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Conservation Ecology Center
Smithsonian Conservation Biology Institute
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Professional Experience

- Associate research scientist, quantitative ecology (2018-present)
University of Maryland, College Park, Department of Biology
- Post-doc, quantitative ecology (2011-2018)
University of Maryland, College Park, Department of Biology
Smithsonian Conservation Biology Institute, Conservation Ecology Center
Advisor: Dr. Justin Calabrese
- Post-doc, quantum information (2011)
University of Maryland, College Park, Department of Physics
Advisor: Dr. Jake Taylor

Educational Background

- Ph.D. in Physics (2002-2011)
University of Maryland, College Park
Thesis: Non-Markovian dynamics of open quantum systems
Advisor: Dr. Bei-Lok Hu
- B.S., *summa cum laude*, Majors in Physics, Mathematics and Statistics (1997-2002)
University of South Alabama

Paid Internships

- Computational molecular dynamics (2001)
Los Alamos National Laboratory
Advisor: Dr. Michael S. Murillo
- Approximation theory (1999-2001)
University of South Alabama
Advisor: Dr. Vasiliy Prokhorov
- Experimental atomic, molecular, and optical physics (2000)
University of South Alabama
Advisor: Dr. Justin M. Sanders

Funding

- NSF DBI award [1915347](#), [1914887](#), [1914928](#) (\$941,173) (2019-2022)
Data integration to improve population distribution estimation with animal tracking data
PI: J. M. Calabrese; Co-PI: W. F. Fagan, **C. H. Fleming**, X. Dong, E. Gurarie, D. Sheldon, R. W. Kays
- Smithsonian Institution Scholarly Studies Grant (\$67,744) (2019-2020)
The bigger they come, the farther they fall: How size-dependent underestimation of home ranges affects umbrella species conservation strategies
PI: J. M. Calabrese; Co-PI: A.-L. Harrison, **C. H. Fleming**, R. W. Kays, M. C. Crofoot, M. Tucker, T. Mueller

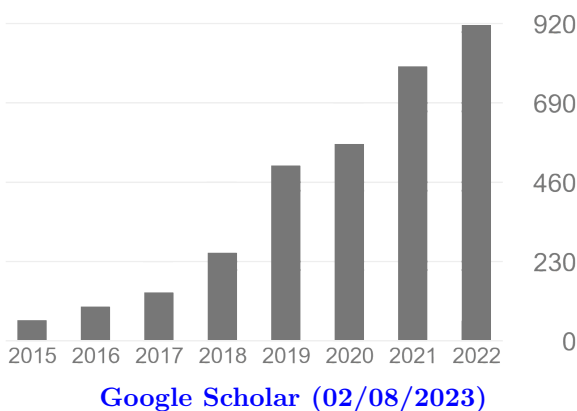
- NSF ABI award [1458748](#) (\$1,162,723) (2015-2019)
Advanced mathematical, statistical, and software tools to unlock the potential of animal tracking data
PI: J. M. Calabrese; Co-PI: W.F. Fagan, B. Hamidzadeh, [†]*The NSF would not allow me to be both a co-PI and salaried post-doc on this grant, and so my co-PI status is unofficial.*
- Smithsonian Institution Competitive Grant for Science (\$100,000) (2015-2017)
By land, sea, and air: General estimation methods and conservation applications of 3D utilization distributions
PI: J. M. Calabrese; Co-PI: R. Condit, D. P. Costa, M. C. Crofoot, M. Detto, **C. H. Fleming**, S. A. Lambertucci, K. Safi, E. L. C. Shepard, S. Villegas-Amtmann
- [Smithsonian Institution Postdoctoral Fellowship](#) (\$50,000) (2015)
Accurate home-range estimation for animal movement data
PI: **C. H. Fleming**; Co-PI: J. M. Calabrese

Scholarships & Awards

- The Wildlife Society Spatial Ecology and Telemetry Working Group Award (2021)
- University of Maryland Physics Departmental Fellowship (2002-2004)
- Dr. Victorino S. Blanco Mathematics Scholarship (2002)
- USA Scholarship (2001-2002)
- Chris Nash Scholarship (2001)
- Sigma Pi Sigma physics honor society membership (2000)
- University of South Alabama Math Contest: 1st place (2000-2001)
- University of South Alabama Physics Scholarship (1997-2001)

