
BARRELS XXXVII, 2024

Chicago, Illinois

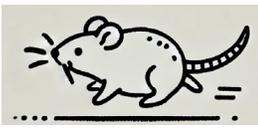
*Chicago campus of Northwestern University:
Baldwin Auditorium, Robert H Lurie Medical Research Center,
303 E. Superior Street Chicago, IL 60611*

Organizers

Solange Brown (Johns Hopkins)
Josh Brumberg (CUNY)
Randy Bruno (Oxford)
Dan Feldman (Berkeley)
Mitra Hartmann (Northwestern)
Kate Hong (CMU)
Dieter Jaeger (Emory)
Krishna Jayant (Purdue)
David Kleinfeld (UCSD)
Keerthi Krishnan (UTK)

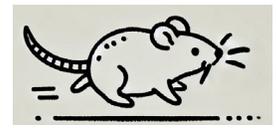
Soohyun Lee (NIH/NIMH)
Farzaneh Najafi (Georgia Tech)
Daniel O'Connor (Johns Hopkins)
Simon Peron (NYU)
Carl Petersen (EPFL)
Scott Pluta (Purdue)
Robert Sachdev (Humboldt-Berlin)
Gordon Shepherd (Northwestern)
Jochen Staiger (Goettingen)
Edward Zagha (UC Riverside)

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THURSDAY MORNING: 8:30 AM - 11:00 AM

8:30 – 9:00 AM	Coffee
9:00 AM – 9:15 AM	Welcome and Outline of Discussion for position paper: <i>Randy Bruno</i>
9:15 AM - 9:45 AM	Invited Talk: Barrel cortex interactions with posterior parietal cortex <i>Adrian Roggenbach, Shuting Han, Fritjof Helmchen</i> , Brain Research Institute; University of Zurich
9:45 AM - 10:00 AM	Short Talk: Disruption of Efficient Maternal Behavior Through Cortical PNN Manipulation <i>Joseph D. Martin, Keerthi Krishnan, Billy Y. B. Lau</i> Dept. of Biochemistry & Cellular and Molecular Biology; 2 Dept. of Psychology and Dept. of Biochemistry & Cellular and Molecular Biology, University of Tennessee, Knoxville, TN
10:00 AM – 10:15 AM	Short Talk: Perceptual decision-making correlates in the primary somatosensory cortex <i>Alex G. Armstrong & Yurii A. Vlasov</i> University of Illinois, Urbana-Champaign
10:15 AM – 10:45 AM	Invited Talk: Long-lasting, subtype-specific regulation of SST neurons during sensory learning <i>Alison L. Barth, Mo Zhu, Matt B. Mosso, Xiaoyang Ma</i> Carnegie Mellon University
10:45 AM – 11:00 AM:	Coffee Break
11:00 AM – 11:30 AM:	Invited Talk: Coordinated development of inhibitory and excitatory networks, <i>Natalia De Marco García</i> , Center for Neurogenetics, Brain and Mind Research Institute, Weill Cornell Medicine, New York
11:30 AM – 11:45 AM	Short Talk: Cortical circuits for context-dependent sensory processing, <i>Pol Bech-Vilaseca, R Dard, S Crochet, CCH Petersen</i> , EPFL
11:45 PM – 12:00 PM	Stretch Break
12:00 PM – 1:30 PM	Position Paper Discussion: Moderator: Gordon Shepherd <ul style="list-style-type: none"> Brain loops - David Kleinfeld <ul style="list-style-type: none"> Thalamocortical loops - Simone Russo Cortico-cortical loops - Daniel Schultz Open microphone Internal models - Soohyun Lee <ul style="list-style-type: none"> Motor control - Farzaneh Najafi Self-motion - Scott Pluta Open microphone Perception of touch - Randy Bruno <ul style="list-style-type: none"> Biomechanics - Mitra Hartmann Cortical representations - Garrett Stanley Open microphone Disease models - Daniel Feldman <ul style="list-style-type: none"> Open microphone Recap - Randy Bruno
1:30 PM – 3:00 PM	LUNCH BREAK

