

# Gideon Bradburd

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## EDUCATION & APPOINTMENTS

<b>Asst. Prof</b>	<i>Michigan State University</i> Department of Integrative Biology Ecology, Evolution, and Behavior Program	2017 - present
<b>Fixed-term Asst. Prof</b>	<i>Michigan State University</i> Department of Integrative Biology Ecology, Evolution, and Behavior Program	2016 - 2017
<b>Postdoc</b>	<i>University of California, Berkeley</i> Museum of Vertebrate Zoology Department of Env. Sci. Pol. and Mgmt Advisors: Michael Nachman, Bree Rosenblum	2015 - 2016
<b>PhD</b>	<i>University of California, Davis</i> Population Biology Graduate Group Department of Ecology and Evolutionary Biology Advisors: Graham Coop, Brad Shaffer	2009 - 2015
<b>BS</b>	<i>Yale University</i> Ecology and Evolutionary Biology Honors Thesis Advisor: Tom Near	2004 - 2008

## FUNDING

<b>NIH Early Stage Investigator MIRA (R35)</b> (2020-2025) Incorporating geography into statistical methods for analysis of population genomic DNA (PI: G. Bradburd)	<b>\$1,849,678</b>
<b>NSF Bridging Ecology &amp; Evolution</b> (2020-2023) Testing eco-evolutionary effects of genetic drift and gene flow in stressful environments (PI: S. Fitzpatrick, co-PIs: B. Rothermel, G. Bradburd)	<b>\$920,700</b>
<b>NSF Dimensions of Biodiversity</b> (2017-2021) Diversification of sensory systems in novel habitat: enhanced vision or compensation in other modalities? (PI: J. Boughman, co-PIs: G. Bradburd, H. Hofmann, J. Keagy, D. Stenkamp)	<b>\$1,118,520</b>
<b>Beacon - NSF Center for the Study of Evolution in Action</b> (2016-present) Evolution of sensory systems in response to loss of visual information (PI: J. Boughman, co-PIs: G. Bradburd, H. Hofmann, J. Keagy, D. Stenkamp)	<b>\$127,579</b>
<b>NSF Doctoral Dissertation Improvement Grant (DDIG)</b> (2014-15) The effect of intraspecific host variation on the structure of parasite populations (PI: G. Bradburd, co-PI: G. Coop)	<b>\$13,918</b>

## PUBLICATIONS

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### Preprints, In Review, and In Revision

- Clark, M., G.S. Bradburd, M. Akopyan, A. Vega, E. Rosenblum, J. Robertson. Genetic isolation by distance underlies color pattern divergence in red-eyed treefrogs (*Agalychnis callidryas*). (*in review*).
- Toczydlowski, R., L. Liggins, M.R. Gaither, T.J. Anderson, R.L. Barton, J.T. Berg, S.G. Beskid, B. Davis, A. Delgado, E. Farrell, M. Ghoojaei, N. Himmelsbach, A.E. Holmes, S.R. Queeno, T. Trinh, C.A. Weyand, G.S. Bradburd, C. Riginos, R.J. Toonen, E.D. Crandall. Lost in time and space: Poor data stewardship will hinder global genetic diversity surveillance. (*in review*).
- Puckett, E., S. Murphy, G.S. Bradburd. Phylogeographic analysis delimits three evolutionary significant units of least chipmunks in North America and identifies unique genetic diversity within the imperiled Peñasco population. (*in review*).
- Shaffer, H.B., E. McCartney-Melstad, P.L. Ralph, G.S. Bradburd, E. Lundgren, J. Vu, B. Hagerty, F. Sandmeier, C. Weitzman, C.R. Tracy. Desert Tortoises in the genomic age: population genetics and the landscape. [bioRxiv](#) (Public comment on Desert Renewable Energy Conservation).