Publications

	All	Since 2018
Citations	3641	3145
h-index	30	28
i10-index	46	42



cation and bias in resource selection functions with autocorrelation-informed weighting”, [Methods in Ecology and Evolution](#) **14**:2 643–654 doi:10.1111/2041-210X.14025 (2023)

54. A. E. De Barros, R. Morato, **C. H. Fleming**, R. Pardini, L. G. Oliveira-Santos, W. Tomas, D. Kantek, F. Tortato, C. Fragoso, F. Azevedo, J. Thompson, P. I. Prado, “Wildfires disproportionately affected jaguars in the Pantanal”, [Communications Biology](#) **5** 1028 (2022)
53. L. Benitez, J. W. Kilian, G. Wittemyer, L. F. Hughey, **C. H. Fleming**, P. Leimgruber, P. du Preez, J. A. Stabach, “Precipitation, vegetation productivity, and human impacts control home range size of elephants in dryland systems in Northern Namibia”, [Ecology and Evolution](#) **12** 9 e9288 (2022)
52. E. P. Medici, S. Mezzini, **C. H. Fleming**, J. M. Calabrese, M. J. Noonan, “Movement ecology of vulnerable lowland tapirs between areas of varying human disturbance”, [Movement Ecology](#) **10** 14 (2022)
51. J. A. Stabach, L. F. Hughey, R. D. Crego,

Print

55. J. M. Alston, **C. H. Fleming**, R. Kays, J. P. Streicher, C. T. Downs, T. Ramesh, B. Reineking, J. M. Calabrese, “Mitigating pseudorepli-

