GORDON J. BERMAN

gordon.berman@emory.edu

CURRENT POSITION

- **Emory University**, Atlanta, GA
  Assistant Professor, Department of Biology
  September 2015 - present
  O. Wayne Rollins Research Center, Room 2107
  1510 Clifton Road NE, Atlanta, GA 30322
  Phone: 404-727-0071

OTHER CURRENT AFFILIATIONS

- **Emory University Physics Graduate Program**, Atlanta, GA (2015 - present)
- **Emory University Neuroscience Graduate Program**, Atlanta, GA (2015 - present)
- **Emory Department of Quantitative Theory and Methods**, Atlanta, GA (2015 - present)
- **Simons-Emory International Consortium on Motor Control**, co-Director (2020 - present)
- **Emory Theory and Modeling of Living Systems Initiative**, Atlanta, GA (2018 - present)
- **Yerkes National Primate Research Center**, Atlanta, GA, Affiliate Scientist in the Division of Behavioral Neuroscience and Psychiatric Disorders (2020 - present)
- **Georgia Institute of Technology**, Atlanta, GA
  Adjunct Assistant Professor, WH Coulter Department of Biomedical Engineering (2016 - present)

PREVIOUS POSITIONS

- **Princeton University**, Princeton, NJ
  Associate Research Scholar
  Lewis-Sigler Institute for Integrative Genomics & Department of Physics
  September 2009 - August 2015
  Mentors: William Bialek and Joshua Shaevitz
- **HHMI Janelia Research Campus**, Ashburn, VA
  Visiting Research Scientist
  January 2012 - January 2017

EDUCATION

- **Doctor of Philosophy** in Physics with a Minor in Applied Mathematics
  Cornell University, Ithaca, NY
  August 2009
  Thesis: Optimization, Control, and Flies: Quantitative Studies of Insect Flight
  Mentor: Z. Jane Wang
- **Master of Science** in Physics with a Minor in Applied Mathematics
  Cornell University, Ithaca, NY
  May 2007
- **Bachelor of Science** with Highest Honors in Physics and Mathematics
  University of Michigan, Ann Arbor, MI
  April 2003
  Honors Thesis: Measurement of the ATLAS Endcap Muon Spectrometer Sagitta Resolution at the 2002 H8 Test Beam
  Mentors: Bing Zhou and Daniel Levin

