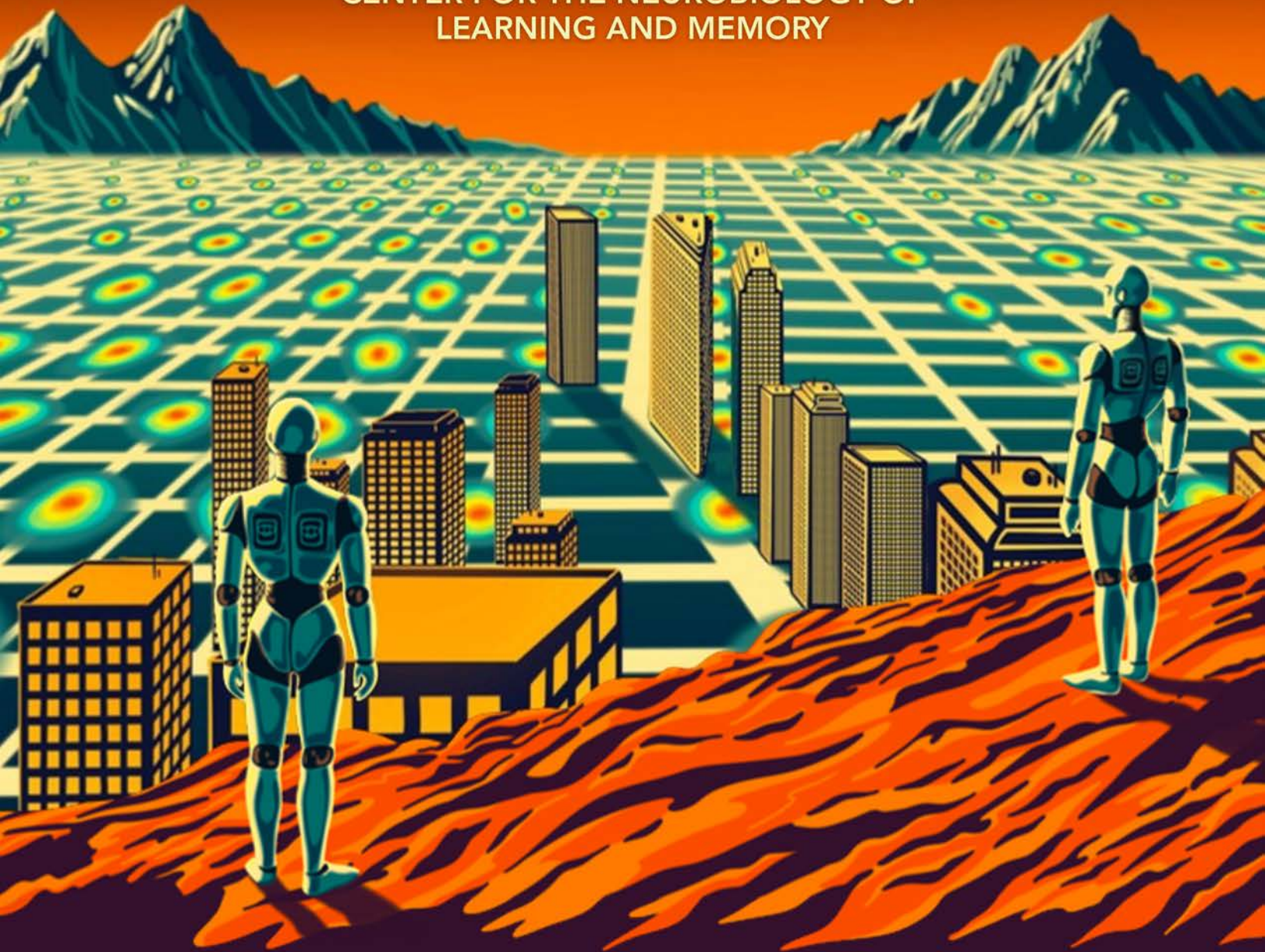


MINDS, MAPS, AND MACHINES

2026 SPRING CONFERENCE

CENTER FOR THE NEUROBIOLOGY OF
LEARNING AND MEMORY



APRIL 9-10

Herklotz Conference Center
University of California, Irvine

Minds, Maps, and Machines

Dear colleagues,

Welcome to the 2026 Spring Conference of the Center for the Neurobiology of Learning and Memory! We are delighted to welcome both returning colleagues and first-time guests to this long-standing tradition at the Center. Since 1982, the CNLM has hosted annual scientific Spring meetings to highlight recent advances in the field, foster collaboration, and spark new partnerships.