- C. H. Fleming**, J. G. C. Hopcraft, P. Leimgruber, T. A. Morrison, J. O. Ogutu, R. S. Reid, J. S. Worden, R. B. Boone, “Increasing anthropogenic disturbance restricts wildebeest movement across East African grazing systems”, *Frontiers in Ecology and Evolution* **15** doi:10.3389/fevo.2022.846171 (2022)
50. **C. H. Fleming**, I. Deznabi, S. Alavi, M. C. Crofoot, B. T. Hirsch, E. P. Medici, M. J. Noonan, R. Kays, W. F. Fagan, D. Sheldon, J. M. Calabrese, “Population-level inference for home-range areas”, *Methods in Ecology and Evolution* **13**:5 1027–1041 (2022)
49. I. Silva, **C. H. Fleming**, M. J. Noonan, J. Alston, C. Foltz, W. F. Fagan, J. M. Calabrese, “Autocorrelation-informed home range estimation: a review and practical guide”, *Methods in Ecology and Evolution* **13**:3 534–544 (2021)
Top Downloaded Article (2021)
48. M. J. Noonan, W. F. Fagan, **C. H. Fleming**, “A semi-variance approach to visualising phylogenetic autocorrelation”, *Methods in Ecology and Evolution* **13**:2 396–406 (2021)
47. M. J. Noonan, R. Martinez-Garcia, G. H. Davis, M. C. Crofoot, R. Kays, B. T. Hirsch, D. Caillaud, E. Payne, A. Sih, D. L. Sinn, O. Spiegel, W. F. Fagan, **C. H. Fleming**, Justin M. Calabrese, “Estimating encounter location distributions from animal tracking data”, *Methods in Ecology and Evolution*, **12** 1158–1173 (2021)
46. T. S. M. Stratmann, N. Dejid, J. M. Calabrese, **C. H. Fleming**, K. A. Olson, T. Mueller, “Resource selection of a nomadic ungulate in a dynamic landscape”, *PLoS ONE* **16**:2, e0246809 (2021)
45. J. M. Calabrese, **C. H. Fleming**, M. J. Noonan, X. Dong, “ctmmweb: A graphical user interface for autocorrelation-informed home range estimation”, *Wildlife Society Bulletin*, **45**:1, 162–169 (2021)
Top Cited Article (2021-2022)
44. R. C. Averill-Murray, **C. H. Fleming**, J. D. Riedle, “Reptile home ranges revisited: a case study of space use of Sonoran Desert Tortoises (*Gopherus morafkai*)”, *Herpetological Conservation and Biology* **15**:2, 253–271 (2020)
43. R. Martinez-Garcia, **C. H. Fleming**, R. Sepelt, W. F. Fagan, J. M. Calabrese, “How range residency and long-range perception change encounter rates”, *Journal of Theoretical Biology*, **498** 110267 (2020)
42. M. J. Noonan, **C. H. Fleming** et al, “Body-size-dependent underestimation of mammalian area requirements”, *Conservation Biology*, **34**:4 1017–1028 (2020)
41. G. Péron, J. M. Calabrese, O. Duriez, **C. H. Fleming**, R. García-Jiménez, A. Johnston, S. Lambertucci, K. Safi, E. L. C. Shepard, “The challenges of estimating the distribution of flight heights from telemetry or altimetry data”, *Animal Biotelemetry* **8**:5 (2020)
40. J. S. Horne, J. Fieberg, L. Börger, J. L. Rachlow, J. M. Calabrese, **C. H. Fleming**, “Animal Home Ranges: Concepts, Uses and Estimation”, Chapter 13, “Population Ecology in Practice”, Ed. D. L. Murray, B. K. Sandercock, Wiley-Blackwell (2020)
39. M. J. Noonan, **C. H. Fleming**, T. S. Akre, J. Drescher-Lehman, E. Gurarie, A.-L. Harrison, R. Kays, Justin Calabrese, “Scale-insensitive estimation of speed and distance traveled from animal tracking data”, *Movement Ecology*, **7**:35 (2019)
38. **C. H. Fleming**, M. J. Noonan, E. P. Medici, J. M. Calabrese, “Overcoming the challenge of small effective sample sizes in home-range estimation”, *Methods in Ecology and Evolution* **10**:10, 1679–1689 (2019)
37. N. Dejid, C. Bracis, K. A. Olson, K. Böhning-Gaese, J. M. Calabrese, C. Buyanaa, W. F. Fagan, **C. H. Fleming**, M. Heiner, P. Kaczensky, P. Leimgruber, M. Dalannast, T. Stratmann, T. Mueller, “Challenges in the conservation of wide-ranging nomadic species”, *Journal of Applied Ecology* **56**:8, 1916–1926 (2019)
36. M. A. Tucker et al, “Large birds travel farther in homogeneous environments”, *Global Ecology and Biogeography* **28**:5, 576–587 (2019)
35. M. J. Noonan and M. A. Tucker, **C. H. Fleming** et al, “A comprehensive analysis of autocorrelation and bias in home range estimation”, *Ecological Monographs* **89**:2, e01344 (2019)
34. Q. Huang and **C. H. Fleming** B. Robb and A. Lothspeich and M. Songer, “How different are species distribution model predictions?—Application of a new measure of dissimilarity

