

# David W. Pfennig

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## Reflective Statement

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I'm broadly interested in evolutionary biology, ecology, behavior, and development. Much of my research aims to understand how organisms assess and react to changes in their environment. I seek to clarify the causes of this 'phenotypic plasticity' as well as its ecological and evolutionary consequences, especially its impacts on evolutionary diversification and innovation. I also strive to convey the excitement and value of scientific research to others.

## Education

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2018	Leadership Development Program, Center for Creative Leadership, Greensboro, NC
1999-2002	Summer Institute in Statistical Genetics, North Carolina State University
1991-1993	National Science Foundation Postdoctoral Fellow in Biosciences Related to the Environment, Cornell University (with P. W. Sherman)
1990-1991	Center for Insect Science Postdoctoral Fellow, University of Arizona
1989-1990	Maytag Postdoctoral Fellow, Arizona State University (with J. P. Collins)
1989	University of Texas at Austin, Ph.D. in Zoology (with J. J. Bull & M. Kirkpatrick)
1982	University of Texas at San Antonio, M.S. in Biology (with G. J. Gamboa)
1979	University of Texas at Austin, B.S. in Zoology
1979	University of Texas at Austin, B.S. in Geology

## Professional Experience

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2012-2015	Caroline & Thomas Royster Distinguished Professor for Graduate Education, Dept. of Biology, University of North Carolina (UNC)
2012-2015	Director, Royster Society of Fellows, The Graduate School, UNC
2007-2012	Zachary Taylor Smith Distinguished Professor for Excellence in Undergraduate Education, Dept. of Biology, UNC
2007	Visiting Scholar, National Evolutionary Synthesis Center, Duke University
2004-present	Professor, Dept. of Biology, UNC
2003-2012	Co-director of Graduate Studies, Dept. of Biology, UNC
1999-2004	Associate Professor, Dept. of Biology, UNC
1996-1999	Assistant Professor, Dept. of Biology, UNC
1993-1996	Assistant Professor, Dept. of Ecology, Ethology, and Evolution, University of Illinois at Urbana-Champaign
1980-1985	Senior Research Associate, Dept. of Genetics, Southwest Foundation for Biomedical Research, San Antonio, TX

## Honors

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2020-2022	Sigma Xi Distinguished Lecturer (The Scientific Research Honor Society)
2018-2019	Fellow, Academic Leadership Program, Institute for Arts and Humanities, UNC
2016	Gaige Annual Lecture, Dept. of Ecology and Evolutionary Biology, University of Michigan
2016	Distinguished Lecturer, Dept. of Ecology and Evolutionary Biology, University of Arizona
2015	Plenary Speaker, "Darwin Day," University of Virginia
2014	Contributing Member, F1000Prime (Faculty of 1000)
2012-2015	Caroline H. & Thomas S. Royster Distinguished Term Professorship for Graduate Education, UNC
2007-2012	Zachary Taylor Smith Distinguished Term Professorship for Excellence in Undergraduate Education, UNC
2005	Walton Lecture, University of Virginia's Mountain Lake Biological Station

- 2001-present My research on mimicry was featured:
- in textbooks, including in "Chapter 1: A Case Study of Scientific Inquiry" in *Campbell Biology*, a widely-used introductory textbook;
  - in books for the public (e.g., *Cheats and Deceits* by Martin Stevens [2015]; *Remarkable Creatures* by Sean Carroll [2009]; *Dazzled and Deceived* by Peter Forbes [2009]);
  - on television (BBC [U.K.] / PBS [U.S.A.] "Nature: Natural Born Hustlers"; broadcast in 2015-2016 to an audience of ~2.5 million);
  - in various magazines, newspapers, & websites (see "Publications")
- 2000 Hettleman Prize for Artistic and Scholarly Achievement, UNC
- 1996 Pitelka Award, International Society for Behavioral Ecology
- 1993 Beckman Award for Outstanding Research Promise, University of Illinois
- 1993-present My research on plasticity, cannibalism, and kin recognition was featured:
- by the National Science Foundations for their *Science Nation* series: "Tiny toad offers big potential for research on plasticity"; see: [https://www.nsf.gov/news/mmg/mmg\\_disp.jsp?med\\_id=185683&from=](https://www.nsf.gov/news/mmg/mmg_disp.jsp?med_id=185683&from=)
  - in books for the public (e.g., Chapter 1 of *Cannibalism: A Perfectly Natural History* by Bill Schutt [2017])
  - in various textbooks, magazines, newspapers, & websites (see "Publications")
  - on television (e.g., on National Geographic TV's "Are We Cannibals?" broadcast in 2004 & on BBC [U.K.] / PBS [U.S.A.] "Nature: The Body Changers"; broadcast in 2000)
- 1989 Gaige Award, American Society of Ichthyologists and Herpetologists

## Publications

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\*high school/undergraduate student co-author; †graduate student co-author; ‡postdoc co-author;  
 PDFs at: <http://labs.bio.unc.edu/pfennig/LabSite/Publications.html>

### Books (Peer-reviewed):

1. Pfennig, D. W. and Pfennig, K. S. 2012. *Evolution's Wedge: Competition and the Origins of Diversity*. University of California Press. Berkeley, CA
2. Pfennig, D. W. (editor). *Phenotypic Plasticity & Evolution: Causes, Consequences, Controversies*. CRC Press. Boca Raton, FL (expected publication early 2021).

### Journal articles (Peer-reviewed):

116. Levist<sup>†</sup>, N. A., Kelly<sup>†</sup>, P. W., Harmont<sup>†</sup>, E. A., Ehrenreich, I. M., McKay, D. J., and Pfennig, D. W. Transcriptomic insights into a complex, environmentally responsive phenotype. (in review).
115. Harmont<sup>†</sup>, E. A and Pfennig, D. W. Evolutionary rescue via transgenerational plasticity: evidence and implications for conservation. *Evolution and Development* (in review).
114. Kelly<sup>†</sup>, P. W., Pfennig, D. W., and Pfennig, K. S. Adaptive plasticity as a fitness benefit of mate choice. *Trends in Ecology & Evolution* (in revision).
113. Kelly<sup>†</sup>, P. W., Pfennig, D. W., and Pfennig, K. S. Male sexual signals predict adaptive plasticity in offspring. (in review).
112. Allf<sup>\*</sup>, B., Sparkman, A., and Pfennig, D. W. 2020. Microevolutionary change in mimicry? Potential erosion of rattling behaviour among nonvenomous snakes on islands lacking rattlesnakes. *Ethology Ecology & Evolution* (in press).
111. de la Serna Buzón<sup>†</sup>, S., Martin, R. A., and Pfennig, D. W. 2020. Carryover effects and the evolution of polyphenism. *Biological Journal of the Linnean Society* (in press).
110. Levist<sup>†</sup>, N. A., Reed<sup>†</sup>, E. M. X., Pfennig, D. W., Burford Reiskind, M. O. 2020. Identification of candidate loci for adaptive phenotypic plasticity in natural populations of spadefoot toads. *Ecology and Evolution* 10: 8976–8988.
109. Levist<sup>†</sup>, N. A., Fuller<sup>\*</sup>, C, and Pfennig, D. W. 2020. An experimental investigation of how intraspecific competition and phenotypic plasticity can promote the evolution of novel, complex phenotypes. *Biological Journal of the Linnean Society* 131: 76–87.
108. Pfennig<sup>\*</sup>, K. S. and Pfennig, D. W. 2020. Dead spadefoot tadpoles adaptively modify development in future generations: a novel form of nongenetic inheritance? *Copeia* 108: 116-121.
107. Levist<sup>†</sup>, N. A. and Pfennig, D. W. 2020. Plasticity-led evolution: a survey of developmental mechanisms and empirical tests. *Evolution and Development* 22: 71–77.
106. Seidl<sup>†</sup>, F., Levist<sup>†</sup>, N. A., Schell<sup>†</sup>, R., Pfennig, D. W., Pfennig, K. S., and Ehrenreich, I. M. 2019. Genome of *Spea multiplicata*, a rapidly developing, phenotypically plastic, and desert-adapted spadefoot toad. *G3: Genes, Genomes, Genetics* 9: 3909–3919.
105. Akcali<sup>†</sup>, C. K., Perez-Mendoza, H. A., Kikuchi, D. W., and Pfennig, D. W. 2019. Multiple models generate a geographical mosaic of resemblance in a Batesian mimicry complex. *Proceedings of the Royal Society B: Biological Sciences* 286: 20191519.