Scientific meetings have a way of energizing us, allowing us to step out of our day-to-day research and dedicate precious time to learning together and growing as a field. There are few things that are as exciting as deep science conversations at a conference. We get to play with ideas and dream up new experiments. It is invigorating to see eyes light up when new connections are made and new scientific collaborations are born.

The CNLM is especially unique in its capacity to foster these conversations. For one, the Spring Conference has a 50/50 rule that outlines the importance of dedicated space for discussion. This rule integrates discussion into the structure of the conference itself—rather than leaving discussion just for lunch time or poster sessions—and has driven these conversations since the origin of these meetings in 1982. The CNLM also stands out as an interdisciplinary hub, where scientists across fields bring their unique perspectives to discuss learning and memory. The Spring Conference is a place where a cognitive scientist studying how a concept is formed can connect with an epigenetics expert working to understand the molecular drivers of memory.

These interdisciplinary connections and the innovative projects that grow from them inspired this year's conference theme: *Minds, Maps, and Machines*. This theme reflects a shared effort to bridge perspectives, from cognitive frameworks of how we form and navigate mental representations to the molecular and computational mechanisms that support them. This theme builds upon last year's recognition of a collaborative project led by members of this year's conference committee—Elizabeth Chrastil, Jeffrey Krichmar, and Douglas Nitz—highlighting the power of integrating approaches across levels of analysis. Together, these efforts capture what makes the CNLM Spring Conference so distinctive: a space where ideas don't just coexist, but actively connect to move the field forward.

The collaborative work of Drs. Chrastil, Krichmar, and Nitz centers on a fundamental but often overlooked aspect of the cognitive map: the ability to translate between first-person experience and global map representations. In other words, how do we seamlessly move from picturing our location on a map to allowing cues from our immersive environment orient us on a map.

By combining human and rodent behavior, neurophysiology, and computational modeling, the project seeks to uncover how the brain enables these perspective transformations and what neural representations support them. Using tools from artificial intelligence, such as variational autoencoders and recurrent neural networks, the team models how global and first-person perspectives can be reconstructed from one another, linking these computational features to known neural systems like place and head direction cells. Together, this interdisciplinary approach advances our understanding of spatial navigation and brain function, particularly in regions like the retrosplenial cortex, and offers novel insights and practical applications ranging from navigation technologies to autonomous systems.

Collaborative work that reaches across subfields and model systems—like the project that inspired this year’s theme—drives innovation and expands how we think about the brain. The Spring Conference is a unique opportunity to seek out these collaborations. It is a privilege to foster this scientific community, at this meeting and beyond. We hope you find these moments of interdisciplinary connection over the next two days and we can’t wait to see the amazing work that arises from them.

The Spring Conference would not be possible without the support of the Friends of the CNLM, whose philanthropic contributions continue to support our mission. We are deeply grateful for this community and their generosity. We are also grateful to the CNLM staff, including Cecilia Martz, Eleanor Chan, Erynn Nassif, and Thien Pham.

On behalf of the Organizing Committee, we thank you for joining us and hope you have a great time.

