Kavli Neuroscience Symposium 2026: Presenter Catalog

Columbia University
Kavli Institute for Brain Science (KIBS)

Valeria Fascianelli, PhD

Center for Theoretical Neuroscience, Columbia University

Bio: Valeria Fascianelli is an Associate Research Scientist in the Fusi Lab at the Center for Theoretical Neuroscience at Columbia University. She earned her bachelor's and master's degrees in physics before transitioning to computational neuroscience for her PhD at Sapienza University of Rome. During her postdoctoral work, she contributed to the development of the representational geometry framework to uncover individual cognitive strategies in the primate prefrontal cortex, investigate the computations underlying decision-making, and characterize stress-related internal states in the amygdala and hippocampus. Her research combines interpretable, data-driven approaches—including machine learning, dynamical systems modeling, and neural decoding—to understand how the geometry of neural activity shapes behavior.

Talk Title: *"Neural Geometry Dynamics Reveal Computational Roles In Multiple Brain Regions During Decision Making"*

Abstract: The neural representational geometry, defined as the spatial arrangement in the activity space of neuronal patterns recorded in different task conditions, has been studied across brain areas, species, and artificial neural networks, revealing interesting structures that can be studied only at the population level. Prior studies focused on static geometry in specific time intervals during the trial. In collaboration with the Salzman lab at Columbia University, we show that the geometry dynamics can suggest different computational roles in a multi-regional circuit during a complex cognitive task.

Haozhe Shan, PhD

Kavli Institute for Brain Science, Department of Neuroscience, Columbia University
Dept of Computer Science, Columbia University

Bio: Haozhe Shan is an ARNI postdoctoral fellow at the Center for Theoretical Neuroscience and Department of Computer Science at Columbia University. He finished his Ph.D. from Harvard University, where he developed theories of learning and memory in neural networks with Haim Sompolinsky. He is broadly interested in computational neuroscience. His current research focuses on compositional computation and continual learning in the brain.

Talk Title: *"Discovering symmetries in connectomes with graph embeddings"*

Abstract: In many circuit models of neural computation, synaptic connections between neurons are organized according to their tuning to the variables being processed, forming symmetries in the connectivity. We develop a graph embedding algorithm to identify such structures from connectomes. It reveals many instances of rotational and translational symmetries in the adult Drosophila brain, pointing to novel candidate circuits for head-direction computation and visuomotor transformation.

Salomon Muller, PhD

Postdoc, Center for Theoretical Neuroscience, Zuckerman Institute, Columbia University

Bio: Salomon is a postdoctoral researcher at the Center for Theoretical Neuroscience at Columbia University, where he studies how the cerebellum and related structures form, maintain, and refine the internal models necessary for sensorimotor control. Salomon completed his PhD at Columbia University under the mentorship of Larry Abbott and Nate Sawtell, and has since expanded his collaborative work with Reza Shadmehr at Johns Hopkins University and David Ehrlich at the University of Wisconsin–Madison.

Talk Title: *"Cerebellum and the Art of Locomotor Maintenance"*

Abstract: The canonical view of the cerebellum is that climbing fibers convey error signals

reflecting deviations from a desired or predicted state, thereby driving plasticity to correct those deviations. However, a growing body of experimental evidence indicates that climbing fiber inputs carry a broader range of signals beyond error. Combining experimental and computational approaches, we suggest that climbing fiber-driven plasticity plays a role in continuously maintaining the weight space of inputs to Purkinje cells. We show that during locomotion in mice (a behavior known to depend on the cerebellum) climbing fibers are phase-modulated across the stride cycle, with the strongest modulation occurring on typical strides rather than on atypical or outlier strides. We further show that during locomotion, climbing fiber-driven plasticity accounts for only ~15% of Purkinje cell simple spike modulation, while the remaining modulation can largely be explained by random initial input structure, suggesting that in the context of locomotion climbing fibers serve to maintain and refine existing representations required for accurate movement.

