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
2005 – 2009 Technical Staff Member, R&D Scientist 4 (the highest: 6), CCS-3, Los Alamos National Laboratory
2004 – 2005 Associate Research Scientist (Research Assistant Professor), 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 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 2010 Emory University: Introductory Physics, Computational Neuroscience, Stochasticity in Biology (tutorial series)
2007 – 2009 *The q-bio Summer School on Cellular Information Processing*, organizer and instructor
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

Los Alamos National Laboratory Distingusihed Performance Award Nomination, 2009
Los Alamos National Laboratory CCS SPOT Award, 2009
National Science Foundation Scholar, StatPhys 22, 2004
Outstanding Teaching Assistant, Department of Physics, Princeton University, 1999
Graduate Student Distinguished Achievement Award, SFSU, 1997
Outstanding Teaching Assistant, Department of Physics, SFSU, 1996
Belarusian State University Honorary Stipend, 1993–1994
Belarusian National High School Physics Olympiad, Winner, 1991

RESEARCH GRANTS

NIH/NIGMS/1R13GM082162 01 "Information Processing In Cellular Signaling and Gene Regulation", contact PI: Ilya Nemenman (multiple PIs), *The q-bio Conference* support grant

DOE/LANL/LDRD/20090001DR "Synthetic Cognition Through Peta-scale Modeling of Mammalian Visual Cortex", 2008–2012, co-PI in 2008-2009, collaborator since 2009

NSF-OCI-0749348 "Peta-scale computing infrastructure: High Performance Neural Computing", co-PI, 2008–2011

NIH/NCI/1R01CA132629 "Differential Metabolic Analysis of Tumor Progression", PI (multiple PIs), 2007–2012

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 Advisoty Committee and Faculty Search Committee, URC Natural Sciences Review 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), *Exerimental 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*, 2007–2010, Santa Fe, NM; 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 q-bio Public Lecture Series*, Santa Fe, NM, 2009

Conference program committees: *RECOMB* satellite workshop on *Systems Biology*, 11/2007; *The DREAM Conference*, 2006–2009

Refereeing: *NIPS*, *Neural Computation*, *J. Neurophysiol.*, *Phys. Rev.*, *Biosystems*, *Pattern Analysis*

and Applications, *Stochastic Modeling and Applications*, *RECOMB*, *DREAM*, *Trends in Cognitive Sciences*, *BMC Bioinformatics*, *BMC Systems Biology*, *PLoS ONE*, *JOSA*, *EURASIP Bioinformatics/Systems Biology*, *Physica D*, *IEEE Trans. Neur. Net.*, *IET Systems Biology*, *PNAS*, *Biophysical J.*, *Physical Biology*, *Proc. R. Soc. B*

Grant refereeing: NSF: Computational Intelligence, Biomedical Engineering, Behavioral Systems Cluster, Cyber-enabled Discovery and Innovation; NIH/NCI; DOE SBIR/STTR; Israeli Science Foundation

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

Memberships: American Physical Society, New York Academy of Sciences

ADVISEES

Postdocs: Nikolai Sinitsyn, Golan Bel, Brian Munsky (LANL), Sorin Tanase Nicola, Martin Tchernookov (Emory)

Graduate Students co-Advised: Etay Ziv (PhD 2007), Andrew Mugler (PhD 2010), Sean Escola (PhD 2009)

Undergraduate Students: Aly Pesic (Stanford), Misha Shashkov (Berkeley), Pradeep Bandaru (Columbia)

COLLABORATORS AND OTHER AFFILIATIONS

William Bialek (Princeton; thesis advisor), Andrea Califano (Columbia; postdoc advisor), Francis Alexander (LANL), Peter Balsam (Columbia), David Dreisigmeyer (Pittsburgh), Jeremy Edwards (UNM), James Faeder (Pittsburgh), Randy Gallistel (Rutgers), Nicolas Hengartner (LANL), William Hlavacek (LANL), Andre Levchenko (Johns Hopkins), Bruce Levin (Emory), William Ryu (Toronto), Rob de Ruyter van Steveninck (Indiana University), Christof Teuscher (Portland State), Naftali Tishby (Hebrew), Cliff Unkefer (LANL), Pat Unkefer (LANL), Michael Wall (LANL), Chris Wiggins (Columbia)

SUMMARY OF RESEARCH INTERESTS

Using methods of theoretical physics and machine learning to develop functional, coarse-grained models of information processing in systems biology, including: reverse-engineering cellular networks, creation of efficient tools for their modeling and analysis, studies of learning and adaptation in sensory systems, and development of large-scale neuromimetic signal processing systems.