Organizing Committee

Elizabeth Chrastil, Ph.D.
*Associate Professor,
Neurobiology and Behavior, UC Irvine*

Jeffrey Krichmar, Ph.D.
*Professor,
Cognitive Sciences, UC Irvine*

Douglas Nitz, Ph.D.
*Professor,
Cognitive Sciences, UC San Diego*

Michael A. Yassa, Ph.D.
Professor and Center Director, CNLM

Manuella Oliveira Yassa, Ph.D.
Director of Outreach and Education, CNLM

Morgan Coburn, Ph.D.
*Assistant Director of Outreach and
Education, CNLM*

Erin Purvis Conway, Ph.D.
Civic Science Fellow, CNLM

Conference Details

Code of Conduct

The Center for the Neurobiology of Learning and Memory (CNLM) at the University of California, Irvine is committed to providing an atmosphere that encourages the free expression of ideas in a safe, positive, and harassment-free environment that is welcoming to all participants, regardless of race, color, national origin, religion, sex, gender, gender expression, gender identity, gender transition status, pregnancy, physical or mental disability, medical condition, genetic information (including family medical history), ancestry, marital status, age, sexual orientation, citizenship, or service in the uniformed services.

In alignment with University of California policies, CNLM scientific conferences and activities prohibit discrimination, harassment, abuse of power, bullying, sexual misconduct and inappropriate behavior in any form. The CNLM is committed to ensuring compliance with the University policies referenced herein and enforcing this Code of Conduct during any CNLM activity. By registering for and/or attending an event, all participants agree to abide by the Code of Conduct. The full text of the Code of Conduct can be found at <http://cnlm.uci.edu/code-of-conduct>.

Reporting Incidents

Any event participant affected by, or who may have witnessed, any inappropriate behaviors that breach the Code of Conduct may make a complaint by using one of the following options:

You may contact the event organizers or CNLM Leadership:

Michael A. Yassa (he/him) | myassa@uci.edu

Manuella Oliveira Yassa (she/her) | yassamo@uci.edu

You may also contact the UCI Office of Equal Opportunity and Diversity (OEOD)/Title IX Office. Any person may report incidents of sexual harassment, discrimination, or sexual violence to the campus Title IX Office by visiting www.oedod.uci.edu, calling 949- 824-5594 or emailing oeod@uci.edu. You may also directly contact the Title IX Officer:

Tierney Anderson (she/they)

Title IX Officer | tierneya@uci.edu

More information, definition, and reporting options can be reviewed online at <https://cnlm.uci.edu/code-of-conduct/>



Wi-Fi Access

Guest Wi-Fi access is available through UC Irvine. Click on the network 'UCI-Guest' and agree to the terms of service. You may also access online services through the Eduroam network.

Travel Information

Air Travel

The closest airport to UC Irvine is John Wayne Airport (SNA) located just 10 minutes from campus. Alternatively, participants may fly into Long Beach Airport (LGB) and Los Angeles International Airport (LAX). Long Beach Airport is a 30-minute drive from campus, Los Angeles International Airport is 60 minutes from campus, without traffic. Traffic from both of these airports can be very heavy during commute times (7-10am and 4-8pm). Please plan accordingly.

Travel by Train

A fun alternative to driving or flying in Southern California is taking the Pacific Surfliner. Connecting San Luis Obispo and San Diego through Los Angeles and Santa Barbara, the Pacific Surfliner route offers a unique vantage on the Southern California seascape. The closest Amtrak stop is in Irvine (IRV) located at the Irvine Transportation Center, 15215 Barranca Parkway, Irvine, CA 92618. From the station, the UCI campus is a short cab or Uber/Lyft ride away. For GPS navigation please use the address: 506 C Student Center, Irvine, CA 92617, which will get you closest to the Herklotz Conference Center. For more information visit: <https://www.amtrak.com/pacific-surfliner-train>