104. Levist, N. A. and Pfennig, D. W. 2019. How stabilizing selection and nongenetic inheritance combine to shape the evolution of phenotypic plasticity. *Journal of Evolutionary Biology* 32: 706–716.
103. Levist, N. A. and Pfennig, D. W. 2019. Plasticity-led evolution: evaluating the key prediction of frequency-dependent adaptation. *Proceedings of the Royal Society B: Biological Sciences* 286: 20182754.
102. Akcalit, C. K., Adán Pérez-Mendoza, H, Salazar-Valenzuela, D., Kikuchi, D. W., Guayasamin, J. M., and Pfennig, D. W. 2019. Evaluating the utility of camera traps in field studies of predation. *PeerJ* 7:e6487.
101. Kellyt, P. W., Pfennig, D. W., de la Serna Buzónt, S., and Pfennig, K. S. 2019. Male sexual signals predict phenotypic plasticity in offspring: implications for the evolution of plasticity and local adaptation. *Philosophical Transactions of the Royal Society B: Biological Sciences* 374: 20180179.
- (Invited peer-reviewed contribution to special theme issue “The role of plasticity in phenotypic adaptation to rapid environmental change”)
100. Levist, N. A. and Pfennig, D. W. 2019. Phenotypic plasticity, canalization, and the origins of novelty: evidence and mechanisms from amphibians. *Seminars in Cell and Developmental Biology* 88: 80–90.
- (Invited peer-reviewed contribution to special theme issue “Canalization”)
99. Levist, N. A., Isdaner\*, A., and Pfennig, D. W. 2018. Morphological novelty emerges from pre-existing phenotypic plasticity. *Nature Ecology and Evolution* 2:1289–1297.
- (highlighted in a feature article in *Science* (“Buying time” vol. 362 (6418), pp. 988-991, Nov. 30, 2018, <http://science.sciencemag.org/content/362/6418/988>)
- (highlighted in Faculty of 1000, Aug. 9, 2018)
98. Levist, N. A. and Pfennig, D. W. 2018. Evolution of phenotypic plasticity and gene expression during character displacement. In: eLS John Wiley & Sons Ltd, Chichester. <http://www.els.net> (<https://doi.org/10.1002/9780470015902.a0028159>)
- (Invited peer-reviewed contribution)
97. Akcalit, C. K., Kikuchi, D. W., Pfennig, D. W. 2018. Coevolutionary arms races in Batesian mimicry? A test of the chase-away hypothesis. *Biological Journal of the Linnean Society* 124: 668–676.
96. Levist, N. A., Martin, R. A., O’Donnell\*, K. A., and Pfennig, D. W. 2017. Intraspecific adaptive radiation: competition, ecological opportunity, and phenotypic diversification within species. *Evolution* 71: 2496–2509.

95. Levist, N. A., Serrato-Capuchina†, A. and Pfennig, D. W. 2017. Genetic accommodation in the wild: evolution of gene expression plasticity during character displacement. *Journal of Evolutionary Biology* 30: 1712–1723.
94. Bono†, L. M., Smith\*, L. B., Pfennig, D. W., and Burch, C. L. 2017. The emergence of trade-offs during local adaptation: insights from experimental evolution. *Molecular Ecology* 26: 1720–1733.
93. Akcali†, C. and Pfennig, D. W. 2017. Geographic variation in mimetic precision among different species of coral snake mimics. *Journal of Evolutionary Biology* 30: 1420–1428.
92. Allf\*, B. C., Durst†, P. A. D., and Pfennig, D. W. 2016. Behavioral plasticity and the origins of novelty: the evolution of the rattlesnake rattle. *The American Naturalist* 188: 475–483.
- (highlighted on *The New Scientist's* webpage (“Rattlesnakes silently shook their tails before evolving rattles” <https://www.newscientist.com/article/2106162-rattlesnakes-silently-shook-their-tails-before-evolving-rattles/>, September 16, 2016))
- (highlighted on *ScienceNews's* webpage (“Tail vibrations may have preceded evolution of rattlesnake rattle” <https://www.sciencenews.org/blog/wild-things/tail-vibrations-may-have-preceded-evolution-rattlesnake-rattle>, August 31, 2016))
- (highlighted on *The Planet Experts's* webpage (“Which Came First: The Rattle or the Rattling?” <http://www.planetexperts.com/came-first-rattle-rattling/>, August 18, 2016))
91. Levist, N. A. and Pfennig, D. W. 2016. Evaluating ‘plasticity-first’ evolution in nature: key criteria and empirical approaches. *Trends in Ecology and Evolution* 31:563–574.
- (“highly cited paper” by Web of Science [“received enough citations to place it in the top 1% of its academic field based on a highly cited threshold for the field and publication year”])
90. Ehrenreich, I. M. and Pfennig, D. W. 2016. Genetic assimilation: a review of its potential proximate causes and evolutionary consequences. *Annals of Botany* 117: 769–779.
89. Bono†, L. M., Gensel\*, C. L., Pfennig, D. W., and Burch, C. L. 2015. Evolutionary rescue and the coexistence of generalist and specialist competitors: an experimental test. *Proceedings of the Royal Society B: Biological Sciences* 282: 20151932.
88. Pfennig, K. S., Pfennig, D. W., Portert†, C., and Martin, R. A. 2015. Sexual selection’s impacts on ecological specialisation: an experimental test. *Proceedings of the Royal Society B: Biological Sciences* 282: 20150217.
87. Murren, C. J., Auld, J. R., Callahan, H. S., Ghalambor, C. K., Handelsmant†, C. A., Heskelt†, M. A., Kingsolver, J. G., Maclean†, H. J., Masel, J., Maughan, H., Pfennig, D. W., Relyea, R. A., Seiter, S, Snell-Rood, E., Steiner, U. K., and

Schlichting, C. D. 2015. Constraints on the evolution of phenotypic plasticity: limits and costs of phenotype and plasticity. *Heredity* 115: 293–301.

86. Levist, N. A., de la Serna Buzon†, S., and Pfennig, D. W. 2015. An inducible offense: carnivore morph tadpoles induced by tadpole carnivory. *Ecology and Evolution* 5: 1405–1411.
85. Pfennig, D. W., Akcalit, C., and Kikuchi, D. W. 2015. Batesian mimicry promotes pre- and post-mating isolation in a snake mimicry complex. *Evolution* 69: 1085–1090.
84. Pfennig, D. W. and Ehrenreich, I. M. 2014. Toward a gene regulatory network perspective on phenotypic plasticity, genetic accommodation, and genetic assimilation. *Molecular Ecology* 23: 4438–4440.
83. Ledón-Rettig, C. C., Pfennig, D. W., Chunco, A. J., and Dworkin, I. 2014. Cryptic genetic variation in natural populations: a predictive framework. *Integrative and Comparative Biology* 54: 783–793.
82. Akcalit, C. K. and Pfennig, D. W. 2014. Rapid evolution of mimicry following local model extinction. *Biology Letters* 10: 20140304.

(featured on the cover of the journal)

(highlighted on PBS's NOVA webpage ("How the Kingsnake Is Still Fooling Predators into Thinking It's Poisonous" <http://www.pbs.org/wgbh/nova/next/evolution/mimicry-evolutionary-momentum/> Aug. 6, 2014)

(highlighted on *Mental Floss* ("Extinct snake lead to better fakes" <http://mentalfloss.com/article/57327/extinct-snakes-lead-better-fakes>, June 18, 2014)

(highlighted on *IFL Science!* ("Scarlet kingsnake still mimics extinct venomous species" <http://www.iflscience.com/plants-and-animals/scarlet-kingsnake-still-mimics-extinct-venomous-species> June 12, 2014))

(highlighted on *The Scientist's* webpage ("Snake imitators persist" [http://www.the-scientist.com/?articles.view/articleNo/40199/title/Snake-Imitators-Persist/June 15, 2014](http://www.the-scientist.com/?articles.view/articleNo/40199/title/Snake-Imitators-Persist/June%2015%202014)))

(highlighted on *PHYS.org* ("Study finds mimicry increased in scarlet kingsnake after disappearance of coral snake" <http://phys.org/news/2014-06-mimicry-scarlet-kingsnake-snake-coral.html>, June 12, 2014)

(highlighted on *Nature's* webpage ("Snakes mimic extinct species to avoid predators" <http://www.nature.com/news/snakes-mimic-extinct-species-to-avoid-predators-1.15397> June 11, 2014))

(highlighted on *LiveScience* ("Weird case of look-alike snakes surprises researchers" <http://www.livescience.com/46248-snake-mimics-surprise-researchers.html>, June 10, 2014))

81. Murren, C. J., Maclean†, H. J., Diamond†, S. E., Steiner, U. K., Heskelt, M. A., Handelsman†, C. A., Ghalambor, C. K., Auld, J. R., Callahan, H. S., Pfennig, D. W.,

Relyea, R. A., Schlichting, C. D., and Kingsolver, J. G. 2014. Evolutionary change in continuous reaction norms. *The American Naturalist* 183: 453–467.

80. Kikuchi†, D. W., Seymoure†, B. M., and Pfennig, D. W. 2014. Mimicry's palette: widespread use of conserved pigments in the aposematic signals of snakes. *Evolution and Development* 16: 61–67.

(featured on the cover of the journal)

79. Titcombe\*, G. C., Kikuchi†, D. W., and Pfennig, D. W. 2014. More than mimicry? Evaluating scope for flicker-fusion as a defensive strategy in coral snake mimics. *Current Zoology* 60: 123–130.
78. Kikuchi†, D. W. and Pfennig, D. W. 2013. Imperfect mimicry and the limits of natural selection. *Quarterly Review of Biology* 88: 297–315.
77. Robinson, B. W. and Pfennig, D. W. 2013. Inducible competitors and diversification. *Current Zoology* 59: 537–552.
76. Pfennig, D. W. and Servedio, M. R. 2013. The role of transgenerational epigenetic inheritance in diversification and speciation. *Non-genetic Inheritance* 1:17–26.
75. Bono†, L. M., Gensel\*, C. L., Pfennig, D. W., and Burch, C. L. 2013. Competition and the origins of novelty: experimental evolution of host-range expansion in a virus. *Biology Letters* 9: 20120616.

