

Assistant Professor
Department of Biological Sciences
Auburn University
331 Funchess Hall
Auburn, Alabama 36849

Phone: 802-280-5843
E-mail: joaks@auburn.edu
Web: phyletica.org

Education

- 2007–2013 Ph.D. in Ecology & Evolutionary Biology, University of Kansas
Advisors: Rafe Brown & Mark Holder
Dissertation: Islands and Integrals: Processes of Diversification in an Island Archipelago and Bayesian Methods of Comparative Phylogeographical Model Choice (*University Honors*; [link](#))
- 2004–2007 M.S. in Biological Sciences, Louisiana State University
- 1999–2004 B.S. in Biology, University of Wisconsin Oshkosh (*Summa Cum Laude*)

Research/Curatorial Appointments

- 2016–present Assistant Professor, Department of Biological Sciences, Auburn University
- 2016–present Curator of Amphibians and Reptiles, Auburn University Museum of Natural History
- 2013–2016 NSF Postdoctoral Research Fellow, University of Washington
◦ Developed statistical methods of comparative phylogeographical model choice

Teaching Experience

- 2017 Workshop on using version control to improve reproducibility in science, Auburn Bioinformatics Bootcamp, Auburn University
- 2017 Advanced statistical methods for evolutionary genetics (BIOL 7960), Auburn University
- 2017 Herpetology (BIOL 5740/6740), Auburn University
- 2016 Evolution & Systematics (BIOL 3030), Auburn University
- 2014–2015 Lecturer, Introductory Biology (BIOL 180), University of Washington
◦ Developing and implementing active-learning exercises, assessing student learning, and lecturing under the mentorship of Dr. Scott Freeman.
- 2014 Guest lecturer, Biogeography (BIOL 470; primary instructor John Klicka), University of Washington
◦ Presented lecture on Phylogenetics
- 2014 Applied Phylogenetics (BIOL 449; primary instructor Adam Leaché) for undergraduate and graduate students, University of Washington
◦ Developed learning-assessment survey for the course
◦ Led guest lecture and lab on divergence-time estimation
- 2013 Teaching Assistant for Software Carpentry Bootcamp at the University of Kansas, 22–23 August 2013
◦ Assisted in teaching graduate students, postdocs, and faculty basic principles of computer programming
- 2013 Instructor for Workshop on New Methods for Phylogenomics and Metagenomics, University of Texas at Austin, 17 February 2013
◦ Taught workshop for the software package [SATé](#) to approximately 150 participants, including graduate students, postdocs, and faculty
- 2012 Teaching Assistant for Workshop on Advances in Multiple Sequence Alignment and Phylogeny Estimation, Smithsonian Institution, Washington DC, 20–21 May 2012
◦ Helped write tutorials and assisted workshop participants with phylogenetic analyses

