

# 2024 Human Performance and Biosystems Program Review

Dr. Patrick Bradshaw | October 22-24, 2024 | Arlington, VA

Basic Research Innovation Collaboration Center (BRICC)  
4100 N Fairfax Drive, Su

## Agenda Day 1 | Tuesday, October 22, 2024

Time	Topic	Speaker
8:15	<b>In-person check-in/Virtual login</b>	
8:30	VOC Biomarker Sensing: Understanding Ultrasensitive Bio Olfactory System	Steve Kim, Elisabeth Steel, AFRL/RH
9:00	Defining How a Directed Energy-Evoked Fast Thermal Gradient Impacts Synaptic Mechanisms at the Dendritic Spine	Bryan Gamboa, AFRL/RHD
9:30	Neural and Behavioral Basis of Sensory Integration in the Mosquito	Jeffrey Riffell, U Washington
10:00	<b>BREAK</b>	
10:30	Molecular pathways underlying homeostatic interactions between metabolism and circadian Rhythms	Jen-Yung Chen, UC San Diego
11:00	Adaptive inertial Sensing in a complex behavioral repertoire	Jess Fox, <b>(remote)</b> , Case Western Univ
11:30	Decision making underlying successful aerial contact in predatory flights: take-off, steering and thrust control	Paloma Bellido Gonzalez, U of Minnesota
12:00	<b>LUNCH</b>	
1:30	Flying in an Uncertain World: Decoding Rules of Neural Control in Insect Flight	Jean-Michel Mongeau, Penn State
2:00	Target Tracking in the Natural World:Neurons and Behavior to Modeling	Karin Nordstrom, Flinders Univ
2:30	Fundamentals and Feasibility of Continuous Protein Monitoring	Jason Heikenfeld, (remote) Univ Cincinnati
3:00	<b>BREAK</b>	
3:30	Microfluidic Photobiology Microscopy of Light Harvesting Bacteria at the Single Cell Limit	Nathan Gabor, UC Riverside
4:00	Nanoelectropulse-induced Changes in Cell Excitability – a new approach for neuromodulation	Gale Craviso, U Nevada Reno
4:30	TBD	
5:00	<b>REVIEW ADJOURN</b>	
5:00	<b>Networking/Social at Bronson Bier Hall</b>	

<b>Agenda Day 2   Wednesday, October 23, 2024</b>		
<b>Time</b>	<b>Topic</b>	<b>Speaker</b>
<b>8:15</b>	<b>In-person check-in/Virtual login</b>	
<b>8:30</b>	Nanosecond electric pulses (NEP) as a stimulus for evoking catecholamine release from adrenal chromaffin cells to elicit the “fight or flight response	Josette Zaklit, U Nevada Reno
<b>9:00</b>	The Adaptive Auditory Mind: Plasticity and Temporal Coherence in Scene Analysis	Shihab Shamma, Univ Maryland
<b>9:30</b>	Exploiting Radio frequency Electromagnetic Field Hormesis to Provide Resilience to Neurons	Ibtissam Echchgadda, AFRL/RHD
<b>10:00</b>	<b>BREAK</b>	
<b>10:30</b>	Magnetoreception in Marine Animals, Bio-inspired algorithms for long range GPS free navigation	Ken Lohmann, Univ North Carolina
<b>11:00</b>	Gravity Dependent Cortical Control of Sensation	Oded Ghitza, Boston University
<b>11:30</b>	Efferent control of synchronization in systems of coupled hair cells	Delores Bozovic, UCLA
<b>12:00</b>	<b>LUNCH</b>	
<b>1:15</b>	Implications of CISS in Bio systems	Ron Naaman ( <b>remote</b> ), Weizmann Institute Israel
<b>1:45</b>	Implications of CISS in Bio systems	Moh El-Naggar, U Southern California
<b>2:15</b>	A gyroscopic control loop for active target vision	Mark Frye, UCLA (JM Mongeau present)
<b>2:45</b>	<b>BREAK</b>	
<b>3:15</b>	The impact of stress on the neurobiology of cognition	Dhruv Grover, UCSD
<b>3:45</b>	Bio-inspired Multispectral-Polarization Imaging Devices with Perovskite Nanocrystals for UV and Visible Spectral Sensing	Viktor Gruev, Univ Illinois
<b>4:15</b>	TBD	
<b>4:45</b>	End of Presentations	
<b>5:00</b>	<b>REVIEW ADJOURN</b>	

## Agenda Day 3 | Thursday, October 24, 2024

Time	Topic	Speaker
<b>8:15</b>	<b>In-person check-in/Virtual login</b>	
<b>8:30</b>	Deciphering the Influence of Unsteady Aerodynamics on Mechanosensation and Olfaction in Insect Flight	Chengyu Li Villanova/Case Western Res
<b>9:00</b>	Precision Nanosurgery and Multimodal Intracellular Monitoring of Cellular Networks by Biomimic Nano-optoelectrode Arrays	Wei Zhou, Virginia Tech
<b>9:30</b>	Biomechanical Responses to Light: Photostimulation of Plasticity in Cultured Neural Cells and Networks	Michael Denton, AFRL/RHD
<b>10:00</b>	<b>BREAK</b>	
<b>10:30</b>	Optically Controlled, Genetically targeted Chemical Assembly of Electric neuromodulation	Jia Liu, Harvard
<b>11:00</b>	Genetic, Biophysical, and Behavioral Characterization of Microbial Extracellular Electron Transport in Human and Animal Systems	Steve Finkel, U Southern California
<b>11:30</b>		
<b>12:00</b>	<b>LUNCH</b>	
<b>1:30</b>	Non-invasive Cell-type-specific Magnetic Neural Modulation	Siyuan Rao, AFRL/RHD
<b>2:00</b>	Controlled Manipulation of Cell Function via Infrared Light	Alexandra Walsh Texas A&M
<b>2:30</b>	Cephalopod-Inspired Adaptive Invisibility in Living Systems	Alon Gorodetsky, UC Irvine
<b>3:00</b>	Augmenting Learning and Memory through Photothermal Nano-Neuromodulation	Srikanth Singamaneni, Wash Univ St Louis
<b>3:30</b>	Topological Data Analysis for Identification of MicroRNAs As Biomarkers for Human Performance	Rajesh Naik, Mined XAI
<b>4:00</b>	Genetic ablation and functional assessment of a target detector in an insect retina	Michael Perry, UC San Diego
<b>4:30</b>	<b>END OF REVIEW</b>	