
COSYNE 2005
Thursday, March 17th – Sunday March 20th
Salt Lake City, Utah

Thursday, March 17th

<i>6PM-8PM</i>	<i>Reception</i>
8PM	Session 1 Keynote
<i>8:00-8:10</i>	<i>Welcome and announcements</i>
<i>8:15-9:15</i>	Keynote: Chuck Stevens (Salk Institute)

Friday, March 18th

8AM-12PM	Session 2 Talks
<i>12-2PM</i>	<i>Lunch break</i>
2-6PM	Session 3 Talks
<i>6-8PM</i>	<i>Dinner break</i>
8PM-1AM	Session 4 Posters

Saturday, March 19th

8:30AM-12PM	Session 5 Talks
<i>12:15-2PM</i>	<i>Lunch break</i>
2-6PM	Session 6 Talks
<i>6-8PM</i>	<i>Dinner break</i>
8PM-1AM	Session 7 Posters

Sunday, March 20th

8:30AM-12:15PM	Session 8 Talks
<i>12:15-2PM</i>	<i>Lunch break</i>
2-3:50PM	Session 9 Talks

Main meeting ends / Travel to Snowbird for workshops

Detailed Schedule

Thursday, March 17th

6PM–8PM Reception

8PM Session 1 Keynote Chair: Tony Zador (CSHL)

8:00–8:10 Welcome and announcements

8:15–9:15 Chuck Stevens (Salk Institute) A design principle for the scalable architecture of vertebrate brains

Friday, March 18th

8AM–12PM Session 2 Talks Chair: Michael Shadlen (U Washington)

8:00–8:40 Eero Simoncelli (NYU) Testing and refining perceptual models with optimized stochastic stimuli

8:50–9:10 Nelson Spruston (Northwestern) Gating of dendritic spikes propagating toward the soma of CA1 pyramidal neurons

9:15–9:35 Andrea Benucci (Smith-Kettlewell) Imaging the dynamics of population responses in visual cortex

9:40–10:00 Daniel Butts (Harvard) The important aspects of visual encoding: relating receptive fields to mutual information rates in visual neurons

10:05–10:25 Coffee break

10:30–10:50 William Softky (RNI) Thalamic bursts as anti-spikes from a non-rectifying predictive comparator

10:55–11:15 Nicholas Lesica (Harvard) LGN bursts enhance detection of specific stimulus features

11:20–11:40 Alex Pouget (Rochester) Bayesian inference and cortical variability

11:45–12:00 Poster Previews

12–2PM Lunch break

2–6PM Session 3 Talks Chair: Zach Mainen (CSHL)

2:00–2:40 Yang Dan (Berkeley) Timing-dependent plasticity in the visual cortex

2:50–3:10 Tony Bell (RNI) Spike timing-dependent learning in networks

3:15–3:35 Karim Nader (McGill) Amygdala LTP is sensitive to probability, as opposed to the coincidence, of pre and post-synaptic activation

3:40–4:00 *Coffee break*

4:05–4:25 Anitha Pasupathy (MIT) During learning, direction selectivity increases faster in the striatum than prefrontal cortex, while decoding of behavior is equally accurate

4:30–4:50 Timothy J. Gardner (MIT) Reprogramming bird song

4:55–5:15 Ned T. Sahin (Harvard) Human in-vivo electrophysiology of language grammar: bridging computational, systems and cognitive approaches

5:20–5:40 Barry Richmond (NIMH) Multimodal responses in dopamine rich brain regions during visually cued reward schedules

5:45–6:00 Poster Previews

6–8PM *Dinner break*

8PM–1AM Session 4 Posters

Saturday, March 19th

8:30AM–12PM Session 5 Talks Chair: Pam Reinagel (UCSD)

8:30–9:10 Bill Freeman (MIT) Sharing features for multi-class object detection

9:20–9:40 Reto Wyss (Caltech) The computational principles of temporal stability and local memory can account for the structural and functional organization of the ventral visual system

9:45–10:05 Yves Fregnac (CNRS) An intracellular view of time coding and sparseness of cortical representation in V1 neurons during virtual oculomotor exploration of natural scenes

10:10–10:30 *Coffee break*

10:35–10:55 Timothy E. Holy (Washington University) Mouse courtship songs and opponency in olfactory sex recognition

11:00–11:20 Nicol Harper (UCL) Neural population coding of sound level depends on stimulus statistics

11:25–11:45 Anne Hsu (Berkeley) Ensemble response in auditory neurons show greater discrimination to natural sounds

11:50–12:10 Charles Ratliff (U. Penn) Natural scenes contain more information in negative than in positive contrasts

12:15–2PM *Lunch break*

2–6PM Session 6 Talks Chair: Stefan Treue (Gottingen)

2:00–2:40 Nancy Kanwisher (MIT) Functional Specificity in Human Extrastriate Cortex

2:50–3:10 Maria Neimark (Harvard) Dynamic modulation of ON- and OFF-inputs to a retinal ganglion cell

3:15–3:35 Gregory W. Schwartz (Princeton) The omitted stimulus response: periodic pattern detection in the retina

3:40–4:00 *Coffee break*

4:05–4:25 Arun Sripati (Johns Hopkins) A continuum mechanical model for mechanoreceptive afferent responses to indented stimuli

4:30–4:50 Israel Nelken (Hebrew University) Representation changes in the ascending auditory pathway

4:55–5:15 Michael DeWeese (CSHL) Sparse synchronous inputs drive neurons in auditory cortex *in vivo*

5:20–5:40 Christopher deCharms Control over patterned brain activation achieved using real time fMRI (rtfMRI) with resultant changes in cognition

5:45–6:00 Poster Previews

6–8PM *Dinner break*

8PM–1AM Session 7 Posters

Sunday, March 20th

8:30AM–12:15PM Session 8 Talks Chair: Philip Sabes (UCSF)

8:30–9:10 Ranulfo Romo (UNAM, Mexico) Decoding the temporal evolution of a simple perceptual act

9:20–9:40 Wei Wu (U. Chicago) Comparing coordinate systems in motor cortical encoding

9:45–10:05 Laura Walker Renninger (Smith-Kettlewell) Eye movements can be understood within an information theoretic framework

10:10–10:30 *Coffee break*

10:35–10:55 Elizabeth Torres (Caltech) Delay-period activity in the posterior parietal cortex unambiguously predicts spatio-temporal features of the motion trajectory during simple and obstacle-avoidance reaches

11:00–11:20 Mark M. Churchland (Stanford) Neural variability in premotor cortex provides a signature of motor preparation

11:25–11:45 Kanaka Rajan (Brandeis) A multi-map network model for generating complex motor trajectories: The Fourier machine

11:50–12:10 Nathaniel Daw (Gatsby) Uncertainty-based competition between prefrontal and striatal systems for behavioural control

12:15–2PM *Lunch break*

2–3:50PM Session 9 Talks Chair: Carlos Brody (CSHL)

2:00–2:40 Christof Koch (Caltech) Decoding visual responses from multiple neurons in the human medial temporal lobe

2:50–3:30 Nikos Logothetis (Tubingen) fMRI in the non human primate: Developments and applications

3:40–3:50 Closing announcements

Main meeting ends / Travel to Snowbird for workshops

Invited Talks

1. Timing-dependent plasticity in the visual cortex

Yang Dan
UC Berkeley

2. Sharing features for multi-class object detection

Bill Freeman
MIT

3. Functional Specificity in Human Extrastriate Cortex

Nancy Kanwisher
MIT

4. fMRI in the non human primate: Developments and applications

Nikos Logothetis
Tubingen

5. Decoding visual responses from multiple neurons in the human medial temporal lobe

Rodrigo Quian-Quiroga¹, Christof Koch¹, Leila Reddy¹, Itzhak Fried²
¹ *Caltech* ² *UCLA*

6. Decoding the temporal evolution of a simple perceptual act

Ranulfo Romo
UNAM, Mexico

7. Testing and refining perceptual models with optimized stochastic stimuli

Eero P. Simoncelli
NYU

8. A design principle for the scalable architecture of vertebrate brains

Chuck Stevens
Salk Institute

Contributed Talks

9. Amygdala LTP is sensitive to probability, as opposed to the coincidence, of pre and post-synaptic activation.

Liz Bauer¹, Joseph LeDoux¹, Karim Nader²
¹ *Center for Neural Science, NYU* ² *McGill University*

10. IMAGING THE DYNAMICS OF POPULATION RESPONSES IN VISUAL CORTEX

Andrea Benucci, Robert A. Frazor, Matteo Carandini
Smith-Kettlewell Eye Research Institute, San Francisco, CA 94115

11. The important aspects of visual encoding: relating receptive fields to mutual information rates in visual neurons

Daniel A. Butts, Garrett B. Stanley
Harvard University

12. Representation changes in the ascending auditory pathway

Gal Chechik¹, Eric D. Young², Naftali Tishby³, Israel Nelken³, Mike Anderson², O. Bar-Yosef³
¹ *stanford university* ² *Johns Hopkins University* ³ *Hebrew University*

13. Neural variability in premotor cortex provides a signature of motor preparation

Mark M Churchland¹, Byron M. Yu², Stephen I. Ryu³, Gopal

Santhanam², Afsheen Afshar³, Krishna V. Shenoy¹
¹ *Neurosciences Program and Dept. of Electrical Engineering, Stanford University* ² *Dept. of Electrical Engineering, Stanford University* ³ *School of Medicine and Dept. of Electrical Engineering, Stanford University*

14. Uncertainty-based competition between prefrontal and striatal systems for behavioural control

Nathaniel D. Daw¹, Yael Niv², Peter Dayan¹
¹ *Gatsby Computational Neuroscience Unit* ² *Interdisciplinary Center for Neural Computation, Hebrew University, Jerusalem, and Gatsby Computational Neuroscience Unit*

15. Neural population coding of sound level depends on stimulus statistics

Isabel Dean, Nicol S Harper, David McAlpine
UCL

16. Sparse synchronous inputs drive neurons in auditory cortex in vivo

Michael DeWeese, Anthony M. Zador
Cold Spring Harbor Laboratory

17. An intracellular view of time coding and sparseness of cortical representation in V1 neurons during virtual oculomotor exploration of natural scenes

Yves Fregnac, Pierre Baudot, Manuel Levy, Olivier Marre
UNIC, UPR 2191 CNRS, Gif-sur-Yvette, France

18. Reprogramming bird song

Timothy J. Gardner¹, Felix Naef², Fernando Nottebohm³
¹ *MIT* ² *Swiss Institute for Experimental Cancer Research* ³ *The Rockefeller University*

19. Mouse courtship songs and opponency in olfactory sex recognition

Timothy E. Holy, Zhongsheng Guo
Washington University School of Medicine

20. Ensemble response in auditory neurons show greater discrimination to natural sounds

Anne Hsu¹, Sarah Woolley¹, Thane Fremouw², Frederic Theunissen¹
¹ *UC Berkeley* ² *University of Maine*

21. LGN bursts enhance detection of specific stimulus features

Nicholas A. Lesica, Garrett B. Stanley
Harvard University

22. Control Over Patterned Brain Activation Achieved Using Real Time fMRI (rtfMRI) With Resultant Changes in Cognition

Fumiko Maeda¹, Kristen Lutomski², Saxon MacLeod², Deepak J. Soneji¹, Sean C. Mackey¹, John D.E. Gabrieli¹, Gary H. Glover¹, John M. Pauly¹, Christopher deCharms¹
¹ *Department of Psychiatry and Behavioral Sciences, Stanford University School of Medicine, Palo Alto, CA USA; Department of Psychology, Stanford University, Palo Alto, CA USA* ² *Neurion, Inc., Palo Alto CA*

23. Dynamic modulation of ON- and OFF-inputs to a retinal ganglion cell.

Maria Neimark, Markus Meister
Harvard University

24. Spike Timing-Dependent Learning in Networks

Lucas C. Parra¹, Anthony J. Bell²
¹ *City College of New York* ² *Redwood Neuroscience Institute*

25. During learning, direction selectivity increases faster in the striatum than prefrontal cortex, while decoding of

behavior is equally accurate

Anitha Pasupathy, Earl K. Miller
Massachusetts Institute of Technology

26. Bayesian inference and cortical variability

Alex Pouget, Beck, J., P.E. Latham
University of Rochester

27. A multi-map network model for generating complex motor trajectories : The Fourier machine.

Kanaka Rajan, L.F. Abbott
Volen Center, Brandeis University

28. Natural scenes contain more information in negative than in positive contrasts

Charles Ratliff, Vijay Balasubramanian, Yen-Hong Kao, Peter Sterling
University of Pennsylvania

29. Eye movements can be understood within an information theoretic framework

Laura Walker Renninger, Preeti Verghese, James Coughlan
Smith-Kettlewell Eye Research Institute

30. Multimodal responses in dopamine rich brain regions during visually cued reward schedules.

Barry J. Richmond¹, Takashi Mizuhiki², Munetaka Shidara²
¹ *nimh/nih/dhhs* ² *National Institute of Advance Industrial Science and Technology, AIST*

