Amoth: *A Fleet of Artificial Chemosensing Moths for Distributed Environmental Monitoring*

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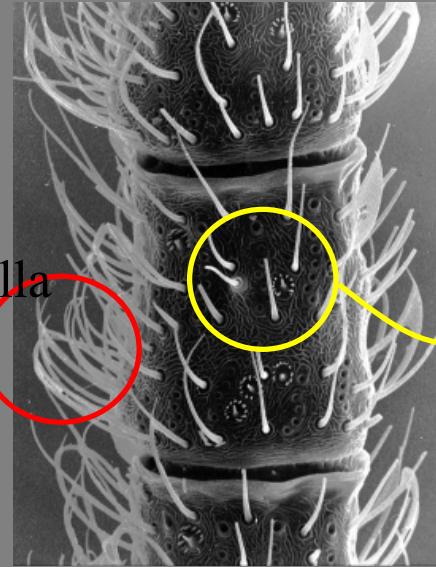# Overview

- Moths, olfaction and machines

- Overview progress WP 1-4

- Future directions
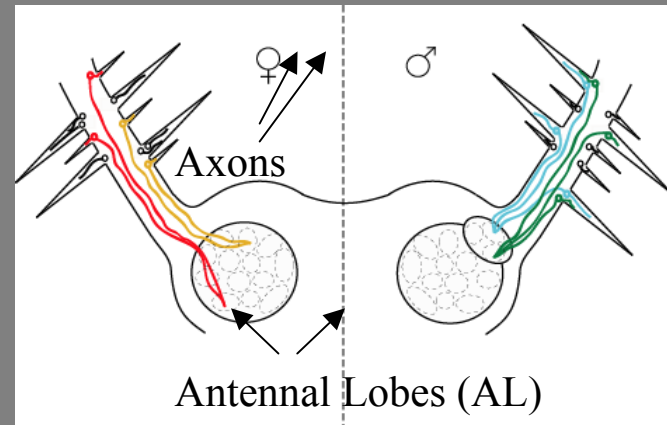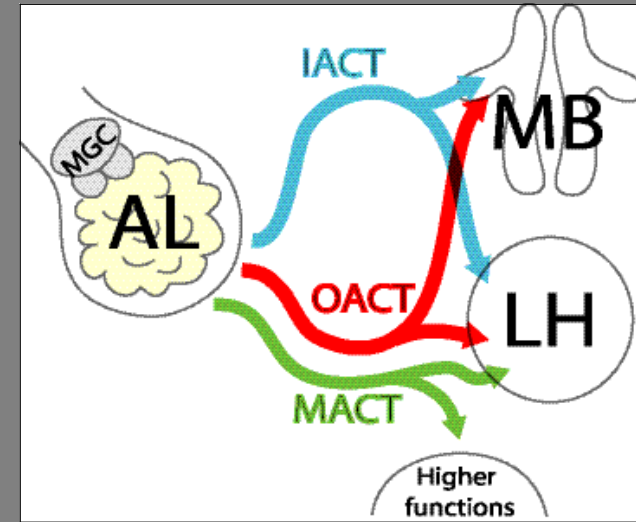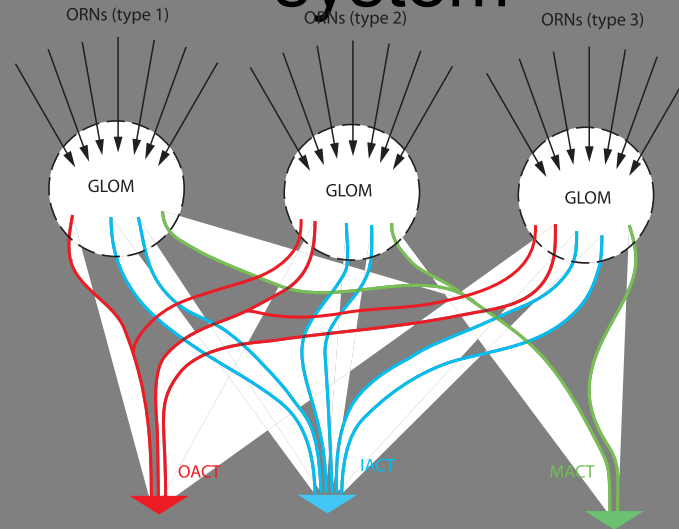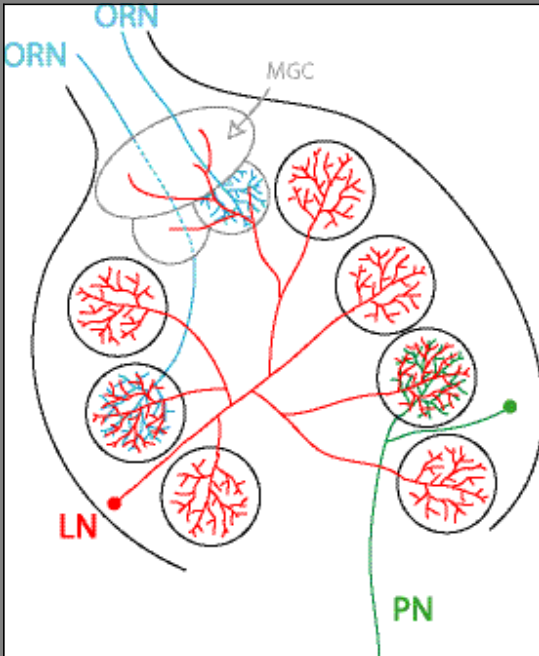 Goal:

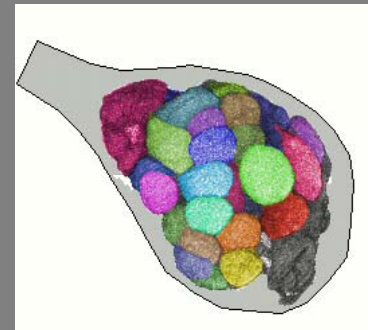# Moth olfaction: periphery
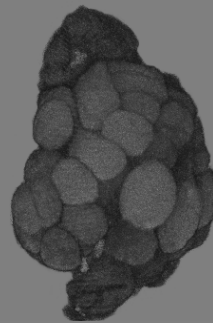
Long Sensilla
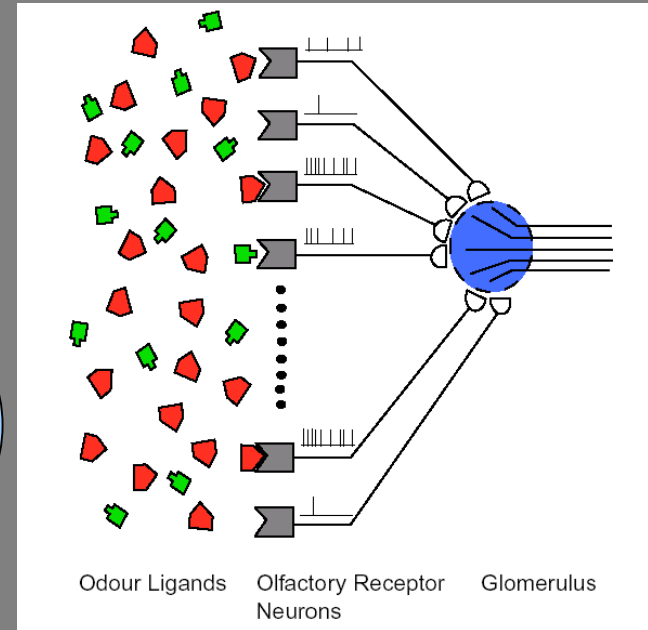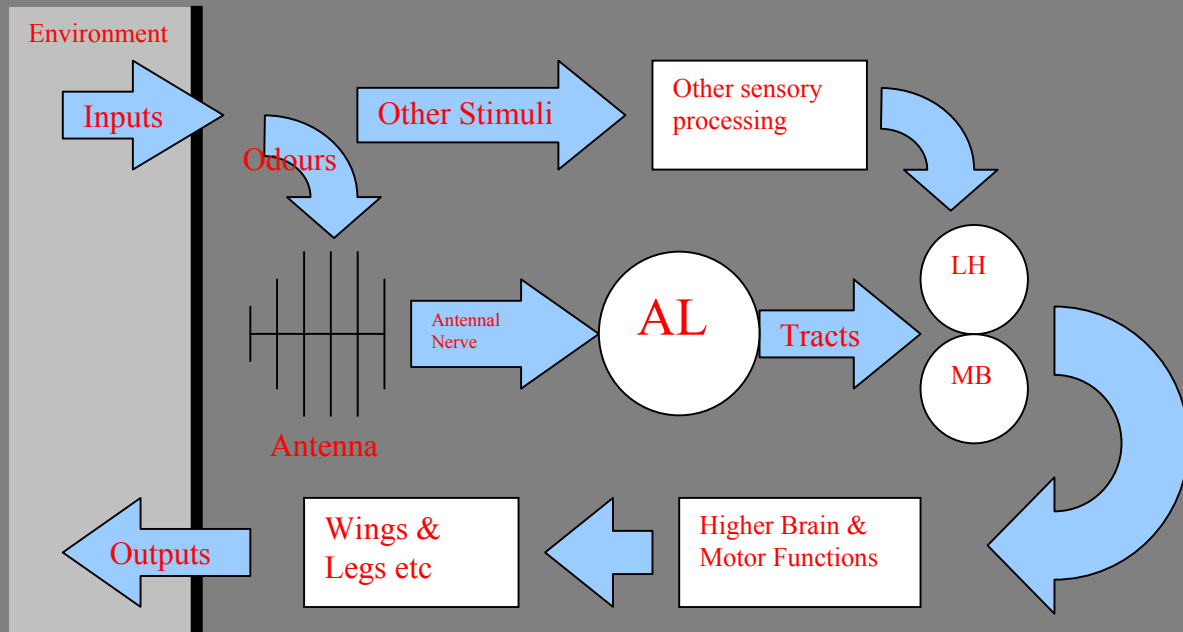
Short Sensil

