

## **PHILIP JOHN HOLMES: Short Curriculum Vitae and Recent Publications** (updated Apr 2011)

Born - Lincolnshire, United Kingdom, May 24, 1945. British and naturalized U.S. citizen. Married with four children.

### **Education**

Oxford University; B.A. (Hons). Engineering Science: 1967.  
Southampton University; Ph.D. Engineering: 1974.

### **Recent Positions**

Professor of Theoretical and Applied Mechanics and Mathematics, Cornell University: 1984-1994.  
Sherman Fairchild Distinguished Scholar, California Institute of Technology: 1988-1989.  
Professeur Associé, Université de Nice: July 1989.  
Charles N. Mellowes Professor of Engineering and Professor of Mathematics, Cornell University: 1992-94  
Professeur Associé, Université de Paris-Sud: June-July 1993.  
Professor of Mechanics and Applied Mathematics, Princeton University: 1994-; Associate Faculty in Department of Mathematics, 2002-.  
Director, Program in Applied and Computational Mathematics, Princeton University: 1994-97, 2010-11.  
Visiting Member, Institute for Advanced Study, Princeton: Spring 2003.  
Interim Chair, Department of Mechanical and Aerospace Engineering, Princeton University, 2006-07.  
Eugene Higgins Professor of Mechanical and Aerospace Engineering, Princeton University: 2008-.

### **Major Honors and Recent Invited Lectures**

John Simon Guggenheim Memorial Fellow, 1993-4.  
Elected Fellow of the American Academy of Arts and Sciences, 1994.  
Erdős Visiting Professor, Paul Erdős Mathematical Center, Budapest, Hungary, January 2000.  
Elected Honorary Member of the Hungarian Academy of Sciences, 2001.  
Plenary Speaker, SIAM 50th Anniversary Meeting, Philadelphia PA, July 2002.  
Plenary Speaker, International Symposium on Nonlinear Theory and its Applications (NOLTA2004), Fukuoka, Japan, December 2004.  
Opening Plenary Speaker, Fifth EUROMECH Nonlinear Dynamics Conference (ENOC-2005), Eindhoven University of Technology, the Netherlands, August 2005.  
Appointed to SIAM Visiting Lecturer Program, 2006.  
Elected Fellow of the American Physical Society, 2006.  
Lyapunov Award, American Society of Mechanical Engineers' Technical Committee on Multibody Systems and Nonlinear Dynamics, 2009.  
Safra Distinguished Visiting Professor, Faculty of Mechanical Engineering, Technion, Israel, February-March 2009.  
Plenary Speaker, 16th International Congress on Mathematical Physics, Prague, Czech Republic, August 3-8, 2009.  
Opening Plenary Speaker, SIAM Conference on Life Sciences, Pittsburgh, PA, July 12-15, 2010.  
Invited speaker, International Congress on Industrial and Applied Mathematics, Vancouver, BC, July 18-22, 2011.  
T.K. Caughey Award, American Society of Mechanical Engineers' Applied Mechanics Division, 2011.  
Elected Fellow of the Society for Industrial and Applied Mathematics, 2011.

### **Theses Directed** (Ph.D., unless stated otherwise)

B.D. Greenspan (1981); J. Belair (1983); S.W. Shaw (1983); S.R. Wiggins (1985); N. MacGiolla Mhuiris (1986); K.G. Hockett (1986); J.J.P. Veerman (1986); A. Szeri (1988); E. Stone (1989); T. Kiemel (1990); V. Brunsden (MSc., 1990); O. O'Reilly (1990); C. Moore (1991); S.A. Campbell (1991); G. Berkooz (1991); P.J. Swart (1991); B. Zombro (1993); J. Duan (1993); W. Kalies (1994); H. Dankowicz (1995); B.D. Collier (1995); R.W. Ghrist (1995); D.A. Taylor (MSc., 1996); R.W. Wittenberg (1998); J.J. Jenkins (MSc., 1999); J.M. Schmitt (2001); J. Cisternas (2003); T.R. Smith (2003); E.T. Brown (2004); R.M. Ghigliazza (2004); J. Seipel (2006); J. Gao (2007); Y. Liu (2007); P. Eckhoff (2009); R. Kukillaya (2010); J. Proctor (2011).