RESEARCH

PUBLICATIONS

- Rivera, C, Hernandez, DG, Cande, J, Zhou, B, Stern, DL, and **Berman, GJ**. "A framework for studying behavioral evolution by reconstructing ancestral repertoires"
(*Preprint*: doi:10.1101/2020.07.17.209361v1, under revision at *eLife*)
- Marshall, JD, Aldarondo, DE, Dunn, TW, Wang, WL, **Berman, GJ**, and Ölveczky, BP, "Long-term continuous tracking of 3D whole-body kinematics across the rodent behavioral repertoire" (in press at *Neuron*).
- Saravanan, V, **Berman, GJ**, and Sober, SJ, "Application of the hierarchical bootstrap to multi-level data in neuroscience," *Neurons, Behavior, Data Analysis, and Theory*, 2020.
- Ding, Y, Lillvis, JL, Cande, J, **Berman, GJ**, Arthur, BJ, Xu, M, Dickson, BJ, Stern, DL, "Neural Evolution of Context-Dependent Fly Song," *Current Biology*, 29, 2019, 1089-1099.
- Saravanan, V, Hoffman, LA, Jacobs, A, **Berman, GJ**, and Sober, SJ, "Dopamine depletion affects vocal acoustics and disrupts sensorimotor adaptation in songbirds," *eNeuro*, 6, 2019, e0190-19.2019.
- Jain, K and **Berman, GJ**, "Opening the black box of social behavior," *Nature Neuroscience*, 2019. (Invited Preview of Calhoun et al, *Nature Neuroscience*, 2019)
- Cande, J, Namiki S, Qiu, J, Korff, W, Card, G, Shaevitz, JW, Stern, DL, and **Berman, GJ**, "Optogenetic dissection of descending behavioral control in *Drosophila*," *eLife*, 7, 2018, e34275.
- **Berman, GJ** "Measuring behavior across scales," *BMC Biology*, 16, 2018, 23.
- **Berman, GJ**, "How to build a behavior," *Neuron*, 100, 2018, 1275-1277.
(Invited Preview of Duistermars et al, *Neuron*, 2018)
- Klibaite, U, **Berman, GJ**, Cande J, Stern, DL, and Shaevitz, JW "An unsupervised method for quantifying the behavior of interacting individuals," *Physical Biology*, 14, 2017, 015006.
- Tabler, JM, Mitchell, MM, **Berman, GJ**, Gopalakrishna, S, Fitch, R, Carter, C, Vokes, S, Tajbakhsh, S, Egnor, SER, and Wallingford, J, "Cilia-mediated Hedgehog signaling controls form and function in the mammalian larynx," *eLife*, 6, 2017, e19153.
- Billings, JC, Medda, A, Shakil, S, Shen, X, Kashyap, A, Chen, S, Abbas, A, Zhang, X, Nezafati, M, Pan, W, **Berman, GJ**, and Keilholz, SD, "Instantaneous Brain Dynamics Mapped to a Continuous State Space," *NeuroImage*, 162, 2017, 344-352.
- Billings, JC, Medda, A, **Berman, GJ** and Keilholz, SD, "Functional connectivity metrics for wavelet clustering of rs-fMRI data," *2016 50th Asilomar Conference on Signals, Systems and Computers*, 2016, 1295-1299.
- Klibaite, U, **Berman, GJ**, Cande J, Stern, DL, and Shaevitz, JW "An unsupervised method for quantifying the behavior of interacting individuals," *Physical Biology*, 14, 2017, 015006.
- **Berman, GJ**, Bialek, W, and Shaevitz, JW, "Predictability and hierarchy in *Drosophila* behavior," *Proc. Nat. Acad. Sci.*, 113, 2016, 11943-11948.
- LaRue, K, Clemens, J, **Berman, GJ**, and Murthy, M, "Acoustic duetting relies on the integration of auditory and tactile signals in *Drosophila virilis*," *eLife*, 2015, e07277.
- **Berman, GJ**, Choi, DM, Bialek, W, and Shaevitz, JW, "Mapping the stereotyped behaviour of freely moving fruit flies," *J. R. Soc. Interface*, 11, 2014, 20140672.
- Ristroph, L, Bergou, AJ, **Berman GJ**, Guckenheimer, J, Wang, ZJ, and Cohen, I Dynamics, Control, and Stabilization of Turning Flight in Fruit Flies. In: Childress, S, Hosoi, A, Schultz, WW, and Wang, ZJ, eds. *Natural Locomotion in Fluids and on Surfaces*, Springer, New York, 2012, 83-100.
- Ristroph, L, Bergou, AJ, Ristroph, G, Coumes, K, **Berman, GJ**, Guckenheimer, J, Wang, ZJ, and Cohen, I, "Discovering the flight autostabilizer of fruit flies by inducing aerial stumbles" *Proc. Nat. Acad. Sci.*, 107, 2010, 4820-4824.

- Ristroph, L, **Berman, GJ**, Bergou, AJ, Wang, ZJ, and Cohen, I, "Automated hull reconstruction motion tracking (HRMT) applied to sideways maneuvers of free-flying insects" *Journal of Experimental Biology*, 212, 2009, 1324-1335.
- **Berman, GJ** and Wang, ZJ, "Energy-minimizing kinematics in hovering insect flight," *Journal of Fluid Mechanics*, 582, 2007, 153-167.

RESEARCH SUPPORT

- "CRCNS: Predictability as a new paradigm for rodent social neurobiology"
  National Institute of Mental Health (Role: MPI, PI: Robert Liu)
  $2,209,695, 2017-2022
- "Remembering the future: Interactions between sensation, memory, and behavior"
  Human Frontiers Science Program (Role: PI, other PIs: Jakob Macke, Aman Saleem)
  $1,050,000, 2018-2021
- "Information bottlenecks and the neural control of behavior in fruit flies"
  Research Corporation for Scientific Advancement Cottrell Scholars Program (Role: PI)
  $100,000, 2019-2022
- "Simons-Emory International Consortium on Motor Control"
  Simons Foundation (Role: co-Director, Director: Samuel Sober)
  $2,520,000, 2020-2022
- "Formation of High a High-Flux Student Research Network (HF-SRN) as a Laboratory for Enhancing Interaction in the PoLS SRN"
  Georgia Institute of Technology / NSF (Role: co-PI, PIs: Ilya Nemenman & Daniel Goldman)
  $500,000 to Emory, 2018-2023
- "Mapping the human gait-ome: Automated analysis of individual-specific walking patterns in health and disease"
  Emory University Nexus/Synergy II Grant (Role: co-PI, PI: Lena Ting)
  $100,000, 2019-2021
- "Developing data-driven models to understand sex differences in stress susceptibility"
  McGill University/National Research Council of Canada (Role: co-PI, PI: Rosemary Bagot)
  $25,000, 2019-2021

HONORS AND AWARDS

- Cottrell Scholar Award (2019) *(for both teaching and research)*
- National Science Foundation IGERT graduate fellowship for the study of nonlinear and complex systems (2004-2006)
- University of Michigan "Outstanding Achievement in Mathematics" Award (2003)
- Phi Beta Kappa (2003)
- National Science Foundation/Ford Summer Undergraduate Research Fellowship at CERN (2002)

