GORDON J. BERMAN

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CURRENT POSITIONS

- **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
- **Georgia Institute of Technology**, Atlanta, GA
  Adjunct Assistant Professor, Wallace H. Coulter Department of Biomedical Engineering
  February 2016 - present

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
  Advisor: 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
  Advisors: Bing Zhou and Daniel Levin

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

OTHER RESEARCH EXPERIENCE

Visiting Researcher	Santa Fe Institute Santa Fe, NM	May 2005 - August 2005
Undergraduate Research Assistant	University of Michigan Ann Arbor, MI	May 2001 - April 2003
Undergraduate Research Fellow	CERN Geneva, Switzerland	May 2002 - August 2002

PEER-REVIEWED PUBLICATIONS

- Tabler, J.M., Mitchell, M.M., Berman, G.J., Gopalakrishna, S., Fitch, R., Carter, C., Vokes, S., Tajbakhsh, S., Egnor, S.E.R., and Wallingford, J., "Cilia-mediated Hedgehog signaling controls form and function in the mammalian larynx," *eLife*, 6, 2017, e19153.
- Klibaite, U., Berman, G.J., Cande J., Stern, D.L., and Shaevitz, J.W. "An unsupervised method for quantifying the behavior of interacting individuals," *Physical Biology*, 14, 2017, 015006.
- Berman, G.J., Bialek, W., and Shaevitz, J.W., "Predictability and hierarchy in *Drosophila* behavior," *Proc. Nat. Acad. Sci.*, 113, 2016, 11943-11948.
- Billings, J.C., Medda, A., Berman, G.J. and Keilholz, S.D., "Functional connectivity metrics for wavelet clustering of rs-fMRI data," *2016 50th Asilomar Conference on Signals, Systems and Computers*, 2016, 1295-1299.
- LaRue, K., Clemens, J., Berman, G.J., and Murthy, M., "Acoustic duetting relies on the integration of auditory and tactile signals in *Drosophila virilis*," *eLife*, 2015, e07277.
- Berman, G.J., Choi, D.M., Bialek, W., and Shaevitz, J.W., "Mapping the stereotyped behaviour of freely moving fruit flies," *J. R. Soc. Interface*, 11, 2014, 20140672.
- Ristroph, L., Bergou, A.J., Berman G.J., Guckenheimer, J., Wang, Z.J., and Cohen, I. Dynamics, Control, and Stabilization of Turning Flight in Fruit Flies. In: Childress, S., Hosoi, A., Schultz, W.W., and Wang, Z.J., eds. *Natural Locomotion in Fluids and on Surfaces*, Springer, New York, 2012, 83-100.
- Ristroph, L., Bergou, A.J., Ristroph, G., Coumes, K., Berman, G.J., Guckenheimer, J., Wang, Z.J., 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, G.J., Bergou, A.J., Wang, Z.J., 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, G.J. and Wang, Z.J., "Energy-minimizing kinematics in hovering insect flight," *Journal of Fluid Mechanics*, 582, 2007, 153-167.

PRE-PRINTS

- Billings, J.C., Medda, A., Shakil, S., Shen, X., Kashyap, A., Chen, S., Abbas, A., Zhang, X., Nezafati, M., Pan, W., Berman, G.J., and Keilholz, S.D., "Instantaneous Brain Dynamics Mapped to a Continuous State Space," *bioRxiv*, 2017, 10.1101/157115.
- Berman, G.J., Choi, D.M., Bialek, W., and Shaevitz, J.W., "Mapping the structure of drosophilid behavior," arχiv, 2013, 1310.4249v1.

PUBLICATIONS IN PREPARATION

- Berman, G.J., Seagraves, K. and Egnor, S.E.R., "Continuous variation in mouse ultrasonic vocalization syllable structure revealed through low-dimensional embedding," *In Prep*.
- Cande, J., Berman, G.J., Namiki S., Korff, W., Card, G., Shaevitz, J.W., and Stern, D.L. "Optogenetic dissection of descending behavioral control in *Drosophila*" *In Prep*.
- Choi, D.M., Berman, G.J., and Shaevitz, J.W., "Complex behavioral correlations and sexual dimorphism in the aging profile of *Drosophila melanogaster*," *In Prep*.