Peer-reviewed Publications

- Leaché, A. D. and J. R. Oaks (2017). The utility of single nucleotide polymorphism (SNP) data in phylogenetics. *Annual Review of Ecology, Evolution, and Systematics* 48: [link](#).
- Lira-Noriega, A., O. Toro-Núñez, J. R. Oaks, and M. E. Mort (2015). The roles of history and ecology in chloroplast phylogeographic patterns of the bird-dispersed plant parasite *Phoradendron californicum* Nutt. (Viscaceae) in the Sonoran Desert. *American Journal of Botany* 102: 149–164. [link](#).
- Grismer, J. L., A. M. Bauer, L. L. Grismer, K. Thirakhupt, A. Aowphol, J. R. Oaks, P. L. Wood, Jr., K. O. Chan, N. Thy, M. Cota, and T. Jackman (2014). Multiple origins of parthenogenesis, and a species phylogeny for the Southeast Asian butterfly lizards, *Leiolepis*. *Biological Journal of the Linnean Society* 113: 1080–1093. [link](#).
- *Oaks, J. R. (2014). An Improved Approximate-Bayesian Model-choice Method for Estimating Shared Evolutionary History. *BMC Evolutionary Biology* 14: 150. [link](#). *Highly accessed.
- Oaks, J. R., C. W. Linkem, and J. Sukumaran (2014). Implications of uniformly distributed, empirically informed priors for phylogeographical model selection: A reply to Hickerson et al. *Evolution* 68: 3607–3617. [link](#).
- Siler, C. D., J. R. Oaks, K. Cobb, O. Hidetoshi, and R. M. Brown (2014). Critically endangered island endemic or peripheral population of a widespread species? Conservation genetics of Kikuchi's gecko and the global challenge of protecting peripheral oceanic island endemic vertebrates. *Diversity and Distributions* 20: 756–772. [link](#).
- Welton, L. J., P. L. Wood, Jr., J. R. Oaks, C. D. Siler, and R. M. Brown (2014). Fossil-calibrated phylogeny and historical biogeography of Southeast Asian water monitors (*Varanus salvator* Complex). *Molecular Phylogenetics and Evolution* 74: 29–37. [link](#).
- Brown, R. M., C. D. Siler, C. H. Oliveros, J. A. Esselstyn, A. C. Diesmos, P. A. Hosner, C. W. Linkem, A. J. Barley, J. R. Oaks, M. B. Sanguila, L. J. Welton, R. G. Moyle, A. T. Peterson, and A. C. Alcalá (2013). Evolutionary processes of diversification in a model island archipelago. *Annual Review of Ecology, Evolution, and Systematics* 44: 411–435. [link](#).
- Oaks, J. R., J. Sukumaran, J. A. Esselstyn, C. W. Linkem, C. D. Siler, M. T. Holder, and R. M. Brown (2013). Evidence for climate-driven diversification? A caution for interpreting ABC inferences of simultaneous historical events. *Evolution* 67: 991–1010. [link](#).
- Welton, L. J., C. D. Siler, J. R. Oaks, A. C. Diesmos, and R. M. Brown (2013). Multilocus Phylogeny and Bayesian Estimates of Species Boundaries Reveal Hidden Evolutionary Relationships and Cryptic Diversity in Southeast Asian Monitor Lizards. *Molecular Ecology* 22: 3495–3510. [link](#).
- *Siler, C. D., J. R. Oaks, L. J. Welton, C. W. Linkem, J. Swab, A. C. Diesmos, and R. M. Brown (2012). Did geckos ride the Palawan raft to the Philippines? *Journal of Biogeography* 39: 1217–1234. [link](#). *Featured on journal cover.
- *Oaks, J. R. (2011). A time-calibrated species tree of Crocodylia reveals a recent radiation of the true crocodiles. *Evolution* 65: 3285–3297. [link](#). *Featured in *Nature* ([link](#)) and on journal cover.
- Siler, C. D., J. R. Oaks, J. A. Esselstyn, A. C. Diesmos, and R. M. Brown (2010). Phylogeny and biogeography of Philippine bent-toed geckos (Gekkonidae: *Cyrtodactylus*) contradict a prevailing model of Pleistocene diversification. *Molecular Phylogenetics and Evolution* 55: 699–710. [link](#).
- Grismer, L. L., T. Neang, T. Chav, P. L. Wood, Jr., J. R. Oaks, J. Holden, J. L. Grismer, T. R. Szutz, and T. M. Youmans (2008). Additional amphibians and reptiles from the Phnom Samkos Wildlife Sanctuary in Northwestern Cardamom Mountains, Cambodia, with comments on their taxonomy and the discovery of four new species. *Raffles Bulletin of Zoology* 56: 161–175. [link](#).
- Oaks, J. R., J. M. Daul, and G. H. Adler (2008). Life span of a tropical forest rodent, *Proechimys semispinosus*. *Journal of Mammalogy* 89: 904–908. [link](#).

