtlandia* 57: 53-60.
10. **Anderson, P. S. L.**, 2010. Using linkage models to explore skull kinematic diversity and functional convergence in arthrodire placoderms. *Journal of Morphology* 271(8): 990-1005.
9. **Anderson, P. S. L.**, 2009b. The effects of trapping and blade angle on how notched dentitions fracture biological tissues. *Journal of Experimental Biology* 212: 3627-3632.  
\*(featured in Ennos, A. R. 2010 *Physics World* 23:28-31)
8. **Anderson, P. S. L.**, 2009a. Biomechanics, functional patterns, and disparity in Late Devonian arthrodires. *Paleobiology* 35(3): 321-342.
7. **Anderson, P. S. L.**, and Westneat, M. W., 2009. A biomechanical model of feeding kinematics for *Dunkleosteus terrelli* (Arthrodira, Placodermi). *Paleobiology* 35(2): 251-269.
6. **Anderson, P. S. L.**, and LaBarbera, M., 2008. Functional consequences of tooth design: effects of blade shape on energetics of cutting. *Journal of Experimental Biology* 211: 3619-3626.
5. **Anderson, P. S. L.**, 2008b. Shape variation between arthrodire morphotypes indicates possible feeding niches. *Journal of Vertebrate Paleontology* 28(4): 961-969.
4. **Anderson, P. S. L.**, 2008a. Cranial muscle homology across modern gnathostomes. *Biological Journal of the Linnean Society* 94: 195-216.
3. Friedman, M., Coates, M. I., and **Anderson, P.**, 2007. First discovery of a primitive coelacanth fin fills a major gap in the evolution of lobed fins and limbs. *Evolution & Development* 9(4): 328-336.

2. **Anderson, P. S. L.**, and Westneat, M. W., **2007**. Feeding mechanics and bite force modelling of the Skull of *Dunkleosteus terrelli*, an Ancient Apex Predator. ***Biology Letters*** 3(1): 76-79.

\*(featured in *National Geographic*, *The New York Times*, *Scientific American*, *Current Biology* and broadcast media: BBC, CBC).

1. Jablonski, D., Roy, K., Valentine, J. W., Price, R. M., and **Anderson, P. S.**, **2003**. The impact of the pull of the recent on the history of marine diversity. ***Science*** 300: 1133-1135.

#### **ORGANIZATION OF SCIENTIFIC MEETINGS**

- 2010            *Functional Morphology at the intersection of Biology and Engineering*,  
International Palaeontological Congress 3, London.
- 2009            *Town Hall meeting on Evolution 6*, Society of Vertebrate Paleontology, Bristol.
- 2008            *The Cleveland Shale and Beyond: Early Vertebrate Form, Function and  
Phylogeny*, Society of Vertebrate Paleontology, Cleveland.

#### **INVITED SEMINAR TALKS**

- 2014            Brown University, Providence, RI
- 2013            Clemson University, Clemson, SC
- 2013            Symposium Speaker, *Vertebrate Land Invasions – Past, Present, and  
Future*, SICB 2013, San Francisco, CA.
- 2012            Hull-York Medical School, Hull, UK.
- 2012            Keck Science Department, Claremont, CA
- 2011            University of Massachusetts, Amherst, MA
- 2009            University of Manchester, Manchester, UK.

#### **GRANT REVIEWER:**

National Science Foundation (NSF), Natural Environment Research Council (NERC)

#### **REFeree:**

*Nature*, *Nature Communications*, *Evolution*, *Biology Letters*, *Current Biology*, *The Anatomical Record*, *Journal of Experimental Biology*, *Journal of Zoology*, *Paleobiology*, *Journal of Morphology*, *Integrative and Comparative Biology*, *The Biological Bulletin*, *Journal of Vertebrate Paleontology*, *Journal of Fossil Research*, *Palaeontologia Electronica*

#### **TEACHING EXPERIENCE**

- 2014            Guest Lecture in: *Principles of Animal Physiology*, Duke University
- 2012            Guest Lecture in: *How Organisms Move*, U. of Massachusetts.
- 2011-2012      Lecturer, University of Bristol, UK. Courses taught: *Biomechanics and Functional Morphology* and *Evolution of Earth and Life*.

- 2009-2010 Guest Lecturer in: *Current Controversies*, U. of Bristol.
- 2007-2010 Visiting Lecturer for the course: *Palaeobiology – Biomechanics option*, U. of Bristol.
- 2007 Guest Lecture in: *Frontiers in Earth Sciences*, U. of Bristol.
- 2007 Teaching Assistant, EVOL34200, *Biological Fluid Mechanics*, U. of Chicago.
- 2004-2007 Teaching Assistant, PHSC13300, *Settlement Systems*, U. of Chicago.
- 2004-2006 Teaching Assistant, PHSC13200, *Dynamic Environment*, U. of Chicago.
- 2002-2006 Teaching Assistant, NTSC10300, *Biological Evolution*, U. of Chicago.
- 2003 Teaching Assistant, PHSC11000, *Environmental History of the Earth*, U. of Chicago.
- 1999 Lab Assistant, *Mineralogy*, Carleton College.

### **GRADUATE STUDENT THESES SUPERVISED**

#### **University of Bristol's Masters in Palaeobiology Program (Primary Advisor)**

- Jamie MacLaren [2012]: Herbivorous dinosaur mechanical disparity
- Samantha Hadfield [2012]: Mouse jaw mechanical plasticity
- Thomas Stubbs [2011]: Mesozoic Crocodylomorph jaw radiations
- Eoin Gardiner [2011]: Cenozoic Crocodylomorph jaw disparity in decline
- Claire Desbottes [2011]: Extant Crocodylomorph jaw disparity
- Tim Davies [2011]: Intra-taxon mouse jaw plasticity

#### **University of Bristol's Masters in Palaeobiology Program (Co-advisor)**

- Robert Lemanis [2012]: Phytosaur FEA
- Matt Larvan [2009]: Sauropodomorph FEA

#### **University of Bristol Palaeontology and Evolution Master's program (Primary Advisor)**

- Thomas Baird [2012]: Intra-taxon tooth disparity in mammals
- Nicola Heckeberg [2010]: Mechanical testing in African Seedcracker finches

### **OUTREACH**

- 2008-2011 Volunteer for the Bristol Dinosaur Project
- 2010 Organizer of the Palaeobiology Research Group table, Bristol Open Doors Day.
- 2009 *SVP Evolution and Science Education Workshop for Educators*. SVP: Bristol.
- 2007 Guest speaker, Chicago Public Schools
- 2006 Guest lecturer on evolution, United Church of Hyde Park, Chicago.
- 2005-2006 Science fair judge, Chicago Public Schools
- 2001 Pilot study on the pollutant run-off for the city of Northfield. MN

