

Brianna K. McHorse

Ph.D Candidate

Department of Organismic and Evolutionary Biology
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EDUCATION

Ph.D

Harvard University

Fall 2013 – Spring 2019 (expected)

Department of Organismic and Evolutionary Biology

Secondary Field: Computational Science and Engineering

Advisors: Andrew Biewener and Stephanie Pierce

Dissertation: The evolution of digit reduction in fossil horses

B.S.

University of Oregon

Awarded June 2013

Biology with honors; minor in Geological Sciences

magna cum laude, Phi Beta Kappa

Robert D. Clark Honors College

Thesis: Conformation and performance in three-day event horses using photographic analysis

PUBLICATIONS

Refereed journal articles

Emery, M.M., **B.K. McHorse**, and E.B. Davis. 2017. Spatially explicit analysis sheds new light on the Pleistocene Megafaunal Extinction in North America. *Paleobiology*. DOI: <https://doi.org/10.1017/pab.2017.15>

McHorse, B.K., A.A. Biewener, and S.E. Pierce. 2017. Mechanics of evolutionary digit reduction in fossil horses (Equidae). *Proceedings of the Royal Society B* 284: 20171174. DOI: 10.1098/rspb.2017.1174.

McHorse, B. K., E. B. Davis, E. Scott, and D. L. Jenkins. 2016. What species of horse was coeval with North America's earliest humans in the Paisley Caves? *Journal of Vertebrate Paleontology*. DOI: 10.1080/02724634.2016.1214595.

Sertich, J.J.W., R.K. Stucky, H.G. McDonald, C. Newton, D.C. Fisher, E. Scott, J.R. Demboski, C. Lucking, **B.K. McHorse**, and E.B. Davis. 2014. High-elevation late Pleistocene (MIS 6–5) vertebrate faunas from the Ziegler Reservoir fossil site, Snowmass Village, Colorado. *Quaternary Research* 82(3): 504–517.

Davis, E.B. and **B.K. McHorse**. 2013. A method for improved identification of postcrania from mammalian fossil assemblages: multivariate discriminant analysis of camelid astragali. *Palaeontologia Electronica* 16(3): 27A, 15p.

McHorse, B.K., J.D. Orcutt, and E.B. Davis. 2012. The carnivoran fauna of Rancho La Brea: average or aberrant? *Palaeogeography, Palaeoclimatology, Palaeoecology* 329–330:118–123.

Preprints/In Review

Heintzman, P. D., G. D. Zazula, R. D. E. MacPhee, E. Scott, J. A. Cahill, **B. K. McHorse**, J. D. Kapp, M. Stiller, M. J. Wooller, L. Orlando, J. R. Southon, D. G. Froese, and B. Shapiro. 2017. A new genus of horse from Pleistocene North America. *bioRxiv* doi: 10.1101/154963

In Prep

McHorse, B.K., W.N.F. McLaughlin, E. Scott, E.B. Davis, and S.S.B. Hopkins. Identifications from isolated postcranial fossils: testing bone choice and certainty.

GRANTS, FELLOWSHIPS, and SCHOLARSHIPS

2017-2019	National Science Foundation Doctoral Dissertation Improvement Grant (DDIG): “Macroevolutionary drivers of digit reduction in fossil horses.”
2016	Sigma Xi Grant in Aid of Research
2016	Chapman Memorial Scholarship for Locomotion Research
2013 – present	National Science Foundation Graduate Research Fellow
2013 – present	Ashford Fellow, Harvard University
	<i>Below awarded at University of Oregon</i>
2013	Stovall Fellowship for Honors Thesis Research
2012, 2013	Undergraduate Conference Travel Grants (SVP and SICB)
2012	Goldwater Scholarship
2012	Bowerman Award
2012	Joy Poust Scholarship, Clark Honors College
2012	Clark Honors College Thesis Research Grant (U.S.).
2011, 2012	Jean Wittemyer Memorial Scholarship
2010 – 2012	Clarence and Lucille Dunbar Scholarship
2009 - 2013	General University Scholarship
2008 – 2012	Singer Foundation Scholarship
2008 – 2012	Dean’s Scholarship
2010	Kidd Tutorial Scholarship
2010	Ira and Eleanor Wong Scholarship
2009	Phyllis Para Talus Presidential Fellowship

