

# ILYA NEMENMAN

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Emory University

Departments of Physics and Biology

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## EDUCATION

Princeton University, Physics, PhD 2000, Advisor: William Bialek

San Francisco State University, Physics, MS 1997, Advisor: Ronald Adler

Santa Clara University, Physics/Math, BS 1995

Belarusian State University, Theoretical Physics, 1991 – 1994, Advisor: Albert Minkevich

## APPOINTMENTS

since 2009 Professor, Departments of Physics and Biology (tenured since 2012, Associate Professor until 2016), Emory University, Atlanta, GA

2005 – 2009 Technical Staff Member, R&D Scientist-4, CCS-3, Los Alamos National Laboratory

2004 – 2005 Associate Research Scientist, Joint Centers for Systems Biology, Columbia University Medical Center, New York, Advisor: Andrea Califano

2001 – 2004 Postdoctoral Scientist, Kavli Institute for Theoretical Physics, UC Santa Barbara, Postdoctoral fellows at KITP do not have formal advisors

2000 – 2001 Postdoctoral Scientist, NEC Research Institute, Princeton, New Jersey, Advisor: William Bialek

1998 – 1999 Research Scientist, Gravity Probe B (GP-B), HEPL, Stanford University.

1997 – 1997 Student Researcher, L3 experiment, CERN/PPE, Geneva

## CONCURRENT APPOINTMENTS

since 2010 Population Biology, Ecology, and Evolution Graduate Program, Emory University

since 2010 Neuroscience Graduate Program, Emory University

since 2011 External Research Associate, Info-metrics Institute, American University, Washington, DC

since 2010 External Associate, Vanderbilt Institute for Integrative Biosystems Research and Education (VIBRE), Nashville, TN

since 2009 Computational and Life Sciences Strategic Initiative Core Faculty, Emory University

2007 – 2010 Visiting Scientist, New Mexico Consortium, Los Alamos, NM

2007 – 2009 Affiliate, Executive Committee Member, Center for Nonlinear Studies, Los Alamos National Laboratory

2008 – 2009 Information Science and Technology Center Science Council, LANL

2007 – 2008 Adjunct Assistant Professor, Department of Physics, University of New Mexico, Albuquerque, NM

## TEACHING

since 2009 Emory University: Introductory Physics, Computational Neuroscience, Stochasticity in Biology, Physical Biology: Information Processing in Biological Systems, Quantum Field Theory, Graduate Electrodynamics, Freshman Seminar: Where do laws of nature come from?, Computational Modeling for Scientists and Engineers

2012, 2015 Emory-Tibet Science Initiative, Quantum Mechanics and Classical Mechanics courses for Tibetan monastics, India

2011 – 2015 *The q-bio Conference on Cellular Information Processing*, tutorial

2007 – 2010, 2013 – 2014 *The q-bio Summer School on Cellular Information Processing*, organizer and instructor

2009 *Information Processing in Biology* summer school, Beijing University, China

2006 – 2007 *Los Alamos Summer School*, instructor

2004 – 2005 Columbia University, Department of Biomedical Informatics, co-instructor, *Computational Biology: Functional and Integrative Genomics*

2002 UCSB, Department of Statistics; NYU, Courant Institute, Bioinformatics group, visiting instructor, lecture series in *Statistical Inference*

1999 – 2001 Marine Biological Laboratory, Woods Hole, MA, teaching assistant, *Methods in Computational Neuroscience*  
 1997 – 1999 Princeton University, Department of Physics, teaching assistant  
 1995 – 1996 San Francisco State University, Department of Physics, teaching assistant

## HONORS AND AWARDS

2016 Fellow, American Physical Society  
 2016 Computational and Systems Neuroscience (COSYNE) Conference Mentorship Travel Award (Mentee: Caroline Holmes)  
 2015 Elected General Member of the Board, Aspen Center for Physics, Aspen, CO  
 2015 Heinz Pagels Public Lecture, Aspen Center for Physics, Aspen, CO  
 2013 Elected to the Chair line, Division of Biological Physics, American Physical Society  
 2013, 2015 Phi Beta Kappa Mentor Recognition  
 2012 James S. McDonnell Foundation Complex Systems Scholar Award  
 2012 Student-invited colloquium, Cornell University Biophysics Program, Ithaca, NY  
 2012 Vice Chair nomination, Division of Biological Physics, American Physical Society  
 2011 Emory University, *Top Ten Science Story of 2011* recognition of Cheong et al., 2011  
 2011 Physical Biology: *Highlight of 2010* recognition of Bel et al., 2010  
 2011 Executive Committee nomination, Division of Biological Physics, American Physical Society  
 2009 Distinguished Performance Award Nomination, LANL  
 2009 SPOT Award, Computer and Computational Sciences Division, LANL  
 2004 National Science Foundation Scholar (declined), StatPhys 22  
 1999 Outstanding Teaching Assistant, Department of Physics, Princeton University  
 1997 Graduate Student Distinguished Achievement Award, SFSU  
 1996 Outstanding Teaching Assistant, Department of Physics, SFSU  
 1993–1994 Honorary Stipend, Belarusian State University, Minsk, Belarus  
 1991 Winner, Belarusian National High School Physics Olympiad