Other Publications

- Oaks, J. R. (2015). Book review of *Bayesian Phylogenetics: Methods, Algorithms, and Applications*, edited by Ming-Hui Chen, Lynn Kuo, and Paul O. Lewis. *Systematic Biology* 64: 1122–1125. [link](#).
- Oaks, J. R. (2014). Book review of *Crocodile* by Dan Wylie. *The Quarterly Review of Biology* 89: 405. [link](#).
- Oaks, J. R. (2014). Who's the living fossil? SciWorthy. <http://sciworthy.com/science-news/science-authors/whos-the-living-fossil/>.

Presentations (presenter in bold)

- Oaks, J.R.** Ecoevolution: Estimating evolutionary coevolution. 2017 Standalone Meeting of the Society of Systematic Biologists, Baton Rouge, Louisiana, January 2017. Talk.
- Oaks, J.R.** Generalizing phylogenetics to infer shared evolutionary events. Brigham Young University, Department of Biology, Provo, Utah, March 2016. Invited Talk.
- Oaks, J.R.** Generalizing phylogenetics to infer shared evolutionary events. St. Cloud State University, Department of Biology, St. Cloud, Minnesota, February 2016. Invited Talk.
- Oaks, J.R.** Accommodating clustered divergences in phylogenetic inference. University of Oklahoma, Department of Biology, Norman, Oklahoma, October 2015. Invited Talk.
- Oaks, J.R.** Improving inference of evolutionary history: Developing comparative methods for genomic data. Auburn University, Department of Biological Sciences, Auburn, Alabama, March 2015. Invited Talk.
- Oaks, J.R.** Improving inference of evolutionary history: Developing comparative methods for genomic data. Oklahoma State University Department of Integrative Biology, Stillwater, Oklahoma, November 2014. Invited Talk.
- Oaks, J.R.** An improved approximate-Bayesian method for estimating shared evolutionary history. Evolution 2014, Ernst Mayr Competition, Raleigh, North Carolina, June 2014. Talk.
- Oaks, J.R.** An improved nonparametric approximate-Bayesian method for estimating shared evolutionary history. EVO-WIBO 2014: 6th meeting of evolutionary biologists of the Pacific Northwest, Port Townsend, Washington, April 2014. Talk.
- Oaks, J.R.**, J. Sukumaran, J.A. Esselstyn, C.W. Linkem, C.D. Siler, R.M. Brown. ABC, not as easy as 1, 2, 3: The potential perils of model choice via approximate Bayesian computation. Cornell University Department of Ecology and Evolutionary Biology, Ithaca, New York, March 2013. Invited talk.
- Oaks, J.R.**, J. Sukumaran, J.A. Esselstyn, C.W. Linkem, C.D. Siler, R.M. Brown. ABC, not as easy as 1, 2, 3: The potential perils of model choice via approximate Bayesian computation. KU Ecology and Evolutionary Biology Department Graduate Student Organization Retreat, University of Kansas, Lawrence, Kansas, November 2012. Talk.
- Oaks, J.R.**, J. Sukumaran, J.A. Esselstyn, C.W. Linkem, C.D. Siler, R.M. Brown. Comparative phylogeography of terrestrial vertebrates across Philippine Pleistocene aggregate island complexes. Evolution 2010, Portland, Oregon, June 2010. Talk.
- ***Lusher, E.** and J.R. Oaks. Phylogeography of Ringneck Snakes across Kansas. University of Kansas Undergraduate Research Symposium, Lawrence, Kansas, April 2010. Poster. *Mentored undergraduate.
- Oaks, J.R.** Objective partition choice and the phylogenetic systematics and biogeography of the true crocodiles (*Crocodylus*). KU Department of Ecology and Evolutionary Biology Seminar Series, Lawrence, Kansas, February 2010. Invited talk.
- Oaks, J.R.** Objective partition choice and the phylogenetic systematics and biogeography of the true crocodiles. Joint Meeting of Ichthyologists and Herpetologists, Portland, Oregon, July 2009. Talk (Awarded best student paper in Systematics/Evolution).
- Oaks, J.R.** and C.W. Linkem. Accommodating Among-Site Rate Variation in Phylogenetic Inference: Data Partitioning as a Random Variable and the Objective Choice of Partition Strategy. Evolution 2009, Ernst Mayr Competition, University of Idaho, Moscow, Idaho, June 2009. Talk.

