

Tirin Moore

Curriculum Vitae

Address Department of Neurobiology, Stanford University School of Medicine
Stanford, CA 94305-5125
phone: 650.283.0188/fax: 650.725.3958/email: *tirin@stanford.edu*

Date/Place of Birth

June 12, 1969, Oakland, CA USA (US citizen)

Education

1995-99 Postdoctoral Fellow, M.I.T. (Supervisor: Peter H. Schiller)
1995 Ph.D., Neuroscience, Princeton University (Supervisor: Charles G. Gross)
1990 B.A., California State University, Chico, (*summa cum laude*, 3 yrs.)

Positions

2015- Professor of Neurobiology, Stanford University
2014- Investigator, Howard Hughes Medical Institute
2011- Associate Professor of Neurobiology, Stanford University
2009- Early Career Scientist, Howard Hughes Medical Institute
2003- Assistant Professor of Neurobiology, Stanford University
1999-03 Visiting Research Fellow/Research Scientist, Princeton University

Selected Honors and Awards

2017- Elected, National Academy of Medicine
2012- Elected, International Neuropsychology Symposium
2009 Troland Award, National Academy of Sciences
2009- Early Career Scientist, Howard Hughes Medical Institute
2006-09 McKnight Scholar Award
2006-11 CAREER Award, National Science Foundation
2005 Alumni Achievement Award, APA Diversity Program in Neuroscience
2004-06 Alfred P. Sloan Fellow
2004-08 Pew Scholar in the Biomedical Sciences
2004 Merck Scholar Finalist
1999-02 National Research Service Award, NIH, Princeton
1995-98 McDonnell-Pew Cognitive Neuroscience Postdoctoral Fellow, M.I.T.
1993-95 American Psychological Association (APA) Neuroscience Fellow
1990-93 National Science Foundation Graduate Fellow
1990 Awarded Ford Foundation Graduate Fellowship (declined)
1990 Awarded Princeton President's Fellowship (declined)
1990 California Predoctoral Scholar, U.C. San Diego

Professional Memberships

Society for Neuroscience (SFN) 1991 -
International Neuropsychology Symposium, 2012 –

Professional and University Service

Member, Committee on Committees, Society for Neuroscience, 2018-

Pew Scholars Alumni Review Committee, 2018-
Hanna H. Gray Fellow Review Committee, HHMI, 2017-
Webinar faculty member, Neurosciences Scholars Program, Society for Neuroscience, 2018-
Board of Scientific Counselors, National Institutes of Mental Health, NIH, 2013-2018
SFN Peter and Patricia Gruber Award Committee, 2015-
Admissions Committee, Stanford Neurosciences Graduate Program, 2006 – 2010; 2015-
Program Committee, Stanford Neurosciences Graduate Program, 2013-2018
Vanderbilt University Provost Research Studio, 2017
SFN Program Committee, 2013-2017
SFN Peter and Patricia Gruber International Research Award Committee, 2012-2014
Associate Editor, *Journal of Neuroscience*, 2009 - 2014
COG/SPC study section member, National Institutes of Health, 2009-2013
Advisory Council, Department of Psychology, Princeton University, 2010-2015
Pre-major Advisor, Stanford University, 2012-2016
Faculty Senate, Stanford University School of Medicine, 2006 - 2009
Faculty Fellows Program, Stanford University School of Medicine, 2008

Journal Review

Nature, *International Quarterly of Cognitive Science*, *Journal of Neurophysiology*, *Journal of Neuroscience*, *Nature Neuroscience*, *Neuropsychologia*, *Proceedings of the National Academy of Sciences*, *Science*, *Exp. Brain Res.*, *Brain Res.*, *European Journal of Neuroscience*, *Journal of Neuroscience Methods*, *Journal of Cognitive Neuroscience*, *Neuron*, *Cerebral Cortex*, *Neuroscience Letters*, *Trends in Cognitive Science*, *PLOS biology*, *Journal Experimental Psychology (General)*, *Vision Research*, *Current Biology*, *PLoSOne*, *Journal of Vision*