## RESEARCH SUPPORT

### *Current*

NIH/1R01EB022872 “Neural Mechanisms And Behavioral Consequences of Non-Gaussian Likelihoods in Sensorimotor Learning”, PI, 2016-2019, , \$1,032k total  
 NSF/PoLS/1410978 “Collaborative Research: Multicellular Communication in Gradient Sensing,” PI, 2015-2018, \$200k total  
 JSMF/ 220020321 “In search of simplicity: Coarse-graining cellular information processing networks”, PI, 2012-2017, \$450k total.

### *Completed*

NSF/IOS/1208126 “Computational characterization of *C. elegans* nociceptive behavior as a quantitative model for pain transduction”, PI, 2012-2016, \$467k total to Emory.  
 HFSP/RGY0084/2011 “Adaptive behavior of *C. elegans* in complex sensory environments”, PI (multiple PIs), collaborative program requiring multiple international investigators, 2011-2015, \$300,000 total.  
 NIH/NIGMS/2R13GM082162-03 “Information processing in cellular signaling and gene regulation”, PI (multiple PIs; contact PI for 2009-2011), *The q-bio Conference* support grant, 2011-2014.  
 NIH/NCI/7R01CA132629 “Differential Metabolic Analysis of Tumor Progression”, co-PI 2007–2012.  
 ARO/60704-NS-II “Improving image segmentation with adaptive, recurrent, spiking neural network models of the primary visual cortex”, PI, 2011-2012.  
 DOE/LANL/LDRD/20090001DR “Synthetic Cognition Through Peta-scale Modeling of Mammalian Visual Cortex”, 2008–2011, co-PI in 2008-2009, collaborator since 2009.  
 NSF-OCI-0749348 “Peta-scale computing infrastructure: High Performance Neural Computing”, co-PI, 2008–2011.  
 DOE/LANL/LDRD/20080391ER “Stochastic Transport on Networks: Efficient Modeling And Applications to Epidemiology”, PI, 2007–2010.

DOE/LANL/LDRD/20080138DR “Genomes to Behavior: Predicting Bacterial Response by Constrained Network Interpolation”, co-investigator, 2007–2010.

NIH/NIGMS/1R21GM080216 “System-wide Study of Transcriptional Control of Metabolism”, co-PI, 2007–2009.

NSF/ECS/0425850 “QSB: Optimal information processing in biological networks”, co-PI, 2004–2008.

NSF/ECS/0332479 “SGER: Developing learning theory for genetic network inference”, co-PI, 2003–2005.

## SYNERGISTIC ACTIVITIES

### National Service

- General Member of the Board, Public Lectures Committee, Aspen Center for Physics
- Chair (2016), Chair-elect / Program Committee chair (2015), and Vice-Chair / Chair of Fellowship Committee (2014), Division of Biological Physics, American Physical Society
- Chair, The q-bio Conference Board (2013-2016)
- Bellman Prize Committee member, Mathematical Biosciences, Society for Mathematical Biology (2015)
- The Info-Metrics Halbert L. White, Jr. Memorial Prize Selection Committee member (2015)

### Emory Service

- Computational and Life Sciences Internal Advisory Committee and Faculty Search Committee (2009-2013)
- URC Natural Sciences Sub-Committee member and chair (2010-2014)
- Physics/Theoretical Biophysics Faculty Search Committee, Biology/Computational Neuroscience Faculty Search Committee (2013-2015)
- Physics Graduate Program Selection Committee (2009-2011)
- PBEE Recruitment Chair (2014-2017)
- Physics Curriculum Committee (2013-onwards)
- Quantitative Biology Track Committee (2014-2015)
- other minor committees

### LANL Service

- Biological and Environmental Research / Systems Biology, Neuroscience, and Information Science steering committee
- New Mexico Consortium Neural Computing steering committee
- CNLS Executive Committee

### External Advising

- DOE/GTL Knowledgebase
- NIH/NCI “Physical Science and New Frontiers in Oncology” Think Tank