### **Current Graduate Students** (Ph.D., unless stated otherwise)

A. Nedic; S. Goldfarb; S. Feng\*; P. Reverdy\* (\* denotes co-advised with N.E. Leonard).

### **Postdoctoral Scholars**

D.C. Whitley (1982-83); I.M. Moroz (1983-84); D. Armbruster (1986-88); A. Mielke (1986-87); J. Elezgaray (1989-91); G. Domokos (1991-92); A. Doelman (1992-93); D. Begie (1993-95); J.N. Kutz (1995-97); R. Goodman (1999-2001); H. Hanßmann (2000-01); J. Moehlis (2000-03); R. Bogacz (2001-04); T. McMillen (2003-06); P. Simen (2004-11); A.J. Yu (2005-08); M. Srinivasan (2006-09); P. Varkonyi (2006-07); KF. Wong-Lin (2006-10); E. Fuchs (2008-); D. Tomlin (2008-); F. Balci (2009-11); M. Schwemmer (2010-).

### **Editorial Board Memberships**

Addison-Wesley, monographs on Global Analysis and Its Applications: 1981-1985. SIAM Journal on Applied Mathematics: 1984-1990. Archive for Rational Mechanics and Analysis: 1986-2003. Complex Systems: 1986-1988. Journal of Nonlinear Science: 1990-; Managing Editor 2001-2005. Nonlinear Science Today: 1990-96. Proceedings of the Edinburgh Mathematical Society: 1991-96. Regular & Chaotic Dynamics: 1996-. Springer Verlag, Applied Mathematics Series and Texts in Applied Mathematics, 1997-; Co-Editor in Chief of 4 book series (AMS, TAM, IAM and STAM), 2010-. Annual Reviews of Fluid Mechanics, guest editor, 1998. SIAM Journal on Applied Dynamical Systems, 2001-. Applied Mathematics Research eXpress, 2001-.

### **Advisory Board Memberships**

Centre de Recherches Mathématiques, Université de Montréal: 1986-1991. S.E.R.C. Nonlinear Systems Panel (U.K.): 1986-1990. Theory Center, Cornell University: 1987-1989. L'Institut des Sciences Mathématiques, Montréal: 1991-96. US National Committee on Theoretical and Applied Mechanics: 1996-2000. AMS NSF Postdoctoral Fellowship Selection Committee: 1998-2000 (Chair, 1999). AMS/SIAM Wiener Prize Committee: 2003. SIAM Jürgen Moser Prize Selection Committee: 2006. Membership Panel, American Academy of Arts and Sciences: 1997-98 and 2004-7 (Chair, 2005-7). SIAM Major Awards Committee, 2008-2010. Centrum voor Wiskunde en Informatica, Amsterdam (CWI) Advisory Council, 2008-.

### **Professional Society Memberships**

American Mathematical Society (AMS representative to US National Committee on Theoretical and Applied Mechanics, 1996-2000); American Physical Society; International Society for the Interaction of Mechanics and Mathematics; Society for Industrial and Applied Mathematics (Council member, 1987-89); Society for Natural Philosophy; Society for Neuroscience.