(highlighted in Faculty of 1000, 21 Feb 2013)

(highlighted on *Phenomena: A science salon hosted by National Geographic magazine* (“When competition is intense, viruses spill over into new hosts” <http://phenomena.nationalgeographic.com/2012/10/16/when-competition-is-intense-viruses-spill-over-into-new-hosts/>, October 16, 2012))

74. Paull†, J. S., Martin†, R. A., and Pfennig, D. W. 2012. Increased competition as a cost of specialization during the evolution of resource polymorphism. *Biological Journal of the Linnean Society* 107: 845–853.
73. Martin†, R. A. and Pfennig, D. W. 2012. Widespread disruptive selection in the wild is associated with intense resource competition. *BMC Evolutionary Biology* 12:136.
72. Pfennig, D. W. and Kikuchi†, D. W. 2012. Competition and the evolution of imperfect mimicry. *Current Zoology* 58: 607–618.
71. Kikuchi†, D. W. and Pfennig, D. W. 2012. A Batesian mimic and its model share color production mechanisms. *Current Zoology* 58: 657–666.
70. Ledón-Rettig†, C. and Pfennig, D. W. 2012. Antipredator behavior plasticity promotes diversification of feeding strategies. *Integrative and Comparative Biology* 52: 53–63.

69. Leichthy<sup>†</sup>, A., Pfennig, D. W., Jones, C. and Pfennig, K. S. 2012. Relaxed genetic constraint is ancestral to the evolution of phenotypic plasticity. *Integrative and Comparative Biology* 52:16–30.
68. Pfennig, D. W. and Pfennig, K. S. 2012. Development and evolution of character displacement. *Annals of the N.Y. Academy of Sciences (The Year in Evolutionary Biology)* 1256: 89–107.
67. Martin<sup>†</sup>, R. A. and Pfennig, D. W. 2011. Evaluating the targets of selection during character displacement. *Evolution* 65: 2946–2958.
66. Moczek, A. P., Sultan, S., Foster, S., Ledón-Rettig<sup>†</sup>, C., Dworkin, I., Nijhout, H. F., Abouheif, E., and Pfennig, D. W. 2011. The role of developmental plasticity in evolutionary innovation. *Proceedings of the Royal Society B: Biological Sciences* 278: 2705–2713.
- (“highly cited paper” by Web of Science [“received enough citations to place it in the top 1% of its academic field based on a highly cited threshold for the field and publication year”])
65. Ledón-Rettig<sup>†</sup>, C. and Pfennig, D. W. 2011. Emerging model systems in eco-evo-devo: the environmentally responsive spadefoot toad. *Evolution and Development* 13: 391–400.
64. Kikuchi<sup>†</sup>, D. W. and Pfennig, D. W. 2010. Predator cognition permits imperfect coral snake mimicry. *The American Naturalist* 176: 830–834.
- (highlighted in Chapter 5 (“A Spider in Ant’s Clothing”) of the book, *Cheats and Deceits: How Animals and Plants Exploit and Mislead*, by Martin Stevens, 2015)
- (highlighted on ScienceNow (Science’s webpage) (“ScienceShot: Snakes Lie to Save Their Skin”, November 19, 2010))
63. Pfennig, D. W. and Pfennig, K. S. 2010. Character displacement and the origins of diversity. *The American Naturalist* 176: S26–S44.
- (Invited peer-reviewed contribution to special theme issue “Darwinian Thinking: 150 years after the “Origin””)
62. Ledón-Rettig<sup>†</sup>, C., Pfennig, D. W., and Crespi, E. J. 2010. Diet and hormone manipulations reveal cryptic genetic variation: implications for the evolution of novel feeding strategies. *Proceedings of the Royal Society B: Biological Sciences* 277: 3569–3578.
- (highlighted in *Nature* (“Evolutionary biology: meat-eating tadpoles”, July 1, 2010, vol. 466, page 11))
61. Pfennig, D. W. and Martin<sup>†</sup>, R. A. 2010. Evolution of character displacement in spadefoot toads: different proximate mechanisms in different species. *Evolution* 64: 2331–2341.

(featured on the cover of the journal)

60. Pfennig, D. W. and Mullen, S. P. 2010. Mimics without models: causes and consequences of allopatry in Batesian mimicry. *Proceedings of the Royal Society B: Biological Sciences* 277: 2577–2585.

(featured on the cover of the journal)

59. Pfennig, D. W., Wund, M. A., Snell-Rood†, E. C., Cruickshank†, T., Schlichting, C. D., and Moczek, A. P. 2010. Phenotypic plasticity's impacts on diversification and speciation. *Trends in Ecology and Evolution* 25: 459–467.

(“highly cited paper” by Web of Science [“received enough citations to place it in the top 1% of its academic field based on a highly cited threshold for the field and publication year”])

58. Martin†, R. A. and Pfennig, D. W. 2010. Field and experimental evidence that competition and ecological opportunity promote resource polymorphism. *Biological Journal of the Linnean Society* 100: 73–88.
57. Rice†, A. M. and Pfennig, D. W. 2010. Does character displacement initiate speciation? Evidence of reduced gene flow between populations experiencing divergent selection. *Journal of Evolutionary Biology* 23: 854–865.
56. Kikuchi†, D. W. and Pfennig, D. W. 2010. High model abundance may permit the gradual evolution of Batesian mimicry: an experimental test. *Proceedings of the Royal Society B: Biological Sciences* 277:1041–1048.
55. Martin†, R. A. and Pfennig, D. W. 2010. Maternal investment influences expression of resource polymorphism in amphibians: implications for the evolution of novel resource-use phenotypes. *PLoS One* 5(2): e9117.

(highlighted on *The New Scientist's* Zoologger (“What turns a tadpole into a killer?”, February 17, 2010))

54. Pfennig, D. W. and McGee\*, M. 2010. Resource polyphenism increases species richness: a test of the hypothesis. *Philosophical Transactions of the Royal Society B: Biological Sciences* 365: 577–591.
53. Ledón-Rettig†, C., Pfennig, D. W., and Crespi, E. J. 2009. Stress hormones and the fitness consequences associated with consuming a novel diet in larval amphibians. *Journal of Experimental Biology* 212: 3743–3750.
52. Rice†, A. M., Leichty†, A. R., and Pfennig, D. W. 2009. Parallel evolution and ecological selection: replicated character displacement in spadefoot toads. *Proceedings of the Royal Society B: Biological Sciences* 276: 4189–4196.
51. Martin†, R. A. and Pfennig, D. W. 2009. Disruptive selection in natural populations: the roles of ecological specialization and resource competition. *The American Naturalist* 174: 268–281.

50. Pfennig, K. S. and Pfennig, D. W. 2009. Character displacement: ecological and reproductive responses to a common evolutionary problem. *Quarterly Review of Biology* 84: 253–276.
49. Pfennig, D. W. and Martin†, R. A. 2009. A maternal effect mediates rapid population divergence and character displacement in spadefoot toads. *Evolution* 63: 898–909.
48. Rice†, A. M. and Pfennig, D. W. 2008. Analysis of range expansion in two species undergoing character displacement: why might invaders generally "win" during character displacement? *Journal of Evolutionary Biology* 21: 696–704.
47. Ledón-Rettig†, C., Pfennig, D. W., and Nascone-Yoder, N. 2008. Ancestral variation and the potential for genetic accommodation in larval amphibians: implications for the evolution of novel feeding strategies. *Evolution and Development* 10: 316–325.
46. Harpert†, G. R. Jr. and Pfennig, D. W. 2008. Selection overrides gene flow to break down maladaptive mimicry. *Nature* 451: 1103–1106.  
 (highlighted in a textbook about evolution intended for the general reader, *The Tangled Bank* by Carl Zimmer, 2009)  
 (highlighted in *Current Biology* ("Batesian mimicry: can a leopard change its spots – and get them back?", June 3, 2008, vol. 18, issue 11, pp. R476–R479))  
 (highlighted in Faculty of 1000 Biology, 14 March 2008)
45. Pfennig, D. W. and Rice†, A. M. 2007. An experimental test of character displacement's role in promoting postmating isolation between conspecific populations in contrasting competitive environments. *Evolution* 61: 2433–2443.
44. Harpert†, G. R. Jr. and Pfennig, D. W. 2007. Mimicry on the edge: why do mimics vary in resemblance to their model in different parts of their geographical range? *Proceedings of the Royal Society B: Biological Sciences* 274: 1955–1961.  
 (highlighted in Chapter 16 of the book, *Dazzled and Deceived: Mimicry and Camouflage*, by Peter Forbes, 2009)
43. Kingsolver, J. G. and Pfennig, D.W. 2007. Patterns and power of phenotypic selection in nature. *BioScience* 57: 561–572.
42. Pfennig, D. W., Rice†, A. M., and Martin†, R. A. 2007. Field and experimental evidence for competition's role in phenotypic divergence. *Evolution* 61: 257–271.
41. Rice†, A. M. and Pfennig, D. W. 2007. Character displacement: *in situ* evolution of novel phenotypes or sorting of pre-existing variation? *Journal of Evolutionary Biology* 20: 448–459.
40. Pfennig, D. W., Harpert†, G. R. Jr., Brumo\*, A. F., Harcombe\*, W. R., and Pfennig, K. S. 2007. Population differences in predation on Batesian mimics in allopatry with

their model: selection against mimics is strongest when they are common. *Behavioral Ecology and Sociobiology* 61: 505–511.