### Published and Accepted

(\*denotes equal authorship)

- Hancock, Z.B., E.S. Lehmborg, G.S. Bradburd. **2021**. Neo-darwinism still haunts evolutionary theory: A modern perspective on Charlesworth, Lande, and Slatkin (1982). **Evolution accepted**.
- Schweizer, R.S., M.R. Jones, G.S. Bradburd, J.F. Storz, N. Senner, C. Wolf, Z.A. Cheviron. **2021**. Broad concordance in the spatial distribution of adaptive and neutral genetic variation along an elevational cline in deer mice. **Molecular Biology and Evolution accepted**.
- Rothstein, A., R. Knapp, G.S. Bradburd, D. Boiano, E.B. Rosenblum. **2020**. Stepping into the past to conserve the future: archived skin swabs from extant and extinct populations inform genetic management of an endangered amphibian. **Molecular Ecology** 29 (14): 2598-2611.
- Fitzpatrick, S.W. G.S. Bradburd, C.T. Kremer, P.E. Salerno, L.M. Angeloni, W.C. Funk. **2020**. Genomic and fitness consequences of genetic rescue in wild populations. **Current Biology** 30: 1-6.
- Schweizer, R.M., J.P. Velotta, C.M. Ivy, M.R. Jones, S.M. Muir, G.S. Bradburd, J.F. Storz, G.R. Scott, Z.A. Cheviron. **2019**. Physiological and genomic evidence that a transcription factor contributes to adaptive cardiovascular function in high-altitude deer mice. **PLoS Genetics** 15 (11), e1008420-e1008420.
- Bradburd, G.S. and P.L. Ralph. **2019**. Spatial population genetics: It's about time. **Annual Reviews in Ecology, Evolution, and Systematics** 50: 427-449.
- Grieneisen, L.E., M.J.E. Charpentier, S.C. Alberts, R. Blekman, G.S. Bradburd, J. Tung, E.A. Archie. **2019**. Genes, geology, and germs: gut microbiota across a primate hybrid zone are explained by site soil properties, not host species. **Proceedings of the Royal Society B** 286: 20190431.
- Bradburd, G.S., G.M. Coop\*, and P.L. Ralph\*. **2018**. Inferring continuous and discrete population genetic structure across space. **Genetics** 210: 33-52.
- Weber, J.N., G.S. Bradburd, Y.E. Stuart, W.E. Stutz, D.I. Bolnick. **2017**. Partitioning the effects of isolation by distance, environment, and physical barriers on genomic divergence between parapatric threespine stickleback. **Evolution** 71: 342-56.
- Hoban, S.\*, J. L. Kelley\*, K. E. Lotterhos\*, M. F. Antolin, G.S. Bradburd, D. B. Lowry, M. L. Poss, L. K. Reed, A. Storfer, M. C. Whitlock. **2016**. Finding the genomic basis of local adaptation in non-model organisms: pitfalls, practical solutions, and future directions. **American Naturalist** 188: 379-397.

- Bradburd, G.S., P.L. Ralph, G.M. Coop. **2016**. A Spatial Framework for Understanding Population Structure and Admixture. **PLoS Genetics** 12: e1005703.
- Hammock, B.G., S. Lesmeister, I. Flores, G.S. Bradburd, F.H. Hammock, S.J. Teh. **2016**. Low food availability narrows the tolerance of the copepod *Eurytemora affinis* to salinity, but not to temperature. **Estuaries and Coasts**. 39: 189-200.
- Agrawal, A.A., A.P. Hastings, G.S. Bradburd, E.C. Woods, T. Züst, J. Harvey, T. Bukovinsky. **2015**. Evolution of plant growth and defense in a continental introduction. **American Naturalist** 186: 1-15.
- Wang, I.J.\* and G.S. Bradburd.\* **2014**. Isolation by Environment. **Molecular Ecology** 23: 5649-5662.
- Bradburd, G.S., P.L. Ralph, and G.M. Coop. **2013**. Disentangling the effects of geographic and ecological isolation on genetic differentiation. **Evolution** 67: 3258-3273.
- Rejmanek, D, P. Freycon, G.S. Bradburd, J. Dinstell, and J. Foley. **2013**. Unique strains of *Anaplasma phagocytophilum* segregate among diverse questing and non-questing *Ixodes* tick species in the western United States. **Ticks and Tick-borne Diseases** 4: 482-487.
- Rejmanek, D., G.S. Bradburd, and J. Foley. **2012**. Molecular characterization reveals distinct genospecies of *Anaplasma phagocytophilum* from diverse North American hosts. **Journal of Medical Microbiology** 61: 204-212.
- Near, T.J., C.M. Bossu, G.S. Bradburd, R.L. Carlson, R.C. Harrington, P.R. Hollingsworth Jr., B.P. Keck, D.A. Etnier. **2011**. Phylogeny and temporal diversification of darters (*Percidae: Etheostomatinae*). **Systematic Biology** 60: 565-595.

