

SEEWIESEN

LECTURE SERIES

FALL/WINTER/SPRING 2019/20



MAX PLANCK
GESELLSCHAFT



THURSDAY | February 6th, 2020 | 13.00 | HOUSE 4 LECTURE ROOM

MANUELA NOWOTNY

University of Jena | Host: Goerlitz Research Group

Processing of auditory signals in bushcrickets – from behaviour to neuronal encoding

Successful acoustic communication requires sender (sound production) and receiver (sound perception) to be attuned. With more than 7000 species, bushcrickets are a highly diverse group with a remarkable variability in their acoustic behaviours that often show asymmetrical signalling between males and females. In our comparative studies we examined sound production and sound perception in different bushcricket species to investigate if sex-specific signalling differences are also reflected in the morphological structures and physiological responses of the hearing organs. Our anatomical, biomechanical and neurophysiological data revealed pronounced and behaviourally relevant differences in the sender and receiver structures in the two different species. Furthermore, we discovered a sex-specific auditory fovea in the ears of male *Ancylecha fenestrata* that is tuned to the dominant frequency of the female call. Population coding by similarly tuned afferent projections from the ears may provide hyperacute temporal signal information, which is currently under further investigation.

WHO IS MANUELA NOWOTNY?

2005	PostDoc ENT clinic Eberhard Karls University Tübingen, Germany
2007	Group Leader, Goethe University Frankfurt, Germany
2019	Heisenberg Professor of Animal Physiology, Friedrich-Schiller University Jena, Germany

SELECTED PUBLICATIONS

- Olson ES, Nowotny M 2019. Experimental and Theoretical Explorations of Traveling Waves and Tuning in the Bushcricket Ear. *Biophys J.* 116(1):165-177.
- Scherberich J, Hummel J, Schöneich S, Nowotny M 2017. Functional basis of the sexual dimorphism in the auditory fovea of the duetting bushcricket *Ancylecha fenestrata*. *Proc Biol Sci.*;284(1865).
- Scherberich J, Hummel J, Schöneich S, Nowotny M* 2016. Auditory fovea in the ear of a duetting katydid shows male-specific adaptation to the female call. *Curr Biol.* 26(23):R1222-R1223.
- Hummel J, Schöneich S, Kössl M, Scherberich J, Hedwig B, Prinz S, Nowotny M* 2016. Gating of Acoustic Transducer Channels Is Shaped by Biomechanical Filter Processes. *J Neurosci.* 36(8):2377-2382.
- Palghat Udayashankar A, Kössl M, Nowotny M* 2012. In-vivo measurements of tonotopically ordered traveling waves. *PLoS One.* 7(2): e31008.

CO-ORDINATOR Nicole Fritz | nicole.fritz@orn.mpg.de | 08157 - 932 240