31. Gating of dendritic spikes propagating toward the soma of CA1 pyramidal neurons

Alex Roxin¹, Tim Jarkys², William L. Kath², Nelson Spruston²
¹ *CNRS - Neurophysics and Physiology* ² *Northwestern University*

32. Human in-vivo electrophysiology of language grammar – bridging computational, systems and cognitive approaches

Ned T. Sahin¹, Steven Pinker², Anders M. Dale³, Istvan Ulbert⁴, Don Schomer⁵, Eric Halgren⁶
¹ *Harvard Psychology Dept; MGH Martinos Neuroimaging Ctr* ² *Harvard Psychology Dept* ³ *Department of Neurology, UCSD* ⁴ *MGH Martinos Neuroimaging Ctr; Hungarian Academy of Sciences* ⁵ *Department of Neurology, Beth Israel Deaconess Medical Center* ⁶ *MGH Martinos Neuroimaging Ctr; INSERM E9926, Marseilles, France*

33. The Omitted Stimulus Response: Periodic Pattern Detection in the Retina

Gregory W. Schwartz, Robert A. Harris, Michael J. Berry
Princeton University

34. Thalamic bursts as anti-spikes from a non-rectifying predictive comparator

William Softky
Redwood Neuroscience Institute

35. A continuum mechanical model for mechanoreceptive afferent responses to indented stimuli

Arun P. Sripati, Sliman J. Bensmaia, Kenneth O. Johnson
Johns Hopkins University

36. Delay-period activity in the Posterior Parietal Cortex unambiguously predicts spatio-temporal features of the motion trajectory during simple and obstacle-avoidance reaches

Elizabeth B. Torres¹, Rodrigo Quian-Quiroga², R.A. Andersen¹
¹ *CALTECH* ² *University of Leicester, UK*

37. Comparing Coordinate Systems in Motor Cortical Encoding

Wei Wu, Nicholas Hatsopoulos
University of Chicago

38. The computational principles of temporal stability and local memory can account for the structural and functional organization of the ventral visual system

Reto Wyss¹, Peter König², Paul F.M.J. Verschure³
¹ *California Institute of Technology, USA* ² *Institute of Cognitive Science, University Osnabrück, Germany* ³ *Institute of Neuroinformatics, University/ETH Zürich, Switzerland*

Posters

39. Propagation of Dendritic Action Potentials: Relation to Biophysical Dendritic Properties

Corey D. Acker, John A. White
Biomedical Engineering, Boston University

40. Neural correlates of decision making in monkey dorsolateral prefrontal cortex.

Carlos Acuña¹, Verónica Nácher¹, Sabela Ojeda¹, Carmen Cadarso-Suárez¹, Javier Roca-Pardiñas²
¹ *University of Santiago de Compostela. Spain* ² *University of Vigo. Spain*

41. Effect of Inhibition on Binaural Sensitivity to Noise

John Agapiou, David McAlpine
Department of Physiology, University College London, UK

42. Estimating non-homogeneous channel densities and synaptic activity from spatiotemporal dendritic voltage recordings

Misha Ahrens, Quentin J.M. Huys, Liam Paninski
Gatsby Computational Neuroscience Unit, University College London

43. Analysis of temporal coding through iterative stimulus refinement

Zane Aldworth, Alexander G. Dimitrov, Tomas Gedeon, John Miller
Montana State University

44. Analysis of Negative Feedback in Circuits of Spiking Neurons

Charles H. Anderson
Wash. Univ. School of Medicine

45. Linear decodability for high-level auditory representations

Hiroki Asari¹, Michael S. Wehr², Anthony M. Zador²
¹ *Watson School of Biological Sciences / CSHL* ² *Cold Spring Harbor Laboratory*

46. Timing contributions of the avian brainstem respiratory-vocal network to song motor program generation

Robin C. Ashmore¹, J. Martin Wild², Marc F. Schmidt¹
¹ *University of Pennsylvania* ² *University of Auckland*

47. Bayesian Decoding Predicts the Structure of Errors in an Oculomotor Sequence Task

Bruno Averbeck, Daeyeol Lee
University of Rochester

48. The PSTH response to spike input as predicted by an expansion of a population equation

Yuval Aviel, Wulfram Gerstner
EPFL

49. Natural movies evoke responses in the primary visual cortex of anesthetized cat that are not well modeled by Poisson processes

Jonathan L. Baker¹, Shih-Cheng Yen¹, Jean-Philippe

Lachaux², Charles M. Gray¹

¹ Center for Computational Biology, Montana State University, Bozeman, MT, USA ² INSERM U280, Lyon, France

50. Spectral Information Fields of DCN Principal Neurons and their Optimal Spectral Features

Sharba Bandyopadhyay, Eric D. Young
Johns Hopkins University

51. Analyzing tuning curve sharpening with analog neurons

Beck, J.¹, P.E. Latham², Alex Pouget¹
¹ University of Rochester ² Gatsby Computational Neuroscience Unit. London

52. Computational modelling predicts a role for neurogenesis in long-term memory retention

Suzanna Becker¹, Jan Marti Wojtowicz²
¹ McMaster University ² University of Toronto

53. Emotional learning and behavioral context influence neural representations of value in monkey amygdala

M.A. Belova¹, J.J. Paton¹, A.C. Smith², J. Scalon³, E.N. Brown⁴, C.D. Salzman⁵
¹ Columbia University ² University of California, Davis ³ Harvard Medical School, MGH ⁴ Harvard Medical School, MGH ⁵ Columbia University

54. Gain modulation: A mechanism for target-switching during visual search

Nick Bentley, Emilio Salinas
Wake Forest University

55. Analysis of inhomogeneous quadratic forms for physiological and theoretical studies

Pietro Berkes, Laurenz Wiskott
Humboldt-University Berlin, Institute for Theoretical Biology

56. Learning efficient overcomplete dictionaries for natural images with binary tree-mixture models

Matthias Bethge, Kilian Koepsell
Redwood Neuroscience Institute

57. How independent are the "Independent Components" of natural images?

Matthias Bethge
Redwood Neuroscience Institute

58. Asynchronous synaptic transmission bolsters persistent activity in neuronal networks

Guo-Qiang Bi, Pakming Lau
University of Pittsburgh

59. On the Receptive Fields of Markov Random Fields

Michael J. Black, Stefan Roth
Brown University

60. Temporal resolution of the visual system for processing color, orientation, and color/orientation conjunctions

Clara Bodelon, Mazyar Fallah, John H. Reynolds
The Salk Institute

61. THE EARLY VISUAL SYSTEM ONLY ADAPTS TO IMAGE MEAN AND STANDARD DEVIATION

Vincent Bonin, Valerio Mante, Matteo Carandini
The Smith-Kettlewell Eye Research Institute

62. Mean theta phase of model CA1 pyramidal cell firing changes with location of synaptic stimuli

Victoria Booth, Gina R. Poe
University of Michigan

63. The correlation between the firing of individual MT neurons and behavioral response across different directions of motion.

William H. Bosking, John H.R. Maunsell
Baylor College of Medicine/Howard Hughes Medical Institute

64. Explaining cyclopean edge selectivity in macaque V2

Christine Bredfeldt, Bruce G. Cumming
Laboratory of Sensorimotor Research, National Eye Institute, National Institutes of Health

65. TEMPORAL DYNAMICS OF OBJECT PART INTEGRATION IN POSTERIOR INFEROTEMPORAL CORTEX

Scott L. Brincat, Charles E. Connor
Johns Hopkins University

66. Principal Component Analysis of the Shapes of the Receptive Fields

Marina Brozovic¹, Y. E. Cohen², R.A. Andersen¹
¹ California Institute of Technology ² Dartmouth

67. Representation of stimulus position and orientation in a model of the visual cortex

Calin Buia, Paul Tiesinga
University of North Carolina at Chapel Hill

68. Decoding of Retinal Spike Trains

C. Andrew Burlingame¹, Fiona J. Burnell¹, Adrienne L. Fairhall², Michael J. Berry¹
¹ Princeton University ² University of Washington

69. Genetic Clock Oscillator Neural Networks

Will Bush¹, Hava Siegelmann¹, Eric Bittman¹, Mary Harrington²
¹ University of Massachusetts ² Smith College

70. Shape representation in V4: Investigating position-specific tuning for boundary conformation with the standard model of object recognition

Charles Cadieu¹, Minjoon Kouh¹, Maximilian Riesenhuber², Tomaso Poggio¹
¹ M.I.T. ² Georgetown University

71. Time-scales of temporal response in regular and fast-spiking cortical neurons

Giancarlo La Camera¹, Alexander Rauch², Walter Senn³, Stefano Fusi³, Dave Thurbon⁴, Hans R. Luescher³
¹ Lab of Neuropsychology, NIMH, NIH, Bethesda, USA ² Max Planck Institute for Biological Cybernetics, Tuebingen, Germany ³ Institute of Physiology, University of Bern, Switzerland ⁴ The Scripps Research Institute, La Jolla, CA 92037, USA

72. Parallel processing of multiple stimulus parameters and the emergence of combination sensitivity

Bruce A. Carlson, Masashi Kawasaki
University of Virginia

73. Responses of Anteroventral Cochlear Nucleus Cells to Tones in the Presence of Noise: Support for Temporal Models of Masked Detection

Laurel H. Carney
Syracuse University

74. Experience-Dependent Frequency Map Reorganization Endures for at Least 20 Days

Rafael A. Carrasco, Roshini Jain, Amanda C. Puckett, Michael P. Kilgard, Pritesh K. Pandya, Christopher L. Heydrick, Alyssa McMenamy, Joanna Gibbons, Raluca Moucha
University of Texas at Dallas

75. Activity-induced slow disinhibition in a cortical model of spatial working memory.

Eugene S Carter, Xiao-Jing Wang
Volen Center. Brandeis University.

76. Evidence of top-down attentional control in the inferior temporal cortex

Yonghong Chen¹, Steven L. Bressler², Charles E. Schroeder³, Mingzhou Ding¹
¹ University of Florida ² Florida Atlantic University ³ Nathan Kline Institute for Psychiatric Research

77. More than 2: Multiple choice decision-making in humans and monkeys

Churchland, Anne, Kiani, Roozbeh, Tam, Marcel, Michael N. Shadlen
University of Washington

78. The architecture of neural systems that structure sensory information

Rhodri Cusack
MRC CBU

79. Emergence of a Dynamic Direction Selective Filter by Optimal Coding of Natural Time Varying Images

Mohammad Dastjerdi¹, Dawei W. Dong²
¹ Center for Complex Systems, Florida Atlantic University ² Center for Complex Systems, Florida Atlantic University

80. What Parrot Neurons Tell about in Control in Monkeys

V. David, J.M. Herrmann, Theo Geisel
Max-Planck Institute for Dynamics and Self-Organization, Goettingen

81. Synaptic and Spiking Dynamics Underlying Cognitive Flexibility

Gustavo Deco¹, Edmund Rolls²
¹ Universitat Pompeu Fabra ² University of Oxford

82. Computing relative motion with complex cells

Babette K. Dellen, John W. Clark, Ralf Wessel
Washington University in St. Louis

83. Learning hierarchical generative models with spiking neurons

Sophie Deneve
Institut des Sciences Cognitives

84. Combining stochastic models with intracellular recordings reveals dominant inhibitory conductances in cortical neurons of awake and naturally-sleeping animals

Alain Destexhe¹, Igor Timofeev², Michael Rudolph¹
¹ Integrative and Computational Neuroscience Unit, CNRS, 91198 Gif-sur-Yvette, France ² Department of Anatomy and Physiology, Laval University, Quebec G1K7P4, Canada

85. Effects of stimulus transformations on perceived functional properties of visual sensory neurons

Alexander G. Dimitrov, Melissa A Sheiko, Jonathan L. Baker, Shih-Cheng Yen
Montana State University

86. Dendritic Dependent Deterministic Gain Control

Brent Doiron¹, W. Hamish Mehaffey², Leonard Maler³, Ray W. Turner²
¹ Center for Neural Science, New York University ² Neuroscience Research Group, University of Calgary ³ Dept. of Cellular and Molecular Medicine, University of Ottawa

87. Modelling Cochleotopic Map Shifts in Auditory Cortex

Melissa Dominguez¹, Suzanna Becker¹, Ian Bruce², Heather Read³
¹ Department of Psychology, McMaster University ² Department of Electrical and Computer Engineering, McMaster University ³ Department of

Psychology, University of Connecticut

88. Maximizing Causal Information: A Theory of Dynamic Processing in Visual Systems

Dawei W. Dong
Florida Atlantic University

89. Relationship of Developmental Changes in Primary Visual Cortical States to Sensory Coding

Sally Duarte, Nathan Rosecrans, Michael Weliky
University of Rochester

90. Functional consequences of altered network topology in temporal lobe epilepsy

Jonas Dyrhfeld-Johnsen¹, Vijayalakshmi Santhakumar¹, Robert J. Morgan², Ramon Huerta³, Lev Tsimring³, Ivan Soltesz¹
¹ Dept. of Anatomy & Neurobiology, UC-Irvine, Irvine, CA, USA ² Dept. of Anatomy & Neurobiology, UC-Irvine, Irvine, CA, USA. ³ Inst. for Nonlinear Science, UC-San Diego, La Jolla, CA, USA

91. Interacting Scene and Object Identification Processes: Strongly Coupled Priors vs. Strongly Coupled Likelihoods.

Tina Ehtiyati, James J. Clark
McGill University, Centre for Intelligent Machines.

