ANDREW M LEIFER, PHD

Lewis-Sigler Institute for Integrative Genomics
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EDUCATION

2012 Harvard University, Cambridge, MA.
Ph.D. in Biophysics
(Defended 19 December 2011, conferred 24 May 2012)
Advisor: Prof. Aravinthan D. T. Samuel
Thesis: Optogenetics and computer vision for *C. elegans* neuroscience and other biophysical applications

2007 Stanford University, Stanford, CA.
B.S. in Physics
B.A. in Political Science
Interdisciplinary Honors in International Security Studies
Thesis: International scientific engagement for mitigating emerging nuclear security threats

AWARDS

2013 American Physical Society, Biological Physics Thesis Award, Certificate of Merit.

2012 Lewis-Sigler Fellow, Princeton University

2008 Derek C. Bok Certificate of Distinction in Teaching, Harvard University.

2007 National Science Foundation Graduate Research Fellowship.

2006 Leonard M. Rieser Fellowship in Science Technology and Global Security, Bulletin of the Atomic Scientist.

2006 SPIE International Society for Optical Engineering Scholarship.

2006 American Institute of Physics, Society of Physics Students, Leadership Award.

2006 National Science Foundation , Summer Undergraduate Research Fellowship, two-time recipient.

2006 AAAS, Center for Science Technology and Security Policy, Intern of the Year Award.

2006 Harry Press Journalism Award, Stanford University.

2006 National Association of Rocketry Academic Scholarship four-time recipient.

2004 Boothe Prize for Excellence in Writing, Stanford University.

2003 Robert C. Byrd Academic Merit Scholarship.

2003 Dofflemyer Eagle Scout Scholarship.

2003 Awards for the author's independent research, "Fractals, Power-Laws and the Weibull Distribution: Mathematically Modeling Crumpled Paper"

Karl Menger Award, American Mathematical Society.

Naval Science Award from The Office of Naval Research, US Navy.

Third Place Team Project, Intel International Science and Engineering Fair 2003.

First Place Team Project, Colorado Science and Engineering Fair.

Outstanding Achievement in Education, Scientific American.

2000 Golden State Governor's Scholarship, State of California.

EMPLOYMENT

2012-Present	Lewis-Sigler Fellow & Lecturer of Physics, Princeton University, Princeton NJ.
2009-2012	Resident Tutor, Senior Staff, Lowell House, Harvard College, Cambridge, MA.
6-9/05, 6-9/06	JILA, National Institute of Standards and Technology at University of Colorado, Boulder.
3/06 – 6/06	Center for Science Technology and Security Policy, American Association for the Advancement of Science, Washington D.C.
2005-2007	Stanford Daily, Stanford CA.
6/04-9/04	Institute for Telecommunication Sciences at the National Telecommunications and Information Administration, Boulder, CO.
6/03-9/03	National Institute of Standards and Technology, US Dept. of Commerce, Boulder, CO.

TEACHING

Spring 2013	Lecturer for Integrated Science 233: "An Integrated Quantitative Introduction to the Natural Sciences II", Princeton University, Princeton, NJ.
	Guest lecturer, Biophysics 242R: "Special Topics in Biophysics: Brain and Behavior," Harvard University, Cambridge, MA.
Fall 2012	Lecturer for Integrated Science 231: "An Integrated Quantitative Introduction to the Natural Sciences I", Princeton University, Princeton, NJ.
Spring 2008	Teaching Fellow for Molecular Cellular Biology 199: "Statistical Thermodynamics for Quantitative Biology", Harvard University, Cambridge, MA.

PUBLICATIONS

Steven J. Husson, Alexander Gottschalk, **Andrew M. Leifer**, "Optogenetic manipulation of neural activity in *C. elegans*: from synapse to circuits and behavior" *invited review in Journal of Biology of the Cell* early online publication (2013).

Jamie L. Donnelly, Christpoher M. Clark, **Andrew M. Leifer**, Marian Haburacak, Jennifer K. Pirri, Michael M. Francis, Aravinthan D. T. Samuel, and Mark J. Alkema. "Monoaminergic orchestration of motorprograms in a complex behavior in *C. elegans*." *PLoS Biology* 11(4): e1001529 (2013).

Quan Wen, Michelle Po, Elizabeth Hulme, Sway Chen, Xinyu Liu, Sen Wai Kwok, Marc Gershow, **Andrew M. Leifer**, Victoria Butler, Christopher Fang-Yen, Taizo Kawano, William R. Schafer, George Whitesides, Matthieu Wyart, Dmitri Chklovskii, Mei Zhen,

Aravinthan D Samuel, "Proprioceptive coupling within motor neurons drives *C. elegans* forward locomotion." *Neuron,* 76, 750-761 (2012).

Chenxiang Lin, Ralf Jungmann, **Andrew M. Leifer**, Chao Li, Daniel Levner, Geroge M. Church, William M. Shih, Peng Yin. "Sub-micrometer geometrically encoded fluorescent barcodes self-assembled from DNA." *Nature Chemistry*, 4, 832–839 (2012).

Andrew M. Leifer, Christopher Fang-Yen, Marc Gershow, Mark Alkema, Aravinthan D.T. Samuel, "Optogenetic manipulation of neural activity in freely moving *Caenorhabditis elegans*," *Nature Methods*, 8, 147–152 (2011) .