### Editorial Boards

- *Physical Biology* (since 2013)
- *IET Systems Biology* (2009-2013)
- *Experimental Biology and Medicine* (2009-2012)

### School organization

- *Cargese School on Theoretical Biophysics*, Corsica, France (2017)
- *The q-bio Summer School on Cellular Information Processing*, Los Alamos, NM (2007-2009) — founding organizer

### Conference organization

- *The APS March Meeting*, Division of Biological Physics program chair, Baltimore, MD (2016)
- *Atlanta Systems Biophysics meeting*, Atlanta, GA (2015)
- *Physics of Neural Systems* Focus Session, APS March Meeting, 2015, San Antonio, TX

- *The q-bio Conference on Cellular Information Processing*, Santa Fe, NM, Blacksburg, VA, Nashville, TN (2007–2017) — founding organizer
- *11th International Conference on Computational Methods in Systems Biology*, Vienna, Austria (2013)
- Aspen Center for Physics program on *Physics of Behavior*, Aspen, CO (2012)
- APS March Meeting Focus Session on *Physics of Behavior*, Portland, OR (2010)
- *Principles of Biological Computation*, Santa Fe, NM (2008)
- CNLS Annual Conference on *Information Sciences and Technology*, Santa Fe, NM (2008)
- *Unconventional computation: Quo Vadis?*, Santa Fe, NM (2007)
- *Grand Challenges in Neural Computation*, Santa Fe, NM (2007)
- *NIPS'03 workshop on Estimation of entropy and information of undersampled probability distributions*, Whistler, BC (2003)
- KITP long program *Understanding the brain*, KITP/UCSB (2004)

#### Public events organization

- *Atlanta Science Festival, Science at Emory: The Lab Changing the World*, Atlanta, GA (2014–2015)
- *The Nature of Knowledge Lecture Series*, Emory University (2012–2013)
- *The q-bio Public Lecture Series*, Santa Fe, NM, 2009.

#### Conference program committees

- APS March Meeting (2015 – 2017)
- *RECOMB* satellite workshop on *Systems Biology* (2007)
- *The DREAM Conference* (2006–2010)

#### Recent Refereeing

- *Nature Phys*, *Science*, *Phys Rev*, *PNAS*, *PLoS Pathogens*, *J Stat Phys*, *PLoS Biology*, *Neural Computation*, *J Neurophysiol*, *BMC Bioinformatics*, *BMC Systems Biology*, *PLoS ONE*, *PLoS Computational Biology*, *Physica D*, *IET Systems Biology*, *Biophys J*, *Physical Biology*, *Proc R Soc B*, *J Theor Biol*, *J Biomed Biotech*, *Entropy*, etc.

#### Grant refereeing

- NSF; NIH/NCI, NIGMS; DOE SBIR/STTR; Israeli Science Foundation

Software: NSB entropy estimation, [nsb-entropy.sf.net](https://github.com/EmoryUniversityTheoreticalBiophysics/SirIsaac); Sir Isaac dynamical inference, <https://github.com/EmoryUniversityTheoreticalBiophysics/SirIsaac>.

Current Memberships: American Physical Society

### ADVISEES

#### Postdocs:

Itai Pinkovezky Current postdoc (co-advised with Daniel Weissman and Gordon Berman)  
 David Hofmann Current postdoc  
 Damian Hernandez Current postdoc  
 Andrew Mugler Currently Assistant Professor, Physics, Purdue University, IN  
 Lina Merchan Currently Assistant Professor, Physics, Savannah State University, Savannah, GA  
 Martin Tchernookov Currently Assistant Professor, Physics, Lamar University, Beaumont, TX  
 Sorin Tanase Nicola Currently Assistant Professor, Cell and Molecular Biology, Uppsala University, Sweden  
 Nikolai Sinitsyn Currently Staff Member, Theory Division, Los Alamos National Lab, Los Alamos, NM  
 Golan Bel Currently Senior Lecturer (Associate Professor), Environmental Physics, Ben Gurion University, Israel  
 Brian Munsky Currently Assistant Professor, Chemical and Biological Engineering, Colorado State University, Fort Collins, CO