92. Task difficulty influences plasticity in primary auditory cortex

Navzer D. Engineer, Crystal T. Novitski, Michael P. Kilgard, Amanda C. Puckett, Pritesh K. Pandya, Vikram Jakkamsetti, Raluca Moucha
University of Texas at Dallas

93. Oscillations and phase coding in excitatory-inhibitory networks

Hugues Etienne
INRIA, Nancy, France

94. Reinforcement Learning with Modulated Spike Timing-Dependent Plasticity

Michael A. Fariès, Adrienne L. Fairhall
University of Washington

95. From synchrony to sparseness: Spike timing-dependent synaptic plasticity selects synchronous input ensembles for sparse coding

Luca A. Finelli¹, Maxim Bazhenov¹, Mark Stopfer², Terrence J. Sejnowski¹, Gilles Laurent³
¹ CNL, The Salk Institute for Biological Studies, La Jolla, CA, USA ² NICHD, NIH, Bethesda, MD, USA ³ Division of Biology, Caltech, Pasadena, CA, USA

96. Dynamical Changes in Spatial Frequency Tuning in Lateral Geniculate Nucleus

Robert A Frazor, Valerio Mante, Vincent Bonin, Matteo Carandini
Smith-Kettlewell Eye Research Institute

97. Multi-Spike Interactions in Spike-Timing-Dependent Synaptic Plasticity

Robert C. Froemke¹, Yang Dan²
¹ University of California, San Francisco ² University of California, Berkeley

98. Learning and forgetting visuo-motor associations in changing environments

Stefano Fusi¹, Wael F. Asaad², Earl K. Miller³, Xiao-Jing Wang⁴
¹ Institute of Physiology, Bern, Switzerland and Volen Center, Brandeis University, Waltham, Massachusetts, USA ² Center for Learning & Memory, M.I.T., Cambridge, MA and Program in Neurosurgery, Massachusetts General Hospital, ³ Center for Learning & Memory, M.I.T.,

Cambridge, MA, USA ⁴ Volen Center for Complex systems, Brandeis University, Wal

99. Touching the Void – Movement Intention Coding in Posterior Parietal Cortex during an Anti-reach Task

Alexander Gail, R.A. Andersen
California Institute of Technology, Pasadena CA

100. Neurophysiology of Prehension in Parietal Cortex: Digital Video Analyses of Trained and Natural Grasping Behaviors

Esther P. Gardner¹, K. Srinivasa Babu², Daniel J. Debowy¹
¹ Department of Physiology & Neuroscience, NYU School of Medicine, New York, NY, USA ² Dept. of Neurological Sciences, Christian Medical College, Vellore 632-004, India, and Department of Physiology & Neuroscience, NYU School of Medicine, New York, NY, USA

101. Integrative dynamics of working memory. Phase synchrony pattern and power spectral topography in an N-back task

Gaspar, Pablo, Bosman, Conrado, Aboitiz, Francisco
Pontificia Universidad Catolica de Chile

102. Cercal Sensory System: A Precise Sense In Which The Tuning Curves Are Optimized

Michael Gastpar¹, Bixio Rimoldi²
¹ University of California, Berkeley ² Swiss Federal Institute of Technology (EPFL), Lausanne

103. A Hierarchical Bayesian Model of Invariant Recognition in the Visual Cortex and Alternative Explanations for Observed Cortical Phenomena

Dileep George¹, Jeff Hawkins²
¹ Stanford University and Redwood Neuroscience Institute ² Redwood Neuroscience Institute

104. A Bayesian Model of Invariant Pattern Recognition in the Visual Cortex

Dileep George¹, Jeff Hawkins²
¹ Stanford University and Redwood Neuroscience Institute ² Redwood Neuroscience Institute

105. Cortical Micro-circuits Derived from Bayesian Belief Propagation Equations Match Anatomical Data

Dileep George¹, Jeff Hawkins²
¹ Stanford University & Redwood Neuroscience Institute ² Redwood Neuroscience Institute

106. Simple adaptive threshold models allow to predict spike times of pyramidal neurons under in-vivo like current injection with ms-precision

Wulfram Gerstner¹, Renaud Jolivet², Alexander Rauch³, Hans R. Luescher⁴
¹ Ecole Polytechnique Federale de Lausanne (EPFL), Brain-Mind Center and School of Computer and Communication Sciences, CH-1015 Lausanne ² Ecole Polytechnique Federale de Lausanne (EPFL) ³ University of Berne ⁴ University of Berne, Institute of Physiology

107. Spike-frequency adaptation and the collective dynamics of neurons: stability enhancement, global oscillations and a hypothesis on implications for learning

Guido Gigante, Maurizio Mattia, Paolo Del Giudice
Istituto Superiore di Sanita', Rome, Italy

108. Concurrent fMRI and EEG recordings support the auditory Asymmetric Sampling in Time theory.

Anne-Lise Giraud¹, Helmuth Laufs², Andreas Kleinschmidt²
¹ Laboratoire de neurosciences cognitives Dpartement dtdudes cognitives, Paris, France ² Cognitive Neurology Unit, Department of Neurology, J. W. Goethe University, Frankfurt am Main, Germany

109. Model of Single Unit Extracellular Potentials Describes Waveforms of CA1 Neurons Recorded In Vivo

Carl Gold¹, Darrell Henze², Gyorgy Buzsaki³, Christof Koch¹
¹ California Institute of Technology ² Merck Research Laboratoris ³ Rutgers Center for Molecular and Behavior Neuroscience

110. Neuroinformatic Resources for the Information-Theoretic Analysis of Spike Trains

David H. Goldberg, Jonathan D. Victor, Daniel Gardner
Weill Medical College of Cornell University

111. Time-warp-invariant pattern recognition with bistable units

Tim Gollisch
Harvard University, Dept. of Molecular and Cellular Biology

112. The human brain as a large-margin classifier

Arnulf B.A. Graf, Felix A. Wichmann, Heinrich H. Buelthoff, Bernhard Schoelkopf
Max Planck Institute for Biological Cybernetics

113. Experimental evidence for, and modeling of, response field gain modulation as a mechanism for sensory-motor adaptation in the posterior parietal cortex

Bradley Greger, Marina Brozovic, Alexander Gail, R.A. Andersen
Caltech

114. Kernel-based dependence detection in the Macaque visual cortex

Arthur Gretton¹, Alex Smola², Olivier Bousquet³, Ralf Herbrich⁴, Andrei Belitski¹, Mark Augath¹, Yusuke Murayama¹, Jon Pauls¹, Bernhard Schoelkopf¹, Nikos Logothetis¹
¹ MPI for Biological Cybernetics ² National ICT Australia ³ Pertinence France ⁴ Microsoft research

115. Kernel-based measures of dependence in the Macaque visual cortex

Arthur Gretton¹, Alex Smola², Olivier Bousquet³, Ralf Herbrich⁴, Andrei Belitski¹, Mark Augath¹, Yusuke Murayama¹, Jon Pauls¹, Bernhard Schoelkopf¹, Nikos Logothetis¹
¹ MPI for Biological Cybernetics ² National ICT Australia ³ Pertinence, Paris ⁴ Microsoft Research Cambridge

116. Motor Simulation for Endpoint Control

Xue Gu, Dana H. Ballard
University of Rochester

117. Using Physiological and Modeling Databases to Investigate the Role of Channel Density Variability in Controlling Neuronal Dynamics.

Cengiz Gunay, Jeremy E. Edgerton, Dieter Jaeger
Dept. Biology, Emory University

118. Cholinergic modulation controls spike generating dynamics in cortical neurons.

Boris S. Gutkin¹, Klaus M Stiefel², Terrence J. Sejnowski³
¹ ² Computational Neurobiology Laboratory, The Salk Institute Biological Studies, La Jolla, CA, USA ³ Computational Neurobiology Laboratory, The Salk Institute Biological Studies, La Jolla, CA, USA and Department of Biology, U.C.S.D, La Jolla, CA, USA

119. The ups and downs of addiction: neurodynamics of positive and opponent processes lead to long-term nicotine addiction.

Boris S. Gutkin¹, Stanislas Dehaene², Jean-Pierre Changeux¹
¹ 3. URA CNRS D1284 «Récepteurs et Cognition», Institut Pasteur, Paris, France ² 2. INSERM-CEA unit 562

“Cognitive Neuroimaging”, Service Hospitalier Frédéric

120. STDP of Inhibitory Synapses in the Entorhinal Cortex: I. Electrophysiology

Julie S. Haas, Thomas Nowotny, H. D. I. Abarbanel
INLS, University of California, San Diego

121. V1 disparity selective cells are most strongly modulated by non-physical stimuli

Ralf M. Haefner, Bruce G. Cumming
Laboratory of Sensorimotor Research, National Eye Institute,
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122. A population-based inference framework for describing and understanding the temporal dynamics of perisaccadic visual perception

Fred H. Hamker, Marc Zirnsak, Dirk Calow, Markus Lappe
Westf. Wilhelms-Universitaet Muenster

123. Biomechanics and Neural Control of Bipedal Locomotion

Joachim Hass, J.M. Herrmann, Theo Geisel
Max-Planck-Institute for Dynamics and Self-Organization

124. Hippocampal rhythms affected by the GABAAR beta3 subunit

Harald Hentschke¹, Matthew I. Banks¹, Mark G. Perkins¹, Gregg E. Homanics², Robert A. Pearce¹
¹ Department of Anesthesiology, University of Wisconsin, Madison WI 53706, USA ² Department of Anesthesiology, University of Pittsburgh School of Medicine, Pittsburgh PA 15261, USA

125. Neural codes for multiple remembered spatial locations in the primate frontal eye fields

Mark H. Histed, Earl K. Miller
Picower Center, RIKEN-MIT Neurosci. Res. Center, and Dept. of Brain and Cog. Sci, MIT

126. Role of colored noise in the detection of synchronous spiking events in neural systems

Thomas Hoch, Klaus Obermayer
Berlin University of Technology, Germany

127. Plasma Membrane Expression of Genetically Encoded Voltage Sensitive Fluorescent Proteins

Ryota Homma, Bradley Baker, Lawrence Cohen, Efstratios Kosmidis
Yale University

128. Sparse and heterogeneous firing in the auditory cortex of unanesthetized rats

Tomas Hromadka¹, Michael DeWeese², Anthony M. Zador²
¹ Watson School of Biological Sciences, Cold Spring Harbor Laboratory ² Cold Spring Harbor Laboratory

129. Adaptive Surround Modulation in Visual Cortical Area MT

Xin Huang¹, Thomas D. Albright¹, Gene R. Stoner²
¹ Vision Center Laboratory, The Salk Institute, La Jolla, CA; Howard Hughes Medical Institute ² Vision Center Laboratory, The Salk Institute, La Jolla, CA

130. Using ‘read-out’ of object identity to understand object coding in the macaque anterior inferior temporal cortex

Chou Hung¹, Gabriel Kreiman¹, Rodrigo Quian-Quiroga², Alexander Kraskov², Tomaso Poggio¹, James DiCarlo¹
¹ MIT ² Caltech

131. Population Coding in a fast-changing world

Quentin J.M. Huys¹, Richard S. Zemel², Rama Natarajan², Peter Dayan¹
¹ Gatsby Computational Neuroscience Unit, University College London ² Department of Computer Science,

University of Toronto

132. A computational model of human anterior prefrontal functions

Alexandre Hyafil, Emmanuel Guigon, Etienne Koechlin
Inserm U742, Universite Pierre et Marie Curie, Paris, France

133. How Natural Environments Alter Spatial Information in Acoustic Cues

Antje Ihlefeld, Barbara G. Shinn-Cunningham
Boston University

134. Visual Motion Processing in a Direction Discrimination Task

Mehrdad Jazayeri, J. Anthony Movshon
New York University

135. A Computational Model of Burst Spike Sequence Generation within Songbird Nucleus HVC

Dezhe Z. Jin¹, Fethi M. Ramazanoglu², Sebastian Seung³
¹ Department of Physics, The Pennsylvania State University ² Department of Physics, Massachusetts Institute of Technology ³ Department of Brain and Cognitive Sciences, Massachusetts Institute of Technology

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Ron Jortner¹, Gilles Laurent²
¹ Hebrew University in Jerusalem/ Caltech ² Caltech

137. Locomotive Network Modeling based on Identified Neurons in Zebrafish

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138. A neural network model to understand the origin of syntactic structure in Bengalese finch

Joseph K. Jun, Dezhe Z. Jin
The Pennsylvania State University

139. Precisely-timed sequence of spontaneous UP-state depolarization in a self-organized recurrent network model

S. Kang¹, K. Kitano², Tomoki Fukai³
¹ Brain Science Research Center, Tamagawa University ² Department of Human and Computer Intelligence, Ritsumeikan University ³ Lab for Neural Circuit Theory, Brain Science Institute, RIKEN