- Linkem, C.W.** and J.R. Oaks. Examination and Utility of the Dirichlet Process Prior in Bayesian Phylogenetics: A Test with Scincid and Anolis Lizards. *Evolution* 2009, Ernst Mayr Competition, University of Idaho, Moscow, Idaho, June 2009. Talk.
- Oaks, J.R.** Approximate Bayesian Computation in the Chiricahua Mountains. KU Natural History Museum Seminar Series, University of Kansas, Lawrence, Kansas, May 2009. Talk.
- Oaks, J.R.** Objective Partitioning in Phylogenetic Inference. Sigma Xi Research Paper Competition, University of Kansas, Lawrence, Kansas, April 2009. Talk
- Oaks, J.R.** Accommodating Among-Site Rate Variation in Phylogenetic Inference: Data Partitioning as a Random Variable and the Objective Choice of Partition Strategy. KU Natural History Museum Graduate Student Organization Retreat, University of Kansas, Lawrence, Kansas, December 2008. Talk.
- Oaks, J.R.** Evolution of the True Crocodiles (*Crocodylus*). Sigma Xi Research Paper Competition, University of Kansas, Lawrence, Kansas, April 2008. Talk (Awarded 2nd place).
- Oaks, J.R.** Phylogenetic Systematics and Biogeography of the True Crocodiles (*Crocodylus*). KU Natural History Museum Seminar Series, University of Kansas, Lawrence, Kansas, November 2007. Talk.
- Carling, M., Z. Cheviron, J. Grismer, A. Jennings, and J.R. Oaks.** Fieldwork at the LSU Museum of Natural Science: Where in the World are the Museum Students? Louisiana State University Museum of Natural Science Seminar Series, Baton Rouge, Louisiana, April 2007. Talk.

Grants

- Zohdy, S. (Co-PI), T. Schwartz (Co-PI), J.R. Oaks (Co-I), and Z. Farris (Co-I). The Coevolution Effect: A Mechanism for Viral Spillover into Humans. Auburn University Intramural Grants Program. \$40,000. 5/2017–5/2019. Funded.
- Oaks, J.R. (PI). Senior personnel: L.L. Grismer, C.D. Siler, and P.L. Wood, Jr. Generalizing Bayesian Phylogenetics to Infer Shared Evolutionary Events. National Science Foundation Division of Environmental Biology Award [1656004](#) \$551,169. 5/2017–5/2020. Funded.
- Grismer, J.L., J.R. Oaks, R.M. Brown, N.B. Ananjeva, X. Guo, and N. Batsaikhan. Revisiting Przhhevsky's Expeditions: Population genetics in the Gobi Desert. National Geographic Committee for Research and Exploration Grant. \$20,000. 5/2014–6/2015. Funded.
- Oaks, J.R. (Co-PI), R. Brown (PI), and M. Holder (Co-PI). Comparative Phylogeography of a Dynamic Archipelago. National Science Foundation Doctoral Dissertation Improvement Grant. \$14,886. 8/2010–8/2012. Funded.
- Oaks, J.R. Comparative Phylogeography of a Dynamic Archipelago. KU Biodiversity Institute Panorama Grant. \$1000. 5/2011–5/2012. Funded.
- Oaks, J.R. Comparative Phylogeography of a Dynamic Archipelago. KU Office of Graduate Studies Doctoral Student Research Award. \$2000. 7/2011–7/2012. Funded.
- Oaks, J.R. NSF stipend to attend a five-day short course, "Comparative Methods and Macroevolution in R." Stipend covered travel and lodging; approximately \$1,000. 6/2010. Funded.
- Oaks, J.R. KU Department of Ecology and Evolutionary Biology Travel Grant. \$300. 6/2010. Funded.
- Oaks, J.R. KU Biodiversity Institute Travel Grant. \$300. 6/2010. Funded.
- Oaks, J.R. Comparative Phylogeography of Southern Indochina. Society of Systematic Biologists Graduate Student Award. \$1650. 6/2009–6/2010. Funded.
- Oaks, J.R. Comparative Phylogeography of Southern Indochina. Sigma Xi. \$1000. 6/2009–6/2010. Funded.
- Oaks, J.R. KU Department of Ecology and Evolutionary Biology Travel Grant. \$300. 5/2010. Funded.
- Oaks, J.R. Estimating Species Trees Workshop Travel Grant. University of Michigan Museum of Zoology. \$500. 1/2009. Funded.
- Oaks, J.R. A Six-day Course in Statistical Phylogeography. KU Biodiversity Institute Panorama Grant.