#### Graduate Students:

George Leung, Baohua Zhou, Catalina Rivera, Joe Natale all current PhD students at Emory  
 Xinxian Shao PhD 2016  
 Vijay Singh PhD 2015, currently Fellow, Computational Neuroscience Institute, University of Pennsylvania  
 Jakub Otwinowski PhD 2012, currently postdoctoral scientist, Evolutionary Biology, University of Pennsylvania  
 John Kirkham MS 2013, currently a software engineer at Janelia Farms  
 Graduate Students co-Advised: Etay Ziv (PhD 2007, Columbia), Andrew Mugler (PhD 2010, Columbia).  
 Graduate Student Theses Committees: Xiang Cheng, Shanshan Li (Emory Physics), Lukas Hoffmann, Varun Saravanan (Emory Neuroscience), Mengcheng Zhu (GaTech BME).  
 Rotation Students: Xiang Cheng, Chloe Robins, Akin Morrison, Shanshan Li, Taylor Smith, Ahmed Roman.  
 Undergraduate Students: Caroline Holmes, Rajiv Velury, Rebecca Butterfield, Farhan Kamili (now: GaTech, Bioengineering).  
 Summer Students: Martin Halicek (GeorgiaTech), Aly Pesic (Stanford), Misha Shashkov (Berkeley), Pradeep Bandaru, Sean Escola, Michael Vidne (Columbia), Wiet de Ronde (AMOLF), Bryan Daniels (Cornell).

### RECENT COLLABORATORS AND OTHER AFFILIATIONS

William Bialek (Princeton; thesis advisor), Andrea Califano (Columbia; postdoc advisor), Rustom Antia (Emory), David Biron (Chicago), Bryan Daniels (ASU), James Faeder (Pittsburgh), Dan Goldman (GaTech), William Hlavacek (LANL), Andre Levchenko (Yale), Bruce Levin (Emory), Pankaj Mehta (Boston), David Schwab (Northwestern), Sam Sober (Emory), Gurol Suel (UCSD), William Ryu (Toronto), Charlie Strauss (LANL), Michael Wall (LANL), Chris Wiggins (Columbia).

### PRESS COVERAGE

1. BRAIN grant to fund study of how the mind learns. *eScienceCommons*, Oct 25, 2016.
2. Cells talk to their neighbors before making a move. *eScienceCommons*, Jan 19, 2016.
3. Professor Ilya Nemenman on machine learning, the laws of biology, and the quest for a ‘robot-scientist’. *Serious Science*, Dec 7, 2015.
4. Biophysicists take small step in quest for ‘robot scientist’. *eScienceCommons*, Aug 25, 2015.
5. Aspen Science Highlights - “Sensing, Learning, and Communication”, Ilya Nemenman and David Schwab with Sy Coleman, July 2015.
6. Physicists eye neural fly data, find formula for Zipf’s law. *eScienceCommons*, Aug 5, 2014.
7. Biochemical cell signals quantified for first time. *EurekAlert*, Sep 15, 2011.
8. Biology may not be so complex after all, physicist finds. *sciencedaily.org*, Mar 19, 2010.
9. Supercomputer simulates human visual system. *slashdot.org*, June 13, 2008.
10. Roadrunner supercomputer puts research at a new scale. *LANL Press Release*, June 12, 2008.
11. Improving Metabolomic Measurement and Analysis. *LANL Science, Technology, and Engineering (STE) Highlights*, Nov 7, p. 2, 2007.
12. Language of A Fly Proves Surprising. *PhysOrg.com*, Mar 10, 2008.
13. The Mind of A Fly: Scientists Tap into The Brains of Flies in An Effort to Improve Artificial Intelligence. By S. Vorenberg, *The Santa Fe New Mexican*, Mar 20, 2008.
14. The Fly Code. By N. Maximov, *Russian Newsweek*, Mar 24, 2008 (in Russian).

### PRESENTATIONS

#### *Invited External Talks*

Nov 2016 UGA Computational Biology Seminar, Athens, GA  
 Nov 2016 Stanford University, q-bio seminar, Palo Alto, CA  
 Oct 2016 UCSD qBio seminar, San Diego, CA

