Neural, Behavioral and Evolutionary Strategies for Animal Survival

June 18 - 23, 2017

Chairs
Melissa Coleman and Keith Sillar

Vice Chairs
Mark A. Frye and Marie Dacke

Les Diablerets Conference Center
Eurotel Victoria
Les Diablerets, CH

Conference Description

The 2017 Gordon Research Conference on Neuroethology will focus on "Neural, Behavioral and Evolutionary Strategies for Animal Survival". The core focus of Neuroethology is the understanding of the neuronal bases of natural animal behaviors. In this conference we will highlight some of the amazing strategies animals use for survival. The behavioral, neural and molecular underpinnings of survival strategies will be highlighted in sessions on topics that including the use of toxins in predation and self-preservation, the ability of animals to adapt to a constantly changing environment, group dynamics and social interactions, and the use of multisensory inputs to sample the environment. The goal is to highlight multidisciplinary approaches in each of these topics to stimulate lively discussions that will bring new ideas and approaches to the field. Invited speakers will include both established and early-stage investigators. In addition to formal talks and discussion sessions, all participants are encouraged to present their research in the form of poster presentations. This conference will also include a new initiative of the Gordon Research Board of Trustees called "Power Hour" that is an informal session open to all attendees in which the challenges facing women in science will be discussed. The conference will be preceded by a compelling Neuroethology Gordon Research Seminar (GRS) which will set the stage for the GRC, but cover a unique set of topics. The GRS is an opportunity for graduate students and post-docs to present their research to peers and future colleagues, and to interact with a senior faculty mentor for career and life advice.

Related Meeting

This GRC will be held in conjunction with the "Neuroethology: Behavior, Evolution and Neurobiology (GRS)" Gordon Research Seminar (GRS). Those interested in attending both meetings must submit an application for the GRS in addition to an application for the GRC. Refer to the associated GRS program page for more information.

Conference Program

Sunday	
4:00 pm - 8:00 pm	Arrival and Check-in
6:00 pm - 7:00 pm	Dinner
7:30 pm - 7:40 pm	Introductory Comments by GRC Site Staff / Welcome from the GRC Chair
7:40 pm - 9:30 pm	**Bat Echolocation** *Session in memory of Annemarie Surlykke, who was elected as the GRC co-chair.* Discussion Leader: **Cynthia Moss** (Johns Hopkins University, USA)
7:40 pm - 7:55 pm	Introduction by Discussion Leader
7:55 pm - 8:20 pm	**Signe Brinklov** (University of Southern Denmark, Denmark) "Oilbird Echolocation Signals - Tuned to Ambient Light Conditions but Not to Best Hearing Frequency"
8:20 pm - 8:25 pm	Discussion
8:25 pm - 8:50 pm	**Lasse Jakobsen** (University of Southern Denmark, Denmark) "Sonar Beam Shape of Nose Emitting Bats Without a Nose-Leaf - A Possible New Model for Nasal Sound Emission"
8:50 pm - 8:55 pm	Discussion
8:55 pm - 9:20 pm	**Khaleel Razak** (University of California, Riverside, USA) "Sound Localization Behavior and Cortical Mechanisms in the Pallid Bat (*Antrozous pallidus*)"
9:20 pm - 9:25 pm	Discussion

9:25 pm - 9:30 pm	General Discussion
Monday	
7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	**The Use of Toxins for Survival** Discussion Leader: **Harold Zakon** (The University of Texas at Austin, USA)
9:00 am - 9:10 am	Introduction by Discussion Leader
9:10 am - 9:40 am	**Michael Fox** (Virginia Tech Carilion Research Institute, USA) "Parasitic Infection Alters Inhibitory Neural Circuits in the Mammalian Brain"
9:40 am - 9:50 am	Discussion
9:50 am - 10:20 am	**Frederic Libersat** (Ben-Gurion University of the Negev, Israel) "Predatory Wasps Manufacture a Chemical Arsenal in Venom to Control the Behavior of Its Cockroach Prey"
10:20 am - 10:30 am	Discussion
10:30 am - 11:00 am	Coffee Break
11:00 am - 11:30 am	**Heather Eisthen** (Michigan State University, USA) "Tetrodotoxin: Beyond Survival to Sex and Symbiosis"
11:30 am - 11:40 am	Discussion
11:40 am - 12:10 pm	**Ashlee Rowe** (Michigan State University, USA) "Coevolution Between Scorpion Neurotoxins and Their Ion Channel Targets: Sensory and Neuromuscular Adaptations that Mediate Predator-Prey Interactions"
12:10 pm - 12:20 pm	Discussion
12:20 pm - 12:30 pm	General Discussion
12:30 pm - 1:30 pm	Group Photo / Lunch
1:30 pm - 4:30 pm	Free Time

