

# Gideon Bradburd

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software: [github.com/gbradburd](https://github.com/gbradburd)

## EDUCATION & APPOINTMENTS

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

## FUNDING

|   |                    |
|---|--------------------|
| <b>NIH Early Stage Investigator MIRA (R35)</b> (2020-2025)<br>Incorporating geography into statistical methods for analysis of population genomic DNA<br>(PI: G. Bradburd)  | <b>\$1,849,678</b> |
| <b>NSF Bridging Ecology &amp; Evolution</b> (2020-2023)<br>Testing eco-evolutionary effects of genetic drift and gene flow in stressful environments<br>(PI: S. Fitzpatrick, co-PIs: B. Rothermel, G. Bradburd)                             | <b>\$920,700</b>   |
| <b>NSF Dimensions of Biodiversity</b> (2017-2021)<br>Diversification of sensory systems in novel habitat: enhanced vision or compensation in other modalities?<br>(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)<br>Evolution of sensory systems in response to loss of visual information<br>(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)<br>The effect of intraspecific host variation on the structure of parasite populations<br>(PI: G. Bradburd, co-PI: G. Coop)   | <b>\$13,918</b>    |

## PUBLICATIONS

### 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 revision*).
- 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*).
- Schweizer, R.S., M.R. Jones, G.S. Bradburd, J.F. Storz, N. Senner, C. Wolf, Z.A. Cheviron. Broad concordance in the spatial distribution of adaptive and neutral genetic variation along an elevational cline in deer mice. (*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**.
- 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: Etheostominae*). **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/gbradbud/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

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|---|--------------|
| 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

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|--|---------|
| <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

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| 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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|                                     |  |      |
|-------------------------------------|--|------|
| 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             |