Oct 2016 Northwestern University, Physics Colloquium, Chicago, IL  
 Oct 2016 University of Chicago, Computational Neuroscience Seminar, Chicago, IL  
 May 2016 Biophysics seminar, U Pennsylvania, Philadelphia, PA  
 May 2016 Center for Theoretical Biological Physics seminar, UCSD, San Diego, CA  
 Mar 2016 Integrative Bio-Systems Institute, Georgia Tech, Atlanta, GA  
 Sep 2015 Center for Studies in Physics and Biology, Rockefeller University, New York, NY  
 July 2015 Kids' Physics Talk, Aspen Science Center, Aspen, CO  
 July 2015 Heinz Pagels Public Lecture, Aspen Center for Physics, Aspen, CO  
 Apr 2015 Rice University / CTBP, Houston, TX  
 Sep 2014 Systems Biology Seminar, Boston University, Boston, MA  
 May 2014 Systems Biology Seminar, Yale University, New Haven, CT  
 May 2014 Condensed Matter Seminar, Physics, Virginia Tech, Blacksburg, VA  
 Oct 2013 Redwood Theoretical Neuroscience Seminar, UC Berkeley, Berkeley, CA  
 Sep 2013 Systems Biology Seminar, Yale University, New Haven, CT  
 Sep 2013 Science at the Edge Seminar, Michigan State University, East Lansing, MI  
 May 2013 Theory Lunch, Department of Systems Biology, Harvard Medical School, Cambridge, MA  
 Apr 2013 University of Houston, Networks Seminar, Houston, TX  
 Feb 2013 Computation in the sciences seminar, University of Chicago, Chicago, IL  
 Dec 2012 IST-Austria Colloquium, Vienna, Austria  
 Oct 2012 ENS Biophysics Seminar, Paris, France  
 Sep 2012 GSU Applied Math and Mathematical Biology Seminar, Atlanta, GA  
 Jul 2012 Vanderbilt University, Physics REU Seminar, Nashville, TN  
 Mar 2012 Cornell Biophysics Colloquium, Students Invited Speaker, Ithaca, NY  
 Jan 2012 UT Southwestern Medical Center, Green Center for Systems Biology Seminar, Dallas, TX  
 Sep 2011 Complexity Study Group, Department of Physics and Astronomy, University of Calgary, Alberta, Canada  
 Apr 2011 Rutgers University, BioMaPS seminar, Piscataway, NJ  
 Jan 2011 University of Waterloo, Physics Colloquium, Waterloo, ON, Canada  
 Oct 2010 University of Maryland Biophysics Group seminar, College Park, MD  
 Sep 2010 University of Tennessee, Physics Colloquium, Knoxville, TN  
 Sep 2010 Georgia Institute of Technology, Physics Colloquium, Atlanta, GA  
 Jun 2010 University of Toronto, Biomedical research seminar, Toronto, ON Canada  
 Apr 2010 University of South Florida, Statistics Colloquium, Tampa, FL  
 Feb 2010 Georgia Institute of Technology, Mathematical Biology Seminar, Atlanta, GA  
 Nov 2009 UC Berkeley, Bioengineering seminar, Berkeley, CA  
 Nov 2009 Santa Clara University, Department of Physics Colloquium, Santa Clara, CA  
 Jun 2009 Vanderbilt University, Biophysics seminar, Nashville, TN  
 May 2009 AMOLF (Amsterdam, The Netherlands) colloquium  
 May 2009 LMU, Bernstein Center for Computational Neuroscience seminar, Munich, Germany  
 Dec 2008 Weizmann Institute, Condensed Matter Theory seminar, Rehovot, Israel  
 Dec 2008 Weizmann Institute, Neurobiology seminar, Rehovot, Israel  
 Dec 2008 Technion, Networks Biology Lab seminar, Haifa, Israel  
 Dec 2008 Hebrew University, Computational neuroscience seminar, Jerusalem, Israel  
 Nov 2008 Princeton University, Biophysics Theory seminar, Princeton, NJ  
 Nov 2008 Emory University, Physics colloquium, Atlanta, GA  
 Nov 2008 Columbia University, Neurotheory Center seminar, New York, NY  
 Nov 2008 Columbia University, C2B2 Computational Biology seminar, New York, NY  
 Apr 2008 Harvard University, Condensed Matter Theory seminar, Cambridge, MA  
 Mar 2008 UCLA, Biomathematics Department seminar, Los Angeles, CA  
 Mar 2008 Caltech, Bio-circuits / Information Science and Technology seminar, Pasadena, CA  
 Mar 2008 UC Irvine, Department of Physics and Astronomy Colloquium, Irvine, CA  
 Feb 2008 Duke University, Physics and Systems Biology Colloquium, Durham, NC  
 Feb 2008 Brown University, Physics Colloquium, Providence, RI  
 Feb 2008 University of Pittsburgh, Department of Computational Biology seminar, Pittsburgh, PA