INVITED TALKS

- *Measuring behavior across scales*, University of Washington, Physics Department Colloquium, Seattle, WA, May 2021.
- *Measuring the hidden dynamics of animal behavior*, Bernstein Computational Neuroscience Colloquium, Universität Tübingen, November, 2020 (virtual).
- *Measuring behavior across scales*, Munich Center for Neuroscience Workshop on Linking Behavioral and Neural Dynamics, October 2020 (virtual).
- *Measuring behavior across scales*, University of Illinois, Mind in-vitro Colloquium, Urbana-Champagne, IL, May 2020. (Rescheduled due to COVID-19).
- *Measuring the hidden dynamics of animal behavior*, University of Minnesota, Center for Neuroengineering Colloquium, April 2020 (vitrual).

- *Measuring the hidden dynamics of animal behavior*, Georgia Institute of Technology, Neuroscience Seminar, Atlanta, GA, April 2019 (Rescheduled due to COVID-19).
- *Measuring behavior across scales*, Johns Hopkins University, Computational Sensing and Robotics Semianr, Baltimore, MD, March 2020 (Rescheduled due to COVID-19).
- *Measuring the hidden dynamics of animal behavior*, Ohio State University, Biophysics Seminar, Columbus, OH, October 2019.
- *Measuring behavior across scales*, Society for Neuroscience Meeting, Short course on Quantifying Behavior as a Lens into the Brain, Chicago, IL, October 2019.
- *Measuring the hidden dynamics of animal behavior*, American Physical Society March Meeting, Invited session on machine learning and inference in biophysics, Boston, MA, March 2019.
- *Why two is tough: conceptual challenges (and some potential solutions) in measuring social behavior*, CoSyNe, Workshop on quantifying social behavioral, Lisbon, Portugal, March 2019.
- *Measuring the hidden dynamics of animal behavior*, Colloquium, Okinawa Institute of Science and Technology, Okinawa, Japan, December 2018.
- *Measuring behavior across scales*, Banbury Conference on Quantitative Approaches to Naturalistic Behaviors, Cold Spring Harbor, NY, September 2018.
- *Measuring behavior across scales*, Champalimaud Centre for the Unknown, Lisbon, Portugal, July 2018.
- *Predictability and generative models of behavior*, University College London, Institute of Behavioral Neuroscience, London, England, July 2018.
- *Time scales, hierarchy, and the neural control of behaviours in flies and rodents*, Federation of European Neuroscience Societies Forum, Symposium on Computational Neuroethology, Berlin, Germany, July 2018.
- *Measuring the hidden dynamics of animal behavior*, Harvard University, Center for Brain Science, Cambridge, MA, January 2018.
- *Mapping the structure of animal behavior*, University of Pennsylvania, Biology Department Colloquium, Philadelphia, PA, October 2017.
- *Predictability and hierarchy in Drosophila behavior*, Tel Aviv University and University of Konstanz research conference on movement and migration, Tel Aviv, Israel, September 2017.
- *Mapping the structure of animal behavior*, Georgia State University, Spineless Seminar, Atlanta, GA, April 2017.
- *Predictability and hierarchy in animal behavior*, American Physical Society March Meeting, Invited session on patterns and sequences of behavior, New Orleans, LA, March 2017.
- *Predictability and hierarchy in animal behavior*, Georgia Institute of Technology, Suddath Symposium on Neuromodulation and Synaptic Control: Modern Tools and Applications, Atlanta, GA, February 2017.
- *Uncovering the latent structure of animal behavior using behavioral embedding*, CoSyNe, Workshop on behavioral and neural data analysis, Snowbird, CO, February 2017.
- *Uncovering the latent structure of animal behavior using behavioral embedding*, Simons Institute, Quantitative Behavior Workshop, New York, NY, December 2016
- *Mapping the structure of animal behavior*, Georgia Institute of Technology, Neuroscience Seminar, Atlanta, GA, December 2016.
- *Decoding descending commands in Drosophila through behavioral space analysis*, Society for Neuroscience Meeting, Mini-symposium on computational ethology, San Diego, CA, November 2016.
- *Mapping the structure of animal behavior*, Instituto de Neurociencias de Alicante, Severo Ochoa Symposium: Behavior and Circuits, Alicante, Spain, October 2016.
- *Mapping the structure of animal behavior*, Champalimaud Centre for the Unknown, Lisbon, Portugal, October 2016.

