CURRICULUM VITAE

Andrew M. Leifer
Lewis-Sigler Fellow and Lecturer of Physics
Princeton University

CONTACT INFORMATION

170 Carl Icahn Laboratories
Lewis-Sigler Institute
Princeton, NJ 08544
USA

Phone: (609) 258-2973
Fax: (609) 258-8020
leifer@princeton.edu
http://leiferlab.princeton.edu

PROFESSIONAL EXPERIENCE

Princeton University, Princeton, NJ 2012–present
Lewis-Sigler Fellow, Lewis-Sigler Institute for Integrative Genomics
Lecturer, Department of Physics.

Harvard University, Cambridge, MA 2007-2012
NSF Graduate Research Fellow, Program in Biophysics and Department of Physics.

JILA (NIST-University of Colorado), Boulder, CO .....Summers 2005-2006
NSF Summer Undergraduate Research Fellow.

American Association for the Advancement of Science, Washington, DC .... Spring 2006
Leonard Reiser Fellow, Center for Science Technology and Security Policy.

Natl. Telecommunications and Information Administration, Boulder, CO . Summer 2004
Researcher, Institute for Telecommunication Sciences, Theory Division.

National Institute of Standards and Technology, Boulder, CO ..... Summer 2003
Researcher, Statistics Division.

EDUCATION

Ph.D. in Biophysics, Harvard University, Cambridge, MA .....June 2012
Thesis Topic: "Optogenetics and computer vision for *C. elegans* Neuroscience and Other Biophysical Applications" Advisor: Professor Aravinthan D.T. Samuel

B.S. in Physics, Stanford University, Stanford, CA .....June 2007
B.A. in Political Science, Stanford University, Stanford, CA .....June 2007

Honors in International Security Studies, Stanford University, Stanford, CA .....June 2007
Thesis Topic: "International scientific engagement for mitigating emerging nuclear security threats" Advisor: Professor Michael May

HONORS AND AWARDS

American Physical Society, Biological Physics Thesis Award, Certificate of Merit 2013
Lewis-Sigler Fellowship, Princeton University 2012–Present
Derek C. Bok Certificate of Distinction in Teaching, Harvard University. 2008
National Science Foundation Graduate Research Fellowship 2007–2011
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 2005–2006
AAAS, Center for Science Technology and Security Policy, Intern of the Year Award. 2006
Harry Press Journalism Award, Stanford University. 2006
Boothe Prize for Excellence in Writing, Stanford University 2004
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" 2003
American Mathematical Society, Karl Menger Award.
Office of Naval Research, Naval Science Award.
Third Place Team Project, Intel International Science and Engineering Fair 2003.
First Place Team Project, Colorado Science and Engineering Fair.
Scientific American, Outstanding Achievement in Education.
Golden State Governor's Scholarship, State of California. 2000

SERVICE

Invited Participant, NSF Worskshop: Frontiers for Integrative Study of Animal Behavior 2014
Session Chair, *C. elegans* Topic Mtg: Neuronal Development, Synaptic Function & Behavior 2014
Member, Council of the Princeton University Community 2013-2014
Chair, Grad Program in Neuroscience Generals Exam Committee, Princeton University 2013
Senior Staff Committee Member, Lowell House, Harvard College, ... 2010–2012
Resident Tutor, Lowell House, Harvard College 2009–2012
Editorial Board Member, Stanford Daily, Stanford University 2006-2007
Scientific content reviewer for peer-reviewed journals including:
Journal of Visual Experiments and PLoS One
Grant reviewer for funding programs including:
NASA Postdoctoral Program and Sir Henry Dale Wellcome Trust Fellowship
Content reviewer for conferences including:
CoSyNe

TEACHING

Princeton University:
ISC 231-232 An Integrated, Quantitative Intro to the Natural Sciences, *Faculty* 2012–2014
ISC 233-234 An Integrated, Quantitative Intro to the Natural Sciences II, *Faculty* 2013–2015
QCB 551 Intro to Genomics & Computational Molecular Biology, *Guest Lecturer* 2014

Biophysics and Computations in Neurons and Networks, *Assistant Instructor*.....Summer 2013

Marine Biological Laboratory, Woods Hole:
Neural Systems and Behavior, *Faculty* ..... Summer 2014

Harvard University:
BIOPHYS 242R, Special Topics in Biophysics: Brain and Behavior, *Guest Lecturer*.....2013
MCB 199, Statistical Thermodynamics for Quantitative Biology, *Teaching Assistant*.....2008

ADVISING

Current PhD Students (jointly advised with Prof. Joshua Shaevitz):
Ashley Linder, Program in Neuroscience
Mochi Liu, Quantitative and Computational Biology
Current Undergraduate Students:
David Mazumder
Past Undergraduate Students:
Peter Johnson, Department of Physics, Junior Project
Kevin Mizes, Department of Physics, Treiman Fellow

INVITED TALKS

CoSyNe Workshop .....expected 2015
Stanford University .....expected 2015
New York University, Center for Soft Matter Research ..... expected 2015
Rockefeller University, Physics Seminar Series .....expected 2015
Delaware Center for Neuroscience Research Annual Symposium 2014
Brandeis University, Computational & Systems Neuroscience Journal Club 2014
Columbia University, Grossman Center, Quantifying Structure in Large Neural Datasets 2014
C. elegans Topic Mtg: Neuronal Development, Synaptic Function & Behavior 2014
Rutgers University, Multi Group Worm Meeting 2013
INSERM, University of Paris Descartes, Optics and Photonics Seminar 2012
Princeton University, Lewis-Sigler Institute for Integrative Genomics 2011
Rutgers University, Molecular Biology and Biochemistry 2010
Harvard University, Rowland Institute 2010

PEER-REVIEWED PUBLICATIONS

1. Frederick B. Shipley, Christopher M. Clark, Mark J. Alkema, **Andrew M. Leifer**, "Simultaneous optogenetic stimulation and calcium imaging in freely moving *C. elegans*." *Frontiers in Neural Circuits* 8:28 (2014).

2. Steven J. Husson, Alexander Gottschalk, **Andrew M. Leifer**, "Optogenetic manipulation of neural activity in C. elegans: from synapse to circuits and behavior" *Journal of Biology of the Cell*, 105, 1–16 (2013). **Invited review.**

3. 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).

4. 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 T Samuel, "Proprioceptive coupling within motor neurons drives *C. elegans* forward locomotion." *Neuron*, 76, 750–761 (2012).

5. 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).

6. **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(2), p.147–152 (2011) .

7. 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).

MANUSCRIPTS PRE-REVIEW

1. Jeffrey Nguyen*, Frederick B. Shipley*, Ashley N. Linder, George Plummer, Joshua W. Shaevitz, **Andrew M. Leifer**, "Whole-brain calcium imaging with cellular resolution in freely behaving *C. elegans*." arXiv:1501.03463.

2. Christopher M. Clark*, **Andrew M. Leifer***, Ni Ji, Jeremey Florman, Kevin Mizes, Aravinthan D.T. Samuel, Mark J. Alkema, "Synaptic chain model for an escape response motor sequence." (in prep for resubmission).

ACTIVE GRANTS

07/2014–07/2017, Simons Collaboration on the Global Brain Research Award (PI)
"Whole brain calcium imaging in freely behaving nematodes"
Annual Direct Costs: $80,000
Total Direct Costs: $240,000

09/2014–08/2016, Inaugural Dean's Innovation Fund for New Ideas in the Natural Sciences (co-PI with Shaevitz)
"All-neuron I/O in freely behaving animals"
Annual Direct Costs: $100,000
Total Direct Costs: $200,000