

CURRICULUM VITAE

Tatiana A. Engel, Ph.D.

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EDUCATION

- 2008 – 2012 **Postdoctoral Associate** (since 2009 **Swartz Fellow**)
Yale University School of Medicine (New Haven, CT)
Computational neuroscience (mentor: Prof. X.-J. Wang)
- 2007 **Postdoctoral Associate**
Max Planck Institute of Colloids and Interfaces (Golm, Germany)
Statistical physics (mentor: Prof. R. Lipowsky)
- 2003 – 2007 **Ph.D. Theoretical Physics, *Summa Cum Laude***
Humboldt University of Berlin (Berlin, Germany)
Advisors: Prof. L. Schimansky-Geier and Prof. I.M. Sokolov
Thesis: Firing Statistics in Neurons as Non-Markovian First Passage Time Problem
- 1997 – 2003 **Diploma Physics** (equivalent to M.Sc.), *with distinction*
Lomonosov Moscow State University, Moscow, Russia
Thesis: Resonance Effects in Ensembles of FitzHugh-Nagumo Oscillators

POSITIONS

- 2025 – present **Associate Professor**, Princeton Neuroscience Institute, Princeton University (Princeton, NJ)
- 2023 – 2025 **Assistant Professor**, Princeton Neuroscience Institute, Princeton University (Princeton, NJ)
- 2022 – 2023 **Associate Professor**, Cold Spring Harbor Laboratory (Cold Spring Harbor, NY)
- 2017 – 2022 **Assistant Professor**, Cold Spring Harbor Laboratory (Cold Spring Harbor, NY)
- 2012 – 2017 **Research Scientist**, Howard Hughes Medical Institute, Stanford University (Stanford, CA)
Mentors: Prof. K. Boahen and Prof. T. Moore

HONORS AND AWARDS

- 2022 The James M. and Cathleen D. Stone Faculty Award to acknowledge a significant research accomplishment of an Assistant or Associate Professor at CSHL
- 2020 Sloan Research Fellowship in Neuroscience, Alfred P. Sloan Foundation
- 2017 Sammy Kuo Award in Neuroscience, postdoctoral Paper of the Year, Stanford Neuroscience Institute
- 2011 Qualcomm travel grant award for the Computational and Systems Neuroscience conference (Cosyne)
- 2007 Award for outstanding young woman scientist of the Forschungsverbund Berlin
- 2007 Lise Meitner Award of the "Vereinigung der Freunde und Förderer der Physik" for the best Ph.D. dissertation in Physics
- 2003 – 2006 Graduate Program Fellowship, DFG GRK 268, Dynamics and Evolution of Cellular and Macromolecular Processes
- 2003 Award of the Lomonosov Moscow State University to the outstanding graduates

LARGE-SCALE COLLABORATION

2020 – present [International Brain Laboratory](#) member

PROFESSIONAL SERVICE

- 2025 Organize workshop on Dynamical Systems Approaches to the Brain at the Gatsby Computational Neuroscience Unit at the University College London, London, UK (together with B. Averbeck and P. Latham)
- 2025 Serve on the Scientific Evaluation Panel of the Jülich Research Center, Helmholtz Association, Jülich, Germany
- 2025 Program Chair of the Computational and Systems Neuroscience conference (Cosyne), Montreal, Canada
- 2025 Program Chair of the Bernstein Conference on Computational Neuroscience, Frankfurt, Germany
- 2024 Organize workshop “Data-Driven Discovery: AI and Modeling in Biology” at the Center for Data-Driven Discovery for Biology at the Allen Institute, Seattle, WA (together with A. Arkhipov, M. Brenner, and S. Saalfeld)
- 2024 Organize workshop “Brain-wide modeling in the era of large-scale recordings and high resolution multi-omics” at the Computational and Systems Neuroscience conference (Cosyne), Lisbon, Portugal (together with W. Soo and A. Battista)
- 2024, 2022, 2021 Reviewer on the Special Emphasis Panel of NINDS for FOA “Team-Research BRAIN Circuit Programs - TeamBCP” (U19) within the NIH BRAIN initiative program
- 2024 Program Vice Chair of the Bernstein Conference on Computational Neuroscience, Frankfurt, Germany
- 2023 Organize the Princeton Symposium on Biological & Artificial Intelligence, Princeton, NJ (together with J. Pillow)
- 2023 Serve on the Organizing Committee of the [Lake Conference on Neural Coding and Dynamics](#), Seattle, WA
- 2022 Organize the Swartz Annual Meeting on Computational Neuroscience, Cold Spring Harbor, NY (together with A. Koulakov)
- 2022 – 2023 Reviewer on the Special Emphasis Panel for Theories, Models, and Methods (R01) within the NIH BRAIN initiative program
- 2022 – 2023 Serve on the Program Committee of the Bernstein Conference for Computational Neuroscience, Berlin, Germany
- 2021 – present Serve on the Neuroscience Advisory Board for Landmarks on [Faculty opinions](#)
- 2020 Reviewer on the Special Emphasis Panel of NINDS for FOA “Research Opportunities Using Invasive Neural Recording and Stimulating Technologies in the Human Brain” (U01 Clinical Trial Required) within the NIH BRAIN initiative program
- 2020 Serve on the Organizing Committee of the International Conference on Mathematical Neuroscience (ICMNS), digital edition, [youtube](#)
- 2019 – 2023 Serve on the Program Committee of the Computational and Systems Neuroscience conference (Cosyne)
- 2019 Organize workshop “Cortical computations via metastable activity” at the Bernstein Conference on Computational Neuroscience, Berlin, Germany (together with G. La Camera and L. Mazzucato)
- 2014 Launch and co-organize a seminar series “Math, Monkeys, Machines” on computational and systems neuroscience for graduate students and postdocs at Stanford University