39. Pfennig, D. W., Rice†, A. M., and Martin†, R. A. 2006. Ecological opportunity and phenotypic plasticity interact to promote character displacement and species coexistence. *Ecology* 87: 769–779.
38. Pfennig, K. S. and Pfennig, D. W. 2005. Character displacement as the ‘best of a bad situation’: fitness trade-offs resulting from selection to minimize resource and mate competition. *Evolution* 59: 2200–2208.
37. Kingsolver, J. G. and Pfennig, D.W. 2004. Individual-level selection as a cause of Cope’s rule of phyletic size increase. *Evolution* 58: 1608–1612.  
(highlighted in *Trends in Ecology and Evolution* (“The evolution of large size: how does Cope’s Rule work?”), January 2005, vol. 20, issue 1, pp. 4–6))
36. Bull, J. J., Pfennig, D. W., and Wang†, I-N. 2004. Genetic details, optimization and phage life histories. *Trends in Ecology and Evolution* 19: 76–82.
35. Pfennig, D. W. and Murphy†, P. J. 2003. A test of alternative hypotheses for character divergence between coexisting species. *Ecology* 84: 1288–1297.
34. Reeve, H. K. and Pfennig, D. W. (equal-authored) 2003. Genetic biases for showy males: are some genetic systems especially conducive to sexual selection? *Proceedings of the National Academy of Sciences, USA* 100: 1089–1094.
33. Pfennig, D. W. and Murphy†, P. J. 2002. How fluctuating competition and phenotypic plasticity mediate species divergence. *Evolution* 56: 1217–1228.  
(highlighted on the *Scientific American Blog Network* (“North American spadefoot toads and their incredible fast-metamorphosing, polymorphic tadpoles”) <http://blogs.scientificamerican.com/tetrapod-zoology/2015/01/02/north-american-spadefoot-toads/>, January 2, 2015)
32. Kingsolver, J. G., Pfennig, D. W., and Servedio, M. R. 2002. Migration, local adaptation, and the evolution of plasticity. *Trends in Ecology and Evolution* 17: 540–541.
31. Frankino†, W. A. and Pfennig, D. W. 2001. Condition-dependent expression of trophic polyphenism: effects of individual size and competitive ability. *Evolutionary Ecology Research* 3: 939–951.
30. Pfennig, D. W., Harcombe\*, W. R., and Pfennig, K. S. 2001. Frequency-dependent Batesian mimicry. *Nature* 410: 323.  
(highlighted in Chapter 4 (“Life Imitates Life”) of the book, *Remarkable Creatures: Epic Adventures in the Origin of Species*, by Sean B. Carroll, 2009)  
(highlighted in Chapter 1 (“A Case Study of Scientific Inquiry”) of a major Biology text, *Campbell Biology*)  
(highlighted in *The 2002 Britannica Book of the Year* (p. 235))

(highlighted in *Natural History* ("Snake Fakery", June 2001, p. 18))

29. Pfennig, D. W. and Murphy<sup>‡</sup>, P. J. 2000. Character displacement in polyphenic tadpoles. *Evolution* 54: 1738–1749.
  28. Pfennig, D. W. 2000. Effect of predator-prey phylogenetic distance on the fitness consequences of predation: a tradeoff between nutrition and disease? *The American Naturalist* 155: 335–345.
  27. Loeb<sup>†</sup>, M. L. G., Diene<sup>\*</sup>, L. and Pfennig, D. W. 2000. Egg dumping lace bugs preferentially oviposit with kin. *Animal Behaviour* 59: 379–383.
  26. Pfennig, D. W., Collins, J. P., and Ziemba<sup>†</sup>, R.E. 1999. A test of alternative hypotheses for kin recognition in cannibalistic tiger salamanders. *Behavioral Ecology* 10: 436–443.
  25. Pfennig, D. W. 1999. Cannibalistic tadpoles that pose the greatest threat to kin are most likely to discriminate kin. *Proceedings of the Royal Society B: Biological Sciences* 266: 57–61.
  24. Hoffmant<sup>†</sup>, E. A. and Pfennig, D. W. 1999. Proximate causes of cannibalistic polyphenism in larval tiger salamanders. *Ecology* 80: 1076–1080.
  23. Pfennig, D. W., Ho<sup>\*</sup>, S., and Hoffmant<sup>†</sup>, E. A. 1998. Pathogen transmission as a selective force against cannibalism. *Animal Behaviour* 55: 1255–1261.
- (highlighted in *National Geographic* (Earth Almanac: "Animal Cannibals: A Risky Diet", April, 1999))
- (highlighted in *The Washington Post* ("Why Don't We Eat Our Own Kind? They'd Bite Back; Cannibals May Risk Ingesting Deadly Germs, Study Finds", August 31, 1998, p. A03))
- (highlighted on ABC News web page ("Cannibalism can Kill You", July 1, 1998))
- (highlighted on *Science's* web page (Daily inSClght) ("Cannibal's Risky Diet", May 13, 1998))
- (highlighted in *Science News* ("Why Aren't There More Cannibals Around?", May 9, 1998, p. 295))
22. Pfennig, D. W. and Frankino<sup>†</sup>, W. A. 1997. Kin-mediated morphogenesis in facultatively cannibalistic tadpoles. *Evolution* 51: 1993–1999.
  21. Pfennig, D. W. 1997. Kinship and cannibalism. *BioScience* 47: 667–675.
  20. Pfennig, D. W. 1995. Absence of joint nesting advantage in desert seed harvester ants: evidence from a field experiment. *Animal Behaviour* 49: 567–575.
  19. Pfennig, D. W., Sherman, P. W., and Collins, J. P. 1994. Kin recognition and cannibalism in polyphenic salamanders. *Behavioral Ecology* 5: 225–232.

18. Pfennig, D. W. and Collins, J. P. 1993. Kinship affects morphogenesis in cannibalistic salamanders. *Nature* 362: 836–838.  
 (highlighted in *Trends in Ecology and Evolution* (“Cannibalism among amphibian larvae: a case of good taste”, January 1994, vol. 9, issue 1, pp. 5–6))  
 (highlighted in *The 1994 Encyclopaedia Britannica Book of the Year* (“Life Sciences, Zoology”, p. 209–210))  
 (highlighted in *The New Scientist* (“Consuming Passion for Distant Relatives”, July 18, 1993, p. 15))  
 (subject of a cartoon by Larry Gonick in *Discover* (“Fine Young Cannibals”, October, 1993, p. 124–125))  
 (featured on the cover of the journal)
17. Pfennig, D. W. and Reeve, H. K. 1993. Nepotism in a solitary wasp as revealed by DNA fingerprinting. *Evolution* 47: 700–704.
16. Pfennig, D. W., Reeve, H. K., and Sherman, P. W. 1993. Kin recognition and cannibalism in spadefoot toad tadpoles. *Animal Behaviour* 46: 87–94.  
 (highlighted in *Scientific American* (“Relative Hunger”, March 1992, p. 18))  
 (highlighted in *The Washington Post* (“For Arizona’s Cannibalistic Tadpoles, Eating is a Relative Matter”, December 9, 1991, p. A3))
15. Pfennig, D. W. 1992. Polyphenism in spadefoot toad tadpoles as a locally-adjusted evolutionarily stable strategy. *Evolution* 46: 1408–1420.
14. Pfennig, D. W. 1992. Proximate and functional causes of polyphenism in an anuran tadpole. *Functional Ecology* 6: 167–174.  
 (highlighted in Chapter 1 (“Animal the Cannibal”) of the book, *Cannibalism: A Perfectly Natural History*, by Bill Schutt, 2017)
13. Pfennig, D. W., Mabry\*, A., and Orange\*, D. 1991. Environmental causes of correlations between age and size at metamorphosis in *Scaphiopus multiplicatus*. *Ecology* 72: 2240–2248.
12. Pfennig, D. W., Loeb†, M. L. G., and Collins, J. P. 1991. Pathogens as a factor limiting the spread of cannibalism among tiger salamanders. *Oecologia* 88: 161–166.  
 (highlighted in *The New Scientist* (“Cannibals Eat Their Way to an Early Death”, December 7, 1991, p. 23))
11. Pfennig, D. W. 1990. “Kin recognition” among spadefoot toad tadpoles: a side-effect of habitat selection? *Evolution* 44: 785–798.
10. Pfennig, D. W. 1990. The adaptive significance of an environmentally-cued developmental switch in an anuran tadpole. *Oecologia* 85: 101–107.