Driving to Irvine

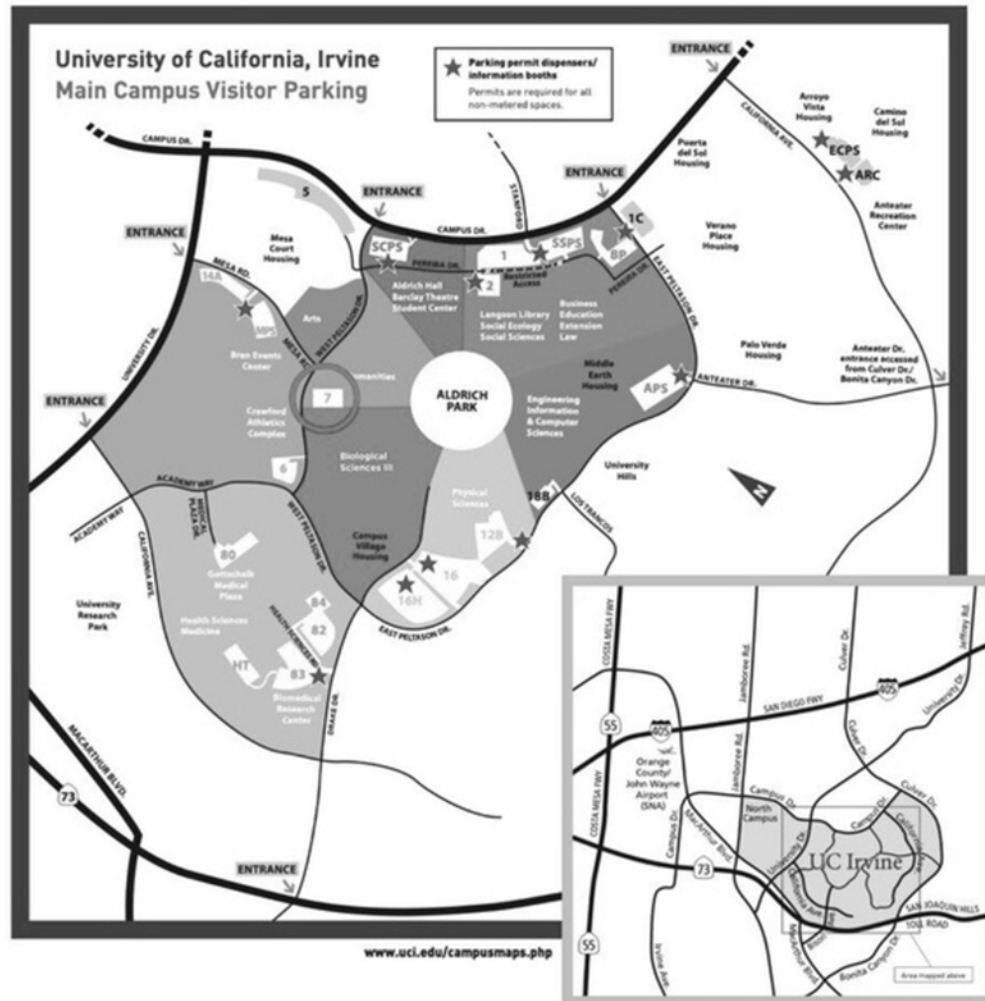
Irvine is centrally located between Los Angeles and San Diego, and can be reached easily by car. From Los Angeles, it is easiest to take the 405 Freeway to the 73 Freeway and exit on Bison Ave/Michael Drake Drive at the edge of campus. Follow the map on the next page to arrive at the CNLM. From San Diego you can take the 5 Freeway either to the 73 Toll Road and exit on Bison/Michael Drake Drive as above, or alternatively you can take the 5 to the 405 and exit on University Ave. From University make a left on Campus Drive and follow the map on the next page to arrive at the CNLM. For GPS navigation please use the address: 506 C Student Center, Irvine, CA 92617, which will get you closest to the Herklotz Conference Center.

Rideshare

If you are using a rideshare app such as Lyft or Uber, please provide the following address:
506C Student Center Drive
Irvine, CA 92697

Parking

Parking for participants traveling by car is available in Lot 7, marked with a red circle in the map below. Parking passes can be purchased at any of the kiosks on the UCI campus (marked with a star on the map below). Additionally, passes can be purchased online through Park-by-Plate at parking.uci.edu/pay. Enter code **7L222** and follow the instructions.



Lodging

We have negotiated special UCI rates with several area hotels. Please call the hotel directly to reserve your room. There is no deadline for room reservations. We include here our two preferred hotels that are convenient to campus.