- 2012 Organize workshop “Understanding heterogeneous cortical activity: the quest for structure and randomness” at the Computational and Systems Neuroscience conference (Cosyne), Salt Lake City, UT (together with S. Ardid and A. Bernacchia)
- 2010 Participate in organization of the Sloan-Swartz Meeting on Computational Neuroscience, New Haven, CT

JOURNAL REVIEW AND EDITORIAL SERVICE

Reviewer for: Nature, Science, Cell, Nature Neuroscience, Nature Machine Intelligence, Nature Reviews Neuroscience, Neuron, Science Advances, Proceedings of the National Academy of Sciences of the USA, PRX Life, Physical Review Letters, eLife, PLoS Computational Biology, Scientific Reports, Journal of Neuroscience, Journal of Neurophysiology, eNeuro, Current Opinion in Neurobiology, Chaos, IEEE Transactions on Neural Networks and Learning Systems, Journal of Cognitive Neuroscience, Journal of Computational Neuroscience, Journal of Mathematical Biology, PLoS One, Biological Cybernetics, Journal of the Royal Society Interface, European Physics Journal, Fluctuation and Noise Letters, Naturwissenschaften, EURASIP Journal of Advanced Signal Processing

Reviewing Editor for the *Journal of Neuroscience*

Editor for *Biological Cybernetics*

Guest Associate Editor for *PLoS Computational Biology*

Certificate of appreciation for exceptional service as an Outstanding Reviewer for *eNeuro* in 2018

Abstract reviewer for the Computational and Systems Neuroscience conference (Cosyne) (2017 – 2019)

PUBLICATIONS

Some publications are under my maiden name: **Verechtchaguina**.

PREPRINTS

P. Tolmachev and **T.A. Engel**. Single-unit activations confer inductive biases for emergent circuit solutions to cognitive tasks. *BioRxiv* preprint at <https://www.biorxiv.org/content/10.1101/2024.11.23.625012v1> (2024)

C. Aghamohammadi, C. Chandrasekaran and **T.A. Engel**. A doubly stochastic renewal framework for partitioning spiking variability. *BioRxiv* preprint at <https://www.biorxiv.org/content/10.1101/2024.02.21.581457v1> (2024)

PEER-REVIEWED ARTICLES

M. Genkin, K.V. Shenoy, C. Chandrasekaran and **T.A. Engel**. The dynamics and geometry of choice in the premotor cortex. *Nature*, <https://www.nature.com/articles/s41586-025-09199-1> (2025)

C. Findling, F. Hubert, International Brain Laboratory, L. Acerbi, B. Benson, J. Benson, D. Birman, N. Bonacchi, M. Carandini, J.A. Catarino, G.A. Chapuis, A.K. Churchland, Y. Dan, E.E.J. DeWitt, **T.A. Engel**, M. Fabbri, M. Faulkner, I.R. Fiete, L. Freitas-Silva, B. Gercek, K.D. Harris, M. Häusser, S.B. Hofer, F. Hu, J.M. Huntenburg, A. Khanal, C. Krasniak, C. Langdon, P.E. Latham, P.Y.P. Lau, Z. Mainen, G.T. Meijer, N.J. Miska, T.D. Mrsic-Flogel, J.-P. Noel, K. Nylund, A. Pan-Vazquez, L. Paninski, J. Pillow, C. Rossant, N. Roth, R. Schaeffer, M. Schartner, Y. Shi, K.Z. Socha, N.A. Steinmetz, K. Svoboda, C. Tessereau, A.E. Urai, M.J. Wells, S.J. West, M.R. Whiteway, O. Winter, I.B. Witten, A. Zador, P. Dayan, A. Pouget. Brain-wide representations of prior information in mouse decision-making. *Nature*, in press (2025)

International Brain Laboratory, B. Benson, J. Benson, D. Birman, N. Bonacchi, M. Carandini, J.A. Catarino, G.A. Chapuis, A.K. Churchland, Y. Dan, P. Dayan, E.E.J. DeWitt, **T.A. Engel**, M. Fabbri, M. Faulkner, I.R. Fiete, C. Findling, L. Freitas-Silva, B. Gercek, K.D. Harris, M. Häusser, S.B. Hofer, F. Hu, F. Hubert, J.M. Huntenburg, A. Khanal, C. Krasniak, C. Langdon, P.Y.P. Lau, Z.F. Mainen, G.T. Meijer, N.J. Miska, T.D. Mrsic-Flogel, J.-P. Noel, K. Nylund, A. Pan-Vazquez, A. Pouget, C. Rossant, N. Roth, R. Schaeffer, M. Schartner, Y. Shi, K.Z. Socha, N.A.

