



## Introductory Remarks to Symposium 32

# Hearing system adaptation for diverse lifestyles across the animal kingdom

*Manuela Nowotny and Stefan Schöneich, Frankfurt/Main and Leipzig*

Hearing is essential for central aspects of the lifestyle in many animals, e.g. for mate finding, predator avoidance or prey detection. This symposium will present latest research on how the ears and auditory pathways in different animals are adapted to the special demands and challenges that come with the behaviours of their specific lifestyles. Jan Clemens will present new results on an auditory feature detector that drives male and female behavioural responses to the mating song in fruit flies. By combining behavioural quantification, 2-photon calcium imaging and optogenetic techniques, he and his collaborators identified a cluster of neurons in the *Drosophila* brain that recognizes a specific song mode. Manuela Nowotny will explain how the extensive overrepresentation of a narrow frequency band (auditory fovea) in a bushcricket ear can improve neuronal detection of conspecific mating calls. Hannah ter Hofstede will review bat detection strategies in insects and provide examples of auditory adaptations in moths and katydids for hearing bat echolocation calls. The number and diversity of insects that have ears, tuned to the echolocation calls of bats demonstrates the enormous selection pressure that these predators exert on these insects. Christine Köppl will talk about nocturnal hunting specialization in barn owls. Her talk will give an overview and then focus specifically on the inner ear (basilar papilla) with its auditory fovea and the associated massive neural overrepresentation of a behaviourally salient frequency band. In a comparative approach that draws its examples from research in invertebrate and vertebrate organisms, the 4 main talks and two short presentations by student researchers in this symposium will highlight a variety of adaptations in hearing organs and neural auditory processing in different animals that are specialists for very different auditory behaviours.

## Symposium 32

Saturday, March 23, 2019  
8:30 - 10:30, Lecture Hall 102

Chairs: Manuela Nowotny and Stefan Schöneich,  
Frankfurt/Main and Leipzig

- 08:30 Jan Clemens, Göttingen  
ACOUSTIC COMMUNICATION IN THE WILD -  
A SHARED SONG FEATURE DETECTOR DRIVES  
MALE AND FEMALE RESPONSES TO SONG  
IN *DROSOPHILA* (S32-1)
- 08:55 Manuela Nowotny, Frankfurt/Main  
TALK TO ME DARLING - NEURONAL ADAPTA-  
TIONS FOR INTRASPECIFIC COMMUNICATION  
IN THE BUSHCRICKET EAR (S32-2)
- 09:20 Hannah M. ter Hofstede, Hanover, USA  
AUDITORY ADAPTATIONS FOR DETECTING  
ECHOLOCATING PREDATORS IN MOTHS AND  
KATYDIDS (S32-3)
- 09:45 Christine Köppl, Oldenburg  
DEATH ON SILENT WINGS - ADAPTATIONS  
FOR SOUND LOCALIZATION IN THE BARN  
OWL (S32-4)
- 10:10 Lina Maria Jaime Tobon, Göttingen  
UNDERSTANDING SOUND ENCODING:  
CORRELATION OF RESPONSE PROPERTIES  
OF AFFERENT INNER HAIR CELL SYNAPSES AT  
NEAR PHYSIOLOGICAL CONDITIONS (S32-5)
- 10:20 Ajayrama Kumaraswamy, Martinsried  
ADAPTATIONS IN AN IDENTIFIED HONEYBEE  
AUDITORY INTERNEURON RESPONSIVE TO  
WAGGLE DANCE VIBRATION SIGNALS (S32-6)