Xenia Gofman-Regev, PhD

Postdoc, Zuckerman Institute, Columbia University

Bio: Xenia Gofman is a postdoctoral researcher at Columbia University, working with Nate Sawtell and Daniel Wolpert in collaboration with Larry Abbott. She completed her PhD at Technion - Israel Institute of Technology under the mentorship of Dori Derdikman, where she studied how transformations between egocentric and allocentric coordinate systems contribute to spatial representations in the hippocampus. Her current research focuses on the role of cerebellar circuitry in shaping stable, continuous behaviors such as locomotion, using chronic Neuropixels recordings in freely moving mice.

Talk Title: *"Cerebellum and the Art of Locomotor Maintenance"*

Abstract: The canonical view of the cerebellum is that climbing fibers convey error signals reflecting deviations from a desired or predicted state, thereby driving plasticity to correct those deviations. However, a growing body of experimental evidence indicates that climbing fiber inputs carry a broader range of signals beyond error. Combining experimental and computational approaches, we suggest that climbing fiber-driven plasticity plays a role in continuously maintaining the weight space of inputs to Purkinje cells. We show that during locomotion in mice (a behavior known to depend on the cerebellum) climbing fibers are phase-modulated across the stride cycle, with the strongest modulation occurring on typical strides rather than on atypical or outlier strides. We further show that during locomotion, climbing fiber-driven plasticity accounts for only ~15% of Purkinje cell simple spike modulation, while the remaining modulation can largely be explained by random initial input structure, suggesting that in the context of locomotion climbing fibers serve to maintain and refine existing representations required for accurate movement.

Johns Hopkins University
Kavli Neuroscience Discovery Institute (Kavli NDI)

Noga Mudrik, PhD Candidate

Johns Hopkins University

Bio: Noga Mudrik is a PhD candidate in Biomedical Engineering at Johns Hopkins University, advised by Dr. Adam Charles and supported by the Kavli NDI Distinguished PhD Fellowship. Her research focuses on computational methods for understanding how neural population dynamics change over time and across brain regions. Her work spans methods for decomposing non-stationary neural dynamics, identifying brain-wide circuits across multi-session recordings, and analyzing ensemble variability across trials and conditions. Noga will join the Allen Institute and the University of Washington as a Shanahan Foundation Fellow in July 2026.

Talk Title: *"Learning Latent Sub-Circuits Underlying Multi-Regional Neural Dynamics"*

Abstract: Neural activity is non-stationary and distributed across brain regions, yet most models treat dynamics as fixed or analyze regions in isolation. We developed a decomposition framework that describes neural population activity as sparse, time-varying combinations of reusable dynamical sub-circuits. When applied to whole-brain Neuropixels recordings in mice performing a memory-guided task, our framework identified distinct circuits encoding task context and decision outcomes.

Sharlen Moore, PhD

Psychological and Brain Sciences, Johns Hopkins University

Bio: Dr. Sharlen Moore is a postdoctoral fellow in the Department of Psychological and Brain Sciences at Johns Hopkins University and a Kavli Neuroscience Discovery Institute Distinguished Fellow. Her research sits at the intersection of systems and behavioral neuroscience.

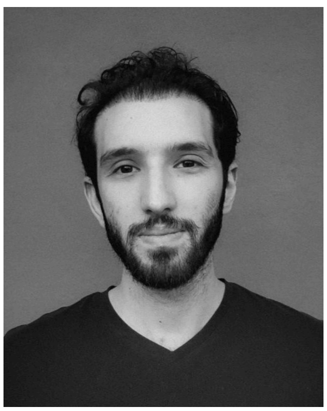
Using integrative approaches spanning behavior, imaging, and circuit-level analysis, she investigates how motivational states influence learning and cognition. Dr. Moore earned her PhD with research work carried out at the Max Planck Institute for Experimental Medicine, in Goettingen, Germany, and has received multiple competitive awards, including funding from the Hearing Health Foundation. Beyond her research, she is deeply engaged in teaching, mentorship, and science outreach, and is committed to bridging neuroscience with broader societal and interdisciplinary perspectives.

Talk Title: *“Revealing abrupt transitions from goal-directed to habitual behavior”*

Abstract: Whether habits emerge gradually or abruptly remains an open question in neuroscience. Here, we show that mice rapidly switch from goal-directed to habitual control behaviorally (within three trials). This is accompanied by a shift in dorsal striatal activity from outcome- to stimulus-driven processing, demonstrating that habits can emerge suddenly through an abrupt reorganization of striatal control.