\$900. 4/2009. Funded.

Oaks, J.R. A Herpetofaunal Survey and Biogeographic Study of the Cardamom Mountains in Southeast Asia. Louisiana State University BioGrads Grant. \$300. 5/2007–7/2007. Funded.

Oaks, J.R. A Herpetofaunal Survey of Phnom Samkos, Cambodia. Louisiana State University Museum of Natural Science Graduate Student Research Grant. \$600. 5/2007–7/2007. Funded.

Oaks, J.R. The Biogeography of the Herpetofauna of the Cardamom Mountains. Louisiana State University BioGrads Grant. \$300. 5/2006–7/2006. Funded.

Oaks, J.R. A Herpetofaunal Survey of the Cardamom Mountains, Cambodia. Louisiana State University Museum of Natural Science Graduate Student Research Grant. \$300. 5/2006–7/2006. Funded.

Oaks, J.R. Herpetology Fieldwork in the Cardamom Mountains of Southeast Asia. Louisiana State University BioGrads Grant. \$300. 5/2006–7/2006. Funded.

Oaks, J.R. Geographic Variation of Multiple Paternity in the American alligator (*Alligator mississippiensis*): Does Selection Rescue Genetic Diversity? Sigma Xi. \$1000. 1/2005–12/2005. Funded.

Oaks, J.R. Coevolution Among Turtles and Parasites: A Test of the Tenant. University of Wisconsin Oshkosh Undergraduate Research Grant. \$2500. 6/2001–6/2002. Funded.

Fellowships, Awards & Honors

Oaks, J.R. National Science Foundation Postdoctoral Research Fellowship in Biology—Intersections of Biology and Mathematical and Physical Sciences and Engineering. \$207,000. 11/2013–11/2016.

Oaks, J.R. National Research Council Postdoctoral Research Associateship—National Institute of Standards and Technology. \$137,200. 7/2013–7/2015. Awarded, but declined.

Oaks, J.R. Improving methods for testing models of shared evolutionary history. KU Office of Graduate Studies Summer Research Fellowship. \$5,000. 5/2013–8/2013.

Oaks, J.R. Kenneth B. Armitage Award for Excellence in Teaching. BIOL 350—Introduction to Genetics. \$250. 5/2011.

Oaks, J.R. Comparative Phylogeography of a Dynamic Archipelago. KU Department of Ecology and Evolutionary Biology Summer Fellowship. \$4,000. 5/2010–8/2010.

Oaks, J.R. Henri Seibert award for best paper in Systematics/Evolution. \$300. Joint Meeting of Ichthyologists and Herpetologists, Portland, Oregon, 07/09.

Oaks, J.R. Graduate Student Enhancement. \$15,000 (3 years). Louisiana State University Department of Biological Sciences. 2004–2007.

Oaks, J.R. Outstanding Biology Major Award. \$500. University of Wisconsin Oshkosh. 2004.

Oaks, J.R. Leslie-Allen Fellowship in Ecology and Field Biology. \$500. University of Wisconsin Oshkosh. 2003.