- and level of significance to giant panda *Ailuropoda melanoleuca*", [Ecological Informatics](#) **46**, 114–124 (2018)
33. K. Winner, M. J. Noonan, **C. H. Fleming**, K. Olson, T. Mueller, D. Sheldon, J. M. Calabrese, "Statistical inference for home range overlap", [Methods in Ecology and Evolution](#) **9**:7, 1679–1691 (2018)
 32. **C. H. Fleming**, D. Sheldon, W. F. Fagan, P. Leimgruber, T. Mueller, D. Nandintsetseg, M. J. Noonan, K. A. Olson, E. Setyawati, A. Siarnipar, J. M. Calabrese, "Correcting for missing and irregular data in home-range estimation", [Ecological Applications](#) **28**:4, 1003–1010 (2018)
 31. M. A. Tucker et al, "Moving in the Anthropocene: Global reductions in terrestrial mammalian movements", [Science](#) **359**:6374, 466–469 (2018)
 30. J. M. Calabrese, **C. H. Fleming**, W. F. Fagan, M. Rimmer, P. Kaczensky, S. Bewick, P. Leimgruber, T. Mueller, "Disentangling social interactions and environmental drivers in multi-individual wildlife tracking data", [Philosophical Transactions B, Philosophical Transactions of the Royal Society B](#) **373**:1746, 10.1098/rstb.2017.0007 (2018)
 29. **C. H. Fleming**, D. Sheldon, E. Gurarie, W. F. Fagan, S. LaPoint, J. M. Calabrese, "Kálmán filters for continuous-time movement models", [Ecological Informatics](#) **40**, 8–21 (2017)
 28. E. Gurarie and **C. H. Fleming**, K. L. Laidre, J. Hernandez-Pliego, W. F. Fagan, O. Ovaskainen, "Correlated velocity models as a fundamental unit of animal movement: synthesis and applications", [Movement Ecology](#) **5**:13, 10.1186/s40462-017-0103-3 (2017)
 27. E. Gurarie, F. Cagnacci, W. Peters, **C. H. Fleming**, J. M. Calabrese, T. Mueller, W. F. Fagan, "A framework for modeling range shifts and migrations: Asking whether, whither, when, and will it return", [Journal of Animal Ecology](#) **86**, 943–959 (2017)
 26. G. Péron, **C. H. Fleming**, O. Duriez, J. Fluhr, C. Itty, S. Lambertucci, K. Safi, E. L. C. Shepard, J. M. Calabrese, "The energy landscape predicts flight height and wind turbine collision hazard in three species of large soaring raptor", [Journal of Applied Ecology](#) **54**:6, 1895–1906 (2017)
 25. G. Péron, **C. H. Fleming**, R. C. de Paula, N. Mitchell, M. Strohbach, P. Leimgruber, J. M. Calabrese, "Periodic continuous-time movement models uncover behavioral changes of wild canids along anthropization gradients", [Ecological Monographs](#) **87**, 442–456 (2017)
 24. R. G. Morato, J. A. Stabach, **C. H. Fleming**, J. M. Calabrese, R. C. De Paula, K. M. P. M. Ferraz, D. L. Z. Kantek, S. S. Miyazaki, T. D. C. Pereira, G. R. Araujo, A. Paviolo, C. De Angelo, M. S. Di Bitetti, P. Cruz, F. Lima, L. Cullen, D. A. Sana, E. E. Ramalho, M. M. Carvalho, F. H. S. Soares, B. Zimbres, M. X. Silva, M. D. F. Moraes, A. Vogliotti, J. A. May Jr., M. Haberfeld, L. Rampim, L. Sartorello, M. C. Ribeiro, P. Leimgruber, "Space Use and Movement of a Neotropical Top Predator: The Endangered Jaguar", [PLoS ONE](#) **10**.1371/journal.pone.0168176 (2016)
 23. **C. H. Fleming**, J. M. Calabrese, "A new kernel-density estimator for accurate home-range and species-range area estimation", [Methods in Ecology and Evolution](#) **8**, 571–579 (2017)
 22. A. M. Moßbrucker, **C. H. Fleming**, M. A. Imron, S. Pudyatmoko, Sumardi, "AKDE home range size and habitat selection of Sumatran elephants", [Wildlife Research](#) **43**, 566–575 (2016)
 21. G. Péron, **C. H. Fleming**, R. C. de Paula, J. M. Calabrese, "Uncovering periodic patterns of space use in animal tracking data with periodograms, including a new algorithm for the Lomb-Scargle periodogram and improved randomization tests", [Movement Ecology](#) **4**:19, 10.1186/s40462-016-0084-7 (2016)
 20. J. M. Calabrese, **C. H. Fleming**, E. Gurarie, "ctmm: An R package for analyzing animal relocation data as a continuous-time stochastic process", [Methods in Ecology and Evolution](#) **7**, 1124–1132 (2016)
 19. **C. H. Fleming**, W. F. Fagan, T. Mueller, K. A. Olson, P. Leimgruber, J. M. Calabrese, "Estimating where and how animals travel: An optimal framework for path reconstruction from autocorrelated tracking data", [Ecology](#) **10**.1890/15-1607 (2016)
 18. K. E. Jenks, E. O. Aikens, N. Songasen, J. M. Calabrese, **C. H. Fleming**, N. Bhumpakphan, S. Wanghonsa, B. Kanchanasaka, M. Songer,

