ILYA NEMENMAN

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EDUCATION

Princeton University, Physics, PhD 2000
San Francisco State University, Physics, MS 1997
Santa Clara University, Physics/Math, BS 1995
Belarusian State University, Theoretical Physics, 1991 – 1994

APPOINTMENTS

since 2009 Associate Professor, Departments of Physics and Biology, Emory University (tenured since 2012)
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
2001 – 2004 Postdoctoral Scientist, Kavli Institute for Theoretical Physics, UC Santa Barbara
2000 – 2001 Postdoctoral Scientist, NEC Research Institute, Princeton, New Jersey
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 (VIIBRE), 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 EXPERIENCE

since 2009 Emory University: Introductory Physics, Computational Neuroscience, Stochasticity in Biology, Physical Biology: Information Processing in Biological Systems, Quantum Field Theory, Graduate Electrodynamics
2012 Emory-Tibet Science Initiative, Quantum Mechanics course for Tibetan monastics, Dharamshala, India
2011 – 2012 *The q-bio Conference on Cellular Information Processing*, tutorial
2007 – 2010 *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

2013 Phi Beta Kappa Recognition
2012 James S. McDonnell Foundation Complex Systems Research Award
2012 Student-invited colloquium, Cornell University Biophysics Program, Ithaca, NY
2012 Vice Chair nomination, Division of Bioogical 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 Distingusihed 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

JSMF/ 220020321 "In search of simplicity: Coarse-graining cellular information processing networks", PI, 2012-2016.
NSF/IOS/1208126 "Computational characterization of *C. elegans* nociceptive behavior as a quantitative model for pain transduction", PI, 2012-2016.
HFSP/RGY0084/2011 "Adaptive behavior of *C. elegans* in complex sensory environments", PI (multiple PIs), collaborative program requiring multiple international investigators, 2011-2014.
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.

Completed

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

Service (Emory): Computational and Life Sciences Internal Advisory Committee and Faculty Search Committee, URC Natural Sciences Sub-Committee member and chair, Physics Faculty Search Committee, Physics Graduate Program Selection Committee, PBEE Recruitment Committee

Service (LANL): Biological and Environmental Research / Systems Biology, Neuroscience, and Information Science steering committee; New Mexico Consortium Neural Computing.

External Advising: DOE/GTL Knowledgebase; NIH/NCI "Physical Science and New Frontiers in Oncology" Think Tank.

Editorial Boards: *IET Systems Biology* (since 2009), *Experimental Biology and Medicine* (since 2009)

School organization: *The q-bio Summer School on Cellular Information Processing*, 2007-2009, Los Alamos, NM.

Conference organization: *The q-bio Conference on Cellular Information Processing*, 2007–2013, Santa Fe, NM; *11th International Conference on Computational Methods in Systems Biology*, Vienna, Austria, 09/2013; Aspen Center for Physics program on *Physics of Behavior*, Aspen, CO, 05-06/2012; APS March Meeting Focus Session on *Physics of Behavior*, Portland, OR, 03/2010; *Principles of Biological Computation*, 05/2008, Santa Fe, NM; CNLS Annual Conference on *Information Sciences and Technology*, 05/2008, Santa Fe, NM; *Unconventional computation: Quo Vadis?*, 03/2007, Santa Fe, NM; *Grand Challenges in Neural Computation*, 02/2007, Santa Fe, NM; *NIPS'03* workshop on *Estimation of entropy and information of undersampled probability distributions*, 12/03, Whistler, BC.

Long program organization: KITP program *Understanding the brain*, KITP/UCSB 2004.

Public events organization: *The Nature of Knowledge* Lecture Series, Emory, 2012–2013; *The q-bio Public Lecture Series*, Santa Fe, NM, 2009.

Conference program committees: *RECOMB* satellite workshop on *Systems Biology*, 11/2007; *The DREAM Conference*, 2006–2010.