Peer-reviewed Publications

1. Moore, T, Rodman, HR, Repp, AB, Gross, CG (1995) Localization of Visual Stimuli After Damage to Striate Cortex in Monkeys: Parallels with Human Blindsight. ***Proc. Natl. Acad. Sci. USA***, 92: 8215-8218.
2. Moore, T, Rodman, HR, Repp, AB, Gross, CG, Mezrich, RS (1996) Greater Residual Vision in Monkeys After Striate Cortex Damage in Infancy. ***J. Neurophysiol.*** 76: 3928-3933.
3. Moore, T, Rodman, HR, Gross, CG (1998) Man, Monkey and Blindsight. ***The Neuroscientist***, 4:227-230.
4. Moore, T, Tolias, AS, Schiller, PH (1998) Visual Representations During Saccadic Eye Movements. ***Proc. Natl. Acad. Sci. USA*** 95: 8981-8984.
5. Moore, T (1999) Shape Representations and Visual Guidance of Saccadic Eye Movements. ***Science***, 285: 1914-1917.
6. Moore, T, Rodman, HR, Gross, CG (2001) Direction of Motion Discrimination After Early Lesions of Striate Cortex (V1) of the Macaque Monkey. ***Proc. Natl. Acad. Sci. USA***, 98: 325-330.
7. Tolias, AS, Moore, T, Smirnakis, SM, Tehovnik, EJ, Siapas, AG, Schiller, PH (2001) Eye Movements Modulate Visual Receptive Fields of V4 Neurons. ***Neuron***, 29: 757-767.
8. Moore, T Fallah, M (2001) Control of Eye Movements and Spatial Attention. ***Proc. Natl. Acad. Sci. USA***, 98: 1273-1276.
9. Graziano, MSA, Taylor, CSR, Moore, T (2002) Complex Movements Evoked by Stimulation of Precentral Cortex, ***Neuron***, 34: 841-851. [Cover Article]
10. Graziano, MSA, Taylor, CSR, Moore, T, Cooke, DF (2002) The Cortical Control of Movement Revisited. ***Neuron***, 36: 349-362.

11. Gross, CG, Moore, T, Rodman, HR (2003) Visually guided behavior after V1 lesions in young and adult monkeys and its relation to blindsight in humans. *Prog Brain Res* 144: 279-294.
12. Moore, T, Armstrong, KM, Fallah, M (2003) Visuomotor Origins of Covert Spatial Attention. *Neuron*, 40: 671-683.
13. Moore, T, Armstrong, KM (2003) Selective Gating of Visual Signals by Microstimulation of Frontal Cortex, *Nature*, 421: 370-373.
14. Cooke, DF, Taylor, CSR, Moore, T, Graziano, MSA (2003) Complex Movements Evoked by Microstimulation of the Ventral Intraparietal Area. *Proc. Natl. Acad. Sci. USA*, 100: 6163-6168.
15. Moore, T, Fallah, M (2004) Microstimulation of Frontal Eye Fields and its Effects on Covert Spatial Attention. *J. Neurophysiol.*, 91: 152-162.
16. Graziano, MS, Cooke, DF, Taylor, CSR, Moore, T (2004) Distribution of Hand Location in Monkeys During Spontaneous Behavior. *Exp Brain Res*, 155: 30-36.
17. Pinsk, MA, Moore, T, Richter MC, Gross CG, Kastner S (2005) Methods for functional magnetic resonance imaging in normal and lesioned behaving monkeys. *Journal of Neuroscience Methods*, 143:179-95.
18. Pinsk, MA, DeSimone, K, Moore, T, Gross, CG, Kastner, S (2005) Representations of Faces and Body Parts in Macaque Temporal Cortex: An fMRI Study, *Proc. Natl. Acad. Sci. USA*, 102: 6996-7001.
19. Awh, E, Armstrong, KM, Moore, T (2006) Visual and Oculomotor Selection: Links, Causes and Implications for Spatial Attention, *Trends Cogn. Sci.*, 10(3): 124-30.
20. Moore, T (2006) The Neurobiology of Visual Attention: finding sources, *Curr. Opin. Neurobiol.*, 16(2):159-65.
21. Armstrong, KM, Fitzgerald, JF, Moore, T (2006) Changes in Visual Receptive Fields with Microstimulation of Frontal Cortex. *Neuron*, 50: 791-8.
22. Armstrong, KM, Moore, T (2007) Rapid Enhancement of Visual Cortical Response Discriminability by Microstimulation of the Frontal Eye Field. *Proc. Natl. Acad. Sci. USA* 104: 9499-9504.
23. Kimmel, DL, Moore, T (2007) Temporal Patterning of Saccadic Eye Movement Signals, *J Neurosci.*, 27: 7619-7630.
24. Schafer, RJ, Moore, T (2007) Attention Governs Action in the Primate Frontal Eye Field. *Neuron*, 56: 541-551.
25. Moore, T and Chang, MH (2009) Presaccadic Discrimination of Receptive Field Stimuli by Area V4 Neurons. *Vision Research*, 49: 1227-1232.
26. Han, X, Xian, SX, Moore, T. (2009) Dynamic Sensitivity of Area V4 Neurons During Saccade Preparation, *Proc. Natl. Acad. Sci. USA* 106: 13046-51.
27. Burrows, BE, Moore T. (2009) Influence and Limitations of Popout in the Selection of Salient Stimuli by V4 Neurons. *J. Neurosci.*, 29: 15169-15177. [Cover Article]
28. Armstrong, KM, Chang, MH, Moore, T (2009) Selection and Maintenance of Spatial Information by Frontal Eye Field Neurons. *J. Neurosci.*, 29: 15621-15629.
29. Churchland, MM, Yu, BM, Cunningham, JP, Sugrue, LP, Cohen, MR, Corrado, GS, Newsome, WT, Clark, AM, Hosseini, P, Scott BB, Bradley, DC, Smith, MA, Kohn, A, Movshon, JA, Armstrong, KM, Moore, T, Chang SW, Snyder, LH, Ryu SI, Santhanam, G, Sahani, M, Shenoy, KV. (2010) Stimulus Onset Quenches Neural Variability: a Widespread Cortical Phenomenon. *Nat. Neurosci.*, 13: 369-378.
30. Steinmetz, NA, Moore, T. (2010) Changes in the Response Rate and Response Variability of Area V4 Neurons During the Preparation of Saccadic Eye Movements. *J. Neurophysiol.*, 103: 1171-1178.
31. Noudoust, B, Chang, MH, Steinmetz, NA, Moore T. (2010) Top-down Control of Visual