Steinmetz, K. Svoboda, A.E. Urai, M.J. Wells, S.J. West, M.R. Whiteway, O. Winter, I.B. Witten. A Brain-Wide Map of Neural Activity during Complex Behavior. *Nature*, in press (2025)

C. Langdon and **T.A. Engel**. Latent circuit inference from heterogeneous neural responses during cognitive tasks. *Nature Neuroscience*, **28**, 665–675 (2025)

R. Zeraati, V. Buendía, **T.A. Engel**, and A. Levina. Topology-dependent coalescence controls scaling exponents in finite networks. *Physical Review Research*, **6**, 023131 (2024)

R. Xia, X. Chen, **T.A. Engel**, and T. Moore. Common and distinct neural mechanisms of attention. *Trends in Cognitive Sciences*, **28**, 554–567 (2024)

J. Wang, D. Tsin, and **T.A. Engel**. Predictive variational autoencoder for learning robust representations of time-series data. Workshop “Unifying Representations in Neural Models” at *Advances in Neural Information Processing Systems*. <https://unireps.org/2023/publication/wang-2023-predictive> (2023)

C. Langdon, M. Genkin, and **T.A. Engel**. A unifying perspective on neural manifolds and circuits for cognition. *Nature Reviews Neuroscience*, **24**, 363 (2023)

R. Zeraati, Y. Shi, N.A. Steinmetz, M.A. Gieselmann, A. Thiele, T. Moore, A. Levina*, and **T.A. Engel***. Intrinsic timescales in the visual cortex change with selective attention and reflect spatial connectivity. *Nature Communications*, **14**, 1858 (2023) (*equal contribution)

J.P. Roach, A.K. Churchland, and **T.A. Engel**. Choice selective inhibition drives stability and competition in decision circuits. *Nature Communications*, **14**, 147 (2023)

Y. Shi, R. Zeraati, A. Levina, and **T.A. Engel**. Spatial and temporal correlations in neural networks with structured connectivity. *Physical Review Research*, **5**, 013005 (2023)

N.X. Bhattasali, A.M. Zador, and **T.A. Engel**. Neural circuit architectural priors for embodied control. *Advances in Neural Information Processing Systems*, **35**, 12744–12759 (2022)

Y. Cohen, **T.A. Engel**, C. Langdon, G.W. Lindsay, T. Ott, M.A. K. Peters, J.M. Shine, V. Breton-Provencher, S. Ramaswamy. Recent advances at the interface of neuroscience and artificial neural networks. *Journal of Neuroscience*, **42**, 8514–8523 (2022)

T.A. Engel. Volatile neurons unite to stabilize visual experience. *Nature*, **605**, 625–626 (2022) *News & Views*

R. Zeraati, **T.A. Engel***, and A. Levina*. A flexible Bayesian framework for unbiased estimation of timescales. *Nature Computational Science*, **2**, 193–204 (2022) (*equal contribution)

Y. Shi, N.A. Steinmetz, T. Moore, K. Boahen, and **T.A. Engel**. Cortical state dynamics and selective attention define the spatial pattern of correlated variability in neocortex. *Nature Communications*, **13**, 44 (2022)

T.A. Engel*, M.L. Schölvinc*, and C.M. Lewis*. The diversity and specificity of functional connectivity across spatial and temporal scales. *NeuroImage*, **245**, 118692 (2021) (*equal contribution)

M. Genkin, O. Hughes, and **T.A. Engel**. Learning non-stationary Langevin dynamics from stochastic observations of latent trajectories. *Nature Communications*, **12**, 5986 (2021)

J. van Kempen, M.A. Gieselmann, M. Boyd, N.A. Steinmetz, T. Moore, **T.A. Engel**, and A. Thiele. Top-down coordination of local cortical state during selective attention. *Neuron*, **109**, 894–904.e8 (2021)

M. Genkin and **T.A. Engel**. Moving beyond generalization to accurate interpretation of flexible models. *Nature Machine Intelligence* **2**, 674–683 (2020)

T.A. Engel and N.A. Steinmetz. New perspectives on dimensionality and variability from large-scale cortical dynamics. *Current Opinion in Neurobiology*, **58**, 181–190 (2019)

T.A. Engel*, N.A. Steinmetz*, M.A. Gieselmann, A. Thiele, T. Moore, and K. Boahen. Selective modulation of cortical state during spatial attention. *Science*, **354**, 1140–1144 (2016) (*equal contribution) *Recommended by Faculty of 1000*

T.A. Engel*, W. Chaisangmongkon*, D.J. Freedman, and X.-J. Wang. Choice-correlated activity fluctuations underlie learning of neuronal category representation. *Nature Communications*, **6**, 6454–12 (2015) (*equal contribution)

T.A. Engel and X.-J. Wang. Same or different? A neural circuit mechanism of similarity based pattern-match decision making. *J. Neurosci.*, **31**, 6982–6996 (2011)

M.M. Rading, **T.A. Engel**, R. Lipowsky, and A. Valleriani. Stationary size distributions of growing cells with binary and multiple cell division. *J. Stat. Phys.* **145**, 1–22 (2011)

T.A. Engel and D. Andrieux. Forget before you remember: dynamic mechanism of memory decay and retrieval. (Commentary) *Front. Neurosci.* (2010)

T.A. Engel, B. Helbig, D.F. Russell, L. Schimansky-Geier, and A.B. Neiman. Coherent stochastic oscillations enhance signal detection in spiking neurons. *Phys. Rev. E*, **80**, 021919 (2009)