140. Soft spots in the functional architecture of the visual cortex

Matthias Kaschube¹, Michael Schnabel¹, Klaus Kreikemeier², Hubert R. Dinse², Ben Godde³, Karl-Friedrich Schmidt⁴, Siegrid Löwel⁴, Fred Wolf¹
¹ Department of Nonlinear Dynamics, MPI for Dynamics and Selforganization, Göttingen, Germany ² Institute of Neuroinformatics, University of Bochum, Germany ³ Jacobs Center for Lifelong Learning, International University of Bremen, Germany ⁴ Leibniz-Institute for Neurobiology, Magdeburg, Germany

141. Emergence of frequency-sweep selectivity in auditory cortex

Christian Kasess, Calin Buia, Paul Tiesinga
Physics and Astronomy, University of North Carolina

142. Theoretical importance of temporal integration for sound localization in everyday environments

Kosuke Kawakyu¹, Barbara G. Shinn-Cunningham²
¹ Harvard-MIT Division of Health Sciences and Technology, Speech and Hearing Biosciences and Technology ² Boston University Hearing Research Center

143. Glycine receptors modulate dendritic input efficacy

in a manner that depends on postsynaptic firing rate in CA1 pyramidal cells

Tara Keck, John A. White
Department of Biomedical Engineering, Boston University

144. Rapid sniffing mode switch in anticipation of olfactory sampling

Adam Kepecs, Naoshige Uchida, Zachary F. Mainen
Cold Spring Harbor Laboratory

145. STIMULUS SIZE CHANGES THE DYNAMICS OF RETINO-TECTAL SIGNAL TRANSFER

Shaban Khanbabaie¹, A.S. Mahani¹, H. Luksch², Ralf Wessel¹
¹ *washington University in St.Louis, MO 63130* ² *Institut für Biologie II, Aachen, Germany*

146. Population coding and decoding with energy filters

Klam, F.¹, Richard S. Zemel², Alex Pouget³
¹ *College de France, Paris.* ² *University of Toronto, Canada.* ³ *University of Rochester*

147. Independent coding dimensions of the optical antennal lobe output neuron response

Philipp Knasel¹, Mikael A. Carlsson², Tim C. Pearce³, Bill S. Hansson², Paul F.M.J. Verschure¹
¹ *ETH Zurich, Switzerland* ² *SLU Alnarp, Sweden* ³ *University of Leicester, United Kingdom*

148. Behaviors of the rat vibrissal system during an object localization task: acuity, strategies, kinematics, and closed loop effects

Per Magne Knutsen, Maciej Pietr, Ehud Ahissar
Department of Neurobiology, Weizmann Institute of Science, Israel

149. An information-theoretic approach to cognitive control in the human prefrontal cortex

Etienne Koechlin
Inserm U742, Universite Pierre et Marie Curie, Paris, France

150. Temporal precision and oscillations in the inputs and outputs of thalamic relay cells during natural stimulation

Kilian Koepsell¹, Yichun Wei², xin Wang², Qingbo Wang², J.A. Hirsch², Fritz Sommer¹
¹ *Redwood Neuroscience Institute* ² *University of Southern California*

151. Gain control circuits underlie tuning of cortical neurons

Minjoon Kouh, Tomaso Poggio
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152. Computational dynamics in an array of attractor networks applied to motor control

Nedialko Krouchev, John Kalaska
Groupe de recherche en sciences neurologiques - CIHR, Département de physiologie, Université de Montréal

153. Dynamics of random networks of spiking neurons with conductance-based synapses

Arvind Kumar¹, Sven Schrader¹, Stefan Rotter², Ad Aertsen¹
¹ *Neurobiology & Biophysics, Institute of Biology III, Albert-Ludwigs-University Freiburg, Germany* ² *Neurobiology & Biophysics, Institute of Biology III, Albert-Ludwigs-University Freiburg, Germany and Theory & Data Analysis, Institute for Frontier Areas of Psychology and Mental Health Freiburg, Germany*

154. Dynamics of Cortical Macrocolumns - An Abstract Derivation

Jörg Lücke
Institut für Neuroinformatik, Ruhr-Universität Bochum,

Germany

155. Representation of tone in fluctuating maskers in the ascending auditory system

Liora Las, Nachum Ulanovsky, Israel Nelken
Department of neurobiology, and the Interdisciplinary Center for Neural Computation, Hebrew University.

156. The contribution of physiological noise to dendritic non-linearities.

Thomas Z. Lauritzen
Redwood Neuroscience Institute, 1010 El Camino Real, Suite 380, Menlo Park, CA 94025, USA

157. The Hodgkin-Huxley Neuron as a Neuro-Modulator

Aurel A. Lazar
Columbia University

158. End-to-End Learning Models of Invariant Object Recognition.

Yann LeCun¹, Fu-Jie Huang¹, Leon Bottou²
¹ *The Courant Institute, New York University* ² *NEC Labs America*

159. Decoding Plasticity at the Hippocampal Mossy Fiber Synapse

Christian Leibold¹, Anja Gundlfinger², Katja Gebert¹, Marion Moisel¹, Richard Kempter¹, Dietmar Schmitz²
¹ *Institute for Theoretical Biology, Humboldt Universitaet Berlin* ² *NeuroScienceResearchCenter, Charite, Universitaetsmedizin Berlin*

160. Matching storage and recall for rate- and phase-based autoassociative memories

Mate Lengyel, Peter Dayan
Gatsby Computational Neuroscience Unit, UCL

161. Dynamics and computation in an excitatory-inhibitory network

Alex Lewis, Li Zhaoping
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162. Stable Propagation of Bursts In a 1D Homogeneous Excitatory Synfire Chain

Meng-Ru Li, Henry Greenside
Department of Physics, Duke University

163. Statistical Pattern Across Spectrally degraded Speech: Implication about speech processing for Cochlear Implants

Tianhao Li¹, Qian-Jie Fu²
¹ *Biomedical Engineering Department, University of Southern California* ² *DAIP, House Ear Institute*

164. Degree of linearity in auditory cortical responses is less plastic than form of linear receptive fields

Jennifer F. Linden¹, Itzel Orduna², Eduardo Mercado², Michael M. Merzenich³, Maneesh Sahani⁴
¹ *UCL* ² *UB-SUNY* ³ *UCSF* ⁴ *Gatsby Computational Neuroscience Unit, UCL*

165. A Neural Code Based on Theta and Gamma Oscillations is Used for Different Functions in Different Brain Regions.

John Lisman, Sridhar Raghavachari
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166. Decision choice readout in a large-scale brain circuit: neural mechanisms underlying the decision threshold

Chung-Chuan Lo¹, Xiao-Jing Wang²
¹ *Volen Center for Complex Systems, Brandeis University* ² *Center for Complex Systems, Brandeis University*

167. Whole-cell recordings in HVC of the sleeping zebra

finch

Michael A. Long, Michale S. Fee
MIT

168. Making sense of graded olfactory stimuli

Matthieu Louis¹, Thomas Huber², Thomas P. Sakmar², Leslie B. Vosshall¹

¹ *The Rockefeller University, Laboratory of Neurogenetics and Behavior* ² *The Rockefeller University, Laboratory of Molecular Biology and Biochemistry*

169. Decoding using a distributional code

Brian Lundstrom, Adrienne L. Fairhall

Department of Physiology and Biophysics, University of Washington

170. Simultaneous encoding of envelope and fine structure in human auditory cortex

Huan Luo, Yadong Wang, David Poeppel, Jonathan Z. Simon

University of Maryland

171. Visual information is used throughout a rapid point to constrain precision

Anna Ma-Wyatt, Suzanne P. McKee

The Smith-Kettlewell Eye Research Institute

172. A simple recipe for building line attractors

Christian Machens, Carlos Brody

Cold Spring Harbor Laboratory

173. Phase-derived time frequency representations

Marcelo O. Magnasco¹, Timothy J. Gardner²

¹ *Rockefeller University* ² *MIT*

174. Motion repulsion arises from stimulus statistics when analyzed with a clustering algorithm

Alireza S Mahani, Anders E Carlsson, Ralf Wessel

Physics Dept, Washington University in St. Louis

175. Surface color perception in three-dimensional scenes with non-uniform spatial and spectral distribution of illumination

Laurence T. Maloney¹, Katja Doerschner¹, Huseyin Boyaci²

¹ *New York University* ² *University of Minnesota*

176. THE IMPORTANCE OF GAIN CONTROL IN NATURAL VISION

Valerio Mante, Vincent Bonin, Matteo Carandini

Smith-Kettlewell Eye Research Institute

177. Computational role of excitability's modulation in working memory mechanisms

Maria Markaki¹, Stelios Orphanoudakis²

¹ *Computer Science Department, University of Crete, Greece* ² *Institute of Computer Science (ICS-FORTH) and Computer Science Department, University of Crete, Greece*

178. Prior probability represented in face sensitive regions in human brain

Sean Marrett¹, Hauke Heekeren², Douglas Ruff³, Peter Bandettini⁴, Leslie G. Ungerleider⁴

¹ *Functional MRI Facility, NIMH/NIH, Bethesda, MD, USA* ² *Berlin Neuroimaging Center, Charite, Humboldt University, Berlin, Germany* ³ *Lab of Brain and Cognition* ⁴ *Lab of Brain and Cognition, NIMH/NIH, Bethesda, MD, USA*

179. EXTRACTING THE INFORMATION OF VISUAL STIMULI FROM A SINGLE-TRIAL ACTIVITY OF A NEURONAL POPULATION IN THE INFERIOR-TEMPORAL CORTEX

Narihisa Matsumoto¹, Yasuko Sugase-Miyamoto¹, Masato Okada²

¹ *National Institute of Advanced Industrial Science and Technology* ² *University of Tokyo*

180. Oscillations enhance the information efficiency of individual hippocampal pyramidal cells.

Douglas McLelland, Ole Paulsen

University of Oxford

181. Toward a complete characterization of single neuron computation

Rebecca Mease, Randall K. Powers, Marc Binder, Adrienne L. Fairhall

University of Washington

182. Bistable network behavior of layer I interneurons in auditory cortex

Elliott B. Merriam¹, Theoden I. Netoff², Matthew I. Banks¹

¹ *University of Wisconsin* ² *Boston University*

183. Non-linear signal processing in the cerebellum

Jason Middleton, Andre Longtin, Leonard Maler

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184. Coherent Oscillations Mediate an Innate Number Sense in a Computer Model

Jeremy A. Miller, Mark C. Flynn, Garrett T. Kenyon

Los Alamos National Laboratory, Biological and Quantum Physics Group (P-21)

185. Search for optimal measure to discriminate spike trains with different randomness

Keiji Miura¹, Masato Okada², Shigeru Shinomoto³

¹ *Kyoto University / RIKEN BSI / JST PRESTO* ² *University of Tokyo / JST PRESTO / RIKEN BSI* ³ *Kyoto University*

186. Using learned attractors for timing and identification of transient sensory signals

Samat Moldakarimov¹, James L. McClelland², Carson C. Chow³

¹ *Center for the Neural Basis of Cognition, University of Pittsburgh* ² *Center for the Neural Basis of Cognition, Carnegie Mellon University* ³ *NIH/NIDDK/LBM*

187. GENETIC ALGORITHM OPTIMIZATION OF NEURONAL PROPERTIES AND SYNAPTIC TIMING TO REPRODUCE MOTONEURON DISCHARGE SYNCHRONY

Anna T. Moritz¹, Roger M. Enoka², Randall K. Powers¹

¹ *University of Washington, Seattle* ² *University of Colorado, Boulder*

188. Dynamical State Representation in Posterior Parietal Cortex: Encoding and Decoding

Grant H. Mulliken, Sam Musallam, R.A. Andersen

California Institute of Technology

189. On the Factors Effecting Binaural Advantage in Speech Intelligibility

Mor Nahum, Ariel Rokem, Israel Nelken, Merav Ahissar

Hebrew University of Jerusalem

190. Gamma band synchronization between frontal and parietal areas correlated with perceptual switching

Hironori Nakatani, Cees van Leeuwen

RIKEN Brain Science Institute

191. Dual Time-Scales in Cortical Decoding: Time-course of Integration and Temporal Resolution in the Neural Discrimination of Natural Stimuli

Rajiv Narayan, Kamal Sen

Hearing Research Center, Dept. of Biomedical Engineering, Boston University

192. The Impact of Subthreshold Action Potential Threshold Adaptation on Neural Coding

Birn Naundorf¹, Maxim Volgushev², Fred Wolf³

¹ *Max-Planck Institute for Dynamics and Self-Organization Gttingen, Germany* ² *Dept. of Neurophysiology, Ruhr-University of Bochum, Germany* ³ *Max-Planck Institute for*

Dynamics and Self-Organization, Göttingen, Germany

193. Smooth Stimuli, Brisk Spikes: Neural Coding of Natural Signals

Ilya Nemenman¹, William Bialek², Rob de Ruyter van Steveninck³

¹ Columbia University ² Princeton University ³ Indiana University

194. Predicting the dynamics of small networks from simple measurements in the constituent neurons

Theoden I. Netoff, Dmitri Pervouchine, Corey D.