THURSDAY AFTERNOON 3:00 PM - 6:00 PM

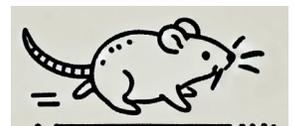
- 3:00 PM – 3:30 PM** **Invited Talk: Heterarchical cortical and subcortical control of limb movements** Joshua Dudman Jason Keller; Junchol Park, Janelia & Princeton
- 3:30 PM – 4:00 PM** **Invited Talk: From circuits to subspaces: The control of movements by the mouse motor cortex**, Michael N. Economo Boston University
- 4:00 PM – 4:15 PM** **Short Talk: Cortical and collicular role in multimodal self-initiated sequential behaviors** Myriam Hamon, Tatiana Lupashina, Jeremie Sibille, Matthew E Larkum, Robert NS Sachdev, Jens Kremkow BCCN Berlin, Humboldt Univ., Neurosci. Res. Ctr. Charité-Universitätsmedizin, Berlin, Germany
- 4:15 PM – 4:30 PM** **Short Talk: Pre-neuronal biomechanical filtering supports tactile encoding**, Neeli Tummala^{1,2}, Gregory Reardon^{1,2}, Bharat Dandu², Yitian Shao², Hannes P. Saal³, Yon Visell². ¹Northwestern University, ²University of California Santa Barbara, ³University of Sheffield
- 4:30 PM – 4:45 PM** **Short Talk: Morphological simplification of the motor control of whisking** Chris S. Bresee, Yifu Luo, Jasmine L. Alade'Fa, Megan E. Black, Kevin J. Kleczka, Nicholas E. Bush, Kevin Zhang, Mitra J.Z. Hartmann Northwestern University Evanston, Illinois
- 4:45 PM – 5:00 PM** **Stretch Break**
- 5:00 PM – 5:15 PM** **Short Talk: The role of primary somatosensory cortex and the superior colliculus in tactile detection**, Alice Y. Nam, Jiwook Shin, Morgan Tenney, Baihe Zhang, and Y. Kate Hong, Carnegie Mellon University
- 5:15 PM – 5:30 PM** **Short Talk: JEDI-1P wide-field cortex voltage imaging during a forelimb reaching task reveals task-related network processing**, Dieter Jaeger and Yunmiao Wang, Emory University
- 5:30 PM – 5:45 PM** **Short Talk: A cortical network for tongue control in probabilistic motor sequences** Jeong Jun Kim, Daniel H. O'Connor, Johns Hopkins University
- 5:45 PM – 6:00 PM** **Short Talk: Traveling waves support dynamic rerouting of communication subspaces across the motor cortical hierarchy**, Hammad F. Khan^{1,2}, O.T. Kolhe^{1,2}, M. Habibimatin^{1,2}, E. Tanase³, K. Jayant^{1,2} 1. Weldon School of Biomedical Engineering; 2. Purdue Institute for Integrative Neuroscience; 3. Elmore School of Electrical and Computer Engineering
- 6:00 PM – 9:00 PM** **DINNER AND POSTERS**