- P. Leimgruber, “Comparative movement analysis for a sympatric dhole and golden jackal in a human-dominated landscape”, *The Raffles Bulletin of Zoology* **63**, 546–554 (2015)
17. **C. H. Fleming**, W. F. Fagan, T. Mueller, K. A. Olson, P. Leimgruber, J. M. Calabrese, “Rigorous home-range estimation with movement data: A new autocorrelated kernel-density estimator”, *Ecology* **96**, 1182–1188 (2015)
 16. C. S. Teitelbaum, W. F. Fagan, **C. H. Fleming**, G. Dressler, J. M. Calabrese, P. Leimgruber, T. Mueller, “How far to go? Determinants of migration distance in land mammals”, *Ecology Letters* **18**, 545–552 (2015)
 15. **C. H. Fleming**, Y. Subaşı, J. M. Calabrese, “A maximum-entropy description of animal movement”, *Physical Review E* **91**, 032107 (2015)
 14. **C. H. Fleming**, J. M. Calabrese, T. Mueller, K. A. Olson, P. Leimgruber, W. F. Fagan, “Non-Markovian maximum likelihood estimation of autocorrelated movement processes”, *Methods in Ecology and Evolution* **5**, 462–472 (2014)
 13. **C. H. Fleming**, J. M. Calabrese, T. Mueller, K. A. Olson, P. Leimgruber, W. F. Fagan, “From fine-scale foraging to home ranges: A semi-variance approach to identifying movement modes across spatiotemporal scales”, *The American Naturalist* **183**, E154–E167 (2014)
 12. **C. H. Fleming**, B. L. Hu, Albert Roura, “Non-equilibrium fluctuation-dissipation inequality and non-equilibrium uncertainty principle”, *Physical Review E* **88**, 012102 (2013)
 11. Y. Subaşı, **C. H. Fleming**, J. M. Taylor, B. L. Hu, “The equilibrium states of open quantum systems in the strong coupling regime”, *Physical Review E* **86**, 061132 (2012)
 10. **C. H. Fleming**, P. R. Johnson, B. L. Hu, “Nonequilibrium dynamics of charged particles in a quantized electromagnetic field: causal, stable and self-consistent dynamics from $1/c$ expansion”, *Journal of Physics A* **45**, 255002 (2012)
 9. **C. H. Fleming**, B. L. Hu, Albert Roura, “Decoherence strength of non-equilibrium environments”, *Physica A* **391**, 4206 (2012)
 8. **C. H. Fleming**, B. L. Hu, “Non-Markovian Dynamics of Open Quantum Systems: Stochastic Equations and their Perturbative Solutions”, *Annals of Physics* **327**, 1238 (2012)
 7. **C. H. Fleming**, N. I. Cummings, Charis Anastopoulos, B. L. Hu, “Non-Markovian Dynamics and Entanglement of Two-level Atoms in a Common Field”, *Journal of Physics A* **45**, 065301 (2012) **IOP SELECT**
 6. **C. H. Fleming**, A. Roura, B. L. Hu, “Initial-state preparation with dynamically generated system-environment correlations”, *Physical Review E* **84**, 021106 (2011)
 5. **C. H. Fleming**, N. I. Cummings, “Accuracy of perturbative master equations”, *Physical Review E* **83**, 031117 (2011)
 4. **C. H. Fleming**, A. Roura, B. L. Hu, “Exact analytical solutions to the master equation of quantum Brownian motion for a general environment”, *Annals of Physics* **326**, 1207 (2011) **Top 25 Hottest Articles (2011)**
 3. **C. H. Fleming**, N. I. Cummings, C. Anastopoulos, B. L. Hu, “The rotating-wave approximation: consistency and applicability from an open quantum system analysis”, *Journal of Physics A* **43**, 405304 (2010)
 2. J. M. Sanders, S. L. Varghese, **C. H. Fleming**, G. A. Soosai, “Electron capture by protons and electron loss from hydrogen atoms in collisions with hydrocarbon and hydrogen molecules in the 60-120 keV energy range”, *Journal of Physics B* **36**, 3835 (2003)
 1. J. M. Sanders, S. L. Varghese, **C. H. Fleming**, “Electron capture and loss cross sections for neutral projectiles colliding with atoms and molecules”, *AIP Conference Proceedings* **576**, 209–212 (2001)
-
- Published software**
3. M. J. Noonan, **C. H. Fleming**, “ctpm: Continuous-time phylogenetic modeling”, *R package version 1.0.1* (2021-present)
 2. X. Dong, **C. H. Fleming**, M. J. Noonan, and J. M. Calabrese, “ctmmweb: A Shiny web app for the ctmm movement analysis package”, *R package version 0.2.11* (2017-present)
 1. **C. H. Fleming**, J. M. Calabrese, “ctmm: Continuous-time movement modeling”, *R package version 1.1.0* (2015-present)