Ahmad B. Taha, PhD Candidate

The Solomon H Snyder Department of Neuroscience, The Johns Hopkins University



Bio: Ahmad Taha received his medical degree from Al-Quds University in Jerusalem before joining Johns Hopkins University, where he is currently a Ph.D. candidate in Neuroscience studying the neural circuits underlying decision-making, with a particular focus on the claustrum. His doctoral work is co-mentored by Jeremiah Cohen and Solange Brown.

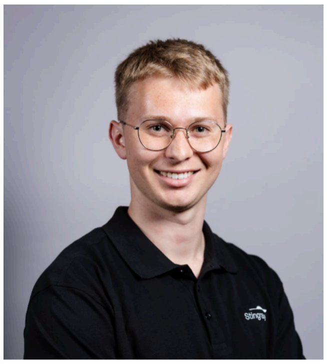
Talk Title: *"Cell-type-specific sustained value representations in the claustrum"*

Abstract: We studied the activity of the claustrum during dynamic foraging and identified two neuronal populations: one that bidirectionally scaled with reward rate, and another that scaled inversely with reward rate and projected to frontal cortex. These findings identify the claustrum as a subcortical locus for stable value signals and integrate it into circuits for value-based decision-making.

NTNU (Norwegian University of Science & Technology)
Kavli Institute for Systems Neuroscience (KISN)

Mathias Karsrud Nordal, PhD Student

Kavli Institute for Systems Neuroscience, NTNU



Bio: I studied industrial mathematics at NTNU, where I wrote my master's thesis on topological data analysis. I recently started my PhD in computational neuroscience at the Kavli Institute for Systems Neuroscience, where I am supervised by Associate Professor Gonzalo Congo. I am interested in understanding how high-dimensional, nonlinear networks support the vast heterogeneity observed in neural responses.

Talk Title: "*Reconciling heterogeneous grid cell responses with continuous attractor models*"

Abstract: Classical continuous attractor network (CAN) models predict highly regular grid cell firing patterns that are consistent with a toroidal manifold. However, experimental recordings reveal substantial heterogeneity in grid cell responses. In this talk, I will show that modelling grid-cell responses as samples from a Gaussian process with a quasiperiodic covariance kernel can generate rate maps that resemble the heterogeneity observed in experimental recordings. These disordered responses can nevertheless be used to construct recurrent networks with a stable toroidal continuous attractor, suggesting that disordered grid cell activity is still consistent with CAN models.

Bjørn André Bredesen-Aa, PhD

Kavli Institute for Systems Neuroscience, The Faculty of Medicine, NTNU

Bio: Bjørn did his Ph.D. with prof. dr. Marc Rehmsmeier at the University of Bergen, Norway, studying gene regulatory sequences using machine learning. Currently, Bjørn is a postdoctoral researcher in the lab of prof. dr. Emre Yaksi at the Kavli Institute for Systems Neuroscience in Trondheim, Norway, studying brain function and evolution through the development and application of data integration methods.

Talk Title: "*Single-cell volumetric transcriptome of the adult zebrafish forebrain reveals teleost homologues of cortical and subcortical structures"*

Abstract: How similar are cortical neurons of terrestrial vertebrates and pallial neurons of teleost fishes? We generated a single-cell spatially resolved transcriptomic atlas of the adult zebrafish forebrain. Integration with terrestrial vertebrate data reveals a molecularly conserved architecture.

Rajat Saxena, PhD

Postdoc fellow, Moser group, Kavli Institute for Systems Neuroscience, NTNU

Bio: Rajat Saxena earned his bachelor's degree in computer science from BITS Pilani, India, and a Ph.D. in Neurosciences from the University of California, Irvine, where he investigated the neural basis of lifelong learning. He is currently a postdoctoral fellow in the Moser group at the Kavli Institute for Systems Neuroscience in Norway, studying how brain circuits generate internal sequences and cognitive maps.