Oaks, J.R. Leslie-Allen Fellowship in Ecology and Field Biology. \$500. University of Wisconsin Oshkosh. 2002.

Software

[Ecoevolity](#): Estimating evolutionary coevality. Author: J. Oaks.

[Sumcoevolity](#): A python package for summarizing the output of Ecoevolity. Author: J. Oaks.

[SumTimes](#): A tool for estimating the probability of divergence-time scenarios from posterior samples of trees. Author: J. Oaks.

[PyMsBayes](#): Multi-processing wrapper and API for approximate-Bayesian computation. Author: J. Oaks.

[dpp-msbayes](#): Approximate-Bayesian method for comparative phylogeographical model choice. Author: J. Oaks.

ABACUS: Approximate Bayesian Computation Utilities. Author: J. Oaks.

SeqSift: Package for manipulating molecular sequence data. Author: J. Oaks.

SplitFreq: A tool to compare split frequencies between collections of trees. Author: J. Oaks.

SATé: Phylogenetic software for simultaneous alignment and tree estimation. Authors: J. Yu, M.T. Holder, J. Sukumaran, S. Mirarab, and J. Oaks.

Professional Affiliations

- American Society of Ichthyologists and Herpetologists
- International Biogeography Society
- Society for the Study of Amphibians and Reptiles
- Society for the Study of Evolution
- Society of Systematic Biologists

Service

Reviewer for the *Society of Systematic Biologists Graduate Student Research Awards* (2017)

Member of the editorial board for *Systematic Biology* (2016–present)

Reviewer for the *National Science Foundation Dimensions of Biodiversity Program* (2016)

Reviewer for the *Society of Systematic Biologists Mini-ARTS Program* (2016)

Reviewer for the *National Security Agency Mathematical Sciences Grant Program* (2014)

Reviewer for *BMC Evolutionary Biology* (2), *Evolution* (3), *Molecular Biology and Evolution* (1), *Molecular Ecology* (3), *Molecular Phylogenetics and Evolution* (1), *Organisms Diversity and Evolution* (2), *Proceedings of the Royal Society B* (1), *Systematic Biology* (6), and *Theoretical Population Biology* (1)

Graduate student representative on the departmental committee for genomics faculty hire, University of Kansas Department of Ecology and Evolutionary Biology (Fall 2011)

Seminar Coordinator, Louisiana State University Museum of Natural Science Seminar Series (2006–2007)

Outreach

Project Lead the Way (PLTW) Alabama State Conference (2016)

- Gave a presentation about bioinformatics to K-12 educators from across Alabama

Open House of the Auburn University Museum of Natural History (2016)

- Led tours through the AUMNH Amphibian and Reptiles Collections for members of the public of all ages

Blog contributor: phyletica.org (2013–present)

Contributed a short story about my research to Sciworthy.com, a news site with the goal of improving public understanding of science (2014)

While conducting fieldwork in Malaysia, I helped train undergraduate and graduate students from Universiti Kebangsaan Malaysia, Universiti Sains Malaysia, and La Sierra University in methods of field collection and specimen preparation (Fall 2011)

Trained two local high school student volunteers as fieldwork and curatorial assistants for the University of Kansas NSF EPSCoR project (2008)

Louisiana State University Museum of Natural Science Children's Special Saturday (2006)

- Gave a presentation to children, ages 5–10, about the basic biology and diversity of frogs

Louisiana State University Museum of Natural Science Children's Special Saturday (2005)

- Introduced high school students to the imperative role of scientific research collections and curatorial

methods

Additional Research Experience & Skills

Computer programming languages: Python, R, C/C++, Java, PERL, shell scripting and L^AT_EX

Fieldwork: Cambodia (2012, 2006); Malaysia (2011, 2006); Great Plains, USA (2007-2009); Southeastern USA (2004-2007); Florida, USA (2002); Wisconsin, USA (2001)