Recent Refereeing: *Phys Rev*, *PNAS*, *PLoS Pathogens*, *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*.

Grant refereeing: NSF; NIH/NCI, NIGMS; DOE SBIR/STTR; Israeli Science Foundation.

Software: NSB entropy estimation, `nsb-entropy.sf.net`.

Memberships: American Physical Society, New York Academy of Sciences, Society for Experimental Biology and Medicine

ADVISEES

Postdocs: *Emory*: Lina Merchan, Martin Tchernookov, Sorin Tanase Nicola (now Assistant Professor, Uppsala); *LANL*: Nikolai Sinitsyn (now LANL Staff Member), Golan Bel (now Assistant Professor, Ben Gurion), Brian Munsky (now Assistant Professor, Colorado State).

Graduate Students: Jakub Otwinowski (now: postdoc, U Pennsylvania), Vijay Singh, George Leung, Xinxian Shao (all Emory).

Graduate Students co-Advised: Etay Ziv (PhD 2007, Columbia), Andrew Mugler (PhD 2010, Columbia).

Rotation Students: Xiang Cheng, John Kirkham, Chloe Robins.

Undergraduate Students: Farhan Kamili (now: Harvard, Systems Biology), Rebecca Butterfield (all Emory).

Summer Students: Aly Pesic (Stanford), Misha Shashkov (Berkeley), Pradeep Bandaru, Sean Escola, Michael Vidne (Columbia), Wiet de Ronde (AMOLF), Bryan Daniels (Cornell).

PRESENTATIONS

Invited External Talks

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

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 Woskhop 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, Washngton, 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

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 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 Americal 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

Refereed

1. V Singh, M Tchernookov, R Butterfield, and I Nemenman. Continuum dynamics model of the primary visual cortex for contour detection. Submitted, 2013.
2. D Schwab, I Nemenman, and P Mehta. Zipfs law and criticality in multivariate data without fine-tuning. Submitted, 2013.
3. M Tchernookov and I Nemenman. Predictive information in a nonequilibrium critical model. *J Stat Phys* **153**, 442, 2013.
4. J Otwinowski and I Nemenman. Genotype to phenotype mapping and the fitness landscape of the *E. coli lac* promoter. *PLoS ONE* **8**, e61570, 2013.
5. S Stromberg, R Antia and I Nemenman. Population-expression modeling of immune response. *Physical Biology* **10**, 035010, 2013.
6. X Cheng, L Merchan, M Tchernookov and I Nemenman. Large number of receptors may reduce cellular response time variation. *Physical Biology* **10**, 035008, 2013.
7. I Nemenman. Gain control in molecular information processing: Lessons from neuroscience. *Physical Biology* **9**, 026003, 2012.
8. I Nemenman. Coincidences and estimation of entropies of random variables with large cardinalities. *Entropy* **13**, 2013-2023, 2011.
9. S Tanase Nicola and I Nemenman. Fitness in time-dependent environments includes a geometric phase contribution. *J R Soc Interf*, doi:10.1098/rsif.2011.0695, 2011.
10. R Cheong, A Rhee, J Wang, I Nemenman, and A Levchenko. Information transduction capacity of noisy biochemical signaling networks. *Science* **334**, 354, 2011.
11. V Gintautas, M Ham, B Kunsberg, S Barr, S Brumby, C Rasmussen, J George, I Nemenman, L Bettencourt, G Kenyon. Model cortical association fields account for the time course and dependence on target complexity of human contour perception. *PLoS Comp Biol* **7**, e1002162, 2011.
12. J Otwinowski, S Tanase Nicola, and I Nemenman. Speeding up evolutionary search by small fitness fluctuations. *J Stat Phys* **144**, 367, 2011.
13. Y Wei, X Wang, J Liu, I Nemenman, A Singh, H Weiss, and B Levin. The population dynamics of bacteria in physically structured habitats and the adaptive virtue of random motility. *Proc Natl Acad Sci USA* **108**, 4047, 2011.
14. P Bandaru, M Bansal, and I Nemenman. Mass conservation and inference of metabolic networks from mass spectrometry data. *J Comput Bio* **18**, 147, 2011.