## SELECTED PUBLICATIONS

### (1) Recent archival articles (2006-2010)

- [1.151] P. Holmes, R.J. Full, D. Koditschek and J. Guckenheimer (2006) *SIAM Review* 48 (2), 207-304. The dynamics of legged locomotion: Models, analyses, and challenges.
- [1.160] R. Bogacz, E. Shea-Brown, J. Moehlis, P. Holmes and J.D. Cohen (2006) *Psych. Rev.* 113 (4), 700-765. The physics of optimal decision making: A formal analysis of models of performance in two-alternative forced choice tasks.
- [1.162] T. McMillen and P. Holmes (2006) *J. Math. Psych.* 50 (1), 30-57. The dynamics of choice among multiple alternatives.
- [1.166] J.E. Seipel and P. Holmes (2006) *Int. J. Robotics Research* 25 (9), 889-902. Three-dimensional translational dynamics and stability of multi-legged runners.
- [1.167] T. McMillen and P. Holmes (2006) *J. Math. Biol.* 53, 843-866. An elastic rod model for anguilliform swimming.
- [1.168] P.A. Simen, J.D. Cohen and P. Holmes (2006) *Neural Networks* 19, 1013-1026. Rapid decision threshold modulation by reward rate in a neural network.
- [1.169] J. Gao and P. Holmes (2007) *J. Comp. Neurosci.* 22, 39-61. On the dynamics of electrically-coupled neurons with inhibitory synapses.
- [1.170] Y. Liu, P. Holmes and J.D. Cohen (2008) *Neural Computation* 20 (2), 345-373. A neural network model of the Eriksen task: Reduction, analysis, and data fitting.
- [1.171] Y. Liu, A.J. Yu and P. Holmes (2009) *Neural Computation* 21 (6), 1520-1553. Dynamical analysis of Bayesian inference models for the Eriksen task.
- [1.172] R. Kukillaya and P. Holmes (2007) *Biological Cybernetics* 97 (5-6), 379-395. A hexapedal jointed-leg model for insect locomotion in the horizontal plane.
- [1.173] J. Seipel and P. Holmes (2007) *Regular & Chaotic Dynamics* 12 (5), 502-520. A simple model for clock-actuated legged locomotion.
- [1.174] J. Zhang, R. Bogacz and P. Holmes (2009) *J. Math. Psych.* 53 (4), 231-241. A comparison of bounded diffusion models for choice in time controlled tasks.
- [1.175] P. Eckhoff, P. Holmes, C. Law, P.M. Connolly and J.I. Gold (2008) *New J. of Physics* 10, doi: 1367-2630/10/1/015006. On diffusion processes with variable drift rates as models for decision making during learning.
- [1.176] P. Simen, D. Contreras, C. Buck, P. Hu, P. Holmes and J.D. Cohen (2009) *J. Exp. Psych. Human Perception and Performance* 35 (6), 1865-1897. Reward rate optimization in two-alternative decision making: Empirical tests of theoretical predictions.
- [1.177] M. Zacksenhouse, P. Holmes and R. Bogacz (2010) *J. Math. Psych.* 54, 230-246. Robust versus optimal strategies for two-alternative forced choice tasks. Online pub. 13 Jan 2010, doi:10.1016/j.jmp.2009.12.004.
- [1.178] M. Srinivasan and P. Holmes (2008) *J. Theoretical Biology* 255, 1-7. How well can spring-mass-like telescoping leg models fit multi-pedal locomotion data?
- [1.179] R. Bogacz, P. Hu, P. Holmes and J.D. Cohen (2010) *Quart. J. Exp. Psych.* 63 (5), 863-891. Do humans produce the speed-accuracy tradeoff that maximizes reward rate? Online publ. Sept 10th, 2009, doi: 10.1080/17470210903091643.
- [1.180] P. Varkonyi, P. Holmes, T. Keimel, K. Hoffman and A.H. Cohen (2008) *J. Comp. Neurosci.* 25 (2), 245-261. On the derivation and tuning of phase oscillator models for lamprey central pattern generators.
- [1.181] J. Gao, G. Schwartz, P. Holmes and M. Berry II (2009) *Network: Computation in Neural Systems* 20 (2), 106-135. An oscillatory circuit underlying the detection of disruptions in temporally-periodic patterns.
- [1.182] P. Varkonyi and P. Holmes (2008) *SIAM J. on Applied Dynamical Systems* 7 (3), 766-794. On synchronization and traveling waves in chains of relaxation oscillators with an application to lamprey CPG.
- [1.183] T. McMillen, T.L. Williams and P. Holmes (2008) *PLoS Computational Biology* 4 (8), e1000157. Nonlinear muscles, passive viscoelasticity and body taper conspire to create neuro-mechanical phase lags in anguilliform swimmers.