T.A. Engel, L. Schimansky-Geier, A.V.M. Herz, S. Schreiber, and I. Erchova. Subthreshold membrane-potential resonances shape spike-train patterns in the entorhinal cortex. *J. Neurophysiol.*, **100**, 1576–1589 (2008)

T. Verechtchaguina, I. M. Sokolov, and L. Schimansky-Geier. Interspike interval densities of resonate and fire neurons. *Biosystems*, **89**, 63–68 (2007)

T. Verechtchaguina, I. M. Sokolov, and L. Schimansky-Geier. First passage time densities in resonate-and-fire models. *Phys. Rev. E*, **73**, 031108 (2006)

T. Verechtchaguina, I. M. Sokolov, and L. Schimansky-Geier. First passage time densities in non-Markovian models with subthreshold oscillations. *Europhys. Lett.*, **73** (5), 691–697 (2006)

T. Verechtchaguina, L. Schimansky-Geier, and I. M. Sokolov. Spectra and waiting-time densities in firing resonant and nonresonant neurons. *Phys. Rev. E*, **70**, 031916 (2004)

RESEARCH SUPPORT

Active

Title: *International Brain Laboratory*

Principal Investigator: Tatiana Engel

Source: Simons Foundation

Dates of Project: 10/1/20—6/30/25

Title: *State-dependent Decision-making in Brainwide Neural Circuits*

Subaward Principal Investigator: Tatiana Engel

Award #: 3U19NS123716-02S1

Source: NIH, subaward with Columbia University

Dates of Project: 08/1/23—7/31/25

Title: *The spatial and temporal scale of neuromodulation in mouse sensory cortex*

Principal Investigator: Jacob Reimer (Baylor College of Medicine); co-PI: Tatiana Engel

Award #: RF1NS128901-01

Source: National Institute of Drug Abuse, NIH

Dates of Project: 8/01/22—7/30/25

Title: *Anatomical connectivity and activity in primary visual cortex of mouse*
Principal Investigator: Jacob Reimer (Baylor College of Medicine); co-PI: Tatiana Engel
Award #: 1RF1MH130416-01
Source: National Institute of Mental Health, NIH
Dates of Project: 8/01/24—7/31/25

Title: *Neural mechanisms for flexible vocal communication*
Principal Investigator: Arkarup Banerjee (Cold Spring Harbor Laboratory); co-PI: Tatiana Engel
Award #: 1R01NS132046-01
Source: National Institute of Drug Abuse, NIH
Dates of Project: 4/01/23—3/31/28

Completed

Title: *Multiscale computational frameworks for integrating large-scale cortical dynamics, connectivity, and behavior*
Principal Investigator: Tatiana Engel
Award #: RF1DA055666
Source: National Institute of Drug Abuse, NIH
Dates of Project: 9/01/21—8/31/24

Title: *Defining the role of sleep in cancer immunity and metabolism*
Principal Investigator: Tobias Janowitz; co-PI: Tatiana Engel
Source: Starr Cancer Consortium Executive Committee
Dates of Project: 2/01/22—12/31/23

Title: *Sloan Research Fellowship*
Principal Investigator: Tatiana Engel
Source: Alfred P. Sloan Foundation
Dates of Project: 9/1/20—8/31/22

Title: *Discovering dynamic computations from large-scale neural activity recordings*
Principal Investigator: Tatiana Engel
Award #: R01 EB026949
Source: National Institute of Biomedical Imaging and Engineering, NIH
Dates of Project: 9/20/18—6/30/22

INVITED TALKS

- Symposium on Neural Population Dynamics & Latent Representations, Sant'Anna School of Advanced Studies, Pisa, Italy, 2025
- Workshop "Emergent Research Topics in NeuroAI", 34th Annual Computational Neuroscience Meeting (CNS), Florence, Italy, 2025
- Bernstein Center for Computational Neuroscience Berlin, Berlin, Germany, 2025
- Max Planck Institute for Biological Cybernetics, Tübingen, Germany, 2025
- The Brain Conference on Frontiers of Theoretical Neuroscience, Rungstedgaard, Denmark, 2025
- Statistical Mechanics Conference, Rutgers University, New Brunswick, NJ, 2025
- NIH workshop: "Network dynamics underlying high-level cognition in humans and monkeys", Bethesda, MD, 2025
- Workshop "Causal perturbation-based approaches to uncover neural dynamics", Computational and Systems Neuroscience conference (Cosyne), Mont-Tremblant, Canada, 2025