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Boston University

195. Unlike MT, disparity selective V1 neurons show no significant choice probabilities in a binocular correlation task.

Hendrikje Nienborg, Bruce G. Cumming

Laboratory of Sensorymotor Research, National Eye Institute, National Institute of Health

196. Motivational effects on behavior: Towards a reinforcement learning model of rates of responding

Yael Niv¹, Nathaniel D. Daw², Daphna Joel³, Peter Dayan²

¹ Interdisciplinary Center for Neural Computation, Hebrew University and Gatsby Computational Neuroscience Unit, UCL ² Gatsby Computational Neuroscience Unit, UCL ³ Department of Psychology, Tel Aviv University

197. STDP of Inhibitory Synapses in the Entorhinal Cortex: II. Implications for network function

Thomas Nowotny, Julie S. Haas, H. D. I. Abarbanel

INLS, University of California, San Diego

198. Network state-dependent operation of excitatory synapses in the hippocampus

Zoltan Nusser, Ágota A. Biró

Laboratory of Cellular Neurophysiology, Institute of Experimental Medicine, Budapest

199. Persistent neural activity in a bilateral neural integrator model

Itsaso Olasagasti¹, Emre Aksay², Guy Major², David Tank², Mark Goldman¹

¹ Wellesley College ² Princeton University

200. Receptive Field Models Fail to Predict Responses of V1 Neurons to Natural Movies

Bruno A. Olshausen¹, Jonathan L. Baker², Shih-Cheng Yen²

¹ UC Davis/Redwood Neuroscience Institute ² Montana State University, Bozeman

201. Vocal experimentation in the juvenile songbird is produced by a basal ganglia circuit

Bence Olveczky¹, Aaron Andalman², Michale S. Fee²

¹ Harvard-MIT ² MIT

202. Estimation of distribution of membrane resistance in hippocampal CA1 pyramidal neuron

Toshiaki Omori¹, Toru Aonishi², Hiroyoshi

Miyakawa³, Masashi Inoue³, Masato Okada⁴

¹ PRESTO, Japan Science and Technology Agency/Brain Science Institute, RIKEN ² Interdisciplinary Graduate School of Science and Engineering, Tokyo Institute of Technology/Brain Science Institute, RIKEN ³ School of Life Science, Tokyo University of Pharmacy and Life Science ⁴ Graduate School of Frontier Sciences, The University of Tokyo/PRESTO, Japan Science and Technology Agency/Brain Science Institute, RIKEN

203. Role of auditory cortex in perceptual decisions

Gonzalo H. Otazu, Anthony M. Zador

Cold Spring Harbor Laboratory

204. The relationship between inter-neuronal correlation

and microcircuitry in the awake auditory cortex

Hysell Oviedo, Anthony M. Zador

Cold Spring Harbor Laboratory

205. Inferring prior probabilities from Bayes-optimal behavior

Liam Paninski

Gatsby Computational Neuroscience Unit, University College London

206. The most likely voltage path and large deviations approximations for integrate-and-fire neurons

Liam Paninski

Gatsby Computational Neuroscience Unit, University College London

207. Improved numerical methods for computing likelihoods in the stochastic integrate-and-fire model

Liam Paninski¹, Adrian Haith², Jonathan W.

Pillow³, Christopher Williams²

¹ Gatsby Computational Neuroscience Unit, University College London ² University of Edinburgh ³ New York University

208. Comparison of power and tractability of neural encoding models that incorporate spike-history dependence

Liam Paninski¹, Jonathan W. Pillow², Eero P. Simoncelli²

¹ Gatsby Computational Neuroscience Unit, University College London ² Center for Neural Science, New York University

209. A comparison of dynamic neural representations of value in monkey amygdala with emotional learning induced by trace conditioning

J.J. Paton, M.A. Belova, S.E. Morrison, C.D. Salzman

Columbia University

210. Exceptional Sensitivity Enhancement during Early Olfactory Processing

Tim C. Pearce¹, Josie A. Mackenzie¹, Qian Han², Takuma

Takanashi², Niels Skals¹, Anna-Carin Backman¹, Bill S.

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¹ University of Leicester ² Swedish University of Agricultural Sciences

211. Optimal Spike Pattern Detection Leads to STDP

Jean-Pascal Pfister¹, Taro Toyozumi¹, David

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¹ School of Computer and Communication Sciences, Brain-Mind Institute, EPFL ² IDIAP, CH-1920 Martigny

212. Modeling multineuronal responses in primate retinal ganglion cells

Jonathan W. Pillow¹, Jonathon Shlens², Liam Paninski³, E.J.

Chichilnisky⁴, Eero P. Simoncelli¹

¹ NYU ² UCSD ³ Gatsby Comp Neurosci Unit ⁴ The Salk Institute

213. Visual Acuity in the presence of Fixational Eye Movements

Xaq Pitkow¹, Markus Meister¹, Haim Sompolinsky²

¹ Harvard University ² Hebrew University

214. The origin of cross-orientation suppression in primary visual cortex

Nicholas Priebe, David Ferster

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215. Probabilistic Inference using Populations of Spiking Neurons

Raiesh P. N. Rao

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216. Despite its perceptual consequences, vertical disparity may not be represented by the visual system

Jenny Read, Bruce G. Cumming
Lab of Sensorimotor Research, NEI, NIH

217. A network model for the rapid formation of binary sparse representations of sensory inputs

Martin Rehn¹, Fritz Sommer²
¹ *KTH, Stockholm, Sweden* ² *Redwood Neurosci Inst., Menlo Park, CA, USA*

218. A reverse-correlation method to assess fine spatial structure of MT receptive fields

Micah Richert¹, Bart Krekelberg², Tom Albright²
¹ *UC San Diego* ² *Salk Institute*

219. Odor Representation in the Olfactory Bulb of Behaving Mice

Dima Rinberg¹, Alex Koulakov², Fred Ollinger¹, Alan Gelperin¹
¹ *Monell Chemical Senses Center* ² *Cold Spring Harbor Laboratory*

220. Stability conditions for the dynamic regulation of plasticity in electrosensory processing

Patrick D. Roberts¹, Gerardo Lafferriere², Nathaniel Sawtell³, Alan Williams³, Curtis C. Bell³
¹ *Neurological Sciences Institute, OHSU* ² *Portland State University* ³ *Neurological Sciences Institute, OHSU*

221. Unipolar brush cells can prolong the delayed representation of cerebellar mossy-fiber input.

Patrick D. Roberts
Neurological Sciences Institute, OHSU

222. How the brain generates movement

Uri Rokni¹, Haim Sompolinsky²
¹ *MIT* ² *Hebrew University*

223. State Analysis of Visual Cortical Network Dynamics

Nathan Rosecrans, Sally Duarte, Michael Weliky
University of Rochester

224. Coding Cortical Hierarchies Using Projection Pursuit

Conatntin Rothkopf, Dana H. Ballard, Jonathan Shaw, Madhur Ambastha
University of Rochester

225. Learning rules for unsupervised perceptual learning

Conatntin Rothkopf¹, Ma, W.J.,¹ P.E. Latham², Bavelier, D.,¹ Alex Pouget¹
¹ *University of Rochester* ² *Gatsby Computational Neuroscience Unit, London*

226. The interplay between delay and patterns of connectivity shapes spatio-temporal dynamics of neuronal networks

Alex Roxin, Nicolas Brunel, David Hansel
CNRS, Neurophysics and Physiology

227. Stable bump states without Mexican Hat connectivity in a Rate Model

Alex Roxin, Nicolas Brunel, David Hansel
CNRS - Neurophysics and Physiology

228. Circuit mechanisms of memory formation during classical conditioning in the rat.

Simon Rumpel¹, Joseph LeDoux², Anthony M. Zador¹, Roberto Malinow¹
¹ *Cold Spring Harbor Laboratory* ² *New York University*

229. Achieving Dendritic Democracy by Anti-STDP in Morphologically Accurate Neuron Models

Clifton C. Rumsey, L.F. Abbott
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230. Credit Assignment in Reach Adaptation

Philip N. Sabes, Sen Cheng
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231. Contribution of Binaural Mechanisms to Spatial Unmasking

Satyavarta¹, Barbara G. Shinn-Cunningham²
¹ *Department of Cognitive and Neural Systems, Boston University* ² *Depts. of Cognitive and Neural Systems and Biomedical Engineering, Boston University*

232. Sensing interval affects stimulus encoding in the active electrosensory system of mormyrid fish

Nathaniel Sawtell¹, Alan Williams¹, Curtis C. Bell¹, Patrick D. Roberts¹, Gerhard von der Emde²
¹ *OHSU* ² *Bonn*

233. Learning intrinsic excitability in medium spiny neurons

Gabriele Scheler
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234. Asymmetric Premotor Recruitment in Left and Right Hemispheres during Production of a Vocal Motor Behavior

Marc F. Schmidt, Paul Nealen
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235. From pairs to populations - correlations and information in networks of neurons

Elad Schneidman, Michael J. Berry, William Bialek
Princeton University

236. Tuning to Natural Stimulus Dynamics in Primary Auditory Cortex

J. W. H. Schnupp, J. A. Garcia-Lazaro, Bashir Ahmed
University of Oxford

237. Internal models for object manipulation: Determining optimal contact locations

Paul R. Schrater, Erik J. Schlicht
University of Minnesota

238. Localization of Neural Activity

Hecke Schrobdsdorff¹, Vincent David¹, Joachim Hass¹, J.M. Herrmann², Theo Geisel³
¹ *MPI for Dynamics and Self-Organization* ² *GA University Goettingen Insitute for Nonlinear Dynamics* ³ *MPI for Dynamics and Self-Organization, GA University Goettingen Insitute for nonlinear Dynamics*

239. An inter-areal feedback model of contextual effects in macaque striate cortex

Lars Schwabe¹, Alessandra Angelucci², Klaus Obermayer¹, Paul Bressloff³
¹ *Fak IV - Electrical Engineering and Computer Science, FR2-1, TU Berlin, Franklinstr. 28/29, 10587 Berlin, Germany* ² *Department of Ophthalmology and Visual Science,* ³ *Department of Mathematics, Univ of Utah, Salt Lake City, Utah 84112*

240. Population Decoding in the Archer Fish Retina

Ronen Segev, Elad Schneidman, Jason Puchalla, Rob Harris, Michael J. Berry
Princeton University

241. Learning difficult tasks using bounded synapses balances excitation and inhibition and equalizes synaptic weights

Walter Senn, Stefano Fusi
Institute of Physiology, University of Bern, Switzerland

242. Decoding the second order statistics of neural population responses

Peggy Series¹, Alex Pouget², P.E. Latham³
¹ *Gatsby Computational Neuroscience Unit, UCL* ² *BCS, University of Rochester* ³ *Gatsby Computational*

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243. Learning a dictionary of shape-components in visual cortex

Thomas Serre, Tomaso Poggio
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244. Implications of neuronal heterogeneity on population coding

Maoz Shamir, Haim Sompolinsky
Racah Institute of Physics, The Hebrew University

245. Auditory streaming and the spectrotemporal analysis of sound in the cortex

Shihab Shamma, Mounya Elhilali
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¹ Courant Institute of Mathematical Sciences and Center for Neural Science, New York Univ. ² Dept. of Mathematics, Univ. of Houston

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¹ Department of Neuroscience, Baylor College of Medicine ² Department of Neuroscience, Howard Hughes Medical Institute, Baylor College of Medicine

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¹ Graduate Program in Neuroscience, SUNY Stony Brook ² Cold Spring Harbor Laboratory

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¹ National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences, Beijing 100080, P. R. China ² Institute of Mental Health, Peking University, Beijing 100083, P. R. China

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¹ University College London ² Gatsby Computational Neuroscience Unit, University College London

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¹ I&C and Brain-mind institute, EPFL ² I&C and Brain-mind institute, EPFL ³ Graduate School of Information Science and Technology, The University of Tokyo

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¹ Department of Psychology, Giessen University ² Department of Psychology and Center for Neural Science, New York University

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Cold Spring Harbor Laboratory

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¹ German Primate Center, Kellnerweg 4, Goettingen, Germany ² FC.Donders Centre for Cognitive Neuroimaging, University of Nijmegen, Netherlands

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¹ Physics, Carl von Ossietzky University of Oldenburg, Oldenburg, Germany ² Physiology, Cambridge University, Cambridge, United Kingdom

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¹ Johns Hopkins University ² Montana State University

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¹ Program in Neurobiology and Behavior, University of Washington, Seattle. ² Department of Physiology and Biophysics, University of Washington, Seattle.