## SOFTWARE

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- Bradburd, G.S. (2018). **conStruct**. A genetic clustering method that accounts for isolation by distance. R package version v1.0.3. <https://cran.r-project.org/web/packages/conStruct/index.html>
- Bradburd, G.S. (2016). **SpaceMix**. A program for estimating geogenetic maps from allele frequency data. R package version 0.13. <https://github.com/gbradburd/SpaceMix>
- Bradburd, G.S. (2013). **BEDASSLE**. Bayesian Estimation of Differentiation in Alleles by Spatial Structure and Local Ecology. R package version 1.5. <https://cran.r-project.org/web/packages/BEDASSLE>

## MENTORSHIP & ADVISING

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### Postdocs

Dr. Zach Hancock	2021-present
Dr. Leonard Jones	2021-present
Dr. Bob Week	2020-present
Dr. Rachel Toczydlowski	2019-present
Dr. Matteo Tomasini	2019-2021
<i>current position</i> : Postdoctoral Researcher, University of Gothenburg	
Dr. Kelsey Yule	2018-2019
<i>current position</i> : Project Manager of the NEON Biorepository, Arizona State University	
Dr. Emily Puckett	2017 - 2018
<i>current position</i> : Asst. Professor of Biological Sciences, U. Tennessee, Memphis	

### Graduate Students

Meaghan Clark	2019-present
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### Graduate student committees

Kyle Teller (PhD, Integrated Applied Math, University of New Hampshire)	2020-present
Bruce Martin (PhD, Plant Biology, MSU)	2019-present
Michael Foisy (Msc, Plant Biology, MSU)	2019-2020
Sara Hugentobler (PhD, Integrative Biology, MSU)	2019-present
Devin Lake (PhD, Integrative Biology, MSU)	2019-present
Jason Olsen (PhD, Plant Biology, MSU)	2018-present
Viviana Ortiz Londono (PhD, Plant Pathology, MSU)	2018-present
Miranda Wade (PhD, Integrative Biology, MSU)	2018-present
Ava Garrison (PhD, Plant Biology, MSU)	2017-present
Dr. Emily Dolson (PhD, Computer Science and Engineering, MSU)	2017-2019

## HONORS, AWARDS, & FELLOWSHIPS

<b>Fitch Award Finalist</b> , Society for Molecular Biology and Evolution (\$2000)	2015
<b>Hamilton Award Finalist</b> , Society for the Study of Evolution (\$500)	2015
<b>XSEDE SuperComputing Resource Allocation</b> , XSEDE (50,000 SUs)	2014-05
<b>Center for Population Biology Research Fellowship</b> CPB, UC Davis (\$4,000)	2011-13
<b>NSF Graduate Research Fellow</b> National Science Foundation (\$90,000)	2010-12
<b>Graduate Scholars Fellowship</b> in Population Biology, UC Davis (\$30,000)	2009-10