WP1,2

Axons

Antennal Lobes (AL)

The organization of the
Antennal Lobe (AL) and Mushroom Body (MB)
system

WP2,3

The problem of sensory encoding and behavioural control

Environment

Inputs

Odours

Other Stimuli

Other sensory processing

Antennal Nerve

AL

Tracts

LH

MB

Antenna

Wings & Legs etc

Higher Brain & Motor Functions

Outputs

Odour Ligands

Olfactory Receptor Neurons

Glomerulus

WP 1,2,3
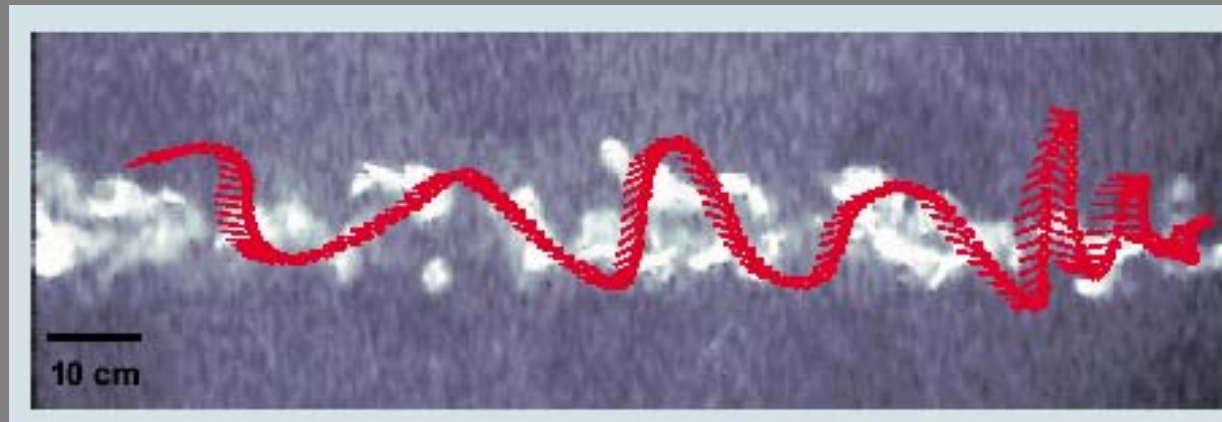
$SNR = \sqrt{n}$

Olfactory search is opto-motoric anemotactic
