Introductory Remarks to Symposium 21

Behavioral decisions based on multimodal information

Basil el Jundi and Martin Strube-Bloss, Würzburg

Every animal on earth relies on sensory information from the outside world to make crucial behavioral decisions. In most cases, it is not enough to consider only one sensory information as basis for these decisions. Even for the most trivial tasks, different sensory inputs need to be combined and weighted in the brain to allow an animal to efficiently guide its next maneuver. For instance, we do not only rely on color information to choose which strawberry to pick but also consider shape, size, smell and even texture as reliable parameters for our decision. In a similar way, insects, such as honeybees or butterflies, need to combine different modalities to recognize their host plants. Even though there is a growing pool of studies showing how a wide range of insects deal with multimodal inputs from a behavioral perspective, there is still a clear gap in the current state of understanding of how these modalities are encoded in the brain. Can we identify common strategies used by insects to combine different sensory modalities irrespective of the behavioral context? For instance, do insects that show different orientation strategies [dung beetles (speaker 1, Marie Dacke) vs. ants (speaker 2, Markus Knaden)] integrate wind and visual or wind and olfactory information differently? Which celestial cues can be used by ants during learning walks to calibrate an internal compass (speaker 3, Robin Grob), and which modalities do insects use to measure distance during foraging (speaker 4, Matthias Wittlinger)? How are two modalities, such as visual and mechanosensory information, combined in a different context, such as when a moth is hovering in front of its host plant (speaker 5, Simon Sponberg)? During all these navigation tasks, the insect does not only need to integrate cues from the external world but to keep track of its own body movements. But how does an insect process proprioceptive information (speaker 6, Arne Gollin)?
In this symposium, we will bring together behavioral physiologists, engineers, and electrophysiological investigators to understand how behavior and brain activity are linked to allow an animal to make solid decisions based on multimodal sensory information.

Symposium 21

Friday, March 22, 2019
11:30 - 13:30, Lecture Hall 9

Chairs: Basil el Jundi and Martin Strube-Bloss, Würzburg

11:30 Marie Dacke, Lund, Sweden
AS THE CRAW FLIES AND THE BEETLE ROLLS: STRAIGHT-LINE ORIENTATION FROM BEHAVIOUR TO NEURONS (S21-1)

11:55 Markus Knaden, Jena
DESERT ANT NAVIGATION BY OLFACTORY AND VISUAL CUES (S21-2)

12:20 Robin Grob, Würzburg
COMPASS SYSTEMS DURING ANT LEARNING WALKS: THE ROLE OF CELESTIAL CUES FOR INITIAL COMPASS CALIBRATION IN CATAGLYPHIS ANTS (S21-3)

12:30 Matthias Wittlinger, Freiburg
MULTIMODAL ODOMETRY IN NAVIGATING CATAGLYPHIS DESERT ANTS (S21-4)

12:55 Simon Sponberg, Atlanta, USA
TIMING, MULTIMODAL INTEGRATION, AND COORDINATION IN THE NEURAL CONTROL OF AGILE FLIGHT IN LOW LIGHT (S21-5)

13:20 Arne Gollin, Bielefeld
ESTIMATING BODY PITCH FROM DISTRIBUTED PROPRIOCEPTION: ON THE ROLE OF AFFERENT NUMBER AND DISTRIBUTION (S21-6)