- Attention. *Curr. Opin. Neurobiol.*, 20:183-90.
32. Noudoost, B, Moore, T (2011) A Reliable Microinjectrode System for Use in Behaving Monkeys. *J. Neurosci. Methods*, 194:218-23.
 33. Clark KL, Armstrong KM, Moore T. (2011) Probing neural circuitry and function with electrical microstimulation. *Proc Biol Sci.* 278: 1121-30.
 34. Noudoost B, Moore T. (2011) The Control of Visual Cortical Signals by Prefrontal Dopamine. *Nature*, 474: 372-5.
 35. Schafer RJ, Moore T. (2011) Selective Attention from Voluntary Control of Prefrontal Neurons. *Science*, 332: 1568-71.
 36. Noudoost B, Moore T (2011) The Role of Neuromodulators in Visual Selective Attention. *Trends Cogn Sci.*, 15: 585-591.
 37. Chang MH, Armstrong KM, Moore T (2012) Dissociation of Response Variability from Firing Rate Effects of Frontal Eye Field Neurons During Visual Stimulation, Working Memory, and Attention. *J Neurosci*, 32: 2204-2216.
 38. Clark KL, Noudoost B, Moore T (2012) Persistent spatial information in the Frontal Eye Field during object-based short-term memory. *J Neurosci*, 32:10907-14.
 39. Squire RF, Noudoost B, Schafer RJ, and Moore T (2013) Prefrontal Contributions to Visual Selective Attention. *Ann Rev Neurosci.*, 36:451-66.
 40. Soltani A, Noudoost B, Moore T (2013) Dissociable dopaminergic control of saccadic target selection and its implications for reward modulation. *Proc Natl Acad Sci, USA* 110: 3579-3584.
 41. Chang MH, Xian S, Rubin J, Moore T (2014) Latency of Chromatic Information in Area V4. *J. Physiol. (Paris)*, 108:11-7.
 42. Noudoost B, Clark KL, Moore T. (2014) Distinct Contribution of the Frontal Eye Field to the Representation of Saccadic Targets. *J Neurosci.*, 34:3687-3698.
 43. Clark KL, Noudoost B, Moore T. (2014) Persistent Spatial Information in the Frontal Eye Field during Object-based Short-term Memory Does Not Contribute to Task Performance. *J Cogn Neurosci.*, 26: 1292-9.
 44. Zirnsak M, Steinmetz NA, Noudoost B, Xu KZ, Moore T. (2014) Visual Space is Compressed in Prefrontal Cortex Before Eye Movements. *Nature*, 507: 504-7.
 45. Burrows BE, Zirnsak M, Akhlaghpour H, Moore T (2014) Global Selection of Saccadic Target Features by Neurons in Area V4. *J Neurosci.*, 34: 6700-6.
 46. Steinmetz NA, Moore T (2014) Eye Movement Preparation Modulates Neuronal Responses in Area V4 When Dissociated From Attentional Demands. *Neuron*, 83:496-506.
 47. Sridharan D, Steinmetz NA, Moore T, Knudsen EI (2014) Distinguishing bias from sensitivity effects in multialternative detection tasks. *J Vis.*, 14, pii: 16.
 48. Zirnsak M, Moore T (2014) Saccades and Shifting Receptive Fields: Anticipating Consequences or Selecting Targets? *Trends Cogn Sci.*, 18: 621-628.
 49. Okun M, Steinmetz NA, Cossell L, Lacaruso MF, Ko H, Bartho P, Moore, T, Hofer SB, Mrsic-Flogel TD, Carandini M, Harris KD (2015) Diverse coupling of neurons to populations in sensory cortex. *Nature*, 521:511-5.
 50. Hu M, Clark KL, Gong X, Noudoost B, Li M, Moore T, Liang H (2015) Copula Regression Analysis of Simultaneously Recorded Frontal Eye Field and Inferotemporal Spiking Activity During Object-based Working Memory. *J Neurosci.*, 35:8745-57.
 51. Krock RM, Moore T (2016) Visual sensitivity of frontal eye field neurons during the preparation of saccadic eye movements. *J Neurophysiol*, 116: 2882-2891.
 52. Engel T, Steinmetz NA, Gieselmann MA, Thiele A, Moore T, Boahen K. (2016) Selective modulation of cortical state during spatial attention. *Science*, 354(6316):1140-1144.
 53. Davis J, McKone E, Zirnsak M, Moore T, O'kearney R, Apthorp D, Palermo R (2017) Social