- Workshop “What biological details matter at mesoscopic scales?”, Computational and Systems Neuroscience conference (Cosyne), Mont-Tremblant, Canada, 2025
- Neuroscience Institute Distinguished Speaker Seminar Series, Carnegie Mellon University, Pittsburgh, PA, 2025
- Center for Brain Science, Harvard University, Boston, MA, 2025
- “Physics of Life” Symposium, the Graduate Center, City University New York, New York, NY, 2025
- Theoretical Neuroscience seminar, Champalimaud Research Centre, Lisbon, Portugal, 2025
- Friedman Brain Institute Translational Neuroscience Seminar Series, Icahn School of Medicine, Mount Sinai, New York, NY, 2025
- Computations in Science seminar at the University of Chicago, Chicago, IL, 2025
- The Graduate Center, City University New York, New York, NY, 2024
- Center for Theoretical Neuroscience, Columbia University, New York, NY, 2024
- Workshop “Bridging RNNs and data: Hypothesis-testing of network dynamics against neural recordings”, Bernstein Conference, Frankfurt, Germany, 2024
- Kavli Institute for Systems Neuroscience extended workshop “Theories of neural computation in the era of large-scale recordings”, Trondheim, Norway, 2024
- AREADNE conference on Research in Encoding and Decoding of Neural Ensembles, Milos, Greece, 2024
- International Neuropsychological Symposium (INS), session “Elucidation or obfuscation: Analysis of neural signals in high dimensional state space”, Constance, Germany, 2024
- Computation and Theory Seminar, HHMI Janelia Research Campus, Ashburn, VA, 2024
- Simons Collaboration on the Global Brain annual meeting, New York, NY, 2024
- Invited Symposium “The geometry of neural representations of tasks: What does it mean for cognition and behavior?”, Cognitive Neuroscience Society (CNS) annual meeting, Toronto, Canada, 2024
- Biophysics Theory Retreat, Princeton University, Princeton, NJ, 2024
- Workshop “Understanding neural computation using task-trained and data-trained networks”, Computational and Systems Neuroscience conference (Cosyne), Lisbon, Portugal, 2024
- Physical Mathematics Seminar, Department of Mathematics, MIT, Boston, MA, 2024
- David Bodian Seminar, Zanvyl Krieger Mind/Brain Institute, Johns Hopkins University, Baltimore, MD, 2024
- Biophysics Seminar, Center for the Physics of Biological Function, Princeton University, Princeton, NJ, 2023
- Swartz Seminar on Computational and Theoretical Neuroscience, New York University, New York, NY, 2023
- Princeton Symposium on Biological and Artificial Intelligence, Princeton, NJ, 2023
- Lake Conference on Neural Coding and Dynamics, Seattle, WA, 2023
- Tübingen Systems Neuroscience Symposium, Tübingen, Germany, 2023
- Seminar at the Allen Institute for Neural Dynamics, Seattle, WA, virtual, 2023
- Workshop “Seeking universality while celebrating heterogeneity among biological attractor networks”, Computational and Systems Neuroscience conference (Cosyne), Mont-Tremblant, Canada, 2023
- Computational and Systems Neuroscience conference (Cosyne) main meeting, Montreal, Canada, [youtube](#), 2023
- 20th Annual Gulf Coast Consortia Theoretical and Computational Neuroscience Conference, Houston, TX, 2023
- Symposium “High-Resolution Electrophysiology: Experiment and Theory”, Society for Neuroscience 53rd annual meeting, San Diego, CA, 2022
- Institute of Neuroscience Seminar, University of Oregon, Eugene, OR, 2022
- Gordon Research Conference on Neurobiology of Cognition, Jordan Hotel at Sunday River, ME, 2022
- Physiology and Biophysics Seminar Series, University of Washington, Seattle, WA, 2022
- Neurosciences Seminar Series, University of California San Diego, San Diego, CA, 2022
- Center for Perceptual Systems, The University of Texas at Austin, Austin, TX, virtual, 2022
- Seminar at the Allen Institute for Neural Dynamics, Seattle, WA, virtual, 2022
- Workshop “How do brains work: Stationarities or no stationarities in brains? Attractors or no attractors in brains?” University of Copenhagen, Denmark, virtual, 2022
- From Neuroscience to Artificially Intelligent Systems (NAISys), Cold Spring Harbor Laboratory, NY, 2022
- Princeton Neuroscience Institute, Princeton University, Princeton, NJ, virtual, 2022
- Perspectives seminar of the Center for Neuroscience, University of California, Davis, CA, virtual, 2022
- Seminar of the Wu Tsai Neurosciences Institute and Stanford Data Science, Stanford University, Stanford, CA, 2022