Sonesta Irvine

17941 Von Karman Ave, Irvine, CA 92614
949-863-1999
Corporate/Group code: UC8

Hyatt Regency Newport Beach

1107 Jamboree Road, Newport Beach, CA 92660
949-729-1234
Corporate/Group Code: CR20258

Visit this link for more information and other options:

<https://www.accounting.uci.edu/ap/travel/resources/hotels.php>

Symposia and the 50/50 Rule

Symposia must adhere to the 50/50 rule, where 50% of the time is reserved for discussion and questions. All speakers are required to stay on time to allow for a robust general discussion to connect themes and ideas across talks.

Data Blitz Sessions

Presentations

Data blitz participants will NOT be able to use their own laptops. Presenters must upload their slide in PDF format prior to the meeting (follow instructions you receive by email). This will ensure that there are no animations and that slides will look as intended. Only one static slide (PDF format) is permitted. Each presenter has 4 minutes for their talk and 1 minute for Q&A and transition. These sessions are very fast paced!

Awards

Data blitz presentations will be judged by an anonymous panel and the top three data blitz presenters will be awarded. Blitzes will be judged based on (1) the ability to communicate a single idea effectively with a focused presentation and a clear concise visual image, (2) giving just enough context so that the listener understands the significance of the question and findings, and (3) strictly adhering to the rules, i.e. time limit and number of slides.

Open Paper Sessions

In addition to presentations from students, we will have one “open paper” session that will feature faculty and postdoctoral fellows delivering 8-minute brief talks with 2 minutes for questions. No more than 10 slides are permitted in open paper sessions.

Meals

The conference registration includes breakfast, lunch, and coffee breaks. Special events are planned for dinners on both evenings (see below).

Casual Pizza Networking Dinner

Join us for pizza and casual networking dinner! This event will be held on Thursday, April 9, 2026 at 5:30 PM in the CNLM Courtyard. **All attendees are invited!**

Brainfest Party

After the conclusion of the final session on Friday, we will celebrate with dinner, music, and good times! Colleagues who are driving back to other UC campuses should consider sticking around to miss rush hour traffic.

Agenda

Day One: Thursday, April 9

- 8:30 am Check in, Breakfast, and Poster Set-up
- 9:15 am Welcome and Introduction
- 9:30 am Symposium 1: Cognitive Maps in Rats, Robots, and Computers
- 11:30 am Lunch and Poster Session
- 1:00 pm Data Blitz Session
- 3:00 pm Refreshment Break
- 3:30 pm Symposium 2: Evolutionary Pressures on the Cognitive Map
- 5:30 pm Casual Pizza Networking Dinner

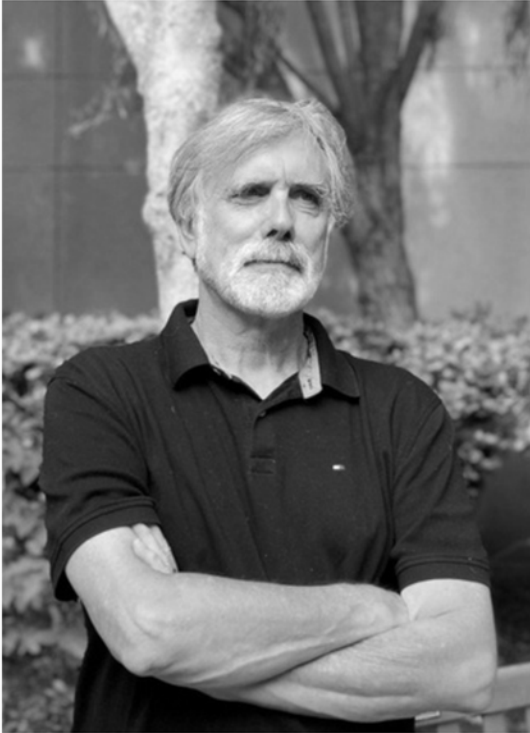
Day Two: Friday, April 10

- 9:00 am Breakfast and Poster Setup
- 9:30 am Symposium 3: Neurophysiology of the Cognitive Map
- 11:30 am Lunch and Poster Session
- 1:00 pm Open Paper Session
- 3:00 pm Refreshment Break
- 3:30 pm Keynote Lecture: Bruce McNaughton
- 4:45 pm Brainfest Party

Keynote

Enriched Experience, Cortical Representation, and Functional Synaptic Connectivity

April 10, 3:30 PM | Herklotz Conference Center



Bruce McNaughton, Ph.D.