- and attention-to-detail subclusters of autistic traits differentially predict looking at eyes and face identity recognition ability. *Br J Psychol.* 108(1):191-219.
54. Sridharan D, Steinmetz NA, Moore T, Knudsen EI, (2017) Does the superior colliculus control perceptual sensitivity or choice bias during attention? Evidence from a multialternative decision framework. *J Neurosci*, 37(3):480-511.
 55. Merrikhi Y, Clark KL, Albarran E, Mohammadbagher P, Zirnsak M, Moore T, Noudoost B (2017) Spatial Working Memory Alters the Efficacy of Input to Visual and Prefrontal Cortex. *Nature Commun.*, 8:15041.
 56. Mueller A, Hong DS, Shepard S, Moore T (2017) Linking ADHD to the Neural circuitry of attention. *Trends Cogn Sci.*, 21: 474-488
 57. Hartmann TS, Zirnsak M, Marquis M, Hamker F, Moore T (2017) Two types of receptive field dynamics in area V4 at the time of eye movements? *Front. Systems Neurosci.*, 11:13.
 58. Ebitz R, Moore T (2017) Selective Modulation of the Pupil Light Reflex by Prefrontal Cortex Microstimulation. *J Neurosci.*, 37:5008-5018.
 59. Ebitz R, Albarran E, Moore T (2018) Exploration Disrupts Choice-Predictive Signals and Alters Dynamics in Prefrontal Cortex. *Neuron*, 97: 450-461. [Cover Article]
 60. Chen X, Zirnsak M, Moore T (2018). Dissonant Representations of Visual Space in Prefrontal Cortex During Eye Movements. *Cell Rep.*, 22(8):2039-2052.
 61. Mueller A, Shepard S, Moore T (2018) Differential expression of dopamine D5 receptors across neuronal subtypes in macaque Frontal Eye Field. *Front. Neural Circuits.*, 12:12.

