



Seewiesen Colloquia

Speaker invited by: Henrik Brumm

Thursday, 17. October 2013, 13h, in House 4, Lecture
**The “biological microphone” approach to study
the sensory ecology of hearing and acoustic interference in insects.**

Prof. Heiner Römer
Zoology, Karl-Franzens-University, Graz, Austria

Sound signals of insects are used for mate attraction and in competitive interactions. Acoustic communication often takes place in multi-species choruses, where acoustic interference is a common problem. In addition, their ears are also used for predator detection, so that the detection and discrimination of predators and mates is not an easy task under such conditions. The acoustic scene relevant for a receiver at a given location may be studied using microphones, but technical receivers differ strongly in their sensitivity, frequency bandwidth, directionality and temporal integration from insect ears. Thus both placed at the same spot in a chorus would tell us different results. We therefore developed a “biological microphone”, a portable neurophysiological set-up which allows single cell recording of the activity of auditory interneurons in the actual environment. We thus listen through the ears of the insect, and can study the representation of a complex acoustic scene in the insect’s brain. In my talk I will demonstrate how this approach allows studying various important questions regarding the sensory ecology of insects.

Who is Heiner Römer?

- 1976: PhD at the Institute of Zoology, Ruhr-University Bochum
- 1986: Habilitation and „Venia legendi“ in Zoology
- 1987: Heisenberg-Research fellow of the DFG
- 1992: Full Professor for Zoology at Department of Zoology, University of Graz

Selected publications:

- Rheinlaender, J., H. Römer (1986) Insect hearing in the field. I. The use of identified nerve cells as „biological microphones“. *J Comp Physiol* 158: 647-651
- van Staden MJ, Römer H (1998) Evolutionary transition from stretch to hearing in ancient grasshoppers. *Nature* 394: 773-776
- Schmidt AKD, Römer H, (2011) Solutions to the Cocktail Party Problem in Insects: Selective Filters, Spatial Release from Masking and Gain Control in Tropical Crickets. *PLoS ONE* 6(12): e28593.
- Pfeiffer M., Hartbauer M., Lang A.B., Maass W. and Römer H. (2012) Probing real sensory worlds of receivers with unsupervised clustering. *PLoS ONE* 7 (6):e37354. doi:10.1371/journal.pone.0037354
- Schmidt AKD, Römer H, Riede K, (2012): Spectral niche segregation and community organization in a tropical cricket assemblage. *Behav Ecol* doi:10.1093/beheco/ars187