- [1.184] Y. Liu, P. Holmes and J.D. Cohen (2008) (*in review*). A Bayesian inference model for sequential effects in the Eriksen task.
- [1.185] J. Gao, K.F. Wong-Lin, P. Holmes, P. Simen and J.D. Cohen (2009) *Neural Computation* 21 (9), 2407-2436. Sequential effects in two-choice reaction time tasks: Decomposition and synthesis of mechanisms.
- [1.186] P. Eckhoff, K.F. Wong-Lin and P. Holmes (2009) *J. Neurosci.* 29 (13), 4301-4311. Optimality and robustness of a biophysical decision-making model under nonepinephrine modulation.
- [1.187] J. Proctor and P. Holmes (2008) *Regular & Chaotic Dynamics* 13 (4), 267-282. Steering by transient destabilization in piecewise-holonomic models of legged locomotion.
- [1.188] R. Kukillaya and P. Holmes (2009) *J. Theoretical Biology* 261 (2), 210-226. A model for insect locomotion in the horizontal plane: Feedforward activation of fast muscles, stability, and robustness. Online pub. 29 Aug 2009, doi: 10.1016/j.jtbi.2009.07.036
- [1.189] S. Feng, P. Holmes, A. Rorie and W.T. Newsome (2009) *PLoS Computational Biology* 5 (2), e1000284. Can monkeys choose optimally when faced with noisy stimuli and unequal rewards?
- [1.190] X. Zhou, K.F. Wong-Lin and P. Holmes (2009) *Neural Computation* 21 (8), 2336-2362. Time-varying perturbations can distinguish among integrate-to-threshold models for perceptual decision making in reaction time tasks.
- [1.191] R. Kukillaya, J. Proctor and P. Holmes (2009) *Chaos: An Interdisciplinary Journal of Nonlinear Science* 19 (2), 026107, doi:10.1063/1.3141306. Neuromechanical models for insect locomotion: Stability, maneuverability, and proprioceptive feedback.
- [1.192] P. Eckhoff, K.F. Wong-Lin and P. Holmes (2011) *SIAM J. on Applied Dynamical Systems* 10 (1), 148-188. Dimension reduction and dynamics of a spiking neuron model for decision making under neuromodulation. Online pub. 22 Feb 2011, 10.1137/090770096.
- [1.193] J. Proctor and P. Holmes (2010) *Biological Cybernetics* 102, 513-531. Reflexes and preflexes: On the role of sensory feedback on rhythmic patterns in legged locomotion. Online pub. 1 April 2010, doi:10.1007/s00422-010-0383-9
- [1.194] T. Broderick, K.F. Wong-Lin and P. Holmes (2010) *Applied Mathematics Research eXpress Vol 2009* (2), 123-141. Closed-form approximations of first-passage distributions for a stochastic decision-making model. Online pub. 11 Feb 2010, doi:10.1093/amrx/abp008.
- [1.195] K.F. Wong-Lin, P. Eckhoff, P. Holmes and J.D. Cohen (2010) *Brain Research* 1318, 178-187. Optimal control of countermanding saccades. Online pub. 27 Jan 2010, doi:10.1016/j.brainres.2009.12.018.
- [1.196] F. Balci, P. Simen, R. Niyogi, A. Saxe, P. Holmes and J.D. Cohen (2011) *Attention, Perception & Psychophysics* 73 (2), 640-657. Acquisition of decision making criteria: Reward rate ultimately beats accuracy. Online pub. 19 Nov 2010, DOI 10.3758/s13414-010-0049-7.
- [1.197] P. Simen, F. Balci, L. deSouza, J.D. Cohen and P. Holmes (2011) *J. Neurosci.* (*in press*). A model of interval timing by neural integration.
- [1.198] D. Tomlin, A. Nedic, D.A. Prentice, P. Holmes and J.D. Cohen (2011) *In review*. Group foraging task reveals neural substrates of social influence.
- [1.199] J. Proctor, R.P. Kukillaya and P. Holmes (2010) *Phil. Trans. Roy. Soc. Lond.* A368, 5087-5104. A phase-reduced neuro-mechanical model for insect locomotion: Feedforward stability and proprioceptive feedback. doi:10.1098/rsta.2010.0134.
- [1.200] A. Nedic, D. Tomlin, P. Holmes, D.A. Prentice and J.D. Cohen (2010) *Proc IEEE* (*in revision*). A decision task in a social context: Human experiments, models, and analyses of behavioral data.
- [1.201] E. Fuchs, P. Holmes, T. Kiemel and A. Ayali (2011) *Frontiers in Neural Circuits* (*to appear*). Intersegmental coordination of cockroach locomotion: Adaptive control of centrally coupled pattern generator circuits. Online pub. 20 Jan 2011, doi: 10.3389/fncir.2010.00125.
- [1.202] E.D. Tytell, P. Holmes and A.H. Cohen (2011) *Current Opinion in Neurobiology* (*submitted*). Spikes alone do not behavior make: Why neuroscience needs biomechanics.
- [1.203] E. Shlizerman and P. Holmes (2011) (*in preparation*). Neural dynamics, bifurcations and firing rates in a quadratic integrate-and-fire model with a recovery variable. I: deterministic behavior.