Under Review/In Revision/In Preparation

Mueller A, Shepard S, Moore T. Pattern of dopaminergic modulation within the top-down circuitry of the primate frontal eye field, *in prep.*

Book Chapters and Commentaries

1. Rodman, HR, Moore, T (1997) Development and Plasticity of Extrastriate Cortex in Monkeys. In *Cerebral Cortex, vol. 12: Extrastriate Cortex*. (eds.) Kaas, J.H., Rockland, K. & Peters, A. Plenum: New York, NY.
2. Moore, T, Rodman, HR, Gross, CG (2001) Recovery of Visual Function Following Damage to Striate Cortex in Monkeys. In: B. de Gelder, E. DeHaan, C. Heywood, (Eds.), *Out of Mind: Varieties of unconscious processing*, Oxford: Oxford, UK.
3. Graziano, MSA, Taylor, CSR, Moore, T (2002) Probing Cortical Function with Electrical Stimulation. *Nature Neuroscience* 10: 921.
4. Graziano MSA, Gross CG, Taylor CSR, Moore, T (2004) A system of multimodal areas in the primate brain. In: *Crossmodal Space and Crossmodal Attention*. Spence and Driver, Eds. Oxford University Press, pp. 51-67.
5. Graziano, MSA, Gross CG, Taylor CSR, Moore, T (2004) Bimodal neurons for the control of defensive movements . In: *The Handbook of Multisensory Processes*. Gemma Calvert, Charles Spence and Barry Stein Eds. MIT Press, pp. 443-452.
6. Moore, T (2004) Homeland Defense Begins in Precentral Cortex. Editorial Focus on: Sensorimotor Integration in the Precentral Gyrus: Polysensory Neurons and Defensive Movements. *J. Neurophysiol.*, 91: 1456-1456.
7. Graziano, MSA, Taylor CSR, Cooke DF, Moore, T (2004) A map of complex movements in motor cortex of primates. In Humphries and Riddoch (Eds.) *Action and Attention*. Oxford University Press. pp. 211-232.
8. Gilja, V, Moore, T (2007) Electrical Signals Propagate Unbiased in Cortex. *Neuron*, 55:684-6.
9. Moore, T, Armstrong, KM, Schafer, RJ (2007) Visual Attention and Saccadic Eye Movements, In: *The Senses: A Comprehensive Reference, Vision*, Eds. T.D. Albright, R. H. Masland, Elsevier.

10. Moore, T, Noudoost, B, Armstrong, KM (2009) Sensorimotor Integration: Attention, premotor theory of In: ***Encyclopedia of Neuroscience***, Squire, L.R. , Elsevier.
11. Moore, T, Schafer, RJ, Noudoost, B. (2010) Circuits of Attention. In: ***Primate Neuroethology***, Eds. A. Ghazanfar, M. Platt.
12. Armstrong, KM, Schafer, RJ, Chang, MH, Moore, T. (2012) Attention and Action in the Primate Frontal Eye Fields. In: ***Neuroscience of Attention***, Ed. GR Mangun.
13. Moore, T, Burrows, B, Armstrong, KM, Schafer, RJ, Chang, MH. (2012) Neural Circuits Controlling Visual Attention. ***Cognitive Neuroscience of Attention***, 2nd Edition, Ed. MI Posner.
14. Steinmetz, NA, Moore, T (2012) Lumping and Splitting the Neural Circuitry of Visual Attention. ***Neuron***, 73: 410-2.
15. Clark, KL, Noudoost, B, Schafer, RJ, Moore, T. Neuronal Mechanisms of Attentional Control: Frontal Cortex. ***Handbook of Attention***, Ed. K. Nobre and S Kastner. Oxford University Press. *In press*.
16. Noudoost, B, Moore, T (2012) Parietal and Prefrontal Neurons Driven to Distraction. ***Nature Neurosci.*** 16:8-9.
17. Squire, RF, Steinmetz, NA, Moore, T. Frontal Eye Field. ***Scholarpedia***.
http://www.scholarpedia.org/article/Frontal_eye_field
18. Noudoost, B, Albarran, E, Moore, T Neural Signatures, and Modulators of Visual Selective Attention. In ***The Cognitive Neurosciences V***. Eds M Gazzaniga, R Mangun. *MIT press*.
19. Krock, RM, Moore, T. (2015) The influence of gaze control on visual perception: eye movements and visual stability. ***Cold Spring Harbor Symp Quant Biol***, 79:123-30.
20. Khorsand, P, Moore, T, Soltani, A (2015) Combined contributions of feedforward and feedback inputs to bottom-up attention. ***Front. Psychol.***, 6:155.
21. Moore, T, Zirnsak, M (2015). The What and Where of Visual Attention. ***Neuron***. 88: 626-8.
22. Moore, T, Zirnsak, M (2016). Neural Mechanisms of Selective Visual Attention. ***Ann. Rev. Psychol.*** 68:47-72.