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¹ Harvard-MIT Division of Health Sciences and Technology ² Harvard University

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Institut für Neuroinformatik, Ruhr-University of Bochum, Germany

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Institute for Adaptive and Neural Computation, University of Edinburgh, UK

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¹ Humboldt-University Berlin, Institute for Theoretical Biology ² Max-Delbrück-Center and Charité, Berlin

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¹ SUNY Downstate Medical Center ² SUNY Downstate Medical Center

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¹ University of Washington ² University of Washington

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¹ Stanford University. ² Gatsby Computational Neuroscience Unit, UCL

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¹ Stowers Institute for Medical Research ² Columbia

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L.F. Abbott	abbott@brandeis.edu	27, 229, 273
Francisco Aboitiz	faboitiz@med.puc.cl	101
Corey D. Acker	cacker@bu.edu	39, 194
Carlos Acuña	carlos.acuna@usc.es	40
Ad Aertsen		153
Afsheen Afshar	afsheen@stanford.edu	13, 290
John Agapiou	j.agapiou@ucl.ac.uk	41
Ehud Ahissar	ehud.ahissar@weizmann.ac.il	148
Merav Ahissar		189
Bashir Ahmed	bashir.ahmed@physiol.ox.ac.uk	236
Misha Ahrens	ahrens@gatsby.ucl.ac.uk	42
Kazuyuki Aihara	aihara@sat.t.u-tokyo.ac.jp	266
Emre Aksay	eaksay@princeton.edu	199
Thomas D. Albright	tom@salk.edu	129
Tom Albright	tom@salk.edu	218
Zane Aldworth	zane@cns.montana.edu	43
Madhur Ambastha		224
Aaron Andalman	andalman@MIT.EDU	201
R.A. Andersen	andersen@vis.caltech.edu	36, 66, 99, 113, 188
Mike Anderson		12
Charles H. Anderson	cha@wustl.edu	44
Alessandra Angelucci	alessandra.angelucci@hsc.utah.edu	239
Toru Aonishi	aonishi@dis.titech.ac.jp	202
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Wael F. Asaad	wfasaad@MIT.EDU	98
Hiroki Asari	asari@cshl.edu	45
Robin C. Ashmore	rashmore@mail.med.upenn.edu	46
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Bruno Averbeck	baverbeck@cvs.rochester.edu	47
Yuval Aviel	yuval.aviel@epfl.ch	48
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K. Srinivasa Babu	srinivas@cmcvellore.ac.in	100
Anna-Carin Backman		210
Jonathan L. Baker	jbaker@cns.montana.edu	49, 85
Bradley Baker	bradley.baker@cmp.yale.edu	127
Jonathan L. Baker	jbaker@cns.montana.edu	200
Vijay Balasubramanian	vijay@physics.upenn.edu	28
Dana H. Ballard	dana@cs.rochester.edu	116, 224
Peter Bandettini		178
Sharba Bandyopadhyay	sbandyop@bme.jhu.edu	50
Matthew I. Banks	mibanks@wisc.edu	124, 182
O. Bar-Yosef		12
David Barber	david.barber@idiap.ch	211
Pierre Baudot	Baudot@iaf.cnrs-gif.fr	17
Liz Bauer	epbauer97@yahoo.com	9
D. Bavelier		225
Maxim Bazhenov	bazhenov@salk.edu	95
J. Beck	jbeck@bcs.rochester.edu	26, 51
Suzanna Becker	becker@mcmaster.ca	52, 87
Andrei Belitski		114, 115
Anthony J. Bell	tbell@rni.org	24
Curtis C. Bell	bellc@ohsu.edu	220, 232
M.A. Belova	mab2058@columbia.edu	53, 209
Sliman J. Bensmaïa	sliman@jhu.edu	35
Nick Bentley	nbentley@wfubmc.edu	54
Andrea Benucci	andrea@ski.org	10
Pietro Berkes	p.berkes@biologie.hu-berlin.de	55

Michael J. Berry	berry@princeton.edu	33, 68, 235, 240
Matthias Bethge	mbethge@rni.org	56, 57
Guo-Qiang Bi	gqbi@pitt.e	58
William Bialek	wbialek@princeton.edu	193, 235
Marc Binder	mbinder@u.washington.edu	181
Ágota A. Biró	biroa@koki.hu	198
Eric Bittman	elb@bio.umass.edu	69
Michael J. Black	black@cs.brown.edu	59
Clara Bodelon	clara@salk.edu	60
Vincent Bonin	vincent@ski.org	61, 96, 176
Victoria Booth	vbooth@umich.edu	62
William H. Bosking	wbosking@bcm.edu	63
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Leon Bottou	leonb@nec-labs.com	158
Olivier Bousquet	olivier.bousquet@pertinence.com	114, 115
Huseyin Boyaci	boyac003@umn.edu	175
Christine Bredfeldt	ceb@lsr.nei.nih.gov	64
Steven L. Bressler	bressler@fau.edu	76
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Scott L. Brincat	sbrincat@jhmi.edu	65
Carlos Brody	brody@cshl.edu	172
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Marina Brozovic	brozovic@vis.caltech.edu	66, 113
Ian Bruce	ibruce@ieee.org	87
Nicolas Brunel	nicolas.brunel@univ-paris5.fr	226, 227
Heinrich H. Buelthoff	heinrich.buelthoff@tuebingen.mpg.de	112
Calin Buia	buia@physics.unc.edu	67, 141
C. Andrew Burlingame	cburling@princeton.edu	68
Fiona J. Burnell	fburnell@princeton.edu	68
Will Bush	will@cs.umass.edu	69
Daniel A. Butts	dbutts@deas.harvard.edu	11
Gyorgy Buzsaki	buzsaki@andromeda.rutgers.edu	109
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Charles Cadieu	cadieu@mit.edu	70
Dirk Calow	calow@psy.uni-muenster.de	122
Giancarlo La Camera	lacamerag@mail.nih.gov	71
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Matteo Carandini	matteo@ski.org	10, 61, 96, 176
Bruce A. Carlson	bc6s@virginia.edu	72
Mikael A. Carlsson	mikael.carlsson@vv.slu.se	147
Anders E Carlsson	aec@wuphys.wustl.edu	174
Laurel H. Carney	lcarney@syr.edu	73
Rafael A. Carrasco	rafael2@utdallas	74
Eugene S Carter	gcarter@brandeis.edu	75
Jean-Pierre Changeux	changeux@pasteur.fr	119
John K. Chapin		287
Ricardo Chavarriaga	ricardo.chavarriaga@epfl.ch	254
Gal Chechik	gal@stanford.edu	12
Yonghong Chen	ychen@bme.ufl.edu	76
Sen Cheng	chengs@phy.ucsf.edu	230
E.J. Chichilnisky		212
Carson C. Chow	carsonc@nidk.nih.gov	186
Mark M Churchland	church@stanford.edu	13
Anne Churchland	churchland@shadlen.org	77
John W. Clark	jwc@wuphys.wustl.edu	82
James J. Clark	clark@cim.mcgill.ca	91
Y. E. Cohen	yale.cohen@dartmouth.edu	66
Lawrence Cohen	lawrence.cohen@yale.edu	127
H. Steven Colburn	colburn@bu.edu	296
Charles E. Connor	connor@jhu.edu	65
James Coughlan	coughlan@ski.org	29
Bruce G. Cumming	bgc@lsr.nei.nih.gov	64, 121, 195, 216
Rhodri Cusack	rhodri.cusack@mrc-cbu.cam.ac.uk	78

Hill SA D	s.hill@neu.edu	137
Knudsen D.	knudsen.d@neu.edu	137
Anders M. Dale	dale@nmr.mgh.harvard.edu	32
Yang Dan		1, 97
Mohammad Dastjerdi	mohammad@dove.ccs.fau.edu	79
V. David	vincent@chaos.gwdg.de	80
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Nathaniel D. Daw	daw@gatsby.ucl.ac.uk	14, 196
Peter Dayan	dayan@gatsby.ucl.ac.uk	14, 131, 160, 196, 293
Isabel Dean	i.dean@ucl.ac.uk	15
Daniel J. Debowy	debowd01@endeavor.med.nyu.edu	100
Christopher deCharms		22
Gustavo Deco	gustavo.deco@upf.edu	81
Stanislas Dehaene	dehaene@cea.fr	119
Babette K. Dellen	bkdellen@hbar.wustl.edu	82
Sophie Deneve	deneve@isc.cnrs.fr	83
Alain Destexhe	destexhe@iaf.cnrs-gif.fr	84
Michael DeWeese	deweese@CSHL.edu	16, 128
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Alexander G. Dimitrov	alex@cns.montana.edu	43, 85
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Lynn E. Dobrunz	dobrunz@nrc.uab.edu	256
Katja Doerschner	kd462@nyu.edu	175
Brent Doiron	bdoiron@cns.nyu.edu	86
Melissa Dominguez	domingm@mcmaster.ca	87
Dawei W. Dong	dawei@dove.ccs.fau.edu	79, 88
Sally Duarte	sduarte@bcs.rochester.edu	89, 223
Jonas Dyhrfeld-Johnsen	jdyhrfje@uci.edu	90
Jeremy E. Edgerton		117
Tina Ehtiati	tina@cim.mcgill.ca	91
Mounya Elhilali	mounya@isr.umd.edu	245
Gerhard von der Emde		232
Navzer D. Engineer	navzer@utdallas.edu	92
Roger M. Enoka	roger.enoka@colorado.edu	187
Stephan Ernst	stephan.ernst@mail.uni-oldenburg.de	271
Hugues Etienne	hugues_ec@yahoo.fr	93
Adrienne L. Fairhall	fairhall@u.washington.edu	68, 94, 169, 181, 250, 278
Mazyar Fallah	maz@salk.edu	60
Michael A. Farries	farries@u.washington.edu	94
Michale S. Fee	fee@mit.edu	167, 201
David Ferster	ferster@northwestern.edu	214
Luca A. Finelli	lfinelli@salk.edu	95
Mark C. Flynn	mflynn@lanl.gov	184
Joseph T. Francis	joe.francis@downstate.edu	287
Robert A. Frazor	robby@sky.org	10
Robert A Frazor	robby@ski.org	96
Bill Freeman	billf@csail.mit.edu	2
Yves Fregnac	Yves.fregnac@iaf.cnrs-gif.fr	17
Thane Fremouw	Thane.Fremouw@umit.maine.edu	20
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Rainer W. Friedrich	Rainer.Friedrich@mpimf-heidelberg.mpg.de	283
Robert C. Froemke	rfroemke@uclink4.berkeley.edu	97
Qian-Jie Fu	qfu@hei.org	163
Tomoki Fukai	tfukai@brain.riken.jp	139
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Fabrizio Gabbiani	gabbiani@bcm.tmc.edu	257
John D.E. Gabrieli		22
Alexander Gail	gail@vis.caltech.edu	99, 113
J. A. Garcia-Lazaro	jose.garcia-lazaro@physiol.ox.ac.uk	236
Timothy J. Gardner	tgardner@mit.edu	18
Esther P. Gardner	gardne01@endeavor.med.nyu.edu	100
Daniel Gardner	dgardner@med.cornell.edu	110

Timothy J. Gardner	tgardner@mit.edu	173
Pablo Gaspar	pgaspar@med.puc.cl	101
Michael Gastpar	gastpar@eecs.berkeley.edu	102
Katja Gebert	k.gebert@biologie.hu-berlin.de	159
Tomas Gedeon	gedeon@math.montana.edu	43
Theo Geisel	geisel@chaos.gwdg.de	80, 123, 238
Alan Gelperin		219
Dileep George	dil@stanford.edu	103, 104, 105
Wulfram Gerstner	Wulfram.Gerstner@epfl.ch	48, 106, 211, 254, 266
Joanna Gibbons		74
Guido Gigante	guido.gigante@iss.infn.it	107
Anne-Lise Giraud		108
Paolo Del Giudice	paolo.delgiudice@iss.infn.it	107
Gary H. Glover		22
Ben Godde		140
Carl Gold	carlg@caltech.edu	109
David H. Goldberg	dhg2002@med.cornell.edu	110
Mark Goldman	mgoldma1@wellesley.edu	199
Tim Gollisch	gollisch@fas.harvard.edu	111
Martin Golubitsky	mg@uh.edu	247
Arnulf B.A. Graf	arnulf.graf@nyu.edu	112
Charles M. Gray		49
Henry Greenside	hsg@phy.duke.edu	162
Bradley Greger	greger@vis.caltech.edu	113
Arthur Gretton	arthur.gretton@tuebingen.mpg.de	114, 115
Xue Gu	xgu@cs.rochester.edu	116
Emmanuel Guigon	guigon@ccr.jussieu.fr	132
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Anja Gundlfinger	anja.gundlfinger@charite.de	159
Zhongsheng Guo	jasonguo@pcg.wustl.edu	19
Boris S. Gutkin	bgutkin@pasteur.fr	118, 119
Julie S. Haas	haas@ucsd.edu	120, 197
Ralf M. Haefner	haefnerr@nei.nih.gov	121
Adrian Haith	s0344718@sms.ed.ac.uk	207
Eric Halgren	halgren@nmr.mgh.harvard.edu	32
Fred H. Hamker	fhamker@uni-muenster.de	122
Qian Han		210
Timothy D. Hanks	tim@shadlen.org	288
David Hansel	David.Hansel@univ-paris5.fr	226, 227
Bill S. Hansson		147, 210
Nicol S Harper	nicol.harper@ucl.ac.uk	15
Mary Harrington		69
Robert A. Harris		33
Rob Harris		240
Joachim Hass	joachim@chaos.gwdg.de	123, 238
Nicholas Hatsopoulos	nicho@uchicago.edu	37
Jeff Hawkins	jhawkins@rni.org	103, 104, 105
Yong He		261
Hauke Heekeren	hauke.heekeren@charite.de	178
Harald Hentschke	hhentschke@wisc.edu	124
Darrell Henze	darrell_henze@merck.com	109
Ralf Herbrich		114, 115
J.M. Herrmann	michael@chaos.gwdg.de	80, 123, 238
Christopher L Heydrick		74
Matthew Higgs	higgsm@u.washington.edu	250
J.A. Hirsch		150
Mark H. Histed	histed@mit.edu	125
Thomas Hoch	hoch@cs.tu-berlin.de	126
Timothy E. Holy	holy@wustl.edu	19
Gregg E. Homanics		124
Ryota Homma	ryota.homma@yale.edu	127
Tomas Hromadka	hromadka@cshl.edu	128
Anne Hsu	showen@uclink4.berkeley.edu	20