Talk Title: *"A bihemispheric Parahippocampal circuit mechanism drives left-right alternating theta sweeps"*

Abstract: Decoding position from grid cells in the medial entorhinal cortex (MEC) shows that neural representations sweep alternately to the left and right of an animal's location on successive theta cycles (~120 ms), driven by a left–right alternating direction signal in the upstream parasubiculum. In this talk, I will present evidence that these theta sweeps arise from a bihemispheric circuit mechanism that rhythmically coordinates activity across hemispheres. I will argue that this left–right alternation reflects a conserved computational motif for map formation, observed across species from Drosophila to zebrafish to rodents.

Rockefeller University
Kavli Neural Systems Institute (Kavli NSI)

Merav Stern, PhD

The Center for Theoretical studies in Physics and Biology, Rockefeller University

Bio: Merav Stern is a theoretical physicist studying biological networks. Her research demonstrates how connectivity features in high-dimensional biological networks enable fast local interactions to produce emergent slow dynamics. She graduated with honors from the Hebrew University and completed a postdoc at the University of Washington before joining Rockefeller University as a Fellow at the Center for Theoretical Studies in Physics and Biology.

Talk Title: "*Structured Connectivity in Neural and Social Networks*"

Abstract: Biological networks, from cortical circuits to ant colonies, are often organized into clusters in which subgroups exhibit stronger internal interactions than external ones. I will demonstrate how clustered neural circuits inherently produce a range of intrinsic timescales, including long timescales that support working memory without requiring fixed firing rates, fine-tuning, or learning. I will further show how the same mathematical tools can be applied to interaction networks in social insects, such as ants, relating local interactions shaped by division of labor to collective colony dynamics, information flow, memory, and adaptive behavior across timescales.

Pyonghwa Kim, PhD

*Kavli Neural Systems Institute Postdoctoral Fellow, Laboratory of Genetics,
Rockefeller University*

Bio: Pyonghwa Kim is a Kavli Neural Systems Institute Postdoctoral Fellow in the Laboratory of Genetics at The Rockefeller University, working with Michael W. Young. His research focuses on understanding how circadian timing shapes brain function at the level of cell types and neural networks. He combines large-scale single-cell transcriptomics with systems-level analysis to investigate how temporal dynamics coordinate intercellular communication and behavior.

Talk Title: "*Temporal Coordination of Brain Networks"*

Abstract: Brain networks are often studied as static systems, despite strong time-dependent changes in behavior and physiology. Using time-resolved single-nucleus transcriptomics of the Drosophila brain, I will show that circadian timing structures cell-type-specific gene expression and coordinates intercellular communication across the brain. These results suggest that time acts as a global variable that dynamically gates interactions within neural networks.

Salk Institute for Biological Studies, UCSD
Kavli Institute for Brain and Mind (KIBM)

Blake Mitchell, PhD

Postdoctoral Researcher, Reynolds Lab, KIBM, Salk Institute for Biological Studies

Bio: Blake Mitchell is a postdoctoral researcher in the Reynolds Lab at the Salk Institute for Biological Studies, where he studies how traveling waves of activity in visual cortex shape perception around the time of saccadic eye movements. He completed his PhD in Neuroscience at Vanderbilt University, with a focus on binocular vision and stereopsis.

Talk Title: "*What cortical traveling waves do when the lights are off*"

Abstract: Cortex generates traveling waves of activity under many conditions — including around the time of eye movements — but whether these waves are a feedforward consequence of the impending visual image that is brought to the fovea or a top-down preparatory signal has remained debated. Using broadband LFP recordings in marmoset area MT, I show that these waves persist even when saccades are made in complete darkness, with no visual input. I will discuss the implications of this finding on our understanding of traveling wave function, and how upcoming experiments utilizing dual-color voltage imaging will test whether different classes of traveling waves (e.g., saccade-related, stimulus-evoked, intrinsic, and sleep) could be underpinned by a single mechanistic substrate.

Shiva Azizpour Lindi, PhD Candidate

Neurosciences graduate program, UCSD

Bio: Shiva Azizpour Lindi is a PhD candidate in the Neurosciences Graduate Program at the University of California, San Diego, where she is advised by Professor Yonatan Aljadeff. She holds a Bachelor's degree in Physics from Sharif University of Technology and a Master's in Neuroscience from the University of Bordeaux. Her prior research includes investigating the circuits of locomotion and the emergence of beta oscillations in the basal ganglia under the supervision of Nicolas Mallet and Arthur Leblois.