- *Mapping the structure of animal behavior*, Cornell University, Neuroscience and Behavioral Biology Seminar, Ithaca, NY, October 2016.
- *Predictability and hierarchy in animal behavior*, Georgia Institute of Technology, Physics of Living Systems Seminar, Atlanta, GA, September 2016.
- *Mapping the structure of animal behavior*, Emory University, Frontiers in Neuroscience Seminar, September 2016.
- *Mapping animal behavior*, The Allied Genetics Conference, Workshop on automated tracking for quantitative phenotyping, Orlando, FL, July 2016.
- *Predictability and hierarchy in Drosophila behavior*, University of Pennsylvania, Computational Neuroscience Seminar, Philadelphia, PA, May 2016.
- *Mapping the structure of animal behavior*, Emory University, ENTICE Innovation Forum, April 2016.
- *Compressing animal behavior*, Emory University, Dimensionality Reduction Workshop, Center for Mind, Brain, and Behavior, October, 2015.
- *Mapping the structure of animal behavior*, Emory University, Physics Department Colloquium, August, 2015.
- *Mapping the structure of animal behavior*, HHMI Janelia Research Campus, Ashburn, VA, April 2015.
- *Mapping the structure of Drosophila behavior*, Drosophila Research Conference, Workshop on behavioral phenotyping in *Drosophila*, Chicago, IL, March 2015.
- *Mapping the structure of animal behavior*, NYU Langone Medical Center, New York, NY, February 2015.
- *Mapping the structure of animal behavior*, Emory University, Department of Biology Seminar, Atlanta, GA, February 2015.
- *Mapping the structure of animal behavior*, Columbia University, Physics Seminar, New York, NY, January 2015.
- *Mapping the structure of animal behavior*, FOM Institute AMOLF (Amsterdam), Biophysics Seminar, Amsterdam, Netherlands, December 2014.
- *Mapping the structure of animal behavior*, Vrije Universiteit Amsterdam, Physics of Living Systems Colloquium, Amsterdam, Netherlands, December 2014.
- *Hierarchy and Predictability in Spontaneous Behavior*, Flies, Worms and Robots: Symposium Combining Perspectives on Minibrains and Behaviour, Sant Feliu, Spain, November 2014.
- *Stereotypy and the Structure of Behavioral Space*, NIST, Biophysics Seminar, Gaithersburg, MD, April 2014.
- *Stereotypy and the Structure of Behavioral Space*, Society for Integrative and Comparative Biology, Symposium on quantitative approaches to behavior, Charleston, SC, January 2012.
- *Data-Driven Classification of Animal Behavior*, HHMI Janelia Research Campus, Ashburn, VA, November 2011.
- *Optimization, Control, and Flies: Quantitative Studies of Insect Flight*, Harvard University, School of Engineering and Applied Sciences, Cambridge, MA, February 2009.
- *Optimization, Control, and Flies: Quantitative Studies of Insect Flight*, Princeton University, Biophysics Seminar, Princeton, NJ, February 2009.
- *Optimization, Control, and Flies: Quantitative Studies of Insect Flight*, University of California at Santa Barbara, Condensed Matter Seminar, Santa Barbara, CA, January 2009.
- *Optimization, Control, and Flies: Quantitative Studies of Insect Flight*, Rockefeller University, Center for Physics and Biology Seminar, New York, NY, January 2009.