Oct 2007	DOE/BER seminar, Washington, DC
Oct 2007	Emory University, Computational Life Sciences seminar, Atlanta, GA
Oct 2007	UC San Diego, Center for Theoretical Biological Physics seminar, San Diego, CA
Apr 2007	UCLA, Biomath department seminar, Los Angeles, CA
Apr 2007	Caltech, CNS seminar, Pasadena, CA
Feb 2007	UNM SIBBS: Seminar in Biological and Biomedical Sciences, Albuquerque, NM
Aug 2006	UNM, CS seminar, Albuquerque, NM
Apr 2006	Indiana University, Biocomplexity seminar, Bloomington, IN
Apr 2006	Santa Fe Institute seminar, Santa Fe, NM
Apr 2006	UNM, Cancer Research Center seminar, Albuquerque, NM
Nov 2005	Baylor College of Medicine, Neuroimaging Laboratory seminar, Houston, TX
Nov 2005	Institute for Advanced Studies, Systems Biology seminar, Princeton, NJ
Oct 2005	Rutgers University, BioMaPs seminar, Piscataway, NJ
Jul 2005	University of Washington, Biophysics and Physiology seminar, Seattle, WA
Jun 2005	UC San Francisco, Computational Biology seminar, San Francisco, CA
Jun 2005	CSHL, Computational Neuroscience seminar, Cold Springs Harbor, NY
Apr 2005	LANL, CCS-3/CNLS seminar, Los Alamos, NM
Apr 2005	Cornell University, LASSP/Physics colloquium, Ithaca, NY
Apr 2005	IBM Watson research center, physics seminar, Yorktown Heights, NY
Feb 2005	Harvard University, Bauer Center for Genomics Research seminar, Cambridge, MA
Feb 2005	University of Michigan, Physics colloquium, Ann Arbor, MI
Jan 2005	University of Maryland, Computational Neuroscience seminar, College Park, MD
Dec 2004	LANL, Theoretical Biology/CNLS seminar, Los Alamos, NM
Nov 2004	Northeastern University, physics colloquium, Boston, MA
Nov 2004	Boston University, Biodynamics lab seminar, Boston, MA
Apr 2004	IPAM/UCLA, Proteomics colloquium, Los Angeles, CA
Apr 2004	UC San Francisco, Keck neuroscience center seminar, San Francisco, CA
Mar 2004	New York University, CS colloquium, New York, NY
Mar 2004	LANL, CNLS seminar, Los Alamos, NM
Mar 2004	IBM Watson Research Center, Systems Biology and Functional Genomics group seminar, Yorktown Heights, NY
Mar 2004	Rockefeller University, Center for Studies in Physics and Biology colloquium, New York, NY
Oct 2003	Columbia University, Computational biology seminar, New York, NY
Nov 2002	CalTech, complexity club seminar, Pasadena, CA
Nov 2002	Princeton University, Theoretical biophysics group seminar, Princeton, NJ
Oct 2002	Columbia University, Applied Mathematics seminar, New York, NY
Oct 2002	New York University, Courant Institute, Bioinformatics seminar, New York, NY
May 2001	New York University, Courant Institute / Center for Neuroscience seminar, New York, NY
Feb 2001	Rockefeller University, Center for Studies in Physics and Biology colloquium, New York, NY
Jan 2001	MIT, Cognitive Science seminar, Cambridge, MA
Nov 2000	New England Complex Science Institute colloquium, Cambridge, MA
Jan 2000	Hebrew University, Machine Learning seminar, Jerusalem, Israel
Jul 1998	Stanford University, Gravity Probe B, Theory Group seminar, Palo Alto, CA

#### *Invited Conference Talks*

Nov 2016	<i>Asilomar Conference on Signals, Systems, and Computers</i> , Asilomar, CA
Nov 2016	<i>Shannon's 100th anniversary workshop</i> , Info-metrics Institute, American University, Washington, DC
July 2016	<i>The 10th q-bio Summer School Student Symposium</i> , Nashville, TN
Nov 2015	<i>Large Deviations</i> workshop, Princeton Center for Theoretical Sciences, Princeton, NJ
Sep 2015	<i>Information Processing in Complex Systems</i> , Conference on Complex Systems Satellite meeting, Tempe, AZ
Oct 2014	<i>Info-metrics Conference</i> , American University, Washington, DC
Oct 2014	<i>Biological and Bio-Inspired Information Theory</i> , BIRS, Banff, Calgary, Canada