Shiva's current work focuses on the theoretical and computational modeling of working memory, specifically exploring how synaptic plasticity rules, such as Hebbian learning, shape neural representations. She is also interested in computational psychiatry, utilizing circuit modeling to understand how neural dynamics become pathological in psychiatric conditions.

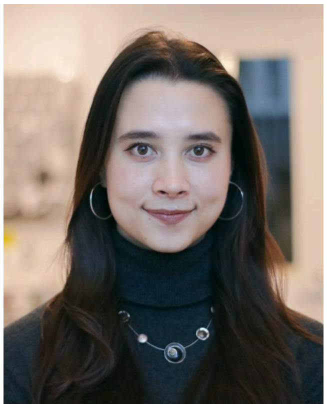
Talk Title: "*A combination of plasticity rules underlies the learning of flexible goal-directed behavior"*

Abstract: The emergence of preparatory activity produced in the motor cortex in a delayed-discrimination task serves as a hallmark of how learned neural dynamics support flexible, goal-directed behavior. By integrating attractor network modeling with analytical mean-field theory, we demonstrate that a specific combination of symmetric and temporally-asymmetric synaptic plasticity rules is required to replicate these empirical dynamics. Furthermore, we show that the statistics of the connectivity motifs, such as feedforward chains, serve as a critical bridge between underlying plasticity mechanisms and cellular-resolution neural data, providing a framework to relate specific changes in network architecture to the learned behaviors they support.

UC San Francisco
Kavli Institute for Fundamental Neuroscience (KIFN)

Jennifer Langen, PhD Candidate

Neurology Department, UCSF



Bio: Jenn is a PhD candidate in the Neuroscience graduate program at UCSF. She received her BA in Neuroscience from the University of Southern California. She is conducting her PhD thesis work in the lab of Daniele Canzio, where she studies the molecular mechanisms of neural self/non-self recognition.

Talk Title: "*Alternative splicing of clustered Protocadherins converts neural self-recognition to repulsion*"

Abstract: Clustered Protocadherins (Pcdhs) drive neural self/non-self recognition through both adhesion and repulsion, yet how a single protein family orchestrates these opposing behaviors has remained unclear. We show that alternative splicing of the Pcdhα intracellular domain toggles Pcdhs between adhesive and repulsive states by including or omitting a C-terminal lysine block (K-block) that couples extracellular polymerization to intracellular clustering and phase separation; disrupting this mechanism in mice traps neurons in adhesive conformations and abolishes self-avoidance. Together, these findings reveal how stochastic promoter choice and alternative splicing allow one transmembrane protein family to assemble the molecular architectures that wire precise neural circuits.

Naz Dundar, PhD Candidate

Department of Neuroscience, UCSF

Bio: Naz is a PhD candidate in Zachary Knight's lab at the University of California, San Francisco. She received her BA in Molecular Biology and Psychology from the University of California, Berkeley. Her research combines in vivo imaging and circuit-level approaches to understand how the brain monitors and coordinates gastrointestinal function, with a focus on identifying the brainstem circuits that translate gut state into digestive and feeding behavior.

Talk Title: *"A gut-brain circuit for the control of gastrointestinal function"*

Abstract: The brain plays an essential role in controlling digestion, yet the specific neurons responsible for coordinating distinct aspects of gastrointestinal function remain largely unknown. Here, we identify neuropeptide FF (Npff) neurons in the brainstem as one such population, capable of sensing the state of the gastrointestinal tract and modulating both gastrointestinal motility and food intake accordingly. Together, these findings establish Npff neurons as a brainstem hub that couples digestive coordination to the control of food intake.