15. N Sinitsyn and I Nemenman, Time-dependent corrections to effective rate and event statistics in Michaelis-Menten kinetics. *IET Syst Biol* **4**, 409, 2010.
16. A Margolin, K Wang, A Califano, and I Nemenman. Multivariate dependence and genetic networks inference. *IET Syst Biol* **4**, 428, 2010.
17. G Bel, B Munsky, and I Nemenman. The simplicity of completion time distributions for common complex biochemical processes. *Physical Biology* **7**, 016003, 2010.
18. B Munsky, I Nemenman, and G Bel. Specificity and Completion Time Distributions of Biochemical Processes. *J Chem Phys* **131**, 235103, 2009.
19. K Wang, M Saito, B Bisikirska, M Alvarez, W Lim, P Rajbhandari, Q Shen, I Nemenman, K Basso, A Margolin, U Klein, R Dalla-Favera, and A Califano. Genome-wide identification of post-translational modulators of transcription factor activity in human B cells. *Nature Biotech* **27**, 829, 2009.
20. W de Ronde, B Daniels, A Mugler, N Sinitsyn, and I Nemenman. Mesoscopic statistical properties of multistep enzyme-mediated reactions. *IET Syst Biol* **3**, 429, 2009.
21. A Mugler, E Ziv, I Nemenman, and C Wiggins. Quantifying evolvability in small biological networks. *IET Syst Biol* **3**, 379, 2009.
22. G Bel and I Nemenman. Ergodic and non-ergodic anomalous diffusion in coupled stochastic processes. *New J Phys* **11** 083009, 2009.
23. N Sinitsyn, N Hengartner, and I Nemenman. Adiabatic coarse-graining and simulations of stochastic biochemical networks. *Proc Natl Acad Sci (USA)* **106**, 10546, 2009.
24. A Mugler, E Ziv, I Nemenman, and C Wiggins. Serially-regulated biological networks fully realize a constrained set of functions. *IET Syst. Biol.* **2**, 313, 2008.
25. D Dreisigmeyer, J Stajic, I Nemenman, W Hlavacek, and M Wall. Determinants of bistability in induction of the *Escherichia coli lac* operon. *IET Syst. Biol.* **2**, 293, 2008.
26. I Nemenman, GD Lewen, W Bialek, RR de Ruyter van Steveninck. Neural coding of natural stimuli: Information at sub-millisecond resolution. *PLoS Comput. Biol.* **4**(3), e1000025, 2008.
    - Preliminary version available as: I Nemenman, G Lewen, W Bialek, and R de Ruyter van Steveninck. Neural coding of natural stimuli: information at sub-millisecond resolution. *BMC Neurosci.* **8** (Suppl 2), S7, 2007.
27. NA Sinitsyn and I Nemenman. A universal geometric theory of mesoscopic stochastic pumps and reversible ratchets. *Phys. Rev. Lett.* **99**, 220408, 2007.
28. I Nemenman, GS Escola, WS Hlavacek, PJ Unkefer, CJ Unkefer, ME Wall. Reconstruction of metabolic networks from high-throughput metabolite profiling data: *in silico* analysis of red blood cell metabolism. *Ann. N.Y. Acad. Sci.* **1115**, 102, 2007.
29. E Ziv, I Nemenman, and C Wiggins. Optimal signal processing in small stochastic biochemical networks. *PLoS ONE* **2**, e1077, 2007.
30. NA Sinitsyn and I Nemenman. Berry phase and pump effect in stochastic chemical kinetics. *EPL* **77**, 58001, 2007.
31. A Margolin, K Wang, WK Lim, M Kustagi, I Nemenman, and A Califano. Reverse engineering cellular networks. *Nature Protocols* **1**, 663, 2006.
32. K Wang, I Nemenman, N Banerjee, A Margolin, and A Califano. Genome-wide discovery of modulators of transcriptional interactions in human B lymphocytes. In *Lecture Notes in Computer Science, '3909*, *Proceedings of Research in Computational Molecular Biology: 10th Annual International Conference, RECOMB 2006*, pp. 348 (Springer: Berlin / Heidelberg, 2006).
33. A Margolin, I Nemenman, K Basso, U Klein, C Wiggins, G Stolovitzky, Riccardo D Favera, and A Califano. ARACNE: An algorithm for reconstruction of genetic networks in a mammalian cellular context. *BMC Bioinformatics* **7**(Suppl. 1), S7, 2006.
34. I Nemenman. Fluctuation-dissipation theorem and models of learning. *Neural Comp.* **17**(9), 2006, 2005.