Outreach and Support

- [ctmm R user group](#) (278 members) (2017-present)
- [ctmm quarterly webinar](#) (2019-present)

Invited Talks & Workshops

- Department of Mathematics, Boise State University (February 2023)
Stochastic process models in movement ecology
- Mathematical-Biology Seminar Series, University of Maryland, College Park (October 2022)
Stochastic process models in movement ecology
- Data Analysis in Movement Ecology, WILDLABS (May 2022)
Statistical challenges in animal movement analysis
- Conservation Ecology Center, Smithsonian Conservation Biology Institute (April 2022)
Resource selection functions
- W. A. Franke College of Forestry & Conservation, University of Montana (April 2022)
Corridors and connectivity
- W. A. Franke College of Forestry & Conservation, University of Montana (March 2022)
Animal space use
- Applied Math Group, SUNY Buffalo (December 2021)
Applications of stochastic processes to animal tracking data
- Center for Biodiversity and Global Change, Yale University (October 2021)
Continuous-time movement modeling
- Center for Biodiversity and Global Change, Yale University (October 2021)
Animal space use
- Animal Movement Ecology Statistics RIT, University of Maryland, College Park (September 2021)
Continuous-time movement modeling
- Mathematical Biology Group, University of British Columbia, Okanagan (August 2021)
Applications of stochastic processes to animal tracking data
- Society for Experimental Biology Annual Meeting, Antwerp (June 2021)
– Putting animal biology in ecological context with advances in animal tracking and bio-logging
Getting a handle on telemetry error
- Spatial and Movement Ecology Lab, University of Glasgow, Glasgow (May 2021)
Continuous-time movement modeling
- College of Science and Mathematics, University of Massachusetts, Boston (February 2021)
Animal space use
- NSF Macrosystems Workshop: Linking remote animal detection and movement data with macrosystem environmental datasets and networks, Smithsonian Conservation Biology Institute (October 2018)
Non-parametric home-range estimation
- AniMove, Max Plank Institute of Ornithology, Radolfzell (September 2018)
Non-stationary movement modeling in continuous time
- Department of Biology, University of Maryland, College Park (January 2018)
Modern challenges in movement ecology
- Department of Mathematics, University of Maryland, College Park (November 2017)
Autocorrelated kernel density estimation
- AniMove, Max Plank Institute of Ornithology, Radolfzell (September 2017)
How to estimate speed
- The Wildlife Society's 2016 Annual Conference, Raleigh (October 2016)
– Opportunities for conservation advances in movement analyses and their applications to wildlife conservation

Individual home-range, population, and species distribution estimates: Synthesizing heterogeneous and autocorrelated datasets

- IUCN World Conservation Congress, Hawaii (September 2016)
 – Wildlife monitoring and data repositories for conservation and protected area management: Advances in technology, analytical tools, and databases
 Utilizing advanced statistical tools for estimating annual and lifetime ranges of animals from movement data
- NSF ABI Project Kickoff Workshop, University of Maryland, College Park (November 2015)
 Core mathematical and statistical methods behind ctmm
- Smithsonian Conservation Biology Institute, Rock Creek (November 2015)
 Continuous-time movement modeling
- Smithsonian Conservation Biology Institute, Front Royal (October 2015)
 Continuous-time movement modeling
- AniMove Symposium, Max Plank Institute of Ornithology, Radolfzell (September 2015)
 Identifying and leveraging autocorrelated movement models
- SI Move movement ecology workshop, Smithsonian Conservation Biology Institute (July 2015)
 Accurate home-range estimation with movement data
- Spatial Ecology Workshop, Smithsonian Conservation Biology Institute (September 2014)
 Leveraging the information content of autocorrelated movement
- Shark ecology and movement workshop, Smithsonian Conservation Biology Institute (January 2013)
 A semi-variance approach to identifying movement modes
- Dauphin Island Sea Lab (November 2012)
 Linking the statistics of animal movement to their environment
- Department of Mathematics and Statistics, University of South Alabama (October 2012)
 Orders of magnitude improvement in autocorrelation estimation via maximum likelihood
- Department of Physics, University of Louisiana (July 2011)
 Precision calculations in quantum open systems and nonequilibrium field theory
- Department of Physics, University of South Alabama (March 2008)
 Quantum Brownian motion
- Quantum Coherence and Decoherence Workshop, Centro de Ciencias de Benasque (September 2008)
 Solutions to master equations of quantum Brownian motion in a general environment with external force
- Department of Physics, University of Maryland, College Park (September 2004)
 The Universe Tunneling from Nothing