Gregory I. Telian, PhD

Psychiatry, UCSF

Bio: Gregory I. Telian, PhD is a postdoctoral scholar in Mazen Kheirbek's lab at UCSF. He received his BS in Brain and Cognitive Sciences at MIT and his PhD in Neuroscience at UC Berkeley with Hillel Adesnik. At UC Berkeley, he studied sensory processing in the mouse whisker system, focusing on neural coding in sensorimotor cortices. In the Kheirbek lab, he combines high density Neuropixel recordings in interconnected brain regions and high-speed videography with machine learning to better identify the neural signatures of effortful behaviors. He has developed a novel effort-based assay designed to address how effort is represented and impacted by stress. He plans on continuing his work as an independent investigator in the future.

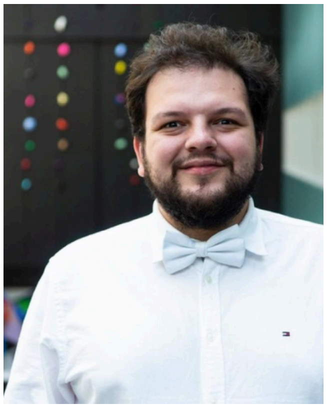
Talk Title: "*Working hard for the sucrose? Neural representations of effort."*

Abstract: Depression and anxiety are two common debilitating psychiatric conditions prevalent in the United States with many patients experiencing anhedonia. To better understand how anhedonia is represented in the brain and how it is induced by stress we developed a novel effort behavioral assay. Looking at stress-associated brain regions with high-density electrophysiology in combination with high-resolution behavioral tracking; we find that effort and reward are differentially encoded in the amygdala and anterior cingulate cortex.

UC Santa Barbara
Kavli Institute for Theoretical Physics (KITP)

Fatih Dinc, PhD

Postdoctoral Research Fellow, Kavli Institute for Theoretical Physics, UC Santa Barbara



Bio: I am a postdoctoral research fellow at Kavli Institute for Theoretical Physics, UC Santa Barbara. My research interests lie in the intersection between neuroscience, theoretical physics and computer science. My research aims to reverse-engineer the computational algorithms used by both artificial and biological neural networks. I received my PhD from the Department of Applied Physics, Stanford University with Dr. Mark Schnitzer. I obtained my MSc in Physics at University of Waterloo, where I participated at the Perimeter Scholars International program. I have received my B.S. degrees in both Electrical & Electronics Engineering and Physics as the valedictorian of 2018 class in Bogazici University. My Phd work, which I will present in this Symposium, has recently received the Siam's Richard C. Di Prima award for best thesis in applied mathematics, awarded internationally to one thesis every two years.

Talk Title: "*A geometric and dynamical theory of latent computations in biological neural networks*"

Abstract: Many studies have identified low-dimensional sets of behavioral variables encoded within large-scale neural activity patterns. However, dimensionality reduction analyses alone cannot yield causal explanations for how networks stably implement computations that are resilient to the substantial variability of single neuron dynamics. Further, existing methods for dimensionality reduction often rely on simplifying assumptions about network structure that limit their applicability and explanatory power. To provide a theoretical framework describing the dynamics of low-dimensional computation in high-dimensional neural networks, here we introduce the concept of latent processing units (LPUs), which are architecture-agnostic computational elements operating within biological neural circuitry. Six theorems governing coding and computation by LPUs collectively provide explanations for a range of common biological findings: low-dimensional sets of coding variables can generate high-dimensional neural dynamics; many neurons have activity patterns that represent behaviorally relevant variables but exert little influence on downstream circuits; linear readouts of neural population activity commonly allow near-optimal decoding of behaviorally relevant variables; drift in neural representations are often substantial even while network computations remain intact. Overall, our treatment of LPUs enacted in network dynamics unifies the geometric and dynamical views of neural computation under a joint framework and provides systems neuroscience with a causal account of how the brain executes reliable computations.

University of Oxford
Kavli Institute for NanoScience Discovery (Kavli INsD)

Tarick J. El-Baba, PhD

Senior Research Scientist, Kavli Institute for Nanoscience Discovery, University of Oxford

Bio: Tarick is a Senior Research Scientist in Carol Robinson's group at the Kavli Institute for Nanoscience Discovery, University of Oxford. His research bridges the molecular and behavioral worlds, investigating how neurotransmitter receptor assemblies and their local molecular environment govern the fundamental mechanisms of neuronal transmission. Drawing on mass spectrometry-based tools paired with behavioral assays in mouse models and post-mortem human tissue, his work traces a path from individual molecules through neural circuits to brain function and disease.