**(2) Recent conference proceedings, abstracts, book chapters and invited papers** (\* indicates full refereed paper).

[2.166] P. Holmes (2006). Dynamics and control in insect running. Invited lecture at Design Principles in Biological Systems, Banbury conference center, Cold Spring Harbor Laboratory, May 7-10, 2006.

[2.167]\* P. Holmes, M. Srinivasan, K. Rogale and R. Kukillaya (2006). On spring-mass models for running animals: Approximate solutions, natural frequencies, stability, and double stance phases. Keynote lecture at the James H. Belfer Memorial Symposium on Nonlinear Mechanics, Technion - Israel Institute of Technology, Department of Mechanical Engineering, June 12th, 2006.

[2.168] T. McMillen and P. Holmes (2006). On the neuromechanics of swimming in lampreys. Invited talk at "From Dust to Planets," a symposium to honor Joe Burns on his 65th birthday. Cornell University, July 28-29th, 2006.

[2.169] P. Holmes (2006) On modeling legged locomotion. Invited lecture at Engineering Principles in Biological Systems, Cold Spring Harbor Laboratory, Dec 3-6, 2006.

[2.170]\* R. Ball and P. Holmes (2007) Dynamical systems, stability and chaos. Expository chapter based on lectures given at COSNet/CSIRO Workshop on Turbulence and Coherent Structures in Fluids, Plasmas and Nonlinear Media, Australian National University, Canberra, Australia Jan 10-13, 2006. In "Frontiers in Turbulence and Coherent Structures," ed. J.P. Denier and J.S. Frederiksen, pp 1-27, World Scientific Press, Singapore, 2007.

[2.171] R. Kukillaya and P. Holmes (2007) Realistic hexapedal models of insect locomotion: Jointed legs and Hill-type muscles. Society for Integrative and Comparative Biology Annual Meeting, Phoenix, AZ, Jan 3-7, 2007.

[2.172] D.M. Dudek, P. Holmes, M. Srinivasan, K. Rogale, R. Kukillaya and R.J. Full (2007) The relevance of resonant frequency in running cockroaches modeled by a spring-loaded, inverted pendulum. Society for Integrative and Comparative Biology Annual Meeting, Phoenix, AZ, Jan 3-7, 2007.

[2.173] P. Holmes (2007) A central pattern generator for insect locomotion: Phase response curves, averaging and reduction of ionic current models of bursting neurons. Invited lecture at MSRI Introductory Workshop on Dynamical Systems with Emphasis on Extended Systems, Berkeley, CA, Jan 21-26, 2007.

[2.174] P. Holmes (2007) Do deciders drift and diffuse? On models of decision making. Invited lecture at AFOSR workshop on Robust Decision Making, Alexandria, VA, Feb 27-28, 2007.

[2.175] P. Holmes (2007) Piecewise-holonomic mechanics, hybrid dynamical systems, and escaping cockroaches. Invited plenary lecture at British Applied Mathematics Colloquium, Bristol University, Bristol, UK, April 16-20, 2007.

[2.177]\* P. Holmes and E.T. Shea-Brown (2007) Stability. Scholarpedia, p.4208.  
<http://www.scholarpedia.org/article/Stability>

[2.178]\* P. Holmes (2007) History of Dynamical Systems. Scholarpedia, p.13425.  
[http://www.scholarpedia.org/article/History\\_of\\_Dynamical\\_Systems](http://www.scholarpedia.org/article/History_of_Dynamical_Systems)

[2.179] P. Holmes (2007) Drift-diffusion models for the dynamics of decision making. Contributed presentation at the SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, May 28-June 1, 2007.

[2.180] P. Holmes (2007) Models of legged locomotion, or How cockroaches run stably without thinking about it. Invited presentation at the Danish Symposium on Applied Analysis, University of Copenhagen, Copenhagen, Denmark, Aug 16-18, 2007.

[2.181] P. Holmes (2007) Oscillatory circuits underlying the retinal detection of temporal patterns. Invited presentation at the Workshop in Mathematical Neuroscience, Centre de Recherches Mathématiques, Université de Montréal, Canada, Sept 16-19, 2007.

[2.182] P. Holmes (2007) What do poems and differential equations share? Some thoughts on metaphors and models. Mathematical Association of America Eastern Pennsylvania and Delaware Section Meeting, Drexel University, Philadelphia PA, Nov 10th, 2007.