9. Pfennig, D. W. 1990. Nestmate and nest discrimination among workers from neighboring colonies in social wasps, *Polistes exclamans*. *Canadian Journal of Zoology* 68: 268–271.
8. Pfennig, D. W. and Reeve, H. K. 1989. Neighbor recognition and context-dependent aggression in a solitary wasp, *Sphecius speciosus* (Hymenoptera: Sphecidae). *Ethology* 80: 1–18.
7. Gamboa, G. J., Reeve, H. K., and Pfennig, D.W. 1986. The evolution and ontogeny of nestmate recognition in social wasps. *Annual Review of Entomology* 31: 431–454.
6. Pfennig, D. W. and Klahn, J. E. 1985. Dominance as a predictor of cofoundress disappearance order in social wasps (*Polistes fuscatus*). *Ethology* (nee: *Zeitschrift für Tierpsychologie*) 67: 198–203.
5. Reeve, H. K., Shellman Reeve, J., and Pfennig, D. W. 1985. Eusociality and genetic variability: a re-evaluation. *Evolution* 39: 200–201.
4. Cothran, E. G., MacCluer, J. W., Weitkamp, L. R., Pfennig, D. W., and Boyce, A. J. 1984. Inbreeding and reproductive performance in Standardbred horses. *Journal of Heredity* 75: 220–224.
3. MacCluer, J. W., Boyce, A. J., Dyke, B., Weitkamp, L. R., Pfennig, D. W., and Parsons, C. J. 1983. Inbreeding and pedigree structure in Standardbred horses. *Journal of Heredity* 74: 394–399.
2. Pfennig, D. W., Gamboa, G. J., Reeve, H. K., Shellman Reeve, J., and Ferguson, I. D. 1983. The mechanism of nestmate discrimination in social wasps (*Polistes*, Hymenoptera: Vespidae). *Behavioral Ecology and Sociobiology* 13: 299–305.
1. Pfennig, D. W., Reeve, H. K., and Shellman, J. S. 1983. Learned component of nestmate discrimination in workers of a social wasp, *Polistes fuscatus* (Hymenoptera: Vespidae). *Animal Behaviour* 31: 412–416.

#### **Book chapters (Peer-reviewed):**

11. Pfennig, D. W. Key questions about phenotypic plasticity. In: D. W. Pfennig (ed.) *Phenotypic Plasticity & Evolution: Causes, Consequences, Controversies*, CRC Press, Boca Raton, FL. (in press)
10. Levist, N. A. and Pfennig, D. W. Innovation and diversification via plasticity-led evolution. In: D. W. Pfennig (ed.) *Phenotypic Plasticity & Evolution: Causes, Consequences, Controversies*, CRC Press, Boca Raton, FL. (in press).
9. Levist, N. A. and Pfennig, D. W. 2020. Phenotypic plasticity and the origins of novelty. pp. 443–458. In H. Levine, M. K. Jolly, P. Kulkarni, and V. Nanjundiah (eds.) *Phenotypic Switching: Implications in Biology and Medicine*, Academic Press, San Diego, CA.

8. Levist, N. A. and Pfennig, D. W. 2017. Phenotypic plasticity. In K. Pfennig (ed.) *Oxford Bibliographies in Evolutionary Biology*. Oxford University Press, New York. (DOI: 10.1093/OBO/9780199941728-0093).
7. Pfennig, D. W. 2017. Principle of divergence. In V. Zeigler-Hill and T. Shackelford (eds.) *Encyclopedia of Personality and Individual Differences*. Springer (doi: 10.1007/978-3-319-28099-8\_1561-1).
6. Kingsolver, J. G. and Pfennig, D. W. 2013. Responses to selection: natural populations. pp. 238-246. In J. B. Losos (ed.) *The Princeton Guide to Evolution*, Princeton University Press, Princeton, NJ.
5. Pfennig, D. W. 2016. Ecological evolutionary developmental biology. pp. 474–481. In R. M. Kliman (ed.) *Encyclopedia of Evolutionary Biology*. vol. 1, Academic Press, Oxford.
4. Kikuchi, D. W. and Pfennig, D. W. Mimicry. 2012. In D. Gibson (ed.) *Oxford Bibliographies in Ecology*. Oxford University Press, New York. (DOI: 10.1093/OBO/9780199830060-0027)
3. Pfennig, D. W. and Kingsolver, J. G. 2009. Phenotypic selection. pp. 101–108. In S. A. Levin (ed.) *The Princeton Guide to Ecology*, Princeton University Press, Princeton, NJ.
2. Pfennig, D. W. 2002. Kin recognition. pp. 592–595. In M. Pagel (ed) *Encyclopedia of Evolution*, Oxford University Press, Oxford.
1. Sherman, P. W., Reeve, H. K., and Pfennig, D. W. 1997. Recognition systems. pp. 69–96. In J. R. Krebs and N. B. Davies (eds) *Behavioural Ecology: An Evolutionary Approach*, 4th edn, Blackwell Scientific Publications, Oxford.

**Other publications (Not peer-reviewed):**

19. Pfennig, D. W. and Pfennig, K. S. 2020. Quick guide: character displacement. *Current Biology* 30: R1023–R1024.
18. Levist, N. A. and Pfennig, D. W. 2020. Evolution: ancestral plasticity promoted extreme temperature adaptation in thermophilic bacteria. *Current Biology* 30: R68–R70.
17. Levist, N. A. and Pfennig, D. W. 2017. Organisms and their environment: an evolving relationship. *Evolution* 71: 503–504. (book review of *Organism and environment: ecological development, niche construction, and adaptation* by S. E. Sultan).
16. Pfennig, D. W. 2016. To mimicry and back again. *Nature* 534:184–185.
15. Pitnick, S. and Pfennig, D. W. 2014. Brotherly love benefits females. *Nature* 505: 626–627.
14. Pfennig, D. W. 2013. Inviatile immigrants drive diversification in the sea. *Proceedings of the National Academy of Sciences, USA* 110: 3713–3714.

13. Pfennig, D. W. 2012. Mimicry: ecology, evolution, and development. *Current Zoology* 58: 603–606.
12. Pfennig, D. W. and Kikuchi†, D. W. 2012. Life imperfectly imitates life. *Nature* 483: 410–411.
11. Kingsolver, J. G. and Pfennig, D. W. 2011. Darwin in the 21st Century. *Evolution* 65: 2130–2132. (book review of *Evolution Since Darwin*, Edited by M. Bell, D. Futuyma, W. Eanes, and J. Levinton).
10. Abbot, P. et al. (Pfennig, D. W. is one of 137 authors). 2011. Inclusive fitness theory and eusociality. *Nature* 471: E1–E4. (Brief communication arising from the article: M. A. Nowak, C. E. Tarnita and E. O. Wilson. *Nature* 466, 1057–1062 (2010)).
9. Pfennig, D. W. and Ledón-Rettig†, C. 2009. The flexible organism. *Science* 325: 268–269. (book review of *Ecological Developmental Biology* by S. F. Gilbert and D. Epel).
8. Pfennig, D. W. 2004. Putting genes in perspective. *The American Scientist* 92: 84–86. (book review of *Developmental Plasticity and Evolution*, by M. J. West-Eberhard).
7. Kingsolver, J. G. and Pfennig, D. W. 2001. Testing Darwin's postulates. *Trends in Ecology and Evolution* 16: 165. (book review of *Adaptive Genetic Variation in the Wild*, Edited by T. Mousseau, B. Sinervo, and J. A. Endler).
6. Pfennig, D. W. 2000. Attack of the tadpoles! *Dragonfly* 4: 16–17.
5. Pfennig, D. W. 1998. The evolution of selflessness and selfishness. *BioScience* 48:9–11. (book review of *Survival Strategies: Cooperation and Conflict in Animal Societies*, by R. Gadagkar).
4. Pfennig, D. W. and Sherman, P. W. 1995. Kin recognition. *Scientific American* 272 (6): 98–103.  
  
(featured on the cover of the journal)
3. Pfennig, D. W. 1994. Cannibalism. *Journal of Evolutionary Biology* 4:121–123. (book review of *Cannibalism. Ecology and Evolution among Diverse Taxa*, Edited by M. A. Elgar and B. J. Crespi).
2. Pfennig, D. W. 1992. Social evolution of wasps. *Journal of Evolutionary Biology* 5: 729–731. (book review of *The Social Biology of Wasps*, Edited by K. G. Ross and R. W. Matthews).
1. Pfennig, D. W. and Sherman, P. W. 1992. Identifying relatives. *Science* 255: 217–218. (book review of *Kin Recognition*, Edited by P. G. Hepper).