INVITED AND REFEREED TALKS

- University of California at Santa Barbara, Condensed Matter Seminar, January 2009.
- Rockefeller University, Center for Physics and Biology Seminar, January 2009.
- Princeton University, Biophysics Seminar, February 2009.
- Harvard University, School of Engineering and Applied Sciences, February 2009.
- HHMI Janelia Research Campus, November 2011.
- Society for Integrative and Comparative Biology, Symposium on quantitative approaches to behavior, January 2012.
- COSYNE, Refereed Oral Presentation, March 2014.
- NIST (Maryland), Biophysics Seminar, April 2014.
- Flies, Worms and Robots: Symposium Combining Perspectives on Minibrains and Behaviour, November 2014
- Vrije Universiteit Amsterdam, Physics of Living Systems Colloquium, December 2014.
- FOM Institute AMOLF (Amsterdam), Biophysics Seminar, December 2014.
- Columbia University, Physics & Neuroscience, January 2015.
- Emory University, Department of Biology Seminar, February 2015.
- NYU Langone Medical Center, February 2015.
- Drosophila Research Conference, Workshop on behavioral phenotyping in *Drosophila*, March 2015.
- HHMI Janelia Research Campus, April 2015.
- Emory University, Dimensionality reduction workshop, Center for Mind, Brain, and Behavior, October, 2015.
- University of Pennsylvania, Computational Neuroscience Seminar, May 2016.
- The Allied Genetics Conference, Workshop on automated tracking for quantitative phenotyping, July 2016.
- Emory University, Frontiers in Neuroscience Seminar, September 2016.
- Georgia Institute of Technology, Physics of Living Systems Seminar, September 2016.
- Cornell University, Neuroscience and Behavioral Biology Seminar, October 2016.
- Instituto de Neurociencias de Alicante, Severo Ochoa Symposium: Behavior and Circuits, October 2016.
- Champalimaud Centre for the Unknown, October 2016.
- Society for Neuroscience Meeting, Mini-symposium on computational ethology, November 2016.
- Georgia Institute of Technology, Neuroscience Seminar, December 2016.
- Georgia Institute of Technology, Suddath Symposium on Neuromodulation and Synaptic Control: Modern Tools and Applications, February 2017.
- COSYNE, Workshop on behavioral and neural data analysis, February 2017.
- APS March Meeting, Invited session on patterns and sequences of behavior, March 2017.
- Georgia State University, Spineless seminar, April 2017.
- Tel Aviv University and University of Konstanz research conference on movement and migration, September 2017.
- University of Pennsylvania, Biology Department Colloquium, October 2017.
- FENS Symposium on Computational Neuroethology, July 2018.

CONFERENCE PRESENTATIONS

- 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.

- 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.

HONORS AND AWARDS

- Finalist, Burroughs Wellcome Fund Career Award at the Scientific Interface (2011)
- 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)

PRIOR TEACHING EXPERIENCE

Lecturer *Physics Department*	Princeton University Princeton, NJ	September 2011 - June 2012
Visiting Lecturer *Mathematics Department*	Cornell University Ithaca, NY	August 2007 - December 2007
Teaching Assistant *Physics Department*	Cornell University Ithaca, NY	August 2003 - May 2004 January 2008 - May 2008
Undergraduate Student Instructor *Mathematics Department*	University of Michigan Ann Arbor, MI	June 2003 - August 2003

GRADUATE ADVISEES

- Josuan Calderon, PhD Candidate, Emory Physics
- Katherine Overman, PhD Candidate, Emory Physics
- Jirui Qiu, MS Candidate, Emory Physics

POSTDOCTORAL ADVISEES

- Itai Pinkovezky (co-advised with Ilya Nemenman and Daniel Weissman)

UNDERGRADUATE ADVISEES

- Yating Yang, Emory Biology (Class of 2018)

PROFESSIONAL AFFILIATIONS

- American Physical Society - Division of Biological Physics
- Genetics Society of America

REFEREE FOR JOURNALS

- Bioinspiration & Biomimetics
- eLife
- Frontiers in Human Neuroscience
- Journal of Bionic Engineering
- Journal of Fluid Mechanics
- Journal of Experimental Biology
- Journal of Fluids and Structures
- Journal of the Royal Society Interface
- PLoS One
- Physical Biology
- Physical Review Letters
- Physical Review E
- Reviews of Modern Physics