[2.183] P. Holmes (2007) Anguilliform swimming by muscle activation of an elastic rod. Invited presentation at Fluids Days, Jawaharlal Nehru Center for Advanced Scientific Research, Bangalore, India, Dec 31, 2007-Jan 1, 2008.

[2.184] P. Holmes (2008) Towards an integrated model for insect locomotion. Presentation at the Workshop on Neuromechanics of Locomotion, Mathematical Biosciences Institute, Ohio State University, Mar 31-Apr 4, 2008.

[2.185] P. Holmes (2008) An oscillatory circuit underlying the retinal detection of disruptions in temporally-periodic patterns. Invited presentation at the Workshop on Dynamical Systems in Biology, New York University NYC, Apr 12-13, 2008.

[2.186] P. Holmes (2008) Stochastic models for individual decisions and social influence in groups. Presentation at the Workshop on Systems Biology of Decision Making, Mathematical Biosciences Institute, Ohio State University, June 16-20, 2008.

[2.187]\* P. Simen, J.D. Cohen and P. Holmes (2009) On the neural implementation of optimal decisions. In “The Oxford Handbook of Human Action,” ed. E. Morsella, J.A. Bargh, and P.M. Gollwitzer, pp 533-548, Oxford University Press, Oxford, UK.

[2.188]\* P. Holmes (2008) A Short History of Dynamical Systems Theory: 1885-2007. In the “Encyclopedia of Life Support Systems (EOLSS): Mathematical Sciences,” UNESCO-EOLSS Publishers, Oxford, UK. Accessible online at [www.eolss.net](http://www.eolss.net).

[2.189]\* A. Nedic, D. Tomlin, P. Holmes, D.A. Prentice and J.D. Cohen (2008) A simple decision task in a social context: preliminary experiments and a model. Presentation invited for the special session Mixed Robot/Human Team Decision Dynamics, IEEE CDC, Cancun, Mexico, Dec 9-11th, 2008. *Proc. 47th IEEE Conference on Decision and Control*.

[2.190] P. Holmes (2008) From spike rates to simple decisions: Stochastic ODEs as models for evidence accumulation in cortical circuits. Invited presentation at “From Nonlinear Dynamics to Systems Biology: a conference in honor of David Rand on his 60th birthday,” Mathematics Institute, University of Warwick, Coventry, U.K., Dec 1-2, 2008.

[2.191] P. Holmes (2008) Neuromechanical models of animal locomotion. Invited presentation at “Stability and Instability in Dynamical Systems: Applications and Numerical Tools,” University of Barcelona and Centre de Recerca Matemàtica, Bellaterra, Barcelona, Spain, Dec 1-5, 2008.

[2.192]\* P. Holmes (2009) Neuromechanical models of legged locomotion: How cockroaches run fast and stably without thinking about it. Keynote lecture at the James H. Belfer Memorial Symposium on Neuro-Mechanics, Dynamics and Decision-making, Technion - Israel Institute of Technology, Department of Mechanical Engineering, Feb 15-16th, 2009.

[2.193] P. Holmes, A. Nedic, D. Tomlin, D. Prentice and J.D. Cohen (2009) A decision task in a social context: Experiments, modeling, and preliminary analyses of behavioral and brain imaging data. SIAM Conference on Control and its Applications, Denver, CO, July 6-8, 2009.

[2.194] P. Holmes, M. Zacksenhouse and R. Bogacz (2009) Robust versus optimal strategies for two-alternative forced-choice tasks. MathPsych 2009, University of Amsterdam, Aug 1-4, 2009.

[2.195] P. Simen, D. Contreras, P. Holmes and J.D. Cohen (2009) Adaptive performance in two-alternative decision making. MathPsych 2009, University of Amsterdam, Aug 1-4, 2009.

[2.196]\* P. Holmes, P. Eckhoff, K.F. Wong-Lin, R. Bogacz, M. Zacksenhouse and J.D. Cohen (2009) The physics of decision making: Stochastic differential equations as models for neural dynamics and evidence accumulation in cortical circuits. Plenary lecture at the XVIth International Congress on Mathematical Physics, Prague, Czech Republic, Aug 3-8, 2009; pp 123-142 in Proceedings volume, ed. P. Exner, World Scientific, 2010.