Talk and poster abstracts start on page 5



FRIDAY MORNING: 8:30 AM - 11:00 AM

8:30 – 9:00 AM	Coffee
9:00 AM – 9:30 AM	Invited Talk: Network influence determines the impact of cortical ensembles on stimulus detection. <i>Hayley Bounds, <u>Hillel Adesnik</u></i> , UC Berkeley Department of Neuroscience
9:30 AM – 9:45 AM	Short Talk: Behavioral relevance shapes motor cortical representation of bilateral tactile space <i><u>Hayagreev V.S. Keri</u>^{1,2}, Sydney J. Sneed¹, Scott R. Pluta^{1,3}</i> 1 Department of Biological Sciences, Purdue University; 2 Weldon School of Biomedical Engineering, Purdue University. 3 Purdue Institute of Integrative Neuroscience, Purdue University
9:45 AM - 10:00 AM	Short Talk: Single-branch preference in thalamocortical axodendritic synaptic targeting <i><u>A. Agmon</u> and Y. Kubota</i> , Dept. of Neuroscience, West Virginia University, Morgantown, WV and Section of Electron Microscopy, National Institute of Physiological Sciences, Okazaki, Japan
10:00 AM - 10:15 AM	Short Talk: Nonuniform NMDA Expression in L2/3 dendrites Allows Differential Processing of Bottom-up and Top down Inputs <i><u>Viktor J Olah</u> & <u>Matthew JM Rowan</u></i> , Emory University
10:15 AM - 10:30 AM	Short Talk: Understanding the Role of Neural Synchrony in Motor Control Using Holographic Optogenetics, <i><u>Ian Anton Oldenburg</u></i> , Rutgers University
10:30 AM - 10:45 AM	Coffee Break
10:45 AM - 11:15 AM	Invited Talk: Neural circuits of thermal perception <i><u>James Poulet</u></i> Max Delbrück Center (MDC), Berlin
11:15 AM - 11:45 AM	Short Talk: Population codes across cortex: Generalization and specialization in inhibitory microcircuits <i><u>Caroline A. Runyan</u></i> , University of Pittsburgh
11:45 AM - 12:00 AM	Short Talk: Context representation in mouse frontal cortex during a short-term memory task. <i>Parviz Ghaderi, Sylvain Crochet and <u>Carl C.H. Petersen</u></i> , EPFL, Switzerland
12:00 AM - 12:15 PM	Short Talk: Consequences of individual PV and VIP interneuron firing on the output of postsynaptic SST neurons in mouse barrel cortex, <i><u>F. Preuß</u>, M. Möck, M. Witte, J. F. Staiger</i> University Medical Center Goettingen, Department of Neuroanatomy, Goettingen, Germany
12:15 PM - 12:30 PM	Short Talk: Real world neuroscience, <i><u>Saikat Ray</u></i> , Weizmann Institute of Science
12:30 PM - 12:45 PM	Stretch Break
12:45 PM - 1:15 PM	Invited Talk: Local and long-range control of gamma-band synchrony in cortical circuits <i><u>Julia Veit</u></i> University of Freiburg
1:15 PM - 2:00 PM	LUNCH BREAK



FRIDAY AFTERNOON: 2:00 PM - 5:00 PM

- 2:00 PM - 2:15 PM** **Short Talk: Simultaneous Targeting of Layer 2/3 and Layer 5 Cortical Neurons using an Enhancer-AAV Only Approach** Matthew JM Rowan, Viktor J Olah, Jenni Issac, Annie Goettemoeller, Emory University
- 2:15 PM - 2:30 PM** **Short Talk: Three-dimensional architecture and linearized mapping of vibrissa follicle afferents**, Ben Gerhardt, Michael Brecht, BCCN Humboldt Universitaet, Berlin
- 2:30 PM - 2:45 PM** **Short Talk: Dopaminergic Signaling Drives Rapid Increases in BBB Permeability.** Kevin L Turner^{1,2}, Sinda Fekir^{1,2}, Seneca Scott^{1,2}, Chanel I. Johnson^{1,2}, Allison Lindquist³, Joseph Namkung^{1,2}, David Berson^{1,2}, Yongxin Zhao³, and Christopher I. Moore^{1,2} 1. Department of Neuroscience, Brown University, Providence, RI, USA 2. Carney Institute for Brain Science, Brown University, Providence, RI, USA 3. Department of Biological Sciences, Carnegie Mellon University, Pittsburgh, PA, USA.
- 2:45 PM - 3:00 PM** **Short Talk: Depth-dependent variations in morphoelectric properties reveal the molecular identity of cortical interneurons.** Felipe Yáñez, Fernando Messori, Guanxiao Qi, Dirk Feldmeyer, Bert Sakmann, Marcel Oberlaender, Max Planck Institute for Neurobiology of Behavior
- 3:00 PM - 3:15 PM** **Short Talk: Parvalbumin interneurons regulate circuit plasticity in the healthy and injured somatosensory cortex.** Baruc Campos, Brenda Vasquez, Iris Marmouset-De La Taille Tretin, & William Zeiger, Department of Neurology, David Geffen School of Medicine, University of California - Los Angeles, Los Angeles, CA
- 3:15 PM - 3:30 PM** **Coffee and Cookies**
- 3:30 AM – 3:45 PM** **Short Talk: Learning enhances behaviorally relevant representations in apical dendrites.** Sam E. Benezra, Kripa B. Patel, Citlali Pérez Campos, Elizabeth M.C. Hillman, Randy M. Bruno, University of Oxford
- 3:45 PM – 4:00 PM** **Short Talk: Representation of Body State in the Barrel Cortex of Freely Moving Mice.** L. Gantar, M. Burgess, N. Mansour, D. Gill, A. Namesna, J. Rusco-Portabella, A. Ebrahimi, R. Storchi, R. S. Petersen. University of Manchester
- 4:00-5:00** **Position Paper Discussion**
Brain loops
Internal models
Perception of touch
Disease models
Recap