3:00 pm - 4:00 pm	**Power Hour** *The GRC Power Hour is an optional informal gathering open to all meeting participants. It is designed to help address the challenges women face in science and support the professional growth of women in our communities by providing an open forum for discussion and mentoring.* Organizer: **Emma Coddington** (Willamette University, USA)
4:30 pm - 6:00 pm	**Poster Session**
6:00 pm - 8:00 pm	**Ballistic Behaviors: Catching Your Own Dinner or Avoiding Being Lunch** Discussion Leader: **William Heitler** (University of St. Andrews, United Kingdom)
6:00 pm - 6:10 pm	Introduction by Discussion Leader
6:10 pm - 6:50 pm	**Stefan Schuster** (University of Bayreuth, Germany) "Combining Speed and Complexity: Prey Catching in Archerfish"
6:50 pm - 7:00 pm	Discussion
7:00 pm - 7:40 pm	**Gregory Sutton** (University of Bristol, United Kingdom) "How Insects Use Muscles and Springs to Jump as Quickly as Possible"
7:40 pm - 7:50 pm	Discussion
7:50 pm - 8:00 pm	General Discussion
8:00 pm - 9:00 pm	Dinner
Tuesday	
7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	**"Survival of the Fittest": Evolution of Behaviors** Discussion Leader: **Kim Hoke** (Colorado State University, USA)
9:00 am - 9:10 am	Introduction by Discussion Leader
9:10 am - 9:50 am	**Christophe Dupre** (Columbia University, USA) "Temporal Structure in Two Behaviors of the Jellyfish *Hydra vulgaris*"

9:50 am - 10:00 am	Discussion
10:00 am - 10:35 am	Coffee Break
10:35 am - 11:15 am	**Jason Gallant** (Michigan State University, USA) "The Evolutionary Genomics of Electric Organs and Electric Signals"
11:15 am - 11:25 am	Discussion
11:25 am - 12:05 pm	**Daphne Soares** (New Jersey Institute of Technology, USA) "Cavefish Strategies for Success in Complete Darkness"
12:05 pm - 12:15 pm	Discussion
12:15 pm - 12:30 pm	General Discussion
12:30 pm - 1:30 pm	Lunch
1:30 pm - 4:30 pm	Free Time
4:30 pm - 6:00 pm	**Poster Session**
6:00 pm - 8:00 pm	**Vision: Seeing Your Predator or Prey** Discussion Leader: **Catherine Carr** (University of Maryland, USA)
6:00 pm - 6:10 pm	Introduction by Discussion Leader
6:10 pm - 6:50 pm	**Paloma Gonzalez Bellido** (University of Cambridge, United Kingdom) "The Visual Adaptations and Behavioural Strategies that Allow Miniature Flies to Detect and Catch Fleeting Prey"
6:50 pm - 7:00 pm	Discussion
7:00 pm - 7:40 pm	**William Mowrey** (Janelia Research Campus, Howard Hughes Medical Institute, USA) "Neural Models of Motion Extrapolation in Amphibian Prey Capture"
7:40 pm - 7:50 pm	Discussion
7:50 pm - 8:00 pm	General Discussion
8:00 pm - 9:00 pm	Dinner