Selected publications about our work

1. Biology may not be so complex after all, physicist finds. *sciencedaily.org*, Mar 19, 2010.
2. Supercomputer simulates human visual system. *slashdot.org*, June 13, 2008.
3. Roadrunner supercomputer puts research at a new scale. *LANL Press Release*, June 12, 2008.
4. Improving Metabolomic Measurement and Analysis. *LANL Science, Technology, and Engineering (STE) Highlights*, Nov 7, p. 2, 2007.
5. Language of A Fly Proves Surprising. *PhysOrg.com*, Mar 10, 2008.
6. 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.
7. The Fly Code. By N. Maximov, *Russian Newsweek*, Mar 24, 2008 (in Russian).

PRESENTATIONS

Oct 2010 University of Maryland Biophysics Group seminar, College Park, MD

Jul 2010 The Fourth International q-bio Conference, Santa Fe, NM

Jul 2010 31st Annual Meeting of the Canadian Applied Mathematics Society (CAIMS-2010), St. John's, Newfoundland, Canada

Jun 2010 University of Toronto, Physics/Biomedical research seminar, Toronto, Canada
May 2010 NSF Workshop on *Shared Organizing Principles in the Computing and Biological Sciences*, Arlington, VA
Apr 2010 University of South Florida, Statistics Colloquium, Tampa, FL
Mar 2010 APS March Meeting, Portland, OR
Feb 2010 Geirgia Institute of Technology, Mathematical Biology Seminar
Dec 2009 Rutgers Statistical Mechanics Meeting, Piscataway, NJ
Nov 2009 76th Meeting of the Southeastern Section of APS, Atlanta, GA
Nov 2009 UC Berkeley Bioengineering / Arkin Lab seminar
Nov 2009 Santa Clara University Department of Physics Colloquium
Nov 2009 *Dynamics of signal transduction and of gene-protein regulatory networks* workshop, Mathematical Biosciences Institute, Ohio State University
Sep 2009 *Stochasticity in Biochemical Reaction Networks* workshop, Banff, Alberta, Canada
Jul 2009 *Information Processing in Biology* conference and summer school, Beijing, China
Jun 2009 Vanderbilt University, Biophysics seminar
May 2009 AMOLF (Amsterdam, The Netherlands) colloquium
May 2009 Bernstein Center for Computational Neuroscience, LMU (Munich, Germany) seminar
Mar 2009 APS March Meeting Contributed Talk
Dec 2008 Weizmann Institute, Condensed Matter Theory seminar
Dec 2008 Weizmann Institute, Neurobiology seminar
Dec 2008 Technion, Networks Biology Lab seminar
Nov 2008 Princeton University, Biophysics Theory seminar
Nov 2008 Columbia University, Neurotheory Center seminar
Nov 2008 Columbia University, C2B2 Computational Biology seminar
Nov 2008 Emory University, Physics colloquium
Jul 2008 International Society for Bayesian Analysis World Meeting, contributed talk
May 2008 SFI "Principles of Biological Computation" workshop talk
Apr 2008 Harvard Condensed Matter Theory seminar
Mar 2008 KITP/UCSB program on "Brain anatomy and development" talk
Mar 2008 UCLA Biomathematics Department seminar
Mar 2008 Caltech Bio-circuits / Information Science and Technology seminar
Mar 2008 APS March Meeting, Invited talk
Mar 2008 UC Irvine Physics Colloquium
Feb 2008 Duke University, Physics and Systems Biology Colloquium
Feb 2008 Brown University Physics Colloquium
Feb 2008 University of Pittsburgh, Department of Computational Biology seminar
Jan 2008 Aspen Center for Physics, *Decision Making in Single Cells* conference talk
Oct 2007 Emory University, Computational Life Sciences seminar
Oct 2007 UCSD Center for Theoretical Biological Physics seminar
Oct 2007 Fall Western Section AMS Meeting, *Methods for Heterogeneous Data Analysis* Workshop, invited talk
Oct 2007 Santa Fe Institute workshop on *High-Level Perception and Low-Level Vision: Bridging the Semantic Gap*, invited talk
Oct 2007 DOE/BER seminar, Washington, DC
Jul 2007 *CNS'2007* workshop on *Methods of Information Theory in Computational Neuroscience*, invited talk
Jul 2007 *CNS'2007*, contributed plenary talk
May 2007 *7th Understanding Complex Systems symposium*, invited talk
Apr 2007 UCLA Biomath department seminar
Apr 2007 Caltech CNS seminar
Apr 2007 KITP/UCSB program on *Evolution of Molecular Networks* seminar
Mar 2007 CNLS conference on *Unconventional Computation: Workshop on Neural Computation*, invited talk

