ELSC Seminar: Lars Chittka- Mar. 23rd, 2017 at 17:00

March 23, 2017

Are Bigger Brains Better?

ELSC cordially invites you to the lecture given by:

Lars Chittka
School of Biological & Chemical Sciences, Mile End Campus, London

On the topic of:

"Are Bigger Brains Better"

The lecture will be held on Thursday March 23rd, 2017 at 17:00

at ELSC: Silberman Bldg., 3rd Wing, 6th Floor,

Edmond J. Safra Campus

Light refreshments served at 16:45

Abstract:
Attempts to relate brain size to behaviour and cognition have rarely integrated information from insects with that from vertebrates. Bees display visual-cognitive capacities that in some views conform to the basic criteria of concept learning, attention, sensitivity to number and metacognition. This raises the obvious question of how such capacities may be implemented at a neuronal level in the miniature brains of insects. We need to understand the neural circuits, not just the size of brain regions, which underlie these feats. Neural network analyses show that cognitive features found in insects, such as numerosity, attention and categorisation-like processes, may require only very limited neuron numbers. Using computational models of the bees' visual system, we explore whether seemingly advanced cognitive capacities might 'pop out' of the properties of relatively basic neural processes in the insect visual periphery, and their connection with the mushroom bodies, higher order learning centres in the brains of insects. Larger brains are, at least partly, a consequence of larger neurons that are necessary in large animals due to basic biophysical constraints. They also contain greater replication of neuronal circuits, adding precision to sensory processes, detail to perception, more parallel processing and enlarged storage capacity. Yet, these advantages are unlikely to produce the qualitativeshifts in behaviour that are often assumed to accompany increased brain size. Instead, modularity and interconnectivity may be more important.

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