CONTRIBUTED CONFERENCE PRESENTATIONS

- Jain, K., Menichini, E., Muzzu, T., Macke, J., Saleem, A., and Berman, G. "Representing rat behavioral dynamics," FENS, July, 2020.
- Braun, J., Schultz, A., Berman, G., Saleem, A., and Macke, J. "Timescales of predictability as a tool to analyse neuronal dynamics across brain areas," FENS, July, 2020.
- Pinkoviezky, I., and Berman, G. "Uncovering the dynamical structure of behavioral repertoires," American Physical Society, Denver, CO, March 2019. (Cancelled due to COVID-19)
- Overman, K., Pinkoviezky, I., and Berman, G. "Inferring behavioral homologies from dynamical models," American Physical Society, Denver, CO, March 2019. (Cancelled due to COVID-19)
- Jain, K., Menichini, E., Muzzu, T., Macke, J., Saleem, A., and Berman, G. "Long timescale dynamics in freely behaving rats," American Physical Society, Denver, CO, March 2019. (Cancelled due to COVID-19)
- Marshall, J., Aldarondo, D., Dunn, T., Wang, W., Berman, G. and Ölveczky, B. "Probing the neural substrates of movement generation across the rodent behavioral repertoire," American Physical Society, Denver, CO, March 2019. (Cancelled due to COVID-19)
- Calderon, J., and Berman, G. "Inferring causality in highly-synchronized dynamics," American Physical Society, Denver, CO, March 2019. (Cancelled due to COVID-19)
- Marshall, J., Aldarondo, D., Dunn, T., Wang, W., Berman, G. and Ölveczky, B. "Probing the neural substrates of movement generation across the rodent behavioral repertoire," COSYNE, Denver, CO, February 2019.
- Agezo, S., Borie, A., Jain, K., Kwon, Y., Young, L., Liu, R., and Berman, G. "Pair bonding increases the predictability of the behavioral repertoire in prairie voles," Society for Neuroscience, Chicago, IL, October, 2019.
- Menichini, E., Muzzu, T., Jain, K., Macke, J., Berman, G., and Saleem, A. "Quantifying the predictability of rat behavior," Society for Neuroscience, Chicago, IL, October, 2019.
- Marshall, J., Aldarondo, D., Dunn, T., Wang, W., Berman, G. and Ölveczky, B. "Continuous recordings of whole-body kinematics across the rodent behavioral repertoire," Society for Neuroscience, Chicago, IL, October, 2019.
- Tian, K., Berman G., and Prinz, A. "Neuronal and synaptic parameter degeneracy in central pattern generator activity," Society for Neuroscience, Chicago, IL, October, 2019.
- Xu, K., Seagraves, K., Egnor, S., and Berman, G. "Context and Complexity in Mouse Vocalizations," Gordon Research Conference on Neuroethology, West Dover, VT, July, 2019.
- Overman, K., Pinkoviezky, I., and Berman, G. "Modeling the hidden dynamics of Drosophila behavior with recurrent neural networks," American Physical Society, Boston, MA, March 2019.
- Pinkoviezky, I., Roman, A., Amadei, E., Liu, R., and Berman, G. "The role of neural excitability and coupling in the formation of social bonds," American Physical Society, Boston, MA, March 2019.
- Rivera, C., Zhou, B., Hernandez-Lahme, D., Cande, J., Stern, D., and Berman, G. "Modeling behavioral evolution in fruit flies through reconstructing ancestral states," American Physical Society, Los Angeles, CA, March 2018.
- Calderon, J., Inman, C., Willie, J., and Berman, G. "Decoding human behavior from complex neural interactions," American Physical Society, Los Angeles, CA, March 2018.
- Pinkoviezky, I., Roman, A., Amadei, E., Liu, R., and Berman, G. "Modeling the Dynamics of Phase-Amplitude-Coupling During Social Bond Formation," American Physical Society, Los Angeles, CA, March 2018.
- Overman, K., Gao, J., Choi, D., Shaevitz, J., and Berman, G. "Inferring the role of internal dynamics in *Drosophila* aging," American Physical Society, Los Angeles, CA, March 2018.
- Manley, J., Berman, G., and Shaevitz, J. "Quantification of Behavioral Stereotypy in Flies," American Physical Society, New Orleans, LA, March 2017.

- Alba, V., Berman, G., Bialek, W., and Shaevitz, J. "Exploring a strongly non-Markovian behavior," American Physical Society, New Orleans, LA, March 2017.
- Kwon, Y., Adams, G.K., Berman, G.J., and Liu, R.C. "Unbiased automated phenotyping of rodent behavior in nonsocial and social contexts," Society for Neuroscience, San Diego, CA, November, 2016.
- Billings, J., Shakil, S., Berman, G., and Keilholz, S. "Embedding dynamic functional connectivity into two dimensions with tSNE", Organization for Human Brain Mapping Annual Meeting, Geneva, Switzerland, June 2016.
- Deny, S., Mackevicius, E., Okubo, T., Berman, G., Shaevitz, J., and Fee, M. "Learning stable representations in a changing world with on-line t-SNE: proof of concept in the songbird," 4th International Conference on Learning Representations, San Juan, Puerto Rico, May 2016.
- Cande, J., Berman, G., Namiki S. , Korff, W., Card, W., Shaevitz, J., Stern, D. "Optogenetic dissection of descending behavioral control in *Drosophila*," COSYNE, Salt Lake City, UT, March 2016.
- Klibaite, U., Berman, G., Wang, Q., Cande, J., Stern, D., and Shaevitz, J. "Unsupervised quantifications of social interactions in fruit flies," COSYNE, Salt Lake City, NY, September 2015.
- Berman, G., Bialek, W., and Shaevitz, J., "Hierarchy and predictability in Drosophila behavior," Cold Spring Harbor Neurobiology of Drosophila meeting, Cold Spring Harbor, TX, March 2015.
- Berman, G., Bialek, W., and Shaevitz, J., "Hierarchy and predictability in spontaneous behavior," APS March Meeting, San Antonio, TX, March 2015.
- Berman, G., Choi, D., Klibaite, U., Bialek, W., and Shaevitz, J., "Stereotypy and the structure of behavioral space," Sloan-Swartz Meeting for Theoretical Neuroscience, Seattle, WA, June 2014.
- LaRue, K., Berman, G., Perez, T., Guan, G., Stern, D., and Murthy, M. "Evolution of female song production in *Drosophila virilis* group species," Evolution, Raleigh, NC, June 2014.
- Berman, G., Choi, D., Bialek, W., and Shaevitz, J., "Mapping the structure of animal behavior," APS March Meeting, Denver, CO, March 2014.
- LaRue, K., Berman, G., Perez, T., Guan, G., Stern, D., and Murthy, M. "Acoustic Duetting During Courtship in *Drosophila virilis*," Drosophila Research Conference, San Diego, CA, March 2014.
- Berman, G., Choi, D., Bialek, W., and Shaevitz, J., "Mapping the structure of animal behavior," Gordon Conference on Genes and Behavior, Galveston, TX, February 2014.
- Berman, G., Choi, D., Bialek, W., and Shaevitz, J., "Discovery of stereotypy through behavioral space embedding," American Physical Society, Baltimore, MD, March 2013.
- Berman, G., Choi, D., Bialek, W., and Shaevitz, J., "Stereotypy and the structure of behavioral space," Society for Integrative and Comparative Biology, San Francisco, CA, January 2013.
- Berman, G., Bialek, W., and Shaevitz, J., "Data-driven classification of animal behavior," American Physical Society, Boston, MA, March 2012.
- Berman, G., Bialek, W., and Shaevitz, J., "Reconstructing the behavior of terrestrial fruit flies," American Physical Society, Portland, OR, March 2010.
- Berman, G., Ristroph, L., Lyon, B., Bergou, A., Cohen, I., and Wang Z.J., "The ascent of freely-flying fruit flies," Society for Integrative and Comparative Biology, Boston, MA, January 2009.
- Bergou, A. J., Ristroph, L., Berman, G., Cohen, I., and Wang, Z. J., "Wing deformation and control in insect flight," Society for Integrative and Comparative Biology, Boston, MA, January 2009.
- Ristroph, L., Berman, G., Bergou, A. J., Cohen, I., and Wang, Z. J., "Sideways flying by phased wing flipping," Society for Integrative and Comparative Biology, Boston, MA, January 2009.ß
- Berman, G., Ristroph, L., Bergou, A., Cohen, I., and Wang Z.J., "A novel automated method for studying free-flight insect maneuvers," American Physical Society Division of Fluid Dynamics, San Antonio, TX, November 2008.