[2.197] P. Holmes (2009) The dynamical legacy of Lyapunov and Poincaré: Reflections on stability, chaos and randomness. Lyapunov Award Lecture for the Technical Committee on Multibody Systems and Nonlinear Dynamics, ASME Design Engineering Technical Conferences and Computers and Information in Engineering Conference, San Diego, CA, Aug 31-Sept 2, 2009.

[2.198] J.L. Proctor and P. Holmes (2010) Chasing the Cockroach: How reflexes enhance running. Presentation at Society for Integrative and Comparative Biology Meeting, Seattle, WA, Jan 3-7, 2010. *Integrative and Comparative Biology* 50, E140-E140 Suppl. 1, 2010.

[2.199] P. Holmes (2010) The neural dynamics of decision making: multiple scales in a single brain. Invited presentation in the Symposium “Moving across scales: Mathematics for investigating biological hierarchies,”

AAAS Annual Meeting, San Diego, CA, Feb 18-22, 2010.

[2.200] P. Holmes (2010) Panel discussions on creativity in the arts and sciences (participant). Banff International Research Station for Mathematical Innovation and Discovery workshop on Creative Writing in Mathematics and Science, The Banff Centre, Alberta, Canada, May 2-7, 2010.

[2.201] P. Holmes (2010) The neurodynamics of simple decisions: Drift-diffusion equations as models for single brains, and for group behaviors. Invited plenary lecture at SIAM Conference on the Life Sciences, Pittsburgh, PA, July 12-15, 2010.

[2.202] P. Holmes (2010) How do neurons integrate information? Clues from optimal signal processing theory. Invited lecture in minisymposium on Understanding the Link Between Neuronal Dynamics and Neuronal Computation, SIAM Conference on the Life Sciences, Pittsburgh, PA, July 12-15, 2010.

[2.203] P. Holmes (2010) From spiking cortical cells to decisions and actions: Two neuroscience problems that I don't really understand. Invited lecture in OCCAM workshop on Future Challenges in Mathematical and Computational Neuroscience, Oxford University, Sept 13-15, 2010.

[2.204]\* P. Holmes (2010) *Caos e dinamica non lineare* (Nonlinear Dynamics and Chaos: A mechanical and mathematical primer), pp 355-394 in *La Matematica Vol 4: Pensare il mondo* (Intertwinements of Mathematics and Science), ed. Claudio Bartocci and Piergiorgio Odifreddi, Einaudi editore, Torino, Italy.

[2.205] J.L. Proctor and P. Holmes (2010) Reflexes and running: Modeling neural feedback in a running cockroach. Presentation at Society for Integrative and Comparative Biology Meeting, Salt Lake City, UT, Jan 3-7, 2011.

[2.206] P. Holmes (2011) Still running! Recent work on the neuromechanics of insect locomotion. Invited lecture at Dynamics Days, University of North Carolina, Jan 5-8, 2011.

### (3) Books

[3.3] J. Guckenheimer and P. Holmes (1983) "Nonlinear Oscillations, Dynamical Systems and Bifurcations of Vector Fields." Applied Mathematical Science No. 42, Springer Verlag, New York, Heidelberg, Berlin. Sixth printing 2002, Chinese paperbound reprint, 1999; Russian translation, R&C Dynamics, Moscow, 2003.

[3.4] P. Holmes, J. L. Lumley and G. Berkooz (1996) "Turbulence, Coherent Structures, Dynamical Systems and Symmetry." Cambridge University Press, Cambridge Monographs on Mechanics. Korean translation, 1999.

[3.5] F. Diacu and P. Holmes (1996) "Celestial Encounters: The Origins of Chaos and Stability." Princeton University Press, Princeton, NJ. Also in Chinese, Greek, Hungarian, Japanese, Roumanian and Russian translations.

[3.6] R.W. Ghrist, P. Holmes and M. Sullivan (1997) "Knots and Links in Three-Dimensional Flows." Springer Lecture Notes in Mathematics Volume 1654, Springer Verlag, Heidelberg, 1997.

### (4) Poetry

[4.1] P. Holmes (1971) "3 Sections of Poems", Anvil Press, London.

[4.2] P. Holmes (1977) "A Place to Stand", Anvil Press, London.

[4.3] P. Holmes (1986) "The Green Road", Anvil Press, London (Poetry Book Society Recommendation).

[4.4] P. Holmes (2002) "Lighting the Steps", Anvil Press, London (shortlisted for Ernest Sandeen Award, Notre Dame University, 1995).