Talk Title: "*Building Bridges Between Synaptic Receptors, Behavior, and Disease with Mass Spectrometry*"

Abstract: Synaptic receptor complexes are molecularly intricate, defined by subunit stoichiometry, post-translational modifications, lipid interactions, and protein-protein networks; studying these features in an integrated way from native brain tissue has remained out of reach. We built a native enrichment platform coupled with mass spectrometry to capture intact receptor complexes directly from defined regions of mouse and human brain. This revealed that receptor assembly states and interaction networks, rather than expression level, are molecular correlate of depression and stress-susceptible behavior. These findings establish a pipeline from receptor-level molecular organization to circuit-specific behavior, with implications for psychiatric disease, anesthetic mechanisms, and synapse-targeted drug development.

Yale University
Kavli Institute for Neuroscience (KIN)

Evyn Dickinson, PhD Candidate

Neuroscience Dept, Yale University

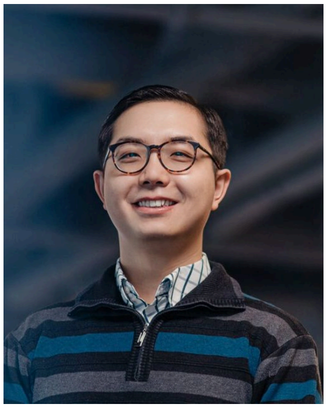
Bio: I am largely interested in how organisms use different types of sensory information to form flexible and adaptive behaviors. I first studied how organisms use a combination of biomechanical and neuromodulatory mechanisms to generate flexible behavior in the heart of the American lobster with Amy Johnson while an undergrad at Bowdoin College in Maine. After college, I taught for a few years as a Peace Corps Volunteer in Morocco. Subsequently, I moved to Seattle to work with John Tuthill at the University of Washington, where I was introduced to the fruit fly model system and spent three years studying proprioception and motor control during locomotion. I am currently a 6th-year Neuroscience PhD Candidate at Yale University, working on my thesis in the lab of James Jeanne.

Talk Title: "*Hierarchical prioritization of behavior during thermal threat*"

Abstract: Animals must constantly navigate competing survival needs, such as feeding, sleeping, and mating, by integrating internal states with external environmental cues. While acute stressors are well established to drive rapid behavioral shifts, how behavioral priorities adjust during sustained threats remains largely unexplored. Here, we discovered that slowly changing temperatures are perceived as a persistent threat and explored how it reorganizes behavioral architecture.

Weikang Shi, PhD

Postdoctoral Associate, Department of Neuroscience, Yale University



Bio: Weikang Shi is a Postdoctoral Associate at Yale University advised by Drs. Steve Chang, Anirvan Nandy, and Monika Jadi. His research investigates the neural mechanisms of strategic prosocial decisions, combining naturalistic behavioral paradigms, large-scale wireless neural recordings, and computational modeling to build a circuit-level understanding of how the cortico-striatal pathway generates cooperative behavior. He completed his PhD at Washington University in St. Louis with Dr. Camillo Padoa-Schioppa, where he established causal links between orbitofrontal cortex activity and economic choice.

Talk Title: *“Behavioral and neural mechanisms of cooperation in freely moving marmosets”*

Abstract: Cooperation requires monitoring a partner, evaluating outcomes, and adjusting one's own behavior accordingly, yet the behavioral and neural mechanisms underlying this process remain poorly understood. Using common marmosets and a custom automated apparatus, we identified two flexible cooperation strategies: a gaze-dependent "gaze-and-pull" strategy and a gaze-independent "pull-in-rhythm" strategy that marmosets use to coordinate joint actions with a partner. Neural recordings from the dorsomedial prefrontal cortex (dmPFC) during freely moving cooperation further revealed that dmPFC firing rate dynamics reflect a social evidence accumulation process, where gaze-accumulated information about the partner's actions drives cooperative decisions.