- Workshop “Dynamical Principles of Biological and Artificial Neural Networks”, Banff International Research Station, [virtual](#), 2022
- Max Planck Institute of Neurobiology, Munich, Germany, virtual, 2021
- Seminar of the Center for Brain Research, CERVO, Laval University, Québec, Canada, virtual, 2021
- Widely Applied Math seminar, Department of Applied Mathematics, Harvard University, Boston, MA, virtual, 2021
- Neuroscience online seminar, Okinawa Institute of Science and Technology, Okinawa, Japan, virtual, 2021
- CRCNS Workshop “Machine Learning for Large-Scale Neuroscience: Looking into the Future”, Flat Iron Institute, New York, NY, 2021
- Symposium on Advances in Systems & Computational Neuroscience, Center for Systems Neuroscience, Boston University, Boston, MA, 2021
- Workshop “Spatiotemporal brain state dynamics and their impact on behavior”, 30th Annual Computational Neuroscience meeting (CNS 2021), [virtual](#), [youtube](#), 2021
- Bonn Center of Neuroscience, University of Bonn, Bonn, Germany, virtual, 2021
- Computer Systems Lab, Yale University, New Haven, CT, virtual, 2021
- World Wide Theoretical Neuroscience Seminar, [virtual](#), 2021
- Institute of Neuroinformatics of the University of Zurich and ETH Zurich, Zurich, Switzerland, virtual, 2021
- Center for Theoretical Neuroscience, Columbia University, New York, NY, 2020
- RIKEN Center for Brain Science, Tokyo, Japan, virtual, 2020
- Brain Circuits and Behavior Lab, IDIBAPS, Barcelona, Spain, virtual, 2020
- International Brain Laboratory (IBL) collaboration, virtual, 2020
- Workshop “Interpretable computational neuroscience: What are we modeling and what does it have to do with the brain?”, Computational and Systems Neuroscience conference (Cosyne), Denver, CO, 2020 [youtube](#)
- Workshop “Dimensionality reduction and population dynamics in neural data”, NORDITA, Stockholm, Sweden, 2020
- Workshop “Physics of neural circuits and network dynamics”, Simons Center for Geometry and Physics, Stony Brook, NY, 2020
- Bernstein Center for Computational Neuroscience Berlin, Berlin, Germany, 2019
- Group for Neural Theory, Ecole Normale Supérieure, Paris, France, 2019
- Workshop “The operating regime of neural circuits as a determinant for computations”, HHMI Janelia research campus, Ashburn, VA, 2019
- MSRI Aspen Computational Neuroscience Meeting: Neural Theories of Cognition, Aspen, CO, 2019
- Workshop “Cortical computations via metastable activity”, Bernstein Conference, Berlin, Germany, 2019
- Workshop “Dynamical richness of cortical networks: role and modulation across brain states”, Bernstein Conference, Berlin, Germany, 2019
- Department of Neurobiology & Anatomy, University of Texas at Houston, Houston, TX, 2019
- Neuro Theory Club, Grossman Institute for Neuroscience, Quantitative Biology and Human Behavior, University of Chicago, Chicago, IL, 2019
- Interdisciplinary Mind and Brain Seminar, Computational Neuroscience Initiative, University of Pennsylvania, Philadelphia, PA, 2019
- NIMH workshop: “From Neural Activity to Behavior: Computational Modeling of the Nervous System”, Bethesda, MD, 2019
- Center for Theoretical Neuroscience, Columbia University, New York, NY, 2019
- Workshop “Sleep: models and experiments on replay, consolidation, and off-line processing”, Computational and Systems Neuroscience conference (Cosyne), Lisbon, Portugal, 2019
- Quantitative Biology Seminar series, Quantitative Biology Institute, Ohio University, Athens, OH, 2019
- Institute of Neuroscience, Newcastle University, Newcastle upon Tyne, UK, 2018
- Gatsby Computational Neuroscience Unit, University College London, London, UK, 2018
- Banbury Workshop “Why Does the Neocortex Have Layers and Columns?”, Cold Spring Harbor, NY, 2018
- NSF workshop: “Integrating Neurophotronics, Statistical Physics, and Control Theory for Advancing Neuroscience”, Alexandria, VA, 2018
- NIH ACD BRAIN Initiative Working Group 2.0 Workshop #3, “From Experiments to Theory and Back”, Baylor College of Medicine, Houston, TX, 2018

- Workshop “Dimensions of Neural Coding, Computation and Communication”, Bernstein Conference, Berlin, Germany, 2018
- Bernstein Conference (main meeting), Berlin, Germany, 2018
- McGovern Symposium “Cortical Interactions in Cognitive Control and Flexibility”, Massachusetts Institute of Technology, Cambridge, MA, 2018
- Swartz Seminar on Computational and Theoretical Neuroscience, New York University, NY, 2018
- Max Planck Institute for Biological Cybernetics, Tübingen, Germany, 2018
- Special lecture, Max Planck Institute for Brain Research, Frankfurt, Germany, 2018
- Symposium “New Dimensions in Computational Neuroscience”, California Institute of Technology, Pasadena, CA, 2018
- Minisymposium “State-dependent cortical processing”, Society for Neuroscience 47th annual meeting, Washington, DC, 2017
- Neural Coding, Computation and Dynamics (NCCD) conference, Capbreton, France, 2017
- Seminar on Theoretical Biology, Department of Mathematics, Pennsylvania State University, State College, PA, 2017
- Department of Physics, Humboldt University of Berlin, Berlin, Germany, 2017
- Modeling of Cognitive Processes and Bernstein Center for Computational Neuroscience, Technical University of Berlin, Berlin, Germany, 2017
- HHMI Janelia Research Campus, Ashburn, VA, 2017
- Sleep Grand Rounds, Stanford Center for Sleep Sciences and Medicine, Stanford, CA, 2017
- Department of Brain & Cognitive Sciences, Massachusetts Institute of Technology, Cambridge, MA, 2017
- European Neuroscience Institute, Göttingen, Germany, 2017
- Department of Electrical and Computer Engineering, Rice University, Houston, TX, 2017
- Department of Biomedical Engineering, Boston University, Boston, MA, 2017
- Department of Electrical and Computer Engineering, University of Virginia, Charlottesville, VA, 2017
- Departments of Biology and Mathematics, University of Oregon, Eugene, OR, 2017
- Center for Mind and Brain, University of California, Davis, CA, 2017
- Department of Physics, Rutgers University, Newark, NJ, 2017
- Blanchette Rockefeller Neurosciences Institute, West Virginia University, Morgantown, WV, 2017
- Department of Physics, Washington University in Saint Louis, Saint Louis, MO, 2017
- Departments of Mathematics and Biology, University of Utah, Salt Lake City, UT, 2017
- College of Sciences, Georgia Institute of Technology, Atlanta, GA, 2017
- Department of Computer Science, University of Miami, Miami, FL, 2017
- Cold Spring Harbor Laboratory, Cold Spring Harbor, NY, 2017
- Department of Physiology and Biophysics, University of Colorado, Denver, CO, 2016
- Computational Science and Data Analytics, University of California, Merced, CA, 2016
- Department of Bioengineering and Helen Wills Neuroscience Institute, University of California, Berkeley, CA, 2016
- Workshop “Neural bases of executive flexibility”, Computational and Systems Neuroscience conference (Cosyne), Salt Lake City, UT, 2016
- Department of Computational Mathematics, Science and Engineering, Michigan State University, East Lansing, MI, 2016
- Department of Brain & Cognitive Sciences, Massachusetts Institute of Technology, Cambridge, MA, 2016
- Departments of Neuroscience, Mathematics and Computer Science, University of Texas at Austin, Austin, TX, 2016
- Initiative for the Theoretical Sciences, the Graduate Center, City University New York, New York, NY, 2016
- Center for the Study of Complex Systems, University of Michigan, Ann Arbor, MI, 2016
- Bernstein Center for Computational Neuroscience, Berlin, Germany, 2015
- Society for Neuroscience 45th annual meeting, nanosymposium “The Nature and Significance of Neuronal Variation”, Chicago, IL, 2015.
- Neuro-Electronics Research Flanders Mini Symposium, Leuven, Belgium, 2015
- Banbury Workshop on Neural Variability and Correlations, Cold Spring Harbor, NY, 2015
- Center for Mind, Brain, and Computation, Stanford University, CA, 2015
- Symposium on Modeling of Cognitive Processes, Bernstein Center for Computational Neuroscience, Berlin, Germany,