June 2014 *Causality, information transfer and dynamical networks*, MPI-PKS, Dresden, Germany  
 May 2014 *JSMF Complex Systems Meeting*, Atlanta, GA USA  
 May 2014 *BioFrontiers Institute Symposium*, University of Colorado, Boulder  
 Mar 2014 *APS March Meeting*, Denver, CO  
 Jan 2014 *Dynamics Days*, GeorgiaTech, Atlanta, GA  
 July 2013 *Information, Probability and Inference in Systems Biology* workshop, Edinburgh, Scotland  
 May 2013 BIRS Program on *Mathematical tools for evolutionary systems biology*, Banff, Alberta, Canada  
 Mar 2013 APS March Meeting, Baltimore, MD  
 Mar 2013 NIMBioS Workshop *Systems and Synthetic Biology of Microbial Systems*, Knoxville, TN  
 Jul 2012 CNS\*2012, *Methods of Information Theory in Computational Neuroscience* Workshop, Atlanta, GA  
 Jun 2012 Aspen Center for Physics *Physics of Behavior* seminar, Aspen, CO  
 Mar 2012 CMACS workshop on *Systems Biology and Formal Methods*, New York University, New York, NY  
 Feb 2012 MBI Workshop on *Robustness in Biological Systems*, Ohio State University, Columbus, OH  
 Jan 2012 NSF Expeditions in Computing *Complex Modeling and Analysis of Complex System* (CMACS)  
 Winter School keynote lecture, Lehman College, CUNY, Bronx, NY  
 Dec 2011 *Computational and Theoretical Biology Symposium*, Rice University, Houston, TX  
 Oct 2011 MBI Workshop on *Stochastic Processes in Cell and Population Biology*, Ohio State University, Columbus, OH  
 May 2011 *Info-Metrics in the Natural Sciences and its implications for the Social Sciences* conference, American University, Washington, DC  
 Feb 2011 *Statistical physics of complexity, optimization, and systems biology*, Bardonecchia, Italy  
 Nov 2010 William Bialek 50th Birthday Symposium, Princeton, NJ  
 Jul 2010 31st Annual Meeting of the Canadian Applied Mathematics Society (CAIMS-2010), St. John's, Newfoundland, Canada  
 May 2010 NSF Workshop on *Open Systems*, University Pennsylvania, Philadelphia, PA  
 May 2010 NSF Workshop on *Shared Organizing Principles in the Computing and Biological Sciences*, Arlington, VA  
 Mar 2010 *American Physical Society March Meeting*, Portland, OR  
 Nov 2009 *Dynamics of signal transduction and of gene-protein regulatory networks* workshop, Mathematical Biosciences Institute, Ohio State University, Columbus, OH  
 Sep 2009 *Stochasticity in Biochemical Reaction Networks* workshop, Banff, Alberta, Canada  
 Jul 2009 *Information Processing in Biology* conference, Beijing University, China  
 May 2008 *Principles of Biological Computation* workshop, Santa Fe Institute, Santa Fe, NM  
 Mar 2008 *American Physical Society March Meeting*, New Orleans, LA  
 Oct 2007 *High-Level Perception and Low-Level Vision: Bridging the Semantic Gap* workshop, Santa Fe Institute, Santa Fe, NM  
 Jul 2007 CNS\*2007 workshop on *Methods of Information Theory in Computational Neuroscience*, Toronto, ON, Canada  
 May 2007 *7th Understanding Complex Systems symposium*, UIUC, Urbana, IL  
 Mar 2007 *Unconventional Computation: Workshop on Neural Computation* workshop, Santa Fe, NM  
 Nov 2005 *Models for Genetic Regulatory Networks* conference, Texas A&M, College Station, TX  
 Dec 2003 NIPS'03 workshop on *Entropy Estimation*, Whistler, BC  
 Nov 2003 *Pattern formation* program, KITP/UCSB, Santa Barbara, CA

#### *Home Institutions Seminars*

Nov 2016 Biology Seminar, Emory University, Atlanta, GA  
 Oct 2016 Physiology Seminar, Emory University, Atlanta, GA  
 Sep 2016 Physics Colloquium, Emory University, Atlanta, GA  
 Nov 2014 Science Cafe, Emory Department of Biology, Emory University, Atlanta, GA  
 Nov 2013 The Worm Club, Emory University, Atlanta, GA  
 Apr 2012 Emory University, Frontiers in Neuroscience, Atlanta, GA  
 Apr 2012 Emory University, Emerson Symposium, Atlanta, GA  
 May 2011 Emory University, Winship Cancer Institute, Cancer genetics and epigenetics seminar, Atlanta, GA  
 Sep 2010 Emory University, Population Biology, Ecology, and Evolution program seminar, Atlanta, GA