Feb 2007 UNM SIBBS: Seminar in Biological and Biomedical Sciences
Sep 2006 LANL TSC capability workshop *Advanced Methods for Data Analysis*, contributed talk
Sep 2006 DIMACS workshop on *Dialogue on Reverse Engineering Assessment and Methods (DREAM)*, contributed talk
Aug 2006 LANL TSC capability workshop *Complex Networks*, contributed talk
Aug 2006 UNM/CS seminar
Aug 2006 *International Conference on Molecular Systems Biology*, Munich, Germany, contributed plenary talk
Apr 2006 Indiana University Biocomplexity seminar
Apr 2006 Santa Fe Institute seminar
Apr 2006 UNM Cancer Research Center seminar
Mar 2006 *New Mexico Bioinformatics Symposium*, Santa Fe, NM
Jan 2006 LANL, D-1 seminar
Dec 2005 *NIPS'05 Computational Biology Workshop*, contributed talk
Nov 2005 Baylor College of Medicine, Neuroimaging Laboratory seminar
Nov 2005 Texas A&M College Station, *Models for Genetic Regulatory Networks* conference, invited talk
Nov 2005 IAS, Princeton, Systems Biology seminar
Oct 2005 Rutgers, BioMaPs seminar
Jul 2005 University of Washington, Seattle, Biophysics and Physiology seminar
Jun 2005 UCSF, Computational Biology seminar
Jun 2005 CSHL, Computational Neuroscience seminar
Jun 2005 Columbia, C2B2 seminar
Apr 2005 LANL, CCS-3/CNLS seminar
Apr 2005 Cornell, LASSP/Physics colloquium
Apr 2005 IBM Watson research center, physics seminar
Mar 2005 Columbia, Computational Neuroscience seminar
Feb 2005 Harvard, Bauer Center for Genomics Research seminar
Feb 2005 University of Michigan, Ann Arbor, Physics colloquium
Jan 2005 University of Maryland, College Park, Computational Neuroscience seminar
Dec 2004 *Rutgers Statistical Mechanics Meeting*, contributed talk
Dec 2004 *NIPS 2004 workshop on Computational Biology*, Whistler, BC, contributed talk.
Dec 2004 LANL, Theoretical Biology/CNLS seminar
Nov 2004 NEU, physics colloquium
Nov 2004 BU, Biodynamics lab seminar
Sep 2004 UCSB, KITP, *Understanding the Brain* program seminar
Apr 2004 UCLA, IPAM, Proteomics colloquium
Apr 2004 UCSF, Keck neuroscience center seminar
Mar 2004 NYU, CS colloquium
Mar 2004 LANL, CNLS seminar
Mar 2004 Columbia, C2B2 seminar
Mar 2004 IBM Watson Research Center, Systems Biology and Functional Genomics group seminar
Mar 2004 Rockefeller University, Center for Studies in Physics and Biology colloquium
Dec 2003 NIPS'03 workshop on *Entropy Estimation*, opening talk
Nov 2003 KITP, UCSB, *Pattern formation* program seminar
Oct 2003 Columbia University, Computational biology seminar
Mar 2003 KITP, UCSB colloquium
Feb 2003 UCSB, Statistics, short lecture series
Dec 2002 NIPS-2002 workshop on *Universal learning*, invited talk
Dec 2002 NIPS-2002 workshop on *Negative results and open problems*, contributed talk
Nov 2002 CalTech's complexity club seminar
Nov 2002 Princeton, Theoretical biophysics group seminar