2012

- Bio-X seminar, Stanford University, Stanford, CA, 2011
- Center for Theoretical Neuroscience, Columbia University, New York, NY, 2011
- Laboratory of Neurophysics and Physiology, Université Paris Descartes, Paris, France, 2011
- Group for Neural Theory, ENS, Paris, France, 2011
- Laboratory of Computational Neuroscience, EPFL, Lausanne, Switzerland, 2011
- Center for Brain Science, Harvard University, Boston, MA, 2010
- ESF Workshop “Noise in Life: Stochastic Dynamics in the Neurosciences”, Dresden, Germany, 2007
- Workshop “Stochastic dynamics of neurons and networks”, Computational Neuroscience meeting, Edinburgh, UK, 2006

SELECTED CONFERENCE PRESENTATIONS

- Conference on Cognitive Computational Neuroscience (CCN), Oxford, UK, 2023. T.A. Engel. A unifying perspective on neural manifolds and circuits for cognition. Generative Adversarial Collaboration on “Reconciling the dichotomy between Sherringtonian and Hopfieldian views on neural computations.” [youtube](#)
- Computational and Systems Neuroscience conference (Cosyne), main meeting, Montreal, Canada, 2023. T.A. Engel. Identifying mechanisms of cognitive computations from spikes. [youtube](#)
- Conference on Cognitive Computational Neuroscience (CCN) [virtual](#), 2021. M. Genkin and T.A. Engel. Flexible identification of population dynamics from neural activity recordings. (Keynote & Tutorial) [youtube](#)

TEACHING

2024	Eresfjord School in Computational Neuroscience, Eresfjord, Nowray (virtual), lecturer
2023, 2024	A module in “Cellular and Circuits Neuroscience” course (NEU 501A), Princeton University, lecturer
2023, 2024	“Mathematical Tools for Neuroscience” (Princeton, NEU 314), instructor
2023	“Neural Data Science” summer course (CSHL), lecturer
2023	A module in “Systems and Cognitive Neuroscience” course (NEU 502A), Princeton University, lecturer
2023	Tutorial for the graduate students at NeuroNex Workshop, Gulf Coast Consortia, Houston, TX
2022	“Computational Neuroscience: Vision” summer course (CSHL), lecturer
2020	Neuromatch Academy Q&A panel on “Dynamic networks” (virtual) youtube
2019	Advanced Quantitative Biology course “Gaussian Processes for Biological Data Analysis” (CSHL), instructor (jointly with Prof. D. McCandlish)
2019	Summer Workshop on the Dynamic Brain (Allen Institute for Brain Science), lecturer
2019	“Neural Data Science” summer course (CSHL), lecturer
2018	Machine learning module within the graduate course on Quantitative Biology, Watson School of Biological Sciences (CSHL), lecturer
2013	Large-Scale Neural Modeling (Stanford BioE332): project-based class using neuromorphic hardware platform Neurogrid, teaching assistant
2006 – 2007	Thermodynamics (Humboldt University, Berlin), recitation leader
2004, 2007	Statistical Physics / Quantum Statistics (Humboldt University, Berlin), recitation leader
2005 – 2006	Introductory Physics Laboratories (Humboldt University, Berlin), teaching assistant
2003 – 2004	Polymer Science (Humboldt University, Berlin), recitation leader