AWARDS and HONORS

2017	Certificate of Distinction in Teaching (LS2, Comparative Anatomy and Physiology)
2016	Certificate of Teaching Excellence (OEB 101, Mammalogy)
2013	President's Award (undergraduate thesis award)
2013	Oregon Six (top 6 Phi Beta Kappa graduates)
2013	Phi Beta Kappa
2012	Marshall Scholarship Alternate
2011	Centurion Award for top 100 juniors at UO

CONFERENCE ABSTRACTS

Oral presentations

Heintzman, P. D., G. D. Zazula, J.A. Cahill, **B.K. McHorse**, J.D. Kapp, M. Stiller, E. Scott, R.D. Macphee, and B. Shapiro. Paleogenomics resolves the taxonomy and systematics of late Pleistocene stilt-legged equids from North America. Society of Vertebrate Paleontology, 2016.

McHorse, B.K., S.E. Pierce, and A.A. Biewener. Beam mechanics of digit reduction in fossil horses. International Congress on Vertebrate Morphology, 2016.

McHorse, B.K., A.A. Biewener, and S.E. Pierce. Evolutionary digit reduction and beam mechanics in fossil and extant horses. Society for Integrative and Comparative Biology, 2016.

Davis, E.B., M.M. Emery, and **B.K. McHorse**. Geospatial analysis of human-megafaunal overlap in North America. International Biogeography Society, 2015.

Emery, M.M., **B.K. McHorse**, and E.B. Davis. Geospatial analysis of human-megafaunal overlap in North America. Geological Society of America, 2014.

McHorse, B.K., E. Scott, W.N.F. McLaughlin, E.B. Davis, and S.S.B. Hopkins. Lost information in the fossil record: using discriminant analysis of postcrania to identify fossils. Society of Vertebrate Paleontology, 2013.

Posters

McHorse, B.K. and S.E. Pierce. Diversity dynamics and digit reduction in fossil horses. Society of Vertebrate Paleontology, 2017. Finalist, Colbert Student Poster Prize competition.

McHorse, B.K. and S.E. Pierce. Changing structural properties and morphology through evolutionary digit reduction in the Equidae (Perissodactyla). Society of Vertebrate Paleontology, 2015. Selected to participate in Colbert Student Poster Prize competition.

McHorse, B.K., S.S.B. Hopkins, and E.B. Davis. Ecomorphological variation in camelid postcrania from Juntura (Clarendonian, ~9Ma). Society of Vertebrate Paleontology, 2014.

McLaughlin, W.N.F., **B.K. McHorse**, S.S.B. Hopkins, and E.B. Davis. The utility of postcranial bones in distinguishing taxa and sexes in modern artiodactyla and the implications for placement of Paleomerycidae within Artiodactyla. Society of Vertebrate Paleontology, 2014.

Scott, E., **B.K. McHorse**, G. Zazula, C. Jass. A morphometric assessment of Pleistocene horse metapodials across western North America. Society of Vertebrate Paleontology, 2014.

McHorse, B.K., E.B. Davis, and S.S.B. Hopkins. Comparing skeletal characteristics of fossil *Equus* and modern mustangs. Society for Integrative and Comparative Biology, 2014.

McHorse, B.K., S.S.B. Hopkins, and E.B. Davis. Functional morphology in modern horses: natural vs. artificial selection. Society of Vertebrate Paleontology, 2013.

McHorse, B.K., S.S.B. Hopkins, and E.B. Davis. Functional morphology in modern horses: natural vs. artificial selection. Society of Vertebrate Paleontology, 2012.

McHorse, B.K., S.S.B. Hopkins, and E.B. Davis. Taxonomy, paleoecology, and functional morphology of Miocene camelids in the Juntura formation. Society of Vertebrate Paleontology, 2011.