Oct-Nov 2002	Courant Institute, NYU, Bioinformatics group, short lecture series
Oct 2002	Columbia University, Applied Mathematics seminar
Oct 2002	Courant Institute, NYU, Bioinformatics seminar
May 2002	UCSB, Statistics Department, colloquium
Mar 2002	ITP, UCSB, Director's blackboard lunch talk
Dec 2001	Contributed spotlight talk at *NIPS-2001*.
Oct 2001	ITP, UCSB colloquium
Mar 2001	Contributed talk at *Conference on Frontiers in physics of complex systems*, Dead Sea, Israel
May 2001	NYU Courant Institute / Center for Neuroscience seminar
Feb 2001	Rockefeller University, Center for Studies in Physics and Biology colloquium
Jan 2001	MIT Cognitive Science, seminar
Nov 2000	New England Complex Science Institute colloquium
Nov 2000	Contributed talk at *NIPS-2000*
Apr, Aug 2000	NEC Research Institute, Princeton, NJ, Biophysics seminar
Jan 2000	Hebrew University, Machine Learning seminar
Jul 1998	Gravity Probe B, Theory Group seminar
Aug 1997	CERN/PPE/L3 seminar
Jul 1994	Belarusian State University, Theoretical Physics seminar

PUBLICATIONS

Refereed

1. P Bandaru, A Califano, I Nemenman. Mass conservation and inference of metabolic networks from mass spectrometry data. *PLoS ONE*, submitted 2010.
2. A Margolin, K Wang, A Califano and I Nemenman. Multivariate dependence and genetic networks inference. *IET Syst Biol*, submitted, 2010.
3. N Sinitsyn and I Nemenman. Time-dependent corrections to effective rate and event statistics in Michaelis-Menten kinetics. *IET Syst Biol*, submitted, 2010.
4. G Bel, B Munsky, and I Nemenman. Common complex biochemical processes exhibit simple completion time distributions. *Physical Biology* **7** 016003, 2010.
5. B Munsky, I Nemenman, and G Bel. Specificity and Completion Time Distributions of Biochemical Processes. *J Chem Phys* **131**, 235103, 2009.
6. 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.
7. W de Ronde, B Daniels, A Mugler, N Sinitsyn, and I Nemenman. Statistical properties of multistep enzyme-mediated reactions. *IET Syst Biol* **3**:429, 2009.
8. A Mugler, E Ziv, I Nemenman, C Wiggins. Quantifying evolvability in small biological networks. *IET Syst Biol* **3**:379, 2009.
9. G Bel and I Nemenman. Ergodic and non-ergodic anomalous diffusion in coupled stochastic processes. *New J Phys* **11** 083009, 2009.
10. N Sinitsyn, N Hengartner, and I Nemenman. Adiabatic coarse-graining and simulations of stochastic biochemical networks. *Proc Natl Acad Sci (USA)* **106**:10546-10551, 2009.
11. I Nemenman. Nonlinearity, memory, and phase transitions in animal learning. Submitted to *COSYNE 2009*, 2008.
12. A Mugler, E Ziv, I Nemenman, C Wiggins. Serially-regulated biological networks fully realize a constrained set of functions. *IET Syst. Biol.* **2**:313, 2008.

13. 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.

14. 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.

15. NA Sinitsyn and I Nemenman. A universal geometric theory of mesoscopic stochastic pumps and reversible ratchets. *Phys. Rev. Lett.* **99**:220408, 2007.

16. 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**:102115, 2007.

17. E Ziv, I Nemenman, and C Wiggins. Optimal information processing in small stochastic biochemical networks. *PLoS ONE* **2**(10): e1077, 2007.