ADVISING

Postdoctoral Advisees

Yiqing Lu, 2024 – present

Pavel Tolmachev, 2021 – present
Christopher Langdon, 2019 – present, Swartz Fellow 2021-2022, Princeton Neuroscience Institute Innovation Award 2024
Cina Aghamohammadi, 2019 – present, Swartz Fellow 2023 – present
Yanliang Shi, 2018 – present, Swartz Fellow 2019–2020
Joao Couto, 2020 – 2023 (co-advised with Prof. A. Churchland, UCLA)
James Roach, 2019 – 2022, BRAIN Initiative F32 Postdoctoral Fellow, CSHL Interdisciplinary Scholar in Experimental and Quantitative Biology (co-advised with Prof. A. Churchland, UCLA)
Mikhail Genkin, 2018 – 2022, Swartz Fellow 2018–2019

Graduate Advisees

Zijian Jiang, 2024 – present, graduate student (Princeton Neuroscience Institute)
Dexter Tsin, 2023 – present, graduate student (Princeton Neuroscience Institute, co-advised with Prof. Annegret Falkner)
Iman Wahle, 2023 – present, graduate student (Princeton Neuroscience Institute, co-advised with Prof. T. Buschman)
Jiayi Zhang, 2023 – present, graduate student (Princeton, Quantitative & Computational Biology)
Yuzheng Lin, 2023 – present, graduate student (Princeton, Physics)
Conor McGrory, 2022 – present, graduate student (Princeton Neuroscience Institute)
Roxana Zeraati, 2018 – 2025, graduate student (University of Tübingen, Germany, co-advised with Prof. A. Levina)
Will Long, 2023 – 2024, graduate student (Princeton Neuroscience Institute, co-advised with Prof. I. Witten)
Julia Wang, 2020 – 2023, graduate student (CSHL School of Biological Sciences)
Sabrina Reguyal, 2023 – 2025, research assistant (Princeton)
Vishnu Pamula, 2022 – 2023, research assistant (CSHL)
Nikhil Bhattasali, 2021 – 2022, NeuroAI Scholar (CSHL, co-advised with Prof. A. Zador), Hertz Foundation Fellow 2022
Robert Kwapich, 2019 – 2021, research assistant (CSHL)
Hein Mante, 2025, rotation student (Princeton, Biophysics)
Shabnam Sahay, 2024, rotation student (Princeton, Quantitative & Computational Biology)
Àngela Rodríguez, 2024, rotation student (Princeton, Applied and Computational Mathematics)
Daniel Bernstein, 2023, rotation student (Princeton, Biophysics)
Khue Tran, 2022, rotation student (Stony Brook University, Neuroscience)
Xingyu (CiCi) Zheng, 2021, rotation student (CSHL School of Biological Sciences)
Siddharth Paliwal, 2020, rotation student (Stony Brook University, Neuroscience)
Ayesha Vermani, 2019, rotation student (Stony Brook University, Neuroscience)
Alexa Pagliaro, 2019, rotation student (Watson School of Biological Sciences, CSHL)
Ziyi Mo, 2019, rotation student (Watson School of Biological Sciences, CSHL)
Yan Ke, 2018, rotation student (Stony Brook University, Physics)
Simon Munoz Lagunas, 2021, master student (Technical University of Berlin, Germany, co-advised with Prof. T. Schwalger)
Ann Christin Vietor, 2020 – 2021, master student (Technical University of Berlin, Germany, co-advised with Prof. T. Schwalger)
Elaine Chou, 2017, rotation student (Stanford, Electrical Engineering)
Kevin Feigelis, 2016, rotation student (Stanford, Physics)
Rohisha Adke, 2016, master student (Stanford, Statistics)

Undergraduate Advisees

Michael House, 2024–2025, Simons Foundation Shenoy Undergraduate Research Fellowship in Neuroscience (Princeton)
Brianna Glenn, 2023–2024, Simons Foundation Shenoy Undergraduate Research Fellowship in Neuroscience (Princeton)
Natalia Efimova, 2023, Undergraduate Summer Research (Princeton)
Will Slatton, 2022, Undergraduate Research Program (CSHL)
Vlad Leonov, 2021, Undergraduate Researcher (UCL)

Shoshana Novik, 2021, Undergraduate Research Program (CSHL)
Owen Hughes, 2019, Undergraduate Research Program (CSHL)
Julia Wang, 2018, Undergraduate Research Program (CSHL)
Eric Luxenberg, 2017, Research Experience for Undergraduates (Stanford)
Vasco Portilheiro, 2017, Research Experience for Undergraduates (Stanford)
Guillermo Angeris, 2015, Research Experience for Undergraduates (Stanford)
Petra Grutzik, 2015, Research Experience for Undergraduates (Stanford)
Sabera Talukder, 2015, Research Experience for Undergraduates (Stanford)

OUTREACH

2019 Presentation about the brain and neuroscience to ~ 100 students at the Science Cafè at Roslyn Middle School, Roslyn Heights, NY

2019 Presentation “Math and Your Brain” within the CSHL *Cocktails & Chromosomes* series at a local bar in Huntington, NY

2018 *WAC Lighting Foundation Invitational Science Fair*, judge in the category “Physics and Astronomy”

2017 – present Mentoring high-school students within *Partners for the Future* program, which provides the students an opportunity to gain hands-on research experience working in the Engel Lab (CSHL).
High-school mentees: Daniel Lee, 2017–2018; Gabriel Chan, 2018–2019; Joseph Massa, 2018–2019; Sonia Sarju, 2019–2020; Aurrel Bhatia, 2021–2022; Erin Wang, 2022–2023.