Selected Invited Talks

Center for Neural Science, New York University, 2003
 Invited Speaker, Integrative Neuroscience Interest Group, National Eye Inst./National Inst. of Mental Health, 2003
 Department of Neuroscience, Baylor College of Medicine, 2003
 Stanford Neuroscience Institute Retreat, 2004
 Invited Speaker, COE International Symp. on Attention and Decision, Tamagawa University, Machida, Tokyo, 2004
 Chair, Society for Neuroscience Minisymposium: *Causal Approaches to the Study of Neural Mechanisms of Cognition and Behavior*, San Diego, CA , 2004
 Vision Lunch Series, Psychology Dept., Stanford University, 2005
 Invited Speaker, Heiligenberg Symposium on Active Sensation, U.C. San Diego, 2005
 Pew Scholars Annual Meeting, Cozumel, Mexico, 2005
 Invited Speaker, Institute of Cognitive Neuroscience, Univ. College London/Exp. Psychology Society, 2006
 Neurology and Behavior Seminar, University of Washington, Seattle, 2006
 Smith-Kettlewell Eye Research Institute, San Francisco, 2006
 Vanderbilt Brain Research Institute, Vanderbilt University, Nashville, TN, 2006
 Invited Speaker, International Society of Behavioral Neuroscience, Bath, U.K., 2006
 Invited Speaker, Conte Center, McGovern Institute, Brain & Cognitive Sciences, MIT, 2006
 Department of Anatomy and Neurobiology, Washington University in St. Louis, 2006
 Boynton Lecture, Center for Visual Science, University of Rochester, 2006

Invited Speaker, Scientific Session lecture, Annual Biomedical Research Conference for Minority Students, 2006

Dept. of Psychology, University of California, Santa Cruz, 2007

Invited Speaker, 2nd Conference on Visual Attention, Buenos Aires, Argentina, 2007

Dept. of Physiology, University of Wisconsin, Madison, 2007

Neurosciences Program, Princeton University, 2007

Department of Psychology Colloquium, Stanford University, 2007

Invited Speaker, Gordon Conference on Oculomotor control, 2007

Speaker, NIMH workshop: *Novel Methods for examining PFC interactions*, 2007

Lecturer, *Structure, Function and Development of the Visual System*, Cold Spring Harbor Laboratory, 2007

Seminar, Stanford Summer Research Program, 2007

Invited Speaker, European Science Foundation- EMBO conference: *Perceptual Consequences of Motor Action*, Sant Feliu de Gixols, Spain, 2007

Barrow Neurological Institute, Phoenix, 2007

Macquarie Center for Cognitive Science, Macquarie University, Sydney NSW, Australia, 2007

Symposium Speaker, *Action for perception: functional significance of eye movements for vision*, Vision Science Society Annual Meeting, 2008

Symposium Speaker, *Blurring the Borders Between Vision, Cognition, and Action*, Center for Visual Science, University of Rochester, 2008

International Society of Behavioral Neuroscience, Sydney, N.S.W., Australia 2008

Speaker, Rovereto Attention Workshop, Rovereto, Italy, 2008

Chair, Society for Neuroscience Symposium *Sources, Signals and Synchrony: New Perspectives on the Neural Mechanisms of Attention*, Washington, D.C. 2008.

Dept. of Neurobiology, Harvard Medical School, 2009

Neurosciences Center, University of North Carolina, Chapel Hill, 2009

Invited Speaker, VisioNYC Speaker (Columbia, Cornell Medical, SUNY Optometry, NYU), 2009

Montreal Neurological Institute, Montreal, Quebec, Canada, 2009

Lecturer, *Structure, Function and Development of the Visual System*, Cold Spring Harbor Laboratory, 2009

Dept. of Neuroscience, Baylor College of Medicine, 2009

Dept. of Psychology, University of Florence, Italy, 2009

Dept. of Physiology/Keck Center, U.C.S.F., 2009

Invited Speaker, Dept. of Psychology, University of Otago, Dunedin, New Zealand, 2009

Program in Neuroscience, University of Western Ontario, Canada, 2010

Invited Speaker, Statistical Analysis of Neural Data (SAND5) workshop, University of Pittsburgh, 2010