18. NA Sinitsyn and I Nemenman. Berry phase and pump effect in stochastic chemical kinetics. *EPL* **77**, 58001, 2007.

19. A Margolin, K Wang, WK Lim, M Kustagi, I Nemenman, and A Califano. Reverse engineering cellular networks. *Nature Protocols* **1**(2):663-672, 2006.

20. 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 - 362 (Springer: Berlin / Heidelberg, 2006).

21. 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.

22. I Nemenman. Fluctuation-dissipation theorem and models of learning. *Neural Comp.* **17**(9): 2006-2033, 2005.

23. 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.

24. C Wiggins and I Nemenman. Process pathway inference via time series analysis. *Experim. Mech.* **43**(3):361-370, 2003.

25. A Silbergleit, I Nemenman, and I Mandel. On the interaction of point charges in an arbitrary domain. *Techn. Phys.* **48**(2):146-151, 2003.

26. A Silbergleit, I Mandel, and I Nemenman. Potential and field singularity at a surface point charge. *J. Math. Phys.* **44**(10):4460-4466, 2003.

27. 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).

28. I Nemenman and W Bialek. Occam factors and model-independent Bayesian learning of continuous distributions. *Phys. Rev. E* **65**(2):026137, 2002.
    - Preliminary version available as: I Nemenman and 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. 287-293 (MIT Press: Cambridge, MA, 2001).

29. W Bialek, I Nemenman, and N Tishby. Complexity through nonextensivity. *Physica A* **302**:89-99, 2001.

30. W Bialek, I Nemenman, and N Tishby. Predictability, complexity, and learning. *Neur. Comp.* **13**:2409-2463, 2001.

31. R Adler, I Nemenman, J Overduin, and D Santiago. On the detectability of quantum space-time foam with gravitational-wave interferometers. *Phys. Lett. B* **477**:424-428, 2000.
32. J Naud, I Nemenman, M Van Raamsdonk, and V Periwal. Minimal subtraction and the Callan-Symanzik equation. *Nucl. Phys. B* **540**:533-539, 1999.
33. 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**:614-624, 1999.
34. 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**:1259-1265, 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**(2):45-51, 1995. In Russian.

Views, Editorials, Books

1. I Nemenman, W Hlavacek, Y Jiang, and M Wall, Editorial: Selected papers from the Second q-bio Conference on Cellular Information Processing. *IET Syst Biol* **3**:297, 2009.
2. I Nemenman, W Hlavacek, J Edwards, J Faeder, Y Jiang, M Wall, Editorial: Selected papers from the First q-bio Conference on Cellular Information Processing. *IET Systems Biology* **2**:203, 2008.
3. C Teuscher, I Nemenman, and F Alexander. Novel Computing Paradigms: Quo Vadis? *Physica D* **237**:10-11, 2008.
4. J Edwards, J Faeder, W Hlavacek, Y Jiang, I Nemenman, and M Wall. q-bio 2007: a watershed moment in modern biology. *Mol. Syst. Biol.* **3**:148, 2007.
5. I Nemenman. *Information Theory and Learning: A Physical Approach*. PhD thesis, Princeton University, Department of Physics, 2000. arXiv:physics/0009032.

Unpublished work

1. K Wang, N Banerjee, A Margolin, I Nemenman, K Basso, R Dalla Favera, and A Califano. Conditional network analysis identifies candidate regulator genes in human B cells. Unpublished manuscript, 2005. arXiv:q-bio/0411003.
2. A Margolin, N Banerjee, I Nemenman, and A Califano. Reverse engineering of yeast transcriptional network using the ARACNE algorithm. Unpublished manuscript, 2004. Available at `menem.com/~ilya`.
3. I Nemenman. Inference of entropies of discrete random variables with unknown cardinalities. Technical Report, KITP. UCSB, 2002. arXiv:physics/0207009.
4. T Holy and I Nemenman. On impossibility of learning in a reparameterization covariant way. Technical Report NSF-KITP-03-123, KITP, UCSB, 2002. Available at `menem.com/~ilya`.
5. I Kominis and I Nemenman. BGO dead crystal correction and shower fitting. Tech. Rep. 2157, *CERN: L3*, 1997. Available at `menem.com/~ilya`.