Sep 2006 LANL, Theory, Simulations, and Computation capability workshop *Advanced Methods for Data Analysis*, Los Alamos, NM  
 Aug 2006 LANL, Theory, Simulations, and Computation capability workshop *Complex Networks*, Los Alamos, NM  
 Jan 2006 LANL, D-1 seminar, Los Alamos, NM  
 Jun 2005 Columbia University, C2B2 seminar, New York, NY  
 Mar 2005 Columbia University, Computational Neuroscience seminar, New York, NY  
 Mar 2004 Columbia University, C2B2 seminar, New York, NY  
 Mar 2003 KITP, UCSB colloquium, Santa Barbara, CA  
 May 2002 UCSB, Statistics Department, colloquium, Santa Barbara, CA  
 Mar 2002 UCSB, ITP Director's blackboard lunch talk, Santa Barbara, CA  
 Oct 2001 UCSB, ITP colloquium, Santa Barbara, CA  
 Apr, Aug 2000 NEC Research Institute, Biophysics seminar, Princeton, NJ  
 Aug 1997 CERN/PPE/L3 seminar, Geneva, Switzerland  
 Jul 1994 Belarusian State University, Theoretical Physics seminar, Minsk Belarus

#### *Contributed Conference Presentations*

Aug 2016 *The Sequencing Revolution and the Role of Physics in Highthroughput Biology*, Aspen, CO  
 Jul 2016 *The 10th q-bio Conference*, Nashville, TN.  
 Mar 2016 *American Physical Society March Meeting*, Baltimore, MD  
 Nov 2015 *Atlanta Systems Biophysics meeting*, Atlanta, GA  
 Aug 2015 *The Ninth International q-bio Conference*, Santa Fe, NM  
 Mar 2015 *American Physical Society March Meeting*, San Antonio, TX  
 Aug 2014 *The Eighth International q-bio Conference*, Santa Fe, NM  
 July 2014 HFSP grantees meeting, Lugano, Switzerland  
 Feb-Mar 2014 *Cosyne meeting*, Salt Lake City, UT  
 Aug 2013 *The Seventh International q-bio Conference*, Santa Fe, NM  
 July 2013 HFSP grantees meeting, Strasbourg, France  
 June 2013 CRCNS-NSF meeting, Cambridge, MA  
 Aug 2012 *The Sixth International q-bio Conference*, Santa Fe, NM  
 Mar 2011 *Microbial and viral evolution program*, KITP/UCSB, Santa Barbara, CA  
 Aug 2010 *The Fourth International q-bio Conference and Summer School*, Santa Fe, NM  
 Dec 2009 *Rutgers Statistical Mechanics Meeting*, Rutgers University, Piscataway, NJ  
 Aug 2009 *Bacteria meet Physics program*, Aspen Center for Physics, Aspen, CO  
 Mar 2009 *American Physical Society March Meeting*, Pittsburgh, PA  
 Nov 2009 *76th Meeting of the Southeastern Section of American Physical Society*, Atlanta, GA  
 Jul 2008 *International Society for Bayesian Analysis World Meeting*, Hamilton Island, Australia  
 Mar 2008 *Brain anatomy and development program*, KITP/UCSB, Santa Barbara, CA  
 Jan 2008 *Decision Making in Single Cells program*, Aspen Center for Physics, Aspen, CO  
 Oct 2007 *Fall Western Section American Mathematical Society Meeting, Methods for Heterogeneous Data Analysis Workshop*, Albuquerque, NM  
 Jul 2007 *CNS'2007*, Toronto, ON, Canada  
 Apr 2007 *Evolution of Molecular Networks program*, KITP/UCSB, Santa Barbara, CA  
 Sep 2006 DIMACS workshop on *Dialogue on Reverse Engineering Assessment and Methods (DREAM)*, Bronx, NY  
 Aug 2006 *International Conference on Molecular Systems Biology*, Munich, Germany  
 Mar 2006 *New Mexico Bioinformatics Symposium*, Santa Fe, NM  
 Dec 2005 *NIPS'05 Computational Biology Workshop*, Whistler, BC, Canada  
 Dec 2004 *Rutgers Statistical Mechanics Meeting*, Piscataway, NJ  
 Dec 2004 *NIPS 2004 workshop on Computational Biology*, Whistler, BC, Canada  
 Sep 2004 *Understanding the Brain program*, KITP/UCSB, Santa Barbara, CA  
 Dec 2002 *NIPS'02 workshop on Universal learning*, Whistler, BC, Canada  
 Dec 2002 *NIPS'02 workshop on Negative results and open problems*, Whistler, BC, Canada  
 Dec 2001 *NIPS'01*, Vancouver, BC, Canada

Mar 2001      *Frontiers in physics of complex systems* conference, Dead Sea, Israel  
 Nov 2000      *NIPS'00*, Denver, CO

## PUBLICATIONS

- Google Scholar summary, 11/1/2016; total 3883 citations; h-index 23.
- Students and postdocs advised or co-advised are *italicized*.

### *Refereed*

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#### *Unpublished work*

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