## SERVICE & LEADERSHIP

### National/International Service

<b>Organizing Committee</b> Midwest Population Genetics Conference	2016-present
<b>Course Instructor</b> UCLA/La Kretz Center Workshop in Conservation Genomics	2014, 16, 19
<b>Judge</b> Hamilton Award (Society for the Study of Evolution)	2017, 19
<b>Reviewer</b> including: PNAS; Ecology Letters; Evolution Letters; Genetics; Evolution; Systematic Biology; Molecular Biology and Evolution; Molecular Ecology; Proceedings of the Royal Society B; American Journal of Human Genetics; Heredity; Molecular Ecology Resources; Methods in Ecology and Evolution; Molecular Phylogenetics and Evolution; New Phytologist; Bioinformatics; Ecology Ecological Monographs	
<b>Society Memberships</b> Society for the Study of Evolution (SSE); American Society of Naturalists (ASN); Genetics Society of America (GSA)	

### Institutional Service

Diversity, Equity, and Inclusion Committee (Dept. Integrative Biology)	2019-present
Co-founder, Diversity, Equity, and Inclusion Reading Group (Dept. Integrative Biology)	2019-present
Co-chair, Presidential Postdoc Fellowship Committee (EEB Program)	2020-present
Seminar Committee (Dept. Integrative Biology)	2020-present
Chair Search Committee (Dept. Integrative Biology)	2020-present
Seminar Committee (EEB Program)	2019-2020
Director Search Committee (EEB Program)	2019-2020
<i>Ad hoc</i> Space Committee (EEB Program)	2019-2020
Strategic Hiring Planning Committee (Dept. Integrative Biology)	2018-2019
Student Representative, Population Biology Grad Group Steering Committee	2013-14
Chair of Student Research Symposium, Center for Population Biology/Pop Bio Grad Group	2013
Course Organizer, The Bodega Bay Applied Phylogenetics Workshop	2012-13
Chair, UC Davis Non-Model Genomics Workshop Committee	2010
Graduate Student Mentor	2009-2015

## TEACHING

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Evolutionary Biology (IBio 849)	Instructor	2018-present
Intro to Statistical Methods in Ecology/Evolution (IBio 830)	Instructor	2017-present
Evolution Discussion Group (IBio 895)	Instructor	2017-present
EVE100 Introduction to Evolution	TA	2015
EVE103 Macroevolution, Speciation, and Phylogeny (Lecture, Lab)	TA	2014
Herpetology (Field, Lab, Lecture)	TA	2012

## INVITED SEMINARS

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North Dakota State University	Dept. of Biological Sciences	2021
University of St. Andrews	Centre of Ecol. and Env. Modelling	2021
Cornell University	Dept. of Computational Biology	2020
Western Michigan University	Dept. of Biological Sciences	2020
Ohio State University	Dept. of Evolution, Ecology, Organismal Bio.	2019
University of Kentucky	Dept. of Biology	2019
Ecological Society of America	Landscape Genetics (student-organized)	2018
Indiana University	Dept. of Biology/Precision Health Initiative	2018
Penn State University	Ecology Seminar Series	2018
University of Toronto (St. George)	Dept. of Ecology and Evolutionary Biology	2018
University of Toronto (Mississauga)	Dept. of Biology	2017
University of Chicago	Dept. of Ecology and Evolution	2017
Michigan State University	Kellogg Biological Station	2017
University of Michigan	Center for Statistical Genetics	2016
University of Wyoming	Dept. of Botany	2016
University of Colorado Boulder	Dept. Ecology and Evolutionary Biology	2016
University of San Francisco	Dept. of Biology	2016
University of California Berkeley	Museum of Vertebrate Zoology	2015
Michigan State University	Ecology, Evolution, and Behavior	2015
Stanford University	Dept. Genetics and Biology	2015
University of Southern California	Molecular and Computational Biology	2014
University of Montana	Division of Biological Sciences	2014
University of Minnesota	Dept. of Plant Biology	2014
Sonoma State University	Biology Dept.	2014
University of Texas, Austin	Dept. Integrative Biology	2013

## CONTRIBUTED PRESENTATIONS

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Society for the Study of Evolution	2012-13,15,17,19
Population, Evolutionary, Quantitative Genetics Meeting	2018
Midwestern Population Genetics Meeting	2016
American Society of Naturalists	2016,18
Society for Molecular Biology and Evolution	2015
Bay Area Population Genomics (BAPG)	2014