Wednesday	
7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	**Social Behaviors** Discussion Leader: **Emma Coddington** (Willamette University, USA)
9:00 am - 9:10 am	Introduction by Discussion Leader
9:10 am - 9:50 am	**Ivan Rodriguez** (University of Geneva, Switzerland) "The Sick Sense Is in the Nose"
9:50 am - 10:00 am	Discussion
10:00 am - 10:35 am	Coffee Break
10:35 am - 11:15 am	**Mala Murthy** (Princeton University, USA) "Neural Mechanisms for Dynamic Acoustic Communication in *Drosophila*"
11:15 am - 11:25 am	Discussion
11:25 am - 12:05 pm	**Eric Fortune** (New Jersey Institute of Technology, USA) "When Brains Cooperate"
12:05 pm - 12:15 pm	Discussion
12:15 pm - 12:30 pm	General Discussion
12:30 pm - 1:30 pm	Lunch
1:30 pm - 4:30 pm	Free Time
4:30 pm - 6:00 pm	**Poster Session**
6:00 pm - 8:00 pm	**Neural Circuit Flexibility Underlying Behavioral Adaptation** Discussion Leader: **Felix Schweizer** (University of California, Los Angeles, USA)
6:00 pm - 6:10 pm	Introduction by Discussion Leader

6:10 pm - 6:50 pm	**Nathalie Rochefort** (University of Edinburgh, United Kingdom) "Behavioural State Modulation of Inhibition in Mouse Primary Visual Cortex"
6:50 pm - 7:00 pm	Discussion
7:00 pm - 7:40 pm	**John Simmers** (University of Bordeaux, France) "Adaptive Flexibility of Spinal Efference Copy and Gaze Control in Metamorphosing Frog"
7:40 pm - 7:50 pm	Discussion
7:50 pm - 8:00 pm	General Discussion
8:00 pm - 9:00 pm	Dinner
Thursday	
7:30 am - 8:30 am	Breakfast
8:30 am - 9:00 am	**Business Meeting** *Nominations for the Next Vice Chair; Fill in Conference Evaluation Forms; Discuss Future Site and Scheduling Preferences; Election of the Next Vice Chair*
9:00 am - 12:30 pm	**Neural Circuits Underlying Behaviors** Discussion Leader: **Keith Sillar** (University of St. Andrews, United Kingdom)
9:00 am - 9:10 am	Introduction by Discussion Leader
9:10 am - 9:50 am	**Denis Combes** (University of Bordeaux, France) "Developmental Plasticity of Locomotor and Respiratory Networks and Their Interaction During Frog Metamorphosis"
9:50 am - 10:00 am	Discussion
10:00 am - 10:35 am	Coffee Break
10:35 am - 11:15 am	**Abdel El Manira** (Karolinska Institute, Sweden) "Modular Microcircuits Underlying Gear Changes During Locomotion"

11:15 am - 11:25 am	Discussion
11:25 am - 12:05 pm	**Claire Wyart** (Brain and Spinal Cord Institute (ICM), France) "Light on an Ancestral Sensory Interface Linking Cerebrospinal Fluid to Motor Circuits in Vertebrates"
12:05 pm - 12:15 pm	Discussion
12:15 pm - 12:30 pm	General Discussion
12:30 pm - 1:30 pm	Lunch
1:30 pm - 4:30 pm	Free Time
4:30 pm - 6:00 pm	**Poster Session**
6:00 pm - 8:00 pm	**Migration and Navigation** Discussion Leader: **Eric Warrant** (Lund University, Sweden)
6:00 pm - 6:10 pm	Introduction by Discussion Leader
6:10 pm - 6:50 pm	**Steven Reppert** (University of Massachusetts Medical School, USA) "Neurobiology of Monarch Butterfly Migration"
6:50 pm - 7:00 pm	Discussion
7:00 pm - 7:40 pm	**Marie Dacke** (Lund University, Sweden) "Compass Orientation in Insects: Behavioural Responses and Underlying Neural Mechanisms"
7:40 pm - 7:50 pm	Discussion
7:50 pm - 8:00 pm	General Discussion
8:00 pm - 9:00 pm	Dinner
Friday	
7:30 am - 8:30 am	Breakfast
9:00 am	Departure

Contributors

Gordon Research Conferences	Carl Storm Underrepresented Minority Fellowship	Carl Storm International Diversity Fellowship
Predominantly Undergraduate Institution Fund (PUI)	NIH National Institutes of Health Turning Discovery Into Health	NSF
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