Lulu (Luke) Gong, PhD

Postdoctoral Fellow, Department of Biomedical Engineering, Yale University

Bio: Lulu (Luke) Gong is a postdoctoral fellow at Yale University, working in Dr. Shreya Saxena’s lab. He received a Ph.D. in dynamical systems and control theory, with a background in the mathematical analysis of complex biological systems. His current work sits at the intersection of theoretical modeling, machine learning, and neuroscience, where he develops principled data-driven methods to uncover interpretable neural dynamics underlying decision-making and motor control.

Talk Title: “*Principled inference of neural population dynamics across modes and timescales”*

Abstract: Neural population activity is highly heterogeneous, reflecting variations across behavioral conditions, internal states, and temporal scales. Dynamical systems models provide a powerful framework for describing these complex activity patterns and uncovering their underlying structure. In this talk, I will present our recent work on inferring neural population dynamics using latent dynamical system models at two levels: across different dynamical modes and across multiple timescales. Together, these approaches aim to provide interpretable tools for understanding how neural populations dynamics support behavior.

Andrea Cuentas-Condori, PhD

Postdoctoral Fellow, Department of Neuroscience, Yale University

Bio: Andrea Cuentas-Condori, Ph.D., is a Postdoctoral Associate in the Laboratory of Daniel Colón-Ramos, Ph.D. at Yale University. Her scientific interests focus on understanding principles of neuronal co-transmission, the capacity of neurons to use more than one small neurotransmitter. Dr. Cuentas-Condori received a B.S. from Universidad Peruana Cayetano Heredia in Biological Sciences in her hometown Lima, Peru. Andrea earned her Ph.D. in Cell and Developmental Biology from Vanderbilt University, where she uncovered cellular mechanisms underlying synaptic remodeling, including how presynaptic components are selectively removed and recycled during neural circuit reorganization. Her work has contributed to establishing Caenorhabditis elegans as a powerful system to study synaptic structure and function, including providing evidence for functional dendritic spines in this organism.

Talk Title: "*Experience-Dependent Co-Transmission Regulates Goal-Oriented Navigation"*

Abstract: Co-transmission—the release of multiple small neurotransmitters from a single neuron— is thought to expand the coding capacity of neural circuits in vivo. Using C. elegans, I developed SynaptoTagMe, a toolkit to visualize and manipulate endogenous vesicular transporters at single-cell resolution, enabling an atlas and functional dissection of co-transmission.

Focusing on the thermosensory neuron AFD, I find that glutamate and acetylcholine transporters are independently and dynamically regulated by sensory experience. This cell-autonomous plasticity tunes transmitter usage to reconfigure circuit output, which controls flexible animal behavior. These results show that co-transmitter synapses increase the dimensionality of neuronal output by enabling context-dependent neurotransmission.

Xize Xu, PhD

Postdoctoral Associate, Department of Psychiatry, Yale University

Bio: I am a Postdoctoral Associate in Computational Neuroscience in the Department of Psychiatry at Yale University, working with Dr. Monika Jadi. I received my PhD from Northwestern University, where I was supervised by Dr. Hermann Riecke in the Department of Applied Mathematics and Engineering Sciences. My research combines mechanistic and statistical circuit-level models to investigate the mechanisms of visual processing, with a particular focus on visual crowding and pre-saccadic remapping. I am especially interested in how non-uniform geometric properties of cortical representations shape these processes, and I pursue this work in close collaboration with experimental researchers.

Talk Title: "*Conjunctive tuning and compensatory cortical distortions support a mechanism of predictive visual remapping"*

Abstract: Perceptual continuity across saccades relies on pre-saccadic remapping of visual receptive fields driven by corollary discharge. I will present a recurrent network model in which neurons conjunctively tuned to retinotopic location and planned saccade direction integrate these signals. Pre-saccadic suppression stabilizes this process by counteracting distortions arising from direction selectivity; macaque V2 recordings during cued saccades show that this suppression is stronger in the fovea than in the periphery. The model predicts eccentricity-dependent remapping errors due to cortical non-uniformity, consistent with experimental data, and further predicts that countervailing distortions in cortical representation mitigate these errors. By revealing novel properties of visual neurons across eccentricities, this work reconciles the competing demands of acuity and perceptual continuity in the visual cortex.