Distinguished Professor

Department of Neurobiology and Behavior

Center for the Neurobiology of Learning and Memory

University of California, Irvine

Bruce McNaughton is a leading figure in systems neuroscience, known for his foundational contributions to understanding how neural populations encode memory and spatial experience. His work has been central to shaping modern views of hippocampal function, including the discovery and characterization of place cell dynamics and the demonstration that neural activity patterns are reactivated during sleep, providing a mechanistic basis for memory consolidation.

McNaughton pioneered the development of tetrode recording techniques, now widely used to monitor large populations of neurons in behaving animals. This approach transformed the field by making it possible to study cognition at the level of coordinated neural ensembles rather than single cells in isolation.

McNaughton received his Ph.D. in Psychology from Dalhousie University in 1978. He previously held faculty positions at the University of Colorado, the University of Arizona, where he served as Chair of the Neuroscience Graduate Interdisciplinary Program, and the University of Lethbridge. He joined the University of California, Irvine in 2014 and became a Faculty Fellow of the Center for the Neurobiology of Learning and Memory.

His contributions have been recognized through numerous honors, including the NIH MERIT and Javits Awards, the Polaris Award from the Alberta Heritage Foundation for Medical Research, and election as a Fellow of the Royal Society of Canada and a foreign member of the Royal Norwegian Society of Sciences and Letters. McNaughton's work has helped define how memory emerges from the dynamic interactions of distributed brain systems, leaving a lasting imprint on both experimental and theoretical neuroscience.

Symposium Sessions

Session 1: Cognitive Maps in Rats, Robots, and Models

Thursday April 9 | 9:30 am

Moderator: Jeffrey Krichmar, University of California, Irvine

Jean-Marc Fellous, University of California, San Diego

Hippocampal coding of very large and complex environments

Sven Koenig, University of California, Irvine

Multi-robot navigation in large warehouses

Mayank Mehta, University of California, Los Angeles

Showtime for hippocampus

Session 2: Evolutionary Pressures on the Cognitive Map

Thursday April 9 | 3:30 pm

Moderator: Liz Chrastil, University of California, Irvine

Georg Striedter, University of California, Irvine

News from non-mammals: coding for place and episodic memories in the hippocampus of a food-catching bird

Lucia Jacobs, University of California, Berkeley

Breath, space and smells: how olfaction shaped the evolution of hippocampal function

Helen Elizabeth Davis, Arizona State University

Spatial cognition, navigation, and social learning in humans: evidence from forager and pastoralist societies

Session 3: Neurophysiology of the Cognitive Map

Friday April 10 | 9:30 am

Moderator: Douglas Nitz, University of California, San Diego

Andrew Alexander, University of California, Santa Barbara

Predictive pursuit emerges in real and artificial neural networks

Michael Goard, University of California, Santa Barbara

Generation of egocentric spatial maps from visual input

Caitlin Mallory, University of California, Berkeley

Organizing your thoughts: what temporal structure reveals about the mechanisms and functions of hippocampal replay

Data Blitz: Thursday 1:00 pm

Alexa Booras, University of California, Irvine

Non-spatial navigation is driven by both adaptive learning and use of successor representations

Keiland Cooper, University of California, Irvine

Multi-step hippocampal replay of abstract relationships among non-spatial event sequences

Natalie DiProspero, University of California, Irvine

Choroid plexus enlargement as a biomarker of Alzheimer's disease in Down syndrome

Selen Dirik, University of California, Irvine

Re-wired for risk? Investigating the imprint of adolescent cannabis exposure on risky decision making

Johanna Extremet, University of California, Irvine

Neuron lineage-specific roles of the AMPA receptor GluA2 subunit in epilepsy and memory