- Ristroph, L., Berman, G., Bergou, A., Wang, Z.J., and Cohen, I., "Sideways flight of insects by phased wing flips," American Physical Society Division of Fluid Dynamics, San Antonio, TX, November 2008.
- Bergou, A., Ristroph, L., Berman, G., Wang, Z.J., and Cohen, I., "Wing Deformation and Control in Insect Flight," American Physical Society Division of Fluid Dynamics, San Antonio, TX, November 2008.
- Berman, G., Ristroph, L., Cohen, I., and Wang Z.J., "An interspecific comparison of fruit fly flight," American Physical Society Division of Fluid Dynamics, Salt Lake City, UT, November 2007.
- I. Cohen, Ristroph, L., Berman, G., and Wang Z.J., "Comparing flight strategies in species of fruit flies," American Physical Society Division of Fluid Dynamics, Salt Lake City, UT, November 2007.
- Berman, G., and Wang, Z.J., "Kinematics, power, and optimization in hovering insect flight," American Physical Society Division of Fluid Dynamics, Chicago, IL, November 2005.

TEACHING

COURSES TAUGHT AT EMORY

- Biology 485/Physics 741R:
  Measuring and Modeling Animal Behavior
  Developed for Fall 2016 and Taught Fall 2016 & Fall 2017
- Biology 355/Quantitative Theory and Methods 355:
  Introduction to Time Series Analysis
  Developed for Spring 2017 and Taught Spring 2017, Spring 2018, & Spring 2019.
- Biology 450/IBS 534:
  Computational Neuroscience
  Directed course during Spring 2019, taught two lectures each in Spring 2016, 2017, & 2018, and three lectures in 2020. Will direct again in Spring 2021.
- Biology 385/QTM 385:
  Analyzing Data in Many Dimensions
  New interdisciplinary course focusing on theory-driven analysis of high-dimensional data. Developed for Fall 2020 as part of a Cottrell Scholar Award.

OTHER TEACHING

- Developed and taught a four lecture sequence on the Physics of Behavior for the 2019 Boulder Summer School on Condensed Matter Physics (School topic: Theoretical biophysics).
- Developed and taught a tutorial on multi-scale behavioral analysis at the Cajal School on the Behavior of Neural Systems in Lisbon, Portugal (July, 2018). I was to co-direct the course in 2020 before it was cancelled due to COVID-19 (will likely be rescheduled to 2021).
- Taught at a Short Course at the 2019 Society for Neuroscience Meeting on modern methods in behavioral analysis in neuroscience (October, 2019).
- Developed lecture on local field potential analysis for Emory Neuroscience 551 (Fall 2019 and Fall 2020).
- Mentor for the Neuromatch Academy summer school on computational neuroscience (Summer 2020).
- Mentor for Emory Neuroscience Graduate Program grant writing class (Fall 2019).
- Gave a lecture and tutorial on analyzing behavioral data at the Severo Ochoa Symposium on Behavior and Circuits in Alicante, Spain (October 2016).
- Developed and taught a behavioral analysis tutorial during the Emory University Dimensionality Reduction Workshop (October, 2015).