INVITED TALKS

2017 Lecture on biomechanics of locomotion, Biology of Mammals course (Harvard)

2016 Lecture on mechanical analysis in paleontology, Vertebrate Evolution course (Harvard)

2015 Lecture on forelimb ecomorphology, What Makes a Cat course (Harvard)

2013 University of California Berkeley, Vertebrate Paleontology

2012 University of Oregon, SuperNOVA

TEACHING and EMPLOYMENT

Head Teaching Fellow, Biology of Mammals (OEB 101), Fall 2015 and 2017. Harvard University Department of Organismic and Evolutionary Biology. Coordinate and teach specimen-based laboratory sections, office hours, exam review, exam writing.

Teaching Fellow, Comparative Anatomy and Physiology (LS2), Fall 2016. Harvard University. Teach weekly dissection/experiment/anatomy lab, office hours, exam review.

Course Developer, Fall 2014. Harvard University Department of Organismic and Evolutionary Biology. Responsible for developing all lab materials (content, assignments, lab handouts, etc.), for undergraduate/graduate mammalogy course. Course is semester-long and includes 12 three-hour labs.

SLP Scholar, Fall 2012. Scientific Literacy Program. Teaching assistant for SLP course, "Scientific Revolutions."

SPICE Instructor, Spring 2012 – 2013. UO Summer Program to Inspire Creativity and Excellence. Co-designed paleontology curriculum. Instructed students (middle school age) and staff.

Research Assistant, 2009 – 2013. Hopkins Lab, University of Oregon Department of Geological Sciences.

Biology Peer Tutor, Fall 2011. University of Oregon Department of Biology. Teaching assistant and tutor for BI 214 (Biochemistry and Genetics).

WORKSHOPS

- 2017 Data Science in Python. IACS ComputeFest, Harvard University, Cambridge, MA.
- 2014 NESCent: Paleobiological and phylogenetic approaches to macroevolution. National Evolutionary Synthesis Center, Durham, NC
- 2013 VertNet: Biodiversity Informatics Training Workshop. University of Colorado Boulder, CO

OUTREACH

Evolving Seabiscuit, Harvard Museum of Natural History. Spring 2015 and 2017. Public talk to 50+ attendees about horse performance and evolution.

Women in Science, Technology, Engineering, and Math (WISTEM), Harvard University. Fall 2013 – present. Mentor undergraduate women majoring in a STEM field.

In-depth Paleontology Training for Museum Volunteers, Harvard Museum of Natural History. Fall 2015.

National Fossil Day, Harvard Museum of Natural History. Fall 2014.

Summer Academy to Inspire Learning (SAIL), University of Oregon. July 2011, August 2012. Assisted with a paleontology and evolution lab for low-income high school students (2011), independently led student tour of lab and discussed paleontology research (2012).

Research CHIP, University of Oregon Clark Honors College (CHC). November 2011, 2012. Presentation to freshmen about research experiences and resources open to them.

Bones and Brew, University of Oregon Museum of Natural and Cultural History (UOMNCH). October 2011. Explained fossil functional morphology to visiting medical doctors.

I Dig Dinosaurs! Exhibit Opening, Science Factory. October 2011.

Week of Welcome, University of Oregon Science Library. September 2011, 2012.

Oregon Explorers, UOMNCH. June 2011. Created 3-minute video about undergraduate research at the UO to share with high-school guidance counselors.

FIELD WORK

Vertebrate paleontology, summers 2011 - 2014. Hopkins Lab and University of Oregon Geology Field Camp: Hawk Rim localities, Crooked River Basin, Gateway quarry, and Owyhee region (Eastern Oregon). Prospecting, excavating, field preparation and jacketing, recording field data, stratigraphic surveying, supervising undergraduate student groups.

PROFESSIONAL SOCIETIES

American Society of Mammalogists
Society for Integrative and Comparative Biology
Society of Vertebrate Paleontology

PEER REVIEW

Biology Letters, Evolution, PeerJ, Royal Society Open Science