Contributed Talks

- The Wildlife Society's 2022 Annual Conference, Spokane (November 2022)
 Habitat-informed home-range estimation
- The Wildlife Society's 2021 Annual Conference, Virtual (November 2021)
 Some useful results for applying resource selection functions
- The Wildlife Society's 2020 Annual Conference, Virtual (October 2020)
 Efficient population-level animal movement modeling in continuous time
- The Wildlife Society's 2018 Annual Conference, Cleveland (October 2018)
 Getting a handle on telemetry error: Speed, distance and flight-height estimation with tracking data
- The Ecological Society of America's 2017 Annual Meeting, Portland (August 2017)
 New approaches to accurate home-range estimation: Dealing with autocorrelation, small effective sample sizes, and irregular sampling
- The Ecological Society of America's 2015 Annual Meeting, Baltimore (August 2015)

Beyond Brownian bridges: Time-series Kriging of autocorrelated animal tracking data

- The Ecological Society of America's 2014 Annual Meeting, Sacramento (August 2014)
Rigorous home-range estimation: Rederiving the kernel-density estimator for use with autocorrelated data
- Symposium on Animal Movement and the Environment, Raleigh (May 2014)
Linking statistics of movement to resource dynamics
- The Ecological Society of America's 2013 Annual Meeting, Minneapolis (August 2013)
Linking statistics of movement to resource dynamics

Teaching Experience

- The Wildlife Society's Annual Conference
Introduction to continuous-time movement modeling for animal tracking data (2020-2022)
- [AniMove](#): Animal movement and remote sensing for conservation instructor
Max Planck Institute of Animal Behavior (2022)
Max Planck–Yale Center for Biodiversity Movement and Global Change (2019)
Instituto de Pesquisas Ecológicas, Campo Grande, Brazil (2019)
Max Planck Institute of Ornithology (2016-2018)
- [Smithsonian-Mason School of Conservation](#), conservation ecology instructor
SMSC 0531: Statistics for animal tracking data (2019)
MCCS 0517: Animal movement analysis for conservation (2014-2015)
- University of Maryland, College Park, physics instructor
PHYS 142: Principles of Physics II (2010)
PHYS 260: Vibrations, Waves, Heat, Electricity & Magnetism (2010-2011)
PHYS 270: Electrodynamics, Light, Relativity & Modern Physics (2006-2010)
- University of Maryland, College Park, physics teaching assistant (2004-2006)
- [University of Maryland: MRSEC](#), GK-12 outreach teacher
Greenbelt Middle School, MD (2003)
Montgomery Blair High School, MD (2002)
- University of South Alabama, undergraduate tutor
Physics department (2000-2002)
Mathematics and Statistics department (1999-2000)

Advising and Co-Advising

- Vickie DeNicola, Ph.D. student, Fondazione Edmund Mach (2022-present)
- Ananke Krishnan, research assistant, University of Maryland (2022-present)
- Jake Krauss, Masters student, University of Florence (2022)
- Iman Deznabi, Ph.D. student, University of Massachusetts (2020-2021)
- Lorena M. Benitez, intern, Smithsonian Conservation Biology Institute (2020-2021)
- Cody Folta, faculty assistant, University of Maryland (2019-2020)
- James Mielke, undergraduate student, University of Maryland (2019-2020)
- Alex Greidinger, intern, Smithsonian Conservation Biology Institute (2019)
- Jonathan Drescher-Lehman, Masters student, George Mason University (2018-2021)
- Dr. E. Patricia Medici, visiting researcher, Instituto de Pesquisas Ecológicas (2018-2019)
- Kevin Winner, Ph.D. student, University of Massachusetts (2016-2018)
- Dr. Michael J. Noonan, post-doc, Smithsonian Conservation Biology Institute (2017-2020)
- Benjamin Robb, intern, Smithsonian Conservation Biology Institute (2017-2018)
- Peter Thompson, undergraduate student, University of Maryland (2017)
- Wiebke Ullmann, Ph.D. student, University of Potsdam (2017)