Kevin J. Coakley, David S. Simons, **Andrew M. Leifer**. "Secondary Ion Mass Spectrometry Measurements of Isotopic Ratios: Correction for Time Varying Count Rate." *International Journal of Mass Spectrometry,* 204, 107-120 (2005).

TALKS

Andrew M. Leifer, Christopher Clark, Mark Alkema, Aravinthan D T Samuel, "Technology for manipulating and monitoring neural activity in *C. elegans* during mechanosensory induced escape response," *Dynamics of Prey Capture and Escape Conference*, Janelia Farms, Ashburn, VA, March 6-9, 2013.

Andrew M. Leifer, "The *C. elegans* escape response as a model for motor sequence behavior," *Multi Group Worm Meeting*, Rutgers University, Piscataway, NJ, February 13, 2013 (invited) .

Andrew M. Leifer, "Two Optical neurophysiology instruments for manipulating and monitoring neural activity in *C. elegans* during motor sequence behaviors." *Optics & neurophotonics seminar*, INSERM, University Paris Descartes, Paris, France, June 8, 2012 (invited).

Andrew M. Leifer, Christopher Clark, Mason Klein, Mark J. Alkema, Aravinthan Samuel, "Two Optical neurophysiology instruments to perturb and observe neural activity in freely-moving *C. elegans*." *Neuronal Circuits Conference*, Cold Spring Harbor Laboratory, Cold Spring Harbor, New York, March 28-31 2012.

Andrew M. Leifer, Chirstopher Clark, Quan Wen, Christopher Fang-Yen, Mark Alkema, Aravinthan Samuel, "Shining light on behavior: An optogenetic dissection of neural circuits in freely behaving *C. elegans*." *18th International* C. elegans *Meeting*, Los Angeles, CA, June 22 - June 26, 2011.

Andrew M. Leifer, Christopher Fang-Yen, Aravinthan D. T. Samuel, "A remote control for the *C. elegans* nervous system." *American Physical Society March Meeting 2010*, Portland, OR, March 15-19, 2010.

POSTERS

Andrew M. Leifer, Christopher Clark, Mark Alkema, Aravinthan Samuel. "Technology for manipulating and monitoring neural activity in *C. elegans* during motor sequence behavior." *C. elegans Neurobiology*, EMBO, EMBL Advanced Training Centre, Heidelberg, Germany. June 14-17, 2012.

Andrew M. Lifer, Christopher Clark, Christopher Fang-Yen, Mark J. Alkema, Aravinthan D. T. Samuel. "Optogenetic investigation of the *C. elegans* mechanosensory circuit." *Synapses: From Molecules to Circuits & Behaviors*, Cold Spring Harbor Laboratory, Cold Spring Harbor, New York, NY, April 12-16, 2011.

Andrew M. Leifer, Christopher Fang-Yen, Aravinthan D. T. Samuel, "Optogenetic manipulation of neural activity in freely moving *C. elegans*," National Institute of Health, *NIH Director's Pioneer Award Symposium*, Bethesda, MD, September 30 – October 1, 2010.

Andrew M. Leifer, Christopher Fang-Yen, Marc Gershow, Aravinthan D. T. Samuel. "Spatiotemporal control of neural activity in freely behaving *C. elegans*," *Neuronal Development, Synaptic Function & Behavior* C. elegans *meeting*, Madison, WI, June 27- 30, 2010

Andrew M. Leifer, Christopher Fang-Yen, Marc Gershow, Aravinthan D. T. Samuel. "Spatiotemporal control of neural activity in freely behaving *C. elegans*," *Neuronal Circuits Meeting*, Cold Spring Harbor, NY, March 10-13, 2010

Andrew M. Leifer, William M. Shih, "Rigid Linear Nano-Actuator Self-Assembled from DNA." *Biophysical Society 53rd Annual Meeting*, Boston, MA, February 29- March 4, 2009.

Tobi A Szuts, Bitaliy Fedeyv, Andrew Leifer, Wladyslaw Dabrowsky, Naoshige Uchida, Alan Litke, Markus Meister, "Wireless Recording from the Cortex of a Freely Roaming Rat." *CoSyNe 09*. Salt Lake City, Utah. Februay 27, 2009.

Tobi Szuts, V Fadeyev, S Kachiguine, MI Grivich, A Sher, AM Leifer, N Uchida, AM Litcke, M Meister. "Wireless Recording from Freely Behaving Rat," *Using In Vivo Physiology to Understand Neural Circuits in Genetic Systems*. Janelia Farm, Virginia. April 20 - 23, 2008.

A. M. Leifer, D. G. Pothier, R. To. "Fractals, Power-Laws and the Weibull Distribution: Mathematically Modeling Crumpled Paper." *Intel International Science and Engineering Fair*. Cleveland, Ohio. May 15, 2003.

SERVICE

Scientific content reviewer for peer-reviewed journals including: *PLoS One* and *JoVe.*

PRIOR ACTIVITIES

President, Stanford Chapter, Society of Physics Students, Stanford, CA.

Undersecretary General, Stanford Model UN Conference, Stanford, CA.

Counselor, Camp Kesem, Stanford, CA.

Managing Editor, Fairview High School Newspaper, Boulder, CO.

Eagle Scout, Boy Scout Troop 273, Boulder, CO.

Last updated on April 6, 2013