

## Kolloquium der TF am 03.02.2014

Sehr geehrte Damen und Herren,

wir laden Sie herzlich zum Kolloquium der TF am **03.02..2014 um 17:15 Uhr** ein. Auf Einladung von *Herrn Prof. Dr. H. Kohlstedt* hält

**Prof. Dr. Dr. h.c. Randolph Menzel**  
**Freie Universität Berlin**  
**Institut f. Biologie - Neurobiologie**

einen Vortrag mit dem Titel:

### **„Neural circuits related to associative learning in the honeybee brain“**

Honeybees have a tiny brain but their cognitive functions are impressive. They navigate according to a map like memory structure of the explored environment and communicate about locations. We are searching for neural correlates of learning, memory formation and memory retrieval. Currently the focus lies on olfactory associative learning, but we are setting out to explore to neural correlate of spatial memory. I shall give an introduction to honeybee biology, navigation, communication and social life. Then I will present data on the organization of the honeybee brain. The neural studies will focus on the mushroom body, a high order integration center of the bee brain. The memory trace at the input side of the mushroom body is characterized by high order combinatorial integration across multiple sensory inputs. Presynaptic boutons of olfactory projection neurons are modulated in their responses to the rewarded olfactory stimuli in a behavioral learning related fashion. Intrinsic neurons of the MB code sensory stimuli in a sparse way both in the temporal domain and on the population level. Learning leads to enhancement, reduction and recruitment of intrinsic neurons changing the sensory code at the individual neuron and population level. MB extrinsic neurons lose their sensory coding properties and appear to represent the acquired values of the learned stimuli. Specifically, extrinsic neurons of the MB may encode learned cues and contexts differently. Memory processing is exemplified by rate changes in an inhibitory recurrent pathway that peak at discrete time windows over three days. Thus MB extrinsic neurons provide neural commands for goal directed behavior and decision making. Furthermore, information stored in the MB and/or extrinsic neurons depends on consolidation processes over the range of days. A model will be presented that aims to capture the multi-faceted and distributed nature of the engram and may help to guide our future search of the engram at a neural systems level.

**Veranstaltungsort ist wie immer der Vortragsraum der Technischen Fakultät („Aquarium“) im Gebäude D, Kaiserstraße 2, 24143 Kiel. Wir erwarten eine interessante Veranstaltung und freuen uns über Ihr Erscheinen.**

Mit freundlichen Grüßen  
i.A. Claudia Martin