- Dr. Ronaldo Morato, visiting researcher, Centro Nacional de Pesquisa (2015-2016)
- Nina Attias, Ph.D. student, Federal University of Mato Grosso do Sul (2016)
- Jamie Wadey, Ph.D. student, The University of Nottingham Malaysia Campus (2015)
- Rogerio Cunha de Paula, Ph.D. student, Escola Superior de Agricultura Luiz de Queiroz (2014-2015)
- Ryan Swift, undergraduate student, University of Maryland (2014)
- Ellen Aikens, intern, Smithsonian Conservation Biology Institute (2013-2014)

Thesis Committee and Review

- Jake Krauss, Masters, University of Florence (2022)
- Francisco Cervantes Peralta, Ph.D., University of Cape Town (2020)
- Jonathan Drescher-Lehman, Masters, George Mason University (2019)

Journal Referee

African Journal of Ecology; Animal Biotelemetry; Annals of Applied Statistics; Annals of Physics; Aquatic Conservation: Marine and Freshwater Ecosystems; Behavioral Ecology; Behavioral Ecology and Sociobiology; Canadian Journal of Physics; Computers and Electronics in Agriculture; Diversity and Distributions; Ecography; Ecological Applications; Ecological Modelling; Ecological Monographs; Ecology; Ecosphere; European Journal of Operational Research; European Journal of Physics; Functional Ecology; Global Ecology and Conservation; Hacettepe Journal of Mathematics and Statistics; IEEE Transactions on Cybernetics; IET Cyber-Physical Systems; Journal of Agricultural, Biological, and Environmental Statistics; Journal of Animal Ecology; Journal of Asia-Pacific Biodiversity; Journal of Mathematical Biology; Journal of Open Source Software; Journal of Physics A; Journal of Physics B; Journal of Physics Communications; Journal of the Royal Statistical Society C; Journal of Wildlife Diseases; Journal of Wildlife Management; Landscape Ecology; Mammalia; Marine Ecology Progress Series; Methods in Ecology and Evolution; Movement Ecology; PeerJ; Philosophical Transactions of the Royal Society B; Physica Scripta; Physics Letters A; Physical Review Letters; Physical Review A; Physical Review E; Physical Review X; PLoS One; Royal Society Open Science; Scientific Reports; Spatial Statistics; Statistics and Computing; The American Naturalist; Tropical Conservation Science; Vector-Borne and Zoonotic Diseases; Wildlife Monographs; Wildlife Research

Quantitative Skills

Mathematics Approximation theory; Calculus of variations; Complex analysis; Differential equations; Functional integration; Harmonic analysis; Integro-differential equations; Lie groups; Linear algebra; Markov chains; Matrix analysis; Partial differential equations; Perturbation theory; Probability theory; Random fields; Riemannian geometry; Stochastic differential equations; Stochastic processes; Transform methods

Statistics Asymptotic theory; Bootstrapping (parametric & non-parametric); Divergence measures; Errors-in-variables regression; Estimation theory; Hierarchical models; Kernel density estimation; Maximum likelihood; Meta-analysis; Model selection; Residual maximum likelihood; Robust multivariate statistics; Robust regression; Spatial statistics; Spectral analysis; Time-frequency analysis; Time-series analysis

Computer Science Complexity theory; Fast Fourier transforms; Linear quadratic estimation; Nonlinear optimization; Numerical analysis; Numerical differentiation; Numerical integration; Parallelization; Preconditioning; Quadratic programming; Switching linear dynamical systems; Vectorization

Physics Dynamics; General relativity; Nonequilibrium quantum field theory; Nonequilibrium statistical mechanics (quantum and classical); Statistical mechanics (quantum and classical); Quantum mechanics

Technical Skills

Programming languages Bash; C; Fortran; JavaScript; Mathematica; R

Miscellany GitHub; HTML; Knitr; L^AT_EX; Markdown