## Research Funding

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(I am the sole PI on all grants listed below unless noted otherwise)

### Major grants:

- 2018-2022 NSF-DEB 1753865: "Evaluating phenotypic plasticity's role in adaptive evolution" (\$566,854 total costs; 06/01/2018–05/31/2022)
- 2016-2019 NSF-DEB 1643239: "Does adaptation facilitate or constrain further adaptation? Evaluating the origins of character displacement" (\$172,000 total costs; PI with co-PI Karin Pfennig, UNC; 07/01/2016–06/30/2019)
- 2010-2016 NSF-DEB 1019479: "Evolution and development of character displacement" (\$557,600 total costs; 09/01/2010–08/31/2016)
- 2009-2013 NSF-DEB 0922111: "Competition and the origins of diversity: experimental evolution of resource polymorphism, character displacement, and reproductive isolation in viruses" (\$561,000 total costs; co-P.I. with Christina Burch, UNC; 07/15/2009–07/14/2013)
- 2007-2011 NSF-DEB 0640026: "Maternal effects, character displacement, and the origins of diversity" (\$371,350 total costs; 02/01/2007–01/31/2011)
- 2003-2007 NSF-DEB 0234714: "Competition and the origins of diversity: an experimental test of the ecological speciation hypothesis" (\$367,384 total costs; 03/01/2003–02/28/2007)
- 1999-2002 NSF-DEB 9873633: "An experimental investigation of ecological character displacement in polyphenic species" (\$167,131 total costs; 05/01/1999–04/30/2002)
- 1998-2003 NSF-IBN 9808641: "Evolution and development of polyphenism" (\$225,000 total costs)
- 1995-1999 NSF-IBN-9512110: "Kin recognition in polyphenic species" (\$163,000 total costs)

### Other grants and supplements:

- 2020 Research Supplement (to support publication of an edited book), funded by the NSF (\$12,400 total costs)
- 2017-2018 Seed Grant, funded by the UNC Biology Dept. (\$30,000 total costs); PI with co-PIs Dan McKay and Nick Levis (UNC)
- 2017-2018 Research Experience for Teachers Supplement, funded by the NSF (\$15,000 total costs)
- 2017-2018 Research Experience for Undergraduates Supplement, funded by the NSF (\$7,000 total costs)

2016	Research Experience for Undergraduates Supplement, funded by the NSF (\$12,500 total costs)
2015	Research Experience for Undergraduates Supplement, funded by the NSF (\$12,600 total costs)
2013	Research Experience for Undergraduates Supplement, funded by the NSF (\$12,500 total costs)
2011-2013	NSF-DEB 1110385: "Evolution of mimicry" (\$15,000 total costs); Doctoral Dissertation Improvement Grant awarded to David Kikuchi (graduate student in my lab); 05/01/2011–04/30/2013
2009-2013	"Evolution and development of polyphenisms: pathways to innovation and diversification", Working Group funded by the National Evolutionary Synthesis Center; co-P.I. with Armin Moczek (IU Bloomington)
2008	"Pathways to innovation and diversification: causes and consequences of polyphenism", Symposium funded by the Animal Behavior Society (\$7,000 total costs); co-P.I. with Armin Moczek (IU Bloomington)
2008	Research Experience for Undergraduates Supplement, funded by the NSF (\$6,000 total costs)
2007	Research Experience for Undergraduates Supplement, funded by the NSF (\$6,000 total costs)
2006	Research Experience for Undergraduates Supplement, funded by the NSF (\$6,000 total costs)
2004	Research Experience for Undergraduates Supplement, funded by the NSF (\$11,200 total costs)
2000	Research Experience for Undergraduates Supplement, funded by the NSF (\$6,000 total costs)

## Teaching & Mentoring

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### Courses taught:

#### University of North Carolina

Biol 469	Behavioral Ecology. 1997, 1999, 2018*, 2019* (*Maymester)
Biol 471	Evolutionary Mechanisms. 1997-present (1/2 semester/yr)
Biol 471L	Evolutionary Mechanisms Lab. 2016-present (1/2 semester/yr)
Biol 514	Evolution and Development. 2002-2012 (1/2 semester/yr)

Biol 514H Evolution and Development (honors class). 2013-2017 (1/2 semester/yr);  
2018 (Full semester)

Biol 659 Graduate Seminar in Evolutionary Biology. 1999, 2001, 2005, 2006, 2010,  
2016, 2019

University of Illinois

EEE 346 Animal Behavior. 1993, 1995

EEE 383 Behavioral Ecology. 1994

EEE 452 Graduate Seminar in Evolutionary Biology. 1994, 1996

Southwestern Research Station (Portal, AZ)

Field Herpetology of the Southwest. 2012-present (1 lecture/summer)

**Research advisor to the following graduate students:**

(All are Ph.D. students unless noted otherwise; \*NSF pre-doctoral fellow; †UNC Royster Fellow)

2018-present Emily Harmon\*†

2018-present Andrew Isdaner

2015-present Pat Kelly (co-advised with Karin Pfennig)

2014-2020 Nick Levis† (Ph.D. 2020); now a postdoctoral fellow, Indiana University

2014-2019 Sofia de la Serna Buzon (Ph.D. 2019; co-advised with Karin Pfennig)

2013-2019 Chris Akcali\* (Ph.D. 2019); now a postdoctoral fellow, National Autonomous  
University of Mexico

2009-2015 Lisa Bono (Ph.D. 2015; co-advised with Christina Burch); now a postdoctoral  
fellow, Yale University / New York University

2009-2012 Jeff W. Paull (M.S. 2012); now an Aquatic Scientist at the Texas Commission  
on Environmental Quality

2008-2013 David Kikuchi\*† (Ph.D. 2013); now a Fellow at the Institute for Advanced  
Study, Berlin, Germany

2008-2011 Aaron R. Leichty (M.S. 2011); now a Postdoctoral Fellow, UC Davis

2005-2010 Dr. Cris Ledón-Rettig\* (Ph.D. 2010); now an Assistant Professor, Indiana U.

2003-2010 Dr. Ryan A. Martin (Ph.D. 2010); now an Assistant Professor, Case Western  
Reserve University

2002-2008 Dr. Amber M. Rice\*† (Ph.D. 2008); now an Associate Professor, Lehigh  
University, Bethlehem, Pennsylvania

- 1999-2006 Dr. George R. Harper, Jr. (Ph.D. 2006); now a Distinguished Professor, Hendrix College, Conway, Arkansas
- 1994-2001 Dr. Michael L. G. Loeb (Ph.D. 2001); now a science writer
- 1994-1997 Dr. Eric A. Hoffman (M.S. 1997); now an Associate Professor, University of Central Florida, Orlando, Florida

**Member on the following non-UNC graduate students' committees:**

(All are Ph.D. students unless noted otherwise)

- 2013-2018 Patrick Green, Duke University
- 2013-2014 Mandy Womble, North Carolina State University
- 2008-2012 Dan Runcie, Duke University
- 2008-2011 Justin Yeager, East Carolina University (master's student)
- 2008 Megan Higgie, University of Queensland, Australia (external examiner)
- 2008 Kevin Parsons, University of Guelph (external examiner)
- 2006 Arianne Albert, University of British Columbia (external examiner)
- 2001-2006 Renee A. Duckworth, Duke University
- 2000-2005 Maria Pia Miglietta, Duke University
- 1995-2000 W. Anthony Frankino, Indiana University
- 1996-1999 Peter J. Murphy, Duke University

**Research advisor to the following postdocs:**

- 2014-2017 Dr. Paul Durst; SPIRE postdoc; now at Princeton University
- 2011-2012 Dr. Tami Cruikshank; NESCent postdoc
- 2011-2012 Dr. Clinton Francis; NESCent postdoc; now an Assistant Prof., California Polytechnic State University
- 2009-2012 Dr. Juan Santos; NESCent postdoc; now a postdoc at Brigham Young University
- 2000-2005 Dr. Allison M. Welch; now an Assistant Prof., College of Charleston
- 2000-2001 Dr. W. Anthony Frankino; now an Associate Prof., University of Houston
- 1999-2000 Dr. Peter J. Murphy; now a Research Associate at University of Nevada, Reno

**Research advisor to the following undergraduate students:**

(\*undergraduate co-author; see Publications list above for citation)

2019-2020	Hannah Kennedy
2018-2019	Adam Yeh
2018-2019	Matthew Lowe
2018-2019	Carly Fuller
2018-2019	Rudi Boekschoten
2017-2019	Matthew Nunez
2017-2018	Christina McCutchin
2017-2018	Andrew Isdaner*
2017-2018	Madison Staves
2016-2017	Wilson Zhang
2016-2017	Connor Barringer
2016-2017	Kevin Schulze (honors thesis)
2015-2016	Kerry O'Donnell (REU student)*
2013-2014	Dylan Carroll (honors thesis)
2013-2014	Brianna Osinski
2013-2014	Justin Dizon (REU student)
2012-2014	Georgia Titcomb (honors thesis)*
2012-2015	Bradley Alf (honors thesis)*
2011-2012	Robert Haynes
2011-2012	Antonio Serrato-Capuchina
2011-2012	Thanh-Tam Thi
2010-2011	Sara Garnett (honors thesis)
2010	David Cykert
2008	Rachael Bernstein
2007-2008	Erika Schroeder
2006-2008	Matt McGee (honors thesis)*
2004-2006	Michelle Tien Landstrom
2001-2003	Abel Brumo*
1997-2000	William Harcombe (honors thesis)*
1997-1999	Katrina Rapa (honors thesis)

1995-1996 Simon Ho (honors thesis)\*

## Invited Presentations

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### Invited presentations to public audiences (in person):