Luis Gonzalez, California State University, San Bernardino

Impact of early methylphenidate on adult attention and sleep/wake using an ADHD rodent model

Shuheng Guo, University of California, Irvine

Replay supports future decisions by updating a successor representation

Savannah Maw, University of California, Davis

The roles of dopamine receptor subtypes in a mouse stimulus discrimination task

Neda Morakabati, University of California, Irvine

Reducing intrusive memories with sleep reactivation of a rescripted trauma narrative

Briana Morales, University of California, Irvine

The magic of magic mushrooms: psilocybin's therapeutic potential

Gautam Narayan, University of California, Irvine

Targeted memory reactivation during sleep supports spatial memory recall in a Minecraft environment

Zaneta Navratilova, University of California, Irvine

Stable landmarks are necessary for the formation, but not maintenance, of spatial tuning in retrosplenial cortex

Matthew Sandoval, University of California, Irvine

Understanding the function of cell adhesion molecule MDGA1 in dentate gyrus granule cell synaptic transmission and memory

Negin Sattari Barabadi, University of California, Irvine

Sleep timing, sex hormones, and memory across the lifespan

Michael Starrett Ambrose, University of California, Irvine

What is the posteromedial cortex and what does it do?

Alina Tu, University of California, Irvine

Hippocampal volume correlates with spatial ability and video game experience, but sex is the primary predictor

Tracy Uzoigwe, University of California, Irvine

Menstrual cycle influences the neurophysiology of sleep and mood: REM sleep is a mood buffer for young women during menses

Leah Varghese, University of California, Irvine

Evaluating plasma Ptau-217 sensitivity in detecting individual differences in early-stage Tau aggregation in cognitively unimpaired older adults

Open Papers: Friday 1:00 pm

Jenna Adams, University of California, Irvine

Impact of Alzheimer's pathology on hippocampal CA1 activation during statistical learning

Liz Chrastil, University of California, Irvine

Dynamics of learning: reconfigurations of functional brain networks across learning predict human navigation performance

Christie Fowler, University of California, Irvine

Negative allosteric modulation of cholinergic signaling in learning and memory

Sung Soo Kim, University of California, Santa Barbara

Vector coordinate transformation in the *Drosophila* navigation system

Eitan Schechtman, University of California, Irvine

Reactivation during sleep segregates the neural representations of episodic memories

Katharine Simon, University of California, Irvine

Longitudinal spatial memory and navigation performance in youth with depressive symptoms

Christine Smith, University of California, San Diego

Sensitivity of news event memory to medial temporal lobe subregion volumes susceptible to Alzheimer's disease

Han Tan, University of California, Irvine

Mapping brain-body communication in metabolism and aging

Thursday Poster Session

Robert Bain, University of California, Irvine

A new platform for studying long-timescale neural dynamics: week-stable single-unit tracking with lightweight flexible probes

Laura Bui, University of California, Irvine

Elucidating the role of cell adhesion molecule MDGA1 in lateral habenula function and depressive behavior in mice

Harrison Espino, University of California, Irvine

A rapid adapting and continual learning spiking neural network path planning algorithm for mobile robots

Andrea García Quiñones, University of Puerto Rico Río Piedras

Exposure to glyphosate enhances avoidance expression and disrupts activity in infralimbic prefrontal cortex in female rats

Danielle Greenman, University of California, Riverside

Optimal NODDI intrinsic diffusivity varies with tissue type and influences age effects: a novel examination of the locus coeruleus

Luis Gonzalez, California State University, San Bernardino

Effects of orexin/hypocretin receptor 1 antagonist on drinking behavior and rest/wake activity

Allison Jian, University of California, Irvine

Neurocognitive benefits of human neural stem cell-derived extracellular vesicles in brain cancer-bearing mice following combined cranial radiation

Rochelle Kaper, University of California, Irvine

Characterizing the contribution of stimulus familiarity and metacognition to hierarchical structure learning and representations

Scott Kilianski, University of Virginia

Neuronal synchrony during spike-wave discharges

Robert Krattli, University of California, Irvine

Comparing functional consequences of iPSC-microglia- and human neural stem cell-derived extracellular vesicles in mitigating the cognitive decline in Alzheimer's disease