TEACHING EXPERIENCE PRIOR TO EMORY

Lecturer — Princeton University — September 2011 - June 2012
Physics Department — Princeton, NJ

Taught introductory physics, chemistry, and biology as part of the Integrated Science curriculum

Visiting Lecturer — Cornell University — August 2007 - December 2007
Mathematics Department — Ithaca, NY

Lectured introductory calculus for engineers

Teaching Assistant — Cornell University — August 2003 - May 2004
Physics Department — Ithaca, NY — January 2008 - May 2008

Recitation instruction of introductory physics classes

Undergraduate Student Instructor — University of Michigan — June 2003 - August 2003
Mathematics Department — Ann Arbor, MI

Co-taught a summer class to high schoolers on "The Nature of Infinity" as part of the Michigan Math and Science Scholars summer program

TEACHING HONORS AND AWARDS

- Cottrell Scholar Award (2019) *(for both teaching and research)*

GRADUATE MENTEES

- Sena Agezo, PhD Candidate, Neuroscience (co-mentored with Robert Liu)
- Josuan Calderon, PhD Candidate, Physics
- Kanishk Jain, PhD Candidate, Physics
- Katherine Overman, PhD Candidate, Physics
- Jirui Qiu, MS, Physics (2017)
  Thesis: *Context-dependent Encoding of Descending Neurons in Drosophila*

Rotation Students

- Eslam Abdelaleem (Physics, 2019)
- Kelvin Chng (Physics, 2021)
- Masud Ehsani (Physics, 2016)
- Aiden Ford (Neuroscience, 2020)
- Rajpreet Kaur (Physics, 2020)
- Weijie Li (Physics, 2017)
- Chen Pang (Physics, 2015)
- Gary Vestal (Physics, 2019)
- Jin Qian (Physics, 2018)

POSTDOCTORAL MENTEE

- Itai Pinkoviezky

UNDERGRADUATE MENTEES

- Xiaoyi Chen, Emory University (Class of 2019)
- Xiaotong (Kary) Fang, Emory University (Class of 2022)
- Jeff Gao, Emory University (Class of 2018)
- Rauf Iftikhar, Emory University (Class of 2023)
- Jessica Ji, Emory University (Class of 2022)
- Shinyoung Kang, Emory University (Class of 2021)
- Elizabeth O'Gorman, Emory University (Class of 2018): **Senior Thesis with Highest Honors**
  Thesis: *Low-Dimensional Mapping of Corticostriatal Neural Circuitry Dynamics Underlying Female Prairie Vole Pair Bonding*
  2018 National Science Foundation Graduate Research Fellowship
- Ishan Saran, Emory University (Class of 2020): **Senior Thesis with Highest Honors**
  Thesis: *Representing Behaviors with Recurrent Neural Networks*
- Hanyao Sun, Emory University (Class of 2019)
- Kevin Xu, Emory University (Class of 2020): **Senior Thesis with Highest Honors**
  Thesis: *Context and Complexity in Mouse Vocalizations*
  Beckman Scholar in Computational Neuroscience (2017-2019)
- Yating Yang, Emory University (Class of 2018): **Senior Thesis with High Honors**
  Thesis: *Low-Dimensional Dynamics Encoding in Human Brain Data*

GRADUATE COMMITTEE MEMBER

Emory Neuroscience:

- Rachel Conn
- James MacGregor
- Andrea Pack
- Kayla Peelman
- Varun Saravanan (PhD, 2019)
- Kun Tian (PhD, 2019)
- Yunmiao Wang
- Feng Zhu

Emory Physics:

- Linnea Bavik
- Mahan Ghafari (MS, 2018)
- KaWai Leung (PhD, 2017)
- Qihan Liu
- Kavinda Nissanka
- Joseph Natale (PhD, 2020)
- Mahajabin Rahman
- Catalina Rivera (PhD, 2020)
- Ahmed Roman
- Tyler Smith
- Baohua Zhao (PhD, 2019)

Emory & Georgia Tech Biomedical Engineering:

- W. Alexander Calhoun
- Kim Le
- Sean O'Connell
- Anderson Speed
- Lahiru Wimalasena

Emory Clinical Psychology:

- Steven Riley

External:

- Kathleen Bates, Georgia Tech BioEngineering (PhD, 2020)
- Shivesh Chaudhary, Georgia Tech Chemical Engineering
- Jake Graving, Universität Konstanz Collective Behaviour
- Ugne Klibaite, Princeton Quantitative and Computational Biology (PhD, 2018)
- Daniel Porto, Georgia Tech BioEngineering (PhD, 2018)

UNDERGRADUATE HONORS COMMITTEE MEMBER

- Ishan Saran (Physics, Class of 2020) (*chair*)
- Kevin Xu (Emory Quantitative Sciences, Class of 2020) (*chair*)
- Danial Arslan (Biology, Class of 2020)
- Mia Morrell (Physics, Class of 2020)
- Nick Green (Biology, Class of 2019)
- Shalini Sreedhar (Biology, Class of 2019)
- Veronica Chiu (NBB, Class of 2019)
- Ruomin Zhu (Physics, Class of 2019)
- Elizabeth O'Gorman (NBB, Class of 2018) (*chair*)
- Yating Yang (Biology, Class of 2018) (*chair*)
- Cyrillus Tan (Physics, Class of 2018)
- Caroline Holmes (Physics & Biology, Class of 2017)
- Hugh Phillis (Physics, Class of 2017)

SERVICE

COMMITTEE-BASED SERVICE

- Co-Chair, Emory Neuroscience Graduate Program Admissions Committee (2019 - current)
- Member, Emory Neuroscience Graduate Program Admissions Committee (2016 - current)
- Member, Emory Physics Graduate Program Admissions Committee (2015 - 2019)
- Member, Emory Physics Graduate Program Matching Committee (2020 - current)
- Chair, Emory Neuroscience Graduate Program Admissions Subcommittee on International Applications (2018 - current)
- Member, Emory Neuroscience Graduate Program Awards Committee (2019 - current)
- Member, Emory Neuroscience Graduate Program Executive Committee (2019 - current)
- Member, Emory Biology Department Search Committee in Theoretical/Computational Epigenetics (2019-2020)
- Member, Emory QTM Department Search Committee (2020-2021)
- Member, Emory STEM Symposium Admissions Committee (2016 - 2018)
- Judge, Emory STEM Symposium (2016 - current)
- Member, Organizing Committee, Georgia Tech/Emory Kavli Brain Forum (2016 - 2019)
- Member, Emory Physics Department Strategic Advisory Committee (Spring/Fall 2018)
- Member, Task Force on Biology Hires within Emory QTM (Summer 2019 - current)
- Member, Task Force on Emory Physics Post-baccalaureate Program (Fall 2019, Fall 2020)

PROFESSIONAL AFFILIATIONS

- American Physical Society
  - Division of Biological Physics
  - Division of Soft Matter
  - Data Science Working Group
  - Statistical and Nonlinear Physics Working Group
- Atlanta Society of Mentors

CONFERENCES/SESSIONS ORGANIZED or CO-ORGANIZED

- "Neural Control of Behavior" Session at 2016 American Physical Society March Meeting (Baltimore, MD)
- "Neural Control of Behavior" Session at 2017 American Physical Society March Meeting (New Orleans, LA)
- "Neural Control of Behavior" Session at 2018 American Physical Society March Meeting (Los Angeles, CA)
- Summer 2018 Aspen Center for Physics Workshop on "The Physics of Behavior" (Aspen, CO)
- Symposium on "Computational Neuroethology" at the 2018 FENS Meeting (Berlin, Germany)
- Theory and Modeling in Living Systems Initiative Workshop on "What is Theoretical Biological Physics in The Age of Quantitative Biology and Big Data?" (Emory University, 2019)
- Theory and Modeling in Living Systems Virtual Workshop on the Physics of Behavior (April 2020)
- Inaugural Symposium (virtual) of the Simons-Emory International Consortium on Motor Control (June 2020)

JOURNAL & CONFERENCE REVIEWS

Over 60 papers total, including papers from: eLife, Frontiers in Human Neuroscience, iScience, Journal of the Royal Society Interface, Nature, Nature Communications, Nature, Nature Methods, Nature Neuroscience, Nature Physics, Neuroinformatics, PLoS Computational Biology, PLoS One, Physical Biology, Physical Review Letters, Physical Review E, Proceedings of the National Academy of Sciences, Reviews of Modern Physics, and Scientific Reports

- Member, Board of Reviewing Editors at *eLife*, 2019 - current
- Reviewer, Cosyne, 2016 - current

GRANT REVIEWS

- Ad hoc grant review for National Science Foundation (IOS)
- German-Israel Foundation for Scientific Research and Development
- Emory University Research Council Internal Grants
- Great Ormond Street Hospital Charity Clinical Research Grants
- Human Frontiers Science Program Young Investigator Grants
- NRSEC (Canada) Discovery Grant Competition

Dated: October 23, 2020