Xin Huang	xin@salk.edu	129
Fu-Jie Huang	jhuangfu@cs.nyu.edu	158
Thomas Huber	hubert@mail.rockefeller.edu	168
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Chou Hung	chouhung@mit.edu	130
Quentin J.M. Huys	qhuys@gatsby.ucl.ac.uk	42, 131, 293
Alexandre Hyafil	alexandre.hyafil@laposte.net	132
Antje Ihlefeld	ihlefeld@bu.edu	133
Masashi Inoue		202
Dieter Jaeger	djaeger@emory.edu	117
Roshini Jain	roshini.jain@utdallas.edu	74
Viren Jain	viren@mit.edu	294
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Tim Jarksy	t-jarsky@northwestern.edu	31
Mehrdad Jazayeri	mjaz@cns.nyu.edu	134
Tianzi Jiang	jiangtz@nlpr.ia.ac.cn	261
Dezhe Z. Jin	djin@phys.psu.edu	135, 138
Daphna Joel	djoel@post.tau.ac.il	196
Kenneth O. Johnson	johnson@mbi.mb.jhu.edu	35
Renaud Jolivet	renaud.jolivet@epfl.ch	106
Ron Jortner	ronijort@alice.nc.huji.ac.il	136
Jorge V. Jose	j.jose@neu.edu	137
Kresimir Josic	josic@math.uh.edu	247
Benjamin Judkewitz	Benjamin.Judkewitz@urz.uni-heidelberg.de	283
Joseph K. Jun	juj12@psu.edu	138
John Kalaska	kalaskaj@PHYSIO.UMontreal.CA	152
S. Kang	siu@brain.inf.eng.tamagawa.ac.jp	139
Nancy Kanwisher		3
Yen-Hong Kao	yen@mail.med.upenn.edu	28
Matthias Kaschube	matze@chaos.gwdg.de	140
Christian Kasess	ckasess@physics.unc.edu	141
William L. Kath	kath@northwestern.edu	31
Kosuke Kawakyu	kosuke@mit.edu	142
Masashi Kawasaki	mk3u@virginia.edu	72
Peter König	peter_koenig@osnnet.de	38
Tara Keck	tk@bu.edu	143
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Richard Kempster	r.kempster@biologie.hu-berlin.de	159
Garrett T. Kenyon	gkenyon@lanl.gov	184
Adam Kepecs	kepecs@cshl.edu	144
Shaban Khanbabaie	reza@hbar.wustl.edu	145
Roosbeh Kiani	roosbeh@u.washington.edu	77
Michael P. Kilgard		74, 92
Michelle M. Kim	mmk35@columbia.edu	292
K. Kitano	kitano@ci.ritsumei.ac.jp	139
F. Klam	fklam@bcs.rochester.edu	146
Andreas Kleinschmidt		108
Philipp Knsel	pknuesel@ini.phys.ethz.ch	147
Per Magne Knutsen	per.knutsen@weizmann.ac.il	148
Christof Koch		5, 109
Etienne Koechlin	koechlin@ccr.jussieu.fr	132, 149
Kilian Koepsell	kkoepsell@rni.org	56, 150
Nancy Kopell		194, 249, 251
Efstratios Kosmidis		127
Minjoon Kouh	kouh@mit.edu	70, 151
Alex Koulakov	akula@cshl.edu	219, 268
Alexander Kraskov		130
Klaus Kreikemeier	Klaus.Kreikemeier@neuroinformatik.ruhr-uni-bochum.de	140
Gabriel Kreiman	kreiman@mit.edu	130
Bart Krekelberg	bart@salk.edu	218
Nedialko Krouchev	Krouchen@physio.umontreal.ca	152
Arvind Kumar	arvind.kumar@biologie.uni-freiburg.de	153
Jean-Philippe Lachaux	lachaux@lyon.inserm.fr	49

Gerardo Lafferriere	gerardol@pdx.edu	220
Michael S. Landy	landy@nyu.edu	267
Markus Lappe		122
Liora Las	lioraa@md.huji.ac.il	155
P.E. Latham	pel@gatsby.ucl.ac.uk	26, 51, 225, 242
Pakming Lau	plau@pitt.edu	58
Helmuth Laufs		108
Gilles Laurent	laurentg@caltech.edu	95, 136, 248
Thomas Z. Lauritzen	tlauritzen@rni.org	156
Aurel A. Lazar	aurel@ee.columbia.edu	157
Siegrid Löwel		140
Jörg Lücke	luecke@neuroinformatik.rub.de	154
Yann LeCun	yann@cs.nyu.edu	158
Joseph LeDoux	ledoux@cns.nyu.edu	9, 228
Daeyeol Lee	dlee@cvs.rochester.edu	47
Cees van Leeuwen	ceesvl@brain.riken.jp	190
Christian Leibold	c.leibold@biologie.hu-berlin.de	159
Roger Lemon	rlemon@ion.ucl.ac.uk	265
Mate Lengyel	lmate@gatsby.ucl.ac.uk	160
Nicholas A. Lesica	lesica@fas.harvard.edu	21
Manuel Levy	Levy@iaf.cnrs-gif.fr	17
Alex Lewis	alex.lewis@ucl.ac.uk	161
Meng-Ru Li	mrli@phy.duke.edu	162
Tianhao Li	tianhaol@usc.edu	163
Lei Li	lei.li@downstate.edu	287
Meng Liang		261
Li Liang		277
Jennifer F. Linden	j.linden@ucl.ac.uk	164
John Lisman	lisman@brandeis.edu	165
Chung-Chuan Lo	ccllo@brandeis.edu	166
Nikos Logothetis		4, 114, 115
Michael A. Long	miclong@mit.edu	167
Andre Longtin		183
Matthieu Louis	louism@mail.rockefeller.edu	168
Thomas Lu	tlu@bme.jhu.edu	277
Hans R. Luescher		71, 106
H. Luksch	luksch@bio2.rwth-aachen.de	145
Brian Lundstrom	lundbr@u.washington.edu	169
Huan Luo	huanl@wam.umd.edu	170
Kristen Lutomski	kristen_lutomski@neurion.com	22
Ma, W.J.	ma@klab.caltech.edu	225
Anna Ma-Wyatt	anna@ski.org	171
Christian Machens	machens@cshl.edu	172
Josie A. Mackenzie	jam33@le.ac.uk	210
Sean C. Mackey		22
Saxon MacLeod	saxon_macleod@neurion.com	22
Fumiko Maeda	fumiko@psych.stanford.edu	22
Marcelo O. Magnasco	magnasco@rockefeller.edu	173
A.S. Mahani	amahani@hbar.wustl.edu	145
Alireza S Mahani	amahani@wustl.edu	174
Zachary F. Mainen	mainen@cshl.edu	144
Guy Major	gmajor@princeton.edu	199
Leonard Maler	lmaler@uottawa.ca	86, 183
Roberto Malinow		228
Laurence T. Maloney	ltm1@nyu.edu	175, 267
Valerio Mante	valerio@ski.org	61, 96, 176
Maria Markaki	mmarkaki@csd.uoc.gr	177
Olivier Marre		17
Sean Marrett	marrett@nih.gov	178
Narihisa Matsumoto	xmatumo@ni.aist.go.jp	179
Maurizio Mattia	mattia@iss.infn.it	107
John H.R. Maunsell	maunsell@bcm.edu	63, 257
Mark Mazurek	mazurek@u.washington.edu	288

McElligott MB		137
David McAlpine	d.mcalpine@ucl.ac.uk	15, 41
James L. McClelland	jlm@cnbc.cmu.edu	186
Suzanne P. McKee	suzanne@ski.org	171, 270
Maria McKinley		288
Douglas McLelland	douglas.mclelland@physiol.ox.ac.uk	180
Alyssa McMenamy		74
Rebecca Mease	beckin@u.washington.edu	181
W. Hamish Mehaffey	whmehaff@ucalgary.ca	86
Markus Meister	meister@mcb.harvard.edu	23, 213, 276
Bartlett W. Mel	mel@usc.edu	295
Eduardo Mercado	emiii@buffalo.edu	164
Elliott B. Merriam	ebmerriam@wisc.edu	182
Michael M. Merzenich		164
Jason Middleton	jmidd620@science.uottawa.ca	183
Earl K. Miller	ekmiller@mit.edu	25
John Miller		43
Earl K. Miller	ekmiller@mit.edu	98, 125
Jeremy A. Miller	jeremy42@comcast.net	184
Jude F Mitchell	Jude@salk.edu	258
Keiji Miura	kmiura@brain.riken.jp	185
Hiroyoshi Miyakawa	miyakawa@ls.toyaku.ac.jp	202
Takashi Mizuhiki	mizuhiki@aist.go.jp	30
Marion Moisel		159
Samat Moldakarimov	sam47@pitt.edu	186
Robert J. Morgan	rjmorgan@uci.edu	90
Anna T. Moritz	atmoritz@u.washington.edu	187
S.E. Morrison	sem2104@columbia.edu	209
Raluca Moucha		74, 92
J. Anthony Movshon	movshon@nyu.edu	134
Eran A. Mukamel	emukamel@stanford.edu	281
Grant H. Mulliken	grant@caltech.edu	188
Yusuke Murayama		114, 115
Sam Musallam	sam@vis.caltech.edu	188
Karim Nader	karim.nader@mcgill.ca	9
Felix Naef		18
Mor Nahum	moris@alice.nc.huji.ac.il	189
Junichi Nakai	jnakai@brain.riken.jp	292
Hironori Nakatani	hnakatani@brain.riken.go.jp	190
Rajiv Narayan	rn@bu.edu	191
Rama Natarajan	rama@cs.toronto.edu	131, 293
Bjrn Naundorf	bjoern@chaos.gwdg.de	192
Verónica Nácher	vnacher@usc.es	40
Paul Nealen	pnealen@sas.upenn.edu	234
Maria Neimark	neimark@fas.harvard.edu	23
Israel Nelken		12, 155, 189
Ilya Nemenman	ilya.nemenman@columbia.edu	193
Theoden I. Netoff	tnetoff@bu.edu	182, 194
Veronika Neuert	V.Neuert.99@cantab.net	271
Hendrikje Nienborg	hn@lsl.nei.nih.gov	195
Yael Niv	yael@gatsby.ucl.ac.uk	14, 196
Fernando Nottebohm	nottebo@mail.rockefeller.edu	18
Crystal T. Novitski	novitski@utdallas.edu	92
Thomas Nowotny	tnowotny@ucsd.edu	120, 197
Zoltan Nusser	nusser@koki.hu	198
Klaus Obermayer	oby@cs.tu-berlin.de	126, 239
Masamichi Ohkura		292
Sabiela Ojeda	sfojeda@dec.usc.es	40
Masato Okada	okada@brain.riken.jp	179, 185, 202
Itsaso Olasagasti	iolasaga@wellesley.edu	199
Fred Ollinger	follinger@monell.org	219
Bruno A. Olshausen	baolshausen@ucdavis.edu	200
Bence Olveczky	olveczky@fas.harvard.edu	201