International Society of Behavioral Neuroscience (ISBN) conference, Collioure, France, 2010

Lecturer, *Fundamental Issues in Vision Research*, Marine Biological Laboratory, Woods Hole, MA, 2010

Seminar, Molecular and Cellular Biology Program, University of Arizona, 2010

Invited Speaker, Computational and Systems Neuroscience (Cosyne), 2011

Invited Speaker, International Neuropsychological Symposium, Mondsee Austria, 2011

Invited speaker, Gordon Conference on Oculomotor Control, Maine, 2011

Invited speaker, Neuroscience Retreat, Washington University, St. Louis, MO 2011

Mahoney Neuroscience Institute, University of Pennsylvania, Philadelphia, PA, 2011

Center for Perceptual Systems, University of Texas, Austin, 2011

Janelia Farms Research Center, Howard Hughes Medical Institute, 2011

Computation and Neural Systems, Caltech, 2012

Neurobiology and Behavior Series, Columbia University, 2012

Center for Cognitive Neuroscience, Duke University, 2012
Neurobiology Seminar Series, University of Chicago, 2012
University of Tuebingen/Max Planck Institute for Biological Cybernetics, 2012
Invited Speaker, AREADNE meeting, Santorini, Greece, 2012
Lecturer, *Computational Neuroscience: Vision*, Cold Spring Harbor Laboratory, 2012
Lecturer, Fundamental Issues in Vision Research, Marine Biological Laboratory, Woods Hole, MA, 2012
Janelia Farm Research Campus, HHMI, 2012
Helen Wills Neuroscience Institute, UC Berkeley, 2012
Dept. of Psychology, UC, San Diego, 2013
Invited speaker, “CharlieFest”, Dept. of Psychology, Princeton Univ., 2013
Riken Brain Science Institute, Tokyo, Japan, 2013
Invited speaker, Champalimaud Centre for the Unknown, Lisbon, Portugal, 2013
Dept. of Neurobiology, Yale University, 2013
Invited Speaker, Janelia Farm Research Campus, HHMI “How to Read a Map”, 2014
Neuroscience Seminar Series, University of Melbourne, 2014
Invited Lecturer, Queensland Brain Institute/Munich Cognitive Neuroscience Spring School, Brisbane and Heron Island, Australia, 2014
Dept. of Neuroscience, University of Minnesota, 2014
International Neuropsychology Symposium, 2014
Invited speaker, Gordon Conference on Cognition, 2014
Lecturer, Fundamental Issues in Vision Research, Marine Biological Laboratory, Woods Hole, MA, 2014
Psychology Dept., Ludwig-Maximilian University, Munich, Germany, 2014
Joint Seminars in Neuroscience, UCLA, 2014
Invited speaker, Picower Institute for Learning and Memory Biennial Symposium, M.I.T., 2014
Institute of Neuroscience, Newcastle University, Newcastle Upon Tyne, UK, 2015
Zanvyl Krieger Mind/Brain Institute, Johns Hopkins University, 2015
Dept. of Anatomy and Neurobiology, Washington University in St. Louis, 2015
Keynote speaker, Gordon Conference on Eye Movements, 2015
Keynote speaker, European Conference on Eye Movements, 2015
Invited speaker, Bernstein Workshop on Active Perception and Memory, Berlin, Germany, 2015
Invited speaker, Department of Psychology, Jagellonian University, Krakow, Poland, 2015
Keynote Lecture, 1st Annual SPINES Symposium, SFN Meeting, Chicago, 2015
Invited speaker, International symposium on Adaptive Circuit Shift, Kyoto Japan 2016
Neurosciences Seminar Series, UC, San Diego, 2016
Dept. of Optometry and Visual Science, Univ. of Alabama, Birmingham, 2016
Center for Molecular and Behavioral Neuroscience, Rutgers University, Newark, 2016
Lecturer, SPINES course, Marine Biological Laboratory, 2016
Distinguished Lecture, UC Irvine MSTP Series, 2017
Martinez-Townsel Endowed Lecture, SPINES course, Marine Biological Laboratory, 2017
Lecturer, *Vision Course*, Cold Spring Harbor Laboratory, 2017
Special Lecture, Society for Neuroscience Annual Meeting, Washington D.C., 2017
Keynote speaker, Delaware Neuroscience Symposium, 2017