- 2019 Gave a presentation on "Plasticity, epigenetics, and evolution" for Darwin Day at the North Carolina Botanical Garden, Chapel Hill, NC
- 2018 Gave 3 presentations on "Life imitating life: the evolution of coral snake mimicry" for Science Day at Culbreth Middle School, Chapel Hill, NC
- 2018 Gave a presentation on "Life imitating life: the evolution of coral snake mimicry" for Herpetology class, Duke University
- 2016 Gave a presentation on "Environment, epigenetics, and evolution" for the UNC Program in the Humanities (Adventure in Ideas Series)
- 2016 Gave a presentation on "Life imitating life: evolution of mimicry" for the Cleveland Museum of Natural History, Cleveland, OH
- 2016 Gave a presentation on "The evolution of mimicry: is that snake dangerous?" for Reptile and Amphibian Day, North Carolina Museum of Natural Sciences
- 2016 Gave a presentation on "The evolution of mimicry: is that snake dangerous?" for Darwin Day, North Carolina Museum of Natural Sciences
- 2015 Gave a presentation on "Cannibal tadpoles and rattlesnake tails: plasticity and the origins of diversity" for the Cornell Herpetological Club, Ithaca, NY
- 2015 Gave 3 presentations on "Coral snake mimicry: is that snake dangerous?" for Science Day at Culbreth Middle School, Chapel Hill, NC
- 2013 Gave a presentation on "When life imitates life" for North Carolina Congress of Herpetology, NC Zoo, Asheboro, NC
- 2012 Gave a presentation on "Nature versus nurture or nature *and* nurture?" for the UNC Program in the Humanities and Human Values (Adventure in Ideas Series)
- 2011 Gave a presentation on "When life imitates life" for the North Carolina Herpetological Society Spring Meeting, Pocosin Lakes National Wildlife Refuge, NC
- 2011 Gave a presentation on "What does a biology professor do?" for Rashkis Elementary School, Chapel Hill, NC

- 2010 Gave a presentation on "What is evolution, how does it work, and why is it important?" for the Osher Lifelong Learning Institute, Duke University
- 2009 Gave a presentation on "How to be a biologist" for Rashkis Elementary School, Chapel Hill, NC
- 2008 Gave a presentation on "What is evolution, how does it work, and why is it important?" for the Morehead Planetarium and Science Center, UNC (part of "Family Science Day")
- 2008 Gave a presentation on "Evolution: how does it work and why it is important?" for the NC Society for Ethical Culture
- 2007 Gave a presentation on "What is phenotypic plasticity and why is it important?" for the North Carolina Herpetological Society Spring Meeting, Grandfather Mountain, NC
- 2006 Gave a presentation on "Evolution: how does it work and why it is important?" for the Science Spectrum Symposium, UNC (presentation for high school students)
- 2006 (June) Gave a presentation on "Evolution: how does it work and why it is important?" for the UNC Program in the Humanities (Adventure in Ideas Series)
- 2006 (January) Gave a presentation on "Evolution: how does it work and why it is important?" for the UNC Program in the Humanities (Adventure in Ideas Series)
- 1999-2005 Gave annual presentations on "Evolution" for McDougle Middle School, Carrboro, NC (for 6 years)
- 1997 Gave a presentation on "Evolution" for the Biology Undergraduate Student Association, Duke University

**Invited presentations to public audiences (via electronic media):**

- 2019 Appeared on an episode of "Science Nation" (produced by the NSF)
- 2018 Interviewed on a podcast ("The Institute") for the Institute for the Arts and Humanities, UNC, Chapel Hill
- 2016 Appeared on the BBC/PBS TV show "Natural Born Hustlers: Episode 1 - Staying Alive" (part of PBS's *Nature* series)
- 2004 Appeared on National Geographic TV's "Are We Cannibals?"
- 2000 Appeared on the BBC/PBS TV show "The Body Changers" (part of PBS's *Nature* series)



2013 Brigham Young University, Dept. of Biology (graduate students' choice)

2013 Davidson College, Dept. of Biology

2013 American Museum of Natural History's Southwestern Research Station

2013 Wake Forest University, Dept. of Biology

2013 Duke University (Developmental and Stem Cell Biology group)

2013 University of North Carolina at Chapel Hill, Royster Society of Fellows  
(UNC-campus wide graduate students' choice "pub" talk)

2012 Reed College, Dept. of Biology

2012 American Museum of Natural History's Southwestern Research Station\*

2012 North Carolina State University, Dept. of Biology

2011 University of Chicago (Evolutionary Morphology group)

2011 Duke University, Dept. of Biology (Evo-Devo-Genomics group)

2011 American Museum of Natural History's Southwestern Research Station

2011 Boston University, Dept. of Biology

2010 University of South Carolina, Dept. of Biological Sciences (graduate students' choice)

2010 American Museum of Natural History's Southwestern Research Station

2010 University of Cincinnati, Dept. of Biological Sciences

2010 University of Nebraska, Dept. of Biological Sciences (graduate students' choice)

2010 Michigan State University, Graduate Program in Ecology, Evolutionary Biology, and Behavior

2009 American Museum of Natural History's Southwestern Research Station

2009 University of North Carolina at Greensboro, Dept. of Biology

2008 Cornell University, Section of Neurobiology and Behavior

2008 Indiana University, Dept. of Biology

2008 Lehigh University, Dept. of Biology

2008 East Carolina University, Dept. of Biology (graduate students' choice)

2008 Ohio University, Dept. of Biological Sciences (graduate students' choice)

2008 University of New Orleans, Dept. of Biology (graduate students' choice)

2008 Duke University, Graduate Program in Ecology

2007 National Evolutionary Synthesis Center, Durham, NC

2007 University of Missouri, Dept. of Biological Sciences  
2007 American Museum of Natural History's Southwestern Research Station  
2007 Stony Brook University, Dept. of Ecology and Evolution (three talks)\*  
2007 Iowa State University, Dept. of Ecology, Evolution, and Organismal Biology  
2005 University of Kentucky, Dept. of Biology\*  
2005 Duke University, Dept. of Biology (EvoDevo group)  
2005 University of Virginia Mountain Lake Biological Station (Walton Lecture)  
2005 College of Charleston, Dept. of Biology  
2003 University of Louisville, Dept. of Biology  
2002 Colorado State University, Dept. of Biology  
2001 University of Memphis, Dept. of Biology  
2001 Rice University, Dept. of Ecology and Evolution  
2001 University of Texas at Austin, Section of Integrative Biology  
2000 Washington University, Dept. of Biology\*  
2000 Wesleyan University, Dept. of Biology  
2000 Appalachian State University, Dept. of Biology  
1998 American Museum of Natural History's Southwestern Research Station  
1998 University of Oklahoma, Dept. of Zoology\*  
1997 University of Georgia, Savannah River Ecology Lab  
1997 North Carolina State University, Dept. of Zoology  
1997 East Carolina University, Dept. of Biology  
1996 Cornell University, Section of Neurobiology and Behavior  
1996 Duke University, Dept. of Zoology  
1996 University of California at Santa Cruz, Dept. of Biology  
1996 University of North Carolina, Dept. of Biology  
1996 University of Arizona, Dept. of Ecology and Evolutionary Biology  
1995 University of Chicago, Dept. of Ecology and Evolution  
1995 University of California at Santa Barbara, Dept. of Biological Sciences  
1995 University of Nebraska, School of Biological Sciences\*  
1995 University of Illinois, Dept. of Animal Sciences  
1994 University of Kansas, Dept. of Ecology and Systematics

1994 University of Missouri, Dept. of Biological Sciences

1993 Purdue University, Dept. of Biological Sciences

1993 Indiana State University, Dept. of Life Sciences

1993 University of Illinois, Dept. of Entomology

1993 University of California at Irvine, Dept. of Ecology and Evolutionary Biology\*

1993 State University of New York at Albany, Dept. of Biological Sciences

1992 Harvard University, Museum of Comparative Zoology

1992 Oregon State University, Dept. of Zoology (graduate students' choice)\*

1992 Wake Forest University, Dept. of Biology

1992 Washington State University, Dept. of Zoology

1992 University of Idaho, Dept. of Biology

1992 University of Illinois, Dept. of Ecology, Ethology and Evolution

1992 Dartmouth College, Dept. of Biology

1992 Queen's University, Dept. of Biology

1991 Cornell University, Section of Neurobiology and Behavior

1990 University of Arizona, Dept. of Ecology and Evolutionary Biology

1990 Cornell University, Section of Genetics and Development

1989 Arizona State University, Dept. of Zoology

1988 American Museum of Natural History's Southwestern Research Station

1987 American Museum of Natural History's Southwestern Research Station

At professional conferences:

2019 Gave a presentation at the Society for the Study of Evolution National Meeting, Providence, RI

2013 Gave a presentation at the Society for the Study of Evolution National Meeting, Snowbird, UT

2012 Invited participant in symposium on "The Impacts of developmental plasticity on evolutionary innovation and diversification"; Charleston, SC; sponsored by the Society for Integrative and Comparative Biology

2009-2011 Invited participant in working group on "Costs of plasticity"; sponsored by the National Evolutionary Synthesis Center