Toshiaki Omori	omori@brain.riken.jp	202
Itzel Orduna	orduna@axon.rutgers.edu	164
Stelios Orphanoudakis	orphanoudakis@admin.forth.gr	177
Gonzalo H. Otazu	otazu@cshl.edu	203
Hysell Oviedo	oviedo@cshl.edu	204
John Palmer	jpalmers@u.washington.edu	288
Pritesh K. Pandya		74, 92
Liam Paninski	liam@gatsby.ucl.ac.uk	42, 205, 206, 207, 208, 212, 265
Lucas C. Parra	parra@ccny.cuny.edu	24
Anitha Pasupathy	anitha@mit.edu	25
J.J. Paton	jp2063@columbia.edu	53, 209
Jon Pauls		114, 115
Ole Paulsen	ole.paulsen@physiol.ox.ac.uk	180
John M. Pauly		22
Robert A. Pearce		124
Tim C. Pearce	tcp1@leicester.ac.uk	147, 210
Miao Peng		261
Mark G. Perkins	perkins@physiology.wisc.edu	124
Dmitri Pervouchine	dp@bu.edu	194
Yury Petrov	yury@ski.org	270
Jean-Pascal Pfister	jean-pascal.pfister@epfl.ch	211, 266
Maciej Pietr	maciej.pietr@weizmann.ac.il	148
Jonathan W. Pillow	pillow@cns.nyu.edu	207, 208, 212
Steven Pinker	pinker@wjh.harvard.edu	32
Xaq Pitkow	pitkow@fas.harvard.edu	213
Gina R. Poe	ginapoe@med.umich.edu	62
David Poeppel	dpoeppel@DEANS.UMD.EDU	170
Tomaso Poggio		70, 130, 151, 243
Alex Pouget	alex@bcs.rochester.edu	26, 51, 146, 225, 242
Randall K. Powers	rkpowers@u.washington.edu	181, 187
Nicholas Priebe	nico@northwestern.edu	214
Jason Puchalla	puchalla@princeton.edu	240
Amanda C. Puckett	apuckett@utdallas.edu	74, 92
Dale Purves		289
Rodrigo Quian-Quiroga		5, 36, 130
Sridhar Raghavachari	sraghava@brandeis.edu	165
Kanaka Rajan	kanaka@brandeis.edu	27
Fethi M. Ramazanoglu	fethi@mit.edu	135
Rajesh P. N. Rao	rao@cs.washington.edu	215
Malte Rasch		286
Charles Ratliff	ratliff@sas.upenn.edu	28
Alexander Rauch	arauch@tuebingen.mpg.de	71, 106
Heather Read		87
Jenny Read	jcr@lsl.nei.nih.gov	216
Leila Reddy		5
Martin Rehn	rehn@nada.kth.se	217
Laura Walker Renninger	laura@ski.org	29
John H. Reynolds	reynolds@salk.edu	60, 258
Micah Richert	mrichert@ucsd.edu	218
Barry J. Richmond	bjr@ln.nimh.nih.gov	30
Maximilian Riesenhuber	mr287@georgetown.edu	70
Bixio Rimoldi	bixio.rimoldi@epfl.ch	102
Dima Rinberg	drinberg@monell.org	219
Patrick D. Roberts	robertpa@ohsu.edu	220, 221, 232
Javier Roca-Pardiñas	roca@uvigo.es	40
Ariel Rokem	arokem@pob.huji.ac.il	189
Uri Rokni	rokniu@mit.edu	222
Edmund Rolls	Edmund.Rolls@psy.ox.ac.uk	81
Ranulfo Romo		6
Nathan Rosecrans	nrosecrans@bcs.rochester.edu	89, 223
Stefan Roth	roth@cs.brown.edu	59
Conatntin Rothkopf	crothkopf@bcs.rochester.edu	224, 225
Stefan Rotter	rotter@biologie.uni-freiburg.de	153

Alex Roxin	alexander.roxin@univ-paris5.fr	31, 226, 227
Michael Rudolph		84
Douglas Ruff	ruffd@mail.nih.gov	178
Simon Rumpel	rumpel@cshl.org	228
Clifton C. Rumsey	rumsey@brandeis.edu	229, 273
Stephen I. Ryu	seoulman@stanford.edu	13, 290, 291
Virginia R. de Sa	desa@cogsci.ucsd.edu	255
Philip N. Sabes	sabes@phy.ucsf.edu	230
Maneesh Sahani	maneesh@gatsby.ucl.ac.uk	164
Ned T. Sahin	sahin@fas.harvard.edu	32
Thomas P. Sakmar	sakmar@mail.rockefeller.edu	168
Emilio Salinas	esalinas@wfubmc.edu	54
C.D. Salzman		53, 209
Vijayalakshmi Santhakumar	vsanthak@uci.edu	90
Gopal Santhanam		13, 290, 291
Satyavarta	sat@cns.bu.edu	231
Nathaniel Sawtell	sawtell@ohsu.edu	220, 232
J. Scalón		53
Gregor Schöner	Gregor.Schoener@neuroinformatik.rub.de	284
Gabriele Scheler	scheler@stanford.edu	233
Erik J. Schlicht	schl0360@umn.edu	237
Marc F. Schmidt	marcschm@sas.upenn.edu	46
Karl-Friedrich Schmidt		140
Marc F. Schmidt	marcschm@sas.upenn.edu	234
Dietmar Schmitz	dietmar.schmitz@charite.de	159
Michael Schnabel	mick@chaos.gwdg.de	140
Elad Schneidman	elads@princeton.edu	235, 240
Mark J. Schnitzer	mschnitz@stanford.edu	281
J. W. H. Schnupp	jan.schnupp@physiol.ox.ac.uk	236
Bernhard Schoelkopf		112, 114, 115
Don Schomer	dschomer@caregroup.harvard.edu	32
Sven Schrader	sven.schrader@biologie.uni-freiburg.de	153
Paul R. Schrater	schrater@umn.edu	237
Hecke Schrobsdorff	hecke@chaos.gwdg.de	238
Charles E. Schroeder	Schrod@NKI.RFMH.ORG	76
Lars Schwabe	schwabe@cs.tu-berlin.de	239
Gregory W. Schwartz	gwschwar@princeton.edu	33
Ronen Segev	rsegev@princeton.edu	240
Terrence J. Sejnowski		95, 118
Kamal Sen	kamalsen@bu.edu	191, 251
Walter Senn	wsenn@cns.unibe.ch	71, 241
Peggy Series	pseries@gatsby.ucl.ac.uk	242
Thomas Serre	serre@MIT.EDU	243
Sebastian Seung	seung@mit.edu	135, 294
Michael N. Shadlen		77, 288
Maoz Shamir	maoz@fiz.huji.ac.il	244
Shihab Shamma	sas@isr.umd.edu	245
Jonathan Shaw	jshaw@cs.rochester.edu	224, 246
Eric T. Shea-Brown	ebrown@math.nyu.edu	247
Melissa A Sheiko	melissa.a.sheiko.04@alum.dartmouth.org	85
Kai Shen	kai@caltech.edu	248
Krishna V. Shenoy	shenoy@stanford.edu	13, 290, 291
Denis Sheynikhovich	denis.sheynikhovich@epfl.ch	254
Munetaka Shidara	m.shidara@aist.go.jp	30
Barbara G. Shinn-Cunningham	shinn@cns.bu.edu	133, 142, 231
Shigeru Shinomoto	shinomoto@scphys.kyoto-u.ac.jp	185
Jonathon Shlens	jonshlens@ucsd.edu	212
Hava Siegelmann	Hava@cs.umass.edu	69
Jonathan Z. Simon		170
Eero P. Simoncelli		7, 208, 212, 253
Ehud Sivan	ehud@bu.edu	249
Niels Skals		210
Sean Slee	seans2@u.washington.edu	250

A.C. Smith	annesmith@ucdavis.edu	53
Alex Smola	alex.smola@nicta.com.au	114, 115
Ross K. Snider	RossS@ece.montana.edu	277
William Softky	bsoftky@rni.org	34
Ivan Soltesz	isoltesz@uci.edu	90
Fritz Sommer		150, 217
Haim Sompolinsky	haim@fiz.huji.ac.il	213, 222, 244, 282
Deepak J. Soneji	sonejid@psych.stanford.edu	22
Gabriel Soto	gabys@math.bu.edu	251
William Spain		250
Nelson Spruston		31
Arun P. Sripati	sparun@jhu.edu	35
Garrett B. Stanley	gstanley@deas.harvard.edu	11, 21, 279
Peter N. Steinmetz	Peter.Steinmetz@asu.edu	252
Peter Sterling		28
Rob de Ruyter van Steveninck	deruyter@indiana.edu	193
Chuck Stevens		8
Klaus M Stiefel	stiefel@salk.edu	118
Alan Stocker	alan.stocker@nyu.edu	253
Gene R. Stoner	gene@salk.edu	129
Mark Stopfer	stopferm@mail.nih.gov	95
Thomas Strösslin	thomas.strosslin@a3.epfl.ch	254
Yasuko Sugase-Miyamoto	y-sugase@aist.go.jp	179
Manqiu Sui		261
Thomas J. Sullivan	tom@sullivan.to	255
Hua Yu Sun	sun@nrc.uab.edu	256
Ping Sun	psun@bcm.tmc.edu	257
Kristy A Sundberg	Sundberg@salk.edu	258
Lung-Hao Tai	ltai@cshl.edu	259
Takuma Takanashi		210
Marcel Tam	mtam@u.washington.edu	77
David Tank		199
Dawn M. Taylor	dxt42@cwru.edu	260
Frederic Theunissen		20
Dave Thurbon		71
Lixia Tian	lxtian@nlpr.ia.ac.cn	261
Paul Tiesinga	tiesinga@physics.unc.edu	67, 141, 262, 264
Igor Timofeev		84
Naftali Tishby	tishby@cs.huji.ac.il	12
Emanuel Todorov	todorov@cogsci.ucsd.edu	263
Elizabeth B. Torres	etorres@vis.caltech.edu	36
J. Vincent Toups	toups@physics.unc.edu	264
Ben Townsend	b.townsend@ion.ucl.ac.uk	265
Taro Toyozumi	taro@sat.t.u-tokyo.ac.jp	211, 266
Stefan Treue	treue@gwdg.de	269
Julia Trommershäuser	Julia.Trommershaeuser@psychol.uni-giessen.de	267
Dmitry Tsigankov	dmitry@cshl.edu	268
Lev Tsimring	ltsimring@ucsd.edu	90
Ray W. Turner		86
Tzvetomir Tzvetanov	ttzvetanov@dpz.gwdg.de	269
Naoshige Uchida	uchida@cshl.edu	144
Nachum Ulanovsky	nulanovsky@psyc.umd.edu	155
Istvan Ulbert		32
Leslie G. Ungerleider	ungerlel@mail.nih.gov	178
Preeti Verghese	preeti@ski.org	29, 270
Jesko L Verhey	jesko.verhey@uni-oldenburg.de	271
Paul F.M.J. Verschure	pfmfv@ini.phys.ethz.ch	38, 147
Jonathan D. Victor	jdvicto@med.cornell.edu	110
Renan Wesley Farinazzo Vitral	renan@icb.ufjf.br	272
Tim Vogels	vogels@brandeis.edu	273
Horatiu Voicu	horatiu@voicu.us	274
Maxim Volgushev	maxim@neurop.ruhr-uni-bochum.de	192
C. van Vreeswijk	carl.van-vreeswijk@biomedicale.univ-paris5.fr	275

Saskia E J de Vries	sdevries@fas.harvard.edu	276
Xiao-Jing Wang	xjwang@brandeis.edu	75, 98
xin Wang	xinw@usc.edu	150
Qingbo Wang		150
Xiao-Jing Wang	xjwang@brandeis.edu	166
Yadong Wang	ydwang@umd.edu	170
Yufeng Wang	wangyf@bjmu.edu.cn	261
Xiaoqin Wang	xwang@bme.jhu.edu	277
Barry Wark	bwark@u.washington.edu	278
Roxanna M. Webber	webber@fas.harvard.edu	279
Michael S. Wehr	wehr@cshl.edu	45, 280
Yichun Wei	yichunwe@usc.edu	150
Michael Weliky	weliky@cvs.rochester.edu	89, 223
Ralf Wessel	rw@wuphys.wustl.edu	82, 145, 174
Daniel Z. Wetmore	wetmore@stanford.edu	281
John A. White	jwhite@bu.edu	39, 143, 194
Olivia L. White	owhite@fas.harvard.edu	282
Felix A. Wichmann	felix.wichmann@tuebingen.mpg.de	112
Martin T. Wiechert	wiechert@mpimf-heidelberg.mpg.de	283
J. Martin Wild		46
Claudia Wilimzig	Claudia.Wilimzig@neuroinformatik.rub.de	284
Christopher Williams		207
Alan Williams		220, 232
David Willshaw	willshaw@inf.ed.ac.uk	285
Ian M Winter		271
Laurenz Wiskott	l.wiskott@biologie.hu-berlin.de	55, 286
Jan Marti Wojtowicz	martin.wojtowicz@utoronto.ca	52
Fred Wolf		140, 192
Thilo Womelsdorf	t.womelsdorf@fcdonders.ru.nl	269
Sarah Woolley	swoolley@socrates.berkeley.edu	20
Wei Wu	weiwu@uchicago.edu	37
Reto Wyss	reto@klab.caltech.edu	38
Shaohua Xu	shaohua.xu@downstate.edu	287
Tianming Yang	tyang@shadlen.org	288
Zhiyong Yang	zhyyang@duke.edu	289
Shih-Cheng Yen	shihcheng@alumni.upenn.edu	49, 85, 200
Eric D. Young	eyoung@bme.jhu.edu	12, 50
Byron M. Yu	byronyu@stanford.edu	13, 290, 291
C. Ron Yu	cry@stowers-institute.org	292
Anthony M. Zador	zador@cshl.edu	16, 45, 128, 203, 204, 228, 259, 280
Yufeng Zang		261
Richard S. Zemel	zemel@cs.toronto.edu	131, 146, 293
Li Zhaoping	z.li@ucl.ac.uk	161
Valentin Zhigulin	valentin@mit.edu	294
Chunhong Zhou	chunhonz@usc.edu	295
Yi Zhou	yizhou@bu.edu	296
Junmei Zhu	jzhu@memphis.edu	297
Yu Zhuang	zhuang@cs.ttu.edu	298
Marc Zirnsak	zirnsak@psy.uni-muenster.de	122