35. I Nemenman, W Bialek, and R de Ruyter van Steveninck. Entropy and information in neural spike trains: Progress on the sampling problem. *Phys. Rev. E* **69**, 056111, 2004.
36. C Wiggins and I Nemenman. Process pathway inference via time series analysis. *Experim. Mech.* **43**, 361, 2003.
37. A Silbergleit, I Nemenman, and I Mandel. On the interaction of point charges in an arbitrary domain. *Techn. Phys.* **48**, 146, 2003.
38. A Silbergleit, I Mandel, and I Nemenman. Potential and field singularity at a surface point charge. *J. Math. Phys.* **44**, 4460, 2003.
39. I Nemenman, F Shafee, and W Bialek. Entropy and inference, revisited. In TG Dietterich, S Becker, and Z Ghahramani, editors, *Adv. Neural Inf. Proc. Syst. 14* (MIT Press: Cambridge, MA, 2002).
40. I Nemenman, and W Bialek. Occam factors and model-independent Bayesian learning of continuous distributions. *Phys. Rev. E* **65**, 026137, 2002.
    - Preliminary version available as: I Nemenmanand W Bialek, Learning Continuous Distributions: Simulations With Field Theoretic Priors. In T Leen, T Dietterich, and V Tresp, eds. *Adv. Neural Inf. Proc. Syst. 13*, pp. 287 (MIT Press: Cambridge, MA, 2001).
41. W Bialek, I Nemenman, and N Tishby. Complexity through nonextensivity. *Physica A* **302**, 89, 2001.
42. W Bialek, I Nemenman, and N Tishby. Predictability, complexity, and learning. *Neur. Comp.* **13**, 2409, 2001.
43. R Adler, I Nemenman, J Overduin, and D Santiago. On the detectability of quantum spacetime foam with gravitational-wave interferometers. *Phys. Lett. B* **477**, 424, 2000.
44. J Naud, I Nemenman, M Van Raamsdonk, and V Periwal. Minimal subtraction and the Callan-Symanzik equation. *Nucl. Phys. B* **540**, 533, 1999.
45. I Nemenman and A Silbergleit. Explicit Green's function of a boundary value problem for a sphere and trapped flux analysis in Gravity Probe B experiment. *J. Appl. Phys.* **86**, 614, 1999.
46. A Minkevich and I Nemenman. On the influence of gravitating vacuum on dynamics of homogeneous isotropic models in gauge-theories of gravity. *Class. Quant. Grav.* **12**, 1259, 1995.
    - Preliminary version available as: A Minkevich and I Nemenman. On the influence of gravitating vacuum on dynamics of homogeneous isotropic models in gauge-theories of gravity. *Dokl. Akad. Nauk Belar.* **39**, 45, 1995. In Russian.

Views, Editorials, Books, and Chapters

1. I Nemenman, S Gnanakaran, B Munski, M Wall, Y Jiang, W Hlavacek, and J Faeder. Special section dedicated to The Sixth q-bio Conference: meeting report and preface. *Physical Biology* **10**, 030301, 2013.
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