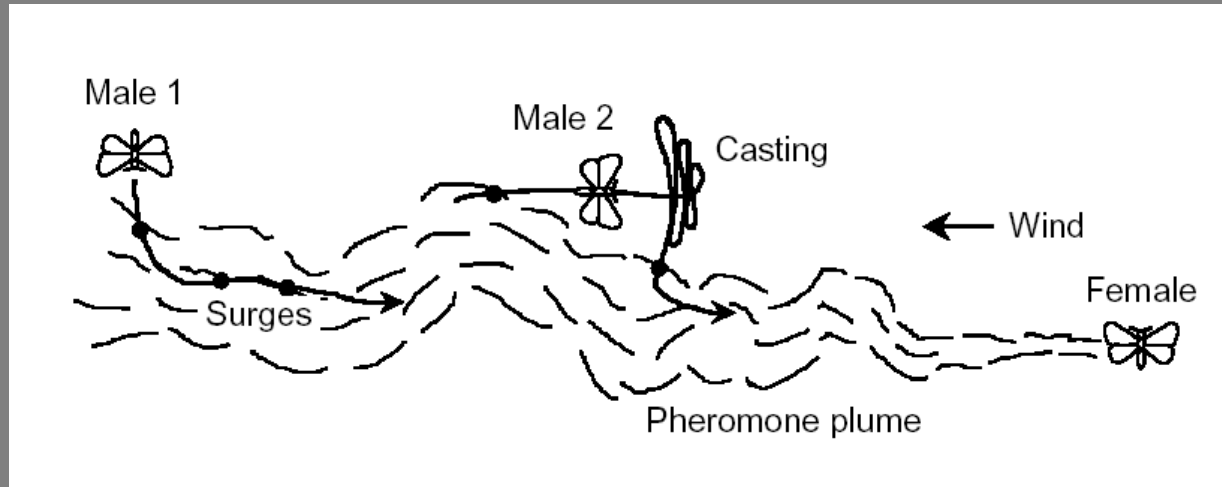
Ishida & Morrizumi, Handbook of Machine Olfaction, Pearce, Schiffman, Nagle, Gardner,(eds.) Wiley-VCH, 2002.

WP 3

Courtesy of J. Hildebrand

Chemo-sensors: thin-film sensor technology

• Low power consumption;   WP 4
• Sensor array miniaturisation;
• Selectivity optimisation with geometry effect, dopant variations, change in operating conditions.
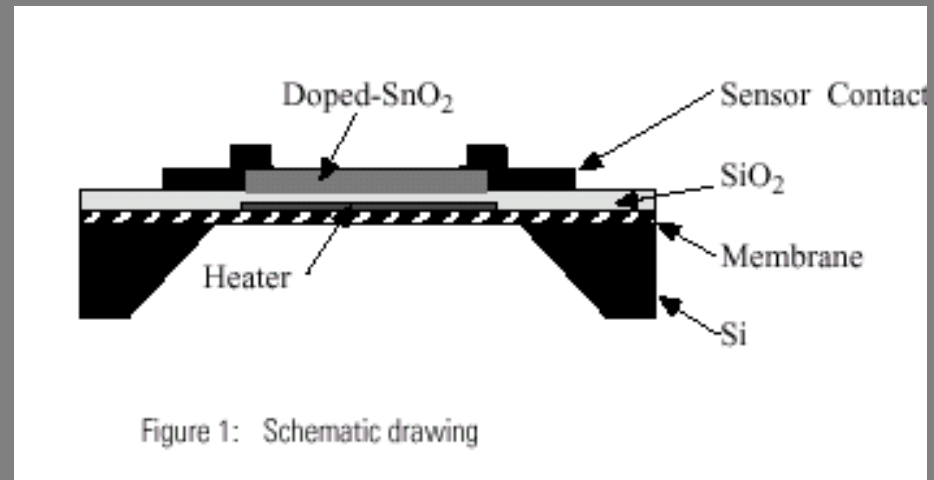

Doped-SnO$_2$ Sensor Contact

SiO$_2$

Heater   Membrane

Si

Figure 1:   Schematic drawing