



**TIFR Centre for Interdisciplinary Sciences,
Narsingi, Hyderabad 500075**

Seminar

**Revealing neural mechanisms of information
processing using a simple brain**

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The remarkable capabilities organized by the brain—from seeing to singing, from remembering to running—originate in the electrical activities of neurons. Neurons interact with each other forming circuits, which process sensory information and drive appropriate behaviors. I am interested in understanding the fundamental mechanisms used by neural circuits for processing information. The insect olfactory system (sense of smell) provides an ideal testbed because of its simple organization, rich behavior, and amenability to *in vivo* experiments. I will describe our recent work using this system and the tools of electrophysiology, imaging, and computational simulations for studying circuit properties, such as inhibition and oscillatory synchronization. I will also describe new experiments testing whether the precise timing of neural activity, at the scale of tens of milliseconds, carries useable information in the responses of relatively quiet neurons. I will end by outlining new directions for my future work, in which I plan to explore how information from different senses is combined, how information from the two sides of the body is compared, and how behavioral preferences to sensory stimuli are encoded in the brain.

Friday, Feb 7th 2014

4:00 PM (Tea/Coffee at 3:30 PM)

Seminar Hall, TCIS