- 2006 Gave a presentation at Society for the Study of Evolution National Meeting, Stony Brook, NY
- 2004 Gave a presentation at Society for the Study of Evolution National Meeting, Ft. Collins, CO
- 2002 Invited participant in symposium on "Phenotypic variation"; Denver, CO; sponsored by the Geological Society of America
- 2002 Gave a presentation at Society for Integrative and Comparative Biology National Meeting, Anaheim, CA
- 2001 Gave a presentation at Society for Integrative and Comparative Biology National Meeting, Chicago, IL
- 2000 Gave a presentation at Society for Integrative and Comparative Biology National Meeting, Atlanta, GA
- 1998 Gave a presentation at International Society for Behavioral Ecology International Meeting, Asilomar, CA
- 1997 Gave a presentation at Society for the Study of Evolution National Meeting, Boulder, CO
- 1996 Gave a presentation at Animal Behavior Society National Meeting, Flagstaff, AZ
- 1995 Gave a presentation at Winter Animal Behavior Conference, Jackson Hole, WY
- 1994 Gave a presentation at Indiana IGERT Mini-Symposium on "Origins of Novel Features", Bloomington, IN
- 1994 Invited participant in symposium on "Origins and evolution of animal body plans" sponsored by Indiana University (Molecular Biology Symposium)
- 1992 Invited participant in symposium on "Cannibalism and infanticide" sponsored by the American Society of Zoologists
- 1992 Gave a presentation at Society for the Study of Evolution National Meeting, Asilomar, CA
- 1991 Gave a presentation at Western Regional Conference of Comparative Endocrinology, Tempe, AZ
- 1991 Gave a presentation at Society for the Study of Evolution National Meeting, Hilo, HI
- 1990 Gave a presentation at American Society of Zoologists National Meeting, San Antonio, TX
- 1990 Gave a presentation at International Congress of Systematic and Evolutionary Biology IV, Washington, D.C.

- 1986 Invited participant in symposium on “Kin recognition” sponsored by the Entomological Society of America
- 1982 Gave a presentation at International Union for the Study of Social Insects, Boulder, CO

## Professional Service

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### **Extramural service:**

#### Elected office:

- 2000-2003 Chair, Division of Animal Behavior, Society for Integrative and Comparative Biology

#### Editorial:

- 2015-present Editorial Advisory Board, *F1000Research* (<http://f1000research.com>)
- 2015-2018 Associate Editor, *Behavioral Ecology and Sociobiology*
- 2014-present Editorial Board, *Evolutionary Developmental Biology*
- 2014-present Contributing Member, *F1000Prime* (Faculty of 1000)
- 2011-2012 Guest Editor, *Current Zoology*
- 2006-2008 Associate Editor, *Evolution*
- 2006-2007 Associate Editor, *Journal of Experimental Zoology*
- 1999-2002 Subject Editor, *Ecology*

#### Advisory boards:

- 2014 Member, Transition Committee, National Evolutionary Synthesis Center
- 2013-2016 Member, Young Investigator Award Selection Committee, American Society of Naturalists (2015-2016: Committee Chair)
- 2009-2012 Member, Operations Committee, National Evolutionary Synthesis Center
- 2008-09 Member, Director Search Committee, National Evolutionary Synthesis Center
- 2003-05, 2010 Member, Advisory Panel, National Science Foundation (NSF) Program in Evolutionary Ecology
- 2004 Member, Advisory Panel, NSF Program in Animal Behavior
- 1999 Member, Advisory Panel, NSF Doctoral Dissertation Improvement Grants

1998-present	Board of Scientific Advisors, Highlands Biological Station (UNC)
1997-2000	Board of Directors, Organization of Tropical Studies
1996-98	Scientific Advisory Committee, Southwestern Research Station, Portal, AZ

Referee for the following journals and publishers

*American Naturalist; Animal Behaviour; Axios; Behavioral Ecology; Behavioral Ecology and Sociobiology; Biological Journal of the Linnean Society of London; Biological Reviews; Biology Letters; BMC Evolutionary Biology; Conservation Biology; Copeia; Current Biology; Current Zoology; Ecology; Ecology Letters; Evolution; Evolutionary Ecology; Frontiers in Genetics; Frontiers in Ecology and Evolution; G3: Genes, Genomes, Genetics; Heredity; Herpetological Journal; Journal of Animal Ecology; Journal of Experimental Zoology; Journal of Evolutionary Biology; Journal of Herpetology; Journal of Theoretical Biology; Journal of Zoology; Molecular Ecology; Molecular Ecology Resources; Nature; Nature Communications; Naturwissenschaften; New Scientist; Pearson Prentice Hall Publishers; PLoS One; Princeton University Press; Proceedings of the National Academy of Sciences, USA; Proceedings of the Royal Society B: Biological Sciences (selected as one of the top reviewers for 2014); Royal Society Open Science; Science; Science News; Sinauer Associates, Inc.; Trends in Ecology and Evolution; Zoological Journal of the Linnean Society*

Funding agencies

Austrian Science Fund; German Excellence Initiative (Zukunftskolleg Fellowship); National Geographic Society; National Sciences and Engineering Research Council of Canada; Netherlands Organisation for Scientific Research; The Royal Society (U.K.); Sigma Xi; Swiss National Science Foundation; US-Israel Binational Science Foundation; U. S. National Science Foundation

External faculty promotions

Boston University; University of Arizona; University of California at Los Angeles; Chatham University; University of Cincinnati; Dartmouth College; East Carolina University; University of Glasgow (Scotland); Indiana State University; Indiana University; Iowa State University; University of Memphis; Michigan State University; University of Missouri; North Carolina State University; Ohio University; University of Oklahoma; University of Pittsburgh; Rensselaer Polytechnic Institute; Rice University; Seoul National University (South Korea); Texas A&M University; University of Texas at Arlington; University of Virginia; Washington State University; Weizmann Institute of Science (Israel)

### Other activities

2014	Member, Organizing Committee, for Evolution2014, the international meeting of the Society of Evolution in Raleigh, NC
2012	Member, Tenure and Promotion Committee, Dept. of Biology, Duke University (evaluated one candidate for promotion to Assistant Professor with tenure)
2011	External reviewer, Dept. of Biology, East Carolina University
2008	Abstract reviewer, International Society for Behavioral Ecology's International Meeting at Cornell University
2001-2002	Judging Committee, Student Paper and Poster Awards, Division of Animal Behavior, Society for Integrative and Comparative Biology

### **Intramural service:**

#### UNC Biology Department

2019-2020	Chair, Teaching and Service Allocation Committee
2019-2020	Member, Post-Tenure Review Committee
2019-2020	Member, Promotion Committee (evaluated one candidate for reappointment for second term as an Assistant Professor)
2015	Member, Tenure and Promotion Committee (evaluated two candidates for promotion to Full Professor)
2014	Member, Tenure and Promotion Committee (evaluated one candidate for promotion to Associate Professor with tenure)
2011	Chair, Tenure and Promotion Committee (evaluated one candidate for promotion to Full Professor)
2010	Member, Tenure and Promotion Committee (evaluated one candidate for promotion to Associate Professor with tenure)
2009	Chair, Tenure and Promotion Committee (evaluated one candidate for promotion to Associate Professor with tenure)
2009	Member, Tenure and Promotion Committee (evaluated one candidate for promotion to Associate Professor with tenure)
2007	Chair, Tenure and Promotion Committee (evaluated two candidates for promotion to Associate Professor with tenure)
2006-2018	Member, Chair's Advisory Committee
2003-2012	Director, Graduate Studies in Evolution, Ecology, and Organismal Biology
2002	Chair, Evolutionary Geneticist Search Committee (hired Dr. Corbin Jones)

2001	Chair, Evolutionary Biologist Search Committee (hired Drs. Christina Burch and Maria Servedio)
1999-2001	Member, Committee on Organismal Biology
1997-2003	Member, Graduate Admissions Committee

UNC Curriculum in Environment and Ecology

2008-2012	Member, Chair's Advisory Committee
2003-04	Member, Conservation Biologist Search Committee (hired Dr. Charles Mitchell)

College and University-wide

2019-present	Faculty Mentor, Targeting Equity in Access to Mentoring (TEAM) ADVANCE Center for Faculty Excellence, UNC
2019-present	Member, Recruitment Fellowship Committee, The Graduate School, UNC
2019-2021	Board Member, Royster Society of Fellows, The Graduate School, UNC
2018	Chair, Selection Committee for Director of the Royster Society of Fellows, The Graduate School, UNC
2012-2015	Director of the Royster Society of Fellows, The Graduate School, UNC
2010-2018	Chair, Polanyi Lectureship Committee, College of Arts and Sciences (committee brought in: Michael Ruse [2011], Philip Kitcher [2013], Naomi Oreskes [2015], Janet Browne [2017])
2008-2011	Member, Dean's Distinguished Dissertation Award Committee
2008-2010	Member, Institutional Animal Care and Use Committee
2003	Member, Packard Fellowship Committee
1999	Member, Biological Oceanographer and Molecular Ecologist Search Committees for Department of Marine Sciences (hired Drs. John Bruno, Peter Marko, Rachel Nobel)