Krishnadev Lakshminarayanan, University of California, Irvine

BDNF enhancement protects from cognitive decline following breast cancer chemotherapy

Nicholas Lew, University of California, Irvine

The effect of circadian state on memory consolidation during sleep

Wing Ning, University of California, Irvine

Laminar organization of sensory and spatial representations differs between primary and association cortices

Rohin Palsule, University of California, Irvine

Comparing a large language model-derived metric of contextual information gain with human judgements in narratives

Asrita Prathigudupu, University of California, Irvine

Neuroprotective effects of cannabidiol in chemotherapy-related cognitive impairment

Fabiola Ricardo, University of Puerto Rico Medical Sciences Campus

Low frequency-DBS of the NAc in morphine spontaneous recovery and reinstatement

Michael Starrett Ambrose, University of California, Irvine

Increased processing time preserves spatial information across reference frames: the role of posterior medial cortex

Cindy Wang, University of California, Irvine

Variables from relationships

Friday Poster Session

Santiago Acosta-Mendoza, University of California, Santa Barbara

Distance representation in mouse visual cortices

Paula Assakura Miyazaki, University of California, Irvine

Distinct contributions of the hippocampus, prefrontal cortex, perirhinal cortex, and midline thalamic nuclei in sequence memory

Natalie DiProspero, University of California, Irvine

Patterns of neurodegeneration due to Alzheimer's disease track with clinical status and cognition in people with Down syndrome

Selen Dirik, University of California, Irvine

Re-wired for risk? Investigating the imprint of adolescent cannabis exposure on reward and threat processing

Daisy Gallardo, University of California, Irvine

Degeneration of motor pathway structures in the 5xFAD mouse model

Lucas Garcia, University of California, Irvine

Neuron lineage-specific contributions of the AMPA receptor GluA1 subunit to cognitive, social and anxiety-related behavior

Elle Giovanni, University of California, Irvine

Being vs. feeling in control: the relationship between objective and subjective agency

Tina Hendi, University of California, Irvine

Exploring predictors of navigation abilities in clinical conditions with trait-based data from a healthy young adult population

Jasmin Hernandez Santacruz, University of California, Irvine

Living across borders: experience-dependent adaptation in bilingual language control

Nikhita Kaushik, University of California, Irvine

Resting-state functional connectivity analysis of individual differences in spatial navigation

Sam Lassers, University of California, Irvine

Sparse axonal theta oscillations evoke bursting in target hippocampal subregions

Royston Long, University of California, Irvine

Evidence for similarity-weighted interleaved learning for continuous learning in neocortex

Morgan Sky Lu, University of California, Irvine

Investigating the function of the neuropsychiatric disorder-associated protein MDGA1 in the dentate gyrus

Soo Bin Park, University of California, Irvine

Mechanisms underlying stress-induced alterations of sensory discrimination in the posterior parietal cortex

Joseph Picone, University of California, Irvine

Investigating the interface between epigenetics and metabolism underlying memory formation in the adult and aging brain

Justin Shobe, University of California, Irvine

The influence of context and spatial position on visual object learning

Alessandra Shuster, University of California, Irvine

Sleep is linked to glycemic dynamics and cognition in T1D

Paulette Vázquez-Martínez, University of Puerto Rico

Activation of the NLRP3 inflammasome along the gut-brain axis following traumatic brain injury

Jasmine Yeo, University of California, Santa Barbara

Layer-specific spatial coding in mouse primary visual cortex during virtual navigation

See you next year!

2027 CNLM Spring Conference

April 8-9, 2027

Suggestions? Ideas?
Scan the QR code to let us know!



The McGaugh-Gerard Lecture on
Learning and Memory

From Moments to Engrams

**Steve
Ramirez, Ph.D.**

Associate Professor of
Psychological and Brain
Sciences, *Boston University*

October 1, 2026
7:30 pm



UC Irvine Center for the
Neurobiology of Learning & Memory

UC Irvine

Center for the Neurobiology
of Learning & Memory

